

Publish date: 03.11.2021

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# Climate-related Disclosures Prototype

## Supplement: Technical Protocols for Disclosure Requirements

Developed by the Technical Readiness Working Group, chaired by the IFRS Foundation, to provide recommendations to the International Sustainability Standards Board for consideration

November 2021



**Climate-related disclosures prototype supplement - technical protocols for disclosure requirements** **Copyright Notice:** *This publication contains copyright material, reprinting selections from the Value Reporting Foundation's SASB Standards, ©2021 SASB, part of the Value Reporting Foundation, all rights reserved. Enquire about licensing at [licensing@sasb.org](mailto:licensing@sasb.org)*

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## APPAREL, ACCESSORIES & FOOTWEAR

### Industry Description

The Apparel, Accessories & Footwear industry includes companies involved in the design, manufacturing, wholesaling, and retailing of various products, including men’s, women’s, and children’s clothing, handbags, jewelry, watches, and footwear. Products are largely manufactured by vendors in emerging markets, thereby allowing companies in the industry to primarily focus on design, wholesaling, marketing, supply chain management, and retail activities.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Raw Materials Sourcing	Description of environmental and social risks associated with sourcing priority raw materials	Discussion and Analysis	n/a	CG-AA-440a.1
	Percentage of raw materials third-party certified to an environmental and/or social sustainability standard, by standard	Quantitative	Percentage (%) by weight	CG-AA-440a.2

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of (1) Tier 1 suppliers and (2) suppliers beyond Tier 1 <sup>1</sup>	Quantitative	Number	CG-AA-000.A

<sup>1</sup> Note to CG-AA-000.A – Tier 1 suppliers are defined as suppliers that transact directly with the entity, such as finished goods manufacturers (e.g., cut and sew facilities). Suppliers beyond Tier 1 are the key suppliers to the entity’s Tier 1 suppliers and can include manufacturers, processing plants, and providers of raw materials extraction (e.g., mills, dye houses and washing facilities, sundry manufacturers, tanneries, embroiderers, screen printers, farms, and/or slaughter houses) The entity shall disclose whether any supplier data beyond Tier 1 is based on assumptions, estimates, or otherwise includes any uncertainty.

# Raw Materials Sourcing

## Topic Summary

The Apparel, Accessories & Footwear industry relies on numerous raw materials as key inputs for finished products, including cotton, leather, wool, rubber, and precious minerals and metals. Sustainability impacts related to climate change, land use, resource scarcity, and conflict in regions where the industry's supply chain operates are increasingly shaping the industry's ability to source materials. The ability of companies to manage potential materials shortages, supply disruptions, price volatility, and reputational risks is made more difficult by the fact that they source materials from geographically diverse regions through supply chains that often lack transparency. Failure to effectively manage this issue can lead to reduced margins, constrained revenue growth, and/or higher costs or capital. The types of risk associated with sourcing different materials can require different solutions, including engaging with suppliers, enhancing transparency, using certification standards, and/or using innovative alternative materials. Companies that are most proactive are likely to reduce their exposure to price volatility and potential supply disruptions, while improving their brand reputation and developing new market opportunities.

## Accounting Metrics

### **CG-AA-440a.1. Description of environmental and social risks associated with sourcing priority raw materials**

- 1 The entity shall discuss its strategic approach to managing environmental and social risks that arise from sourcing priority raw materials (disclosure corresponds to the Sustainable Apparel Coalition's Higg Brand & Retail Module (BRM)).
  - 1.1 Priority raw materials are defined as those that are essential to the entity's principal products, where principal products are those that accounted for 10 percent or more of consolidated revenue in any of the last three fiscal years, consistent with 17 CFR 229.101.
- 2 Disclosure shall include the methodology of how the entity identified priority raw materials.
- 3 Raw materials include synthetic fibers and fabrics, natural fibers and fabrics, cellulosic materials, materials derived from animals, and any other materials used directly to make apparel, accessories, or footwear products, including, but not limited to:
  - 3.1 Cotton, rayon, polyester, acrylic, spandex, nylon, rubber, leather, wool, flax, silk, hemp, and down
- 4 The entity shall disclose the priority raw materials that comprise its products regardless of whether the entity purchased the materials directly or its suppliers purchased the materials.
- 5 Environmental supply chain risks include, but are not limited to:
  - 5.1 Climate change impacts (e.g., changing temperatures and/or water stress) on natural fiber crop production that may affect their price and availability

- 5.2 Legislation on greenhouse gases (GHG) affecting the price of petroleum which may affect the price of petroleum-derived raw materials
  - 5.3 Tightening environmental regulations for suppliers that could affect the cost or availability of raw materials they supply
  - 5.4 Lack of full traceability to the source of the raw materials, which may hinder the ability to identify compliance incidents that could lead to negative effects on brand reputation
  - 5.5 Improper land use practices within the supply chain that may affect the yield of natural fiber raw materials
  - 5.6 Other environmental factors that may have an impact on the entity's ability to source raw materials for its products
- 6 Social supply chain risks include, but are not limited to:
- 6.1 Suppliers' animal welfare, labor, and human rights practices that may affect the entity's reputation
  - 6.2 Sourcing materials from regions of conflict which may affect the price and availability of raw materials
- 7 If the entity identifies cotton as one of its priority raw materials, it shall discuss its vulnerability to cotton-growing regions with water stress and how it manages the risk of price variability due to sourcing cotton from these regions.
- 7.1 The entity may identify its known sources of cotton for High (40—80%) or Extremely High (>80%) Baseline Water Stress using the World Resources Institute's (WRI) Water Risk Atlas tool, Aqueduct.
- 8 The entity shall discuss its approach to managing risks associated with the use of raw materials in its products, including physical limits on availability, access, price, and reputational risks.
- 8.1 Relevant strategies to discuss include: due diligence practices, supply chain auditing, partnerships with industry groups or nongovernmental development organizations, using substitute materials, research and development into materials with less environmental or social risks, supplier diversification, implementing supply chain codes of conduct, training or engagement programs, supplier audits and/or certifications, and research into the full traceability of material sources, among other strategies.

**CG-AA-440a.2. Percentage of raw materials third-party certified to an environmental and/or social sustainability standard, by standard**

- 1 The entity shall disclose the percentage of raw materials that are third-party certified to an environmental or social sustainability standard.
  - 1.1 Environmental and social sustainability standards are defined as standards that address environmental and social impacts that result from the primary sourcing of raw materials, such as standards for organic or recycled content, animal welfare, and/or fair labor.
  - 1.2 Environmental and social sustainability standards include, but are not limited to:
    - 1.2.1 Outdoor Industry Association's Content Claim Standard (CCS)

- 1.2.2 Textile Exchange's Recycled Claim Standard, Global Recycled Standard, Organic Cotton Standard, and Responsible Down Standard
  - 1.2.3 Certified Organic
  - 1.2.4 Control Union Global Organic Textile Standard
  - 1.2.5 Better Cotton Initiative
  - 1.2.6 Forestry Stewardship Council certification (for lyocell and rubber)
  - 1.2.7 Rainforest Alliance leather products
  - 1.2.8 Global Organic Textile Standard
  - 1.2.9 STeP by OEKO-TEX®
  - 1.2.10 OEKO-TEX® Standard 100
  - 1.2.11 ECO PASSPORT
  - 1.2.12 Cradle to Cradle
  - 1.2.13 Bluesign
- 1.3 The entity shall calculate the percentage as the weight of raw materials third-party certified to an environmental and/or social standard divided by the total weight of raw materials that compose the entity's finished products.
- 1.3.1 The scope of raw materials third-party certified to an environmental and/or social standard includes raw materials derived using a process third-party certified to an environmental and/or social standard.
  - 1.3.2 The scope of disclosure includes third-party certifications that are based on environmental best practices, social best practices, or both.
- 2 The entity shall disclose the percentage of raw materials third-party certified to an environmental or social sustainability standard, by standard.
- 2.1 The entity shall calculate the percentage as the weight of raw materials that are certified to each respective third-party environmental and/or social standard divided by the total weight of raw materials that compose the entity's finished products.
- 3 The entity may discuss its use of other sustainable materials that may not be third-party certified, but may demonstrate an environmental lifecycle benefit, and fibers such as reclaimed cotton and wool, mechanically or chemically recycled polyester, nylon, and lyocell.



## APPLIANCE MANUFACTURING

### Industry Description

The Appliance Manufacturing industry includes companies involved in the design and manufacturing of household appliances and hand tools. The industry sells and manufactures products around the world, primarily selling products to consumers through retail locations.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Product Lifecycle Environmental Impacts	Percentage of eligible products by revenue certified to the ENERGY STAR® program	Quantitative	Percentage (%) by revenue	CG-AM-410a.1
	Percentage of eligible products certified to an Association of Home Appliance Manufacturers (AHAM) sustainability standard	Quantitative	Percentage (%) by revenue	CG-AM-410a.2
	Description of efforts to manage products' end-of-life impacts	Discussion and Analysis	n/a	CG-AM-410a.3

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Annual production <sup>2</sup>	Quantitative	Number of units	CG-AM-000.A

<sup>2</sup> Note to CG-AM-000.A – Production shall be disclosed as the number of units produced by product category, where relevant product categories may include small appliances and major appliances.

# Product Lifecycle Environmental Impacts

## Topic Summary

Companies in the Appliance Manufacturing industry are constantly seeking to differentiate their products from those of their competitors. One key differentiating factor is the environmental impact of products over their lifecycle, which is often associated with the cost of using appliances. This issue involves a company's ability to design products with the entire lifecycle in mind, from creation and use to disposal. In particular, this covers energy and water efficiency in appliances, which account for a significant proportion of a home's energy and water use, as well as designing for and facilitating safe end-of-life disposal and recycling. Companies that prioritize designing and manufacturing products with improved environmental impacts are more likely to grow consumer demand and market share. Furthermore, companies that are able to minimize the environmental impacts of products are more likely to be better positioned to increased regulation related to areas such as extended producer responsibility.

## Accounting Metrics

### **CG-AM-410a.1. Percentage of eligible products by revenue certified to the ENERGY STAR® program**

- 1 The entity shall disclose the percentage of its revenue from eligible products certified to the U.S. Environmental Protection Agency (EPA) ENERGY STAR® program.
  - 1.1 Eligible products are those in a product category for which ENERGY STAR® certification exists, including the following appliance and heating and cooling product categories: air purifiers, clothes dryers, clothes washers, dehumidifiers, dishwashers, freezers, refrigerators, air conditioning, boilers, ductless heating and cooling, furnaces, heat pumps, and ventilation fans.
  - 1.2 The entity shall calculate the percentage as the revenue from products meeting the requirements for ENERGY STAR® certification divided by total revenue from products eligible for ENERGY STAR® certification.
- 2 The scope of disclosure includes products that meet the requirements of the most current version of the applicable ENERGY STAR® certification requirements.
  - 2.1 If the entity has products certified to a previous version of ENERGY STAR® certification requirements, it shall disclose this information, including to which version its products are certified, a breakdown of how many products are certified to that version, and its timeline(s) for achieving certification to the most current version of the requirements.

### **CG-AM-410a.2. Percentage of eligible products certified to an Association of Home Appliance**

## **Manufacturers (AHAM) sustainability standard**

- 1 The entity shall disclose the percentage of its revenue from eligible products certified to an [Association of Home Appliance Manufacturers \(AHAM\) sustainability standard](#).
  - 1.1 Eligible products are those addressed by the scope of an AHAM sustainability standard.
  - 1.2 The entity shall calculate the percentage as the revenue from products certified to an AHAM sustainability standard divided by total revenue from products eligible for certification to an AHAM sustainability standard.
- 2 The scope of disclosure includes, but is not limited to, products certified to the following AHAM sustainability standards:
  - 2.1 ANSI/AHAM 7001.2-2015: Sustainability Standard for Household Refrigeration Appliances
  - 2.2 AHAM 7002-2014: Sustainability Standard for Household Portable and Floor Care Appliances
  - 2.3 ANSI/AHAM 7003-2016: Sustainability Standard for Household Clothes Washers
  - 2.4 ANSI/AHAM 7004-2018: Sustainability Standard for Household Cooking Appliances
  - 2.5 ANSI/AHAM 7005-2017: Sustainability Standard for Household Clothes Drying Appliances
  - 2.6 ANSI/AHAM 7006.2-2018: Sustainability Standard for Household Room Air Conditioning Appliances-Second Edition
  - 2.7 AHAM 7007-2017: Sustainability Standard for Household Microwave Oven Appliances
  - 2.8 AHAM 7008-2018: Sustainability Standard for Household Dehumidifier Appliances
- 3 Additions or updates to the scope of AHAM sustainability standards and/or eligible products addressed therein constitute additions to the scope of this disclosure.

## **CG-AM-410a.3. Description of efforts to manage products' end-of-life impacts**

- 1 The entity shall describe its efforts to manage the end-of-life impacts of its products, including those related to safe and proper disposal or recycling of constituent chemicals and other product components, including, but not limited to, toxic heavy metals (e.g., mercury, cadmium), rigid polymers, refrigerants, and other metals (e.g., steel and aluminum).
- 2 The entity shall describe the scope of its efforts, including to which product categories, business segments, and/or operating regions they relate.
- 3 The entity shall discuss how it incorporates end-of-life considerations into the design of its product(s) such as:
  - 3.1 Use of materials that are easily and commonly recyclable in existing recycling infrastructure
  - 3.2 Eliminating or minimizing the use of hazardous materials or materials that may otherwise pose environmental harm upon disposal (e.g., refrigerants with ozone depleting potential and/or global warming potential)
  - 3.3 Designing products for disassembly (i.e., designing products so they can be easily, rapidly, and cost-effectively disassembled with commonly available tools)
  - 3.4 Proper labeling of products and their component materials to facilitate disassembly and recycling
- 4 The entity shall discuss its participation in extended producer responsibility (EPR) initiatives, including the following aspects:

- 4.1 Whether the entity directly conducts product take-back, recovery, and recycling or if the entity supports infrastructure for product recovery and recycling through joint ventures, partnerships with retailers and others, or by funding research into recycling technologies
- 4.2 Whether the initiative is voluntary or mandatory (e.g., in order to maintain compliance with EU Directive 2012/19/EU on waste electrical and electronic equipment (WEEE) or the Japan home appliance recycling law)
- 4.3 Relevant performance measures or targets for the initiative such as the total amount of material recovered and the total amount of material recycled

## BUILDING PRODUCTS & FURNISHINGS

### Industry Description

The Building Products & Furnishings industry comprises companies involved in the design and manufacturing of home improvement products, home and office furnishings, and structural wood building materials. The industry's products include flooring, ceiling tiles, home and office furniture and fixtures, wood trusses, plywood, paneling, and lumber. Companies typically sell their products through distribution channels to retail stores or through independent or company-owned dealerships.

Table 1. *Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management in Manufacturing	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	CG-BF-130a.1
Product Lifecycle Environmental Impacts	Description of efforts to manage product lifecycle impacts and meet demand for sustainable products	Discussion and Analysis	n/a	CG-BF-410a.1
	(1) Weight of end-of-life material recovered, (2) percentage of recovered materials recycled	Quantitative	Metric tons (t), Percentage (%) by weight	CG-BF-410a.2
Wood Supply Chain Management	(1) Total weight of wood fiber materials purchased, (2) percentage from third-party certified forestlands, (3) percentage by standard, and (4) percentage certified to other wood fiber standards, (5) percentage by standard <sup>3</sup>	Quantitative	Metric tons (t), Percentage (%) by weight	CG-BF-430a.1

Table 2. *Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Annual production <sup>4</sup>	Quantitative	See note	CG-BF-000.A
Area of manufacturing facilities <sup>5</sup>	Quantitative	Square meters (m <sup>2</sup> )	CG-BF-000.B

<sup>3</sup> Note to **CG-BF-430a.1** – The entity shall describe its practices for sourcing: (1) wood fiber materials from forestlands that are not certified to a third-party forest management standard, and (2) wood fiber materials not certified to other wood fiber certification standards.

<sup>4</sup> Note to **CG-BF-000.A** – Production shall be disclosed in typical units tracked by the entity such as number of units, weight, and/or square feet.

<sup>5</sup> Note to **CG-BF-000.B** – The scope shall be limited to total area under roof, including manufacturing and administrative functions.

# Energy Management in Manufacturing

## Topic Summary

The Building Products & Furnishings industry creates value through energy-intensive manufacturing processes. Purchased electricity represents the largest share of energy consumption across the industry, while companies may also utilize fossil fuel energy on site. The price of conventional grid electricity and volatility of fossil fuel prices may increase as a result of evolving climate change regulations and new incentives for energy efficiency and renewable energy, among other factors, while alternative energy sources become more cost-competitive. Decisions regarding energy sourcing and type, as well as the use of alternative energy, can create trade-offs related to the energy supply's cost and reliability for operations. As the industry operates on relatively narrow profit margins, reductions in energy consumption may have a significant influence on financial performance. The manner in which a company manages energy efficiency, its reliance on different types of energy and the associated sustainability risks, and its ability to access alternative energy sources is likely to impact financial performance.

## Accounting Metrics

### **CG-BF-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase

agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

# Product Lifecycle Environmental Impacts

## Topic Summary

Depending on the specific building product or furnishing, significant environmental impacts can arise during raw material sourcing, transportation, manufacturing, use-phase, or end-of-life. Rising consumer and regulatory preference for less-impactful products has spawned the development of more sustainable products, broadly termed “green building materials.” In addition, product lifecycle certification has arisen as a tool for companies and their customers to assess and improve a product’s lifecycle impact. Certification programs typically address specific sustainability characteristics of a product category and include the use of closed-loop materials that help minimize a product’s end-of-life environmental impacts and reduce the need for extracting or producing virgin materials. Through product innovation and design that facilitates end-of-life product recovery and the use of less-impactful materials, the adoption of product certification programs, and partnerships with customers, manufacturers of building products can achieve improvements in lifecycle impacts, reduce regulatory risk, meet growing customer demand, and realize cost savings.

## Accounting Metrics

### **CG-BF-410a.1. Description of efforts to manage product lifecycle impacts and meet demand for sustainable products**

- 1 The entity shall discuss its strategies to assess and manage the environmental impact of products throughout their lifecycle.
  - 1.1 Relevant strategies and efforts to assess product lifecycle impacts include the use of environmentally focused design principles, the use of sustainability performance standards, and the use of screening tools and sampling methods, among others, including the operational processes it employs for these assessments.
  - 1.2 Relevant strategies and efforts to manage product lifecycle impacts include changes in materials selection, assessment of upstream environmental impacts, changes in manufacturing (resource intensity), use of recycled materials, use of renewable materials, optimization of packaging, design for consolidated shipping, design of low-energy-consumption products, design for product take-back, and labeling for recycling, among others.
- 2 The entity shall discuss factors that drive demand for its sustainable building and furnishings products, including green building certification programs, federal and state procurement criteria, demand from retailers, and/or retail consumer demand.
- 3 The entity shall describe the scope of its efforts including to which product categories, business segments, and/or operating regions they relate.
- 4 The entity may discuss its use of Life Cycle Assessment (LCA) and Environmental Product Declarations (EPD) in the context of its approach to reducing environmental impact and maximizing product resource efficiency.
  - 4.1 Improvements to the environmental efficiency of products should be discussed in terms of LCA functional unit service parameters (i.e., time, extent, and quality of function).



- 4.2 LCA should be based on [ISO 14040](#) and [ISO 14044](#); EPD should be based on [ISO 14025](#) and [ISO 21930:2017](#) for construction products.
- 5 The entity may disclose the percentage of its products that are certified to third-party multi-attribute or single-attribute sustainability standards.
- 5.1 Multi-attribute sustainability standards include, but are not limited to, NSF/ANSI 140: Carpet, NSF/ANSI 332: Resilient Floor Coverings, NSF/ANSI 336: Commercial Furnishings Fabric, NSF/ANSI 342: Wallcoverings, NSF/ANSI 347: Single Ply Roofing Membranes, ANSI/NSC 373: Sustainable Stone, NSF P391: Services and Service Providers, Green Squared<sup>SM</sup>: Tile and Installation Materials / ANSI A138.1- 2011, ANSI/BIFMA e3 level<sup>®</sup>: Business Furniture, and the Cradle to Cradle Certified<sup>TM</sup> Products Standard.
- 5.2 Single-attribute standards include, but are not limited to, ENERGYSTAR<sup>®</sup>, WaterSense, and recycled content certifications.
- 6 The entity may describe its extended producer responsibility (EPR) efforts, including the following aspects:
- 6.1 How end-of-life considerations are incorporated into the design of products, including using materials that are easily and commonly recyclable in existing recycling infrastructure, designing products for disassembly (i.e., designing products so they can be easily, rapidly, and cost-effectively disassembled with commonly available tools), and properly labeling products and their component materials to facilitate disassembly and recycling.

## **CG-BF-410a.2. (1) Weight of end-of-life material recovered, (2) percentage of recovered materials recycled**

- 1 The entity shall disclose the weight, in metric tons, of materials recovered, including those recovered through recycling services, product take-back programs, and refurbishment services.
- 1.1 The scope of disclosure shall include products, materials, and parts at the end of their useful life that would have otherwise been disposed of as waste or used for energy recovery, but have instead been collected.
- 1.2 The scope of disclosure shall include both materials physically handled by the entity and materials of which the entity does not take physical possession, but for which it has contracted with a third party the task of collection for the express purpose of reuse, recycling, or refurbishment.
- 1.3 The scope of disclosure excludes products and parts that are in-warranty and have been collected for repairs.
- 2 The entity shall disclose the percentage of end-of-life materials recovered that were recycled or remanufactured.
- 2.1 Recycled and remanufactured materials are defined as waste materials that have been reprocessed or treated by means of production or manufacturing processes and made into a final product or a component for incorporation into a product.
- 2.2 The scope of recycled materials includes materials that are used, reused, or reclaimed.

2.2.1 Reused materials are defined as those recovered products or components of products that are used for the same purpose for which they were conceived.

2.2.2 Reclaimed materials are defined as those processed to recover or regenerate a usable product.

2.3 The scope of recycled materials includes materials sent for further recycling through the transfer to a third party for the express purpose of reuse, recycling, or refurbishment.

2.4 The scope of recycled and remanufactured products includes primary recycled materials, co-products (outputs of equal value to primary recycled materials), and by-products (outputs of lesser value than primary recycled materials).

2.5 The entity shall calculate the percentage as the weight of incoming recovered material that was recycled or remanufactured divided by the total weight of incoming recovered material.

2.6 Portions of products and materials that are disposed of in landfills are not considered recycled. Only the portions of products that are directly incorporated into new products, co-products, or by-products shall be included in the percentage recycled.

2.7 Materials incinerated, including for energy recovery, are not considered reused, recycled, or reclaimed.

2.7.1 Energy recovery is defined as the use of combustible waste as a means to generate energy through direct incineration, with or without other waste, but with recovery of the heat.

3 The entity may disclose the following:

3.1 Whether it directly conducts product take-back, recovery, and recycling or if it contracts with a third party the task of collection for the express purpose of reuse, recycling, or refurbishment

3.2 If it supports infrastructure for product recovery and recycling through joint ventures, partnerships, or by funding research into recycling technologies

3.3 Whether its product take-back, recovery, and recycling efforts are voluntary or mandatory (e.g., in order to maintain compliance with California Carpet Stewardship Law)

3.4 Relevant performance measures or targets for its product take-back, recovery, and recycling efforts such as the total amount of material recovered and the total amount of material recycled

# Wood Supply Chain Management

## Topic Summary

The Building Products & Furnishings industry utilizes large amounts of wood sourced from forests worldwide. Unsustainable production and harvesting of timber can result in adverse environmental and social impacts, including biodiversity loss and harm to the livelihoods of forest-dependent communities. Companies may inadvertently source wood from areas that are susceptible to unsustainable forestry practices. Reports of illegal logging, environmental pollution, or adverse impacts on communities can result in reputational repercussions that can damage a company's brand value, affecting demand for their products. In addition, regulations that address the importation of illegally produced wood can result in penalties and further damage to brand value. To mitigate these risks, companies are increasingly adopting third-party certifications that verify that wood is grown and harvested in a sustainable manner. Obtaining wood sourcing certifications can also provide companies with a potential growth channel, as they can satisfy customer demand for certified products.

## Accounting Metrics

### **CG-BF-430a.1. (1) Total weight of wood fiber materials purchased, (2) percentage from third-party certified forestlands, (3) percentage by standard, and (4) percentage certified to other wood fiber standards, (5) percentage by standard**

- 1 The entity shall disclose the total amount of wood fiber materials (in air-dried metric tons) it purchased during the reporting period.
  - 1.1 Wood fiber materials include wood-fiber-based raw materials, components, and semi-finished and finished goods.
  - 1.2 The scope of wood-fiber-based materials includes all inputs that are processed to be sold as finished goods, including recycled raw materials, virgin raw materials, and goods that will be consumed directly in the production process, excluding biomass for energy.
  - 1.3 If wood fiber comprises a portion of a material, component, or product, the entity shall include the portion in the total amount.
- 2 The entity shall disclose the percentage of its total wood fiber materials purchased that have been sourced from forestlands that are certified to a third-party forest management standard.
  - 2.1 Third-party forest management standards are those that certify that forests are harvested in a sustainable manner and that cover environmental and social criteria including legal compliance, land rights, community and worker relations, environmental impact and biodiversity, forest management plans and practices, land use, wildlife habitat conservation, and water conservation, among others.
  - 2.2 Third-party forest management standards include, but are not limited to:
    - 2.2.1 American Tree Farm (ATFS)
    - 2.2.2 Forest Stewardship Council (FSC) (Forest Management and Chain of Custody certifications)

- 2.2.3 Programme for the Endorsement of Forest Certification (PEFC) Chain of Custody certifications
  - 2.2.4 Forest certification systems endorsed by the PEFC
  - 2.2.5 Sustainable Forest Initiative (SFI) Forest Management and Chain of Custody certifications
- 2.3 The percentage shall be calculated as the weight (in air-dried metric tons) of the entity's wood fiber materials purchased during the reporting period that have been sourced from forestlands certified to one or more of the third-party forest management standards divided by the total weight (in air-dried metric tons) of wood fiber materials purchased during the reporting period.
- 2.3.1 Wood fiber certified to multiple third-party forest management standards shall be accounted for by the entity only once.
- 3 The entity shall disclose the percentage of its total wood fiber materials purchase that have been sourced from forestlands that are certified to each applicable third-party forest management standard, separately by standard.
- 3.1 The percentage shall be calculated as the weight (in air-dried metric tons) of the entity's wood fiber materials purchased during the reporting period that have been sourced from forestlands certified to each applicable third-party forest management standard divided by the total weight (in air-dried metric tons) of wood fiber materials purchased during the reporting period.
    - 3.1.1 Wood-fiber certified to multiple third-party forest management standards shall be accounted for by the entity in its calculations for each applicable standard.
- 4 The entity shall disclose the percentage of its total wood fiber materials purchased that have been certified to wood fiber standards.
- 4.1 Wood fiber standards exclude third-party forest management standards.
  - 4.2 Wood fiber standards include, but are not limited to:
    - 4.2.1 SFI Certified Fiber Sourcing Standard
    - 4.2.2 FSC Controlled Wood Standard
    - 4.2.3 PEFC Controlled Wood Standard
    - 4.2.4 Recycled wood fiber standards that include post- and pre-consumer reclaimed material (e.g., PEFC Recycled Label, FSC Recycled Label)
    - 4.2.5 Any other due diligence standards that cover wood fiber sourcing requirements for wood fiber from non-certified forestlands
  - 4.3 The percentage shall be calculated as the weight (in air-dried metric tons) of the entity's wood fiber materials purchased during the reporting period that have been certified to wood fiber standards divided by the total weight (in air-dried metric tons) of wood fiber materials purchased during the reporting period.
    - 4.3.1 Wood-fiber certified to multiple wood fiber standards shall be accounted for by the entity only once.

5 The entity shall disclose the percentage of its wood fiber materials purchased that have been certified to wood fiber standards, separately by standard.

5.1 The percentage shall be calculated as the weight (in air-dried metric tons) of the entity's wood fiber materials purchased during the reporting period that have been certified to each applicable wood fiber standard divided by the total weight (in air-dried metric tons) of wood fiber materials purchased during the reporting period.

5.1.1 Wood-fiber certified to multiple third-party wood fiber standards shall be accounted for by the entity in its calculations for each applicable standard.

**Note to CG-BF-430a.1**

1 The entity shall describe its practices for sourcing wood fiber materials from forestlands that are not certified to a third-party forest management standard and for sourcing wood fiber materials not certified to other wood fiber certification standards.

2 The entity shall describe its policies to verify the forestry management and harvesting practices of suppliers, which include, but are not limited to, codes of conduct, audits, and/or contracts.

3 The scope of disclosure shall include how the entity's sourcing practices and policies take into account the following criteria:

3.1 Wood legality and compliance with the U.S. Lacey Act of 1990 (16 U.S.C. §§ 3371–3378)

3.2 Wood sourced from areas of protected conservation status or high biodiversity value

3.3 Logging in or near areas of endangered species habitat

3.4 Logging in or near areas of indigenous peoples' land

3.5 The forestry management and harvesting practices of suppliers, including environmental impact assessments or forestry management plans

3.6 The use of genetically modified organisms (GMOs), pesticides, or other chemicals in forests

3.7 Criteria outlined in the definition of SFI "controversial sources," the definition of FSC "controlled wood," or the equivalent

4 The entity may also disclose the sources of its wood fiber (e.g., from corporate, private, or federally owned forestlands and whether fiber is grown domestically or internationally) and the potential risks associated with procuring fiber from these sources.

## E-COMMERCE

### Industry Description

The E-Commerce industry is composed of firms that provide an online marketplace for other firms or individuals to sell their goods and services, as well as retailers and wholesalers that provide an exclusively web-based platform for consumers to buy goods and services. Firms in this industry sell to consumers as well as to other businesses. Because of the accessibility of e-commerce sites, the industry is a global marketplace for buyers and sellers. Note: The industry scope exclusively applies to “pure-play” e-commerce operations and does not address the manufacturing or brick-and-mortar retail operations of companies. Many consumer goods manufacturers and retailers have incorporated, or are in the process of incorporating, an e-commerce component to their business. SASB has separate standards for the Multiline and Specialty Retailers & Distributors (CG-MR); Apparel, Accessories & Footwear (CG-AA); and Toys & Sporting Goods (CG-TS) industries. Depending on the specific activities and operations of firms in the aforementioned industries, disclosure topics and accounting metrics associated with the E-Commerce industry standard may also be relevant.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Hardware Infrastructure Energy & Water Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	CG-EC-130a.1
	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	CG-EC-130a.2
	Discussion of the integration of environmental considerations into strategic planning for data center needs	Discussion and Analysis	n/a	CG-EC-130a.3
Product Packaging & Distribution	Total greenhouse gas (GHG) footprint of product shipments	Quantitative	Metric tons (t) CO <sub>2</sub> -e	CG-EC-410a.1
	Discussion of strategies to reduce the environmental impact of product delivery	Discussion and Analysis	n/a	CG-EC-410a.2

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Entity-defined measure of user activity <sup>6</sup>	Quantitative	Number	CG-EC-000.A
Data processing capacity, percentage outsourced <sup>7</sup>	Quantitative	See note	CG-EC-000.B

<sup>6</sup>Note to **CG-EC-000.A** – The entity shall define and disclose a basic measure of user activity suitable for its business activities. This measure may be sales transactions, purchase transactions, number of searches, monthly active users, page views, and/or unique URLs.

<sup>7</sup>Note to **CG-EC-000B** – Data processing capacity shall be reported in units of measure typically tracked by the entity or used as the basis for contracting its IT services needs, such as million service units (MSUs), million instructions per second (MIPS), mega floating-point operations per second (MFLOPS), compute cycles, or other units of measure. Alternatively, the entity may disclose owned and outsourced data processing needs in other units of measure, such as rack space or data center square footage. The percentage outsourced shall include co-

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of shipments	Quantitative	Number	CG-EC-000.C

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location facilities and cloud services (e.g., Platform as a Service and Infrastructure as a Service).

# Hardware Infrastructure Energy & Water Management

## Topic Summary

A large part of the energy consumed by the E-Commerce industry is used to power critical hardware and IT infrastructure in data centers. Data centers need to be powered continuously, and disruptions to the energy supply can have a material impact on operations, depending on the magnitude and timing of the disruption. Companies also face a tradeoff when it comes to energy and water consumption for their data center cooling needs: Cooling data centers with water instead of chillers is a means of improving energy efficiency, but it can lead to dependence on significant local water resources. Companies that effectively manage this issue may benefit from cost savings and minimize reputational risks, as there is growing concern over energy and water use.

## Accounting Metrics

### **CG-EC-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a



Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0 (2017)* or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

5 The entity may disclose the trailing twelve-month (TTM) weighted average power usage effectiveness (PUE) for its data centers.

5.1 PUE is defined as the ratio of the total amount of power used by a computer data center facility to the amount of power delivered to computing equipment.

5.2 If disclosing PUE, the entity shall follow the guidance and calculation methodology described in *PUE™: A Comprehensive Examination of the Metric (2014)*, published by ASHRAE and The Green Grid Association.

## **CG-EC-130a.2. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**

1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.

1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.

- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 2.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:
    - 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 3.1.2 Water that is directly or indirectly incorporated into the entity's product or service;
    - 3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.
- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute's (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

### **CG-EC-130a.3. Discussion of the integration of environmental considerations into strategic planning for data center needs**

- 1 The entity shall discuss the environmental considerations that it integrates into siting, design, construction, refurbishment, and operational specifications for its data centers, including factors related to energy and water consumption.
  - 1.1 Environmental factors may include, but are not limited to, energy-efficiency standards; layout design, such as "hot aisle/cold aisle" layouts; and location-based factors, such as accounting for regional humidity, average temperature, water availability and groundwater stress, water permits, regional- or state-level carbon legislation or pricing, and the carbon intensity of electricity from the local grid.
- 2 The scope of disclosure shall include data centers currently owned and operated by the entity, data centers that have been planned or are under construction, and outsourced data center services.

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- 3 The entity shall discuss how the environmental considerations it identifies were incorporated into decisions related to its data centers that were made during the reporting period, including if they influenced decisions to insource or outsource data center services, improve efficiency of existing data centers, and/or construct new data centers.

# Product Packaging & Distribution

## Topic Summary

A significant part of the E-Commerce industry's added value comes from firms' ability to move a wide array of goods efficiently to consumers who would otherwise have to personally travel to collect the goods from brick-and-mortar stores. As the volume of packaging shipments increases, the industry may become more exposed to environmental externalities, such as carbon pricing and subsequent rising fuel costs that present risks associated with the shipping of products. While firms that outsource shipping and logistics have less control over the specific processes of shipping operations, they can still select suppliers with more energy-efficient business practices. As this is a highly competitive and low-margin industry, the ability to shave off shipping costs through fuel reduction and more efficient routing can allow firms to pass those savings on to their customers. Additionally, e-commerce firms have an incentive to minimize the use of packaging. Efficient packaging can lead to cost savings from reducing the amount of material that needs to be purchased, as well as saving on logistics costs, as more products can fit into a single shipping load.

## Accounting Metrics

### CG-EC-410a.1. Total greenhouse gas (GHG) footprint of product shipments

- 1 The entity shall disclose the complete tank-to-wheels greenhouse gas (GHG) footprint, in metric tons of CO<sub>2</sub>-e, associated with outbound shipment of the entity's products.
  - 1.1 Tank-to-wheels emissions relate to vehicle processes and exclude upstream emissions associated with primary energy production (i.e., well-to-tank emissions).
  - 1.2 The entity shall calculate its disclosure according to EN 16258:2012, Methodology for calculation and declaration of energy consumption and GHG emissions of transport services (freight and passengers).
    - 1.2.1 Calculations shall be consistent with the methodology used to calculate the "tank-to-wheels GHG emissions (Gt)" result that is described in EN 16258:2012.
    - 1.2.2 Determination of transportation system scope, boundaries, and any necessary allocations shall be consistent with the methodology described in EN 16258:2012.
- 2 The scope of disclosure includes emissions from all freight transportation and logistics activities associated with outbound shipment of the entity's products, including those from contract carriers and outsourced freight forwarding services and logistics providers (Scope 3) as well as those from the entity's own assets (Scope 1).
- 3 The scope of disclosure includes emissions from all modes of transportation, such as road freight, air freight, barge transport, marine transport, and rail transport.
- 4 Consistent with EN 16258:2012, disclosure may be based on calculations from a mix of categories of emissions values (i.e., specific measured values, transport operator vehicle-type- or route-type-specific values, transport operator fleet values, and default values).

- 5 Where relevant and necessary for interpretation of disclosure, the entity shall describe its allocation methods, emissions values, boundaries, mix of transport services used, and other information.

### **CG-EC-410a.2. Discussion of strategies to reduce the environmental impact of product delivery**

- 1 The entity shall discuss its strategies to reduce the environmental impact of fulfillment and delivery of its products, including impacts associated with packaging materials and those associated with product transportation.
- 2 Relevant strategies to discuss include, but are not limited to:
  - 2.1 Discussion of logistics selection, mode selection, and management (e.g., rail transport vs. air freight transport) and/or operation for route efficiency
  - 2.2 Discussion of packaging choices, including, but not limited to, decisions to utilize recycled or renewable (e.g., bio-based plastic) packaging material, decisions to optimize the amount of packaging materials used (e.g., source reduction), use of refillable or reusable packaging, and design for efficient shipping and transport
  - 2.3 Discussion of fuel choices and vehicle choices for fleets owned and/or operated by the entity, such as decisions to use renewable and low-emission fuels and low-emission vehicles
  - 2.4 Other relevant strategies, such as efforts to reduce idling of vehicles owned and/or operated by the entity, innovations to improve the efficiency of “last-mile” delivery, and strategies to optimize delivery times to reduce traffic congestion

## HOUSEHOLD & PERSONAL PRODUCTS

### Industry Description

The Household & Personal Products industry comprises companies that manufacture a wide range of goods for personal and commercial consumption, including cosmetics, household and industrial cleaning supplies, soaps and detergents, sanitary paper products, household batteries, razors, and kitchen utensils. Household and personal products companies operate globally and typically sell their products to mass merchants, grocery stores, membership club stores, drug stores, high-frequency stores, distributors, and e-commerce retailers. Some companies sell products through independent representatives rather than third-party retail establishments.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Water Management	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	CG-HP-140a.1
	Description of water management risks and discussion of strategies and practices to mitigate those risks	Discussion and Analysis	n/a	CG-HP-140a.2
Environmental & Social Impacts of Palm Oil Supply Chain	Amount of palm oil sourced, percentage certified through the Roundtable on Sustainable Palm Oil (RSPO) supply chains as (a) Identity Preserved, (b) Segregated, (c) Mass Balance, or (d) Book & Claim	Quantitative	Metric tons (t), Percentage (%)	CG-HP-430a.1

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Units of products sold, total weight of products sold	Quantitative	Number, Metric tons (t)	CG-HP-000.A
Number of manufacturing facilities	Quantitative	Number	CG-HP-000.B

# Water Management

## Topic Summary

Water is vital to the Household & Personal Products industry, both as a coolant in manufacturing processes and as a main input for many of the industry's products. Water is becoming a scarcer resource around the world due to increasing consumption as a result of population growth, rapid urbanization, and reduced supplies due to drought and climate change. Many firms in this industry have operations in regions of the world that are facing water scarcity. Without careful planning, companies could face increased costs or, worse, lose access to water in these regions, thereby presenting a risk to production. Having rigorous checks in place to ensure a steady supply of water to all factories, as well as investing in technology to increase the efficiency of water use, will help firms in this industry keep a lower risk profile as water scarcity becomes a more pressing global issue.

## Accounting Metrics

### **CG-HP-140a.1. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.
  - 1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 2.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:
    - 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 3.1.2 Water that is directly or indirectly incorporated into the entity's product or service;
    - 3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.

- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

## **CG-HP-140a.2. Description of water management risks and discussion of strategies and practices to mitigate those risks**

- 1 The entity shall describe its water management risks associated with water withdrawals, water consumption, and discharge of water and/or wastewater.
  - 1.1 Risks associated with water withdrawals and water consumption include risks to the availability of adequate, clean water resources, including, but not limited to:
    - 1.1.1 Environmental constraints—such as operating in water-stressed regions, drought, concerns of aquatic impingement or entrainment, interannual or seasonal variability, and risks due to the impact of climate change
    - 1.1.2 Regulatory and financial constraints—such as volatility in water costs, stakeholder perceptions and concerns related to water withdrawals (e.g., those from local communities, non-governmental organizations, and regulatory agencies), direct competition with and impact from the actions of other users (e.g., commercial and municipal users), restrictions to withdrawals due to regulations, and constraints on the entity’s ability to obtain and retain water rights or permits
  - 1.2 Risks associated with the discharge of water and/or wastewater, include, but are not limited to, the ability to obtain rights or permits related to discharges, compliance with regulations related to discharges, restrictions to discharges, the ability to maintain control over the temperature of water discharges, liabilities and/or reputational risks, and increased operating costs due to regulation, stakeholder perceptions and concerns related to water discharges (e.g., those from local communities, non-governmental organizations, and regulatory agencies).
- 2 The entity may describe water management risks in the context of:
  - 2.1 How risks may vary by withdrawal source, including surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities; and
  - 2.2 How risks may vary by discharge destinations, including surface water, groundwater, or wastewater utilities.
- 3 The entity may discuss the potential impacts that water management risks may have on its operations and the timeline over which such risks are expected to manifest.



- 3.1 Impacts may include, but are not limited to, those associated with costs, revenues, liabilities, continuity of operations, and reputation.
- 4 The entity shall discuss its short-term and long-term strategies or plan to mitigate water management risks, including, but not limited to:
  - 4.1 The scope of its strategy, plans, goals and/or targets, such as how they relate to different business units, geographies, or water-consuming operational processes.
  - 4.2 Any water management goals and/or targets it has prioritized, and an analysis of performance against those goals and/or targets.
    - 4.2.1 Goals and targets may include, but are not limited to, those associated with reducing water withdrawals, reducing water consumption, reducing water discharges, reducing aquatic impingements, improving the quality of water discharges, and regulatory compliance.
  - 4.3 The activities and investments required to achieve the plans, goals and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 4.4 Disclosure of strategies, plans, goals, and/or targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.
- 5 For water management targets, the entity shall additionally disclose:
  - 5.1 Whether the target is absolute or intensity-based, and the metric denominator if it is an intensity-based target.
  - 5.2 The timelines for the water management plans, including the start year, the target year, and the base year.
  - 5.3 The mechanism(s) for achieving the target, including:
    - 5.3.1 Efficiency efforts, such as the use of water recycling and/or closed-loop systems;
    - 5.3.2 Product innovations such as redesigning products or services to require less water;
    - 5.3.3 Process and equipment innovations, such as those that enable the reduction of aquatic impingements or entrainments;
    - 5.3.4 Use of tools and technologies (e.g., the [World Wildlife Fund Water Risk Filter](#), [The Global Water Tool](#), and [Water Footprint Network Footprint Assessment Tool](#)) to analyze water use, risk, and opportunities; and
    - 5.3.5 Collaborations or programs in place with the community or other organizations.
  - 5.4 The percentage reduction or improvement from the base year, where the base year is the first year against which water management targets are evaluated toward the achievement of the target.
- 6 The entity shall discuss whether its water management practices result in any additional lifecycle impacts or tradeoffs in its organization, including tradeoffs in land use, energy production, and greenhouse gas (GHG) emissions, and why the entity chose these practices despite lifecycle tradeoffs.

# Environmental & Social Impacts of Palm Oil Supply Chain

## Topic Summary

Palm oil has rapidly risen in popularity as a cheap input for a wide range of goods in the Household & Personal Products industry, including cleaning products, candles, and cosmetics. Palm oil harvesting in specific regions of the world can contribute to deforestation, GHG emissions, and other environmental and social problems. If not sourced responsibly, palm oil materials contribute to environmental and social externalities that can present reputational and regulatory risks for companies. Further, companies in this industry are exposed to the risk of supply chain disruptions, input price increases, and reputational damage associated with environmental and social externalities from palm oil sourcing. Thus, companies face pressure to track and responsibly source palm oil. Additionally, they face pressure to ensure minimum standards for working conditions in the supply chain, as the production of palm oil is often associated with labor issues. Implementing sourcing standards can contribute to reducing risks, as can innovations at the product-design phase to reduce dependence on controversial materials such as palm oil.

## Accounting Metrics

### **CG-HP-430a.1. Amount of palm oil sourced, percentage certified through the Roundtable on Sustainable Palm Oil (RSPO) supply chains as (a) Identity Preserved, (b) Segregated, (c) Mass Balance, or (d) Book & Claim**

- 1 The entity shall disclose the amount, in metric tons, of palm oil that it sourced during the reporting period.
  - 1.1 The scope of palm oil includes palm kernel oil and palm kernel expeller.
- 2 The entity shall disclose the percentage, on a weight basis, of palm oil it sourced that has been third-party certified to bear a Roundtable on Sustainable Palm Oil (RSPO) claim for each of the RSPO supply chain models: (a) Identity Preserved (IP), (b) Segregated (SG), (c) Mass Balance (MB), or (d) Book & Claim (B&C).
  - 2.1 B&C transactions are represented by “RSPO Credits” purchased in the RSPO PalmTrace platform.
  - 2.2 The percentage shall be calculated as the weight in each respective RSPO supply chain model (IP, SG, MB, or B&C) of RSPO-certified palm oil sourced by the entity divided by the total weight, in metric tons, of palm oil sourced by the entity.
- 3 The entity may discuss other strategies, approaches, and mechanisms used to manage risks and opportunities associated with the environmental and social impacts of palm oil sourcing.

## MULTILINE AND SPECIALTY RETAILERS & DISTRIBUTORS

### Industry Description

The Multiline and Specialty Retailers & Distributors industry encompasses a variety of retailing categories such as department stores, mass merchants, home products stores, and warehouse clubs, as well as a smaller segment of distributors like electronics wholesalers and automotive wholesalers. Common to these companies (except for the distribution segment) is that they manage global supply chains to anticipate consumer demands, keep costs low, and keep products stocked in their brick-and-mortar storefronts. This is a highly competitive industry, in which each company category generally has a small number of key players, characterized by generally low margins. The relatively substitutable nature of retail makes companies in this industry especially susceptible to reputational risks.

Note: SASB has separate standards for the Food Retailers & Distributors (FB-FR), Drug Retailers (HC-DR), E-Commerce (CG-EC), and Apparel, Accessories & Footwear (CG-AA) industries. Retail companies involved in food or drug retail, e-commerce, or apparel, accessories, and footwear manufacturing should also consider the disclosure topics and metrics outlined in these other standards.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management in Retail & Distribution	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	CG-MR-130a.1

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of: (1) retail locations and (2) distribution centers	Quantitative	Number	CG-MR-000.A
Total area of: (1) retail space and (2) distribution centers	Quantitative	Square meters (m <sup>2</sup> )	CG-MR-000.B

# Energy Management in Retail & Distribution

## Topic Summary

Companies in this industry require significant amounts of energy for their retail facilities and warehouses. Sustainability factors—such as the increasing number of GHG-emissions regulations, incentives for energy efficiency and renewable energy—are leading to price increases in conventional electricity sources while making alternative sources more cost-competitive. Fossil fuel-based energy production and consumption contribute to significant environmental impacts, including climate change and pollution. Decisions regarding energy sourcing and type, as well as the use of alternative energy, can create trade-offs related to the energy supply's cost and reliability for operations. It is becoming increasingly important for companies to manage their overall energy efficiency, and their access to alternative energy sources. Efficiency in this area can have financial implications through direct cost savings, which are particularly beneficial in this low-margin industry.

## Accounting Metrics

### **CG-MR-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a

Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0 (2017)* or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

## COAL OPERATIONS

### Industry Description

The Coal Operations industry includes companies that mine coal and those that manufacture coal products. Mining activity covers both underground and surface mining, and thermal and metallurgical coal.

Table 1. *Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations	Quantitative	Metric tons (t) CO <sub>2</sub> -e, Percentage (%)	EM-CO-110a.1
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	EM-CO-110a.2
Water Management	(1) Total fresh water withdrawn, (2) percentage recycled, (3) percentage in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	EM-CO-140a.1
	Number of incidents of non-compliance associated with water quality permits, standards, and regulations	Quantitative	Number	EM-CO-140a.2
Reserves Valuation & Capital Expenditures	Sensitivity of coal reserve levels to future price projection scenarios that account for a price on carbon emissions	Quantitative	Million metric tons (Mt)	EM-CO-420a.1
	Estimated carbon dioxide emissions embedded in proven coal reserves	Quantitative	Metric tons (t) CO <sub>2</sub> -e	EM-CO-420a.2
	Discussion of how price and demand for coal and/or climate regulation influence the capital expenditure strategy for exploration, acquisition, and development of assets	Discussion and Analysis	n/a	EM-CO-420a.3

Table 2. *Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Production of thermal coal	Quantitative	Million metric tons (Mt)	EM-CO-000.A
Production of metallurgical coal <sup>8</sup>	Quantitative	Million metric tons (Mt)	EM-CO-000.B

<sup>8</sup>Note to EM-CO-000.B – The scope includes pulverized coal injection.

# Greenhouse Gas Emissions

## Topic Summary

Coal operations are energy intensive and generate significant direct greenhouse gas (GHG) emissions, including carbon dioxide from fuel use and methane released from coal beds during mining and post-mining activities. Regulatory efforts to reduce GHG emissions in response to the risks posed by climate change may result in higher operating and capital expenditures based on the magnitude of their direct emissions. Operational efficiencies can be achieved through the cost-effective reduction of GHG emissions. Such efficiencies can mitigate the potential financial impact of increased fuel costs from regulations that seek to limit—or put a price on—GHG emissions.

## Accounting Metrics

### EM-CO-110a.1. Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalent (CO<sub>2</sub>-e), and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 These emissions include direct emissions of GHGs from stationary or mobile sources; these sources include but are not limited to: equipment at mine sites, mine mouth electric generating facilities, coal seam methane emissions, production and processing facilities, storage facilities, office buildings, and transportation (marine, road, and rail).
  - 2.2 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:
    - 2.2.1 *GHG Reporting Guidance for the Aerospace Industry* provided by International Aerospace Environmental Group (IAEG)
    - 2.2.2 *Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources* provided by the U.S. Environmental Protection Agency (EPA)

- 2.2.3 India GHG Inventory Program
  - 2.2.4 ISO 14064-1
  - 2.2.5 Petroleum Industry Guidelines for reporting GHG emissions, 2nd edition, 2011, published by IPIECA
  - 2.2.6 Protocol for the quantification of greenhouse gas emissions from waste management activities published by Entreprises pour l'Environnement (EpE)
- 2.3 GHG emissions data shall be consolidated and disclosed according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the “financial control” approach defined by the GHG Protocol, and the approach provided by the Climate Disclosure Standards Board (CDSB) that is described in REQ-07, “Organisational boundary,” of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).
- 3 The entity shall disclose the percentage of its gross global Scope 1 GHG emissions that are covered under an emissions-limiting regulation or program that is intended to directly limit or reduce emissions, such as cap-and-trade schemes, carbon tax/fee systems, and other emissions control (e.g., command-and-control approach) and permit-based mechanisms.
- 3.1 Examples of emissions-limiting regulations include, but are not limited to:
- 3.1.1 California Cap-and-Trade (California Global Warming Solutions Act)
  - 3.1.2 European Union Emissions Trading Scheme (EU ETS)
  - 3.1.3 Quebec Cap-and-Trade (Draft Bill 42 of 2009)
- 3.2 The percentage shall be calculated as the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e) that are covered under emissions-limiting regulations divided by the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e).
- 3.2.1 For emissions that are subject to multiple emissions-limiting regulations, the entity shall not account for those emissions more than once.
- 3.3 The scope of emissions-limiting regulations excludes emissions covered under voluntary emissions-limiting regulations (e.g., voluntary trading systems), as well as reporting-based regulations [e.g., the U.S. Environmental Protection Agency (EPA) GHG Reporting Program].
- 4 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 5 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 6 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.



## **EM-CO-110a.2. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined according to *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 2.2 Whether the target is absolute- or intensity-based, and the metric denominator, if it is an intensity-based target;
  - 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated toward the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;
  - 2.5 The mechanism(s) for achieving the target; and
  - 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset.
  
- 3 The entity shall discuss the activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
- 4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as whether they pertain differently to different business units, geographies, or emissions sources.
- 5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions-limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
- 6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

# Water Management

## Topic Summary

Coal operations have an impact on both the quality and quantity of local water resources. Coal operations are water intensive. The use of water in coal washing to remove sulfur, in cooling drilling equipment, and in transporting coal in slurry pipelines can impact resources. The severity of these risks can vary depending on the region's water availability and the regulatory environment. Reducing water use and contamination could also create operational efficiencies for companies and lower their operating costs. Wastewater treatment and discharge is often regulated by national or local agencies. Violating limits on selenium, sulfate, and dissolved solids could affect coal operations companies through significant penalties, compliance costs, delays in production, or higher costs related to mine closure.

## Accounting Metrics

### **EM-CO-140a.1. (1) Total fresh water withdrawn, (2) percentage recycled, (3) percentage in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from freshwater sources:
  - 1.1 Fresh water may be defined according to the local statutes and regulations where the entity operates. Where there is no regulatory definition, fresh water shall be considered to be water that has less than 1000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 1.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 2 The entity shall disclose the percentage of water recycled as the volume, in thousands of cubic meters, recycled divided by the volume of water withdrawn.
  - 2.1 Any volume of water reused multiple times shall be counted as recycled each time it is recycled and reused.
- 3 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80%) or Extremely High (>80%) Baseline Water Stress as classified by the World Resources Institute's (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 4 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 5 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

### **EM-CO-140a.2. Number of incidents of non-compliance associated with water quality**

## permits, standards, and regulations

- 1 The entity shall disclose the total number of instances of non-compliance, including violations of a technology-based standard and exceedances of quantity and/or quality-based standards.
- 2 The scope of disclosure includes incidents governed by national, state, and local statutory permits and regulations, including, but not limited to, the discharge of a hazardous substance, violation of pretreatment requirements, or total maximum daily load (TMDL) exceedances.
  - 2.1 Typical parameters of concern include selenium, total dissolved solids (TDS), sulfate, total suspended solids (TSS), and pH.
- 3 The scope of disclosure shall only include incidents of non-compliance that resulted in a formal enforcement action(s).
  - 3.1 Formal enforcement actions are defined as governmental recognized actions that address a violation or threatened violation of water quantity and/or quality laws, regulations, policies, or orders, and can result in administrative penalty orders, administrative orders, and judicial actions, among others. For example, the U.S. Environmental Protection Agency (EPA) provides guidance on the scope of formal enforcement actions in, [Informal and Formal Actions, Summary Guidance and Portrayal on EPA Websites](#).
- 4 Violations shall be disclosed, regardless of their measurement methodology or frequency. These include violations for:
  - 4.1 Continuous discharges, limitations, standards, and prohibitions that are generally expressed as maximum daily, weekly average, and monthly averages
  - 4.2 Non-continuous discharges and limitations that are generally expressed in terms of frequency, total mass, maximum rate of discharge, and mass or concentration of specified pollutants

# Reserves Valuation & Capital Expenditures

## Topic Summary

Estimates suggest that coal companies may be unable to extract a significant proportion of their coal reserves if greenhouse gas (GHG) emissions are to be controlled to limit global temperature increases to two degrees Celsius per the Paris Agreement. Stewardship of capital resources while taking into account medium- to long-term trends, particularly related to climate change mitigation actions, is critical in order to prevent asset impairment and maintain profitability and creditworthiness. Globally, regulations and policies are and may continue to be put into place to limit GHG emissions from coal-fired power plants—the customers of coal companies—thus lowering the demand for, and subsequently the prices of, coal. Coal demand is also being affected by regulations governing other harmful air emissions that apply to coal-fired power plants. An expansion of GHG-mitigation regulations may increase the magnitude of potential financial impacts in the medium to long term. Along with improved competitiveness of alternative energy technologies, this poses a long-term risk for the reserves and capital expenditures of coal operations companies.

## Accounting Metrics

### EM-CO-420a.1. Sensitivity of coal reserve levels to future price projection scenarios that account for a price on carbon emissions

- 1 The entity shall perform a sensitivity analysis of its reserves to determine how several future scenarios may affect its determination of whether the reserves are proven or probable.
- 2 The entity shall analyze the sensitivity of its current proven and probable reserves using the price trajectories published by the International Energy Agency (IEA) in its [World Energy Outlook \(WEO\) publication](#), including:
  - 2.1 Current Policies Scenario, which assumes no changes in policies from the mid-point of the year of publication of the WEO
  - 2.2 New Policies Scenario, which assumes that broad policy commitments and plans that have been announced by countries—including national pledges to reduce greenhouse gas emissions and plans to phase out fossil-energy subsidies—occur, even if the measures to implement these commitments have yet to be identified or announced. This broadly serves as the IEA baseline scenario.
  - 2.3 Sustainable Development Scenario, which assumes an energy pathway occurs that is consistent with the goal of limiting the global increase in temperature to 2°C by limiting concentration of greenhouse gases in the atmosphere to around 450 parts per million of CO<sub>2</sub>-e
- 3 The entity shall consider the WEO scenarios as a normative reference, thus any updates to the WEO made year-on-year shall be considered updates to this guidance.
- 4 Reserves are defined by U.S. Securities and Exchange Commission (SEC) [Industry Guide 7, Description of Property by Issuers Engaged or to Be Engaged in Significant Mining Operations](#):

- 4.1 Reserves, as that part of a mineral deposit that could be economically and legally extracted or produced at the time of the reserve determination
  - 4.2 Proven reserves, as reserves for which (a) quantity is computed from dimensions revealed in outcrops, trenches, workings, or drill holes; grade and/or quality are computed from the results of detailed sampling and (b) the sites for inspection, sampling, and measurement are spaced so closely and the geographic character is so well defined that size, shape, depth, and mineral content of reserves are well established
  - 4.3 Probable reserves, as reserves for which quantity and grade and/or quality are computed from information similar to that used for proven (measured) reserves, but the sites for inspection, sampling, and measurement are farther apart or are otherwise less adequately spaced. The degree of assurance, although lower than that for proven (measured) reserves, is high enough to assume continuity between points of observation.
- 5 The entity shall follow guidance published by the Securities and Exchange Commission (SEC) in its [Oil and Gas Reporting Modernization](#) (Section §229.1202 (Item 1202) Disclosure of Reserves) for conducting a reserves sensitivity analysis.
  - 6 The entity may summarize its findings in the following table format:

**Table 1. Sensitivity of Reserves to Prices By Principal Product Type and Price Scenario**

PRICE CASE	PROVEN RESERVES		PROBABLE RESERVES	
	Coal	Product A	Coal	Product A
(Scenario)	(tons)	(measure)	(tons)	(measure)
Current Policies Scenario (base)				
New Policies Scenario				
Sustainable Development Scenario				

- 7 The entity may disclose the sensitivity of its reserve levels in other price and demand scenarios in addition to those described above, particularly if these scenarios differ depending on the type of coal reserves, regulatory environment in the countries or regions where mining occurs, end-use of the entity's products, or other factors.
- 8 For additional sensitivity analyses, the entity should consider disclosing the following, per the Task Force on Climate-Related Financial Disclosures (TCFD) Recommendations Report Figure 8 as well as the Implementing the Recommendations of the TCFD Report, Section E:
  - 8.1 The alternative scenarios used, including other 2°C or lower scenarios
  - 8.2 Critical input parameters, assumptions, and analytical choices for the climate-related scenarios used, particularly as they relate to key areas such as policy assumptions, energy deployment pathways, technology pathways, and related timing assumptions
  - 8.3 Time frames used for scenarios, including short-, medium-, and long-term milestones (e.g., how organizations consider timing of potential future implications under the scenarios used)

## **EM-CO-420a.2. Estimated carbon dioxide emissions embedded in proven coal reserves**

- 1 The entity shall calculate and disclose an estimate of the carbon dioxide emissions embedded in its proven coal reserves.

- 1.1 *Nota bene* — this estimate applies a factor for potential CO<sub>2</sub> only and does not include an estimate for all potential greenhouse gas emissions, as these are dependent on downstream use (e.g., utility electricity generation, industrial heating and electricity generation, cement production, or steel production).
- 2 Estimated potential carbon dioxide emissions from proven coal reserves shall be calculated according to the following formula, derived from [Meinshausen et al](#):
  - 2.1  $E = R \times V \times C$ , where:
    - 2.1.1 E are the potential emissions in kilograms of carbon dioxide (kg CO<sub>2</sub>);
    - 2.1.2 R are the proven reserves in gigagrams (Gg);
    - 2.1.3 V is the net calorific value in terajoules per gigagram (TJ/Gg); and
    - 2.1.4 C is the effective carbon dioxide emission factor in kilograms CO<sub>2</sub> per terajoule (kg/TJ).
- 3 In the absence of data specific to the entity's coal reserves, carbon content shall be calculated using default data for each major type of coal resource published by the Intergovernmental Panel on Climate Change (IPCC) in its 2006 IPCC Guidelines for National Greenhouse Gas Inventories.
  - 3.1 The entity shall use default carbon content values per unit of energy that is listed in IPCC Table 1.3 Default Values of Carbon Content, Volume 2: Energy, Chapter 1.
  - 3.2 The entity shall use calorific values per weight of coal resource contained in IPCC Table 1.2 Default Net Calorific Values (NCVs) and Lower and Upper Limit of the 95% Confidence Intervals, Volume 2: Energy, Chapter 1.
- 4 The entity shall use engineering estimates to determine the weight of its coal reserves in gigagrams.
- 5 For other assumptions required to estimate the carbon content of coal reserves, the entity shall rely on guidance from the IPCC, Greenhouse Gas Protocol, U.S. Energy Information Agency (EIA), or the International Energy Agency (IEA).

### **EM-CO-420a.3. Discussion of how price and demand for coal and/or climate regulation influence the capital expenditure strategy for exploration, acquisition, and development of assets**

- 1 The entity shall discuss how projections for price and demand for coal and the path of air quality and climate regulation influence the entity's capital expenditure (CAPEX) strategy.
  - 1.1 This discussion should include the entity's projections and assumptions about future coal prices and the likelihood that certain price and demand scenarios occur.
- 2 The entity shall discuss the implications of price and demand scenario planning (i.e., EM-CO-420a.1) and how they may affect decisions to explore, acquire, and develop new reserves.
- 3 The entity may discuss factors that materially influence its CAPEX decision making, including, but not limited to:

- 3.1 How the scope of air quality and climate change regulation—such as which countries, regions, and/or industries are likely to be impacted—may influence where the entity focuses its exploration and development
  - 3.2 Its view of the alignment between the time horizon during which price and demand for coal may be affected by climate regulation and time horizons for returns on capital expenditures on reserves
  - 3.3 How the structure of climate regulation—i.e., a carbon tax versus cap-and-trade—may differently affect price and demand, and thus the entity's capital expenditure decision making
- 4 The entity may discuss how these trends affect decision-making in the context of different types of reserve expenditures, including development of assets, acquisition of properties with proven reserves, acquisition of properties with unproven resources, and exploration activities.

## CONSTRUCTION MATERIALS

### Industry Description

Construction materials companies have global operations and produce construction materials for sale to construction firms or wholesale distributors. These primarily include cement and aggregates, but also glass, plastic materials, insulation, bricks, and roofing material. Materials producers operate their own quarries, mining crushed stone or sand and gravel. They may also purchase raw materials from the mining and petroleum industries.

Note: Companies producing wood-building products are included the Building Products & Furnishings (CG-BF) industry, Forestry Management industry (RR-FM), and Pulp & Paper Products industry (RR-PP) under the Sustainable Industry Classification System (SICS) and are not included in the Construction Materials standard.

Table 1. Climate-related Disclosure Topics & Accounting Metrics

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations	Quantitative	Metric tons (t) CO <sub>2</sub> -e, Percentage (%)	EM-CM-110a.1
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	EM-CM-110a.2
Air Quality	Air emissions of the following pollutants: (1) NO <sub>x</sub> (excluding N <sub>2</sub> O), (2) SO <sub>x</sub> , (3) particulate matter (PM <sub>10</sub> ), (4) dioxins/furans, (5) volatile organic compounds (VOCs), (6) polycyclic aromatic hydrocarbons (PAHs), and (7) heavy metals	Quantitative	Metric tons (t)	EM-CM-120a.1
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage alternative, (4) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	EM-CM-130a.1
Water Management	(1) Total fresh water withdrawn, (2) percentage recycled, (3) percentage in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	EM-CM-140a.1
Waste Management	Amount of waste generated, percentage hazardous, percentage recycled	Quantitative	Metric tons (t), Percentage (%)	EM-CM-150a.1
Product Innovation	Percentage of products that qualify for credits in sustainable building design and construction certifications	Quantitative	Percentage (%) by annual sales revenue	EM-CM-410a.1
	Total addressable market and share of market for products that reduce energy, water, and/or material impacts during usage and/or production	Quantitative	Reporting currency, Percentage (%)	EM-CM-410a.2



Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Production by major product line <sup>9</sup>	Quantitative	Metric tons (t)	EM-CM-000.A

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<sup>9</sup> Note to EM-CM-000.A – Determination of major product line (e.g., cement and aggregates, composites, roofing materials, fiberglass, brick, and tile, or others) should be based on revenue generation, and may include a category of “other” construction materials products that combines multiple smaller revenue streams.

# Greenhouse Gas Emissions

## Topic Summary

The production of construction materials, particularly cement, generates significant direct greenhouse gas (GHG) emissions from on-site fuel combustion and chemical processes. The industry has achieved gains in efficiency for reducing emissions per ton of materials produced. At the same time, increasing production is associated with an increase in absolute emissions from cement production. The production of construction materials remains carbon-intensive relative to other industries, exposing the industry to higher operating and capital expenditures from emissions regulations. Strategies to reduce GHG emissions include: energy efficiency, use of alternative and renewable fuels, carbon sequestration, and clinker substitution. Operational efficiencies can be achieved through the cost-effective reduction of GHG emissions. Such efficiencies can mitigate the potential financial impact of increased fuel costs as well as direct emissions from regulations that seek to limit—or put a price on—GHG emissions.

## Accounting Metrics

### EM-CM-110a.1. Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalent (CO<sub>2</sub>-e), and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 These emissions include direct emissions of GHGs from stationary or mobile sources that include, but are not limited to, production facilities, office buildings, and products transportation (marine, road, and rail).
  - 2.2 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:
    - 2.2.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)

- 2.2.2 Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources published by the U.S. Environmental Protection Agency (EPA)
  - 2.2.3 India GHG Inventory Program
  - 2.2.4 ISO 14064-1
  - 2.2.5 Petroleum Industry Guidelines for reporting GHG emissions, 2nd edition, 2011, published by IPIECA
  - 2.2.6 Protocol for the quantification of greenhouse gas emissions from waste management activities published by Entreprises pour l'Environnement (EpE)
- 2.3 GHG emissions data shall be consolidated and disclosed according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the “financial control” approach defined by the GHG Protocol, and the approach published by the Climate Disclosure Standards Board (CDSB) that is described in REQ-07, “Organisational boundary,” of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).
- 3 The entity shall disclose the percentage of its gross global Scope 1 GHG emissions that are covered under an emissions-limiting regulation or program that is intended to directly limit or reduce emissions, such as cap-and-trade schemes, carbon tax/fee systems, and other emissions control (e.g., command-and-control approach) and permit-based mechanisms.
- 3.1 Examples of emissions-limiting regulations include, but are not limited to:
- 3.1.1 California Cap-and-Trade (California Global Warming Solutions Act)
  - 3.1.2 European Union Emissions Trading Scheme (EU ETS)
  - 3.1.3 Quebec Cap-and-Trade (Draft Bill 42 of 2009)
- 3.2 The percentage shall be calculated as the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e) that are covered under emissions-limiting regulations divided by the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e).
- 3.2.1 For emissions that are subject to multiple emissions-limiting regulations, the entity shall not account for those emissions more than once.
- 3.3 The scope of emissions-limiting regulations excludes emissions covered under voluntary emissions-limiting regulations (e.g., voluntary trading systems), as well as reporting-based regulations [e.g., the U.S. Environmental Protection Agency (EPA) GHG Reporting Program].
- 4 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 5 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.

- 6 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

## **EM-CM-110a.2. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 2.2 Whether the target is absolute- or intensity-based, and the metric denominator, if it is an intensity-based target;
  - 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated toward the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;
  - 2.5 The mechanism(s) for achieving the target; and
  - 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset.
- 3 The entity shall discuss the activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
- 4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as whether they pertain differently to different business units, geographies, or emissions sources.
- 5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
- 6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

# Air Quality

## Topic Summary

On-site fuel combustion and production processes in the Construction Materials industry emit criteria air pollutants and hazardous chemicals, including small quantities of organic compounds and heavy metals. Emissions of particular concern include nitrogen oxides, sulfur dioxides, particulate matter, heavy metals (e.g., mercury), dioxins, and volatile organic compounds, among others. These air emissions can have significant, localized human health and environmental impacts. Financial impacts resulting from air emissions will vary depending on the specific location of operations and the applicable air emissions regulations, but could include higher operating or capital expenditures and regulatory or legal penalties. Active management of the issue—through technological and process improvements—could allow companies to limit the impact of regulations and benefit from operational efficiencies that could lead to a lower cost structure over time.

## Accounting Metrics

### **EM-CM-120a.1. Air emissions of the following pollutants: (1) NO<sub>x</sub> (excluding N<sub>2</sub>O), (2) SO<sub>x</sub>, (3) particulate matter (PM<sub>10</sub>), (4) dioxins/furans, (5) volatile organic compounds (VOCs), (6) polycyclic aromatic hydrocarbons (PAHs), and (7) heavy metals**

- 1 The entity shall disclose its emissions of air pollutants, in metric tons per pollutant, that are released into the atmosphere.
  - 1.1 The scope of disclosure includes air pollutants associated with the entity's direct air emissions resulting from all of the entity's activities and sources of emissions, including, but not limited to, stationary and mobile sources, production facilities, office buildings, and transportation fleets.
- 2 The entity shall disclose its emissions of (1) oxides of nitrogen (NO<sub>x</sub>), reported as NO<sub>x</sub>.
  - 2.1 The scope of NO<sub>x</sub> includes NO and NO<sub>2</sub>, but excludes N<sub>2</sub>O.
- 3 The entity shall disclose its emissions of (2) oxides of sulfur (SO<sub>x</sub>), reported as SO<sub>x</sub>.
  - 3.1 The scope of SO<sub>x</sub> includes SO<sub>2</sub> and SO<sub>3</sub>.
- 4 The entity shall disclose its emissions of (3) particulate matter 10 micrometers or less in diameter (PM<sub>10</sub>), reported as PM<sub>10</sub>.
  - 4.1 PM<sub>10</sub> is defined, according to U.S. 40 CFR Part 51.100, as any airborne finely divided solid or liquid material with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
- 5 The entity shall disclose its emissions of (4) dioxins/furans.
  - 5.1 Dioxins/furans include, but are not limited to the sum of the 17 congeners of polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) that contain chlorine

- 6 The entity shall disclose its emissions of (5) non-methane volatile organic compounds (VOCs).
  - 6.1 VOCs are defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate, and methane, that participates in atmospheric photochemical reactions, except those designated by the U.S. Environmental Protection Agency (EPA) as having negligible photochemical reactivity.
    - 6.1.1 This definition is aligned with U.S. 40 CFR Part 51.100, where a list of compounds that have been determined to have negligible photochemical reactivity can be obtained.
    - 6.1.2 Where applicable regulatory definitions of VOCs may conflict with this definition, such as the EU Paints Directive (Directive 2004/42/EC), and Schedule 1 of the Canadian Environmental Protection Act 1999, the entity may define VOCs as per the applicable regulatory definition.
- 7 The entity shall disclose its emissions of (6) polycyclic aromatic hydrocarbons (PAHs).
  - 7.1 PAHs include, but are not limited to those listed in Table 1 of the European Commission Joint Research Centre's Institute for Reference Materials and Measurements [PAH Factsheet](#).
    - 7.1.1 These include compounds frequently monitored by the Scientific Committee for Food (SCF), the European Union (EU), and the U.S. EPA.
- 8 The entity shall disclose its emissions of (7) heavy metals.
  - 8.1 The scope of heavy metals includes Lead (Pb), mercury (Hg), and cadmium (Cd).
- 9 The entity may discuss the calculation methodology for its emissions disclosure, such as whether data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

# Energy Management

## Topic Summary

The production of construction materials requires a significant quantity of energy, sourced primarily from direct combustion of fossil fuels as well as from purchased electricity. Energy-intensive production has implications for climate change, and electricity purchases from the grid can create indirect Scope 2 emissions. Construction materials companies also use alternative fuels for their kilns, such as scrap tires and waste oil—often waste generated by other industries. If properly managed, these can lower energy costs and greenhouse gas (GHG) emissions. However, there could be potentially negative impacts, such as releases of harmful air pollutants that companies need to minimize in order to obtain net benefits from using such fuels. Decisions about use of alternative fuels, renewable energy, and on-site generation of electricity (versus purchases from the grid) can play an important role in influencing both the costs and reliability of energy supply. Affordable, easily accessible, and reliable energy is an important competitive factor in this industry, with purchased fuels and electricity accounting for a significant proportion of total production costs. The way in which a construction materials company manages its overall energy efficiency, its reliance on different types of energy and associated sustainability risks, and its ability to access alternative sources of energy can influence its profitability.

## Accounting Metrics

### **EM-CM-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage alternative, (4) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that was from alternative sources, in terms of its energy content.

- 3.1 Alternative sources of energy include, but are not limited to: used tires, spent solvents and waste oils, processed municipal solid waste, household wastes, agricultural wastes such as rice, peanut shells and coffee husks, animal meal, and sewage sludge.
- 4 The entity shall disclose (4) the percentage of energy it consumed that is renewable energy.
  - 4.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 4.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 4.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.
    - 4.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
    - 4.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
    - 4.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.
  - 4.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:
    - 4.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;
    - 4.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the [Green-e Framework for Renewable Energy Certification](#), Version 1.0 (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.
- 5 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).



# Water Management

## Topic Summary

The production of construction materials requires substantial volumes of water for the production process. Companies face operational, regulatory, and reputational risks due to water scarcity, costs of water acquisition, regulations on effluents or amount of water used, and competition with local communities and other industries for limited water resources. Risks are likely to be higher in regions of water scarcity, due to potential water availability constraints and price volatility. Companies that are unable to secure a stable water supply could face production disruptions, while rising water prices could directly increase production costs. Consequently, the adoption of technologies and processes that reduce water consumption could lower operating risks and costs for companies by minimizing the impact of regulations, water supply shortages, and community-related disruptions on company operations.

## Accounting Metrics

### EM-CM-140a.1. (1) Total fresh water withdrawn, (2) percentage recycled, (3) percentage in regions with High or Extremely High Baseline Water Stress

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from freshwater sources:
  - 1.1 Fresh water may be defined according to the local statutes and regulations where the entity operates. Where there is no regulatory definition, fresh water shall be considered to be water that has less than 1000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 1.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 2 The entity shall disclose the percentage of water recycled as the volume, in thousands of cubic meters, recycled divided by the volume of water withdrawn.
  - 2.1 Any volume of water reused multiple times shall be counted as recycled each time it is recycled and reused.
- 3 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80%) or Extremely High (>80%) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 4 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 5 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

# Waste Management

## Topic Summary

Recycling rates in construction materials production are high. However, wastes from production processes, pollution control devices, and from hazardous waste management activities present a regulatory risk and can raise operating costs. Cement kiln dust (CKD)—consisting of fine-grained, solid, highly alkaline waste removed from cement kiln exhaust gas by air pollution control devices—is the most significant waste category in the industry. Regulatory risk remains from evolving environmental laws, including those at local and national levels and for other waste streams. Companies that reduce waste streams—hazardous waste streams in particular—and recycle by-products, can therefore lower regulatory and litigation risks and costs.

## Accounting Metrics

### EM-CM-150a.1. Amount of waste generated, percentage hazardous, percentage recycled

- 1 The entity shall disclose the amount of waste generated in metric tons.
  - 1.1 Waste is defined as anything for which the entity has no further use and which is discarded or is released to the environment.
  - 1.2 The scope includes slags, dusts, sludges, used oil, and other solid wastes that meet the above definition.
  - 1.3 The scope excludes gaseous wastes.
- 2 The entity shall disclose the percentage of waste generated that was hazardous.
  - 2.1 The percentage of hazardous waste shall be calculated as the weight of waste that meets the definition of hazardous waste under Subtitle C of the U.S. Environmental Protection Agency's (EPA) Resource Conservation and Recovery Act (RCRA) or under the EU Waste Framework Directive (Directive 2008/98/EC on waste, including its subsequent amendments) divided by the total weight of waste material.
  - 2.2 Hazardous wastes include those that display the following characteristics: ignitability, corrosivity, reactivity, or toxicity.
- 3 The entity shall disclose the percentage of waste generated that was recycled.
  - 3.1 The percentage recycled shall be calculated as the weight of waste material that was reused, plus the weight recycled or remanufactured (through treatment or processing) by the entity, plus the amount sent externally for further recycling, divided by the total weight of waste material, where:
    - 3.1.1 Reused materials are defined as those recovered products or components of products that are used for the same purpose for which they were conceived.

- 3.1.2 Recycled and remanufactured materials are defined as waste materials that have been reprocessed or treated by means of production or manufacturing processes and made into a final product or made into a component for incorporation into a product.
  - 3.1.3 The scope of recycled and remanufactured products include primary recycled materials, co-products (outputs of equal value to primary recycled materials), and by-products (outputs of lesser value to primary recycled materials).
  - 3.1.4 Portions of products and materials that are disposed of in landfills are not considered recycled; only the portions of products that are directly incorporated into new products, co-products, or by-products shall be included in the percentage recycled.
  - 3.1.5 Materials sent for further recycling include those materials which are transferred to a third party for the expressed purpose of reuse, recycling, or refurbishment.
- 3.2 Materials incinerated, including for energy recovery, shall not be considered within the scope of recycled materials.
- 3.2.1 Energy recovery is defined as the use of combustible waste as a means to generate energy through direct incineration, with or without other waste, but with recovery of the heat.
  - 3.2.2 The entity may separately disclose the percentage of hazardous waste generated that was incinerated.

# Product Innovation

## Topic Summary

Innovations in building materials are a key component in the growth of sustainable construction. Consumer and regulatory trends are largely driving adoption of sustainable building materials and processes that are more resource efficient and can reduce health impacts of buildings throughout their lifecycle. This is creating new business drivers for construction materials companies, with an opportunity to increase revenues. Furthermore, some new products require less energy to produce, or use largely recycled inputs, reducing production costs. Sustainable construction materials, therefore, can contribute to a company's long-term growth and competitiveness.

## Accounting Metrics

### **EM-CM-410a.1. Percentage of products that qualify for credits in sustainable building design and construction certifications**

- 1 The entity shall calculate the percentage as the revenue during the reporting period from products that qualify for credits in recognized sustainable design and construction certifications divided by the total revenue from building products.
  - 1.1 The scope of products excludes raw or intermediate materials that would require additional manufacturing before being incorporated into a building; the entity shall exclude these products from the numerator and denominator of its calculations.
- 2 Recognized sustainable building design and construction certifications and guidelines include: BREEAM® (BRE Global), Green Globes® (Green Building Initiative), LEED® (U.S. Green Building Council), and ICC-700 National Green Building Standard® (National Association of Home Builders).<sup>10</sup>
  - 2.1 If the entity's products can be used to obtain credits in certifications other than those described above, it shall provide the name of the certification and evidence of why it is equal to or more rigorous than those standards listed here.
- 3 The entity may disclose and discuss which specific products contribute to sustainable building practices and future plans to address market demand for these types of products.

### **EM-CM-410a.2. Total addressable market and share of market for products that reduce**

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SASB is not affiliated with any of the standards or organization listed, and listing should not be taken as an endorsement of any standard or organization. Listing of standards is not meant to imply that standards are identical in scope, underlying requirements, or criteria, or that standards are interchangeable.

## **energy, water, and/or material impacts during usage and/or production**

- 1 The entity shall provide an estimation of the total addressable market for products that show reduced environmental impacts at various lifecycle stages, including during material sourcing, manufacturing, and product usage (hereafter, “reduced environmental impact products”).
  - 1.1 Total addressable market is defined as potential revenue (in billions of U.S. dollars) should the entity capture 100 percent of the market share of the product category (e.g., the global market for reduced environmental impact building products).
- 2 The scope of products includes those:
  - 2.1 With product attributes that reduce energy consumption or increase energy efficiency for users, such as by providing improved insulation as compared to typical products
  - 2.2 With process or product attributes that reduce the amount water required in manufacturing, during product assembly, or product usage
  - 2.3 That use secondary or recycled materials in place of virgin materials such that upstream impacts are reduced
  - 2.4 Made with design innovations that lower carbon emissions during manufacturing, such as use of renewable fuels, energy efficiency improvements, or the use of materials requiring less processing
- 3 If there is a significant difference between the total addressable market and the market that the entity can serve through its existing or planned capabilities, sales channels, or products (i.e., the serviceable available market) then the entity should disclose this information.
- 4 The entity shall disclose the share of the total addressable market for reduced environmental impact products that it currently captures with its products.
  - 4.1 Market share shall be calculated as revenues from these products divided by the size of the total addressable market.
- 5 The entity may provide a projection of growth of this market, where the projected addressable market is represented – based on a reasonable set of assumptions about changes in market conditions – as a percentage of year-on-year growth or as an estimate of the market size after a defined period (i.e., the market size in 10 years).
  - 5.1 The entity may disclose its target three-year market share as a measurement of targeted growth, where the target is the percentage of the total addressable market that the entity plans to address over a three-year time horizon.

## IRON & STEEL PRODUCERS

### Industry Description

The Iron & Steel Producers industry consists of steel producers with iron and steel mills and companies with iron and steel foundries. The steel producers segment consists of companies that produce iron and steel products from their own mills. These products include flat-rolled sheets, tin plates, pipes, tubes, and products made of stainless steel, titanium, and high alloy steels. Iron and steel foundries, which cast various products, typically purchase iron and steel from other firms. The industry also includes metal service centers and other metal merchant wholesalers, which distribute, import, or export ferrous products. Steel production occurs via two primary methods: the Basic Oxygen Furnace (BOF), which uses iron ore as an input, and the Electric Arc Furnace (EAF), which uses scrap steel. Many companies in the industry operate on an international scale. Note: With a few exceptions, most companies do not mine their own ore to manufacture steel and iron products. There are separate SASB standards for the Metals & Mining (EM-MM) industry.

Table 1. *Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations	Quantitative	Metric tons (t) CO <sub>2</sub> -e, Percentage (%)	EM-IS-110a.1
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	EM-IS-110a.2
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	EM-IS-130a.1
	(1) Total fuel consumed, (2) percentage coal, (3) percentage natural gas, (4) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	EM-IS-130a.2
Water Management	(1) Total fresh water withdrawn, (2) percentage recycled, (3) percentage in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	EM-IS-140a.1
Supply Chain Management	Discussion of the process for managing iron ore and/or coking coal sourcing risks arising from environmental and social issues	Discussion and Analysis	n/a	EM-IS-430a.1

Table 2. *Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Raw steel production, percentage from: (1) basic oxygen furnace processes, (2) electric arc furnace processes	Quantitative	Metric tons (t), Percentage (%)	EM-IS-000.A

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Total iron ore production <sup>11</sup>	Quantitative	Metric tons (t)	EM-IS-000.B
Total coking coal production <sup>12</sup>	Quantitative	Metric tons (t)	EM-IS-000.C

<sup>11</sup> Note to **EM-IS-000.B** – The scope of production includes iron ore consumed internally and that which is made available for sale.

<sup>12</sup> Note to **EM-IS-000.C** – The scope of production includes coking coal consumed internally and that which is made available for sale.

# Greenhouse Gas Emissions

## Topic Summary

Iron and steel production generates significant direct greenhouse gas (GHG) emissions, primarily of carbon dioxide and methane, from production processes and on-site fuel combustion. While technological improvements have reduced the GHG emissions per ton of steel produced, steel production remains carbon-intensive relative to other industries. Regulatory efforts to reduce GHG emissions in response to the risks posed by climate change may result in additional regulatory compliance costs and risks for iron and steel companies due to climate change mitigation policies. Operational efficiencies can be achieved through the cost-effective reduction of GHG emissions. Such efficiencies can mitigate the potential financial impact of increased fuel costs from regulations that seek to limit—or put a price on—GHG emissions.

## Accounting Metrics

### EM-IS-110a.1. Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e), and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
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  - 2.2 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:
    - 2.2.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)
    - 2.2.2 *Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources* published by the U.S. Environmental Protection Agency (EPA)



- 2.2.3 India GHG Inventory Program
  - 2.2.4 ISO 14064-1
  - 2.2.5 Petroleum Industry Guidelines for reporting GHG emissions, 2nd edition, 2011, published by IPIECA
  - 2.2.6 Protocol for the quantification of greenhouse gas emissions from waste management activities published by Entreprises pour l'Environnement (EpE)
- 2.3 GHG emissions data shall be consolidated and disclosed according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the "financial control" approach defined by the GHG Protocol, and the approach published by the Climate Disclosure Standards Board (CDSB) described in REQ-07, "Organisational boundary," of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).
- 3 The entity shall disclose the percentage of its gross global Scope 1 GHG emissions that are covered under an emissions-limiting regulation or program that is intended to directly limit or reduce emissions, such as cap-and-trade schemes, carbon tax/fee systems, and other emissions control (e.g., command-and-control approach) and permit-based mechanisms.
- 3.1 Examples of emissions-limiting regulations include, but are not limited to:
- 3.1.1 California Cap-and-Trade (California Global Warming Solutions Act)
  - 3.1.2 European Union Emissions Trading Scheme (EU ETS)
  - 3.1.3 Quebec Cap-and-Trade (Draft Bill 42 of 2009)
- 3.2 The percentage shall be calculated as the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e) that are covered under emissions-limiting regulations divided by the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e).
- 3.2.1 For emissions that are subject to multiple emissions-limiting regulations, the entity shall not account for those emissions more than once.
- 3.3 The scope of emissions-limiting regulations excludes emissions covered under voluntary emissions-limiting regulations (e.g., voluntary trading systems), as well as reporting-based regulations [e.g., the U.S. Environmental Protection Agency (EPA) GHG Reporting Program].
- 4 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 5 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 6 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

## **EM-IS-110a.2. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined according to *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 2.2 Whether the target is absolute- or intensity-based, and the metric denominator, if it is an intensity-based target;
  - 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated toward the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;
  - 2.5 The mechanism(s) for achieving the target; and
  - 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset.
- 3 The entity shall discuss the activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
- 4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as whether they pertain differently to different business units, geographies, or emissions sources.
- 5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
- 6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

# Energy Management

## Topic Summary

The production of steel requires significant quantities of energy, sourced primarily from the direct combustion of fossil fuels as well as energy purchased from the grid. Energy-intensive production has implications for climate change and electricity purchases from the grid can result in indirect Scope 2 emissions. The choice between different production processes—electric arc furnaces and integrated basic oxygen furnace—can influence whether a company uses fossil fuels or purchases electricity. This decision, together with the choice between using coal versus natural gas or on-site versus grid-sourced electricity, can play an important role in influencing both the costs and reliability of energy supply. Affordable, easily accessible, and reliable energy is an important competitive factor in this industry, with energy costs accounting for a substantial portion of manufacturing costs. The way in which an iron and steel company manages its overall energy efficiency, its reliance on different types of energy and associated sustainability risks, and its ability to access alternative sources of energy can influence its profitability.

## Accounting Metrics

### **EM-IS-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase

agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

3.4.1 Energy from hydro sources that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard; and

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the Green-e Framework for Renewable Energy Certification, Version 1.0 (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

## **EM-IS-130a.2. (1) Total fuel consumed, (2) percentage coal, (3) percentage natural gas, (4) percentage renewable**

1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).

1.1 The calculation methodology for fuel consumed shall be based on actual fuel consumed as opposed to design parameters.

1.2 Acceptable calculation methodologies for fuel consumed include, but are not limited to, methodologies based on:

1.2.1 Adding fuel purchases made during the reporting period to beginning inventory at the start of the reporting period, less any fuel inventory at the end of the reporting period

1.2.2 Tracking fuel consumed by vehicles

1.2.3 Tracking fuel expenses

- 2 The entity shall disclose (2) the percentage of fuel consumed that is coal.
  - 2.1 The percentage shall be calculated as the amount of coal consumed (in GJ) divided by the total amount of fuel consumed (in GJ).
  - 2.2 The scope of coal consumed includes, but is not limited to, thermal coal, metallurgical coal, coke, and coke breeze.
- 3 The entity shall disclose (3) the percentage of fuel consumed that is natural gas.
  - 3.1 The percentage shall be calculated as the amount of natural gas consumed (in GJ) divided by the total amount of fuel consumed (in GJ).
- 4 The entity shall disclose (4) the percentage of fuel consumed that is renewable fuel.
  - 4.1 Renewable fuel is defined, consistent with the U.S. Renewable Fuel Standard (U.S. 40 CFR 80.1401), as fuel that meets all of the following requirements:
    - 4.1.1 Produced from renewable biomass;
    - 4.1.2 Used to replace or reduce the quantity of fossil fuel present in a transportation fuel, heating oil, or jet fuel; and
    - 4.1.3 Has lifecycle greenhouse gas (GHG) emissions that are at least 20 percent less than baseline lifecycle GHG emissions, unless the fuel is exempt from this requirement pursuant to U.S. 40 CFR 80.1403.
  - 4.2 The scope of renewable fuel includes fuel that qualifies for Renewable Identification Numbers (RINs) under the U.S. Renewable Fuel Standard.
  - 4.3 The percentage shall be calculated as the amount of renewable fuel consumed (in GJ) divided by the total amount of fuel consumed (in GJ).
- 5 In calculating energy consumption from fuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change, the U.S. Department of Energy, or the U.S. Energy Information Agency.
- 6 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage.

# Water Management

## Topic Summary

Steel production requires a substantial amount of water. Companies face operational, regulatory, and reputational risks due to water scarcity, costs of water acquisition, regulations on effluents or amount of water used, and competition with local communities and other industries for limited water resources. This is the case especially in regions of water scarcity, due to potential water availability constraints and price volatility. Companies that are unable to secure a stable water supply could face production disruptions, while rising water prices could directly increase production costs. Consequently, the adoption of technologies and processes that reduce water consumption could lower operating risks and costs for companies by minimizing the impact of regulations, water supply shortages, and community-related disruptions on company operations.

## Accounting Metrics

### EM-IS-140a.1. (1) Total fresh water withdrawn, (2) percentage recycled, (3) percentage in regions with High or Extremely High Baseline Water Stress

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from freshwater sources:
  - 1.1 Fresh water may be defined according to the local statutes and regulations where the entity operates. Where there is no regulatory definition, fresh water shall be considered to be water that has less than 1000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 1.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 2 The entity shall disclose the percentage of water recycled as the volume, in thousands of cubic meters, recycled divided by the volume of water withdrawn.
  - 2.1 Any volume of water reused multiple times shall be counted as recycled each time it is recycled and reused.
- 3 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80%) or Extremely High (>80%) Baseline Water Stress as classified by the World Resources Institute's (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 4 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 5 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

# Supply Chain Management

## Topic Summary

Iron ore and coal are critical raw material inputs to the steel production process. Iron ore mining and coal production are resource-intensive processes. Extraction of these materials often has substantial environmental and social externalities affecting local communities, workers, and ecosystems. Such impacts can result in disruptions to mining operations due to community protests, legal or regulatory action, or increased costs of extraction as a result of regulatory compliance costs or penalties. Iron and steel companies could face disruptions as a result, or in some cases, may also be subject to regulatory penalties associated with the environmental or social impact of the mining company supplier. In order to minimize such risks, iron and steel producers may proactively manage their direct suppliers of critical raw materials to ensure that they are not engaged in illegal or otherwise environmentally or socially damaging practices, through appropriate supplier screening, monitoring, and engagement.

## Accounting Metrics

### **EM-IS-430a.1. Discussion of the process for managing iron ore and/or coking coal sourcing risks arising from environmental and social issues**

- 1 The entity shall discuss its policies and procedures for managing environmental and social risks that may affect sourcing that are present in its iron ore and/or coking coal supply chain.
  - 1.1 Discussion shall include any existing or projected risks or constraints in obtaining raw materials (e.g., iron ore, or coking coal) within the supply chain, including those related to restricted/limited availability, political situations, local labor conditions, natural disasters, climate change, or regulations.
  - 1.2 The scope of disclosure may include description of the use of screening, codes of conduct, audits, and certifications.
- 2 If audits are discussed, the entity may indicate whether audits are internal (first party), independent (third party), or administered by peers (e.g., trade organizations).

## METALS & MINING

### Industry Description

The Metals & Mining industry is involved in extracting metals and minerals, producing ores, quarrying stones, smelting and manufacturing metals, refining metals, and providing mining support activities. It also produces iron ores, rare earth metals, and precious metals and stones. Larger companies in this industry are vertically integrated – from mining across global operations to wholesaling metals to customers.

Note: SASB has separate standards for the Iron & Steel Producers industry (EM-IS).

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations	Quantitative	Metric tons (t) CO <sub>2</sub> -e, Percentage (%)	EM-MM-110a.1
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	EM-MM-110a.2
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	EM-MM-130a.1
Water Management	(1) Total fresh water withdrawn, (2) total fresh water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	EM-MM-140a.1
	Number of incidents of non-compliance associated with water quality permits, standards, and regulations	Quantitative	Number	EM-MM-140a.2

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Production of (1) metal ores and (2) finished metal products	Quantitative	Metric tons (t) saleable	EM-MM-000.A
Total number of employees, percentage contractors	Quantitative	Number, Percentage (%)	EM-MM-000.B



# Greenhouse Gas Emissions

## Topic Summary

Mining operations are energy-intensive and generate significant direct greenhouse gas (GHG) emissions, including carbon dioxide from fuel use during mining, ore processing, and smelting activities. The extent and type of GHG emissions can vary depending on the metal mined and processed. Regulatory efforts to reduce GHG emissions in response to the risks posed by climate change may result in additional regulatory compliance costs and risks for metals and mining companies due to climate change mitigation policies. Operational efficiencies can be achieved through the cost-effective reduction of GHG emissions. Such efficiencies can mitigate the potential financial impact of increased fuel costs from regulations that seek to limit—or put a price on—GHG emissions.

## Accounting Metrics

### EM-MM-110a.1. Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e), and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 These emissions include direct emissions of GHGs from stationary or mobile sources that include, but are not limited to, equipment at mine sites, refineries and smelting facilities, office buildings, and metal transportation (marine, road, and rail).
  - 2.2 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:
    - 2.2.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)

- 2.2.2 Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources published by the U.S. Environmental Protection Agency (EPA)
  - 2.2.3 India GHG Inventory Program
  - 2.2.4 ISO 14064-1
  - 2.2.5 Petroleum Industry Guidelines for reporting GHG emissions, 2nd edition, 2011, published by IPIECA
  - 2.2.6 Protocol for the quantification of greenhouse gas emissions from waste management activities published by Entreprises pour l'Environnement (EpE)
- 2.3 GHG emissions data shall be consolidated and disclosed according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the “financial control” approach defined by the GHG Protocol, and the approach published by the Climate Disclosure Standards Board (CDSB) described in REQ-07, “Organisational boundary,” of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).
- 3 The entity shall disclose the percentage of its gross global Scope 1 GHG emissions that are covered under an emissions-limiting regulation or program that is intended to directly limit or reduce emissions, such as cap-and-trade schemes, carbon tax/fee systems, and other emissions control (e.g., command-and-control approach) and permit-based mechanisms.
- 3.1 Examples of emissions-limiting regulations include, but are not limited to:
- 3.1.1 California Cap-and-Trade (California Global Warming Solutions Act)
  - 3.1.2 European Union Emissions Trading Scheme (EU ETS)
  - 3.1.3 Quebec Cap-and-Trade (Draft Bill 42 of 2009)
- 3.2 The percentage shall be calculated as the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e) that are covered under emissions-limiting regulations divided by the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e).
- 3.2.1 For emissions that are subject to multiple emissions-limiting regulations, the entity shall not account for those emissions more than once.
- 3.3 The scope of emissions-limiting regulations excludes emissions covered under voluntary emissions-limiting regulations (e.g., voluntary trading systems), as well as reporting-based regulations [e.g., the U.S. Environmental Protection Agency (EPA) GHG Reporting Program].
- 4 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 5 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.

- 6 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.
- 7 The entity may, where relevant, provide a breakdown of its emissions by mineral or business unit.
  - 7.1 Minerals or business units may include, but are not limited to: aluminum, copper, zinc, iron ore, precious metals, or diamonds.

**EM-MM-110a.2. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined according to *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions the target is applicable to);
  - 2.2 Whether the target is absolute- or intensity-based, and the metric denominator, if it is an intensity-based target;
  - 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated toward the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;
  - 2.5 The mechanism(s) for achieving the target; and
  - 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset.
- 3 The entity shall discuss the activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
- 4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as whether they pertain differently to different business units, geographies, or emissions sources.
- 5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
- 6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

# Energy Management

## Topic Summary

Mining and metals production is often energy-intensive, with a significant proportion of energy consumption in the industry accounted for by purchased electricity. While fuel combustion on-site contributes to the industry's direct (Scope 1) GHG emissions, electricity purchases from the grid can result in indirect, Scope 2 emissions. The energy intensity of operations may increase with decreasing grades of deposits and increasing depth and scale of mining operations. The choice between on-site versus grid-sourced electricity, and use of alternative energy, can play an important role in influencing both the costs and reliability of energy supply. Affordable and easily accessible energy is an important competitive factor in a commodity market driven by global competition, and purchased fuels and electricity can account for a significant proportion of total production costs. The way in which a company manages its overall energy efficiency and intensity, its reliance on different types of energy, and its ability to access alternative sources of energy, can therefore be a material factor.

## Accounting Metrics

### **EM-MM-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase

agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

# Water Management

## Topic Summary

Mining and metals production can impact both the availability and the quality of local water resources. Metals and mining companies face operational, regulatory, and reputational risks due to water scarcity, costs of water acquisition, regulations on effluents or amount of water used, and competition with local communities and other industries for limited water resources. Impacts associated with water management may include higher costs, liabilities, and lost revenues due to curtailment or suspension of operations. The severity of these risks can vary depending on the region's water availability and the regulatory environment. Companies in the industry may deploy new technologies to manage risks related to water risk, including desalination, water recirculation, and innovative waste-disposal solutions. Reducing water use and contamination can create operational efficiencies for companies and lower their operating costs.

## Accounting Metrics

### **EM-MM-140a.1. (1) Total fresh water withdrawn, (2) total fresh water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from freshwater sources:
  - 1.1 Fresh water may be defined according to the local statutes and regulations where the entity operates. Where there is no regulatory definition, fresh water shall be considered to be water that has less than 1000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 1.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 2 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations
  - 2.1 Water consumption is defined as:
    - 2.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 2.1.2 Water that is directly or indirectly incorporated into the entity's product or service;
    - 2.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.
- 3 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80%) or Extremely High (>80%) Baseline Water Stress as classified by the World Resources Institute's (WRI) Water Risk Atlas tool, [Aqueduct](#).
  - 3.1 The entity shall list its facilities or operations which are located in areas of High or Extremely High Baseline Water Stress.

- 4 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 5 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

### **EM-MM-140a.2. Number of incidents of non-compliance associated with water quality permits, standards, and regulations**

- 1 The entity shall disclose the total number of instances of non-compliance, including violations of a technology-based standard and exceedances of quality-based standards.
- 2 The scope of disclosure includes incidents governed by national, state, and local statutory permits and regulations, including, but not limited to, the discharge of a hazardous substances, violation of pretreatment requirements, or total maximum daily load (TMDL) exceedances.
  - 2.1 Typical parameters of concern include arsenic, copper, lead, nickel, zinc, cyanide, radium-226, total suspended solids, pH, and toxicity.
- 3 The scope of disclosure shall only include incidents of non-compliance that resulted in a formal enforcement action(s).
  - 3.1 Formal enforcement actions are defined as governmental actions that address a violation or threatened violation of water quantity and/or quality laws, regulations, policies, or orders, and can result in administrative penalty orders, administrative orders, and judicial actions, among others. For example, the U.S. Environmental Protection Agency (EPA) provides guidance on the scope of formal enforcement actions in, [Informal and Formal Actions, Summary Guidance and Portrayal on EPA Websites](#).
- 4 Violations shall be disclosed, regardless of their measurement methodology or frequency. These include violations for:
  - 4.1 Continuous discharges, limitations, standards, and prohibitions that are generally expressed as maximum daily, weekly average, and monthly averages.
  - 4.2 Non-continuous discharges and limitations that are generally expressed in terms of frequency, total mass, maximum rate of discharge, and mass or concentration of specified pollutants.

## OIL & GAS – EXPLORATION & PRODUCTION

### Industry Description

Oil & Gas - Exploration & Production (E&P) companies explore for, extract, or produce energy products such as crude oil and natural gas, which comprise the upstream operations of the oil and gas value chain. Companies in the industry develop conventional and unconventional oil and gas reserves; these include, but are not limited to, shale oil and/or gas reserves, oil sands, and gas hydrates. Activities covered by this standard include the development of both on-shore and off-shore reserves. The E&P industry creates contracts with the Oil and Gas Services industry to conduct several E&P activities and to obtain equipment and oilfield services.

Note: The Standards discussed below are for “pure-play” E&P activities, or independent E&P companies. Integrated oil and gas companies conduct upstream operations but are also involved in the distribution and/or refining or marketing of products. SASB has separate standards for the Oil and Gas Midstream (EM-MD) and Refining & Marketing industries (EM-RM). As such, integrated companies should also consider the disclosure topics and metrics from these standards. SASB also has separate standards for Oil and Gas Services (EM-SV).

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions, percentage methane, percentage covered under emissions-limiting regulations	Quantitative	Metric tons CO <sub>2</sub> -e (t), Percentage (%)	EM-EP-110a.1
	Amount of gross global Scope 1 emissions from: (1) flared hydrocarbons, (2) other combustion, (3) process emissions, (4) other vented emissions, and (5) fugitive emissions	Quantitative	Metric tons CO <sub>2</sub> -e	EM-EP-110a.2
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	EM-EP-110a.3
Water Management	(1) Total fresh water withdrawn, (2) total fresh water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	EM-EP-140a.1
	Volume of produced water and flowback generated; percentage (1) discharged, (2) injected, (3) recycled; hydrocarbon content in discharged water	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%), Metric tons (t)	EM-EP-140a.2
	Percentage of hydraulically fractured wells for which there is public disclosure of all fracturing fluid chemicals used	Quantitative	Percentage (%)	EM-EP-140a.3



TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
	Percentage of hydraulic fracturing sites where ground or surface water quality deteriorated compared to a baseline <sup>13</sup>	Quantitative	Percentage (%)	EM-EP-140a.4
Reserves Valuation & Capital Expenditures	Sensitivity of hydrocarbon reserve levels to future price projection scenarios that account for a price on carbon emissions	Quantitative	Million barrels (MMbbls), Million standard cubic feet (MMscf)	EM-EP-420a.1
	Estimated carbon dioxide emissions embedded in proved hydrocarbon reserves	Quantitative	Metric tons (t) CO <sub>2</sub> -e	EM-EP-420a.2
	Amount invested in renewable energy, revenue generated by renewable energy sales	Quantitative	Reporting currency	EM-EP-420a.3
	Discussion of how price and demand for hydrocarbons and/or climate regulation influence the capital expenditure strategy for exploration, acquisition, and development of assets	Discussion and Analysis	n/a	EM-EP-420a.4

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Production of: (1) oil, (2) natural gas, (3) synthetic oil, and (4) synthetic gas	Quantitative	Thousand barrels per day (Mbbbl/day); Million standard cubic feet per day (MMscf/day)	EM-EP-000.A
Number of offshore sites	Quantitative	Number	EM-EP-000.B
Number of terrestrial sites	Quantitative	Number	EM-EP-000.C

<sup>13</sup> Note to EM-EP-140a.4 – The entity shall disclose its policies and practices related to ground and surface water quality management.

# Greenhouse Gas Emissions

## Topic Summary

Exploration & Production (E&P) activities generate significant direct greenhouse gas (GHG) emissions from a variety of sources. Emissions can be combusted, including those arising from flaring or power generation equipment, as well as uncombusted, including those emissions arising from gas processing equipment, venting, flaring, and fugitive methane. Regulatory efforts to reduce GHG emissions in response to the risks posed by climate change may result in additional regulatory compliance costs and risks for E&P companies. With natural gas production from shale resources expanding, the management of the emission of methane, a highly potent GHG, from oil and gas E&P systems has emerged as a major operational, reputational, and regulatory risk for companies. Furthermore, the development of unconventional hydrocarbon resources may be more or less GHG-intensive than conventional oil and gas, with associated impacts to regulatory risk. Energy efficiency, use of less carbon-intensive fuels, or process improvements to reduce fugitive emissions, venting, and flaring, can provide benefits to E&P companies in the form of climate risk mitigation, lower costs, or increased revenues.

## Accounting Metrics

### EM-EP-110a.1. Gross global Scope 1 emissions, percentage methane, percentage covered under emissions-limiting regulations

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalent (CO<sub>2</sub>-e), and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 These emissions include direct emissions of GHGs from stationary or mobile sources; these sources include but are not limited to: equipment at well sites, production facilities, refineries, chemical plants, terminals, fixed site drilling rigs, office buildings, marine vessels transporting products, tank truck fleets, mobile drilling rigs, and moveable equipment at drilling and production facilities.
  - 2.2 Acceptable calculation methodologies include those that conform with the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include but are not limited to:

- 2.2.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)
  - 2.2.2 *Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources* published by the U.S. Environmental Protection Agency (EPA)
  - 2.2.3 India GHG Inventory Program
  - 2.2.4 ISO 14064-1
  - 2.2.5 *Petroleum Industry Guidelines for reporting GHG emissions*, 2nd edition, 2011, published by IPIECA
  - 2.2.6 *Protocol for the quantification of greenhouse gas emissions from waste management activities* published by Entreprises pour l'Environnement (EpE)
- 2.3 GHG emission data shall be consolidated according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the "financial control" approach defined by the GHG Protocol as well as:
- 2.3.1 The financial approach detailed in Chapter 3 of the IPIECA/API/OGP *Petroleum Industry Guidelines for Reporting Greenhouse Gas Emissions*, Second Edition, 2011 (hereafter, the "IPIECA GHG Guidelines")
  - 2.3.2 The approach provided by the Climate Disclosure Standards Board (CDSB) that is described in REQ-07, "Organisational boundary," of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018)
- 3 The entity shall disclose the percentage of gross global Scope 1 emissions from methane emissions.
- 3.1 The percentage of gross global Scope 1 GHG emissions from methane emissions shall be calculated as the methane emissions in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e) divided by the gross global Scope 1 GHG emissions in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e).
- 4 The entity shall disclose the percentage of its emissions that are covered under an emissions-limiting regulation or that is intended to directly limit or reduce emissions, such as cap-and-trade schemes, carbon tax/fee systems, and other emissions control (e.g., command-and-control approach) and permit-based mechanisms.
- 4.1 Examples of emissions-limiting regulations include, but are not limited to:
- 4.1.1 California Cap-and-Trade (California Global Warming Solutions Act)
  - 4.1.2 European Union Emissions Trading Scheme (EU ETS)
  - 4.1.3 Quebec Cap-and-Trade (Draft Bill 42 of 2009)
- 4.2 The percentage shall be calculated as the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e) that are covered under emissions-limiting regulations divided by the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e).
- 4.2.1 For emissions that are subject to multiple emissions-limiting regulations, the entity shall not account for those emissions more than once.

- 4.3 The scope of emissions-limiting regulations excludes emissions covered under voluntary emissions-limiting regulations (e.g., voluntary trading systems) as well as disclosure-based regulations [e.g., the U.S. Environmental Protection Agency (EPA) GHG Reporting Program].
- 5 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 6 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 7 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

**EM-EP-110a.2. Amount of gross global Scope 1 emissions from: (1) flared hydrocarbons, (2) other combustion, (3) process emissions, (4) other vented emissions, and (5) fugitive emissions**

- 1 The entity shall disclose the amount of direct greenhouse gas (GHG) emissions in CO<sub>2</sub>-e from the following sources (1) flared hydrocarbons, (2) other combustion, (3) process emissions, (4) other vented emissions, and (5) fugitive emissions from operations.
  - 1.1 Sources shall generally correspond to the definitions provided in the [API Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry \(2009\)](#).
  - 1.2 Flared hydrocarbons shall include all emissions emitted from flares and which are associated with the management and disposal of unrecoverable natural gas via combustion of hydrocarbon products from routine operations, upsets, or emergencies.
  - 1.3 Other combusted emissions shall include, but are not limited to:
    - 1.3.1 Emissions from stationary devices, including, but not limited to boilers, heaters, furnaces, reciprocating internal combustion engines and turbines, incinerators, and thermal/catalytic oxidizers
    - 1.3.2 Emissions from mobile sources, including, but not limited to barges, ships, railcars, and trucks for material transport; planes/helicopters and other company vehicles for personnel transport; forklifts, all terrain vehicles, construction equipment, and other off-road mobile equipment
  - 1.4 Other combusted emissions shall exclude those emissions disclosed as flared hydrocarbons.
  - 1.5 Process emissions shall include those emissions that are not combusted and are intentional or designed into the process or technology to occur during normal operations and are a result of some form of chemical transformation or processing step. Such emissions include but are not limited to: emissions from hydrogen plants, amine units, glycol dehydrators, fluid catalytic cracking unit and reformer generation, and flexi-coker coke burn.
  - 1.6 Vented emissions shall include those emissions that are not combusted and are intentional or designed into the process or technology to occur during normal operations, and which include, but are not limited to:

- 1.6.1 Venting from crude oil, condensate, or natural gas product storage tanks, gas-driven pneumatic devices, gas samplers, chemical injection pumps, exploratory drilling, loading/ballasting/transit, and loading racks
  - 1.6.2 Venting resulting from maintenance/turn-arounds, including, but not limited to decoking of furnace tubes, well unloading, vessel and gas compressor depressurizing, compressor starts, gas sampling, and pipeline blowdowns
  - 1.6.3 Venting from non-routine activities, including but not limited to pressure relief valves, pressure control valves, fuel supply unloading valves, and emergency shut-down devices
- 1.7 Vented emissions shall exclude those emissions disclosed as process emissions.
  - 1.8 Fugitive emissions shall include those emissions that can be individually found and fixed to reduce emissions rates to near zero and which include, but are not limited to, emissions from valves, flanges, connectors, pumps, compressor seal leaks, catalytic heaters, and wastewater treatment and surface impoundments.

**EM-EP-110a.3. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined according to *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 2.2 Whether the target is absolute- or intensity-based, and the metric denominator, if it is an intensity-based target;
  - 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated towards the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;
  - 2.5 The mechanism(s) for achieving the target; and
  - 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset which may include, but are not limited to energy efficiency efforts, energy source diversification, carbon capture and storage, or the implementation of leak detection and repair processes.
- 3 The entity shall discuss activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.

- 4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as whether they pertain differently to different business units, geographies, or emissions sources.
  - 4.1 Categories of emissions sources generally correspond to those defined in the API Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry (2009), and may include:
    - 4.1.1 Flared hydrocarbons, including all emissions emitted from flares and which are associated with the management and disposal of unrecoverable natural gas via combustion of hydrocarbon products from routine operations, upsets, or emergencies
    - 4.1.2 Other combusted emissions, including, but not limited to: (1) emissions from stationary devices, including, but not limited to boilers, heaters, furnaces, reciprocating internal combustion engines and turbines, incinerators, and thermal/catalytic oxidizers, (2) emissions from mobile sources, including, but not limited to barges, ships, railcars, and trucks for material transport; planes/helicopters and other company vehicles for personnel transport; forklifts, all terrain vehicles, construction equipment, and other off-road mobile equipment, and (3) other combusted emissions shall exclude those emissions disclosed as flared hydrocarbons
    - 4.1.3 Process emissions, including, but not limited to those emissions that are not combusted and are intentional or designed into the process or technology to occur during normal operations and are a result of some form of chemical transformation or processing step. Such emissions include, but are not limited to those from hydrogen plants, amine units, glycol dehydrators, fluid catalytic cracking unit and reformer generation, and flexi-coker coke burn
    - 4.1.4 Vented emissions, including those emissions that are not combusted and are intentional or designed into the process or technology to occur during normal operations, and which include, but are not limited to: (1) venting from crude oil, condensate, or natural gas product storage tanks, gas-driven pneumatic devices, gas samplers, chemical injection pumps, exploratory drilling, loading/ballasting/transit, and loading racks, (2) venting resulting from maintenance/turn-arounds, including, but not limited to decoking of furnace tubes, well unloading, vessel and gas compressor depressurizing, compressor starts, gas sampling, and pipeline blowdowns, and (3) venting from non-routine activities, including but not limited to pressure relief valves, pressure control valves, fuel supply unloading valves, and emergency shut-down devices
    - 4.1.5 Fugitive emissions, including, but not limited to those emissions which can be individually found and “fixed” to make emissions “near zero” and which include, but are not limited to emissions from valves, flanges, connectors, pumps, compressor seal leaks, catadyne heaters, and wastewater treatment and surface impoundments
- 5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international or sectoral programs.
- 6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

# Water Management

## Topic Summary

Depending on the extraction technique, exploration and production operations may consume significant quantities of water, which may expose companies to the risk of reduced water availability, regulations limiting usage, or related cost increases, particularly in water-stressed regions. Contamination of local water resources can result from incidents involving produced water, flowback water, hydraulic fracturing fluids, and other well fluids. Historically, there has been concern regarding the impacts of hydraulic fracturing operations on the contamination of groundwater supplies. In the U.S., concerns about chemicals used in hydraulic fracturing fluids have led to increased disclosure by companies through a voluntary industry registry, FracFocus. There have also been related state regulations, as well as legislative proposals to repeal federal exemptions for hydraulic fracturing operations. Reducing water use and contamination through recycling, other water management strategies, and use of non-toxic fracturing fluids could create operational efficiency for companies and lower their operating costs. Such strategies could also minimize the impacts that regulations, water supply shortages, and community-related disruptions have on operations.

## Accounting Metrics

### **EM-EP-140a.1. (1) Total fresh water withdrawn, (2) total fresh water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from freshwater sources:
  - 1.1 Fresh water may be defined according to the local statutes and regulations where the entity operates. Where there is no regulatory definition, fresh water shall be considered to be water that has less than 1000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 1.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 2 The entity shall disclose the amount of fresh water, in thousands of cubic meters, that was consumed in its operations.
  - 2.1 Water consumption is defined as:
    - 2.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 2.1.2 Water that is directly or indirectly incorporated into the entity's product or service;
    - 2.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.
- 3 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80%) or Extremely High (>80%) Baseline Water Stress as classified by the World Resources Institute's (WRI) Water Risk Atlas tool, [Aqueduct](#).

- 4 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 5 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

**EM-EP-140a.2. Volume of produced water and flowback generated; percentage (1) discharged, (2) injected, (3) recycled; hydrocarbon content in discharged water**

- 1 The entity shall disclose the volume, in thousands of cubic meters, of produced water and flowback fluid generated during its activities.
- 2 Produced water is defined according to the U.S. Environmental Protection Agency (EPA) according to 40 CFR 435.41 as water (brine) obtained from the hydrocarbon bearing formation strata during the extraction of oil and gas. This can include formation water, injection water, and any chemicals added downhole or during the oil/water separation process.
- 3 Flowback is defined as the recovered hydraulic fracturing fluid that returns to the surface during a hydraulic fracturing operation that may often be mixed with produced water.
- 4 The entity shall calculate the percentage of produced water and flowback fluid that was:
  - 4.1 Discharged directly to the environment or indirectly discharged through a third party, such as a local wastewater treatment plant
  - 4.2 Injected, such as into a Class II injection well under the EPA's Underground Injection Control (UIC) program, or equivalent
  - 4.3 Recycled for use in other wells in fracturing fluids or in other drilling and production processes
- 5 The entity shall disclose the amount, in metric tons, of hydrocarbons water that was discharged to the environment.
  - 5.1 The scope of disclosure includes produced water, flowback, process water, storm water, or other water that was discharged to the environment.
  - 5.2 Measurements of hydrocarbon content should be made using test methods required or approved by local regulatory authorities (or equivalent applicable standards).

**EM-EP-140a.3. Percentage of hydraulically fractured wells for which there is public disclosure of all fracturing fluid chemicals used**

- 1 The entity shall disclose the percentage of hydraulically fractured wells for which there is public disclosure of all fracturing fluid chemicals used.
  - 1.1 The percentage shall be calculated as the number of hydraulically fractured wells for which it provides public disclosure of all of the chemical content of fracturing fluid, divided by the total number of hydraulically fractured wells.



- 1.2 The entity shall include in the percentage only those wells for which all fluid chemicals are publicly disclosed, including the chemicals that meet the definition of a trade secret, according to [Appendix E to 29 CFR Part §1910.1200](#) and may be exempt from disclosure on a material safety data sheet (MSDS).
- 2 Public disclosure includes, but is not limited to, posting to a publicly accessible corporate website or the [FracFocus Chemical Disclosure Registry](#).

#### **EM-EP-140a.4. Percentage of hydraulic fracturing sites where ground or surface water quality deteriorated compared to a baseline**

- 1 The entity shall calculate the percentage as: the total number of hydraulic fracturing well sites for which it detected a deterioration in the ground or surface water surrounding the well site as compared to a baseline measurement, divided by the total number of hydraulic fracturing well sites.
- 2 Deterioration in water quality is, at a minimum, defined as occurring when testing indicates:
  - 2.1 Presence of thermogenic gas or a mixture of thermogenic and biogenic gas that was not present in baseline testing.
  - 2.2 An increase in methane concentration by more than 5.0 mg/l between sampling periods.
  - 2.3 Benzene, toluene, ethylbenzene, or xylenes (BTEX compounds) or total petroleum hydrocarbons (TPH) are present in higher concentrations as compared to the baseline.
- 3 The entity shall determine whether water quality deteriorated against a baseline through monitoring of ground and surface water surrounding hydraulically fractured well sites.
  - 3.1 Determinations shall be consistent with Chapter 3 of the Wyoming Oil and Gas Conservation Commission (WOGCC) Rules and Regulations and/or the Colorado Oil and Gas Conservation Commission's (COGCC) Rule 609 — Statewide Groundwater Baseline Sampling and Monitoring.
- 4 The initial baseline sample shall occur:
  - 4.1 Prior to drilling or before installation of a surface oil and gas facility on a location
  - 4.2 Prior to re-stimulation of a well, if more than 12 months have passed since the initial pre-drilling sampling event or the most recent re-stimulation sampling event
- 5 Ongoing monitoring shall occur with at least the following frequency:
  - 5.1 One subsequent sampling between 12 and 18 months after well completion or facility installation
  - 5.2 A second subsequent sampling between 60 and 78 months after the previous sampling event. Dry holes are exempt from this requirement
- 6 The entity shall collect initial baseline samples and subsequent monitoring samples from all available water sources within a one-half mile radius of a proposed well, multi-well site, or dedicated injection well.

- 6.1 The entity shall follow sampling guidance from the WOGCC and COGCC for the collection of samples, including for instances when few or no sampling sites exist or are accessible.
- 7 If the entity does not conduct baseline water quality assessments and ongoing monitoring for any of its well sites, then it shall disclose the percentage of wells for which there is no baseline and/or ongoing monitoring.
- 8 The entity may disclose whether results of baseline groundwater quality tests and ongoing monitoring are communicated to local regulatory authorities (where not required by local law) and/or residents and business owners in proximity to hydraulic fracturing sites.

**Note to EM-EP-140a.4**

- 1 The entity shall describe its policies and practices related to its management of ground and surface water quality.
- 2 Applicable policies and practices may include, but are not limited to:
  - 2.1 Well design and well integrity management
  - 2.2 Hydraulic fracturing procedures
  - 2.3 Surface facility design, including the use of backflow preventers, storage tank design, and impoundment design
  - 2.4 Surface and groundwater quality and testing
  - 2.5 Chemicals management
  - 2.6 Water reuse, processing, and disposal

# Reserves Valuation & Capital Expenditures

## Topic Summary

Estimates suggest that exploration and production (E&P) companies may be unable to extract a significant proportion of their proved and probable oil and gas reserves if greenhouse gas (GHG) emissions are to be controlled to limit global temperature increases to two degrees Celsius as per the Paris Agreement. Companies with more carbon-intensive reserves and production and higher capital costs are likely to face greater risks. Regulatory limits on GHG emissions, together with improved competitiveness of alternative energy technologies, could lower or reduce the growth in global demand, and therefore reduce prices for oil and gas products. Extraction costs could increase with regulations that put a price on GHG emissions. These factors could affect the economic viability to extract oil and gas reserves. Regulatory actions that are more abrupt than anticipated, or those focusing on industries with high emissions, could impair asset values over a short period of time. Stewardship of capital resources and production decisions that take into account near- and long-term trends related to climate change mitigation actions can help prevent current asset impairment and maintain profitability and creditworthiness.

## Accounting Metrics

### **EM-EP-420a.1. Sensitivity of hydrocarbon reserve levels to future price projection scenarios that account for a price on carbon emissions**

- 1 The entity shall perform a sensitivity analysis of its reserves to determine how several future scenarios may affect its determination of whether the reserves are proved or probable.
- 2 The entity shall analyze the sensitivity of its current proven and probable reserves using the price trajectories published by the International Energy Agency (IEA) in its [World Energy Outlook \(WEO\) publication](#), including:
  - 2.1 Current Policies Scenario, which assumes no changes in policies from the mid-point of the year of publication of the WEO.
  - 2.2 New Policies Scenario, which assumes that broad policy commitments and plans that have been announced by countries (including national pledges to reduce greenhouse gas emissions and plans to phase out fossil-energy subsidies), occur even if the measures to implement these commitments have yet to be identified or announced. This broadly serves as the IEA baseline scenario.
  - 2.3 Sustainable Development Scenario, which assumes that an energy pathway occurs that is consistent with the goal of limiting the global increase in temperature to 2°C by limiting concentration of greenhouse gases in the atmosphere to around 450 parts per million of CO<sub>2</sub>-e.
- 3 The entity shall consider the WEO scenarios as a normative reference, thus any updates to the WEO made year-on-year shall be considered updates to this guidance.
- 4 The entity shall follow guidance published by the U.S. Securities and Exchange Commission (SEC) in its [Oil and Gas Reporting Modernization](#) (Regulation S-X Section §210.4-10 and §229.1202 [Item 1202] Disclosure of Reserves) for the following:

- 4.1 Classifying of reserves as proved and probable
- 4.2 Conducting a reserves sensitivity analysis
- 4.3 Current (or base) case of reserve levels

5 The entity may use the following table format to summarize its findings:

*Table 3. Sensitivity of Reserves to Prices by Principal Product Type and Price Scenario*

PRICE CASE	PROVED RESERVES			PROBABLE RESERVES		
(Scenario)	Oil (MMbbls)	Gas (MMscf)	Product:A (measure)	Oil (MMbbls)	Gas (MMscf)	Product:A (measure)
Current Policies Scenario (base)						
New Policies Scenario						
Sustainable Development Scenario						

- 6 The entity may disclose the sensitivity of its reserve levels in other price and demand scenarios in addition to those described above, particularly if these scenarios differ depending on the type of hydrocarbon reserves, regulatory environment in the countries or regions where exploration occurs, end-use of the entity's products, or other factors.
- 7 For additional sensitivity analyses, the entity should consider disclosing the following, per the Task Force on Climate-Related Financial Disclosures (TCFD) Recommendations Report Figure 8 as well as the Implementing the Recommendations of the TCFD Report, Section E:
  - 7.1 The alternative scenarios used, including other 2°C or lower scenarios
  - 7.2 Critical input parameters, assumptions, and analytical choices for the climate-related scenarios used, particularly as they relate to key areas such as policy assumptions, energy deployment pathways, technology pathways, and related timing assumptions
  - 7.3 Time frames used for scenarios, including short-, medium-, and long-term milestones (e.g., how organizations consider timing of potential future implications under the scenarios used)

**EM-EP-420a.2. Estimated carbon dioxide emissions embedded in proved hydrocarbon reserves**

- 1 The entity shall calculate and disclose an estimate of the carbon dioxide emissions embedded in its proved hydrocarbon reserves.
  - 1.1 Nota bene — this estimate applies a factor for potential CO<sub>2</sub> only and does not include an estimate for all potential greenhouse gas emissions, as these are dependent on downstream use (e.g., utility electricity generation, industrial heating and electricity generation, residential heating and cooling, transportation, or use in petrochemicals, agrochemicals, asphalt, and lubricants).

2 Estimated potential carbon dioxide emissions from proved hydrocarbon reserves shall be calculated according to the following formula, derived from [Meinshausen et al.](#):

2.1  $E = R \times V \times C$ , where:

2.1.1 E are the potential emissions in kilograms of carbon dioxide (kg CO<sub>2</sub>);

2.1.2 R are the proved reserves in gigagrams (Gg);

2.1.3 V is the net calorific value in terajoules per gigagram (TJ/Gg); and

2.1.4 C is the effective carbon dioxide emission factor in kilograms CO<sub>2</sub> per terajoule (kg/TJ).

3 In the absence of data specific to the entity's hydrocarbon reserves, carbon content shall be calculated using default data for each major hydrocarbon resource published by the Intergovernmental Panel on Climate Change (IPCC) in its 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

3.1 The entity shall use default carbon content values per unit of energy that is listed in IPCC Table 1.3 Default Values of Carbon Content, Volume 2: Energy, Chapter 1.

3.2 The entity shall use calorific values per weight of hydrocarbon contained in IPCC Table 1.2 Default Net Calorific Values (NCVs) and Lower and Upper Limit of the 95% Confidence Intervals, Volume 2: Energy, Chapter 1.

4 The entity shall use engineering estimates to determine the weight of its hydrocarbons reserves in gigagrams, such as the type of hydrocarbon reserves and its API gravity as published by the American Petroleum Institute.

5 For other assumptions required to estimate the carbon content of hydrocarbon reserves, the entity shall rely on guidance from the IPCC, Greenhouse Gas Protocol, U.S. Energy Information Agency (EIA), or the International Energy Agency (IEA).

### **EM-EP-420a.3. Amount invested in renewable energy, revenue generated by renewable energy sales**

1 The entity shall disclose the total amount spent, including capital and research and development expenditures, on renewable or alternative energy sources.

1.1 Such disclosure generally corresponds to the renewable energy technology areas per C-OG 9.6 of the CDP Climate Change Questionnaire.

2 The entity shall disclose the sales generated from renewable energy sources.

2.1 Such disclosure generally corresponds to the renewable energy strategic development areas Section C4.5a of the CDP Climate Change Questionnaire

3 Renewable energy is defined as energy from sources that are capable of being replenished in a short time through ecological cycles, such as geothermal, wind, solar, hydro, and biomass.

- 3.1 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources are limited to the following:
  - 3.1.1 Energy from hydro sources that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard.
  - 3.1.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered “eligible renewables” according to the Green-e Energy National Standard.
  - 3.1.3 Version 3.1 (2017), and materials that are eligible for a state Renewable Portfolio Standard.
  - 3.1.4 The entity shall consider the Green-e Energy National Standard as a normative reference, thus any updates to the Standard made year-on-year shall be considered updates to this guidance.
  
- 4 The entity shall consider the CDP Climate Change Questionnaire a normative reference, thus any updates made year-on-year shall be considered updates to the guidance.

**EM-EP-420a.4. Discussion of how price and demand for hydrocarbons and/or climate regulation influence the capital expenditure strategy for exploration, acquisition, and development of assets**

- 1 The entity shall discuss how projections for price and demand for hydrocarbon products and the path of climate regulation influence the entity's capital expenditure (CAPEX) strategy.
  - 1.1 This discussion should include the entity's projections and assumptions about future hydrocarbon prices and the likelihood that certain price and demand scenarios occur.
  
- 2 The entity shall discuss the implications of how price and demand scenario planning (i.e., EM-EP-420a.1) may affect decisions to explore, acquire, and develop new reserves.
  
- 3 The entity may discuss factors that materially influence its CAPEX decision making, including, but not limited to:
  - 3.1 How the scope of climate change regulation—such as which countries, regions, and/or industries are likely to be impacted—may influence the type of hydrocarbon on which the entity focuses its exploration and development
  - 3.2 Its view of the alignment between the time horizon over which price and demand for hydrocarbons may be affected by climate regulation and time horizons for returns on capital expenditures on reserves
  - 3.3 How the structure of climate regulation—i.e., a carbon tax versus cap-and-trade—may differently affect price and demand, and thus the entity's capital expenditure decision making
  
- 4 The entity may discuss how these trends affect decision-making in the context of different types of reserve expenditures, including development of assets, acquisition of properties with proved reserves, acquisition of properties with unproved reserves, and exploration activities.

- 4.1 The entity shall discuss capital expenditures, regardless of the accounting method it uses (i.e., full cost or successful efforts).

## OIL & GAS – MIDSTREAM

### Industry Description

The Oil and Gas - Midstream industry consists of companies involved in the transportation or storage of natural gas, crude oil, and refined petroleum products. Midstream natural gas activities involve gathering, transport, and processing of natural gas from the wellhead, as well as the removal of impurities, production of natural gas liquids, storage, pipeline transport, and shipping, liquefaction, or regasification of liquefied natural gas. Midstream oil activities mainly involve transport of crude oil and refined products over land, using a network of pipes and pumping stations, as well as trucks and rail cars, and over seas and rivers via tanker ships or barges. Companies that operate bulk stations and terminals, as well as those that manufacture and install storage tanks and pipelines, are also part of this industry.

Note: The standards discussed below are for “pure-play” midstream activities or independent midstream companies. Integrated oil and gas companies may own or operate midstream operations, but are also involved in the upstream operations of the oil and gas value chain and in the refining or marketing of products. SASB has separate standards for the Oil and Gas Exploration & Production (EM-EP) and Refining & Marketing industries (EM-MD). As such, integrated companies should also consider the disclosure topics and metrics from these standards.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions, percentage methane, percentage covered under emissions-limiting regulations	Quantitative	Metric tons (t) CO <sub>2</sub> -e, Percentage (%)	EM-MD-110a.1
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	EM-MD-110a.2

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Total metric ton-kilometers of: (1) natural gas, (2) crude oil, and (3) refined petroleum products transported, by mode of transport <sup>14</sup>	Quantitative	Metric ton (t) kilometers	EM-MD-000.A

<sup>14</sup> Note to **EM-MD-000.A** – Relevant modes of transport include: pipeline, tanker, truck, etc.



# Greenhouse Gas Emissions

## Topic Summary

The midstream industry generates significant quantities of greenhouse gases and other air emissions from compressor engine exhausts, oil and condensate tank vents, natural gas processing, and fugitive emissions, in addition to emissions from mobile sources. GHG emissions contribute to climate change and create additional regulatory compliance costs and risks for midstream companies due to climate change mitigation policies. At the same time, the management of fugitive emissions of methane, a potent greenhouse gas, has emerged as a major operational, reputational, and regulatory risk. Financial impacts on companies will vary depending on the specific location of operations and the prevailing emissions regulations, and include higher operating or capital expenditures and regulatory or legal penalties. Companies that capture and monetize, or cost-effectively reduce emissions by implementing innovative monitoring and mitigation efforts and fuel efficiency measures could enjoy several benefits. These companies have the opportunity to reduce regulatory risks and to realize operational efficiencies in an environment of increasing regulatory and public concerns about air quality and climate change.

## Accounting Metrics

### EM-MD-110a.1. Gross global Scope 1 emissions, percentage methane, percentage covered under emissions-limiting regulations

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e), calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP factors is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in [The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard](#), Revised Edition, March 2004 (hereafter, the “GHG Protocol”), provided by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 These emissions include direct emissions of GHGs from stationary or mobile sources; these sources include but are not limited to: equipment at well sites, production facilities, refineries, chemical plants, terminals, fixed site drilling rigs, office buildings, marine vessels transporting products, tank truck fleets, mobile drilling rigs, and moveable equipment at drilling and production facilities.
  - 2.2 Acceptable calculation methodologies include those that conform with the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include but are not limited to:

- 2.2.1 *GHG Reporting Guidance for the Aerospace Industry* provided by International Aerospace Environmental Group (IAEG)
  - 2.2.2 Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources provided by the U.S. Environmental Protection Agency (EPA)
  - 2.2.3 India GHG Inventory Program
  - 2.2.4 ISO 14064-1
  - 2.2.5 Petroleum Industry Guidelines for reporting GHG emissions, 2nd edition, 2011, published by IPIECA
  - 2.2.6 *Protocol for the quantification of greenhouse gas emissions from waste management activities* provided by Entreprises pour l'Environnement (EpE)
- 2.3 GHG emission data shall be consolidated according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the "financial control" approach defined by the GHG Protocol as well as:
- 2.3.1 The financial approach detailed in Chapter 3 of the IPIECA/API/OGP Petroleum Industry Guidelines for Reporting Greenhouse Gas Emissions, Second Edition, 2011 (hereafter, the "IPIECA GHG Guidelines")
  - 2.3.2 The approach provided by the Climate Disclosure Standards Board (CDSB) that is described in REQ-07, "Organisational boundary," of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018)
- 3 The entity shall disclose the percentage of gross global Scope 1 emissions from methane emissions.
- 3.1 The percentage of gross global Scope 1 GHG emissions from methane emissions shall be calculated as the methane emissions in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e) divided by the gross global Scope 1 GHG emissions in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e).
- 4 The entity shall disclose the percentage of its emissions that are covered under an emissions-limiting regulation or that is intended to directly limit or reduce emissions, such as cap-and-trade schemes, carbon tax/fee systems, and other emissions control (e.g., command-and-control approach) and permit-based mechanisms.
- 4.1 Examples of emissions-limiting regulations include, but are not limited to:
- 4.1.1 California Cap-and-Trade (California Global Warming Solutions Act)
  - 4.1.2 European Union Emissions Trading Scheme (EU ETS)
  - 4.1.3 Quebec Cap-and-Trade (Draft Bill 42 of 2009)
- 4.2 The percentage shall be calculated as the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e) that are covered under emissions-limiting regulations divided by the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e).
- 4.2.1 For emissions that are subject to multiple emissions-limiting regulations, the entity shall not account for those emissions more than once.

- 4.3 The scope of emissions-limiting regulations excludes emissions covered under voluntary emissions-limiting regulations (e.g., voluntary trading systems) as well as disclosure-based regulations [e.g., the U.S. Environmental Protection Agency (EPA) GHG Reporting Program].
- 5 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 6 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 7 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

## **EM-MD-110a.2. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined according to *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 2.2 Whether the target is absolute or intensity-based, and the metric denominator, if it is an intensity-based target;
  - 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated towards the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;
  - 2.5 The mechanism(s) for achieving the target; and
  - 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset which may include, but are not limited to energy efficiency efforts, energy source diversification, carbon capture and storage, or the implementation of leak detection and repair processes.
- 3 The entity shall discuss activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievements of the plans and/or targets.

- 4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as whether they pertain differently to different business units, geographies, or emissions sources.
  - 4.1 Categories of emissions sources generally correspond to those defined in the [API Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry](#) (2009), and may include:
    - 4.1.1 Flared hydrocarbons, including all emissions emitted from flares and which are associated with the management and disposal of unrecoverable natural gas via combustion of hydrocarbon products from routine operations, upsets, or emergencies
    - 4.1.2 Other combusted emissions, including, but not limited to: (1) emissions from stationary devices, including, but not limited to boilers, heaters, furnaces, reciprocating internal combustion engines and turbines, incinerators, and thermal/catalytic oxidizers, (2) emissions from mobile sources, including, but not limited to barges, ships, railcars, and trucks for material transport; planes/helicopters and other company vehicles for personnel transport; forklifts, all terrain vehicles, construction equipment, and other off-road mobile equipment, and (3) other combusted emissions shall exclude those emissions disclosed as flared hydrocarbons
    - 4.1.3 Process emissions, including, but not limited to those emissions that are not combusted and are intentional or designed into the process or technology to occur during normal operations and are a result of some form of chemical transformation or processing step. Such emissions include, but are not limited to those from hydrogen plants, amine units, glycol dehydrators, fluid catalytic cracking unit and reformer generation, and flexi-coker coke burn
    - 4.1.4 Vented emissions, including those emissions that are not combusted and are intentional or designed into the process or technology to occur during normal operations, and which include, but are not limited to: (1) venting from crude oil, condensate, or natural gas product storage tanks, gas-driven pneumatic devices, gas samplers, chemical injection pumps, exploratory drilling, loading/ballasting/transit, and loading racks, (2) venting resulting from maintenance/turn-arounds, including, but not limited to decoking of furnace tubes, well unloading, vessel and gas compressor depressurizing, compressor starts, gas sampling, and pipeline blowdowns, and (3) venting from non-routine activities, including but not limited to pressure relief valves, pressure control valves, fuel supply unloading valves, and emergency shut-down devices
    - 4.1.5 Fugitive emissions, including those emissions which can be individually found and “fixed” to make emissions “near zero” and which include, but are not limited to emissions from valves, flanges, connectors, pumps, compressor seal leaks, catadyne heaters, and wastewater treatment and surface impoundments
- 5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
- 6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

## OIL & GAS – REFINING & MARKETING

### Industry Description

Oil & Gas - Refining & Marketing (R&M) companies refine petroleum products, market oil and gas products, and/ or operate gas stations and convenience stores, all of which comprise the downstream operations of the oil and gas value chain. The types of refinery products and crude oil inputs influence the complexity of the refining process used, with different expenditure needs and intensity of environmental and social impacts.

Note: The standards discussed below are for “pure-play” R&M activities, or independent R&M companies. Integrated oil and gas companies conduct upstream operations and are also involved in the distribution and/or refining or marketing of products.

SASB has separate standards for the Oil and Gas Exploration & Production (EM-EP), and Midstream (EM-MD) industries. As such, integrated companies should also consider the disclosure topics and metrics from these standards.

**Table 1. Climate-related Disclosure Topics & Accounting Metrics**

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations	Quantitative	Metric tons (t) CO <sub>2</sub> -e, Percentage (%)	EM-RM-110a.1
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	EM-RM-110a.2
Water Management	(1) Total fresh water withdrawn, (2) percentage recycled, (3) percentage in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	EM-RM-140a.1
Product Specifications & Clean Fuel Blends	Percentage of Renewable Volume Obligation (RVO) met through: (1) production of renewable fuels, (2) purchase of “separated” renewable identification numbers (RIN)	Quantitative	Percentage (%)	EM-RM-410a.1
	Total addressable market and share of market for advanced biofuels and associated infrastructure	Quantitative	Reporting currency, Percentage (%)	EM-RM-410a.2

**Table 2. Activity Metrics**

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Refining throughput of crude oil and other feedstocks <sup>15</sup>	Quantitative	Barrels of oil Equivalent (BOE)	EM-RM-000.A

<sup>15</sup> Note to **EM-RM-000.A** – The total volume of crude oil and other feedstocks processed in the refinery system during the reporting period.

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Refining operating capacity <sup>16</sup>	Quantitative	Million barrels per calendar day (MBPD)	EM-RM-000.B

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<sup>16</sup> Note to **EM-RM-000.B** – Per the U.S. Energy Information Administration, operating (or operable) capacity is: the amount of capacity that, at the beginning of the period, is in operation; not in operation and not under active repair, but capable of being placed in operation within 30 days; or not in operation but under active repair that can be completed within 90 days. Operable capacity is the sum of the operating and idle capacity and is measured in barrels per calendar day.

# Greenhouse Gas Emissions

## Topic Summary

Oil and Gas R&M operations generate significant direct greenhouse gas (GHG) emissions, from a variety of sources. Emissions primarily consist of carbon dioxide and methane from the stationary combustion of fossil fuels for energy consumption. Energy costs are a significant share of refinery operating costs. Greenhouse gases are also released from process emissions, fugitive emissions resulting from leaks, emissions from venting and flaring, and from non-routine events such as equipment maintenance. The energy intensity of production, and therefore the GHG emissions intensity, can vary significantly depending on the type of crude oil feedstock used and refined product specifications. Companies that cost-effectively reduce GHG emissions from their operations can create operational efficiencies. Such reduction can also mitigate the impact on value of increased fuel costs from regulations that seek to limit—or put a price on—GHG emissions.

## Accounting Metrics

### EM-RM-110a.1. Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e), calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP factors is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 These emissions include direct emissions of GHGs from stationary or mobile sources; these sources include but are not limited to: equipment at well sites, production facilities, refineries, chemical plants, terminals, fixed site drilling rigs, office buildings, marine vessels transporting products, tank truck fleets, mobile drilling rigs, and moveable equipment at drilling and production facilities.
  - 2.2 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:

- 2.2.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)
  - 2.2.2 *Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources* published by the U.S. Environmental Protection Agency (EPA)
  - 2.2.3 India GHG Inventory Program
  - 2.2.4 ISO 14064-1
  - 2.2.5 *Petroleum Industry Guidelines for reporting GHG emissions*, 2nd edition, 2011, published by IPIECA
  - 2.2.6 *Protocol for the quantification of greenhouse gas emissions from waste management activities* published by Entreprises pour l'Environnement (EpE)
- 2.3 GHG emissions data shall be consolidated according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the “financial control” approach defined by the GHG Protocol as well as:
- 2.3.1 The financial approach detailed in Chapter 3 of the IPIECA/API/OGP *Petroleum Industry Guidelines for Reporting Greenhouse Gas Emissions*, Second Edition, 2011 (hereafter, the “IPIECA GHG Guidelines”)
  - 2.3.2 The approach provided by the Climate Disclosure Standards Board (CDSB) that is described in REQ-07, “Organisational boundary,” of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018)
- 3 The entity shall disclose the percentage of its gross global Scope 1 GHG emissions that are covered under an emissions-limiting regulation or program that is intended to directly limit or reduce emissions, such as cap-and-trade schemes, carbon tax/fee systems, and other emissions control (e.g., command-and-control approach) and permit-based mechanisms.
- 3.1 Examples of emissions-limiting regulations include, but are not limited to:
    - 3.1.1 California Cap-and-Trade (California Global Warming Solutions Act)
    - 3.1.2 European Union Emissions Trading Scheme (EU ETS)
    - 3.1.3 Quebec Cap-and-Trade (Draft Bill 42 of 2009)
  - 3.2 The percentage shall be calculated as the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e) that are covered under emissions-limiting regulations divided by the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e).
    - 3.2.1 For emissions that are subject to multiple emissions-limiting regulations, the entity shall not account for those emissions more than once.
  - 3.3 The scope of emissions-limiting regulations excludes emissions covered under voluntary emissions-limiting regulations (e.g., voluntary trading systems), as well as disclosure-based regulations [e.g., the U.S. Environmental Protection Agency (EPA) GHG Reporting Program].



- 4 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 5 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 6 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

### **EM-RM-110a.2. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined according to *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 2.2 Whether the target is absolute or intensity-based, and the metric denominator, if it is an intensity-based target;
  - 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated towards the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;
  - 2.5 The mechanism(s) for achieving the target; and
  - 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset which may include, but are not limited to energy efficiency efforts, energy source diversification, carbon capture and storage, or the implementation of leak detection and repair processes.
- 3 The entity shall discuss activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
- 4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as whether they pertain differently to different business units, geographies, or emissions sources.

- 4.1 Categories of emissions sources generally correspond to those defined in the [API Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry](#) (2009), and may include:
- 4.1.1 Flared hydrocarbons, including all emissions emitted from flares and which are associated with the management and disposal of unrecoverable natural gas via combustion of hydrocarbon products from routine operations, upsets, or emergencies
  - 4.1.2 Other combusted emissions, including, but not limited to: (1) emissions from stationary devices, including, but not limited to boilers, heaters, furnaces, reciprocating internal combustion engines and turbines, incinerators, and thermal/catalytic oxidizers, (2) emissions from mobile sources, including, but not limited to barges, ships, railcars, and trucks for material transport; planes/helicopters and other company vehicles for personnel transport; forklifts, all terrain vehicles, construction equipment, and other off-road mobile equipment, and (3) other combusted emissions shall exclude those emissions disclosed as flared hydrocarbons
  - 4.1.3 Process emissions, including, but not limited to those emissions that are not combusted and are intentional or designed into the process or technology to occur during normal operations and are a result of some form of chemical transformation or processing step. Such emissions include, but are not limited to those from hydrogen plants, amine units, glycol dehydrators, fluid catalytic cracking unit and reformer generation, and flexi-coker coke burn
  - 4.1.4 Vented emissions, including those emissions that are not combusted and are intentional or designed into the process or technology to occur during normal operations, and which include, but are not limited to: (1) venting from crude oil, condensate, or natural gas product storage tanks, gas-driven pneumatic devices, gas samplers, chemical injection pumps, exploratory drilling, loading/ballasting/transit, and loading racks, (2) venting resulting from maintenance/turn-arounds, including, but not limited to decoking of furnace tubes, well unloading, vessel and gas compressor depressurizing, compressor starts, gas sampling, and pipeline blowdowns, and (3) venting from non-routine activities, including but not limited to pressure relief valves, pressure control valves, fuel supply unloading valves, and emergency shut-down devices
  - 4.1.5 Fugitive emissions, including those emissions which can be individually found and “fixed” to make emissions “near zero” and which include, but are not limited to emissions from valves, flanges, connectors, pumps, compressor seal leaks, catalytic heaters, and wastewater treatment and surface impoundments
- 5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international or sectoral programs.
- 6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

# Water Management

## Topic Summary

Refineries can use relatively large quantities of water depending on their size and the complexity of the refining process. This exposes them to the risk of reduced water availability, depending on their location, and related costs. Extraction of water from water-stressed regions or water contamination may also create tensions with local communities. Refinery operations often require wastewater treatment and disposal, often via on-site wastewater treatment plants before discharge. Reducing water use and contamination through recycling and other water management strategies may result in operational efficiencies for companies and lower their operating costs. They could also minimize the impacts of regulations, water supply shortages, and community-related disruptions on operations.

## Accounting Metrics

### **EM-RM-140a.1. (1) Total fresh water withdrawn, (2) percentage recycled, (3) percentage in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from freshwater sources:
  - 1.1 Fresh water may be defined according to the local statutes and regulations where the entity operates. Where there is no regulatory definition, fresh water shall be considered to be water that has less than 1000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 1.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 2 The entity shall disclose the percentage of water recycled as the volume, in thousands of cubic meters, recycled divided by the volume of water withdrawn.
  - 2.1 Any volume of water reused multiple times shall be counted as recycled each time it is recycled and reused.
- 3 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80%) or Extremely High (>80%) Baseline Water Stress as classified by the World Resources Institute's (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 4 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 5 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

# Product Specifications & Clean Fuel Blends

## Topic Summary

Human health risks and broad environmental risks such as those associated with climate change have raised concerns about the end use of products such as gasoline from the Refining & Marketing (R&M) industry. In response, some regulatory jurisdictions have implemented product specifications and renewable fuel blends, which pose significant compliance and operational risks for R&M companies. Companies may face long-term reductions in revenue from fossil fuel-based products and services due to GHG mitigation policies such as the renewable fuel mandates or standards, as well as competition from non-fossil fuel products. Companies that purchase credits known as renewable identification numbers (RINs) to meet regulatory requirements for renewable fuels in the U.S. can face regulatory and cost risks. In order to ensure regulatory compliance and position themselves for long-term competitiveness, some companies are investing in or purchasing ethanol and other renewable biofuels. Advanced biofuels and fuel technologies have lower lifecycle impacts than traditional biofuels, and can be used to minimize future regulatory risks and public pressure. Although short-term costs to find commercially viable technologies can be significant, investments in R&D for such technologies could serve to advance R&M companies' long-term profitability.

## Accounting Metrics

### **EM-RM-410a.1. Percentage of Renewable Volume Obligation (RVO) met through: (1) production of renewable fuels, (2) purchase of “separated” renewable identification numbers (RIN)**

- 1 The entity shall disclose the percentage of its Renewable Volume Obligation (RVO) met through the production of renewable fuels, including biofuels, cellulosic biofuel, ethanol, advanced biofuels, and other renewable fuels as defined in U.S. [40 CFR 80.1401](#).
- 2 The entity shall disclose the percentage of its RVO met through purchase of “separated” renewable identification numbers (RIN).
  - 2.1 A separated RIN is defined as one that is no longer associated with a physical product and may be traded on an open market.
- 3 The entity may provide a break down and analysis of its RVO by fuel type: cellulosic biofuels, ethanol equivalent for biomass-based diesel, or advanced biofuels.

### **EM-RM-410a.2. Total addressable market and share of market for advanced biofuels and associated infrastructure**

- 1 The entity shall provide an estimation of the total addressable market for advanced biofuels and associated infrastructure.
  - 1.1 Total addressable market is defined as potential revenue should the entity capture 100 percent of the market share of the product category (e.g., the global market for advanced biofuels and advanced biofuel infrastructure).

- 2 The entity shall disclose the share of the total addressable market for advanced biofuels and/or associated infrastructure that it currently captures with its products.
  - 2.1 Market share shall be calculated as revenues from these products divided by the size of the total addressable market.
- 3 Advanced biofuels are defined according to Section 201 of the Energy Independence and Security Act of 2007 (EISA) as biofuels other than ethanol derived from corn starch (kernels) and having 50% lower lifecycle greenhouse gas emissions relative to gasoline.
- 4 Revenue from advanced biofuel infrastructure includes that from the entity's retail operations (i.e., fuel stations), joint ventures with primary producers, or technologies that enable the production of advanced biofuels.
- 5 If there is a significant difference between the total addressable market and the market that the entity can serve through its existing or planned capabilities, sales channels, or products (i.e., the serviceable available market) then the entity may disclose this information.
- 6 The entity may provide a projection of growth of this market, where the projected addressable market is represented— based on a reasonable set of assumptions about changes in market conditions— as a percentage of year-on-year growth or as an estimate of the market size after a defined period (i.e., the market size in 10 years).
  - 6.1 The entity may disclose its target three-year market share as a measurement of targeted growth, where the target is the percentage of the total addressable market that the entity plans to address over a three-year time horizon.
- 7 The entity may discuss other non-revenue generating initiatives it has undertaken to commercialize biofuels, such as partnerships (e.g., pilot projects, research and development projects) with fleet operators (air, ground, or marine transportation), airlines, vehicle manufacturers, and governmental agencies (e.g., U.S. Department of Agriculture, U.S. Department of Energy, or armed forces).

## OIL & GAS – SERVICES

### Industry Description

Oil and gas services companies provide support services, manufacture equipment, or are contract drillers for oil and natural gas exploration and production (E&P) companies. The drilling and drilling-support segment comprises companies that drill for oil and natural gas on-shore and off-shore on a contract basis. Companies in this segment may also manufacture jack-up rigs, semisubmersible rigs, and drill ships. Companies in the oilfield services segment manufacture equipment that is used in the extraction, storage, and transportation of oil and natural gas. They also provide support services such as seismic surveying, equipment rental, well cementing, and well monitoring. These services are commonly provided on a contractual basis, and the customer will purchase or lease the materials and equipment from the service provider. Service companies may also provide personnel or subject matter expertise as part of their scope of service. The contractual relationship between oil and gas services companies and their customers plays a significant role in determining the material impacts of their sustainability performance. Besides the rates charged, companies compete on the basis of their operational and safety performance, technology and process offerings, and reputation.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Emissions Reduction Services & Fuels Management	Total fuel consumed, percentage renewable, percentage used in: (1) on-road equipment and vehicles and (2) off-road equipment	Quantitative	Gigajoules (GJ), Percentage (%)	EM-SV-110a.1
	Discussion of strategy or plans to address air emissions-related risks, opportunities, and impacts	Discussion and Analysis	n/a	EM-SV-110a.2
	Percentage of engines in service that meet Tier 4 compliance for non-road diesel engine emissions	Quantitative	Percentage (%)	EM-SV-110a.3
Water Management Services	(1) Total volume of fresh water handled in operations, (2) percentage recycled	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	EM-SV-140a.1
	Discussion of strategy or plans to address water consumption and disposal-related risks, opportunities, and impacts	Discussion and Analysis	n/a	EM-SV-140a.2

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of active rig sites <sup>17</sup>	Quantitative	Number	EM-SV-000.A

<sup>17</sup> Note to **EM-SV-000.A** – Rigs that are on location and involved in drilling, completions, cementing, fracturing, decommissioning etc., are considered active. Rigs that are in transit from one location to another, or are otherwise idled, are inactive.

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of active well sites <sup>18</sup>	Quantitative	Number	EM-SV-000.B
Total amount of drilling performed	Quantitative	Meters (m)	EM-SV-000.C
Total number of hours worked by all employees	Quantitative	Hours	EM-SV-000.D

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<sup>18</sup> Note to **EM-SV-000.B** – The number of well sites for which the entity has provided or is providing (on an ongoing basis) drilling, completion, fracturing, and/or decommissioning services.

# Emissions Reduction Services & Fuels Management

## Topic Summary

While direct greenhouse gas (GHG) emissions and associated regulatory risks are relatively low for oil and gas services providers relative to other industries, emissions from the operations of their customers—the oil and gas exploration and production (E&P) companies—can be significant. Emissions include GHGs that can contribute to climate change as well as other air pollutants that can have significant localized human health and environmental impacts. Increasing regulation and high costs of fuels associated with these emissions present substantial risk to E&P companies. This is driving companies to seek ways to lower their emissions, including converting pumps and engines to run on natural gas instead of diesel fuel. Oil and gas services companies compete for contracts with E&P companies partly on the basis of providing cutting-edge, efficient technologies that can help customers reduce costs and improve process efficiencies. Services companies can gain a competitive advantage and protect their revenues and market share by providing customers with services and equipment that reduce the emissions and fuel consumption of E&P activities, and by capturing saleable gas that may otherwise be flared or escape through leaks.

## Accounting Metrics

### **EM-SV-110a.1. Total fuel consumed, percentage renewable, percentage used in: (1) on-road equipment and vehicles and (2) off-road equipment**

- 1 The entity shall disclose total fuel consumed from all sources as an aggregate figure, in gigajoules (GJ).
  - 1.1 The calculation methodology for fuel consumed shall be based on actual fuel consumed as opposed to design parameters.
  - 1.2 Acceptable calculation methodologies for fuel consumed include, but are not limited to, methodologies based on:
    - 1.2.1 Adding fuel purchases made during the reporting period to beginning inventory at the start of the reporting period, less any fuel inventory at the end of the reporting period
    - 1.2.2 Tracking fuel consumed by vehicles
    - 1.2.3 Tracking fuel expenses
- 2 The entity shall disclose the percentage of the total amount of fuel consumed from all sources that is renewable.
  - 2.1 Renewable fuel is defined by the U.S. Renewable Fuel Standard (U.S. 40 CFR 80.1401), as fuel that meets all of the following requirements:
    - 2.1.1 Produced from renewable biomass;
    - 2.1.2 Used to replace or reduce the quantity of fossil fuel present in a transportation fuel, heating oil, or jet fuel; and
    - 2.1.3 Has lifecycle greenhouse gas (GHG) emissions that are at least 20 percent less than baseline lifecycle GHG emissions, unless the fuel is exempt from this requirement pursuant to U.S. 40 CFR 80.1403.



- 2.2 The scope of renewable fuel includes fuel that qualifies for Renewable Identification Numbers (RINs) under the U.S. Renewable Fuel Standard.
- 2.3 The percentage shall be calculated as the amount of renewable fuel consumed by the entity's fleet vehicles (in GJ) divided by the total amount of fuel consumed by the entity's fleet vehicles (in GJ).
- 3 The entity shall disclose the percentage of total fuel consumed by (1) on-road, mobile equipment and vehicles and (2) off-road equipment, including stationary rigs, generators, and mounted equipment.
- 4 The scope of disclosure includes only fuel consumed by entities owned or controlled by the organization.
  - 4.1 The scope excludes non-fuel energy sources such as purchased electricity and purchased steam.
  - 4.2 The scope of disclosure includes combustion sources owned and/or operated by the entity, regardless of which entity bears the cost of fuel and/or considers greenhouse gas (GHG) emissions from these sources to be part of its Scope 1 inventory.
- 5 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change, the U.S. Department of Energy, or the U.S. Energy Information Agency.
- 6 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels).

## **EM-SV-110a.2. Discussion of strategy or plans to address air emissions-related risks, opportunities, and impacts**

- 1 The entity shall discuss its strategies or plans to address air-emissions related risks, opportunities, and impacts.
  - 1.1 The scope of disclosure includes the entity's strategies, plans, and/or emissions reduction activities, such as whether they pertain differently to different business units, geographies, or emissions sources.
  - 1.2 The scope of disclosure includes activities and investments required to achieve the plans and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 1.3 The scope of disclosure includes the discussion of the demand for specific products, services, and technologies that reduce well and field operator's fuel consumption, emissions, and/or create other efficiencies, and its ability to meet this demand.
- 2 The entity shall discuss its short-term and long-term plans related to air quality management, where:
  - 2.1 Short-term strategies may include fuel substitution (e.g., drop-in biodiesel), use of dual fuel equipment, or engine maintenance.
  - 2.2 Long-term strategies may include alternative fuel equipment, process, or equipment redesigns and innovations, carbon capture, and storage.
- 3 The scope of disclosure shall include, but is not limited to emissions from the following specific sources:

- 3.1 Combustion emissions (e.g., fuel use in gas compression, power generation).
  - 3.2 Flaring of hydrocarbons (e.g., in depressurizing, start-up/shut-down, well testing and well work-over).
  - 3.3 Process emissions (e.g., vessel loading, tank storage, and flushing).
  - 3.4 Venting of hydrocarbons, defined as the intentional (or designed), controlled release of gas to the atmosphere during normal operations.
  - 3.5 Fugitive emissions of greenhouse gases (including equipment leaks).
  - 3.6 Other non-routine events (e.g., gas releases or equipment maintenance).
- 4 The entity shall discuss risks and opportunities it may face relating to its ability to offer its customers services, technologies, or solutions that enhance energy efficiency and reduce air emissions, including of greenhouse gases.

### **EM-SV-110a.3. Percentage of engines in service that meet Tier 4 compliance for non-road diesel engine emissions**

- 1 The entity shall disclose the percentage of its non-road diesel engines that are in compliance with the U.S. Environmental Protection Agency's (EPA) Tier 4 emissions standards for non-road diesel engines.
  - 1.1 The scope of disclosure shall include new and in-use non-road diesel engines, including, but not limited to, those used in equipment, pumps, compressors, and generators.
- 2 The entity shall calculate the percentage as the new and in-use number of non-road diesel engines that are in full compliance with the Tier 4 emissions standards during the reporting period, divided by the total number of non-road diesel engines active during the reporting period, where:
  - 2.1 An engine is considered in compliance with the Tier 4 emission standards if (1) it belongs to an engine family which has test results showing official emission results and deteriorated emission levels at or below these standards, and (2) the engine family has received a certificate of conformity from the EPA for that model year.
  - 2.2 Engine families are defined as engine product lines that are expected to have similar emissions characteristics, as defined by U.S. CFR§1039.230.
- 3 Engines that are exempt from the EPA rules, such as certain marine engines, shall be exempt for the purposes of this disclosure.
- 4 The scope of disclosure includes both U.S. and non-U.S. operations, regardless of whether they are under EPA jurisdiction.
- 5 The scope of disclosure includes non-road diesel engines manufactured, owned, and/or operated by the entity, regardless of which entity bears the EPA compliance obligation.

# Water Management Services

## Topic Summary

Oil and gas development often requires large quantities of water, exposing producers to the risk of reduced water availability, regulations limiting usage, or related cost increases, particularly in water-stressed regions. Producers also face risks and costs associated with wastewater disposal. As such, companies that provide these oil and gas producers with services have developed technologies and processes such as closed-loop water recycling systems to reduce customers' water consumption and disposal costs. These offerings provide service companies the potential to gain market share and increase revenues, as management of drilling and wastewater can be a significant competitive factor for their customers.

## Accounting Metrics

### EM-SV-140a.1. (1) Total volume of fresh water handled in operations, (2) percentage recycled

- 1 The entity shall disclose the volume of fresh water, in thousands of cubic meters, handled in operations.
  - 1.1 Handled water includes that which is transferred to the entity from a third party for the purpose of providing the entity's contractual scope of service as well as that which is directly obtained and used by the entity in its operations.
  - 1.2 Fresh water may be defined according to the local statutes and regulations where the entity operates. Where there is no regulatory definition, fresh water shall be considered to be water that has less than 1000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 1.3 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 2 The entity shall disclose the percentage of water recycled as the volume recycled divided by the volume of fresh water handled.
- 3 Recycled water shall include the amount recycled in closed-loop and open-loop systems as well as recycled produced water or flowback.
  - 3.1 Any volume of water reused multiple times shall be counted as recycled each time it is recycled and reused.
- 4 Produced water is defined according to the U.S. Environmental Protection Agency (EPA) according to U.S. 40 CFR 435.41 as water (brine) brought up from the hydrocarbon bearing formation strata during the extraction of oil and gas and can include formation water, injection water, and any chemicals added downhole or during the oil/water separation process.
- 5 Flowback is defined according to U.S. 40 CFR 60.5430a as the process of allowing fluids (including water) and entrained solids to flow from a well following a treatment, either in preparation for a subsequent phase of treatment or in preparation for cleanup and returning the well to production.

- 5.1 The term flowback also means the fluids and entrained solids that emerge from a well during the flowback process. The flowback period begins when material introduced into the well during the treatment returns to the surface following hydraulic fracturing or refracturing.
  - 5.2 The flowback period ends when either the well is shut in and permanently disconnected from the flowback equipment or at the startup of production.
  - 5.3 The flowback period includes the initial flowback stage and the separation flowback stage.
- 6 The scope is limited to operations for which the entity provides hydraulic fracturing, completion, drilling, and/or water management services [e.g., injection of produced water or flowback into a Class II injection well under the EPA's Underground Injection Control (UIC) program or equivalent, water treatment for reuse in drilling or hydraulic fracturing, reduction of unwanted water in subsurface areas].
- 6.1 The scope includes, but is not limited to, water that is used in hydraulic fracturing fluids, drilling fluids, dust control, and drilling cement production.

## **EM-SV-140a.2. Discussion of strategy or plans to address water consumption and disposal-related risks, opportunities, and impacts**

- 1 The entity shall discuss its strategy or plans to address water consumption and disposal-related risks, opportunities, and impacts.
  - 1.1 The scope of disclosure shall include the entity's strategies, plans, and/or reduction activities, including whether they pertain differently to different business units, geographies, or water sources.
  - 1.2 The scope of disclosure includes the activities and investments by the entity that are required to achieve the plans and any risks or limiting factors that might affect achievement of the plans and/or targets.
- 2 The entity shall discuss demand for specific products, services, and technologies that offer well and field operators reduced water consumption, water recycling, and/or other water impact reductions, and its ability to meet this demand.
- 3 The entity shall discuss its short-term and long-term plans related to water management, where:
  - 3.1 Short-term strategies may include adopting best practices in water recycling or water efficiency initiatives.
  - 3.2 Long-term strategies may include process redesigns or technological innovations that lower withdrawal of fresh water in constrained regions, reduce excess water production from wells, provide new water treatment or recycling systems.
- 4 The scope of impact reductions may relate to the following specific areas of water consumption or disposal:
  - 4.1 Hydraulic fracturing fluids
  - 4.2 Drilling fluids
  - 4.3 Dust control
  - 4.4 Cement production

#### 4.5 Produced water or flowback

- 5 The entity shall discuss risks and opportunities it may face relating to: being able to offer its customers services, technologies, or solutions that enhance water use efficiency, treatment and reuse, and reduce water consumption or wastewater production.

## ASSET MANAGEMENT & CUSTODY ACTIVITIES

### Industry Description

The Asset Management & Custody Activities industry is comprised of companies that manage investment portfolios on a commission or fee basis for institutional, retail, and high net-worth investors. In addition, firms in this industry provide wealth management, private banking, financial planning, and investment advisory and retail securities brokerage services. Investment portfolios and strategies may be diversified across multiple asset classes, which include, but are not limited to, equities, fixed income, and hedge fund investments. Specific companies are engaged in venture capital and private equity investments. The industry provides an essential service in assisting a range of customers from individual retail investors to large, institutional asset owners to meet specified investment goals. Companies in the industry range from large multi-national asset managers with a wide range of investable products, strategies, and asset classes to small boutique firms providing services to a very specific market niche. While large firms generally compete on the basis of management fees charged for their services as well as their potential to generate superior investment performance, the smaller firms generally compete on their ability to provide products and services geared towards individual clients to satisfy their diversification needs. The 2008 financial crisis and subsequent regulatory developments highlight the social impact of the industry in terms of providing fair advice to customers and managing risks at the entity, portfolio, and economy-wide levels. In addition, the collective impact of the industry on the allocation of capital creates a responsibility to integrate sustainability factors in investment decisions and management.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Incorporation of Environmental, Social, and Governance Factors in Investment Management & Advisory	Amount of assets under management, by asset class, that employ (1) integration of environmental, social, and governance (ESG) issues, (2) sustainability themed investing, and (3) screening	Quantitative	Reporting currency	FN-AC-410a.1
	Description of approach to incorporation of environmental, social, and governance (ESG) factors in investment and/or wealth management processes and strategies	Discussion and Analysis	n/a	FN-AC-410a.2
	Description of proxy voting and investee engagement policies and procedures	Discussion and Analysis	n/a	FN-AC-410a.3

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
(1) Total registered and (2) total unregistered assets under management (AUM) <sup>19</sup>	Quantitative	Reporting currency	FN-AC-000.A

<sup>19</sup> Note to **FN-AC-000.A** – Registered AUM include those subject to the regulations of the Investment Company Act of 1940 (1940 Act), such as mutual funds, managed under the Employee Retirement Income Security Act of 1974 (ERISA), subject to the Undertakings for Collective

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Total assets under custody and supervision	Quantitative	Reporting currency	FN-AC-000.B

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Investment in Transferable Securities (UCITS) Directive, or managed under the Commodity Futures Trading Commission's (CFTC's) Commodity Pool Operator (CPO) regulations. Unregistered AUM are those that do not fall under the definition of the registered AUM.

# Incorporation of Environmental, Social, and Governance Factors in Investment Management & Advisory

## Topic Summary

Asset management and custody activities companies maintain a fiduciary responsibility to their clients. These companies must therefore consider and incorporate an analysis of all material information into investment decisions, including environmental, social, and governance (ESG) factors. The process of ESG incorporation involves consideration of ESG factors in valuation, modeling, portfolio construction, proxy voting, and engagement with investees and, as a result, in investment decision-making by asset and wealth managers. As the management and use of non-financial forms of capital increasingly contribute to market value, incorporation of ESG factors in analysis of investees has become more relevant. Research has established that a company's management of certain ESG factors can materially impact both its accounting and market returns. Therefore, deep understanding of investees' ESG performance, integration of ESG factors in valuation and modeling, as well as engagement with investees on sustainability issues allows asset managers to generate superior returns. On the other hand, asset management and custody activities companies that fail to consider these risks and opportunities in their investment management activities could see diminished investment returns in their portfolios which would lead to reduced performance fees. Over the long term, it could result in outflow of assets under management (AUM) resulting in the loss of market share and lower management fees.

## Accounting Metrics

### **FN-AC-410a.1. Amount of assets under management, by asset class, that employ (1) integration of environmental, social, and governance (ESG) issues, (2) sustainability themed investing, and (3) screening**

- 1 The entity shall disclose the amount of assets under managements (AUM), that employ (1) integration of environmental, social, and governance (ESG) issues, (2) sustainability themed investing, and (3) screening.
  - 1.1 AUM shall be defined broadly as per Section 203A of the Investment Advisers Act of 1940 Section 203A as, "the securities portfolios with respect to which an adviser provides continuous and regular supervisory or management services."
  - 1.2 Integration of ESG issues is defined as the systematic and explicit inclusion of material ESG factors into investment analysis and investment decisions, as aligned with the [PRI Reporting Framework – Main definitions 2018](#).
  - 1.3 Sustainability themed investing is defined as investment in themes or assets specifically related to sustainability (for example clean energy, green technology or sustainable agriculture), as aligned with the [PRI Reporting Framework – Main definitions 2018](#).
  - 1.4 Screening, including (a) negative/exclusionary, (b) positive/best-in-class, and (c) norms-based, is defined by the [PRI Reporting Framework – Main definitions 2018](#).
  - 1.5 The scope of disclosure includes both passive and active strategies.



- 2 The entity shall break down its disclosure by asset class: (a) equities, (b) fixed income, (c) cash equivalents/money market instruments, and (d) other (e.g., real estate and commodities).
- 3 The entity shall identify and disclose the amount of any AUM managed using more than one ESG integration strategy (e.g., screening and integration).

## **FN-AC-410a.2. Description of approach to incorporation of environmental, social, and governance (ESG) factors in investment and/or wealth management processes and strategies**

- 1 The entity shall describe its approach to incorporation of environmental, social, and governance (ESG) factors in its investment and/or wealth management processes and strategies.
  - 1.1 The definition of incorporation of ESG factors is aligned with that of the [Global Sustainable Investment Alliance \(GSIA\)](#) and includes the use of ESG information in investment decision-making processes.
  - 1.2 Examples of ESG factors/issues are provided in the [PRI Reporting Framework – Main definitions 2018](#), section “ESG issues.”
  - 1.3 Incorporation of ESG factors include the following approaches, consistent with the [PRI Reporting Framework – Main definitions 2018](#):
    - 1.3.1 Screening, including (a) negative/exclusionary, (b) positive/best-in-class, and (c) norms-based
    - 1.3.2 Sustainability themed investment, defined as investment in themes or assets specifically related to sustainability (for example clean energy, green technology or sustainable agriculture)
    - 1.3.3 Integration of ESG, defined as the systematic and explicit inclusion of material ESG factors into investment analysis and investment decisions
    - 1.3.4 A combination of the above
- 2 The entity shall describe policies that determine its approach to incorporation of ESG factors in its investment and/or wealth management processes and strategies.
- 3 The scope of disclosure shall exclude discussion of the entity’s proxy voting and investee engagement policies and procedures, which is included in metric FN-AC-410a.3, “Description of proxy voting and investee engagement policies and procedures.”
- 4 The entity shall describe its approach to implementation of the aspects of the entity’s ESG incorporation practices.
  - 4.1 The discussion shall include, but is not limited to:
    - 4.1.1 Parties responsible for day-to-day incorporation of ESG factors
    - 4.1.2 Roles and responsibilities of employees involved
    - 4.1.3 Approach to conducting ESG-related research
    - 4.1.4 Approach to incorporating ESG factors into investment strategies
- 5 The entity shall describe its oversight/accountability approach to the incorporation of ESG factors.

- 5.1 The discussion shall include, but is not limited to:
  - 5.1.1 Formal oversight individuals and/or bodies involved
  - 5.1.2 Roles and responsibilities of employees involved
  - 5.1.3 Criteria used in assessing the quality of ESG incorporation
  
- 6 The entity shall discuss whether it conducts scenario analysis and/or modeling in which the risk profile of future ESG trends is calculated at the portfolio level.
  - 6.1 ESG trends include, but are not limited to, climate change, natural resource constraints, human capital risks and opportunities, and cybersecurity risks.
  - 6.2 The entity shall describe the types of portfolios and/or strategies where it executes scenario analysis and/or modeling.
    - 6.2.1 The entity is not required to provide such disclosure at the individual portfolio and/or strategy level.
  
- 7 The entity shall discuss ESG trends that it views as broadly applicable in terms of their impact on sectors and industries as well as the trends it views as sector- or industry-specific.
  
- 8 The entity shall describe whether it incorporates ESG factors in strategic asset allocation and/or allocation of assets between sectors or geographic markets.
  - 8.1 The entity shall describe the types of portfolios and/or strategies where it incorporates ESG factors in strategic asset allocation and/or allocation of assets between sectors or geographic markets.
    - 8.1.1 The entity is not required to provide such disclosure at the individual portfolio and/or strategy level.
  
- 9 The entity shall describe how ESG factors are incorporated in the assessment of and influence the entity's views on:
  - 9.1 Time horizon of investments
  - 9.2 Risk and return profiles of investments
  - 9.3 Traditional fundamental factors such as economic conditions, central bank policy, industry trends, and geopolitical risks
  
- 10 When relevant, the entity shall discuss its approach to incorporation of ESG factors in selecting external fund managers and fiduciary managers.
  - 10.1 The entity shall describe its oversight/accountability approach to assessing the quality of incorporation of ESG factors by external fund managers and fiduciary managers, which includes, but is not limited to:
    - 10.1.1 Formal oversight individuals and/or bodies involved
    - 10.1.2 Roles and responsibilities of employees involved
    - 10.1.3 Criteria used in assessing the quality of ESG incorporation

- 11 The scope of disclosure shall include investment and/or wealth management services where the entity maintains decision-making power, regardless of strategy and asset class.
- 12 The scope of disclosure shall exclude execution and/or advisory services where investment decision-making power remains with clients.
- 13 When relevant, the description of the entity's approach to incorporation of ESG factors in its investment and/or wealth management activities shall be broken down by asset class or by style employed.
  - 13.1 The discussion shall include, but is not limited to, the differences in the entity's approaches to incorporation of ESG factors in:
    - 13.1.1 Public equity, fixed income, private equity, or alternative asset classes
    - 13.1.2 Passive versus active investment strategies
    - 13.1.3 Fundamental, quantitative, and technical analyses of investments

### **FN-AC-410a.3. Description of proxy voting and investee engagement policies and procedures**

- 1 The entity shall describe its approach to proxy voting, including, but not limited to, its process for making proxy voting decisions, including its approach to defining materiality.
  - 1.1 The discussion shall include, but is not limited to, elements highlighted in the [PRI's Reporting Framework for Direct – Listed Equity Active Ownership](#):
    - 1.1.1 The scope of the entity's voting activities
    - 1.1.2 The objectives of the entity's voting activities
    - 1.1.3 How, if at all, the entity's voting approach differs among markets
    - 1.1.4 Whether the entity has a default position of voting in favor of management in particular markets or on particular issues
    - 1.1.5 Whether and how local regulatory or other requirements influence the entity's approach to voting
    - 1.1.6 Whether the entity votes by proxy or in person by attending annual general meetings (AGMs) (or a combination of both)
  - 1.2 The entity shall describe its approach to determining support for proposals, including its approach to defining materiality.
    - 1.2.1 The scope of disclosure includes proposals addressing Environmental and Social (ES) issues
  - 1.3 The entity shall describe how it communicates its proxy voting policy to clients as well as to the public.
    - 1.3.1 The entity may provide the link to its formal proxy voting policy.
- 2 The entity shall describe its process of making proxy voting decisions.

- 2.1 The discussion shall include, but not be limited to, the elements highlighted in the PRI's Reporting Framework for Direct – Listed Equity Active Ownership, which include:
  - 2.1.1 Use of internal research team and/or third-party service providers
  - 2.1.2 Review and monitoring process for service provider recommendations
- 3 The entity shall describe its approach to communicating its voting decisions to company management, including the rationale for voting for/against the management's recommendations.
- 4 The entity shall describe its approach to engagement on ES issues.
  - 4.1 The discussion shall include, but is not limited to:
    - 4.1.1 The entity's objectives for undertaking engagement activities
    - 4.1.2 Whether the entity's engagements related to ES issues are primarily proactive to ensure that ES issues are well-managed in a preventive manner, or reactive to address issues that may have already occurred
    - 4.1.3 The outcomes the entity seeks from engaging with companies on ES issues (e.g., influencing corporate practice, improve the quality of ES disclosure)
    - 4.1.4 The entity's staff that carries out the engagement (e.g., specialized in-house engagement teams, fund managers or equity/credit analysts, more senior-level roles)
    - 4.1.5 The roles of individuals at the portfolio companies the entity seeks to engage with (e.g., board members, board chair, CEO, corporate secretary, investor relations managers)
  - 4.2 The entity shall describe how it communicates its engagement policy to clients as well as to the public.
    - 4.2.1 The entity may provide the link to its formal engagement policy.
  - 4.3 The scope of disclosure includes all asset classes, portfolios, and/or strategies where the entity conducts engagement on ES issues.
- 5 The entity shall describe how the outcomes of its proxy voting and engagement activities inform its investment decision-making process.
  - 5.1 The discussion shall include, but is not limited to:
    - 5.1.1 How the entity decides what information to pass on to investment decision-makers
    - 5.1.2 How the entity monitors the use of the information passed on in investment decision-making
- 6 The entity shall describe its escalation process for engagements when company dialogue is failing.
  - 6.1 The escalation process includes, but is not limited to, tactics highlighted in the International Corporate Governance Network (ICGN) [Global Stewardship Principles](#):

- 6.1.1 Expressing concerns to corporate representatives or non-executive directors, either directly or in a shareholder meeting
- 6.1.2 Expressing the entity's concern collectively with other investors
- 6.1.3 Making a public statement
- 6.1.4 Submitting shareholder resolutions
- 6.1.5 Speaking at general meetings
- 6.1.6 Submitting one or more nominations for election to the board as appropriate and convening a shareholder meeting
- 6.1.7 Seeking governance improvements and/or damages through legal remedies or arbitration
- 6.1.8 Exit or threat to exit from the investment

- 7 The entity shall describe how its ES engagement strategy fits into the entity's overall engagement strategy.
- 8 The entity may disclose additional quantitative measures related to its proxy voting and engagement activities, such as:
  - 8.1 Number of engagements, percentage of those in-person
  - 8.2 Number of staff involved in proxy voting and engagement activities

## COMMERCIAL BANKS

### Industry Description

Commercial banks accept deposits and make loans to individuals and corporations as well as engage in lending for infrastructure, real estate, and other projects. By providing these services, the industry serves an essential role in the functioning of global economies and in facilitating the transfer of financial resources to their most productive capacity. The industry is driven by the volume of deposits, quality of loans made, the economic environment, and interest rates. It is further characterized by risk from mismatched assets and liabilities. The regulatory environment that governs the commercial banking industry saw significant changes in the wake of the financial crisis of 2008 and continues to evolve today. These and other regulatory trends have the potential to impact shareholder value and sustainability performance. Commercial banks with global operations must manage new regulations in multiple jurisdictions that are creating regulatory uncertainty, particularly around consistent application of new rules.

Note: The SASB Commercial Banks (FN-CB) Standard addresses “pure play” commercial banking services, which the SASB recognizes may not include all the activities of integrated financial institutions, such as investment banking and brokerage services, mortgage finance, consumer finance, asset management and custody services, and insurance. Separate SASB accounting standards are available that address the sustainability issues for activities in those industries.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Incorporation of Environmental, Social, and Governance Factors in Credit Analysis	Commercial and industrial credit exposure, by industry	Quantitative	Reporting currency	FN-CB-410a.1
	Description of approach to incorporation of environmental, social, and governance (ESG) factors in credit analysis	Discussion and Analysis	n/a	FN-CB-410a.2

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
(1) Number and (2) value of checking and savings accounts by segment: (a) personal and (b) small business	Quantitative	Number, Reporting currency	FN-CB-000.A
(1) Number and (2) value of loans by segment: (a) personal, (b) small business, and (c) corporate <sup>20</sup>	Quantitative	Number, Reporting currency	FN-CB-000.B

<sup>20</sup> Note to **FN-CB-000.B** – Mortgage loans as well as revolving credit loans shall be excluded from the scope of disclosure.

# Incorporation of Environmental, Social, and Governance Factors in Credit Analysis

## Topic Summary

As financial intermediaries, commercial banks contribute to significant positive and negative environmental and social externalities through their lending practices. Therefore, environmental, social, and governance (ESG) factors can have material implications for the underlying companies, assets, and projects that commercial banks lend to across a range of industries. It is therefore increasingly necessary for companies to examine ESG factors when determining the quality of collateral. Commercial banks also have the potential to enable positive environmental and social externalities and to generate significant revenue streams through their lending practices. Commercial banks that fail to address these risks and opportunities could face diminished returns and reduced value for shareholders. Commercial banks should subsequently disclose how ESG factors are integrated into lending processes and the current level of portfolio risk associated with specific sustainability trends. In particular, investor and regulatory pressure is mounting for banks to disclose how they address climate change related risks.

## Accounting Metrics

### **FN-CB-410a.1. Commercial and industrial credit exposure, by industry**

- 1 The entity shall disclose its commercial and industrial credit exposure.
  - 1.1 The entity shall calculate its exposure in accordance with the guidance to [Schedule RC-C](#) and [Schedule RC-I](#) of the Consolidated Report of Condition and Income (Call Report).
  - 1.2 The reported value shall include the notional amount of direct outstanding and unfunded legally binding lending commitments net of amounts distributed (e.g., syndicated or participated) to other financial institutions.
- 2 The entity shall break down its commercial and industrial credit exposure by industry.
  - 2.1 The entity shall use the North American Industry Classification System (NAICS) for classifying counterparties.
    - 2.1.1 The entity shall use the NAICS 3 Digit Subsector code-level breakdown in its disclosure.
    - 2.1.2 The entity shall use the latest version of the NAICS available at the time of disclosure.
  - 2.2 The entity shall disclose its exposure to at least the 10 largest industries by monetary amount of exposure, or to industries representing at least 2 percent of the overall portfolio monetary exposure.
- 3 The entity shall consider guidance to Schedule RC-C and Schedule RC-I of the Call Report a normative reference, thus any future updates made to it shall be considered updates to this guidance.

### **FN-CB-410a.2. Description of approach to incorporation of environmental, social, and**

## **governance (ESG) factors in credit analysis**

- 1 The entity shall describe its approach to the incorporating environmental, social, and governance (ESG) factors into its credit analysis.
  - 1.1 The definition of incorporation of ESG factors is aligned with that of the [Global Sustainable Investment Alliance \(GSIA\)](#) and includes the use of ESG information in the investment decision-making processes.
  - 1.2 Examples of ESG factors/issues are provided in the [PRI Reporting Framework – Main definitions 2018](#), section “ESG issues.”
  - 1.3 Credit analysis is defined as method to calculate the creditworthiness of a business or organization, i.e., their ability to honor debt obligations, which seeks to identify the appropriate level of default risk associated with financing such business, organization, or project.
- 2 The scope of disclosure shall include commercial and industrial lending as well as project finance.
- 3 The entity shall describe policies that determine its approach to the incorporation of ESG factors in credit analysis.
- 4 The entity shall discuss how it incorporates ESG factors when estimating credit losses over the contractual term of the entity’s financial assets.
- 5 The entity shall describe its approach to implementation of the aspects of the entity’s ESG incorporation practices.
  - 5.1 The discussion shall include, but is not limited to:
    - 5.1.1 Parties responsible for day-to-day incorporation of ESG factors
    - 5.1.2 Roles and responsibilities of employees involved
    - 5.1.3 Approach to conducting ESG-related research
    - 5.1.4 Approach to incorporating ESG factors into assessing creditworthiness of borrowers
- 6 The entity shall describe its oversight/accountability approach to the incorporation of ESG factors.
  - 6.1 The discussion shall include, but is not limited to:
    - 6.1.1 Formal oversight individuals and/or bodies involved
    - 6.1.2 Roles and responsibilities of employees involved
    - 6.1.3 Criteria used in assessing the quality of ESG incorporation
- 7 The entity shall discuss whether it conducts scenario analysis and/or modeling in which the risk profile of future ESG trends is calculated at the portfolio level of commercial and industrial credit exposure.
  - 7.1 ESG trends include, but are not limited to, climate change, natural resource constraints, human capital risks and opportunities, and cybersecurity risks.
- 8 The entity shall discuss ESG trends that it views as broadly applicable in terms of their impact on sectors and industries, as well as the trends it views as sector- or industry-specific.



- 8.1 The entity may further provide the discussion in the context of geographic exposure of its commercial and industrial credit portfolio.
- 9 The entity shall describe significant concentrations of credit exposure to ESG factors, including, but not limited to, carbon-related assets, water-stressed regions, and cybersecurity risks.
- 10 The entity shall describe how ESG factors are incorporated in the assessment of and influence the entity's perspectives on:
  - 10.1 Traditional macroeconomic factors such as the economic conditions, central bank monetary policy, industry trends, and geopolitical risks that affect creditworthiness of borrowers
  - 10.2 Traditional microeconomic factors such as supply and demand for products or services that affect financial conditions and operational results of borrowers as well as their creditworthiness
  - 10.3 Overall creditworthiness of a borrower
  - 10.4 Maturity or tenor of a loan
  - 10.5 Expected loss, including probability of default, exposure at default, and loss given default
  - 10.6 Value of posted collateral
- 11 The entity may disclose additional quantitative measures related to its approach to the incorporation of ESG factors in credit analysis, such as:
  - 11.1 Number of commercial and industrial loans and project finance screened according to the [Equator Principles \(EP III\)](#) (or equivalent) by EP Category
  - 11.2 Number of loans for which a review of environmental or social risks was performed, e.g., by the entity's Environmental and Social Risk Management (ESRM) group

## INSURANCE

### Industry Description

The Insurance industry provides both traditional and nontraditional insurance-related products. Traditional policy lines include property, life, casualty, and reinsurance. Nontraditional products include annuities, alternative risk transfers, and financial guarantees. Companies in the insurance industry also engage in proprietary investments. Insurance companies generally operate within a single segment in the industry, e.g., property and casualty, although there are some large insurance companies with diversified operations. Similarly, companies may vary based on the level of their geographic segmentation. While large companies may underwrite insurance premiums in multiple countries, smaller companies generally operate at a national or even local level. Insurance premiums, underwriting revenue, and investment income drive industry growth, while insurance claim payments present the most significant cost and source of uncertainty for profits. Insurance companies provide products and services that enable the transfer, pooling, and sharing of risk necessary for a well-functioning economy. Insurance companies, through their products, can also create a form of moral hazard, lowering incentives to improve underlying behavior and performance, and thus contributing to sustainability impacts. Similar to other financial institutions, insurance companies face risks associated with credit and financial markets. Within the industry, companies that engage in non-traditional or non-insurance activities, including credit default swaps (CDS) protection and debt securities insurance, have been identified by regulators as being more vulnerable to financial market developments, and subsequently, more likely to amplify or contribute to systemic risk. As a result, insurance companies face the potential of being designated as Systemically Important Financial Institutions, thus exposing them to enhanced regulation and oversight.

Note: Accounting metrics for the material sustainability issues associated with the provision of health insurance are outlined in the SASB Managed Care (HC-MC) Industry Standard.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Incorporation of Environmental, Social, and Governance Factors in Investment Management	Total invested assets, by industry and asset class	Quantitative	Reporting currency	FN-IN-410a.1
	Description of approach to incorporation of environmental, social, and governance (ESG) factors in investment management processes and strategies	Discussion and Analysis	n/a	FN-IN-410a.2
Policies Designed to Incentivize Responsible Behavior	Net premiums written related to energy efficiency and low carbon technology	Quantitative	Reporting currency	FN-IN-410b.1
	Discussion of products and/or product features that incentivize health, safety, and/or environmentally responsible actions and/or behaviors	Discussion and Analysis	n/a	FN-IN-410b.2

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Environmental Risk Exposure	Probable Maximum Loss (PML) of insured products from weather-related natural catastrophes <sup>21</sup>	Quantitative	Reporting currency	FN-IN-450a.1
	Total amount of monetary losses attributable to insurance payouts from (1) modeled natural catastrophes and (2) non-modeled natural catastrophes, by type of event and geographic segment (net and gross of reinsurance) <sup>22</sup>	Quantitative	Reporting currency	FN-IN-450a.2
	Description of approach to incorporation of environmental risks into (1) the underwriting process for individual contracts and (2) the management of firm-level risks and capital adequacy	Discussion and Analysis	n/a	FN-IN-450a.3

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of policies in force, by segment: (1) property and casualty, (2) life, (3) assumed reinsurance <sup>23</sup>	Quantitative	Number	FN-IN-000.A

<sup>21</sup> Note to **FN-IN-450a.1** – The entity shall describe climate-related scenarios used, including the critical input parameters, assumptions and considerations, analytical choices, and time frames, in calculation of the PML.

<sup>22</sup> Note to **FN-IN-450a.2** – The entity shall discuss how climate change-related impacts and variability of weather-related losses impact the cost of reinsurance and the entity's approach to transferring risk through reinsurance.

<sup>23</sup> Note to **FN-IN-000.A** – The entity may additionally break down the number of policies in force by product line.

# Incorporation of Environmental, Social, and Governance Factors in Investment Management

## Topic Summary

Insurance companies are responsible for investing capital to ensure the preservation of premium revenues equivalent to expected policy claim payouts and must be able to maintain this asset-liability parity over the long term. As environmental, social, and governance (ESG) factors have increasingly been shown to have a material impact on the performance of corporations and other assets, there is an increasing need for insurance companies to incorporate these factors into the management of their investments. Failure to address these issues could lead to diminished risk-adjusted returns of their portfolios and limit a company's ability to issue claim payments. Companies should therefore enhance disclosure on how ESG factors, including climate change and natural resource constraints, are incorporated into the investment of policy premiums and affect the portfolio risk.

## Accounting Metrics

### **FN-IN-410a.1. Total invested assets, by industry and asset class**

- 1 The entity shall disclose the amount of its short-term and long-term investment assets by asset class.
  - 1.1 The scope of the disclosure includes:
    - 1.1.1 Stock and bond investments reported on Schedule D
    - 1.1.2 Derivatives reported on Schedule DB
    - 1.1.3 Mortgage loans on real estate reported on Schedule B
    - 1.1.4 Real estate reported on schedule A
- 2 The entity shall break down its stock, bond, and derivative investments by industry.
  - 2.1 The entity shall use the North American Industry Classification System (NAICS) for classifying investees.
    - 2.1.1 The entity shall use the NAICS 3 Digit Subsector code-level breakdown in its disclosure.
    - 2.1.2 The entity shall use the latest version of the NAICS available at the time of disclosure.
  - 2.2 The entity shall disclose its exposure to at least the 10 largest industries by monetary amount of exposure, or to industries representing at least 2 percent of the overall portfolio monetary exposure.
- 3 The entity may additionally breakdown the exposure by credit quality (investment-grade vs. noninvestment-grade).

### **FN-IN-410a.2. Description of approach to incorporation of environmental, social, and**

## **governance (ESG) factors in investment management processes and strategies**

- 1 The entity shall describe its approach to incorporation of environmental, social, and governance (ESG) factors in its investment management processes and strategies.
  - 1.1 The definition of incorporation of ESG factors is aligned with that of the [Global Sustainable Investment Alliance \(GSIA\)](#) and includes the use of ESG information in the investment decision-making processes.
  - 1.2 Examples of ESG factors/issues are provided in the [PRI Reporting Framework – Main definitions 2018](#), section “ESG issues.”
  - 1.3 Incorporation of ESG factors include the following approaches, consistent with the [PRI Reporting Framework – Main definitions 2018](#):
    - 1.3.1 Screening, including a) negative/exclusionary, b) positive/best-in-class, and c) norms-based
    - 1.3.2 Sustainability themed investment, defined as investment in themes or assets specifically related to sustainability (for example clean energy, green technology or sustainable agriculture)
    - 1.3.3 Integration of ESG, defined as the systematic and explicit inclusion of material ESG factors into investment analysis and investment decisions
    - 1.3.4 A combination of the above
- 2 The entity shall describe regulatory requirements it is subject to that limit the types of allowable investments the entity may make as well as allowable credit and equity risk the entity may be exposed to.
  - 2.1 The description of the entity’s approach to incorporation of ESG factors in its investment management processes and strategies shall be provided in the context of the regulatory environment the entity is subject to.
- 3 The entity shall describe policies that determine its approach to incorporation of ESG factors in its investment management processes and strategies.
- 4 The entity shall describe its approach to implementation of the aspects of the entity’s ESG incorporation practices.
  - 4.1 The discussion shall include, but is not limited to:
    - 4.1.1 Parties responsible for day-to-day incorporation of ESG factors
    - 4.1.2 Roles and responsibilities of employees involved
    - 4.1.3 Approach to conducting ESG-related research
    - 4.1.4 Approach to incorporating ESG factors into investment strategies
- 5 The entity shall describe its oversight/accountability approach to the incorporation of ESG factors.
  - 5.1 The discussion shall include, but is not limited to:
    - 5.1.1 Formal oversight individuals and/or bodies involved
    - 5.1.2 Roles and responsibilities of employees involved
    - 5.1.3 Criteria used in assessing the quality of ESG incorporation

- 6 The entity shall discuss whether it conducts scenario analysis and/or modeling in which the risk profile of future ESG factors at the portfolio level is calculated.
  - 6.1 ESG factors include, but are not limited to, climate change, natural resource constraints, human capital risks and opportunities, and cybersecurity risks.
- 7 The entity shall discuss ESG factors that it views as broadly applicable in terms of their impact on sectors and industries as well as the factors it views as sector- or industry-specific.
- 8 The entity shall describe whether it incorporates ESG factors in strategic asset allocation and/or allocation of assets between sectors or geographic markets.
- 9 The entity shall describe how ESG factors are incorporated into the assessment of and influence the entity's perspectives on:
  - 9.1 Time horizon of investments
  - 9.2 Risk and return profiles of investments
  - 9.3 Traditional fundamental factors such as economic conditions, Federal Reserve policy, industry factors, and geopolitical risks
- 10 Where relevant, the entity shall discuss its approach to incorporation of ESG factors in selecting external fund managers and fiduciary managers.
  - 10.1 The entity shall describe its oversight/accountability approach to assessing the quality of incorporation of ESG factors by external fund managers and fiduciary managers, which includes, but is not limited to:
    - 10.1.1 Formal oversight individuals and/or bodies involved
    - 10.1.2 Roles and responsibilities of employees involved
    - 10.1.3 Criteria used in assessing the quality of ESG incorporation
- 11 Where relevant, the description of the entity's approach to incorporation of ESG factors in its investment management activities shall be broken down by asset class or by style employed.
  - 11.1 The discussion shall include, but is not limited to, the differences in the entity's approaches to incorporation of ESG factors in:
    - 11.1.1 Public equity, fixed income, private equity, or alternative asset classes
    - 11.1.2 Passive versus active investment strategies
    - 11.1.3 Fundamental, quantitative, and technical analyses of investments

# Policies Designed to Incentivize Responsible Behavior

## Topic Summary

Advances in technology and the development of new policy products have allowed insurance companies to limit claim payments while encouraging responsible behavior. The industry is subsequently in a unique position to generate positive social and environmental externalities. Insurance companies have the ability to incentivize healthy lifestyles and safe behavior as well as the development of sustainability-related projects and technologies such as those focused on renewable energy, energy efficiency, and carbon capture. As the renewable energy industry continues to grow, insurance companies may seek related growth opportunities by underwriting insurance in this area. Additionally, such policy clauses that provide incentives through incorporation of environmental, social, and governance (ESG) factors can be used as tools to mitigate risk in the overall underwriting portfolio, which can reduce insurance payouts over the long term. Therefore, disclosure on premiums written related to energy efficiency and low carbon technology as well as discussion of how companies incentivize health, safety, and/or environmentally responsible actions or behaviors would allow investors to assess how insurance companies manage their performance on this topic.

## Accounting Metrics

### **FN-IN-410b.1. Net premiums written related to energy efficiency and low carbon technology**

- 1 The entity shall disclose the net premiums written for policies related to energy efficiency and low carbon technology, including renewable energy insurance, energy savings warranties, and carbon capture and storage insurance).
  - 1.1 The scope of disclosure includes policies that can be demonstrated to absorb environmental risks, thereby enabling sustainability-related projects, technologies, and activities.
  - 1.2 Renewable energy insurance may range from specialized protection against natural hazards or mechanical breakdowns to insurance against fluctuations in the availability of wind or solar radiation.
  - 1.3 Energy savings warranties insure the energy savings guaranteed by Energy Services Companies (ESCOs) for building retrofitting and other energy efficiency projects.
- 2 The scope of disclosure shall include policies where the insurer has separately priced and identified such net premiums in its billing to the customer.

### **FN-IN-410b.2. Discussion of products and/or product features that incentivize health, safety, and/or environmentally responsible actions and/or behaviors**

- 1 The entity shall describe how it incentivizes health, safety, and/or environmentally responsible actions or behaviors through incorporation of clauses in the insurance policies sold to clients and through pricing structure of the policies.

- 1.1 The scope of disclosure includes policies underwritten in the Property & Casualty (P&C) and Life segments and excludes Health Insurance policies.
- 1.2 The scope of disclosure includes the consumer insurance segment and the commercial insurance segment:
  - 1.2.1 The consumer segment includes homeowners, automotive, supplemental health and accident, and other personal insurance.
  - 1.2.2 The commercial segment includes casualty (e.g., liability, workers' compensation), property, specialty (e.g., crop, marine, political risk), and financial (e.g., errors and omissions, fiduciary liability) insurance.
- 2 Disclosure shall include a description of the aspects of traditional products that incentivize health, safety, and/or environmentally responsible actions or behavior. Such aspects include, but are not limited to:
  - 2.1 Premium discounts for green buildings
  - 2.2 Premium discounts for improving resource efficiency of properties
  - 2.3 Actuarially adjusted premiums for the use of low-emission vehicles, fuel-efficient non-hybrid vehicles, or alternative-fuel vehicles
  - 2.4 Premium discounts for safer driving and lower use of personal vehicles
  - 2.5 Premium discounts for healthy behavior (healthy diet, routine exercise, weight loss, giving up smoking/drinking)
- 3 The entity may disclose quantitative measures related to performance on underwriting of products with clauses incentivizing healthy, safe, and/or environmentally responsible actions or behavior such as:
  - 3.1 Number of policies incorporating such clauses
  - 3.2 Amount of premiums generated from the relevant products
  - 3.3 Quantitative measures of the associated social and environmental factors influenced through products (i.e., reduction in the amount of car accidents involving policyholders, amount of exercise hours per week, average amount of weight lost by a policyholder)



# Environmental Risk Exposure

## Topic Summary

Catastrophe losses associated with extreme weather events will continue to have a material, adverse impact on the Insurance industry. The extent of this impact is likely to evolve as climate change increases the frequency and severity of both modeled and non-modeled natural catastrophes, including hurricanes, floods, and droughts. Failure to appropriately understand environmental risks and price them into the underwritten insurance products may result in higher than expected claims on policies. Subsequently, insurance companies that incorporate climate change considerations into their underwriting process for individual contracts as well as the management of firm-level risks and capital adequacy will be better positioned to protect shareholder value. Enhanced disclosure of a company's approach to incorporating these factors, in addition to quantitative data such as the probable maximum loss and total losses attributable to insurance payouts, will provide investors with the information necessary to assess current and future performance on this issue.

## Accounting Metrics

### **FN-IN-450a.1. Probable Maximum Loss (PML) of insured products from weather-related natural catastrophes**

- 1 The entity shall disclose the Probable Maximum Loss (PML) of insured products from natural peril catastrophe events.
  - 1.1 PML is defined as the anticipated value of the largest monetary loss affecting the entity's insurance portfolio that could result from weather-related natural catastrophes and is based on catastrophe modeling and exceedance probability (EP).
  - 1.2 The scope of disclosure by a natural peril catastrophe event includes: hurricanes (typhoons), tornadoes, tsunamis, floods, droughts, extreme heat, and winter weather.
- 2 The entity shall disclose the PML using, at a minimum, three likelihood of exceedance scenarios: (1) 2% (1-in-50); (2) 1% (1-in-100); (3) 0.4% (1-in-250).
  - 2.1 The entity may disclose additional likelihood of exceedance scenarios.
- 3 The entity shall provide the PML breakdown by geographic location.
  - 3.1 Geographic location breakdown shall be aligned with that required by the Regulation S-K item 101(d).
- 4 The entity shall report the PML amount on gross and net of catastrophe reinsurance bases.
  - 4.1 The gross PML is the gross probable maximum loss for natural peril catastrophe events (prior to reinsurance) for annual aggregate exposure to all risks, including reinstatement premiums for the year following the relevant year based upon the entity's catastrophe model.

4.2 The net PML is the net probable maximum loss for natural peril catastrophe events (after reinsurance) for annual aggregate exposure to all risks, including reinstatement premiums for the year following the relevant year based upon the entity's catastrophe model.

5 Disclosure shall be provided for relevant geographic regions.

6 The entity may summarize the breakdown of the PML in the following table:

Table 3. **Gross PML**

	1-IN-50	1-IN-100	1-IN-250
Hurricanes (Typhoons)			
Tornadoes			
Tsunamis			
Floods			
Droughts			
Extreme Heat			
Winter Weather			

Table 4. **Net PML**

	1-IN-50	1-IN-100	1-IN-250
Hurricanes (Typhoons)			
Tornadoes			
Tsunamis			
Floods			
Droughts			
Extreme Heat			
Winter Weather			

Note to **FN-IN-450a.1**

1 The entity shall describe climate-related scenarios used, including the critical input parameters, assumptions and considerations, analytical choices, and time frames, in calculation of the PML, as aligned with the Task Force on Climate-related Financial Disclosures (TCFD) [Supplemental Guidance for Insurance Companies](#).

**FN-IN-450a.2. Total amount of monetary losses attributable to insurance payouts from (1) modeled natural catastrophes and (2) non-modeled natural catastrophes, by type of event**

## and geographic segment (net and gross of reinsurance)

- 1 The entity shall disclose the amount of policyholder benefits paid and claims incurred during the reporting period as a result of incurred policy losses and benefits expenses related to modeled and non-modeled natural peril catastrophe events.
  - 1.1 The scope of disclosure by a natural peril catastrophe event includes: hurricanes (typhoons), tornadoes, tsunamis, floods, droughts, extreme heat, and winter weather.
- 2 Benefits and claims incurred shall be disclosed in accordance with the Financial Accounting Standards Board's (FASB) Accounting Standards Codification (ASC) [Topic 944 Financial Services – Insurance](#).
- 3 The entity shall break down the policy losses and benefits expenses for modeled and non-modeled natural peril catastrophe events.
  - 3.1 Modeled natural catastrophes are typically large-scale events, such as hurricanes and earthquakes, that the entity has analyzed using a catastrophic risk model.
  - 3.2 Non-modeled events are typically smaller-scale events, such as floods, droughts, snowstorms, and tornados, that the entity has not analyzed using a catastrophic model (CAT model).
    - 3.2.1 CAT models are probabilistic mathematical models that simulate hazardous events and estimate the associated potential damages and insured losses. They may be conducted by the entity or by a third party on behalf of the entity.
- 4 The entity shall break down the policy losses and benefits expenses by geographic segment.
- 5 The entity shall break down the policy losses and benefits expenses by natural peril catastrophe events.
  - 5.1 Where relevant, natural peril catastrophe events include: hurricanes (typhoons), tornadoes, tsunamis, floods, droughts, extreme heat, and winter weather.
- 6 The entity shall report the policy losses and benefits expenses on a gross and net of catastrophe reinsurance base.
  - 6.1 The net amount shall be calculated as the gross amount of policy losses and benefits expenses from natural peril catastrophe events minus the recoverables from ceded reinsurance.
- 7 The entity shall consider the FASB's ASC Topic 944 – Financial Services – Insurance a normative reference, thus any future updates made to it shall be considered updates to this guidance.

### Note to **FN-IN-450a.2**

- 1 The entity shall discuss its strategy around enhancing catastrophe modeling.
- 2 The entity shall discuss how climate change-related impacts and variability of weather-related losses impact the cost of reinsurance and the entity's approach to transferring risk through reinsurance.

### **FN-IN-450a.3. Description of approach to incorporation of environmental risks into (1) the underwriting process for individual contracts and (2) the management of firm-level risks and capital adequacy**

- 1 The entity shall describe its approach to incorporation of environmental risks into both individual policyholder contracts and enterprise-wide assessments of risk.
- 2 The entity shall describe the processes for identifying and assessing climate-related risks on insurance and reinsurance portfolios by geography, business division, or product segments.
  - 2.1 Climate-related risks are defined by the Task Force on Climate-related Financial Disclosures (TCFD) as:
    - 2.1.1 Physical risks from changing frequencies and intensities of weather-related perils
    - 2.1.2 Transition risks resulting from a reduction in insurable interest due to a decline in value, changing energy costs, or implementation of carbon regulation
    - 2.1.3 Liability risks that could intensify due to a possible increase in litigation
- 3 The entity shall describe what it considers to be the relevant short-, medium-, and long-term horizons in the context of underwriting process for individual contracts as well as the management of firm-level risks and capital adequacy.
- 4 The entity shall describe specific climate-related risks for each time horizon (short, medium, and long term) that the entity considers in the underwriting process for individual contracts as well as in the management of firm-level risks and capital adequacy.
- 5 The entity shall describe the process for integration of climate-related risks in probabilistic mathematical models (i.e., catastrophic models).
  - 5.1 Discussion shall include, but is not limited to:
    - 5.1.1 The use of new and emerging datasets (e.g., for dam burst risk)
    - 5.1.2 The use of the critical input parameters, assumptions and considerations, and analytical choices
  - 5.2 Discussion shall be provided in the context of the relevant short-, medium-, and long-term horizons.
- 6 The entity shall describe how outputs of catastrophe models inform its underwriting decisions.
  - 6.1 Discussion shall include, but is not limited to:
    - 6.1.1 Development of insurance and reinsurance products which take into account climate-related risks
    - 6.1.2 Pricing of insurance and reinsurance policies
    - 6.1.3 Client selection (i.e., type of events the entity chooses to cover or not and/or geographic markets in which the entity chooses not to underwrite policies)
    - 6.1.4 Cedent selection (i.e., decisions on the amount of risk the entity chooses to transfer through reinsurance)
  - 6.2 Discussion shall be provided in the context of the relevant short-, medium-, and long-term horizons.

- 7 The entity shall describe the process for incorporation of clauses in the insurance policies sold to clients that incentivize reduction of exposure to climate-related risks of insured assets through pricing structure of the policies.
  - 7.1 Discussion shall include, but is not limited to, incentives such as:
    - 7.1.1 The use of sustainable building materials
    - 7.1.2 Enhancement of the weather resiliency of properties
    - 7.1.3 Coverage of properties in communities with building codes requiring climate-risk adaptations
  
- 8 The entity shall discuss the process for integration of environmental risks into enterprise-wide assessments.
  - 8.1 Discussion shall include, but is not limited to:
    - 8.1.1 Consideration of risks by segment (e.g., life versus property and casualty)
    - 8.1.2 Capital adequacy
    - 8.1.3 Contingency planning for market failure (i.e., from numerous disaster-related claims)
    - 8.1.4 Use of alternative risk transfer (e.g., catastrophe bonds, weather derivatives)
  - 8.2 Discussion shall be provided in the context of the relevant short-, medium-, and long-term horizons.
  
- 9 The entity may discuss how sustainability risks are integrated into its use of an enterprise risk management (ERM) framework, such as the Committee of Sponsoring Organizations of the Treadway Commission (COSO) Enterprise Risk Management–Integrated Framework.

## INVESTMENT BANKING & BROKERAGE

### Industry Description

The Investment Banking & Brokerage industry consists of firms performing a wide range of functions in the capital markets, including assisting with the capital-raising and allocation process, and providing market-making and advisory services for corporations, financial institutions, governments, and high net-worth individuals. Specific activities include financial advisory and securities underwriting services conducted on a fee basis; securities and commodities brokerage activities, which involves buying and selling securities or commodities contracts and options on a commission or fee basis for investors; and trading and principal investment activities, which involves the buying and selling of equities, fixed income, currencies, commodities, and other securities for client-driven and proprietary trading. Investment banks also originate and securitize loans for infrastructure and other projects. Companies in the industry generate their revenues from global markets and, therefore, are exposed to various regulatory environments. The industry continues to face regulatory pressure to reform and disclose aspects of operations that present systemic risks. Specifically, firms are facing new capital requirements, stress testing, limits on proprietary trading, and increased scrutiny on compensation practices.

Note: The SASB Investment Banking & Brokerage (FN-IB) Standard addresses “pure play” investment banking and brokerage services, which the SASB recognizes may not include all the activities of integrated financial institutions, such as mortgage finance, commercial banking, consumer finance, asset management and custody services, and insurance. Separate SASB accounting standards are available that address the sustainability issues for activities in those industries.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Incorporation of Environmental, Social, and Governance Factors in Investment Banking & Brokerage Activities	Revenue from (1) underwriting, (2) advisory, and (3) securitization transactions incorporating integration of environmental, social, and governance (ESG) factors, by industry	Quantitative	Reporting currency	FN-IB-410a.1
	(1) Number and (2) total value of investments and loans incorporating integration of environmental, social, and governance (ESG) factors, by industry	Quantitative	Number, Reporting currency	FN-IB-410a.2
	Description of approach to incorporation of environmental, social, and governance (ESG) factors in investment banking and brokerage activities	Discussion and Analysis	n/a	FN-IB-410a.3

Table 2. *Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
(1) Number and (2) value of (a) underwriting, (b) advisory, and (c) securitization transactions <sup>24</sup>	Quantitative	Number, Reporting currency	FN-IB-000.A
(1) Number and (2) value of proprietary investments and loans by sector <sup>25</sup>	Quantitative	Number, Reporting currency	FN-IB-000.B
(1) Number and (2) value of market making transactions in (a) fixed income, (b) equity, (c) currency, (d) derivatives, and (e) commodity products	Quantitative	Number, Reporting currency	FN-IB-000.C

<sup>24</sup>

Note to **FN-IB-000.A** – For syndicate transactions, the entity shall include only the value for which it was accountable.

<sup>25</sup>

Note to **FN-IB-000.B** – The entity shall use the North American Industry Classification System (NAICS) for classifying investees and borrowers.

# Incorporation of Environmental, Social, and Governance Factors in Investment Banking & Brokerage Activities

## Topic Summary

Environmental, social, and governance (ESG) factors can have material implications for the companies, assets, and projects that investment banks provide services to or invest in across a range of industries. Therefore, by taking these factors into account in their underwriting, advisory, and investing and lending activities, investment banks can address significant positive and negative environmental and social externalities. The potential for both value creation and loss associated with ESG factors suggests that investment banking and brokerage firms have a responsibility to their shareholders and clients to incorporate consideration of these factors into analysis and valuation related to all core products, including sell-side research, advisory services, origination, underwriting, and principal transactions. Investment banking and brokerage companies that fail to address these risks and opportunities could expose themselves to increased reputational and financial risks. On the other hand, appropriately pricing ESG risks could reduce investment banks' financial risk exposure, help generate additional revenue, and/or open new market opportunities. To help investors understand how well companies in the industry manage performance around this issue, investment banks should disclose how ESG factors are incorporated into their core products and services.

## Accounting Metrics

### **FN-IB-410a.1. Revenue from (1) underwriting, (2) advisory, and (3) securitization transactions incorporating integration of environmental, social, and governance (ESG) factors, by industry**

- 1 The entity shall report the total revenue earned from transactions in which the entity incorporates integration of environmental, social, and governance (ESG) factors.
  - 1.1 Integration of ESG factors is defined as the systematic and explicit inclusion of material ESG factors into underwriting, advisory, and securitization activities and may include, but is not limited to, review of transactions by the entity's Environmental and Social Risk Management (ESRM) group and/or screening (exclusionary, inclusionary, or benchmarked).
    - 1.1.1 The entity shall describe how ESG factors are integrated in the aforementioned activities.
- 2 The entity shall break down the revenue from transactions by key business activities including (a) underwriting, (b) advisory, and (c) securitization.
  - 2.1 Underwriting is defined as activities in which the entity raises investment capital from investors on behalf of corporations and governments that are issuing either equity or debt securities. It includes public offerings and private placements, including local and cross-border transactions and acquisition financing of a wide range of securities and other financial instruments, including loans. Underwriting also covers derivative transactions entered into with public and private sector clients in connection with the entity's underwriting activities.



- 2.2 Advisory is defined as activities in which the entity provides financial advice to institutional clients on a fee basis. It excludes wealth management and asset management activities.
  - 2.3 Securitization is defined as the process through which the entity creates a financial instrument by combining other financial assets and then marketing different tiers of the repackaged instruments to investors. It may include securitization of residential and commercial mortgages, corporate bonds, loans, and other types of financial assets by selling these assets to securitization vehicles (e.g., trusts, corporate entities, and limited liability companies) or through a re-securitization.
- 3 The entity shall break down the revenue from transactions by industry.
    - 3.1 The entity shall use the North American Industry Classification System (NAICS) for classifying transactions.
      - 3.1.1 The entity shall use the NAICS 3 Digit Subsector code-level breakdown in its disclosure.
      - 3.1.2 The entity shall use the latest version of the NAICS available at the time of disclosure.
  - 4 The entity shall provide disclosure for at least the 10 largest industries by monetary amount of exposure, or to industries representing at least 2 percent of the overall monetary amount of exposure.

**FN-IB-410a.2. (1) Number and (2) total value of investments and loans incorporating integration of environmental, social, and governance (ESG) factors, by industry**

- 1 The entity shall report the number of proprietary investments and loans incorporating integration of environmental, social, and governance (ESG) factors.
- 2 The entity shall report the value of proprietary investments and loans incorporating integration of ESG factors.
- 3 The scope of disclosure includes the entity's investing and relationship lending activities across various asset classes, including debt securities and loans, public and private equity securities, infrastructure, and real estate. These activities include investing directly in publicly and privately traded securities and in loans, and also through certain investment funds that the entity manages and through funds managed by external parties.
  - 3.1 The scope of disclosure excludes commercial, consumer, and mortgage lending activities.
- 4 Integration of ESG factors is defined as the systematic and explicit inclusion of material ESG factors into traditional fundamental financial analysis through the consideration of qualitative risks and opportunities, quantitative metrics, and the incorporation of ESG variables into models to inform the entity's decision-making processes involved in proprietary investing and lending.
- 5 The entity shall break down the number and value of investments and loans by industry.
  - 5.1 The entity shall use the North American Industry Classification System (NAICS) for classifying investees and borrowers.
    - 5.1.1 The entity shall use the NAICS 3 Digit Subsector code-level breakdown in its disclosure.
    - 5.1.2 The entity shall use the latest version of the NAICS available at the time of disclosure.

- 5.2 The entity shall disclose its exposure to at least the 10 largest industries by monetary amount of exposure, or to industries representing at least 2 percent of the overall portfolio monetary exposure.

### **FN-IB-410a.3. Description of approach to incorporation of environmental, social, and governance (ESG) factors in investment banking and brokerage activities**

- 1 The entity shall describe its approach to incorporation of environmental, social, and governance (ESG) factors in its investment banking and brokerage activities.
  - 1.1 The definition of incorporation of ESG factors is aligned with that of the [Global Sustainable Investment Alliance \(GSIA\)](#) and includes the use of ESG information in the investment decision-making processes.
  - 1.2 Examples of ESG factors/issues are provided in the [PRI Reporting Framework – Main definitions 2018](#), section “ESG issues.”
  - 1.3 The scope of investment banking and brokerage activities include, but are not limited to, (a) underwriting, (b) advisory, (c) securitization, (d) investing and lending, and (e) securities services.
    - 1.3.1 Underwriting is defined as activities in which the entity raises investment capital from investors on behalf of corporations and governments that are issuing either equity or debt securities. It includes public offerings and private placements, including local and cross-border transactions and acquisition financing of a wide range of securities and other financial instruments, including loans. Underwriting also covers derivative transactions entered into with public and private sector clients in connection with the entity’s underwriting activities.
    - 1.3.2 Advisory is defined as activities in which the entity provides financial advice to institutional clients on a fee basis. It excludes wealth management and asset management activities.
    - 1.3.3 Securitization is defined as the process through which the entity creates a financial instrument by combining other financial assets and then marketing different tiers of the repackaged instruments to investors. It may include securitization of residential and commercial mortgages, corporate bonds, loans, and other types of financial assets by selling these assets to securitization vehicles (e.g., trusts, corporate entities, and limited liability companies) or through a re-securitization.
    - 1.3.4 Investing and lending includes short-term and long-term investing and relationship lending activities across various asset classes such as debt securities and loans, public and private equity securities, infrastructure, and real estate.
    - 1.3.5 Securities services include (i) financing services (for the entity clients’ securities trading activities through margin loans that are collateralized by securities), (ii) securities lending services (borrowing and lending securities to cover institutional clients’ short sales, borrowing securities to cover the entity’s short sales, otherwise to making deliveries into the market, broker-to-broker securities lending, and third-party agency lending activities), and (iii) other prime brokerage services (clearing and settlement services).
- 2 The entity shall describe its approach to implementation of the aspects of the entity’s ESG incorporation practices.
  - 2.1 The discussion shall include, but is not limited to:

- 2.1.1 Parties responsible for day-to-day incorporation of ESG factors
  - 2.1.2 Roles and responsibilities of employees involved
  - 2.1.3 Approach to conducting ESG-related research
  - 2.1.4 Approach to incorporating ESG factors into products and services
- 3 The entity shall describe its oversight/accountability approach to the incorporation of ESG factors.
  - 3.1 The discussion shall include, but is not limited to:
    - 3.1.1 Formal oversight individuals and/or bodies involved
    - 3.1.2 Roles and responsibilities of employees involved
    - 3.1.3 Criteria used in assessing the quality of ESG incorporation
- 4 The entity shall discuss whether it conducts scenario analysis and/or modeling in which the risk profile of future ESG trends is calculated across its investment banking and brokerage activities.
  - 4.1 Where relevant, the entity shall disclose whether such scenario analysis is performed for specific business activities, including (a) underwriting, (b) advisory, (c) securitization, (d) investing and lending, and (e) securities services lines of business.
  - 4.2 ESG trends include, but are not limited to, climate change, natural resource constraints, human capital risks and opportunities, and cybersecurity risks.
- 5 The entity shall discuss ESG trends that it views as broadly applicable in terms of their impact on sectors and industries as well as trends it views as sector- or industry-specific.
  - 5.1 The entity may further provide the discussion in the context of geographic exposure of its portfolio, by line of business.
- 6 The entity shall describe significant concentrations of exposure to ESG factors, including, but not limited to, carbon-related assets, water-stressed regions, and cybersecurity risks.
- 7 The entity shall describe how ESG factors are incorporated in the assessment of, and influence the entity's perspectives on:
  - 7.1 Traditional macroeconomic factors such as the economic conditions, central bank monetary policy, industry trends, and geopolitical risks that affect risk profile of clients or individual transactions
  - 7.2 Traditional microeconomic factors such supply and demand for products or services which affect financial conditions and operational results of clients as well as their creditworthiness
  - 7.3 Time horizon of investments and loans
  - 7.4 Risk and return profiles of investments and loans
  - 7.5 Risk profiles of (a) underwritten debt and equity securities, (b) advisory transactions (e.g., mergers and acquisitions), and (c) securitized assets

- 8 The entity may disclose additional quantitative measures related to its approach to incorporation of ESG factors in investment banking and brokerage activities, such as:
  - 8.1 Number of investment banking and brokerage transactions screened according to [Equator Principles \(EP III\)](#) (or equivalent) by EP Category
  - 8.2 Number of investment banking and brokerage transactions for which a review of environmental or social risks was performed, e.g., by the entity's Environmental and Social Risk Management (ESRM) group

## MORTGAGE FINANCE

### Industry Description

The Mortgage Finance industry provides an essential public good in enabling consumers to purchase homes, and contributes to the overall home ownership rate. Companies in the industry lend capital to individual and commercial customers with property as collateral. The primary products are residential and commercial mortgages, while other services offered include: mortgage servicing, title insurance, closing and settlement services, and valuation. In addition, mortgage finance firms own, manage, and finance real estate related investments such as mortgage pass-through certificates and collateralized mortgage obligations. Recent trends in the regulatory environment indicate a significant shift toward consumer protection, disclosure, and accountability. Legislation passed in response to the 2008 mortgage crisis demonstrates the potential for further alignment between the interests of society and those of long-term investors.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Environmental Risk to Mortgaged Properties	(1) Number and (2) value of mortgage loans in 100-year flood zones	Quantitative	Number, Reporting currency	FN-MF-450a.1
	(1) Total expected loss and (2) Loss Given Default (LGD) attributable to mortgage loan default and delinquency due to weather-related natural catastrophes, by geographic region	Quantitative	Reporting currency, Percentage (%)	FN-MF-450a.2
	Description of how climate change and other environmental risks are incorporated into mortgage origination and underwriting	Discussion and Analysis	n/a	FN-MF-450a.3

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
(1) Number and (2) value of mortgages originated by category: (a) residential and (b) commercial	Quantitative	Number, Reporting currency	FN-MF-000.A
(1) Number and (2) value of mortgages purchased by category: (a) residential and (b) commercial	Quantitative	Number, Reporting currency	FN-MF-000.B

# Environmental Risk to Mortgaged Properties

## Topic Summary

An increase in the frequency of extreme weather events associated with climate change may have an adverse impact on the Mortgage Finance industry. Specifically, hurricanes, floods, and other climate change-related events have the potential to lead to missed payments and loan defaults, while also decreasing the value of underlying assets. Disclosure of overall exposure, loan forgiveness programs, and the incorporation of climate change into lending analysis will allow shareholders to determine which mortgage finance firms are best positioned to protect value in light of environmental risks.

## Accounting Metrics

### **FN-MF-450a.1. (1) Number and (2) value of mortgage loans in 100-year flood zones**

- 1 The entity shall disclose the (1) number and (2) value of mortgage loans in the entity's portfolio underwritten on properties that are located in 100-year flood zones.
  - 1.1 100-year flood zones are defined as land areas subject to a one-percent or greater chance of flooding in any given year. Such areas may also be referred to as being subject to the one-percent annual chance flood, the one-percent annual exceedance probability flood, or the 100-year flood.
    - 1.1.1 Examples of 100-year flood zones may include, but are not limited to, coastal flood plains, flood plains along major rivers, and areas subject to flooding from ponding in low-lying areas.
  - 1.2 For mortgage loans on properties located in the U.S., 100-year flood zones shall include those land areas designated by the U.S. Federal Emergency Management Agency (FEMA) as special flood hazard areas (SFHA).
    - 1.2.1 SFHAs are defined as land area in the flood plain subject to a one-percent or greater chance of flooding in any given year. The area may be designated in the applicable flood insurance rate map, as per the U.S. National Flood Insurance Program, as Zones A, AO, AH, A1-30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, V1-30, VE, and V. This definition is derived from U.S. 44 CFR 59.1.
    - 1.2.2 The entity may disclose its risk perception and potential impacts resulting from reclassification of FEMA SFHAs, including the risk of expansion of such areas into real estate property covered by mortgages owned by the entity.
  - 1.3 For mortgage loans on properties located in Canada, the entity may refer to Canada's Provincial/Territorial Flood Damage Reduction Programs.
  - 1.4 For mortgage loans on properties located in the EU, the entity may refer to the EU's Flood Directive.
- 2 The scope of disclosure shall include all of the entity's mortgage loans underwritten on properties that are located in 100-year flood zones, regardless of the country of their location.

- 2.1 The scope of mortgage loans shall include those first mortgages (1-4 family) and junior lien (1-4 family second mortgages or home equity lines of credit) loans that the entity holds as loan assets.
- 2.2 The scope of mortgage loans shall exclude mortgages held for sale, mortgage-backed securities, and mortgages serviced by the entity.

**FN-MF-450a.2. (1) Total expected loss and (2) Loss Given Default (LGD) attributable to mortgage loan default and delinquency due to weather-related natural catastrophes, by geographic region**

- 1 The entity shall disclose the (1) total expected loss and (2) Loss Given Default (LGD), as a percentage, attributable to mortgage loan default and delinquency due to weather-related natural catastrophes.
  - 1.1 Expected loss is defined and calculated as the sum of the values of all the possible losses for the entity's mortgage loans, each multiplied by the probability of that loss occurring.
  - 1.2 LGD is defined as the share of an asset lost in the situation of default.
  - 1.3 Weather-related natural catastrophes include:
    - 1.3.1 Meteorological events (e.g., hurricanes and storms)
    - 1.3.2 Hydrological events (floods)
    - 1.3.3 Climatological events (e.g., heat waves, cold waves, droughts, and wildfires)
  - 1.4 Weather-related natural catastrophes exclude geophysical events (e.g., earthquakes and volcanic eruptions)
- 2 The entity shall break down its disclosure by geographic region.
  - 2.1 Applicable regions are determined by the entity, and may include: Gulf Coast, California, Northeast, Mountain, Midwest.

**FN-MF-450a.3. Description of how climate change and other environmental risks are incorporated into mortgage origination and underwriting**

- 1 The entity shall describe how it has incorporated climate change and other environmental risks into its mortgage origination and underwriting processes.
  - 1.1 The mortgage origination process is defined broadly as all the steps in a mortgage transaction between a lender and a borrower, including, but not limited to, application, processing, and underwriting.
  - 1.2 The scope of climate change and other environmental risks includes, but is not limited to:
    - 1.2.1 The increased frequency and severity of weather-related natural catastrophes, including meteorological events (e.g., hurricanes and storms), hydrological events (floods), and climatological events (e.g., heat waves, cold waves, droughts, and wildfires).

1.2.2 The occurrence of geophysical events (e.g., earthquakes and volcanic eruptions).

2 The entity shall disclose how and if these risks affect its origination models and decisions.

2.1 The scope of disclosure includes, but is not limited to:

2.1.1 How the risk impacts the valuation of collateral, such as accounting for inherent risks due to location or assessing for the implementation of basic adaptive measures (e.g., reinforcement, hurricane shutters).

2.1.2 How natural disaster risks affect credit risk analysis, including if the entity assumes that increases in natural disaster frequency and severity will increase the likelihood of default due to properties being un-insured or under-insured.



## AGRICULTURAL PRODUCTS

### Industry Description

The Agricultural Products industry is engaged in processing, trading, and distributing vegetables and fruits, and producing and milling agricultural commodities such as grains, sugar, consumable oils, maize, soybeans, and animal feed. Agricultural products are sold directly to consumers and to businesses for use in consumer and industrial products. Companies in the industry typically purchase agricultural products from entities that grow such products (either directly or indirectly) to then conduct value-adding activities (e.g., processing, trading, distributing, and milling). Agricultural products companies are also involved in wholesale and distribution. Companies in the industry may source a substantial portion of agricultural commodities from third-party growers in various countries. Therefore, managing sustainability risks within the supply chain is critical to securing a reliable supply of raw materials and reducing the risk of price increases and volatility over the long term.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions	Quantitative	Metric tons (t) CO <sub>2</sub> -e	FB-AG-110a.1
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	FB-AG-110a.2
	Fleet fuel consumed, percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	FB-AG-110a.3
Energy Management	(1) Operational energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	FB-AG-130a.1
Water Management	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	FB-AG-140a.1
	Description of water management risks and discussion of strategies and practices to mitigate those risks	Discussion and Analysis	n/a	FB-AG-140a.2
	Number of incidents of non-compliance associated with water quantity and/or quality permits, standards, and regulations	Quantitative	Number	FB-AG-140a.3
Ingredient Sourcing	Identification of principal crops and description of risks and opportunities presented by climate change	Discussion and Analysis	n/a	FB-AG-440a.1
	Percentage of agricultural products sourced from regions with High or Extremely High Baseline Water Stress	Quantitative	Percentage (%) by cost	FB-AG-440a.2

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Production by principal crop <sup>26</sup>	Quantitative	Metric tons (t)	FB-AG-000.A
Number of processing facilities <sup>27</sup>	Quantitative	Number	FB-AG-000.B
Total land area under active production	Quantitative	Hectares	FB-AG-000.C
Cost of agricultural products sourced externally <sup>28</sup>	Quantitative	Reporting currency	FB-AG-000.D

<sup>26</sup>

Note to **FB-AG-000.A** – Principal crops are those crops that accounted for 10 percent or more of consolidated revenue in any of the last three fiscal years.

<sup>27</sup>

Note to **FB-AG-000.B** – Processing facilities include those facilities that are involved in the manufacturing, processing, packing, or holding of agricultural products and exclude administrative offices.

<sup>28</sup>

Note to **FB-AG-000.C** – Agricultural products are defined as food, feed, and biofuel ingredients that are sourced for use in the entity's operations. The scope of agricultural products sourced externally excludes agricultural products grown on land that is owned or operated by the entity.

# Greenhouse Gas Emissions

## Topic Summary

Companies in the Agricultural Products industry generate direct greenhouse gas (GHG) emissions from the processing and transportation of goods via land and sea freight operations. Emissions regulations may increase the cost of capital, operational costs, and affect the operational efficiency of companies that do not have strategies in place to manage GHG emissions. Employing innovative technologies that use alternative fuels and energy inputs—including biomass waste generated from internal processes—and improving fuel efficiency are ways companies can limit exposure to volatile fuel pricing, supply disruptions, future regulatory costs, and other potential consequences of GHG emissions.

## Accounting Metrics

### FB-AG-110a.1. Gross global Scope 1 emissions

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e), and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:
    - 2.1.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)
    - 2.1.2 *Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources* published by the U.S. Environmental Protection Agency (EPA)
    - 2.1.3 India GHG Inventory Program
    - 2.1.4 ISO 14064-1
    - 2.1.5 *Petroleum Industry Guidelines for reporting GHG emissions*, 2nd edition, 2011, published by IPIECA

2.1.6 Protocol for the quantification of greenhouse gas emissions from waste management activities published by Entreprises pour l'Environnement (EpE)

2.2 GHG emissions data shall be consolidated and disclosed according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the “financial control” approach defined by the GHG Protocol, and the approach published by the Climate Disclosure Standards Board (CDSB) described in REQ-07, “Organisational boundary,” of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).

- 3 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 4 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 5 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

## **FB-AG-110a.2. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined according to *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 2.2 Whether the target is absolute- or intensity-based, and the metric denominator, if it is an intensity-based target;
  - 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated toward the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;
  - 2.5 The mechanism(s) for achieving the target; and

- 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset.
- 3 The entity shall discuss the activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
- 4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as how they relate to different business units, geographies, or emissions sources.
- 5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
- 6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

### **FB-AG-110a.3. Fleet fuel consumed, percentage renewable**

- 1 The entity shall disclose the total amount of fuel consumed by its fleet vehicles as an aggregate figure, in gigajoules (GJ).
  - 1.1 The calculation methodology for fuel consumed shall be based on actual fuel consumed as opposed to design parameters.
  - 1.2 Acceptable calculation methodologies for fuel consumed include, but are not limited to, methodologies based on:
    - 1.2.1 Adding fuel purchases made during the reporting period to beginning inventory at the start of the reporting period, less any fuel inventory at the end of the reporting period
    - 1.2.2 Tracking fuel consumed by vehicles
    - 1.2.3 Tracking fuel expenses
- 2 The entity shall disclose the percentage of the total amount of fuel consumed by its fleet vehicles that is renewable fuel.
  - 2.1 Renewable fuel is defined by the U.S. Renewable Fuel Standard (U.S. 40 CFR 80.1401), as fuel that meets all of the following requirements:
    - 2.1.1 Produced from renewable biomass;
    - 2.1.2 Used to replace or reduce the quantity of fossil fuel present in a transportation fuel, heating oil, or jet fuel; and
    - 2.1.3 Has lifecycle greenhouse gas (GHG) emissions that are at least 20 percent less than baseline lifecycle GHG emissions, unless the fuel is exempt from this requirement pursuant to U.S. 40 CFR 80.1403.
  - 2.2 The scope of renewable fuel includes fuel that qualifies for Renewable Identification Numbers (RINs) under the U.S. Renewable Fuel Standard.
  - 2.3 The percentage shall be calculated as the amount of renewable fuel consumed by the entity's fleet vehicles (in GJ) divided by the total amount of fuel consumed by the entity's fleet vehicles (in GJ).

- 3 The scope of disclosure includes fuel consumed by vehicles owned or operated by the entity.
- 4 The scope of disclosure excludes fuel consumed in the transportation of the entity's products by third parties.

# Energy Management

## Topic Summary

Processing and milling agricultural products requires substantial energy input. While some agricultural products companies generate energy on-site through the direct combustion of fossil fuels and/or biomass, most energy is procured from the electrical grid. Energy consumption contributes to environmental impacts, including climate change and pollution. Energy management affects current and future costs of operation. Climate regulation and other sustainability factors could result in higher and/or more volatile electricity and fuel prices, increasing operating costs for agricultural products companies. Therefore, energy efficiency gained through process improvements can lower operating costs. The tradeoff between on-site versus grid-sourced electricity as well as the use of alternative energy can play important roles in influencing both the long-term cost and reliability of a company's energy supply and the extent of regulatory impact from direct versus indirect emissions.

## Accounting Metrics

### **FB-AG-130a.1. (1) Operational energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed (excluding fleet vehicles) as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption excludes fuel consumed by fleet vehicles, but includes energy from all other sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed (excluding fleet vehicles) that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed (excluding fleet vehicles) that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.

- 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.
  - 3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.
- 3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:
  - 3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;
  - 3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.
- 4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).



# Water Management

## Topic Summary

The Agricultural Products industry relies on water for processing activities, and companies in the industry also typically generate wastewater, or effluent. The availability of water, due to physical availability and/or regulatory access, directly impacts the industry's ability to efficiently operate processing facilities. Companies in the industry are increasingly exposed to water-related risks and regulations, which may increase capital expenditure costs, operating costs, remediation costs, and/or potential fines. Companies can manage water-related risks and opportunities and mitigate long-term costs through capital investments and assessment of facility locations relative to water scarcity risks, improvements to operational efficiency, and work with regulators and communities on issues related to water access and effluent. Risks related to crop production that are driven by water availability and access are addressed in a separate supply chain-oriented topic, Ingredient Sourcing.

## Accounting Metrics

### **FB-AG-140a.1. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.
  - 1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 2.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:
    - 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 3.1.2 Water that is directly or indirectly incorporated into the entity's product or service;
    - 3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.

- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

## **FB-AG-140a.2. Description of water management risks and discussion of strategies and practices to mitigate those risks**

- 1 The entity shall describe its water management risks associated with water withdrawals, water consumption, and discharge of water and/or wastewater.
  - 1.1 Risks associated with water withdrawals and water consumption include risks to the availability of adequate, clean water resources, including, but not limited to:
    - 1.1.1 Environmental constraints—such as operating in water-stressed regions, drought, concerns of aquatic impingement or entrainment, interannual or seasonal variability, and risks due to the impact of climate change
    - 1.1.2 Regulatory and financial constraints—such as volatility in water costs, stakeholder perceptions and concerns related to water withdrawals (e.g., those from local communities, non-governmental organizations, and regulatory agencies), direct competition with and impact from the actions of other users (e.g., commercial and municipal users), restrictions to withdrawals due to regulations, and constraints on the entity’s ability to obtain and retain water rights or permits
  - 1.2 Risks associated with the discharge of water and/or wastewater, include, but are not limited to, the ability to obtain rights or permits related to discharges, compliance with regulations related to discharges, restrictions to discharges, the ability to maintain control over the temperature of water discharges, liabilities and/or reputational risks, and increased operating costs due to regulation, stakeholder perceptions and concerns related to water discharges (e.g., those from local communities, non-governmental organizations, and regulatory agencies).
- 2 The entity may describe water management risks in the context of:
  - 2.1 How risks may vary by withdrawal source, including surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities; and
  - 2.2 How risks may vary by discharge destinations, including surface water, groundwater, or wastewater utilities.
- 3 The entity may discuss the potential impacts that water management risks may have on its operations and the timeline over which such risks are expected to manifest.

- 3.1 Impacts may include, but are not limited to, those associated with costs, revenues, liabilities, continuity of operations, and reputation.
- 4 The entity shall discuss its short-term and long-term strategies or plan to mitigate water management risks, including, but not limited to:
  - 4.1 The scope of its strategy, plans, goals and/or targets, such as how they relate to different business units, geographies, or water-consuming operational processes.
  - 4.2 Any water management goals and/or targets it has prioritized, and an analysis of performance against those goals and/or targets.
    - 4.2.1 Goals and targets may include, but are not limited to, those associated with reducing water withdrawals, reducing water consumption, reducing water discharges, reducing aquatic impingements, improving the quality of water discharges, and regulatory compliance.
  - 4.3 The activities and investments required to achieve the plans, goals and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 4.4 Disclosure of strategies, plans, goals, and/or targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.
- 5 For water management targets, the entity shall additionally disclose:
  - 5.1 Whether the target is absolute or intensity-based, and the metric denominator if it is an intensity-based target.
  - 5.2 The timelines for the water management plans, including the start year, the target year, and the base year.
  - 5.3 The mechanism(s) for achieving the target, including:
    - 5.3.1 Efficiency efforts, such as the use of water recycling and/or closed-loop systems;
    - 5.3.2 Product innovations such as redesigning products or services to require less water;
    - 5.3.3 Process and equipment innovations, such as those that enable the reduction of aquatic impingements or entrainments;
    - 5.3.4 Use of tools and technologies (e.g., the [World Wildlife Fund Water Risk Filter](#), [The Global Water Tool](#), and [Water Footprint Network Footprint Assessment Tool](#)) to analyze water use, risk, and opportunities; and
    - 5.3.5 Collaborations or programs in place with the community or other organizations.
  - 5.4 The percentage reduction or improvement from the base year, where the base year is the first year against which water management targets are evaluated toward the achievement of the target.
- 6 The entity shall discuss whether its water management practices result in any additional lifecycle impacts or tradeoffs in its organization, including tradeoffs in land use, energy production, and greenhouse gas (GHG) emissions, and why the entity chose these practices despite lifecycle tradeoffs.

### **FB-AG-140a.3. Number of incidents of non-compliance associated with water quantity and/or quality permits, standards, and regulations**

- 1 The entity shall disclose the total number of instances of non-compliance, including violations of technology-based standards and exceedances of quantity and/or quality-based standards.
- 2 The scope of disclosure includes incidents governed by national, state, and local statutory permits and regulations, including, but not limited to, the discharge of a hazardous substance, violation of pretreatment requirements, or total maximum daily load (TMDL) exceedances.
- 3 The scope of disclosure shall only include incidents of non-compliance that resulted in a formal enforcement action(s).
  - 3.1 Formal enforcement actions are defined as statutorily recognized actions that address a violation or threatened violation of water quantity and/or quality laws, regulations, policies, or orders, and can result in administrative penalty orders, administrative orders, and judicial actions, among others. For example, the U.S. Environmental Protection Agency (EPA) provides guidance on the scope of formal enforcement actions in [Informal and Formal Actions, Summary Guidance and Portrayal on EPA Websites](#).
- 4 Violations shall be disclosed, regardless of their measurement methodology or frequency. These include violations for:
  - 4.1 Continuous discharges, limitations, standards, and prohibitions that are generally expressed as maximum daily, weekly average, and monthly averages
  - 4.2 Non-continuous discharges and limitations that are generally expressed in terms of frequency, total mass, maximum rate of discharge, and mass or concentration of specified pollutants

# Ingredient Sourcing

## Topic Summary

Agricultural products companies source a wide variety of commodities and ingredients from farmers and/or intermediary distributors. The industry's ability to reliably source ingredients at desired price points fluctuates with crop yield, which may be affected by climate change, water scarcity, land management, and other resource scarcity considerations. Companies that source more productive and less resource-intensive crops, or those that work closely with suppliers to increase their adaptability to climate change and other resource scarcity risks, will be better protected from volatility in crop prices and from disruptions in crop supplies. Additionally, companies may improve their brand reputation and develop new market opportunities. Failure to effectively manage sourcing risks can lead to higher costs of capital, reduced margins, and constrained revenue growth.

## Accounting Metrics

### **FB-AG-440a.1. Identification of principal crops and description of risks and opportunities presented by climate change**

- 1 The entity shall identify any principal crops that are a priority to the entity's business.
  - 1.1 Principal crops are those crops that accounted for 10 percent or more of consolidated revenue in any of the last three reporting periods, as disclosed in FB-AG-000.A.
- 2 The scope of disclosure shall include crops that are cultivated directly by the entity, grown on a contract basis, or sourced as a commodity.
  - 2.1 Crops cultivated directly by the entity include those grown on farms owned and/or operated by the entity.
  - 2.2 Crops grown on a contract basis include those for which the entity has directly contracted the conditions of crop production and the quality of crops with the farmer, consistent with the Food and Agriculture Organization of the United Nations (FAO) "[Contract Farming Resource Center](#)."
  - 2.3 Crops sourced as a commodity include those bought through the spot market, to-arrive bids, grain elevators, or other measures by which the entity is not able to control the production process.
- 3 The entity shall describe the risks and/or opportunities that are presented to its principal crops by climate change scenarios, including, where relevant:
  - 3.1 Identification of the risks presented by climate change, including, but not limited to, availability of water, shifts in crop regions, pest migration, and extreme weather events
  - 3.2 Discussion of the scenarios used to determine the risks and opportunities presented by climate change
  - 3.3 Discussion of how such scenarios will manifest (e.g., effects directly on the entity or effects on the entity's supply chain) and the potential implications that these would have on its priority crops

- 3.4 The timeline over which such risks and opportunities are expected to manifest
- 4 The entity may discuss the methods or models used to develop these scenarios, including the use of global gridded crop models or scientific research provided by governmental and non-governmental organizations (e.g., [Intergovernmental Panel on Climate Change Climate Scenario Process](#)).
- 5 The entity shall discuss efforts to assess and monitor the impacts of climate change and the related strategies to alleviate and/or adapt to any risks and/or utilize any opportunities (e.g., FAO "[Climate-Smart Agriculture](#)" approach.)
  - 5.1 Alleviation strategies include, but are not limited to, use of crop insurance, investments in hedging instruments, and supply chain diversification.
  - 5.2 Adaptation strategies include, but are not limited to, improving ecosystem management and biodiversity, development of tolerant crop varieties, and optimizing timing of planting and harvesting.

## **FB-AG-440a.2. Percentage of agricultural products sourced from regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the percentage of agricultural products sourced from regions with High or Extremely High Baseline Water Stress.
  - 1.1 Agricultural products are defined as raw materials such as food, feed, and biofuel ingredients that are sourced for use in the entity's operations.
- 2 The percentage shall be calculated as the cost of agricultural products purchased from Tier 1 suppliers that withdraw and consume water in regions with High or Extremely High Baseline Water Stress for the production of the agricultural products divided by the total cost of agricultural products purchased from Tier 1 suppliers.
  - 2.1 The entity shall identify Tier 1 suppliers that withdraw and consume water in locations with High (40–80%) or Extremely High (>80%) Baseline Water Stress as classified by the World Resources Institute's (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 3 The scope of disclosure is agricultural products purchased from Tier 1 suppliers, including those grown on a contract basis or sourced as a commodity.
  - 3.1 Tier 1 suppliers are defined as suppliers that transact directly with the entity for agricultural products.
  - 3.2 Agricultural products grown on a contract basis include those for which the entity has directly contracted the conditions of crop production and the quality of crops with the farmer, consistent with the Food and Agriculture Organization of the United Nations (FAO) "[Contract Farming Resource Center](#)."
  - 3.3 Agricultural products sourced as a commodity include those bought through the spot market, to-arrive bids, grain elevators, or other measures by which the entity is not able to control the production process.
- 4 If the entity is unable to identify or collect data pertaining to all Tier 1 suppliers, the entity shall disclose the percentage of agricultural products for which the source region and water risks are unknown

## ALCOHOLIC BEVERAGES

### Industry Description

The Alcoholic Beverages industry includes companies that brew, distill, and manufacture various alcoholic beverages, including beer, wine, and liquor. Companies in this industry transform agricultural products, including sugar, barley, and corn, into finished alcoholic beverages. The largest companies have global operations, with portfolios of numerous branded products. Levels of vertical integration within the industry vary due to regulation in different markets. Breweries generally have multiple manufacturing facilities to provide access to different markets, while vintners and distillers are typically located where they have a history of production.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	FB-AB-130a.1
Water Management	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	FB-AB-140a.1
	Description of water management risks and discussion of strategies and practices to mitigate those risks	Discussion and Analysis	n/a	FB-AB-140a.2
Environmental & Social Impacts of Ingredient Supply Chain	Suppliers' social and environmental responsibility audit (1) non-conformance rate and (2) associated corrective action rate for (a) major and (b) minor non-conformances	Quantitative	Rate	FB-AB-430a.1
Ingredient Sourcing	Percentage of beverage ingredients sourced from regions with High or Extremely High Baseline Water Stress	Quantitative	Percentage (%) by cost	FB-AB-440a.1
	List of priority beverage ingredients and description of sourcing risks due to environmental and social considerations	Discussion and Analysis	n/a	FB-AB-440a.2

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Volume of products sold	Quantitative	Millions of hectoliters (Mhl)	FB-AB-000.A
Number of production facilities	Quantitative	Number	FB-AB-000.B
Total fleet road miles traveled	Quantitative	Miles	FB-AB-000.C

# Energy Management

## Topic Summary

Companies in the Alcoholic Beverages industry rely on both purchased electricity and fuel as critical inputs for value creation. Fossil fuel and electrical energy consumption can contribute to environmental impacts, including climate change and pollution. These impacts have the potential to affect the value of companies in this industry as regulations of greenhouse gas (GHG) emissions and new incentives for energy efficiency and renewable energy could lead to increased price volatility for fossil fuels and conventional electricity while making alternative sources cost-competitive. Companies that manage their overall energy use through increased efficiency and use of alternative energy sources can increase profitability by lowering expenses and reducing risk.

## Accounting Metrics

### **FB-AB-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a



Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0 (2017)* or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

# Water Management

## Topic Summary

Water management relates to a company's direct water usage, the exposure of its operations to water-scarce regions, and its management of wastewater. Companies in the Alcoholic Beverages industry use a large amount of water in their operations, as water is a key input to their finished products. Given alcoholic beverage companies' heavy reliance on large volumes of clean water and the fact that water stress is increasing in different regions globally, companies may be exposed to supply disruptions that could significantly impact operations and add to costs. Companies operating in water-stressed regions that fail to address local water concerns may face further risk of losing their social license to operate. Improving water management through increased efficiency and recycling, particularly in regions with baseline water stress, can lead to lower operating costs, reduced risk, and higher intangible asset value.

## Accounting Metrics

### **FB-AB-140a.1. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.
  - 1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 2.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:
    - 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 3.1.2 Water that is directly or indirectly incorporated into the entity's product or service;
    - 3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.

- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

## **FB-AB-140a.2. Description of water management risks and discussion of strategies and practices to mitigate those risks**

- 1 The entity shall describe its water management risks associated with water withdrawals, water consumption, and discharge of water and/or wastewater.
  - 1.1 Risks associated with water withdrawals and water consumption include risks to the availability of adequate, clean water resources, including, but not limited to:
    - 1.1.1 Environmental constraints—such as operating in water-stressed regions, drought, concerns of aquatic impingement or entrainment, interannual or seasonal variability, and risks due to the impact of climate change
    - 1.1.2 Regulatory and financial constraints—such as volatility in water costs, stakeholder perceptions and concerns related to water withdrawals (e.g., those from local communities, non-governmental organizations, and regulatory agencies), direct competition with and impact from the actions of other users (e.g., commercial and municipal users), restrictions to withdrawals due to regulations, and constraints on the entity’s ability to obtain and retain water rights or permits
  - 1.2 Risks associated with the discharge of water and/or wastewater, include, but are not limited to, the ability to obtain rights or permits related to discharges, compliance with regulations related to discharges, restrictions to discharges, the ability to maintain control over the temperature of water discharges, liabilities and/or reputational risks, and increased operating costs due to regulation, stakeholder perceptions and concerns related to water discharges (e.g., those from local communities, non-governmental organizations, and regulatory agencies).
- 2 The entity may describe water management risks in the context of:
  - 2.1 How risks may vary by withdrawal source, including surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities; and
  - 2.2 How risks may vary by discharge destinations, including surface water, groundwater, or wastewater utilities.
- 3 The entity may discuss the potential impacts that water management risks may have on its operations and the timeline over which such risks are expected to manifest.

- 3.1 Impacts may include, but are not limited to, those associated with costs, revenues, liabilities, continuity of operations, and reputation.
- 4 The entity shall discuss its short-term and long-term strategies or plan to mitigate water management risks, including, but not limited to:
  - 4.1 The scope of its strategy, plans, goals and/or targets, such as how they relate to different business units, geographies, or water-consuming operational processes.
  - 4.2 Any water management goals and/or targets it has prioritized, and an analysis of performance against those goals and/or targets.
    - 4.2.1 Goals and targets may include, but are not limited to, those associated with reducing water withdrawals, reducing water consumption, reducing water discharges, reducing aquatic impingements, improving the quality of water discharges, and regulatory compliance.
  - 4.3 The activities and investments required to achieve the plans, goals and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 4.4 Disclosure of strategies, plans, goals, and/or targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.
- 5 For water management targets, the entity shall additionally disclose:
  - 5.1 Whether the target is absolute or intensity-based, and the metric denominator if it is an intensity-based target.
  - 5.2 The timelines for the water management activities, including the start year, the target year, and the base year.
  - 5.3 The mechanism(s) for achieving the target, including:
    - 5.3.1 Efficiency efforts, such as the use of water recycling and/or closed-loop systems;
    - 5.3.2 Product innovations such as redesigning products or services to require less water;
    - 5.3.3 Process and equipment innovations, such as those that enable the reduction of aquatic impingements or entrainments;
    - 5.3.4 Use of tools and technologies (e.g., the [World Wildlife Fund Water Risk Filter](#), [The Global Water Tool](#), and [Water Footprint Network Footprint Assessment Tool](#)) to analyze water use, risk, and opportunities; and
    - 5.3.5 Collaborations or programs in place with the community or other organizations.
  - 5.4 The percentage reduction or improvement from the base year, where the base year is the first year against which water management targets are evaluated toward the achievement of the target.
- 6 The entity shall discuss whether its water management practices result in any additional lifecycle impacts or tradeoffs in its organization, including tradeoffs in land use, energy production, and greenhouse gas (GHG) emissions, and why the entity chose these practices despite lifecycle tradeoffs.

# Environmental & Social Impacts of Ingredient Supply Chain

## Topic Summary

Companies in the Alcoholic Beverages industry manage global supply chains to source a wide range of ingredient inputs. How companies screen, monitor, and engage with suppliers on environmental and social topics affects companies' ability to secure supply and manage price fluctuations. Supply chain interruption can cause loss of revenue and negatively impact market share if companies are not able to find alternatives for key suppliers or have to source ingredients at higher cost. Supply chain management issues related to labor practices, environmental responsibility, ethics or corruption may also result in regulatory fines and/or increased long-term operational costs. The consumer-facing nature of the industry increases the reputational risks associated with supplier actions. Managing a company's exposure to environmental and social risks can lead to improved supply chain resiliency and enhanced reputation. Companies can engage with key suppliers to manage environmental and social risks to improve supply chain resiliency, mitigate reputational risks, and potentially increase consumer demand or capture new market opportunities.

## Accounting Metrics

### **FB-AB-430a.1. Suppliers' social and environmental responsibility audit (1) non-conformance rate and (2) associated corrective action rate for (a) major and (b) minor non-conformances**

- 1 The entity shall disclose its supplier facilities' (1) non-conformance rate with external social and environmental audit standard(s) or internally developed supplier code(s) of conduct for (a) major non-conformances, and separately, (b) minor non-conformances.
  - 1.1 A major non-conformance is defined as the highest severity of non-conformance and require escalation by auditors. Major non-conformances confirm the presence of underage child workers (below the legal age for work or apprenticeship), forced labor, health and safety issues that can cause immediate danger to life or serious injury, and/or environmental practices that can cause serious and immediate harm to the community. Major non-conformance includes material breach or systemic breaking of code requirement or law. Major non-conformances may also be referred to as critical or priority non-conformances.
  - 1.2 A minor non-conformance is defined as a non-conformance that by itself is not indicative of a systemic problem with the management system. Minor non-conformances are typically isolated or random incidents and represent a low risk to workers and/or the environment.
  - 1.3 The entity shall calculate the non-conformance rates as the total number of non-conformances (in each respective category) identified among its supplier facilities divided by the number of supplier facilities audited.
- 2 The entity shall disclose the (2) corrective action rates associated with its supplier facilities' (a) major non-conformances, and separately, (b) minor non-conformances.
  - 2.1 A corrective action is defined as the completion of an action (generally identified in a corrective action plan) within 90 days for major non-conformances, and 60 days for minor non-conformances, that has been designed to eliminate

the cause of a detected non-conformance. This includes, including the implementation of practices or systems to eliminate any non-conformance and ensure there will be no reoccurrence of the non-conformance, as well as verification that the action has taken place.

- 2.2 The entity shall calculate the corrective action rates as the number of corrective actions that address non-conformances (in each respective category) divided by the total number of non-conformances (in each respective category) that have been identified.
- 3 The entity shall disclose the standard(s) and/or code(s) of conduct to which it has measured social and environmental responsibility audit compliance.
  - 3.1 For internally developed supplier code(s) of conduct, the entity shall disclose the public location where such code(s) can be viewed.

# Ingredient Sourcing

## Topic Summary

Companies in the Alcoholic Beverages industry source a wide range of ingredients, largely agricultural inputs, from suppliers worldwide. The industry's ability to source ingredients and at certain price points fluctuates with supply availability, which may be affected by climate change, water scarcity, land management, and other resource scarcity considerations. This exposure can lead to price volatility and can affect company profitability. Ultimately, climate change, water scarcity, and land-use restriction present risks to a company's long-term ability to source key materials and ingredients. Companies that source ingredients that are more productive, effectively cultivated, and less resource-intensive, or work closely with suppliers to increase their adaptability to climate change and manage exposure to other resource scarcity risks will be better protected from price volatility and/or supply disruptions.

## Accounting Metrics

### **FB-AB-440a.1. Percentage of beverage ingredients sourced from regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the percentage of beverage ingredients sourced from regions with High or Extremely High Baseline Water Stress.
- 2 The percentage shall be calculated as the cost of beverage ingredients purchased from Tier 1 suppliers that withdraw and consume water in regions with High or Extremely High Baseline Water Stress for the production of the beverage ingredients divided by the total cost of beverage ingredients purchased from Tier 1 suppliers.
  - 2.1 Tier 1 suppliers are defined as suppliers that transact directly with the entity for agricultural products.
  - 2.2 The entity shall identify Tier 1 suppliers that withdraw and consume water in locations with High (40–80%) or Extremely High (>80%) Baseline Water Stress as classified by the World Resources Institute's (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 3 If the entity is unable to identify or collect data pertaining to all Tier 1 suppliers, the entity shall disclose the percentage of agricultural products for which the source region and water risks are unknown.

### **FB-AB-440a.2. List of priority beverage ingredients and description of sourcing risks due to environmental and social considerations**

- 1 The entity shall identify the highest priority beverage ingredients to its business.
  - 1.1 Priority beverage ingredients are defined as ingredients (excluding water) that constitute the largest beverage ingredient expense and/or those ingredients that have otherwise been identified by the entity as essential to its products or as having significant environmental or social risks.

- 1.2 The scope of disclosure includes priority beverage ingredients sourced by the entity, including, but not limited to, those sourced directly from contract growers and from producer supply agreements.
- 2 The entity shall discuss its strategic approach to managing the environmental and social risks that arise from its highest priority beverage ingredients.
  - 2.1 Environmental risks include, but are not limited to, effects of drought and climate change on ingredient prices, reputational damage due to deforestation, and other risks resulting from the environmental impacts associated with the entity's supply chain.
  - 2.2 Social risks include, but are not limited to, effects of workers' rights on productivity, reputational damage due to human rights issues, and other risks resulting from the social impacts associated with the entity's supply chain.
- 3 The entity may identify which beverage ingredients present risks to its operations, the risks that are represented, and the strategies the entity uses to mitigate such risks.
  - 3.1 For environmental risks, relevant strategies to discuss may include, but are not limited to, the diversification of suppliers, supplier training programs on environmental best management practices, expenditures on research and development for alternative and substitute crops, and audits or certifications of suppliers' environmental practices.
  - 3.2 For social risks, relevant strategies to discuss include, but are not limited to, supplier training programs on agrochemical application, engagement with suppliers on labor and human rights issues, and maintenance of a supply chain code of conduct.



## FOOD RETAILERS & DISTRIBUTORS

### Industry Description

The Food Retailers & Distributors industry consists of companies engaged in wholesale and retail sales of food, beverage, and agricultural products. Store formats include retail supermarkets, convenience stores, warehouse supermarkets, liquor stores, bakeries, natural food stores, specialty food stores, seafood stores, and distribution centers. Companies may specialize in one type of store format or have facilities that contain multiple formats. Products are typically sourced worldwide and include fresh meat and produce, prepared foods, processed foods, baked goods, frozen and canned foods, nonalcoholic and alcoholic beverages, and a wide selection of household goods and personal care products.

Note: The standard discussed below is for “pure-play” food retail and distribution companies. Many major food retailers also have pharmacy operations and other retail operations, and may manufacture private-label processed foods. SASB has separate standards for the Drug Retailers, Multiline and Specialty Retailers & Distributors, and Processed Foods industries. Companies involved in multiple lines of business should also consider the disclosure topics and metrics outlined in these other standards.

Table 1. *Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Fleet Fuel Management	Fleet fuel consumed, percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	FB-FR-110a.1
Air Emissions from Refrigeration	Gross global Scope 1 emissions from refrigerants	Quantitative	Metric tons (t) CO <sub>2</sub> -e	FB-FR-110b.1
	Percentage of refrigerants consumed with zero ozone-depleting potential	Quantitative	Percentage (%) by weight	FB-FR-110b.2
	Average refrigerant emissions rate	Quantitative	Percentage (%)	FB-FR-110b.3
Energy Management	(1) Operational energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	FB-FR-130a.1
Management of Environmental & Social Impacts in the Supply Chain	Revenue from products third-party certified to environmental or social sustainability sourcing standard	Quantitative	Reporting currency	FB-FR-430a.1
	Discussion of strategy to manage environmental and social risks within the supply chain, including animal welfare	Discussion and Analysis	n/a	FB-FR-430a.3
	Discussion of strategies to reduce the environmental impact of packaging	Discussion and Analysis	n/a	FB-FR-430a.4

Table 2. *Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of (1) retail locations and (2) distribution centers	Quantitative	Number	FB-FR-000.A

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Total area of (1) retail space and (2) distribution centers	Quantitative	Square meters (m <sup>2</sup> )	FB-FR-000.B
Number of vehicles in commercial fleet	Quantitative	Number	FB-FR-000.C
Ton miles travelled	Quantitative	Ton miles	FB-FR-000.D

# Fleet Fuel Management

## Topic Summary

Companies in the Food Retailers & Distributors industry own and operate vehicle fleets to deliver products between its distribution and retail locations. The fuel consumption of vehicle fleets is a significant industry expense, both in terms of operating costs and associated capital expenditures. Fossil fuel consumption can contribute to environmental impacts, including climate change and pollution. These environmental impacts have the potential to affect food retailers and distributors through regulatory exposure. Efficiencies gained in fuel use can reduce costs, mitigate exposure to fossil fuel price volatility, and limit the carbon footprint associated with storage and transportation. Short-term capital expenditures in fuel-efficient fleets and more energy efficient technologies may be outweighed by long-term operational savings and decreased exposure to regulatory risks.

## Accounting Metrics

### FB-FR-110a.1. Fleet fuel consumed, percentage renewable

- 1 The entity shall disclose the total amount of fuel consumed by its fleet vehicles as an aggregate figure, in gigajoules (GJ).
  - 1.1 The calculation methodology for fuel consumed shall be based on actual fuel consumed as opposed to design parameters.
  - 1.2 Acceptable calculation methodologies for fuel consumed include, but are not limited to, methodologies based on:
    - 1.2.1 Adding fuel purchases made during the reporting period to beginning inventory at the start of the reporting period, less any fuel inventory at the end of the reporting period
    - 1.2.2 Tracking fuel consumed by vehicles
    - 1.2.3 Tracking fuel expenses
- 2 The entity shall disclose the percentage of the total amount of fuel consumed by its fleet vehicles that is renewable fuel.
  - 2.1 Renewable fuel is defined by the U.S. Renewable Fuel Standard (U.S. 40 CFR 80.1401), as fuel that meets all of the following requirements:
    - 2.1.1 Produced from renewable biomass;
    - 2.1.2 Used to replace or reduce the quantity of fossil fuel present in a transportation fuel, heating oil, or jet fuel; and
    - 2.1.3 Has lifecycle greenhouse gas (GHG) emissions that are at least 20 percent less than baseline lifecycle GHG emissions, unless the fuel is exempt from this requirement pursuant to U.S. 40 CFR 80.1403.
  - 2.2 The scope of renewable fuel includes fuel that qualifies for Renewable Identification Numbers (RINs) under the U.S. Renewable Fuel Standard.

2.3 The percentage shall be calculated as the amount of renewable fuel consumed by the entity's fleet vehicles (in GJ) divided by the total amount of fuel consumed by the entity's fleet vehicles (in GJ).

- 3 The scope of disclosure includes fuel consumed by vehicles owned or operated by the entity.
- 4 The scope of disclosure excludes fuel consumed in the transportation of the entity's products by third parties.
- 5 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change, the U.S. Department of Energy, or the U.S. Energy Information Agency.
- 6 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels).

# Air Emissions from Refrigeration

## Topic Summary

Emissions of refrigeration chemicals from equipment used to store and display perishable foods pose unique regulatory risks for the Food Retailers & Distributors industry. International regulations on hydrochlorofluorocarbons (HCFCs) aim to mitigate damage by HCFCs to the Earth's ozone layer. Additionally, many common HCFCs and hydrofluorocarbons (HFCs) are highly potent greenhouse gases (GHGs), which increases the industry's exposure to climate change-related regulations. Regulators can assess penalties to companies that violate emissions standards, while companies may be required to upgrade or replace equipment, requiring capital expenditures, to reduce their emissions or replace existing refrigerants with potentially costlier, but less environmentally-damaging alternatives.

## Accounting Metrics

### FB-FR-110b.1. Gross global Scope 1 emissions from refrigerants

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>)—that originated from the use of refrigerants.
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e), and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
  - 1.3 Refrigerants are defined as substances or mixtures used in a heat pump or refrigeration cycle for the purpose of absorbing and releasing heat.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 The scope of emissions includes all direct emissions of GHGs resulting from the entity's use of commercial stationary and mobile refrigerants in retail locations, distribution centers, and its transportation fleet.
  - 2.2 For the purposes of this disclosure, the scope of emissions excludes direct emissions of GHGs from the combustion of fossil fuels, non-refrigerant process emissions, and other sources unrelated to refrigerants.
  - 2.3 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:

- 2.3.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)
  - 2.3.2 *Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources* published by the U.S. Environmental Protection Agency (EPA)
  - 2.3.3 India GHG Inventory Program
  - 2.3.4 ISO 14064-1
  - 2.3.5 *Petroleum Industry Guidelines for reporting GHG emissions*, 2nd edition, 2011, published by IPIECA.
  - 2.3.6 *Protocol for the quantification of greenhouse gas emissions from waste management activities* published by Entreprises pour l'Environnement (EpE)
- 2.4 GHG emissions data shall be consolidated and disclosed according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the “financial control” approach defined by the GHG Protocol, and the approach published by the Climate Disclosure Standards Board (CDSB) described in REQ-07, “Organisational boundary,” of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).
- 3 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 4 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 5 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

## **FB-FR-110b.2. Percentage of refrigerants consumed with zero ozone-depleting potential**

- 1 The entity shall disclose the percentage of the refrigerants consumed in its operations that have zero ozone-depleting potential (ODP).
- 1.1 ODP is defined as the amount of ozone depletion caused by a substance, where ozone depletion is defined as a chemical destruction of the stratospheric ozone layer beyond natural reactions.
  - 1.2 A refrigerant with zero ODP is defined as substance that has a published ODP value of zero, has no impact on the stratospheric ozone layer beyond natural reactions, and does not contain chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), halons, methyl bromide, carbon tetrachloride, hydrobromofluorocarbons, chlorobromomethane, or methyl chloroform.
- 2 A list of compounds recognized as ozone-depleting substances (ODS), and their respective ODPs, under the Montreal Protocol, is available through the U.S. Environmental Protection Agency’s (EPA) website, “Ozone-Depleting Substances.”

- 2.1 Consumption of refrigerants is defined as the amount of refrigerant charged into the entity's commercial refrigeration equipment during the reporting period.
  - 2.2 The percentage shall be calculated as the amount (by weight) of refrigerants consumed in the entity's operations that have zero ODP, divided by the total amount (by weight) of refrigerants consumed in the entity's operations.
- 3 The scope of disclosure includes all commercial stationary and mobile refrigerants used by the entity in retail locations, distribution centers, and transportation fleet.

### **FB-FR-110b.3. Average refrigerant emissions rate**

- 1 The entity shall disclose its average refrigerant emissions rate as a percentage.
  - 1.1 Refrigerant emissions rate is defined as the rate of refrigerant loss from a commercial refrigeration equipment or system.
  - 1.2 The entity shall calculate the average refrigerant emissions rate as the total amount, in pounds, of refrigerant emitted over the reporting period, divided by the total weight, in pounds, of refrigerants that are charged into commercial refrigeration equipment over the reporting period.
- 2 The scope of disclosure includes all commercial stationary and mobile refrigerant sources used by the entity in its retail locations, distribution centers, and its transportation fleet.

# Energy Management

## Topic Summary

Food retail and distribution facilities are typically more energy-intensive than other types of commercial spaces. Energy is used predominately for refrigeration, heating, ventilation, and air conditioning (HVAC), as well as lighting. Companies in the industry generally purchase the majority of consumed electricity, while some are beginning to generate energy on-site or add renewable energy into their energy mix. Energy production and consumption contribute to environmental impacts, including climate change and pollution, which have the potential to indirectly, yet materially, impact the operations of food retailers and distributors. Companies that manage their overall energy use through increased efficiency and use of alternative energy sources can increase profitability by lowering expenses and reducing risk.

## Accounting Metrics

### **FB-FR-130a.1. (1) Operational energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed (excluding fleet vehicles) as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption excludes fuel consumed by fleet vehicles, but includes energy from all other sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed (excluding fleet vehicles) that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed (excluding fleet vehicles) that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase



agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

# Management of Environmental & Social Impacts in the Supply Chain

## Topic Summary

Food retailers and distributors source merchandise from a wide range of manufacturers. These suppliers face a myriad of sustainability-related challenges that include resource conservation, water scarcity, animal welfare, fair labor practices, and climate change. When poorly managed, these issues can affect the price and availability of food. Additionally, consumers are increasingly concerned with the production methods, origins, and externalities associated with the foods they purchase, which may affect a company's reputation. Food retailers and distributors can also work with suppliers on packaging design to generate cost savings in transport, improve brand reputation, and reduce the environmental impact. Companies that can address product supply risks by assessing and engaging with suppliers, implementing sustainable sourcing guidelines, and enhancing supply chain transparency will likely be better positioned to improve supply chain resiliency, mitigate reputational risks, and potentially increase consumer demand or capture new market opportunities.

## Accounting Metrics

### **FB-FR-430a.1. Revenue from products third-party certified to environmental or social sustainability sourcing standards**

- 1 The entity shall disclose its revenue from products that are third-party certified to an environmental or social sustainability standard.
  - 1.1 Environmental standards are defined as standards that address environmental impacts related to the production of agricultural products such as, protection of primary forests, maintenance of surface water and groundwater quality, and implementation of integrated pest management (IPM) solutions or an Organic System Plan.
  - 1.2 Social standards are defined as standards that address social impacts related to the production of agricultural products such as, compensation of the workforce, training and continual monitoring of health and safety risks associated with applications of agrochemicals, and child-labor practices.
  - 1.3 Examples of certifications to third-party environmental and social standards include, but are not limited to:
    - 1.3.1 Bonsucro
    - 1.3.2 Fairtrade International
    - 1.3.3 Fair Trade USA
    - 1.3.4 Roundtable on Sustainable Palm Oil (RSPO)
    - 1.3.5 Roundtable on Responsible Soy (RTRS)
    - 1.3.6 Rainforest Alliance
    - 1.3.7 SA8000
    - 1.3.8 U.S. Department of Agriculture (USDA) Organic
    - 1.3.9 UTZ Certified

- 2 The entity may additionally break down the disclosure by product category and certification type.
  - 2.1 A product category is defined as a group of related products that offer a similar general functionality (e.g., meat, produce, packaged goods).
  - 2.2 Certification types may be grouped based on the topic or scope of the standard, and can include animal welfare, working conditions, organic, sustainable fishing or harvesting.

### **FB-FR-430a.3. Discussion of strategy to manage environmental and social risks within the supply chain, including animal welfare**

- 1 The entity shall discuss its strategic approach to managing its environmental and social risks that are present within, or arise out of, its food and food products supply chain.
  - 1.1 Environmental and social risks may include, but are not limited to:
    - 1.1.1 Impacts on crop and livestock production due to climate change (e.g., changing average temperatures and water stress) that may affect cost and availability of produce, meat, poultry, dairy, and processed foods products
    - 1.1.2 Animal feed price increases resulting from environmental and social factors and/or tightening environmental regulations that may have price impacts on meat, poultry, and dairy
    - 1.1.3 Fuel economy regulations that affect transportation costs
    - 1.1.4 Labor rights and immigration reforms that affect food prices and availability
    - 1.1.5 International trade barriers and/or varying levels of food safety oversight in a global market
    - 1.1.6 Commercial catch limits that could affect the supply of seafood products
    - 1.1.7 Animal welfare, human rights, or related supply chain incidents that may result in reputational damage
  - 1.2 Relevant strategies to discuss may include, but are not limited to, supplier screening, diversification of suppliers, supplier training programs on environmental best management practices, supplier engagement on labor and human rights issues, and maintenance of a supply chain code of conduct, supply chain audits, and certifications.
- 2 The entity may identify which products or product lines present risks to its operations, the risks that are represented, and the strategies the entity uses to mitigate such risks.
- 3 The entity shall discuss its animal welfare standards applicable to its supply chain.
  - 3.1 Animal welfare standards are defined as policies for beef, pork, poultry, and/or dairy production conditions, including:
    - 3.1.1 Animal treatment and handling
    - 3.1.2 Housing and transportation conditions
    - 3.1.3 Slaughter facilities and procedures
    - 3.1.4 Use of antibiotics and hormones

- 3.2 Discussion shall include, but is not limited to:
- 3.2.1 Any targets the entity has related to animal welfare standards and its progress toward those targets.
  - 3.2.2 Any requirements for suppliers related to animal welfare standards
  - 3.2.3 How, if in any way, animal welfare standards are addressed in supplier contracts
- 4 The entity shall describe its use of animal welfare certifications, where certifications include, but are not limited to: Animal Welfare Approved, Certified Humane Program, Food Alliance Certified, and Global Animal Partnership 5-Step Animal Welfare Rating Program.
- 5 The entity may disclose the percentage of animal protein sold, by animal protein type, that is produced without medically important antibiotics.
- 5.1 Medically important antibiotics (or “medically important antimicrobial drugs”) are defined according to the U.S. Food and Drug Administration’s (FDA) Veterinary Feed Directive (VFD) as all three tiers (“critically important,” “highly important,” and “important”) of antimicrobial drugs listed in Appendix A to its Guidance for Industry (GFI) #152 to be “medically important.”
  - 5.2 The percentage is calculated as the carcass (or dressed) weight of animal protein purchased that did not receive medically important antibiotics at any stage of its life divided by the total carcass (or dressed) weight of animal protein purchased.

#### **FB-FR-430a.4. Discussion of strategies to reduce the environmental impact of packaging**

- 1 The entity shall discuss its strategies to reduce the environmental impacts of packaging, such as optimizing packaging weight and volume for a given application, or using alternative materials, including those that are renewable, recycled, recyclable, or compostable.
- 2 Relevant disclosure may include, but is not limited to, the following:
- 2.1 Design innovations, including strategies to optimize the amount of material used; packaging weight, shape, and size; product-to-package ratio; cube utilization; and void fill
  - 2.2 Implementation of the “Essential Requirements” in Article 9, Annex II of the EU Directive on Packaging and Packaging Waste (94/62/EC), which includes minimization of packaging weight and volume to the amount needed for safety, hygiene, and consumer acceptance of the packed product; minimization of noxious or hazardous constituents; and suitability for reuse, material recycling, energy recovery, or composting
  - 2.3 Performance on the [Global Protocol on Packaging Sustainability 2.0](#) metrics for Packaging Weight and Optimization and/or Assessment and Minimization of Substances Hazardous to the Environment
- 3 The entity may discuss its strategies as they relate to primary, secondary, and tertiary packaging of its private-label products as well as the packaging of products from its vendors.
- 3.1 Primary packaging is designed to come into direct contact with the product.

- 3.2 Secondary packaging is designed to contain one or more primary packages together with any protective materials, where required.
  - 3.3 Tertiary packaging is designed to contain one or more articles or packages, or bulk material, for the purposes of transport, handling, and/or distribution. Tertiary packaging is also known as “distribution” or “transport” packaging.
  - 3.4 A private-label product is a store-brand product packaged for sale with a retailer’s brand name, whether manufactured by the retailer or by another manufacturer.
- 4 The entity may discuss its use of Life Cycle Assessment (LCA) analysis in the context of its approach to environmental impact reduction and maximization of product efficiency, including weight reduction and transportation efficiency.
- 4.1 When discussing improvements to the environmental efficiency of packaging products, improvements may be discussed in terms of LCA functional unit service parameters (i.e., time, extent, and quality of function).

## MEAT, POULTRY & DAIRY

### Industry Description

The Meat, Poultry & Dairy industry produces raw and processed animal products, including meats, eggs, and dairy products, for human and animal consumption. Key activities include animal raising, slaughtering, processing, and packaging. The industry's largest companies have international operations, and companies are vertically integrated to varying degrees, depending on the type of animal produced. Large industry operators typically rely on contract or independent farmers to supply their animals, and may have varying degrees of control over their operations. The industry sells products primarily to the Processed Foods industry and to retail distributors that distribute finished products to key end markets including restaurants, livestock and pet feed consumers, and grocery retailers.

Table 1. Climate-related Disclosure Topics & Accounting Metrics

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions	Quantitative	Metric tons (t) CO <sub>2</sub> -e	FB-MP-110a.1
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	FB-MP-110a.2
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	FB-MP-130a.1
Water Management	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	FB-MP-140a.1
	Description of water management risks and discussion of strategies and practices to mitigate those risks	Discussion and Analysis	n/a	FB-MP-140a.2
	Number of incidents of non-compliance with water quality permits, standards, and regulations	Quantitative	Number	FB-MP-140a.3
Land Use & Ecological Impacts	Amount of animal litter and manure generated, percentage managed according to a nutrient management plan	Quantitative	Metric tons (t), Percentage (%)	FB-MP-160a.1
	Percentage of pasture and grazing land managed to Natural Resources Conservation Service (NRCS) conservation plan criteria	Quantitative	Percentage (%) by hectares	FB-MP-160a.2
	Animal protein production from concentrated animal feeding operations (CAFOs)	Quantitative	Metric tons (t)	FB-MP-160a.3
Animal & Feed Sourcing	Percentage of animal feed sourced from regions with High or Extremely High Baseline Water Stress	Quantitative	Percentage (%) by weight	FB-MP-440a.1

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
	Percentage of contracts with producers located in regions with High or Extremely High Baseline Water Stress	Quantitative	Percentage (%) by contract value	FB-MP-440a.2
	Discussion of strategy to manage opportunities and risks to feed sourcing and livestock supply presented by climate change	Discussion and Analysis	n/a	FB-MP-440a.3

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of processing and manufacturing facilities	Quantitative	Number	FB-MP-000.A
Animal protein production, by category; percentage outsourced <sup>29</sup>	Quantitative	Various, Percentage (%)	FB-MP-000.B

<sup>29</sup>

Note to **FB-MP-000.B** – Categories of animal protein production may be based on animal (e.g., chicken, pork, beef) and/or product type (e.g., milk, shell eggs). Units of measure shall be appropriate to the animal or product category (e.g., metric tons, number/head, gallons).

# Greenhouse Gas Emissions

## Topic Summary

The Meat, Poultry & Dairy industry generates significant Scope 1 greenhouse gas (GHG) emissions from both livestock and energy-intensive industrial processes. GHG emissions contribute to climate change and create additional regulatory compliance costs and risks for meat, poultry, and dairy companies due to climate change mitigation policies. The majority of the industry's emissions stem directly from the animals themselves through the release of methane during enteric fermentation, and from manure storage and processing. The direct emissions from raising and producing livestock represent a significant portion of total GHG emissions released among all sources, both in the U.S. and globally. These emissions sources are currently not widely regulated, which presents uncertainties as to the future of GHG regulations for the industry. Companies in this industry also use large quantities of fossil fuels to meet energy needs, generating additional direct GHG emissions and increasing exposure to regulatory risks. Future emission regulations could result in additional operating and/or compliance costs. By implementing new technologies to capture animal emissions and focusing on energy efficiency, companies can mitigate regulatory risk and volatile energy costs while also limiting their GHG emissions.

## Accounting Metrics

### FB-MP-110a.1. Gross global Scope 1 emissions

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e), and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:
    - 2.1.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)



- 2.1.2 Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources published by the U.S. Environmental Protection Agency (EPA)
  - 2.1.3 India GHG Inventory Program
  - 2.1.4 ISO 14064-1
  - 2.1.5 Petroleum Industry Guidelines for reporting GHG emissions, 2nd edition, 2011, published by IPIECA
  - 2.1.6 Protocol for the quantification of greenhouse gas emissions from waste management activities published by Entreprises pour l'Environnement (EpE)
- 2.2 GHG emissions data shall be consolidated and disclosed according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the “financial control” approach defined by the GHG Protocol, and the approach published by the Climate Disclosure Standards Board (CDSB) described in REQ-07, “Organisational boundary,” of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).
- 3 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
  - 4 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
  - 5 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

**FB-MP-110a.2. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined according to *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 2.2 Whether the target is absolute- or intensity-based, and the metric denominator, if it is an intensity-based target;

- 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated toward the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;
  - 2.5 The mechanism(s) for achieving the target; and
  - 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset.
- 3 The entity shall discuss the activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as how they relate to different business units, geographies, or emissions sources.
  - 5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
  - 6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

# Energy Management

## Topic Summary

The Meat, Poultry & Dairy industry relies heavily on purchased electricity and fuel as critical inputs for value creation. Companies' use of electricity and fossil fuels in their operations results in direct and indirect greenhouse gas (GHG) emissions, which contribute to environmental impacts, including climate change and pollution. Purchased electricity is a significant operating cost for meat, poultry, and dairy companies. Efficient energy usage is essential to maintain a competitive advantage in this industry, as purchased fuels and electricity account for a significant portion of total production costs. Decisions regarding the use of alternative fuels, renewable energy, and on-site generation of electricity versus purchasing from the grid can play an important role in influencing both the costs and the reliability of the energy supply.

## Accounting Metrics

### **FB-MP-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a

Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

# Water Management

## Topic Summary

The Meat, Poultry & Dairy industry is water-intensive both in raising livestock and industrial processing. Additionally, companies in the industry typically generate wastewater, or effluent, from both animal production and processing activities. As water scarcity becomes an issue of growing importance due to population growth, increasing consumption per capita, poor water management, and climate change, companies in the industry may face higher operational costs or lost revenues due to water shortages and/or regulations resulting in production reduction. Companies can manage water-related risks and opportunities through capital investments and assessment of facility locations relative to water scarcity risks, improvements to operational efficiency, and partnerships with regulators and communities on issues related to water access and effluent.

## Accounting Metrics

### **FB-MP-140a.1. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.
  - 1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 2.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:
    - 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 3.1.2 Water that is directly or indirectly incorporated into the entity's product or service;
    - 3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.

- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

## **FB-MP-140a.2. Description of water management risks and discussion of strategies and practices to mitigate those risks**

- 1 The entity shall describe its water management risks associated with water withdrawals, water consumption, and discharge of water and/or wastewater.
  - 1.1 Risks associated with water withdrawals and water consumption include risks to the availability of adequate, clean water resources, including, but not limited to:
    - 1.1.1 Environmental constraints—such as operating in water-stressed regions, drought, concerns of aquatic impingement or entrainment, interannual or seasonal variability, and risks due to the impact of climate change
    - 1.1.2 Regulatory and financial constraints—such as volatility in water costs, stakeholder perceptions and concerns related to water withdrawals (e.g., those from local communities, non-governmental organizations, and regulatory agencies), direct competition with and impact from the actions of other users (e.g., commercial and municipal users), restrictions to withdrawals due to regulations, and constraints on the entity’s ability to obtain and retain water rights or permits
  - 1.2 Risks associated with the discharge of water and/or wastewater, include, but are not limited to, the ability to obtain rights or permits related to discharges, compliance with regulations related to discharges, restrictions to discharges, the ability to maintain control over the temperature of water discharges, liabilities and/or reputational risks, and increased operating costs due to regulation, stakeholder perceptions and concerns related to water discharges (e.g., those from local communities, non-governmental organizations, and regulatory agencies).
- 2 The entity may describe water management risks in the context of:
  - 2.1 How risks may vary by withdrawal source, including surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities; and
  - 2.2 How risks may vary by discharge destinations, including surface water, groundwater, or wastewater utilities.
- 3 The entity may discuss the potential impacts that water management risks may have on its operations and the timeline over which such risks are expected to manifest.

- 3.1 Impacts may include, but are not limited to, those associated with costs, revenues, liabilities, continuity of operations, and reputation.
- 4 The entity shall discuss its short-term and long-term strategies or plan to mitigate water management risks, including, but not limited to:
  - 4.1 The scope of its strategy, plans, goals and/or targets, such as how they relate to different business units, geographies, or water-consuming operational processes.
  - 4.2 Any water management goals and/or targets it has prioritized, and an analysis of performance against those goals and/or targets.
    - 4.2.1 Goals and targets may include, but are not limited to, those associated with reducing water withdrawals, reducing water consumption, reducing water discharges, reducing aquatic impingements, improving the quality of water discharges, and regulatory compliance.
  - 4.3 The activities and investments required to achieve the plans, goals and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 4.4 Disclosure of strategies, plans, goals, and/or targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.
- 5 For water management targets, the entity shall additionally disclose:
  - 5.1 Whether the target is absolute or intensity-based, and the metric denominator if it is an intensity-based target.
  - 5.2 The timelines for the water management plans, including the start year, the target year, and the base year.
  - 5.3 The mechanism(s) for achieving the target, including:
    - 5.3.1 Efficiency efforts, such as the use of water recycling and/or closed-loop systems;
    - 5.3.2 Product innovations such as redesigning products or services to require less water;
    - 5.3.3 Process and equipment innovations, such as those that enable the reduction of aquatic impingements or entrainments;
    - 5.3.4 Use of tools and technologies (e.g., the [World Wildlife Fund Water Risk Filter](#), [The Global Water Tool](#), and [Water Footprint Network Footprint Assessment Tool](#)) to analyze water use, risk, and opportunities; and
    - 5.3.5 Collaborations or programs in place with the community or other organizations.
  - 5.4 The percentage reduction or improvement from the base year, where the base year is the first year against which water management targets are evaluated toward the achievement of the target.
- 6 The entity shall discuss whether its water management practices result in any additional lifecycle impacts or tradeoffs in its organization, including tradeoffs in land use, energy production, and greenhouse gas (GHG) emissions, and why the entity chose these practices despite lifecycle tradeoffs.

### **FB-MP-140a.3. Number of incidents of non-compliance with water quality permits, standards, and regulations**

- 1 The entity shall disclose the total number of instances of non-compliance, including violations of a technology-based standard and exceedances of quantity and/or quality-based standards.
- 2 The scope of disclosure includes incidents governed by national, state, and local statutory permits and regulations, including, but not limited to, the discharge of a hazardous substance, violation of pretreatment requirements, or total maximum daily load (TMDL) exceedances.
- 3 The scope of disclosure shall only include incidents of non-compliance that resulted in a formal enforcement action(s).
  - 3.1 Formal enforcement actions are defined as governmental actions that address a violation or threatened violation of water quantity and/or quality laws, regulations, policies, or orders, and can result in administrative penalty orders, administrative orders, and judicial actions, among others. For example, the U.S. Environmental Protection Agency (EPA) provides guidance on the scope of formal enforcement actions in, [Informal and Formal Actions, Summary Guidance and Portrayal on EPA Websites](#).
- 4 Violations shall be disclosed, regardless of their measurement methodology or frequency. These include:
  - 4.1 Continuous discharges, limitations, standards, and prohibitions that are generally expressed as maximum daily, weekly average, and monthly averages.
  - 4.2 Non-continuous discharges and limitations that are generally expressed in terms of frequency, total mass, maximum rate of discharge, and mass or concentration of specified pollutants.



# Land Use & Ecological Impacts

## Topic Summary

Meat, Poultry & Dairy industry operations have diverse ecological impacts, primarily because of significant land-use needs to raise livestock and the contamination of the air, land, and groundwater by animal waste. While the impacts are different, both traditional and Concentrated Animal Feeding Operations (CAFO) lead to significant ecological impacts. The primary concern from CAFOs and animal-product processing facilities is the generation of large and concentrated amounts of waste and pollutants into the environment. Treating effluent and waste from facilities involves significant costs. Non-CAFO animal farming, which requires large tracts of pastureland, can lead to physical degradation of land resources. Land use and ecological impacts pose legal and regulatory risks in the form of fines, litigation, and difficulties obtaining permits for facility expansions or waste discharges.

## Accounting Metrics

### **FB-MP-160a.1. Amount of animal litter and manure generated, percentage managed according to a nutrient management plan**

- 1 The entity shall disclose the total amount, in metric tons, of animal litter and manure generated at its facilities.
  - 1.1 The scope of animal litter and manure includes both dry and liquid manures and litter.
- 2 The entity shall disclose the percentage of animal litter and manure generated from facilities that implement a nutrient management plan divided by the total amount of animal litter and manure generated.
  - 2.1 A nutrient management plan is defined as a documented management practice that addresses the generation, collection, treatment, storage, and agronomic use of all manure.
  - 2.2 At a minimum, the nutrient management plan shall meet the minimum specific elements of the Natural Resources Conservation Service (NRCS) Comprehensive Nutrient Management Plan (CNMP), which include:
    - 2.2.1 Background and Site Information
    - 2.2.2 Manure and Wastewater Handling and Storage
    - 2.2.3 Farmstead Safety and Security
    - 2.2.4 Land Treatment Practices
    - 2.2.5 Soil and Risk Assessment Analyses
    - 2.2.6 Nutrient Management according to the criteria in the Nutrient Management Conservation Practice (Code 590)
    - 2.2.7 Recordkeeping
    - 2.2.8 References

- 3 The scope of disclosure includes facilities that the entity owns and operates, facilities from which it contracts animal production (e.g., independent producers), and facilities that otherwise supply animal protein to the entity (e.g., for processing by the entity).
- 4 The scope of disclosure includes production areas and land treatment areas.
  - 4.1 Production area includes the animal confinement area, storage areas for feed and other raw materials, animal mortality facilities, and manure-handling containment or storage areas.
  - 4.2 Land treatment area includes land under control of the entity and/or its contracted suppliers (e.g., independent producers), whether it is owned, rented, or leased, to which manure or process wastewater is, or might be, applied for crop, hay, or pasture production or other uses.

### **FB-MP-160a.2. Percentage of pasture and grazing land managed to Natural Resources Conservation Service (NRCS) conservation plan criteria**

- 1 The entity shall disclose the percentage of pasture and grazing land that is managed to the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) conservation plan criteria.
  - 1.1 Land shall be considered to be managed to NRCS conservation plan criteria if its management follows the planning process described by the [National Planning Procedures Handbook](#) and management practices outlined in the [National Range and Pasture Handbook \(NRPH\)](#), USDA NRCS, Grazing Lands Technology Institute Revision 1, December 2003.
  - 1.2 The percentage shall be calculated as the area of pasture and grazing land managed to NRCS conservation plan criteria divided by the total area of pasture and grazing land.
- 2 The scope of disclosure includes land defined by the [NRPH](#) as rangeland, which includes grazed forest, naturalized pasture, pastureland, hayland, and grazed and hayed cropland.
  - 2.1 The scope of disclosure includes land from operations that the entity owns and operates, operations with which it contracts animal production (e.g., independent producers), and operations that otherwise supply animal protein to the entity (e.g., for processing by the entity).

### **FB-MP-160a.3. Animal protein production from concentrated animal feeding operations (CAFOs)**

- 1 The entity shall disclose the amount, in metric tons, of animal protein production from concentrated animal feeding operations (CAFOs).
  - 1.1 CAFOs are defined according to U.S. 40 CFR 40, Part 122.23, "Concentrated animal feeding operations."
  - 1.2 The amount shall be calculated as the carcass (or dressed) weight of animal protein.
    - 1.2.1 Carcass is defined according to U.S. 9 CFR 301.2 as all parts, including viscera, of any slaughtered livestock.

- 2 The scope includes animal protein from operations that the entity owns and operates, operations with which it contracts animal production (e.g., independent producers), and operations that otherwise supply animal protein to the entity (e.g., for processing by the entity).

# Animal & Feed Sourcing

## Topic Summary

Meat, poultry, and dairy companies source animal and animal feed from a range of suppliers depending on animal species. The industry's ability to reliably source animals and animal feed at desired price points may be affected by climate change, water scarcity, land management, and other resource scarcity considerations. Companies that select and work with suppliers who are less resource-intensive and who actively manage adaptation to climate change and other resource scarcity risks, will be better protected from potential price volatility and supply disruptions. Additionally, such companies may improve their brand reputation and develop new market opportunities. Failure to effectively manage sourcing risks can lead to higher costs of capital, reduced margins, and constrained revenue growth.

## Accounting Metrics

### **FB-MP-440a.1. Percentage of animal feed sourced from regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the percentage of animal feed sourced from regions with High or Extremely High Baseline Water Stress.
  - 1.1 Animal feed includes soybean meal, cornmeal and other grains, and other fodder provided to livestock, but excludes forage.
- 2 The scope of disclosure shall include feed grown and/or manufactured by the entity and feed that is purchased by the entity.
- 3 The percentage shall be calculated as the weight of animal feed sourced from regions with High or Extremely High Baseline Water Stress divided by the total weight of animal feed sourced by the entity.
  - 3.1 The entity shall identify animal feed sourced from locations with High (40–80%) or Extremely High (>80%) Baseline Water Stress as classified by the World Resources Institute's (WRI) Water Risk Atlas tool, [Aqueduct](#).

### **FB-MP-440a.2. Percentage of contracts with producers located in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the percentage of contracts with producers located in regions with High or Extremely High Baseline Water Stress.
  - 1.1 A contract producer (or grower) is a party with which the entity has an agreement under which the party typically agrees to provide facilities, labor, utilities, and care for livestock owned by the entity in return for payment.

- 2 The percentage shall be calculated as the value of contracts associated with entities located in water-stressed regions divided by the total value of contracts associated with contract production of animal protein.
  - 2.1 The entity shall identify contract producers that withdraw and consume water in locations with High (40–80%) or Extremely High (>80%) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, [Aqueduct](#).

### **FB-MP-440a.3. Discussion of strategy to manage opportunities and risks to feed sourcing and livestock supply presented by climate change**

- 1 The entity shall discuss the risks and/or opportunities that are presented by climate change scenarios to its feed sourcing and livestock supply.
  - 1.1 Feed-sourcing risks and opportunities include those at the cultivation, milling and other processing, and transportation phases of animal feed production.
  - 1.2 Livestock production risks and opportunities include those affecting all lifecycle phases of bringing animal protein to market, including breeding, grazing, feedlot, slaughter, processing, and distribution/transportation of live animals and processed animal protein products.
- 2 The entity may identify the risks presented by climate change, including, but not limited to, availability of water, shifts in rangeland quality, disease migration, and more frequent extreme weather events.
- 3 The entity may discuss how climate change scenarios will manifest (e.g., at the point they will affect the entity’s supply chain), how each type of feed (e.g., soybean meal, cornmeal and other grains, or hay) or livestock (e.g., beef cattle, dairy cattle, pigs, or poultry) may be affected, and how other operating conditions (e.g., transportation and logistics or physical infrastructure) will be affected.
- 4 The entity shall discuss efforts to assess and monitor the impacts of climate change and the related strategies it employs to adapt to any risks and/or recognize any opportunities.
  - 4.1 For feed, strategies include, but are not limited to, use of insurance, investments in hedging instruments, supply chain diversification, and ecosystem and biodiversity management.
  - 4.2 For livestock, strategies include, but are not limited to, use of insurance, investments in hedging instruments, supply chain diversification, ecosystem and biodiversity management, and development of tolerant livestock breeds.
- 5 The entity may discuss the probability that risks and opportunities will come to fruition, the likely magnitude of the impact on financial results and operating conditions, and the timeframe over which such risks and opportunities are expected to manifest.
- 6 The entity may include discussion of the methods or models used to develop the climate change scenario(s) it uses, including the use of global gridded crop models or scientific research provided by governmental and non-governmental organizations (e.g., [Intergovernmental Panel on Climate Change Climate Scenario Process](#)).

- 7 The scope of disclosure includes the impact of climate change on the entity's operations, but excludes the entity's strategy and risks and opportunities related to the mitigation of greenhouse gas (GHG) emissions that are generated through its operations (addressed in FB-MP.110a.2).

## NON-ALCOHOLIC BEVERAGES

### Industry Description

The Non-Alcoholic Beverages industry produces a broad range of beverage products, including various carbonated soft drinks, syrup concentrates, juices, energy and sport drinks, teas, coffee, and water products. The industry is dominated by large, international companies. Companies partake in syrup manufacturing, marketing, bottling operations, and distribution, with larger companies typically being more vertically integrated into operations that bottle, sell, and distribute the finished products.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Fleet Fuel Management	Fleet fuel consumed, percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	FB-NB-110a.1
Energy Management	(1) Operational energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	FB-NB-130a.1
Water Management	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	FB-NB-140a.1
	Description of water management risks and discussion of strategies and practices to mitigate those risks	Discussion and Analysis	n/a	FB-NB-140a.2
Environmental & Social Impacts of Ingredient Supply Chain	Suppliers' social and environmental responsibility audit (1) non-conformance rate and (2) associated corrective action rate for (a) major and (b) minor non-conformances	Quantitative	Rate	FB-NB-430a.1
Ingredient Sourcing	Percentage of beverage ingredients sourced from regions with High or Extremely High Baseline Water Stress	Quantitative	Percentage (%) by cost	FB-NB-440a.1
	List of priority beverage ingredients and description of sourcing risks due to environmental and social considerations	Discussion and Analysis	n/a	FB-NB-440a.2

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Volume of products sold	Quantitative	Millions of hectoliters (Mhl)	FB-NB-000.A
Number of production facilities	Quantitative	Number	FB-NB-000.B
Total fleet road miles traveled	Quantitative	Miles	FB-NB-000.C

# Fleet Fuel Management

## Topic Summary

Non-alcoholic beverages companies generate direct Scope 1 greenhouse gas (GHG) emissions from large vehicle fleets for distribution and from manufacturing facilities. Specifically, refrigeration used in manufacturing facilities and in transport vehicles contributes to a large portion of overall emissions for the industry. Efficiencies gained in fuel use can reduce costs, mitigate exposure to fossil fuel price volatility, and limit emissions from production, storage, and transportation of products. Short-term capital expenditures in fuel efficient fleets and more energy-efficient technologies may be outweighed by long-term operational savings and mitigation of regulatory risk.

## Accounting Metrics

### FB-NB-110a.1. Fleet fuel consumed, percentage renewable

- 1 The entity shall disclose the total amount of fuel consumed by its fleet vehicles as an aggregate figure, in gigajoules (GJ).
  - 1.1 The calculation methodology for fuel consumed shall be based on actual fuel consumed as opposed to design parameters.
  - 1.2 Acceptable calculation methodologies for fuel consumed include, but are not limited to, methodologies based on:
    - 1.2.1 Adding fuel purchases made during the reporting period to beginning inventory at the start of the reporting period, less any fuel inventory at the end of the reporting period
    - 1.2.2 Tracking fuel consumed by vehicles
    - 1.2.3 Tracking fuel expenses
- 2 The entity shall disclose the percentage of the total amount of fuel consumed by its fleet vehicles that is renewable fuel.
  - 2.1 Renewable fuel is defined by the U.S. Renewable Fuel Standard (U.S. 40 CFR 80.1401), as fuel that meets all of the following requirements:
    - 2.1.1 Produced from renewable biomass;
    - 2.1.2 Used to replace or reduce the quantity of fossil fuel present in a transportation fuel, heating oil, or jet fuel; and
    - 2.1.3 Has lifecycle greenhouse gas (GHG) emissions that are at least 20 percent less than baseline lifecycle GHG emissions, unless the fuel is exempt from this requirement pursuant to U.S. 40 CFR 80.1403.
  - 2.2 The scope of renewable fuel includes fuel that qualifies for Renewable Identification Numbers (RINs) under the U.S. Renewable Fuel Standard.
  - 2.3 The percentage shall be calculated as the amount of renewable fuel consumed by the entity's fleet vehicles (in GJ) divided by the total amount of fuel consumed by the entity's fleet vehicles (in GJ).



- 3 The scope of disclosure includes fuel consumed by vehicles owned or operated by the entity.
- 4 The scope of disclosure excludes fuel consumed in the transportation of the entity's products by third parties.
- 5 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change, the U.S. Department of Energy, or the U.S. Energy Information Agency.
- 6 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels).

# Energy Management

## Topic Summary

Companies in the Non-Alcoholic Beverages industry use significant energy to operate manufacturing facilities, distribution centers, and warehouses. Companies in the industry generally purchase electricity from the grid. Energy generation contributes to environmental impacts, including climate change and pollution, which have the potential to indirectly, yet materially, impact the operations of non-alcoholic beverages companies. Companies can reduce energy consumption and associated greenhouse gas (GHG) emissions from their operations by implementing more efficient technologies and processes. Decisions regarding the use of alternative fuels, renewable energy, and on-site generation of electricity versus purchasing from the grid, can play an important role in influencing both the costs and reliability of the energy supply.

## Accounting Metrics

### **FB-NB-130a.1. (1) Operational energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed (excluding fleet vehicles) as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption excludes fuel consumed by fleet vehicles, but includes energy from all other sources, including energy purchased from sources external to the organization and energy produced by the organization itself (self-generated). For example, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed (excluding fleet vehicles) that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed (excluding fleet vehicles) that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase

agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the [Green-e Framework for Renewable Energy Certification, Version 1.0](#) (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

# Water Management

## Topic Summary

Water management relates to a company's direct water usage, the exposure of its operations to water-stressed regions, and its management of wastewater. Companies in the Non-Alcoholic Beverages industry use a large amount of water in their operations, as water is a key input to finished products. Given non-alcoholic beverage companies' heavy reliance on large volumes of clean water and the fact that water stress is increasing in different regions globally, companies may be exposed to supply disruptions that could significantly impact operations and add to costs. Companies operating in water-stressed regions that fail to address local water concerns may face further risk of losing their social license to operate. Additionally, proper wastewater treatment is an important element of managing water issues in operations, because bottling plants release large quantities of effluents. Improving water management through increased efficiency, recycling, and proper disposal, particularly in regions with baseline water stress, can lead to lower operating costs, reduced risks, and higher intangible asset value.

## Accounting Metrics

### **FB-NB-140a.1. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.
  - 1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 2.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:
    - 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 3.1.2 Water that is directly or indirectly incorporated into the entity's product or service;
    - 3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.

- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

## **FB-NB-140a.2. Description of water management risks and discussion of strategies and practices to mitigate those risks**

- 1 The entity shall describe its water management risks associated with water withdrawals, water consumption, and discharge of water and/or wastewater.
  - 1.1 Risks associated with water withdrawals and water consumption include risks to the availability of adequate, clean water resources, including, but not limited to:
    - 1.1.1 Environmental constraints—such as operating in water-stressed regions, drought, concerns of aquatic impingement or entrainment, interannual or seasonal variability, and risks due to the impact of climate change
    - 1.1.2 Regulatory and financial constraints—such as volatility in water costs, stakeholder perceptions and concerns related to water withdrawals (e.g., those from local communities, non-governmental organizations, and regulatory agencies), direct competition with and impact from the actions of other users (e.g., commercial and municipal users), restrictions to withdrawals due to regulations, and constraints on the entity’s ability to obtain and retain water rights or permits
  - 1.2 Risks associated with the discharge of water and/or wastewater, include, but are not limited to, the ability to obtain rights or permits related to discharges, compliance with regulations related to discharges, restrictions to discharges, the ability to maintain control over the temperature of water discharges, liabilities and/or reputational risks, and increased operating costs due to regulation, stakeholder perceptions and concerns related to water discharges (e.g., those from local communities, non-governmental organizations, and regulatory agencies).
- 2 The entity may describe water management risks in the context of:
  - 2.1 How risks may vary by withdrawal source, including surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities; and
  - 2.2 How risks may vary by discharge destinations, including surface water, groundwater, or wastewater utilities.
- 3 The entity may discuss the potential impacts that water management risks may have on its operations and the timeline over which such risks are expected to manifest.

- 3.1 Impacts may include, but are not limited to, those associated with costs, revenues, liabilities, continuity of operations, and reputation.
- 4 The entity shall discuss its short-term and long-term strategies or plan to mitigate water management risks, including, but not limited to:
  - 4.1 The scope of its strategy, plans, goals and/or targets, such as how they relate to different business units, geographies, or water-consuming operational processes.
  - 4.2 Any water management goals and/or targets it has prioritized, and an analysis of performance against those goals and/or targets.
    - 4.2.1 Goals and targets may include, but are not limited to, those associated with reducing water withdrawals, reducing water consumption, reducing water discharges, reducing aquatic impingements, improving the quality of water discharges, and regulatory compliance.
  - 4.3 The activities and investments required to achieve the plans, goals and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 4.4 Disclosure of strategies, plans, goals, and/or targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.
- 5 For water management targets, the entity shall additionally disclose:
  - 5.1 Whether the target is absolute or intensity-based, and the metric denominator if it is an intensity-based target.
  - 5.2 The timelines for the water management plans, including the start year, the target year, and the base year.
  - 5.3 The mechanism(s) for achieving the target, including:
    - 5.3.1 Efficiency efforts, such as the use of water recycling and/or closed-loop systems;
    - 5.3.2 Product innovations such as redesigning products or services to require less water;
    - 5.3.3 Process and equipment innovations, such as those that enable the reduction of aquatic impingements or entrainments;
    - 5.3.4 Use of tools and technologies (e.g., the [World Wildlife Fund Water Risk Filter](#), [The Global Water Tool](#), and [Water Footprint Network Footprint Assessment Tool](#)) to analyze water use, risk, and opportunities; and
    - 5.3.5 Collaborations or programs in place with the community or other organizations.
  - 5.4 The percentage reduction or improvement from the base year, where the base year is the first year against which water management targets are evaluated toward the achievement of the target.
- 6 The entity shall discuss whether its water management practices result in any additional lifecycle impacts or tradeoffs in its organization, including tradeoffs in land use, energy production, and greenhouse gas (GHG) emissions, and why the entity chose these practices despite lifecycle tradeoffs.

# Environmental & Social Impacts of Ingredient Supply Chain

## Topic Summary

Companies in the Non-Alcoholic Beverages industry manage global supply chains to source a wide range of ingredient inputs. How companies screen, monitor, and engage with suppliers on environmental and social topics affects the ability of companies to secure supply and manage price fluctuations. Supply chain interruption can cause loss of revenue and negatively impact market share if companies are not able to find alternatives for key suppliers or have to source ingredients at higher cost. Supply chain management issues related to labor practices, environmental responsibility, ethics, or corruption may also result in regulatory fines and/or increased long-term operational costs for companies. The consumer-facing nature of the industry increases the reputational risks associated with supplier actions. Managing a company's exposure to environmental and social risks can lead to improved supply chain resiliency and enhanced reputation, which provide value to shareholders. Companies can engage with key suppliers to manage environmental and social risks to improve supply chain resiliency, mitigate reputational risks, and potentially increase consumer demand or capture new market opportunities.

## Accounting Metrics

### **FB-NB-430a.1. Suppliers' social and environmental responsibility audit (1) non-conformance rate and (2) associated corrective action rate for (a) major and (b) minor non-conformances**

- 1 The entity shall disclose its supplier facilities' (1) non-conformance rate with external social and environmental audit standard(s) or internally developed supplier code(s) of conduct for (a) major non-conformances, and separately, (b) minor non-conformances.
  - 1.1 A major non-conformance is defined as the highest severity of non-conformance and require escalation by auditors. Major non-conformances confirm the presence of underage child workers (below the legal age for work or apprenticeship), forced labor, health and safety issues that can cause immediate danger to life or serious injury, and/or environmental practices that can cause serious and immediate harm to the community. Major non-conformance includes material breach or systemic breaking of code requirement or law. Major non-conformances may also be referred to as critical or priority non-conformances.
  - 1.2 A minor non-conformance is defined as a non-conformance that by itself is not indicative of a systemic problem with the management system. Minor non-conformances are typically isolated or random incidents and represent a low risk to workers and/or the environment.
  - 1.3 The entity shall calculate the non-conformance rates as the total number of non-conformances (in each respective category) identified among its supplier facilities divided by the number of supplier facilities audited.
- 2 The entity shall disclose the (2) corrective action rates associated with its supplier facilities' (a) major non-conformances, and separately, (b) minor non-conformances.
  - 2.1 A corrective action is defined as the completion of an action (generally identified in a corrective action plan) within 90 days for major non-conformances, and 60 days for minor non-conformances, that has been designed to eliminate

the cause of a detected non-conformance, including the implementation of practices or systems to eliminate any non-conformance and ensure there will be no reoccurrence of the non-conformance, as well as verification that the action has taken place.

- 2.2 The entity shall calculate the corrective action rates as the number of corrective actions that address non-conformances (in each respective category) divided by the total number of non-conformances (in each respective category) that have been identified.
  
- 3 The entity shall disclose the standards and/or code(s) of conduct to which it has measured social and environmental responsibility audit compliance.
  - 3.1 For internally developed supplier code(s) of conduct, the entity shall disclose the public location where such code(s) can be viewed.



# Ingredient Sourcing

## Topic Summary

Companies in the Non-Alcoholic Beverages industry source a wide range of ingredients from suppliers worldwide. The industry's ability to source ingredients and at certain price points fluctuates with supply availability, which may be affected by climate change, water scarcity, land management, and other resource scarcity considerations. This exposure can lead to price volatility which may affect company profitability. Ultimately, climate change, water scarcity, and land-use restrictions present risks to a company's long-term ability to source key materials and ingredients. Companies that source ingredients which are more productive and less resource-intensive, or work closely with suppliers to increase their adaptability to climate change and other resource scarcity risks will be better protected from price volatility and/or supply disruptions.

## Accounting Metrics

### **FB-NB-440a.1. Percentage of beverage ingredients sourced from regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the percentage of beverage ingredients sourced from regions with High or Extremely High Baseline Water Stress.
- 2 The percentage shall be calculated as the cost of beverage ingredients purchased from Tier 1 suppliers that withdraw and consume water in regions with High or Extremely High Baseline Water Stress for the production of the beverage ingredients divided by the total cost of agricultural products purchased from Tier 1 suppliers.
  - 2.1 Tier 1 suppliers are defined as suppliers that transact directly with the entity for agricultural products.
  - 2.2 The entity shall identify Tier 1 suppliers that withdraw and consume water in locations with High (40–80%) or Extremely High (>80%) Baseline Water Stress as classified by the World Resources Institute's (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 3 If the entity is unable to identify or collect data pertaining to all Tier 1 suppliers, the entity shall disclose the percentage of agricultural products for which the source region and water risks are unknown.

### **FB-NB-440a.2. List of priority beverage ingredients and description of sourcing risks due to environmental and social considerations**

- 1 The entity shall identify the highest priority beverage ingredients to its business.
  - 1.1 Priority beverage ingredients are defined as ingredients (excluding water) that constitute the largest beverage ingredient expense and/or those ingredients that have otherwise been identified by the entity as essential to its products or as having significant environmental or social risks.
  - 1.2 The scope of disclosure includes priority beverage ingredients sourced by the entity, including, but not limited to, those sourced directly from contract growers and from producer supply agreements.

- 2 The entity shall discuss its strategic approach to managing the environmental and social risks that arise from its highest priority beverage ingredients.
  - 2.1 Environmental risks include, but are not limited to, effects of drought and climate change on ingredient prices, reputational damage due to deforestation, and other risks resulting from the environmental impacts associated with the entity's supply chain.
  - 2.2 Social risks include, but are not limited to, effects of workers' rights on productivity, reputational damage due to human rights issues, and other risks resulting from the social impacts associated with the entity's supply chain.
  
- 3 The entity may identify which beverage ingredients present risks to its operations, the risks that are represented, and the strategies the entity uses to mitigate such risks.
  - 3.1 For environmental risks, relevant strategies to discuss may include, but are not limited to, the diversification of suppliers, supplier training programs on environmental best management practices, expenditures on research and development for alternative and substitute crops, and audits or certifications of suppliers' environmental practices.
  - 3.2 For social risks, relevant strategies to discuss include, but are not limited to, supplier training programs on agrochemical application, engagement with suppliers on labor and human rights issues, and maintenance of a supply chain code of conduct.

## PROCESSED FOODS

### Industry Description

The Processed Foods industry includes companies that process and package foods such as bread, frozen foods, snack foods, pet foods, and condiments for retail consumer consumption. Typically, these products are made ready to consume, are marketed for retail consumers, and can be found on food retailers' shelves. The industry is characterized by large and complex ingredient supply chains, as many companies source ingredients from around the world. Large companies operate globally, and international opportunities are driving growth.

Table 1. *Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	FB-PF-130a.1
Water Management	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	FB-PF-140a.1
	Number of incidents of non-compliance associated with water quantity and/or quality permits, standards, and regulations	Quantitative	Number	FB-PF-140a.2
	Description of water management risks and discussion of strategies and practices to mitigate those risks	Discussion and Analysis	n/a	FB-PF-140a.3
Environmental & Social Impacts of Ingredient Supply Chain	Percentage of food ingredients sourced that are certified to third-party environmental and/or social standards, and percentages by standard	Quantitative	Percentage (%) by cost	FB-PF-430a.1
	Suppliers' social and environmental responsibility audit (1) non-conformance rate and (2) associated corrective action rate for (a) major and (b) minor non-conformances	Quantitative	Rate	FB-PF-430a.2
Ingredient Sourcing	Percentage of food ingredients sourced from regions with High or Extremely High Baseline Water Stress	Quantitative	Percentage (%) by cost	FB-PF-440a.1
	List of priority food ingredients and discussion of sourcing risks due to environmental and social considerations	Discussion and Analysis	n/a	FB-PF-440a.2

Table 2. *Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Weight of products sold	Quantitative	Metric tons (t)	FB-PF-000.A
Number of production facilities	Quantitative	Number	FB-PF-000.B

# Energy Management

## Topic Summary

The Processed Foods industry is highly reliant on energy and fuel as primary inputs for value creation in manufacturing food products. Energy is needed to operate large manufacturing facilities for cooking, refrigeration, and packaging. Energy production and consumption contributes to significant environmental impacts, including climate change and pollution, which have the potential to indirectly, yet materially, impact the results of operations of processed foods companies. Energy efficiency in production and distribution can mitigate exposure to volatile energy costs and limit a company's contribution to direct and indirect greenhouse gas (GHG) emissions. Producers may be able to further reduce the risk posed by volatile fossil fuel energy costs—particularly natural gas, which is used heavily in the industry—by diversifying their energy portfolio across a range of sources. Decisions regarding the use of alternative fuels, renewable energy, and on-site generation of electricity versus purchasing from the grid, can play an important role in influencing both the costs and reliability of the energy supply.

## Accounting Metrics

### **FB-PF-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase

agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

# Water Management

## Topic Summary

Processed Foods companies rely on a large water supply for cooking, processing, and cleaning finished goods. Additionally, companies in the industry generate and must manage its wastewater discharge from processing activities. As water scarcity becomes an issue of increasing importance, processed foods companies—especially those operating in water-stressed regions—may face increasing operational risks. Companies in the industry may face higher operational costs as well as water shortages due to physical availability and/or regulations. Companies can manage water-related risks and opportunities through capital investments and assessment of facility locations relative to water scarcity risks, improvements to operational efficiency, and partnerships with regulators and communities on issues related to water access and effluent.

## Accounting Metrics

### **FB-PF-140a.1. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.
  - 1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 2.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:
    - 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 3.1.2 Water that is directly or indirectly incorporated into the entity's product or service;
    - 3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.

- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

### **FB-PF-140a.2. Number of incidents of non-compliance associated with water quantity and/or quality permits, standards, and regulations**

- 1 The entity shall disclose the total number of instances of non-compliance, including violations of a technology-based standard and exceedances of quantity and/or quality-based standards.
- 2 The scope of disclosure includes incidents governed by national, state, and local statutory permits and regulations, including, but not limited to, the discharge of a hazardous substance, violation of pretreatment requirements, or total maximum daily load (TMDL) exceedances.
- 3 The scope of disclosure shall only include incidents of non-compliance that resulted in a formal enforcement action(s).
  - 3.1 Formal enforcement actions are defined as governmental actions that address a violation or threatened violation of water quantity and/or quality laws, regulations, policies, or orders, and can result in administrative penalty orders, administrative orders, and judicial actions, among others. For example, the U.S. Environmental Protection Agency (EPA) provides guidance on the scope of formal enforcement actions in, [Informal and Formal Actions, Summary Guidance and Portrayal on EPA Websites](#).
- 4 Violations shall be disclosed, regardless of their measurement methodology or frequency. These include violations for:
  - 4.1 Continuous discharges, limitations, standards, and prohibitions that are generally expressed as maximum daily, weekly average, and monthly averages
  - 4.2 Non-continuous discharges and limitations that are generally expressed in terms of frequency, total mass, maximum rate of discharge, and mass or concentration of specified pollutants

### **FB-PF-140a.3. Description of water management risks and discussion of strategies and practices to mitigate those risks**

- 1 The entity shall describe its water management risks associated with water withdrawals, water consumption, and discharge of water and/or wastewater.
  - 1.1 Risks associated with water withdrawals and water consumption include risks to the availability of adequate, clean water resources, including, but not limited to:

- 1.1.1 Environmental constraints—such as operating in water-stressed regions, drought, concerns of aquatic impingement or entrainment, interannual or seasonal variability, and risks due to the impact of climate change
    - 1.1.2 Regulatory and financial constraints—such as volatility in water costs, stakeholder perceptions and concerns related to water withdrawals (e.g., those from local communities, non-governmental organizations, and regulatory agencies), direct competition with and impact from the actions of other users (e.g., commercial and municipal users), restrictions to withdrawals due to regulations, and constraints on the entity’s ability to obtain and retain water rights or permits
  - 1.2 Risks associated with the discharge of water and/or wastewater, include, but are not limited to, the ability to obtain rights or permits related to discharges, compliance with regulations related to discharges, restrictions to discharges, the ability to maintain control over the temperature of water discharges, liabilities and/or reputational risks, and increased operating costs due to regulation, stakeholder perceptions and concerns related to water discharges (e.g., those from local communities, non-governmental organizations, and regulatory agencies).
- 2 The entity may describe water management risks in the context of:
  - 2.1 How risks may vary by withdrawal source, including surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities; and
  - 2.2 How risks may vary by discharge destinations, including surface water, groundwater, or wastewater utilities.
- 3 The entity may discuss the potential impacts that water management risks may have on its operations and the timeline over which such risks are expected to manifest.
  - 3.1 Impacts may include, but are not limited to, those associated with costs, revenues, liabilities, continuity of operations, and reputation.
- 4 The entity shall discuss its short-term and long-term strategies or plan to mitigate water management risks, including, but not limited to:
  - 4.1 The scope of its strategy, plans, goals and/or targets, such as how they relate to different business units, geographies, or water-consuming operational processes.
  - 4.2 Any water management goals and/or targets it has prioritized, and an analysis of performance against those goals and/or targets.
    - 4.2.1 Goals and targets may include, but are not limited to, those associated with reducing water withdrawals, reducing water consumption, reducing water discharges, reducing aquatic impingements, improving the quality of water discharges, and regulatory compliance.
  - 4.3 The activities and investments required to achieve the plans, goals and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.



- 4.4 Disclosure of strategies, plans, goals, and/or targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.
- 5 For water management targets, the entity shall additionally disclose:
  - 5.1 Whether the target is absolute or intensity-based, and the metric denominator if it is an intensity-based target.
  - 5.2 The timelines for the water management plans, including the start year, the target year, and the base year.
  - 5.3 The mechanism(s) for achieving the target, including:
    - 5.3.1 Efficiency efforts, such as the use of water recycling and/or closed-loop systems;
    - 5.3.2 Product innovations such as redesigning products or services to require less water;
    - 5.3.3 Process and equipment innovations, such as those that enable the reduction of aquatic impingements or entrainments;
    - 5.3.4 Use of tools and technologies (e.g., the [World Wildlife Fund Water Risk Filter](#), [The Global Water Tool](#), and [Water Footprint Network Footprint Assessment Tool](#)) to analyze water use, risk, and opportunities;
    - 5.3.5 Collaborations or programs in place with the community or other organizations.
  - 5.4 The percentage reduction or improvement from the base year, where the base year is the first year against which water management targets are evaluated toward the achievement of the target.
- 6 The entity shall discuss whether its water management practices result in any additional lifecycle impacts or tradeoffs in its organization, including tradeoffs in land use, energy production, and greenhouse gas (GHG) emissions, and why the entity chose these practices despite lifecycle tradeoffs.

# Environmental & Social Impacts of Ingredient Supply Chain

## Topic Summary

Companies in the Processed Foods industry manage global supply chains to source a wide range of ingredient inputs. How companies screen, monitor, and engage with suppliers on environmental and social topics affects the ability of companies to maintain a steady supply and manage price fluctuations. Supply chain management issues related to labor and environmental practices, ethics, or corruption may also result in regulatory fines and/or increased long-term operational costs for companies. The consumer-facing nature of the industry increases the reputational risks associated with supplier performance. Companies can engage with key suppliers to manage environmental and social risks to improve supply chain resiliency, mitigate reputational risks, and potentially increase consumer demand or capture new market opportunities.

## Accounting Metrics

### **FB-PF-430a.1. Percentage of food ingredients sourced that are certified to third-party environmental and/or social standards, and percentages by standard**

- 1 The entity shall disclose the percentage of food ingredients sourced that are certified to a third-party environmental and/or social standard.
  - 1.1 Environmental standards are defined as standards that address environmental impacts related to the production of food ingredients such as, protection of primary forests, maintenance of surface water and groundwater quality, and implementation of integrated pest management solutions or an Organic System Plan.
  - 1.2 Social standards are defined as standards that address social impacts related to the production of food ingredients such as, compensation of workforce, training and continual monitoring of health and safety risks associated with the application of agrochemicals and child-labor practices.
  - 1.3 The percentage shall be calculated as the cost of food ingredients purchased from Tier 1 suppliers that have been certified to a third-party environmental and/or social standard divided by the total cost of food ingredients purchased from Tier 1 suppliers.
  - 1.4 Examples of certifications to third-party environmental and social standards include, but are not limited to:
    - 1.4.1 Bonsucro
    - 1.4.2 Fairtrade International
    - 1.4.3 Fair Trade USA
    - 1.4.4 Roundtable on Sustainable Palm Oil (RSPO)
    - 1.4.5 Roundtable on Responsible Soy (RTRS)
    - 1.4.6 Rainforest Alliance
    - 1.4.7 SA8000
    - 1.4.8 U.S. Department of Agriculture (USDA) Organic
    - 1.4.9 UTZ Certified

- 2 The entity shall disclose the percentage of food ingredients it sourced that are certified to a third-party environmental or social standard, by standard.
  - 2.1 The entity shall calculate the percentage as the cost of food ingredients purchased from Tier 1 suppliers that have been certified to each respective third-party environmental or social standard divided by the total cost of agricultural products purchased from Tier 1 suppliers.
    - 2.1.1 For Bonsucro certification, the entity shall disclose whether the food ingredients are certified to the Bonsucro Production Standard or the Bonsucro Chain of Custody Standard.
    - 2.1.2 For Fairtrade International and Fair Trade USA, the entity shall disclose whether the food ingredients are certified to the standards for small producer organizations, hired labor, contract production, traders, independent small holders, or capture fisheries.
    - 2.1.3 For RSPO certification, the entity shall disclose which of the RSPO supply chain models the food ingredients are certified to: Identity Preserved (IP); Segregated (SG); Mass Balance (MB); or Book & Claim (B&C).
    - 2.1.4 For RTRS certification, the entity shall disclose whether the food ingredients are certified to the RTRS Production standard or the RTRS Chain of Custody Standard and whether traceability in the chain of custody standard is kept through segregation or mass balance.
    - 2.1.5 For other third-party certifications, the entity may specify the type of certification if there are multiple types.
  - 2.2 The entity may aggregate the percentages of multiple third-party certifications into one aggregate percentage, if the certifications are for the same food ingredient and deliver similar environmental and/or social criteria.
- 3 The scope of disclosure includes food ingredients purchased from Tier 1 suppliers.
  - 3.1 Tier 1 suppliers are defined as suppliers that transact directly with the entity for food ingredients.

**FB-PF-430a.2. Suppliers' social and environmental responsibility audit (1) non-conformance rate and (2) associated corrective action rate for (a) major and (b) minor non-conformances**

- 1 The entity shall disclose its supplier facilities' (1) non-conformance rate with external social and environmental audit standard(s) or internally developed supplier code(s) of conduct for (a) major non-conformances, and separately, (b) minor non-conformances.
  - 1.1 A major non-conformance is defined as the highest severity of non-conformance and require escalation by auditors. Major non-conformances confirm the presence of underage child workers (below the legal age for work or apprenticeship), forced labor, health and safety issues that can cause immediate danger to life or serious injury, and/or environmental practices that can cause serious and immediate harm to the community. Major non-conformance includes material breach or systemic breaking of code requirement or law. Major non-conformances may also be referred to as critical or priority non-conformances.

- 1.2 A minor non-conformance is defined as a non-conformance that by itself is not indicative of a systemic problem with the management system. Minor non-conformances are typically isolated or random incidents and represent a low risk to workers and/or the environment.
  - 1.3 The entity shall calculate the non-conformance rates as the total number of non-conformances (in each respective category) identified among its supplier facilities divided by the number of supplier facilities audited.
- 2 The entity shall disclose the (2) corrective action rates associated with its supplier facilities' (a) major non-conformances, and separately, (b) minor non-conformances.
  - 2.1 A corrective action is defined as the completion of an action (generally identified in a corrective action plan) within 90 days, that has been designed to eliminate the cause of a detected non-conformance, including the implementation of practices or systems to eliminate any non-conformance and ensure there will be no reoccurrence of the non-conformance, as well as verification that the action has taken place.
  - 2.2 The entity shall calculate the corrective action rates as the number of corrective actions that address non-conformances (in each respective category) divided by the total number of non-conformances (in each respective category) that have been identified.
- 3 The entity shall disclose the standards and/or code(s) of conduct to which it has measured social and environmental responsibility audit compliance.
  - 3.1 For internally developed supplier code(s) of conduct, the entity shall disclose the public location where such code(s) can be viewed.

# Ingredient Sourcing

## Topic Summary

Companies in the Processed Foods industry source a wide range of ingredients, largely agricultural inputs, from global suppliers. The industry's ability to source ingredients and at certain price points fluctuates with supply availability, which may be affected by climate change, water scarcity, land management, and other resource scarcity considerations. This exposure can lead to price volatility which may affect company profitability. Climate change, water scarcity, and land-use restrictions present risks to a company's long-term ability to source key materials and ingredients. Companies that source ingredients which are more productive and less resource-intensive, or work closely with suppliers to increase their adaptability to climate change and other resource scarcity risks will be better protected from price volatility and/or supply disruptions.

## Accounting Metrics

### FB-PF-440a.1. Percentage of food ingredients sourced from regions with High or Extremely High Baseline Water Stress

- 1 The entity shall disclose the percentage of food ingredients sourced from regions with High or Extremely High Baseline Water Stress.
- 2 The percentage shall be calculated as the cost of food ingredients purchased from Tier 1 suppliers that withdraw and consume water in regions with High or Extremely High Baseline Water Stress for the production of the agricultural products divided by the total cost of food ingredients purchased from Tier 1 suppliers.
  - 2.1 Tier 1 suppliers are defined as suppliers that transact directly with the entity for food ingredients.
  - 2.2 The entity shall identify Tier 1 suppliers that withdraw and consume water in locations with High (40–80%) or Extremely High (>80%) Baseline Water Stress as classified by the World Resources Institute's (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 3 If the entity is unable to identify or collect data pertaining to all Tier 1 suppliers, the entity shall disclose the percentage of agricultural products for which the source region and water risks are unknown.

### FB-PF-440a.2. List of priority food ingredients and discussion of sourcing risks due to environmental and social considerations

- 1 The entity shall identify the highest priority food ingredients to its business.
  - 1.1 Priority food ingredients are defined as ingredients (excluding water) that constitute the largest food ingredient expense and/or those ingredients that have otherwise been identified by the entity as essential to its products or as having significant environmental or social risks.
  - 1.2 The scope of disclosure includes priority food ingredients sourced by the entity, including, but not limited to, those sourced directly from contract growers and from producer supply agreements.

- 2 The entity shall discuss its strategic approach to managing the environmental and social risks that arise from its highest priority food ingredients.
  - 2.1 Environmental risks include, but are not limited to, effects of drought and climate change on ingredient prices, reputational damage due to deforestation, and other risks resulting from the environmental impacts associated with the entity's supply chain.
  - 2.2 Social risks include, but are not limited to, effects of workers' rights on productivity, reputational damage due to human rights issues, and other risks resulting from the social impacts associated with the entity's supply chain.
  
- 3 The entity may identify which food ingredients present risks to its operations, the risks that are represented, and the strategies the entity uses to mitigate such risks.
  - 3.1 For environmental risks, relevant strategies to discuss may include, but are not limited to, the diversification of suppliers, supplier training programs on environmental best management practices, expenditures on research and development for alternative and substitute crops, and audits or certifications of suppliers' environmental practices.
  - 3.2 For social risks, relevant strategies to discuss include, but are not limited to, supplier training programs on agrochemical application, engagement with suppliers on labor and human rights issues, and maintenance of a supply chain code of conduct.

## RESTAURANTS

### Industry Description

Companies in the Restaurants industry prepare meals, snacks, and beverages to customers' orders for immediate on- and off-premises consumption. Broadly divided into three sub-categories, the restaurant industry includes limited-service eating places, casual full-service eating places, and upscale full-service eating places. Limited-service restaurants provide services to customers who order and pay before eating. Fast-food restaurants represent the largest share of the limited-service restaurants segment. Full-service restaurants offer more service, food for consumption primarily on-premise, and typically reflect higher quality food and prices.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	FB-RN-130a.1
Water Management	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	FB-RN-140a.1
Supply Chain Management & Food Sourcing	Percentage of food purchased that (1) meets environmental and social sourcing standards and (2) is certified to third-party environmental and/or social standards	Quantitative	Percentage (%) by cost	FB-RN-430a.1
	Discussion of strategy to manage environmental and social risks within the supply chain, including animal welfare	Discussion and Analysis	n/a	FB-RN-430a.3

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of (1) company-owned and (2) franchise restaurants	Quantitative	Number	FB-RN-000.A
Number of employees at (1) company-owned and (2) franchise locations	Quantitative	Number	FB-RN-000.B

# Energy Management

## Topic Summary

Restaurant operations have high energy intensity compared to other commercial building operations. Commercial kitchen appliances are extremely energy intensive, and dining areas are typically temperature-controlled for customers. Fossil fuel-based energy production and consumption contribute to significant environmental impacts, including climate change and air pollution, which have the potential to indirectly, yet materially, impact the results of restaurant operations. Regulations on greenhouse gas (GHG) emissions pricing or regulatory incentives for energy efficiency improvements and renewable energy affect conventional and renewable energy prices. Companies that manage energy consumption at company-owned and franchise locations can decrease operational costs through energy efficiency upgrades and limit exposure to GHG emissions regulations through the use of renewable energy resources.

## Accounting Metrics

### **FB-RN-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a



Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

# Water Management

## Topic Summary

Water is used throughout restaurant operations, from cooking and dishwashing to cleaning. The restaurant format, size, and equipment all affect water use. Restaurants located in water-stressed regions may be exposed to water usage restrictions or face high water costs. Long-term historic increases in the costs of water, and expectations around continued increases due to overconsumption and constrained supplies resulting from population growth and shifts, pollution, and climate change, indicate the heightened importance of water management. Companies can reduce water use and associated operational costs through implementing water-efficient practices and using water-efficient commercial kitchen equipment.

## Accounting Metrics

### **FB-RN-140a.1. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.
  - 1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 2.2 Water obtained from a water utility in compliance with [U.S. National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:
    - 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 3.1.2 Water that is directly or indirectly incorporated into the entity's product or service;
    - 3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.

- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

# Supply Chain Management & Food Sourcing

## Topic Summary

Restaurants source ingredients and products from a wide range of suppliers. Supply chain management is crucial for restaurants to ensure food safety, protect their reputations, and improve revenues. Sourcing quality ingredients to maintain a consistent level of quality across different locations can be operationally challenging. This problem is exacerbated by the global nature of the industry. Demand from food and beverage industries, including restaurants, drives and shapes agricultural production, indicating that actions by industry players have larger impacts on society. Therefore, sustainable and ethical sourcing by industry players is necessary to ensure continued future supply and to minimize lifecycle impacts of company operations. Sourcing from suppliers that have high quality standards, employ environmentally sustainable farming methods, and honor labor rights will better position companies to protect long-term shareholder value. By increasing the amount of food supply sourced in conformance with environmental and social standards, as well as conformance with animal welfare standards and best practices, restaurant operators will be able to maintain food quality, manage food safety issues, enhance their reputation, and expand their market share.

## Accounting Metrics

### **FB-RN-430a.1. Percentage of food purchased that (1) meets environmental and social sourcing standards and (2) is certified to third-party environmental and/or social standards**

- 1 The entity shall disclose (1) the percentage of food purchased that meets both environmental and social sourcing standards.
  - 1.1 Environmental standards are defined as standards that address environmental impacts related to food production such as, protection of natural resources and improvements in resource efficiency.
  - 1.2 Social standards are defined as standards that address social impacts related to food production such as, treatment of workers and community, animal health and welfare, and food quality and safety.
  - 1.3 The percentage shall be calculated as the cost of food (and food products) purchased that meets environmental and social standards divided by the total cost of food (and food products) purchased.
  - 1.4 The scope of environmental and/or social standards includes programs, guidelines, best practices, criteria, codes of conduct, and certifications that are developed internally, through industry initiatives, or by third-parties.
  - 1.5 Examples of environmental and social sourcing standards include, but are not limited to:
    - 1.5.1 Global Roundtable for Sustainable Beef [Principles & Criteria for Defining Global Sustainable Beef](#)
    - 1.5.2 IDH [Sustainability Initiative Fruits and Vegetables \(SIFAV\)](#)
    - 1.5.3 Sustainable Agriculture Initiative (SAI) Platform, Principles & Practices for Dairy Farming, Sustainable Fruit Production, Sustainable Green Coffee Production, and Sustainable Production of Arable & Vegetable Crops
- 2 The entity shall disclose (2) the percentage of food purchased that has been certified to a third-party environmental and/or social standard.

2.1 The percentage shall be calculated as the cost of food (and food products) purchased that has been certified to a third-party environmental and/or social standard divided by the total cost of food (and food products) purchased.

2.2 Examples of certifications to third-party environmental and social standards include, but are not limited to:

2.2.1 Fairtrade International

2.2.2 Fair Trade USA

2.2.3 Marine Stewardship Council

2.2.4 Rainforest Alliance Certified

2.2.5 Roundtable on Responsible Soy (RTRS)

2.2.6 Roundtable on Sustainable Palm Oil (RSPO)

3 The entity shall generally indicate which third-party environmental and social standards it uses.

### **FB-RN-430a.3. Discussion of strategy to manage environmental and social risks within the supply chain, including animal welfare**

1 The entity shall discuss its strategic approach to managing its environmental and social risks that are present within, or arise out of, its food and food products supply chain.

1.1 Environmental and social risks may include, but are not limited to:

1.1.1 Impacts on crop and livestock production due to climate change (e.g., changing average temperatures and water stress) that may affect cost and availability of produce, meat, poultry, dairy, and processed foods products

1.1.2 Animal feed price increases resulting from environmental and social factors and/or tightening environmental regulations that may have price impacts on meat, poultry, and dairy

1.1.3 Fuel economy regulations that affect transportation costs

1.1.4 Labor rights and immigration reforms that affect food prices and availability

1.1.5 International trade barriers and/or varying levels of food safety oversight in a global market

1.1.6 Commercial catch limits that could affect the supply of seafood products

1.1.7 Animal welfare, human rights, or related supply chain incidents that may result in reputational damage

1.2 Relevant strategies to discuss may include, but are not limited to, supplier screening, diversification of suppliers, supplier training programs on environmental best management practices, supplier engagement on labor and human rights issues, and maintenance of a supply chain code of conduct, supply chain audits, and certifications.

2 The entity may identify which products or product lines present risks to its operations, the risks that are represented, and the strategies the entity uses to mitigate such risks.

3 The entity shall discuss its animal welfare standards applicable to its supply chain.

- 3.1 Animal welfare standards are defined as policies for beef, pork, poultry, and/or dairy production conditions, including:
  - 3.1.1 Animal treatment and handling
  - 3.1.2 Housing and transportation conditions
  - 3.1.3 Slaughter facilities and procedures
  - 3.1.4 Use of antibiotics and hormones
- 3.2 Discussion shall include, but is not limited to:
  - 3.2.1 Any targets the entity has related to animal welfare standards and its progress toward those targets
  - 3.2.2 Any requirements for suppliers related to animal welfare standards
  - 3.2.3 How, if in any way, animal welfare standards are addressed in supplier contracts
- 4 The entity shall describe its use of animal welfare certifications, where certifications include, but are not limited to: Animal Welfare Approved, Certified Humane Program, Food Alliance Certified, and Global Animal Partnership 5-Step Animal Welfare Rating Program.
- 5 The entity may disclose the percentage of animal protein sold, by animal protein type, that is produced without medically important antibiotics.
  - 5.1 Medically important antibiotics (or “medically important antimicrobial drugs”) are defined according to the U.S. Food and Drug Administration’s (FDA) Veterinary Feed Directive (VFD) as all three tiers (“critically important,” “highly important,” and “important”) of antimicrobial drugs listed in Appendix A to its Guidance for Industry (GFI) #152 to be “medically important.”
  - 5.2 The percentage is calculated as the carcass (or dressed) weight of animal protein purchased that did not receive medically important antibiotics at any stage of its life divided by the total carcass (or dressed) weight of animal protein purchased.

## DRUG RETAILERS

### Industry Description

The Drug Retailers industry comprises companies that operate retail pharmacies and distribution centers that supply retail stores. Stores may be company-owned or franchised. Large companies operate mainly in the U.S. and source drugs and other merchandise through wholesalers and distributors. The majority of the industry's revenues are derived from consumer sales of prescription and over-the-counter pharmaceutical products; other goods sold include household goods, personal care products, and a limited selection of groceries. Additionally, the pharmacy retailer segment is expanding its health-focused services by offering clinics at various retail locations, which adds to the industry's shifting sustainability landscape.

Table 1. *Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management in Retail	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	HC-DR-130a.1

Table 2. *Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of pharmacy locations	Quantitative	Number	HC-DR-000.A
Total area of retail space	Quantitative	Square meters (m <sup>2</sup> )	HC-DR-000.B
Number of prescriptions filled, percentage for controlled substances	Quantitative	Number, Percentage (%)	HC-DR-000.C
Number of pharmacists <sup>30</sup>	Quantitative	Number	HC-DR-000.D

<sup>30</sup>

Pharmacists are employees in the 29-1051 group of the EEO-1 Job Classification Guide who dispense drugs prescribed by physicians and other health practitioners and provide information to patients about medications and their use. Pharmacists may advise physicians and other health practitioners on the selection, dosage, interactions, and side effects of medications.

# Energy Management in Retail

## Topic Summary

Chain drug retailers operate thousands of locations that consume large quantities of energy. Electricity is used primarily for lighting and refrigeration purposes. Energy demand is often increased by the fact that many retail locations operate around the clock. Energy efficiency in operation and the diversification of energy portfolios across a range of supply sources can mitigate exposure to rising energy costs and limit a company's contribution to indirect greenhouse gas emissions.

## Accounting Metrics

### HC-DR-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.
    - 3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.



- 3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
    - 3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.
  - 3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:
    - 3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;
    - 3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.
- 4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

## HEALTH CARE DELIVERY

### Industry Description

The Health Care Delivery industry owns and manages hospitals, clinics, and other health care-related facilities. Companies provide a range of services, including inpatient and outpatient care, surgery, mental health, rehabilitation, and clinical laboratory services. Demand for health care delivery services is driven largely by rates of insurance coverage, demographics, illness, and injury rates. The U.S. Patient Protection and Affordable Care Act (PPACA) increased the number of individuals with insurance, however, the future of this legislation remains uncertain. The industry is characterized by high fixed labor and facilities costs, and an increased regulatory emphasis on reduced costs of care and improved outcomes. Health care delivery companies also face significant competition for patients and resources from private, nonprofit, and religious health care systems.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	HC-DY-130a.1
Waste Management	Total amount of medical waste, percentage (a) incinerated, (b) recycled or treated, and (c) landfilled	Quantitative	Metric tons (t)	HC-DY-150a.1
	Total amount of: (1) hazardous and (2) non-hazardous pharmaceutical waste, percentage (a) incinerated, (b) recycled or treated, and (c) landfilled	Quantitative	Metric tons (t), Percentage (%)	HC-DY-150a.2
Climate Change Impacts on Human Health & Infrastructure	Description of policies and practices to address: (1) the physical risks due to an increased frequency and intensity of extreme weather events and (2) changes in the morbidity and mortality rates of illnesses and diseases, associated with climate change	Discussion and Analysis	n/a	HC-DY-450a.1
	Percentage of health care facilities that comply with the Centers for Medicare and Medicaid Services (CMS) Emergency Preparedness Rule	Quantitative	Percentage (%)	HC-DY-450a.2

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of (1) facilities and (2) beds, by type	Quantitative	Number	HC-DY-000.A
Number of (1) inpatient admissions and (2) outpatient visits	Quantitative	Number	HC-DY-000.B

# Energy Management

## Topic Summary

Health care delivery companies operate energy-intensive facilities and rely on both purchased electricity and fuel. The consumption of both can contribute to environmental impacts, including climate change and pollution. Legislative attempts to limit these impacts and to incentivize energy efficiency and renewable energy may result in price volatility associated with fossil fuels and conventional electricity. Companies that are able to improve energy efficiency can decrease costs and limit exposure to fluctuations in energy pricing.

## Accounting Metrics

### HC-DY-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

- 3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.
- 3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:
- 3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;
  - 3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.
- 4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

# Waste Management

## Topic Summary

Health care delivery companies generate a significant amount of regulated medical and pharmaceutical waste. Disposal fees for these types of waste are typically higher than that of conventional waste and can present a significant cost for the industry. Companies that are able to reduce the amount of waste generated by enhanced waste segregation strategies, recycling, and reuse can limit their exposure to these costs.

## Accounting Metrics

### HC-DY-150a.1. Total amount of medical waste, percentage (a) incinerated, (b) recycled or treated, and (c) landfilled

- 1 The entity shall disclose the total amount of medical waste generated, in metric tons, aggregated for all facilities it owns and operates.
- 2 Medical waste (also known as regulated medical waste, infectious waste, biomedical waste, or biohazardous waste), that may be subject to federal or state level regulation, shall be defined according to the expired [Medical Waste Tracking Act of 1988](#) and includes:
  - 2.1 Cultures and Stocks — Cultures and stocks of infection agents and associated biological cultures, including cultures from medical and pathological laboratories, and stocks of infectious agents from research and industrial laboratories, waste from the production of biological, discarded live and attenuated vaccines, and culture dishes and devices used to transfer, inoculate, and mix cultures.
  - 2.2 Pathological Wastes — Human pathological wastes, including tissues, organs, body parts, and body fluids that are removed during surgery and autopsy, or other medical procedures, and specimens of body fluids and their containers.
  - 2.3 Human Blood and Blood Products — (1) Liquid waste human blood; (2) products of blood; (3) items saturated and/or dripping with human blood; or (4) items that were saturated and/or dripping with human blood that are now caked with dried human blood, including serum, plasma, and other blood components, and their containers that were used or intended for use in patient care, testing and laboratory analysis, or the development of pharmaceuticals. Intravenous bags are also included in this category.
  - 2.4 Sharps — Sharps that have been used in animal or human patient care or treatment, or in medical research or industrial laboratories, including hypodermic needles, syringes (with or without the attached needle), Pasteur pipettes, scalpel blades, blood vials, needles with attached tubing, and culture dishes (regardless of presence of infectious agents). Also included are other types of broken or unbroken glassware that were in contact with infectious agents, such as used slide and cover slips.
  - 2.5 Animal Waste — Contaminated animal carcasses, body parts, and bedding of animals that were known to have been exposed to infectious agents during research (including research in veterinary hospitals), production of biologicals, or testing of pharmaceuticals.

- 2.6 Isolation Wastes — Biological waste and discarded materials contaminated with blood, excretion, exudates, or secretions from humans who are isolated to protect others from certain highly communicable diseases, or isolated animals known to be infected with highly communicable diseases.
  - 2.7 Unused Sharps — The following unused discarded sharps: hypodermic needles, suture needles, syringes, and scalpel blades.
- 3 The entity shall calculate the percentages of medical waste by their final disposition method as the total weight of medical waste generated that was (a) incinerated, (b) recycled or treated, and (c) landfilled, divided by the total weight of medical waste generated.
    - 3.1 Recycling or treatment shall include disposal via recycling facility, treatment facility, or other (e.g., return to a supplier or commercial composting).
  - 4 If the entity utilizes a waste transport service, broker, or intermediary to handle its medical waste, it shall make a good faith effort to determine the final disposition method.

**HC-DY-150a.2. Total amount of: (1) hazardous and (2) non-hazardous pharmaceutical waste, percentage (a) incinerated, (b) recycled or treated, and (c) landfilled**

- 1 The entity shall disclose (1) the total amount of hazardous pharmaceutical waste generated, in metric tons, aggregated for all facilities it owns and operates, and the percentage (a) incinerated, (b) recycled or treated, and (c) landfilled.
  - 1.1 Hazardous waste includes listed Resource Conservation and Recovery Act (RCRA) waste and non-listed, characteristic waste.
    - 1.1.1 Listed RCRA waste is defined as waste that appears on one of the four hazardous wastes lists (F-list, K-list, P-list, or U-list) found in regulation 40 CFR Part 261.
    - 1.1.2 Non-listed, characteristic waste is defined as waste that exhibits at least one of four characteristics: ignitibility, corrosivity, reactivity, or toxicity.
  - 1.2 The entity shall follow the most recent version of definitions provided by the Environmental Protection Agency (EPA) Management Standards for Hazardous Waste Pharmaceuticals.
  - 1.3 The entity shall calculate the percentages of hazardous pharmaceutical waste by their final disposition method as the total weight of hazardous pharmaceutical waste generated that was (a) incinerated, (b) recycled/treated, and (c) landfilled, divided by the total weight of hazardous pharmaceutical waste generated.
    - 1.3.1 Recycling or treatment shall include disposal via recycling facility, treatment facility, or other (e.g., return to a supplier or commercial composting).
- 2 The entity shall disclose (2) the total amount of non-hazardous pharmaceutical waste generated, in metric tons, aggregated for all facilities it owns and operates, and the percentage (a) incinerated, (b) recycled or treated, and (c) landfilled.

- 2.1 Non-hazardous (solid) waste is defined as any garbage or refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities. It may require special handling because it is a controlled substance or poses an environmental or human health effect.
- 2.2 The entity shall calculate the percentages of non-hazardous pharmaceutical waste by their final disposition method as the total weight of non-hazardous pharmaceutical waste generated that was (a) incinerated, (b) recycled/treated, and (c) landfilled, divided by the total weight of non-hazardous pharmaceutical waste generated.
  - 2.2.1 Recycling or treatment shall include disposal via recycling facility, treatment facility, or other (e.g., return to a supplier or commercial composting).
- 3 If there are other disposition methods for hazardous or non-hazardous pharmaceutical waste (e.g., composting or permanent long-term storage), then the entity should disclose these.
- 4 If the entity utilizes a waste transport service, broker, or intermediary to handle its pharmaceutical waste, it shall make a good faith effort to determine the final disposition method.

# Climate Change Impacts on Human Health & Infrastructure

## Topic Summary

An increase in extreme weather events associated with climate change could present physical threats to health care delivery facilities and create challenges in serving affected populations. Coupled with the potential spread of infectious diseases, and food and water scarcity, these events may present material implications for the Health Care Delivery industry. Company disclosure on policies, practices, and preparedness relating to climate change will help investors understand how value will be protected.

## Accounting Metrics

### **HC-DY-450a.1. Description of policies and practices to address: (1) the physical risks due to an increased frequency and intensity of extreme weather events and (2) changes in the morbidity and mortality rates of illnesses and diseases, associated with climate change**

- 1 The entity shall describe the nature, scope, and implementation of its policies and practices related to addressing the risks to physical infrastructure and assets presented by changes in the frequency, severity, type, and geographic location of extreme weather events such as:
  - 1.1 Risks to physical infrastructure that is located in flood prone low-lying and/or hurricane-prone areas
  - 1.2 Risks to physical infrastructure based on facility design, such as having key medical equipment in basements or the availability of backup power
  
- 2 The entity shall describe the nature, scope, and implementation of its policies and practices related to addressing the risks presented by the changes in prevalence, geography, and severity of certain diseases that are likely to be impacted by climate change, such as:
  - 2.1 The need for added and/or flexible capacity due to influx of patients due to heat-related illness
  - 2.2 Obtaining the necessary facilities and expertise to identify and treat changing disease profiles in patients, such as for:
    - 2.2.1 Malaria, dengue fever, and other vector borne diseases that affect tropical populations, but due to climate change may target non-tropical regions in the future
    - 2.2.2 Heat-related diseases (e.g., lung diseases such as asthma caused by increases in ground level ozone)
    - 2.2.3 Waterborne diseases (e.g., cholera due to increased flooding incidence)
    - 2.2.4 Human developmental disorders (e.g., malnutrition due to decreased food availability)

### **HC-DY-450a.2. Percentage of health care facilities that comply with the Centers for Medicare**



## **and Medicaid Services (CMS) Emergency Preparedness Rule**

- 1 The entity shall disclose the percentage of the health care facilities that it owns or operates that are in compliance with the Centers for Medicare and Medicaid Services (CMS) [Emergency Preparedness Rule](#).
  - 1.1 The rule and the terms of compliance are determined by the CMS in the Medicare and Medicaid Programs Emergency Preparedness Requirements for Medicare and Medicaid Participating Providers and Suppliers.
  - 1.2 The entity shall consider the Emergency Preparedness Rule as a normative reference; therefore, any updates made year-on-year shall be considered as updates to this guidance.
  
- 2 The entity shall indicate the number of health care facilities it owns or operates which have been excluded from the Emergency Preparedness Rule.

## HEALTH CARE DISTRIBUTORS

### Industry Description

Health care distributors purchase, inventory, and sell pharmaceutical products and medical equipment to hospitals, pharmacies, and physicians. Demand for the industry’s services is driven largely by rates of insurance, pharmaceutical spending, illness, and demographics. Increased enrollment in government insurance programs under the U.S Patient Protection and Affordable Care Act, electronic health records, and consolidation throughout the Health Care sector will likely continue to shape the industry. The health care sector continues to face an emphasis on reduced costs and improved efficiencies, which will also impact the Health Care Distributors industry. Companies in this industry face challenges from consolidation and partnerships between pharmacies, payers, and manufacturers.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Fleet Fuel Management	Payload fuel economy	Quantitative	Gallons, Tons (U.S.), Miles	HC-DI-110a.1
	Description of efforts to reduce the environmental impact of logistics	Discussion and Analysis	n/a	HC-DI-110a.2

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of pharmaceutical units sold by product category	Quantitative	Number	HC-DI-000.A
Number of medical devices sold by product category	Quantitative	Number	HC-DI-000.B

# Fleet Fuel Management

## Topic Summary

The distribution of health care products and supplies requires significant transportation networks. Concern over climate change and dwindling natural resources may impact fuel pricing, and expose health care distributors to fluctuations in costs. Firms that are able to improve transportation efficiencies may be able to enhance shareholder value.

## Accounting Metrics

### HC-DI-110a.1. Payload fuel economy

- 1 The entity shall disclose its aggregate payload fuel economy for its transportation fleet.
- 2 The entity shall calculate payload fuel economy across its delivery fleet, limited to vehicles used for the delivery of products (excluding vehicles used primarily for the transportation of passengers).
  - 2.1 The entity shall disclose payload fuel economy for vehicles it operates (e.g., owns or long-term leases) and specify if all or a portion of its logistics operations are outsourced.
- 3 Payload fuel economy shall be calculated as: total gallons of fuel consumed / revenue tons miles (RTM), where revenue ton miles (RTM) = total weight of paid tonnage transported (payload) × total distance in miles goods were transported.
  - 3.1 Payload includes the weight of paid tonnage and excludes the vehicle weight.
- 4 The entity shall aggregate payload fuel economy for types of transportation, which include, but are not limited to:
  - 4.1 Air transportation
  - 4.2 Marine transportation
  - 4.3 Rail transportation
  - 4.4 Road transportation

### HC-DI-110a.2. Description of efforts to reduce the environmental impact of logistics

- 1 The entity shall describe the nature, scope, and implementation of its programs and initiatives to reduce the environmental impact of its logistics operations.
- 2 Relevant efforts to describe include, but are not limited to, upgrades to fleet (fuel efficiency), usage of alternative and/or renewable fuels, optimized logistics routes, and idling reduction programs.
- 3 The entity shall discuss whether it is a participant in the [EPA SmartWay](#) program, or a similar program. If the entity is a participant in the EPA SmartWay program, it should describe the nature of its participation, such as:
  - 3.1 SmartWay Carriers

3.2 SmartWay Logistics Companies

3.3 SmartWay Shipper

## MANAGED CARE

### Industry Description

The Managed Care industry offers health insurance products for individual, commercial, Medicare, and Medicaid members. Companies also provide administrative services and network access for self-funded insurance plans and manage pharmacy benefits. Enrollment in managed care has traditionally been correlated with employment rates, while revenues are driven by the inflation of medical costs. The Patient Protection and Affordable Care Act reduced the percentage of uninsured adults, and created additional demand for the industry's plans. However, legislative uncertainty and a focus on reducing health care costs may create downward pricing pressure and continue to drive consolidation within the industry. In addition, a focus on patient outcomes and plan performance continue to shape the industry's sustainability risks and opportunities.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Climate Change Impacts on Human Health	Discussion of the strategy to address the effects of climate change on business operations and how specific risks presented by changes in the geographic incidence, morbidity, and mortality of illnesses and diseases are incorporated into risk models	Discussion and Analysis	n/a	HC-MC-450a.1

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of enrollees by plan type	Quantitative	Number	HC-MC-000.A

# Climate Change Impacts on Human Health

## Topic Summary

An increase in extreme weather events associated with climate change could have significant health impacts. These events, coupled with the potential spread of infectious diseases and food and water scarcity, are likely to present material implications for the Managed Care industry through an increase in encounters with the health care system. Companies that are able to address the risks posed by extreme weather events and potential changes in the incidence, morbidity, and mortality of illnesses and diseases may be better positioned to protect shareholder value.

## Accounting Metrics

### **HC-MC-450a.1. Discussion of the strategy to address the effects of climate change on business operations and how specific risks presented by changes in the geographic incidence, morbidity, and mortality of illnesses and diseases are incorporated into risk models**

- 1 The entity shall discuss its strategic business approach to addressing significant risks related to the effects of climate change, including, but not limited to, changes in the following aspects of illnesses and diseases:
  - 1.1 Geographic incidence
  - 1.2 Morbidity
  - 1.3 Mortality
- 2 Relevant disclosure may include, but is not limited to, discussion of the following:
  - 2.1 Increases in allergic responses, asthma rates, and heat-induced illness
  - 2.2 Migration of tropical diseases such as malaria, dengue fever, and other vector-borne tropical diseases to non-tropical regions
  - 2.3 Increases in waterborne diseases, such as cholera, due to increased natural disaster incidence
  - 2.4 Increased rates of human developmental diseases such as malnutrition due to decreased food availability
- 3 The entity shall discuss any projected impacts on revenue, costs, or plan affordability.
- 4 The entity may discuss it how it incorporates the effects of climate change into its risk assessment and risk adjustment activities.

## MEDICAL EQUIPMENT & SUPPLIES

### Industry Description

The Medical Equipment & Supplies industry researches, develops, and produces medical, surgical, dental, ophthalmic, and veterinary instruments and devices. Products are used in settings, including hospitals, clinics, and laboratories, and range from disposable items to highly specialized equipment. The increased prevalence of diseases associated with unhealthy lifestyles and an aging population are important factors that may impact growth in this industry. Emerging markets and the expansion of health insurance in the U.S. will contribute to further growth. However, the extension of government insurance programs, provider and payer consolidation, and regulatory emphasis on reduced costs in all markets may result in downward pricing pressure.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Product Design & Lifecycle Management	Discussion of process to assess and manage environmental and human health considerations associated with chemicals in products, and meet demand for sustainable products	Discussion and Analysis	n/a	HC-MS-410a.1
	Total amount of products accepted for take-back and reused, recycled, or donated, broken down by: (1) devices and equipment and (2) supplies	Quantitative	Metric tons (t)	HC-MS-410a.2

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of units sold by product category	Quantitative	Number	HC-MS-000.A

# Product Design & Lifecycle Management

## Topic Summary

Medical equipment and supplies companies face increasing challenges associated with the human and environmental impact of the industry's products. Companies may face consumer and regulatory pressure to limit the use of material inputs that are associated with health concerns, while also addressing issues such as the energy efficiency and end-of-life disposal of specific products. Firms that are able to address these concerns while engaging in efforts to enhance product take-back may be better positioned to meet consumer demand and reduce future liabilities.

## Accounting Metrics

### **HC-MS-410a.1. Discussion of process to assess and manage environmental and human health considerations associated with chemicals in products, and meet demand for sustainable products**

- 1 The entity shall describe its strategic approach to addressing specific environmental and human health impacts of its products, including, but not limited to:
  - 1.1 Energy efficiency of products during use
  - 1.2 Disposal of the products
  - 1.3 Material efficiency
  - 1.4 Product packaging
  - 1.5 Toxicity of materials
  
- 2 The entity shall only describe design considerations that it can determine will deliver a specific, demonstrable environmental benefit.
  - 2.1 Environmental benefits shall be taken to mean those related to:
    - 2.1.1 Energy consumption
    - 2.1.2 Environmental health
    - 2.1.3 Human health
    - 2.1.4 Waste generation
    - 2.1.5 Water use
  
- 3 The entity shall provide an indication of how central the environmental benefit imparted is to functionality of products.
- 4 The entity shall make its determination in good faith and clarify whether the benefit relates to the product, package, or service, avoiding a general statement of environmental benefits and following guidance from applicable laws and statutes, including, but not limited to:



- 4.1 U.S. Federal Trade Commission’s “Green Guides” (16 C.F.R. Part 260: Guides for the Use of Environmental Marketing Claims)
- 5 The entity shall specify during which lifecycle stage(s) it takes into account the environmental impacts associated with its products.
- 6 The entity shall reference the mechanism through which it implements efforts, including, but not limited to:
  - 6.1 Use of design protocols
  - 6.2 Procurement policies
  - 6.3 Restricted substances lists (RSLs)
  - 6.4 Certifications
  - 6.5 Product take-back programs
  - 6.6 Packaging take-back
- 7 For efforts related to the end-of-life of product management, the entity shall discuss only design-related considerations.
- 8 The entity shall disclose the percentage of products, by revenue, for which it has integrated the aforementioned environmental considerations into the design.

**HC-MS-410a.2. Total amount of products accepted for take-back and reused, recycled, or donated, broken down by: (1) devices and equipment and (2) supplies**

- 1 The entity shall disclose the amount, in metric tons, of its products that it recovered and reused (refurbished), recycled, or donated.
  - 1.1 This figure shall be broken down into: (1) devices and equipment and (2) supplies.
    - 1.1.1 Devices and equipment include high-value machines and advanced devices.
    - 1.1.2 Supplies include simple supplies and low-cost equipment (e.g., scalpels, gloves, and thermometers).
  - 1.2 This figure shall exclude products that were accepted for take-back but were ultimately discarded as waste.
    - 1.2.1 The entity may indicate if it reclaimed any products it was unable to reuse or recycle because proper, safe disposal was necessary.
- 2 The entity shall describe programs and initiatives it implements, funds, or participates in that are related to product take-back for end-of-life management of its products.

## ELECTRIC UTILITIES & POWER GENERATORS

### Industry Description

The Electric Utilities & Power Generators industry is made up of companies that generate electricity; build, own, and operate transmission and distribution (T&D) lines; and sell electricity. Utilities generate electricity from a number of different sources, commonly including coal, natural gas, nuclear energy, hydropower, solar, wind, and other renewable and fossil fuel energy sources. The industry comprises companies operating in both regulated and unregulated business structures. Regulated utilities maintain a business model in which they accept comprehensive oversight from regulators on their pricing mechanisms and their allowed return on equity, among other types of regulation, in exchange for their license to operate as a monopoly. Unregulated companies, or merchant power companies, are often independent power producers (IPPs) that generate electricity to sell to the wholesale market, which includes regulated utility buyers and other end-users. Furthermore, the industry is divided across regulated and deregulated power markets—referring to how far up the value chain regulated utility operations span. Regulated markets typically contain vertically integrated utilities that own and operate everything from the generation of power to its retail distribution. Deregulated markets commonly split generation from distribution, designed to encourage competition at the wholesale power level. Overall, companies in the industry are challenged with the complex mission of providing reliable, accessible, low-cost power while balancing the protection of human life and the environment.

Note: The SASB Electric Utilities & Power Generators Industry covers activities related only to electricity provision, not to natural gas provision. Some utilities may operate in both electricity and natural gas markets. Utilities undertaking activities related to natural gas sourcing and distribution should also consider the separate Gas Utilities & Distributors Industry Standard (IF-GU).

Table 1. *Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions & Energy Resource Planning	(1) Gross global Scope 1 emissions, percentage covered under (2) emissions-limiting regulations, and (3) emissions-reporting regulations	Quantitative	Metric tons (t) CO <sub>2</sub> -e, Percentage (%)	IF-EU-110a.1
	Greenhouse gas (GHG) emissions associated with power deliveries	Quantitative	Metric tons (t) CO <sub>2</sub> -e	IF-EU-110a.2
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	IF-EU-110a.3
	(1) Number of customers served in markets subject to renewable portfolio standards (RPS) and (2) percentage fulfillment of RPS target by market <sup>31</sup>	Quantitative	Number, Percentage (%)	IF-EU-110a.4

<sup>31</sup>

Note to **IF-EU-110a.4** – The entity shall discuss its operations in markets with renewable portfolio standards (RPS) regulations or where regulations are emerging, including whether it is meeting its regulatory obligations, whether regulations require future increases or changes to the entity's renewable energy portfolio, and strategies to maintain compliance with emerging regulations.

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Water Management	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	IF-EU-140a.1
	Number of incidents of non-compliance associated with water quantity and/or quality permits, standards, and regulations	Quantitative	Number	IF-EU-140a.2
	Description of water management risks and discussion of strategies and practices to mitigate those risks	Discussion and Analysis	n/a	IF-EU-140a.3
End-Use Efficiency & Demand	Percentage of electric utility revenues from rate structures that (1) are decoupled and (2) contain a lost revenue adjustment mechanism (LRAM)	Quantitative	Percentage (%)	IF-EU-420a.1
	Percentage of electric load served by smart grid technology <sup>32</sup>	Quantitative	Percentage (%) by megawatt hours (MWh)	IF-EU-420a.2
	Customer electricity savings from efficiency measures, by market <sup>33</sup>	Quantitative	Megawatt hours (MWh)	IF-EU-420a.3
Nuclear Safety & Emergency Management	Total number of nuclear power units, broken down by U.S. Nuclear Regulatory Commission (NRC) Action Matrix Column	Quantitative	Number	IF-EU-540a.1
	Description of efforts to manage nuclear safety and emergency preparedness	Discussion and Analysis	n/a	IF-EU-540a.2
Grid Resiliency	Number of incidents of non-compliance with physical and/or cybersecurity standards or regulations	Quantitative	Number	IF-EU-550a.1
	(1) System Average Interruption Duration Index (SAIDI), (2) System Average Interruption Frequency Index (SAIFI), and (3) Customer Average Interruption Duration Index (CAIDI), inclusive of major event days <sup>34</sup>	Quantitative	Minutes, Number	IF-EU-550a.2

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of: (1) residential, (2) commercial, and (3) industrial customers served <sup>35</sup>	Quantitative	Number	IF-EU-000.A

<sup>32</sup>

Note to **IF-EU-420a.2** – The entity shall discuss the opportunities and challenges associated with the development and operations of a smart grid.

<sup>33</sup>

Note to **IF-EU-420a.3** – The entity shall discuss customer efficiency regulations relevant to each market in which it operates.

<sup>34</sup>

Note to **IF-EU-550a.2** – The entity shall discuss notable service disruptions such as those that affected a significant number of customers or disruptions of extended duration.

<sup>35</sup>

Note to **IF-EU-000.A** – The number of customers served for each category shall be considered as the number of meters billed for residential, commercial, and industrial customers.

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Total electricity delivered to: (1) residential, (2) commercial, (3) industrial, (4) all other retail customers, and (5) wholesale customers	Quantitative	Megawatt hours (MWh)	IF-EU-000.B
Length of transmission and distribution lines <sup>36</sup>	Quantitative	Kilometers (km)	IF-EU-000.C
Total electricity generated, percentage by major energy source, percentage in regulated markets <sup>37</sup>	Quantitative	Megawatt hours (MWh), Percentage (%)	IF-EU-000.D
Total wholesale electricity purchased <sup>38</sup>	Quantitative	Megawatt hours (MWh)	IF-EU-000.E

<sup>36</sup>

Note to **IF-EU-000.C** – The length of transmission and distribution lines shall be calculated on a circuit kilometer basis, where a circuit-kilometer is defined as the total length of circuits, regardless of conductors used per circuit.

<sup>37</sup>

Note to **IF-EU-000.D** – Generation shall be disclosed by each of the following major energy sources: coal, natural gas, nuclear, petroleum, hydropower, solar, wind, other renewables, and other gases. The scope includes owned and/or operated assets. The scope excludes electricity consumed at the generating facilities.

<sup>38</sup>

Note to **IF-EU-000.E** – The scope excludes electricity consumed at the generating facilities.

# Greenhouse Gas Emissions & Energy Resource Planning

## Topic Summary

Electricity generation represents the largest source of greenhouse gas (GHG) emissions in the world. These emissions, mainly carbon dioxide, methane, and nitrous oxide, are mostly by-products of fossil fuels combustion. The transmission and/or distribution (T&D) segments of the industry are responsible for a negligible amount of its emissions. Electric utility companies could face significant operating and capital expenditures for mitigating GHG emissions as environmental regulations become increasingly stringent. While many of these costs can be passed on to a utility's customers, some power generators, especially in deregulated markets, may not be able to recoup these costs. Companies can reduce GHG emissions from electricity generation mainly through careful planning of their infrastructure investments to ensure an energy mix capable of meeting the emissions requirements set forth by regulations and by implementing industry-leading technologies and processes. Being proactive in cost-effectively reducing GHG emissions can create a competitive advantage for companies and mitigate unanticipated regulatory compliance costs. Failure to properly estimate capital-expenditure needs and permitting costs, or other difficulties in reducing GHG emissions, could result in significant negative impacts on returns in the future in the form of asset write-downs, costs of obtaining carbon credits, or unexpected increases in operating and capital expenditures. Regulatory emphasis on this issue will likely increase in the coming decades, as exemplified by the international emissions-reduction agreement made at the 21st session of the United Nations Conference of the Parties that took place in late 2015.

## Accounting Metrics

### IF-EU-110a.1. (1) Gross global Scope 1 emissions, percentage covered under (2) emissions-limiting regulations, and (3) emissions-reporting regulations

- 1 The entity shall disclose its (1) gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e), and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:

- 2.1.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)
  - 2.1.2 *Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources* published by the U.S. Environmental Protection Agency (EPA)
  - 2.1.3 India GHG Inventory Program
  - 2.1.4 ISO 14064-1
  - 2.1.5 *Petroleum Industry Guidelines for reporting GHG emissions*, 2nd edition, 2011, published by IPIECA
  - 2.1.6 *Protocol for the quantification of greenhouse gas emissions from waste management activities* published by Entreprises pour l'Environnement (EpE)
- 2.2 GHG emissions data shall be consolidated and disclosed according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the “financial control” approach defined by the GHG Protocol, and the approach published by the Climate Disclosure Standards Board (CDSB) described in REQ-07, “Organisational boundary,” of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).
- 3 The entity shall disclose (2) the percentage of its gross global Scope 1 GHG emissions that are covered under an emissions-limiting regulation or program that is intended to directly limit or reduce emissions, such as cap-and-trade schemes, carbon tax/fee systems, and other emissions control (e.g., command-and-control approach) and permit-based mechanisms.
- 3.1 Examples of emissions-limiting regulations include, but are not limited to:
- 3.1.1 California Cap-and-Trade (California Global Warming Solutions Act)
  - 3.1.2 European Union Emissions Trading Scheme (EU ETS)
  - 3.1.3 Quebec Cap-and-Trade (Draft Bill 42 of 2009)
- 3.2 The percentage shall be calculated as the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e) that are covered under emissions-limiting regulations divided by the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e).
- 3.2.1 For emissions that are subject to multiple emissions-limiting regulations, the entity shall not account for those emissions more than once.
- 3.3 The scope of emissions-limiting regulations excludes emissions covered under voluntary emissions-limiting regulations (e.g., voluntary trading systems), as well as reporting-based regulations [e.g., the U.S. Environmental Protection Agency (EPA) GHG Reporting Program].
- 4 The entity shall disclose (3) the percentage of its gross global Scope 1 GHG emissions that are covered under emissions reporting-based regulations.

- 4.1 Emissions reporting-based regulations are defined as regulations that demand the disclosure of GHG emissions data to regulators and/or the public, but for which there is no limit, cost, target, or controls on the amount of emissions generated (e.g., the U.S. EPA Greenhouse Gas Reporting Program).
- 4.2 The percentage shall be calculated as the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e) that are covered under emissions reporting-based regulations divided by the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e).
  - 4.2.1 For emissions that are subject to multiple emissions reporting-based regulations, the entity shall not account for those emissions more than once.
- 4.3 The scope of emissions reporting-based regulations does not exclude emissions covered under emissions-limiting regulations.
- 5 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 6 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 7 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

## **IF-EU-110a.2. Greenhouse gas (GHG) emissions associated with power deliveries**

- 1 The entity shall disclose gross global greenhouse gas (GHG) emissions associated with electric power delivered to retail customers, resulting from owned power generation and purchased power.
  - 1.1 GHG emissions are defined as emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
    - 1.1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e), calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP factors is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
    - 1.1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets or credits.
- 2 GHG emissions associated with electric power delivered to retail customers are defined by and shall be calculated according to the methodology established by the numerator in "EPS Metric D-3: Retail Electric Deliveries," contained in the [Electric Power Sector Protocol for the Voluntary Reporting Program](#), June 2009, Version 1.0, provided by The Climate

Registry, including [2010 Updates and Clarifications](#) (which clarified that “EPS Metric D-3: Retail Electric Deliveries” was mislabeled as “EPS Metric D-1” in Version 1.0).

- 2.1 These emissions are generally calculated as the sum of emissions from power generation facilities that are owned by the entity and those from power that was purchased from a third-party, subtracted by the emissions from power that was resold at the wholesale level.
  - 2.2 The scope of GHG emissions shall include all emissions associated from power delivered to retail customers, including emissions associated with power lost in transmission and distribution.
  - 2.3 Emissions factors for power purchased from third-parties are based on the most relevant and accurate method, which will depend on the type of power purchased. The Electric Power Sector Protocol for the Voluntary Reporting Program establishes potential methods.
- 3 Disclosure corresponds to the numerator in the metric contained in the Electric Power Research Institute’s 2018 *Metrics to Benchmark Electric Power Company Sustainability Performance*, “Total CO<sub>2</sub> emissions rate for power deliveries,” with the exception of the scope of emissions including all seven GHGs covered under the Kyoto Protocol.

### **IF-EU-110a.3. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined according to *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 2.2 Whether the target is absolute- or intensity-based, and the metric denominator, if it is an intensity-based target;
  - 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated toward the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;
  - 2.5 The mechanism(s) for achieving the target; and
  - 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset.



- 3 The entity shall discuss its strategy to manage risks and opportunities associated with the GHG emissions regulatory environment, which may include, but are not limited to:
  - 3.1 Any changes it has made or plans to make to its business structure or model
  - 3.2 The development of new technologies or services
  - 3.3 Any changes it has made or plans to make to its operational process, control, or organizational structures
  - 3.4 Influencing the regulatory or legislative process and outcomes, including but not limited to, interactions with regulators, regulatory agencies, utility commissions, legislators, and policymakers
- 4 The entity may discuss its involvement in green power markets, including the number of customers served (by customer category) and the corresponding electricity generated.
  - 4.1 Green power markets are defined as an optional utility service that allows customers the opportunity to support a greater level of utility company investment in renewable energy technologies.
  - 4.2 The entity may disclose instances where the provision of green power markets are required by state renewable portfolio standards.
- 5 The entity shall discuss the activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
- 6 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as how they relate to different business units, geographies, or emissions sources.
- 7 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
- 8 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

#### **IF-EU-110a.4. (1) Number of customers served in markets subject to renewable portfolio standards (RPS) and (2) percentage fulfillment of RPS target by market**

- 1 The entity shall disclose (1) the number of customers it serves located in markets subject to renewable portfolio standards (RPS).
  - 1.1 An RPS is defined as a regulatory mandate to increase production of electricity from renewable resources such as wind, solar, biomass, and other alternatives to fossil and nuclear electric power generation.
  - 1.2 Relevant U.S. state RPSs include those listed through the National Conference of State Legislatures' "[State Renewable Portfolio Standards and Goals](#)." Examples include, but are not limited to:
    - 1.2.1 California [Public Utilities Code Section 399.11-399.32](#)
    - 1.2.2 Massachusetts [General Laws Part I Title II Chapter 25A Section 11F](#)
    - 1.2.3 New York [Case 03-E-0188](#)

1.2.4 Texas [Utilities Code Title 2 Subtitle B Chapter 39 Subchapter z Section 39.904](#)

- 2 The entity shall disclose (2) its fulfillment of RPS targets as a percentage on a sales-weighted basis, in megawatt hours.
  - 2.1 The entity shall calculate its percentage fulfillment of RPS targets for each of the markets it serves as the amount of renewable electricity sold (in megawatt hours) in markets with RPS regulations divided by the amount of renewable electricity (in megawatt hours) that would need to be sold to achieve the entity's target compliance obligation set forth through the relevant RPS regulations.
    - 2.1.1 Markets are defined as those operations that are subject to distinct public utility regulatory oversight
- 3 The scope of disclosure is limited to those markets with established RPSs that regulate the entity's operations.
- 4 The entity may disclose the number of customers it serves that are located in markets where RPSs are voluntary, including a disclosure of the percentage fulfillment of voluntary RPSs.

Note to **IF-EU-110a.4**

- 1 The entity shall discuss its operations in markets with renewable portfolio standards (RPS) regulations or where regulations are emerging, including whether it is meeting its regulatory obligations, whether regulations require future increases or changes to the entity's renewable energy portfolio, and strategies to maintain compliance with emerging regulations.
- 2 In this discussion, the entity may consider the implications of non-RPS regulations on current and future RPS regulations.
- 3 Where the entity does not meet its current RPS obligations, or may be at risk of not being able to meet future RPS regulations, the entity may include a discussion of:
  - 3.1 The reasons for not meeting RPS regulations;
  - 3.2 The number of customers for whom RPS standards are not met or likely not to be met; and/or
  - 3.3 Any punitive fines or settlements stemming from failure to meet RPS regulations.

# Water Management

## Topic Summary

Electricity generation is one of the most water-intensive industries in the world in terms of water withdrawals. Thermoelectric power plants—typically coal, nuclear, and natural gas—are dependent on large quantities of water for cooling purposes. The industry is facing increasing water-related supply and regulatory risks, potentially requiring capital investment in technology or even resulting in stranded assets. As water supplies tighten in many regions—and electricity generation, agriculture, and community use compete for water supplies in the coming decade—power plants may increasingly be unable to operate at their full capacity, or at all, because of region-specific water constraints. The availability of water is a key factor to consider when calculating the future value of many electricity-generating assets and for evaluating existing proposals for new generation sources. Heightened water scarcity—due to factors such as increasing consumption and reduced supplies as a result of climate change, which could result in more frequent or intense droughts—could prompt regulatory authorities to limit companies’ ability to withdraw necessary amounts of water, especially in regions with high baseline water stress. Furthermore, companies must contend with the growing regulations related to the significant biodiversity impacts that such large withdrawals can cause. To mitigate risks, companies can both invest in more efficient water-usage systems for existing plants and place strategic priority on assessing long-term water availability, as well as water-related biodiversity risks, when siting new power plants.

## Accounting Metrics

### **IF-EU-140a.1. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.
  - 1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 2.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:

- 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
  - 3.1.2 Water that is directly or indirectly incorporated into the entity's product or service;
  - 3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.
- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute's (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

### **IF-EU-140a.2. Number of incidents of non-compliance associated with water quantity and/or quality permits, standards, and regulations**

- 1 The entity shall disclose the total number of instances of non-compliance, including violations of a technology-based standard and exceedances of quantity and/or quality-based standards.
- 2 The scope of disclosure includes incidents governed by national, state, and local statutory permits and regulations, including, but not limited to, discharge of a hazardous substance, violation of pretreatment requirements, or total maximum daily load (TMDL) exceedances.
- 3 The scope of disclosure shall only include incidents of non-compliance that resulted in a formal enforcement action(s).
  - 3.1 Formal enforcement actions are defined as governmental actions that address a violation or threatened violation of water quantity and/or quality laws, regulations, policies, or orders, and can result in administrative penalty orders, administrative orders, and judicial actions, among others. For example, the U.S. Environmental Protection Agency (EPA) provides guidance on the scope of formal enforcement actions in, [Informal and Formal Actions, Summary Guidance and Portrayal on EPA Websites](#).
- 4 Violations shall be disclosed, regardless of their measurement methodology or frequency. These include violations for:
  - 4.1 Continuous discharges, limitations, standards, and prohibitions that are generally expressed as maximum daily, weekly, and monthly averages.
  - 4.2 Non-continuous discharges and limitations that are generally expressed in terms of frequency, total mass, maximum rate of discharge, and mass or concentration of specified pollutants.

### **IF-EU-140a.3. Description of water management risks and discussion of strategies and practices to mitigate those risks**

- 1 The entity shall describe its water management risks associated with water withdrawals, water consumption, and discharge of water and/or wastewater.

- 1.1 Risks associated with water withdrawals and water consumption include risks to the availability of adequate, clean water resources, including, but not limited to:
  - 1.1.1 Environmental constraints—such as operating in water-stressed regions, drought, concerns of aquatic impingement or entrainment, interannual or seasonal variability, and risks due to the impact of climate change
  - 1.1.2 Regulatory and financial constraints—such as volatility in water costs, stakeholder perceptions and concerns related to water withdrawals (e.g., those from local communities, non-governmental organizations, and regulatory agencies), direct competition with and impact from the actions of other users (e.g., commercial and municipal users), restrictions to withdrawals due to regulations, and constraints on the entity’s ability to obtain and retain water rights or permits
- 1.2 Risks associated with the discharge of water and/or wastewater, include, but are not limited to, the ability to obtain rights or permits related to discharges, compliance with regulations related to discharges, restrictions to discharges, the ability to maintain control over the temperature of water discharges, liabilities and/or reputational risks, and increased operating costs due to regulation, stakeholder perceptions and concerns related to water discharges (e.g., those from local communities, non-governmental organizations, and regulatory agencies).
- 2 The entity may describe water management risks in the context of:
  - 2.1 How risks may vary by withdrawal source, including surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities; and
  - 2.2 How risks may vary by discharge destinations, including surface water, groundwater, or wastewater utilities.
- 3 The entity may discuss the potential impacts that water management risks may have on its operations and the timeline over which such risks are expected to manifest.
  - 3.1 Impacts may include, but are not limited to, those associated with costs, revenues, liabilities, continuity of operations, and reputation.
- 4 The entity shall discuss its short-term and long-term strategies or plan to mitigate water management risks, including, but not limited to:
  - 4.1 The scope of its strategy, plans, goals and/or targets, such as how they relate to different business units, geographies, or water-consuming operational processes.
  - 4.2 Any water management goals and/or targets it has prioritized, and an analysis of performance against those goals and/or targets.
    - 4.2.1 Goals and targets may include, but are not limited to, those associated with reducing water withdrawals, reducing water consumption, reducing water discharges, reducing aquatic impingements, improving the quality of water discharges, and regulatory compliance.

- 4.3 The activities and investments required to achieve the plans, goals, and/or targets and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 4.4 Disclosure of strategies, plans, goals, and/or targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.
- 5 For water management targets, the entity shall additionally disclose:
- 5.1 Whether the target is absolute or intensity-based, and the metric denominator if it is an intensity-based target.
  - 5.2 The timelines for the water management plans, including the start year, the target year, and the base year.
  - 5.3 The mechanism(s) for achieving the target, including:
    - 5.3.1 Efficiency efforts, such as the use of water recycling and/or closed-loop systems;
    - 5.3.2 Product innovations such as redesigning products or services to require less water;
    - 5.3.3 Process and equipment innovations, such as those that enable the reduction of aquatic impingements or entrainments;
    - 5.3.4 Use of tools and technologies (e.g., the [World Wildlife Fund Water Risk Filter](#), [The Global Water Tool](#), and [Water Footprint Network Footprint Assessment Tool](#)) to analyze water use, risk, and opportunities; and
    - 5.3.5 Collaborations or programs in place with the community or other organizations.
  - 5.4 The percentage reduction or improvement from the base year, where the base year is the first year against which water management targets are evaluated toward the achievement of the target.
- 6 The entity shall discuss whether its water management practices result in any additional lifecycle impacts or tradeoffs in its organization, including tradeoffs in land use, energy production, and greenhouse gas (GHG) emissions, and why the entity chose these practices despite lifecycle tradeoffs.

# End-Use Efficiency & Demand

## Topic Summary

Energy efficiency is a low-lifecycle-cost method to reduce greenhouse gas (GHG) emissions, as less electricity needs to be generated to provide the same end-use energy services. Utilities can partake in a wide range of activities to promote energy efficiency and conservation among their customers. Such strategies include offering rebates for energy-efficient appliances, weatherizing customers' homes, educating customers on energy-saving methods, offering incentives to customers to curb electricity use during times of peak demand ("demand response"), and investing in technology such as smart meters, which allows customers to track their energy usage—among many other strategies. These efforts, which save consumers money, can also manifest in lowered operating costs for electric utilities because they can reduce peak demand. Furthermore, depending on the sentiment of the utilities commission in a company's region, energy efficiency can be a regulatory priority before new builds are considered. How an electric utility stands to gain or lose from this trend toward GHG mitigation is significantly predicated on its regulatory environment. Traditional rate structures generally do not give electric utilities an incentive for energy efficiency, and further, they may economically suffer from reductions in customer demand. This is increasingly driving electric utilities, and their regulators and customers, to pursue alternative ratemaking. Such alternative rate design often "decouples" utility revenues from customer consumption, and may also build in explicit incentives for end-use efficiency and demand reductions. Overall, companies whose strategic plan strives to reduce their downside risks from demand fluctuations, gain adequate and timely returns on needed efficiency investments. Further, lowering costs through efficiency initiatives help position utility companies to earn stronger risk-adjusted returns over the long term.

## Accounting Metrics

### **IF-EU-420a.1. Percentage of electric utility revenues from rate structures that (1) are decoupled and (2) contain a lost revenue adjustment mechanism (LRAM)**

- 1 The entity shall disclose the percentage of electric utility revenues from (1) decoupled rate structures.
  - 1.1 Revenue decoupled rate structures are defined, according to the U.S. National Association of Regulatory Utility Commissioners in [Decoupling for Electric & Gas Utilities](#) (September 2007), as a rate adjustment mechanism that separates the entity's electric utility's fixed cost recovery from the amount of electricity sold—and the utility's revenues are collected based on the regulatory-determined revenue requirement.
    - 1.1.1 Revenue decoupled rate structures may also be referred to as, "revenue regulation" or "revenue cap regulation," where the regulator establishes an allowed revenue requirement and adjusts collections so as to achieve that allowed, or "target," revenue irrespective of actual sales (definition adapted from [Decoupling Case Studies: Revenue Regulation Implementation in Six States](#), The Regulatory Assistance Project, July 2014).
    - 1.1.2 Additional guidance on the scope of revenue decoupled rate structures is contained in [Alternative Regulation for Emerging Utility Challenges: 2015 Update](#), Edison Electric Institute, November 11, 2015.

- 1.2 The scope of decoupled rate structures shall exclude straight fixed-variable rate design and those rate structures that contain a lost revenue adjustment mechanism (LRAM).
  - 1.3 The percentage shall be calculated as the total regulated electric utility revenue from revenue decoupled rate structures divided by total regulated electric utility revenue.
- 2 The entity shall disclose the percentage of electric utility revenues from (2) rate structures that contain an LRAM.
    - 2.1 Rate structures that contain an LRAM are defined as volumetric rates that contain a mechanism which allows the entity to recover revenues lost directly resulting from energy conservation, energy efficiency, demand-side management, and/or distributed generation programs that are directly managed and/or implemented by the entity.
    - 2.2 Additional guidance on the scope of LRAMs is contained in [Alternative Regulation for Emerging Utility Challenges: 2015 Update](#), Edison Electric Institute, November 11, 2015.
    - 2.3 The scope includes mechanisms that allow the estimation of lost revenues based on the programs' actual impacts, but excludes lost revenues from planned or forecasted programs' impacts—as described in [Alternative Regulation and Ratemaking Approaches for Water Companies](#), The Brattle Group, September 23, 2013. While the referenced resource is intended for water utilities, the concept of LRAMs is similar for electric utilities.
    - 2.4 The percentage shall be calculated as the total regulated electric utility revenue from rate structures that contain an LRAM divided by total regulated electric utility revenue.
- 3 The scope of disclosure is limited to revenues directly resulting from the provision of electricity to retail customers by regulated utilities.

## **IF-EU-420a.2. Percentage of electric load served by smart grid technology**

- 1 The entity shall disclose the percentage of its electric load, in megawatt hours, served by smart grid technology.
  - 1.1 An electric load is considered to be served by smart grid technology when the technology enables one or more of the distinguishing characteristics set forth in Title XIII of the U.S. [Energy Independence Act of 2007](#).
    - 1.1.1 Examples of smart grid technologies include, but are not limited to, demand-response systems, distribution automation, smart inverters, advanced metering equipment, and other smart home and intelligent building control products.
  - 1.2 According to the Energy Independence Act of 2007, distinguishing characteristics of the smart grid include:
    - 1.2.1 Increased use of digital information and control technology to improve reliability, security, and efficiency of the electric grid;
    - 1.2.2 Deployment and integration of distributed resources and generation, including renewable resources;
    - 1.2.3 Development and incorporation of demand-response programs, demand-side resources, and energy efficiency resources;



- 1.2.4 Deployment of “smart” technologies for metering, communications concerning grid operations and status, and distribution automation;
  - 1.2.5 Deployment and integration of advanced electricity storage and peak-shaving technologies, including plug-in electric and hybrid electric vehicles and thermal-storage air conditioning; and
  - 1.2.6 Provision of timely information and control options to customers.
- 1.3 A smart grid is defined, consistent with the National Institute of Standards and Technology (NIST) [Smart Grid Interoperability Standards](#), as a modernized grid that enables bidirectional flows of energy and uses two-way communication and control capabilities that will lead to an array of new functionalities and applications.
- 2 The percentage of load served by smart grid technology shall be calculated as the total amount of energy load, in megawatt hours, served by smart grid technology divided by the total amount of energy load, in megawatt hours.
- 2.1 The electric load served by smart grid technology is defined as the amount of electricity delivered to the entity’s customers that incorporates the use of smart grid technologies to meet the electricity demand of the consumer.
- 3 The entity may discuss the type of smart grid technology through which its electric load is served, the customer types that are utilizing the technology (e.g., residential, commercial, or industrial), whether technologies are owned by the utility or the customer, and any plans for further integration of smart grid capabilities.

**Note to IF-EU-420a.2**

- 1 The entity shall discuss the opportunities and challenges associated with the development and operations of a smart grid, including, where relevant:
- 1.1 Demand-response and end-user efficiency opportunities (e.g., smoothing of the demand curve, increased cost-effective electric generation, improved incorporation of distributed generation, and increased generation and transmission efficiency)
  - 1.2 Political and deployment challenges (e.g., opposition to smart grid development, disparate degrees of technology deployment, and economic dis-incentives)

**IF-EU-420a.3. Customer electricity savings from efficiency measures, by market**

- 1 The entity shall disclose the total amount of electricity savings delivered to customers, in megawatt hours, from energy efficiency measures during the reporting period, for each of its markets.
- 1.1 Markets are defined as those operations that are subject to distinct public utility regulatory oversight.
  - 1.2 Electricity savings are defined according to the gross savings approach as the changes in energy consumption and/or demand that results from program-related actions taken by participants in an efficiency program, regardless of why they participated.

- 1.2.1 The entity may list those markets where it reports electricity savings on a net electricity savings basis, and thus, may be different from the figures disclosed here. Net electricity savings are defined as changes in consumption that are specifically attributable to an energy efficiency program, and that would not have occurred in the absence of the program.
- 2 Electricity savings shall be calculated on a gross basis but consistent with the methodology set forth in national, state, or local evaluation, measurement, and verification (EM&V) regulations where such savings occur. Examples of U.S. state regulations include, but are not limited to:
  - 2.1 California Public Utility Commission (CPUC) [Decision 09-09-047](#)
  - 2.2 New York [Case 07-M-0458](#)
  - 2.3 Public Utility Commission of Texas (PUCT) [Substantive Rule 25.181](#)
- 3 Where national, state, or local regulations do not exist, the entity shall calculate energy savings consistent with the measurement and verification methods outlined by the U.S. Department of Energy's (DOE) Federal Energy Management Program (FEMP) [M&V Guidelines: Measurement and Verification for Federal Energy Projects, Version 4.0](#).
- 4 The scope of electricity savings from efficiency measures includes savings delivered directly by the entity and, where regulations provide, savings substantiated through purchases of efficiency savings credits.
  - 4.1 For any savings from efficiency measures delivered directly by the entity, any efficiency savings credits must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them delivered electricity savings.
  - 4.2 For efficiency savings credits purchased, the agreement must explicitly include and convey that credits be retained and retired on behalf of the entity in order for the entity to claim them.
- 5 Relevant regulations governing efficiency savings credits include the following regulations in the U.S.:
  - 5.1 Connecticut [House Bill 7432](#)
  - 5.2 Nevada [Regulation of Public Utilities Chapter 704](#)
  - 5.3 Pennsylvania [Act 129](#)

**Note to IF-EU-420a.3**

- 1 The entity shall discuss regulations related to customer efficiency measures for each of its relevant markets, including:
  - 1.1 The amount or percentage of electricity savings from efficiency measures required by regulations for each market.
  - 1.2 Instances of non-compliance with electricity savings obligations.
  - 1.3 In such instances, the entity shall disclose the difference between the energy savings delivered and the amount required by the regulation.
  - 1.4 Electricity savings delivered that exceed those required by regulations and that resulted in the entity receiving energy efficiency performance incentives, including the value of any such incentives.

- 2 Relevant energy-efficiency regulations in the U.S. include, but are not limited to:
  - 2.1 Illinois [Power Agency Act 220 ILCS 5/8-103](#)
  - 2.2 California Public Utilities Commission [Decision 14-10-046](#)
  - 2.3 Massachusetts Department of Public Utilities [Three Year Energy Efficiency Plan 15-160 to 15-169](#)
  - 2.4 Texas [Senate Bill 1125](#)
- 3 The entity shall discuss the forms of policy, by each market, that allow for or incentivize energy efficiency, including a discussion of the benefits, challenges, and financial impacts associated with such regulations.
- 4 Relevant policy mechanisms to discuss include, but are not limited to:
  - 4.1 Deferral decoupling
  - 4.2 Current period decoupling
  - 4.3 Single fixed variable rates
  - 4.4 Lost revenue adjustments
  - 4.5 Energy efficiency feebates
- 5 For markets lacking regulations that allow for or incentivize energy efficiency, the entity shall discuss its stance on and efforts to manage risks and opportunities relating to such regulation.
- 6 The entity may discuss any efforts to meet regulations through incentives it has developed for its customers that promote end-use efficiency, including but not limited to, dynamic pricing, energy efficiency rebates, and other measures to subsidize customer energy efficiency.

# Nuclear Safety & Emergency Management

## Topic Summary

Nuclear incidents, while exceedingly rare, can have significant human health and environmental consequences as nuclear accidents can be severe if they do occur. While owners of nuclear power plants in many regions have operated for decades without any major public safety incidents, the occurrence of infrequent but high-magnitude incidents anywhere in the world can have major impacts on the entire nuclear power industry. Companies that own and operate nuclear plants could face a loss of their license to operate, either entirely or in the operation of nuclear plants, as well as many other financial consequences in the event of an accident—though companies carry insurance and may have legal protections from certain liabilities. Failure to comply with the safety regulations can be extremely expensive to nuclear power operators; in extreme circumstances it can make the continued operation of the plant uneconomical. As a result of significant financial repercussions, both from ongoing safety compliance as well as the materialization of tail risk incidents, companies that own or operate nuclear plants need to be vigilant in the safety compliance, best practices, and upgrades of their facilities. They also need to maintain robust emergency preparedness training for their staff and a strong safety culture. These measures can reduce the probability that accidents will occur and enable a company to effectively detect and respond to such incidents.

## Accounting Metrics

### IF-EU-540a.1. Total number of nuclear power units, broken down by U.S. Nuclear Regulatory Commission (NRC) Action Matrix Column

- 1 The entity shall disclose the total number of nuclear power units that it owns and/or operates, where:
  - 1.1 A nuclear power unit is defined, consistent with U.S. 10 CFR 50, as a nuclear reactor and associated equipment necessary for electric power generation, including those structures, systems, and components required to provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public.
- 2 The entity shall provide a breakdown of nuclear power units that it owns and/or operates by the U.S. Nuclear Regulatory Commission (NRC) [Action Matrix Column](#).
- 3 Relevant Action Matrix Columns include, in order of increasing significance:
  - 3.1 Licensee Response Column
  - 3.2 Regulatory Response Column
  - 3.3 Degraded Cornerstone Column
  - 3.4 Multiple/Repetitive Degraded Cornerstone Column
  - 3.5 Unacceptable Performance Column

## IF-EU-540a.2. Description of efforts to manage nuclear safety and emergency preparedness

- 1 The entity shall discuss its efforts to manage nuclear safety and emergency preparedness, including its efforts to identify, report, and assess initiating events and event sequences relating to nuclear safety and emergency preparedness.
  - 1.1 Initiating events are defined, consistent with U.S. 10 CFR 63, as natural or human-induced events that cause an event sequence.
  - 1.2 An event sequence is defined as a series of actions and/or occurrences within the natural and engineered components of a geologic repository operations area that could potentially lead to exposure of individuals to radiation. An event sequence includes one or more initiating events and associated combinations of repository system component failures, including those produced by the action or inaction of operating personnel.
  - 1.3 Disclosure may focus broadly on nuclear safety and emergency management systems, but shall specifically address the systems in place to avoid and manage initiating events, accidents, emergencies, and incidents that could have catastrophic impacts on human health, the local community, and the environment.
- 2 The entity shall discuss how it manages nuclear safety and emergency preparedness, such as through training, rules and guidelines (and their enforcement), implementation of emergency plans (consistent with those developed in accordance with U.S. 10 CFR 50.47), and use of technology.
- 3 The entity shall discuss its efforts to create and maintain a culture of nuclear safety and emergency preparedness, including its alignment with the U.S. Nuclear Regulatory Commission's (NRC) [Safety Culture Policy Statement](#) and efforts to institute the traits of a positive safety culture, where the traits of a positive safety culture include:
  - 3.1 Leadership safety values and actions
  - 3.2 Problem identification and resolution
  - 3.3 Personal accountability
  - 3.4 Work process
  - 3.5 Continuous learning
  - 3.6 Environment for raising concerns
  - 3.7 Effective safety communications
  - 3.8 Respectful work environment
  - 3.9 Questioning attitude
- 4 The entity may discuss implementation of the [Institute of Nuclear Power Operations \(INPO\) Principles for a Strong Nuclear Safety Culture](#) and/or the [International Atomic Energy Agency's \(IAEA\) Best Practices in the Utilization and Dissemination of Operating Experience at Nuclear Power Plants](#).

# Grid Resiliency

## Topic Summary

Electricity is critical for the continued function of most elements of modern life, from medicine to finance, creating a societal reliance on continuous service. There are potentially high societal costs from major disruptions to electricity infrastructure. Disruptions can be caused by extreme weather events, natural disasters, and cyber attacks. As the frequency and severity of extreme weather events associated with climate change continues to increase, all segments of electric utilities companies—and especially major transmission and distribution (T&D) operations—will face increasing physical threats to their infrastructure. This could result in frequent or significant service disruptions, outages, and the need to upgrade or repair damaged or compromised equipment, all of which may result in substantial costs and damaged perspectives of regulators and customers. The increased usage of smart grid technology has several benefits, including strengthening the resiliency of the grid to extreme weather events. However, this technology can make the grid more vulnerable to cyber attacks, as it provides hackers more entryways into infrastructure systems. Companies need to implement strategies that minimize the probability and magnitude of impacts from extreme weather events and cyber attacks. They can remain competitive in the face of increasing external competition by actively submitting compelling rate cases to improve the reliability, resilience, and quality of their infrastructure.

## Accounting Metrics

### **IF-EU-550a.1. Number of incidents of non-compliance with physical and/or cybersecurity standards or regulations**

- 1 The entity shall disclose the total number of instances of non-compliance with physical and/or cybersecurity standards or regulations applicable to electricity infrastructure that is owned and/or operated by the entity.
  - 1.1 The scope of physical and/or cybersecurity standards or regulations includes mandatory, enforceable standards and regulations that are intended to mitigate physical and/or cybersecurity risks related to the reliability and/or resiliency of electricity infrastructure, including the electricity grid.
    - 1.1.1 Physical and/or cybersecurity standards or regulations include the North American Electric Reliability Corporation (NERC) Critical Infrastructure (CIP) standards when the standards are applicable to electricity infrastructure that is owned and/or operated by the entity.
    - 1.1.2 The entity may disclose instances of non-compliance with voluntary physical and/or cybersecurity standards or regulations.

### **IF-EU-550a.2. (1) System Average Interruption Duration Index (SAIDI), (2) System Average Interruption Frequency Index (SAIFI), and (3) Customer Average Interruption Duration Index (CAIDI), inclusive of major event days**

- 1 The entity shall disclose its (1) System Average Interruption Duration Index (SAIDI), in minutes.

- 1.1 The SAIDI is defined as the total duration of an interruption for the average customer during the period under reporting.
  - 1.2 The entity shall calculate its SAIDI as the total number of customers interrupted multiplied by the duration of interruptions (i.e., restoration time) divided by the total number of customers served, written as  $\sum(r_i \times N_i) / N_T$ 
    - 1.2.1  $\sum$  = Summation function
    - 1.2.2  $r_i$  = Restoration time, in minutes
    - 1.2.3  $N_i$  = Total number of customers interrupted
    - 1.2.4  $N_T$  = Total number of customers served
- 2 The entity shall disclose its (2) System Average Interruption Frequency Index (SAIFI).
- 2.1 SAIFI is defined as the average number of times that a system customer experiences an outage during the period under reporting.
  - 2.2 The entity shall calculate its SAIFI as the total number of customers interrupted divided by the total number of customers served, written as  $\sum(N_i) / N_T$ 
    - 2.2.1  $\sum$  = Summation function
    - 2.2.2  $N_i$  = Total number of customers interrupted
    - 2.2.3  $N_T$  = Total number of customers served
- 3 The entity shall disclose its (3) Customer Average Interruption Duration Index (CAIDI):
- 3.1 The CAIDI is defined as the average amount of time required to restore service once an outage has occurred.
  - 3.2 The entity shall calculate its CAIDI as the total number of customers interrupted multiplied by the duration of interruptions (i.e., restoration time, in minutes ) divided by the sum of the number of customers interrupted, written as  $\sum(r_i \times N_i) / \sum(N_i)$ 
    - 3.2.1  $\sum$  = Summation function
    - 3.2.2  $r_i$  = Restoration time, in minutes
    - 3.2.3  $N_i$  = Total number of customers interrupted
- 4 The entity shall disclose its SAIDI, SAIFI, and CAIDI inclusive of major event days, where:
- 4.1 Major event days are defined, according to IEEE Std 1366, as days in which the daily SAIDI exceeds a threshold value,  $T_{MED}$ , where  $T_{MED}$  is calculated as follows:
    - 4.1.1 The entity should collect values of daily SAIDI for five sequential years, ending on the last day of the last complete reporting period. If fewer than five years of historical data are available, use all of the available historical data.
    - 4.1.2 If any day in the data set has a value of zero for SAIDI, replace it with the lowest non-zero SAIDI value in the data set—this permits taking the logarithm of every day.

- 4.1.3 Take the natural logarithm ( $\ln$ ) of each daily SAIDI value in the data set.
- 4.1.4 Find  $\alpha$  (Alpha), the average of the logarithms (also known as the logaverage) of the data set.
- 4.1.5 Find  $\beta$  (Beta), the standard deviation of the logarithms (also known as the log-average) of the data set.
- 4.1.6 Compute the major event day threshold,  $T_{MED}$ , using the equation:  $T_{MED} = e^{(\alpha+\beta)}$ .
- 4.1.7 Any day with daily SAIDI greater than the threshold value  $T_{MED}$  that occurs during the subsequent reporting period is a major event day.

**Note to IF-EU-550a.2**

- 1 The entity shall discuss notable service disruptions such as those that affected a significant number of customers or disruptions of extended duration.
- 2 For such disruptions, the entity should provide:
  - 2.1 Description and cause of the service disruption
  - 2.2 The total generation or transmission capacity, in megawatts, and population affected by the disruption
  - 2.3 The costs associated with the service disruption
  - 2.4 Actions taken to mitigate the potential for future service interruptions
  - 2.5 Any other significant outcomes (e.g., legal proceedings or related fatalities)



## ENGINEERING & CONSTRUCTION SERVICES

### Industry Description

The Engineering & Construction Services industry provides engineering, construction, design, consulting, contracting, and other related services that support various building and infrastructure projects. The industry is primarily made up of four major segments: engineering services, infrastructure construction, non-residential building construction, and building sub-contractors and construction-related professional services. The infrastructure construction segment includes companies that design and/or build infrastructure projects such as power plants, dams, oil and gas pipelines, refineries, highways, bridges, tunnels, railways, ports, airports, waste treatment plants, water networks, and stadiums. The non-residential building construction segment includes companies that design and/or build industrial and commercial facilities such as factories, warehouses, data centers, offices, hotels, hospitals, universities, and retail spaces like malls. The engineering services segment includes companies that provide specialized architectural and engineering services such as design and development of feasibility studies for many of the project types listed above. Finally, the building sub-contractors and other construction-related professional services segment includes smaller companies that provide ancillary services such as carpentry, electrical, plumbing, painting, waterproofing, landscaping, interior design, and building inspection. The industry's customers include infrastructure owners and developers in the public and private sectors. Large companies in this industry operate and generate revenue globally and typically specialize in multiple segments.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Environmental Impacts of Project Development	Number of incidents of non-compliance with environmental permits, standards, and regulations	Quantitative	Number	IF-EN-160a.1
	Discussion of processes to assess and manage environmental risks associated with project design, siting, and construction	Discussion and Analysis	n/a	IF-EN-160a.2
Structural Integrity & Safety	Amount of defect- and safety-related rework costs	Quantitative	Reporting currency	IF-EN-250a.1
	Total amount of monetary losses as a result of legal proceedings associated with defect- and safety-related incidents <sup>39</sup>	Quantitative	Reporting currency	IF-EN-250a.2
Lifecycle Impacts of Buildings & Infrastructure	Number of (1) commissioned projects certified to a third-party multi-attribute sustainability standard and (2) active projects seeking such certification	Quantitative	Number	IF-EN-410a.1
	Discussion of process to incorporate operational-phase energy and water efficiency considerations into project planning and design	Discussion and Analysis	n/a	IF-EN-410a.2

<sup>39</sup>

Note to **IF-EN-250a.2** – The entity shall briefly describe the nature, context, and any corrective actions taken as a result of the monetary losses.

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Climate Impacts of Business Mix	Amount of backlog for (1) hydrocarbon-related projects and (2) renewable energy projects	Quantitative	Reporting currency	IF-EN-410b.1
	Amount of backlog cancellations associated with hydrocarbon-related projects	Quantitative	Reporting currency	IF-EN-410b.2
	Amount of backlog for non-energy projects associated with climate change mitigation	Quantitative	Reporting currency	IF-EN-410b.3

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of active projects <sup>40</sup>	Quantitative	Number	IF-EN-000.A
Number of commissioned projects <sup>41</sup>	Quantitative	Number	IF-EN-000.B
Total backlog <sup>42</sup>	Quantitative	Reporting currency	IF-EN-000.C

<sup>40</sup>

Note to **IF-EN-000.A** – Active projects are defined as buildings and infrastructure projects under development that the entity was actively providing services to as of the close of the reporting period, including, but not limited to, both the design and construction stages. Active projects exclude projects that were commissioned during the reporting period.

<sup>41</sup>

Note to **IF-EN-000.B** – Commissioned projects are defined as projects that were completed and deemed ready for service during the reporting period. The scope of commissioned projects shall only include projects that the entity provided construction services to.

<sup>42</sup>

Note to **IF-EN-000.C** – Backlog is defined as the value of projects not completed as of the close of the reporting period (i.e., revenue contractually expected in the future but that has not been recognized), or is defined by the entity, consistent with its existing disclosure of backlog. Backlog may also be referred to as revenue backlog or unsatisfied performance obligations. The scope of disclosure is limited to buildings and infrastructure projects where the entity provides engineering, construction, architecture, design, installation, planning, consulting, repair, and/or maintenance services, or other similar services.

# Environmental Impacts of Project Development

## Topic Summary

Infrastructure construction projects help improve economic and social development; however, they can also pose risks to the local environment and surrounding communities. Industry activities can disrupt local ecosystems through biodiversity impacts, emissions into the air, water discharges, natural resource consumption, waste generation, and the use of hazardous chemicals. In particular, construction companies perform clearing, grading, and excavation activities and may generate harmful waste during project construction. Effectively assessing environmental impacts prior to construction may help mitigate unforeseen issues that can raise operational and capital costs. In some cases, environmental concerns and/or local community pushback can result in project delays and, in extreme cases, project cancellations, which may impact a company's profitability and growth opportunities. A failure to comply with environmental regulations during construction can result in costly fines and remediation costs, and can damage a company's reputation. Environmental impact assessments can provide an understanding of a project's potential environmental impacts and the mitigation activities that may be necessary before it begins. Likewise, proper management of environmental risks during project construction can reduce regulatory oversight and/or community pushback. By assessing environmental considerations up front, as well as continuing to evaluate them during project development, engineering and construction companies may be better prepared to mitigate the potential environmental issues and financial risks that may occur, while also establishing a competitive advantage for obtaining new contracts with prospective clients.

## Accounting Metrics

### **IF-EN-160a.1. Number of incidents of non-compliance with environmental permits, standards, and regulations**

- 1 The entity shall disclose the total number of instances of non-compliance associated with the environment, including, but not limited to, violations of permits, standards, and/or regulations associated with waste, air quality and/or emissions, water discharges, water withdrawal exceedances, effluent limit exceedances (such as waste load allocation), violation of wastewater pretreatment requirements, oil or hazardous substance spills, land use, and endangered species.
- 2 The scope of disclosure includes incidents governed by national, state, and local statutory permits and regulations.
- 3 The scope of disclosure includes incidents of non-compliance received by the entity and by subcontractors under the entity's direct supervision.
- 4 An incident of non-compliance shall be disclosed regardless of whether it resulted in an enforcement action (e.g., fine and/or warning letter).
- 5 An incident of non-compliance, regardless of the measurement methodology or frequency, shall be disclosed. These include violations for one-time violations, continuous discharges, and non-continuous discharges.

### **IF-EN-160a.2. Discussion of processes to assess and manage environmental risks associated**

## with project design, siting, and construction

- 1 The entity shall discuss the processes it employs to assess and manage the environmental risks associated with project siting, design and construction.
  - 1.1 Environmental risks may include, but are not limited to, ecological impacts, biodiversity impacts, emissions to air, discharges to water, slope disturbance, soil disturbance and erosion, storm water management, waste management, natural resource consumption, and hazardous chemical usage.
- 2 The entity shall discuss the due diligence practices it employs to assess the environmental risks of projects, where relevant due diligence practices include environmental impact assessments and stakeholder engagement practices.
  - 2.1 Relevant items to discuss include, but are not limited to: practices to assess the baseline environmental considerations of the project site; feasible, environmentally preferable alternatives for the project; local legal requirements; the protection of biodiversity; use of renewable natural resources; use of hazardous substances; and efficient production, delivery and use of energy.
- 3 The entity shall discuss the operational practices it employs to minimize environmental impacts during project siting, design, and construction, which may include, but are not limited to: waste management, reducing biodiversity impacts, emissions to air, discharges to water, natural resource consumption, and hazardous chemical usage.
- 4 The entity shall describe its approach to operating in compliance with all applicable environmental regulations and permits.
  - 4.1 Relevant items to discuss include, but are not limited to: employee training on relevant regulations and cleanup procedures, quality control processes on project sites, internal mechanisms for reporting and following up on environmental incidents, and maintenance and reporting of accurate data.
- 5 The entity shall discuss the use of codes, guidelines, and standards to assess and minimize environmental impacts of project siting, design, and construction, where applicable. Relevant codes, guidelines, and standards may include, but are not limited to:
  - 5.1 BREEAM®
  - 5.2 The Equator Principles
  - 5.3 International Finance Corporation's Environmental and Social Performance Standards and Guidance Notes
  - 5.4 Institute for Sustainable Infrastructure's (ISI) Envision® rating system
  - 5.5 International Organization for Standardization (ISO) environmental standards
  - 5.6 United Nations Development Programme's Performance Standards on Environmental and Social Sustainability
  - 5.7 United Nations Global Compact's Environmental Principles
  - 5.8 U.S. Green Building Council's LEED® certification
- 6 The entity shall describe its approach to managing projects that have heightened environmental and/or social due diligence requirements or are expected to have significant adverse environmental and/or social impacts, including additional measures or policies it employs.

- 6.1 An example of a project type that has heightened environmental and/or social impacts are “[Category A](#)” projects categorized by the International Finance Corporation (IFC).
  - 6.2 The entity may describe its approach to categorizing the severity of environmental risk for its projects, including how it determines if a project has heightened environmental risk.
- 7 Where applicable and relevant, the entity shall describe differences between policies and practices for its different operating regions, project types, and business segments.
  - 8 The scope of disclosure includes project stages associated with siting, design, and construction that the entity is involved with through contractual responsibility, including, but not limited to, feasibility studies, proposals, design and planning, subcontractor procurement, and construction.

# Structural Integrity & Safety

## Topic Summary

Whether providing engineering, design, architectural, consulting, inspection, construction, or maintenance services, companies in this industry have a professional responsibility to ensure the safety and integrity of their work. Errors or inadequate quality in the project design phase and construction of buildings or infrastructure can cause significant personal injury, loss of property value, and economic harm. Companies that perform poorly on structural integrity and safety can therefore face potentially high costs due to redesign and/or repair work and legal liabilities, as well as reputational damage that could hurt growth prospects. Moreover, when designing and constructing buildings or infrastructure, companies in the industry must increasingly contemplate potential climate change impacts, which may affect the structural integrity of projects and the safety of the general public. Compliance with minimum applicable codes and standards may not be sufficient for maintaining and growing reputational value (or even mitigating legal liabilities) in certain circumstances, especially if the frequency and severity of climate-change-related events increases as expected. Meeting or exceeding new industry standards for quality and establishing internal control procedures to address potential design issues, including those resulting from climate risks, are practices that can help companies reduce these risks.

## Accounting Metrics

### IF-EN-250a.1. Amount of defect- and safety-related rework costs

- 1 The entity shall disclose the total amount of defect- and safety-related rework costs incurred.
  - 1.1 Rework is defined, consistent with the Construction Industry Institute's definition, as activities in the field that have to be done more than once in the field or activities that remove work previously installed as part of the project.
  - 1.2 For the purposes of this disclosure, the scope of rework costs excludes costs resulting from client- or project-owner-driven modifications including, but not limited to, change orders, revisions to scope, or revisions to design.
  - 1.3 The scope of rework costs includes, but is not limited to, costs associated with labor, materials, design, equipment, and subcontractors.
- 2 The entity may discuss projects with significant rework costs relative to actual or projected total project costs. Relevant context to provide may include, but is not limited to:
  - 2.1 Root causes of rework
  - 2.2 Corrective actions implemented
  - 2.3 Financial impacts to company

### IF-EN-250a.2. Total amount of monetary losses as a result of legal proceedings associated

## **with defect- and safety-related incidents**

- 1 The entity shall disclose the total amount of monetary losses it incurred during the reporting period as a result of legal proceedings associated with defect- and safety-related incidents and allegations.
- 2 The legal proceedings shall include any adjudicative proceeding in which the entity was involved, whether before a court, a regulator, an arbitrator, or otherwise.
- 3 The losses shall include all monetary liabilities to the opposing party or to others (whether as the result of settlement or verdict after trial or otherwise), including fines and other monetary liabilities incurred during the reporting period as a result of civil actions (e.g., civil judgments or settlements), regulatory proceedings (e.g., penalties, disgorgement, or restitution), and criminal actions (e.g., criminal judgment, penalties, or restitution) brought by any entity (e.g., governmental, business, or individual).
- 4 The scope of monetary losses shall exclude legal and other fees and expenses incurred by the entity in its defense.

### **Note to IF-EN-250a.2**

- 1 The entity shall briefly describe the nature (e.g., judgment or order issued after trial, settlement, guilty plea, deferred prosecution agreement, or non-prosecution agreement) and context (e.g., negligence) of all monetary losses as a result of legal proceedings.
- 2 The entity shall describe any corrective actions it has implemented as a result of legal proceedings. This may include, but is not limited to, specific changes in operations, management, processes, products, business partners, training, or technology.

# Lifecycle Impacts of Buildings & Infrastructure

## Topic Summary

Buildings and major infrastructure projects are among the largest users of natural resources in the economy; during construction, these materials include iron and steel products, cement, concrete, bricks, drywall, wallboards, glass, insulation, fixtures, doors, and cabinetry, among others. Once completed, and during their daily use, these projects often consume significant amounts of resources in the form of energy and water (for a discussion on direct environmental impacts from project construction see the Environmental Impacts of Project Development topic). Therefore, the sourcing of construction materials and the everyday use of buildings and infrastructure can contribute to direct and indirect greenhouse gas (GHG) emissions, global and/or local resource constraints, water stress, and negative human health outcomes. Client and regulatory pressures to develop a sustainable built environment are contributing to the growth of markets intended to reduce the lifecycle impacts of buildings and infrastructure projects. In response, various international sustainable building and infrastructure certification schemes have been developed to assess, among other aspects, a project's use-phase energy and water efficiency, impacts on human health, and the use of sustainable construction and building materials. As a result, multiple opportunities are being created for industries in the value chain—from suppliers that can provide such materials, to companies in the Engineering & Construction Services industry that can provide sustainability-oriented project design, consulting, and construction services. Such services can provide a competitive advantage and revenue growth opportunities as client demand for economically advantageous sustainable projects increases and related regulations evolve. Companies unable to effectively integrate such considerations into their services may stand to lose market share in the long term.

## Accounting Metrics

### **IF-EN-410a.1. Number of (1) commissioned projects certified to a third-party multi-attribute sustainability standard and (2) active projects seeking such certification**

- 1 The entity shall disclose (1) the number of projects commissioned during the reporting period that were certified to a third-party multi-attribute sustainability standard.
  - 1.1 The scope of third-party multi-attribute sustainability standards is limited to standards or certifications that, at a minimum, address the following aspects of building or infrastructure design and construction:
    - 1.1.1 Energy efficiency;
    - 1.1.2 Water conservation;
    - 1.1.3 Material and resource efficiency; and
    - 1.1.4 Indoor environmental quality.
  - 1.2 Examples of third-party multi-attribute sustainability standards include:
    - 1.2.1 BREEAM®
    - 1.2.2 Green Globes®



1.2.3 Institute for Sustainable Infrastructure's (ISI) Envision®

1.2.4 LEED®

- 2 The entity shall disclose (2) the number of active projects that sought certification to a third-party multi-attribute sustainability standard during the reporting period.
  - 2.1 The scope of active projects includes all buildings and infrastructure projects actively under development at the close of the reporting period, including, but not limited to, those in the design and construction stages.
  - 2.2 The scope of active projects excludes projects that were commissioned during the reporting period.
- 3 The entity shall disclose the third-party multi-attribute sustainability standard(s) to which projects are certified or seeking certification.
- 4 The scope of disclosure is limited to projects in which the entity had a direct role in design, engineering, procurement and/or construction of the building or infrastructure project.
- 5 The scope of disclosure includes buildings (such as residential, commercial and retail, government, healthcare, and offices) and other infrastructure projects (such as transportation, oil and gas, electrical grid, renewable energy, water supply distribution, and water treatment).
- 6 The entity may discuss sustainability standards or guidelines that it implements into its building and infrastructure project design and construction that are not third-party verified.

## **IF-EN-410a.2. Discussion of process to incorporate operational-phase energy and water efficiency considerations into project planning and design**

- 1 The entity shall provide a discussion of the process it uses to incorporate operational-phase energy and water efficiency considerations into project planning and design.
  - 1.1 Operational-phase energy and water efficiency considerations are solutions aimed at reducing and optimizing operational use of energy and water, including, but not limited to, water collection and reuse designs, repair and retrofits, improved insulation and material use, shading devices, energy procurement, and use of energy- and water-efficient devices and lighting.
  - 1.2 Relevant information to disclose includes, but is not limited to:
    - 1.2.1 The actions taken to incorporate such considerations, such as design solutions, technological solutions, material use, modeling of energy and water use
    - 1.2.2 The geographic markets where the entity operates in, including current and expected future energy and water efficiency regulations, potential constraints on water and/or energy resources, and stakeholder demands in those markets
    - 1.2.3 Whether these energy and water efficiency solutions serve as competitive advantages in project bids and proposals, and how the entity communicates performance—including any perceived competitive advantages—to project owners

1.2.4 How the entity communicates long-term cost-benefit analyses to project owners or developers, including the potential savings from energy efficiency projects based on past performance of energy efficiency projects

- 2 The entity shall describe its approach to assessing risks associated with operational-phase energy and water efficiency considerations, including internal policies, practices, and procedures.
- 3 The entity shall describe its use of codes, guidelines, and standards that address operational-phase energy and water efficiency, where applicable.

3.1 The entity may discuss how its energy and water efficiency efforts exceed building code requirements.

- 4 The scope of disclosure excludes environmental impacts associated with project construction, as well as codes, guidelines, and standards associated with project construction, which are both included within the scope of IF-EN-160a.2.

# Climate Impacts of Business Mix

## Topic Summary

The Engineering & Construction Services industry works with clients that are exposed to potentially disruptive climate regulation as well as those that play a role in addressing climate change. Certain types of construction projects are significant contributors toward climate change due to the greenhouse gases (GHGs) emitted during their use phase. Projects that are likely to contribute to global GHG emissions include those in the oil and gas space and other extractives industries, as well as large buildings. While some infrastructure projects, such as renewable energy projects, are designed to reduce GHG emissions, many types of projects present trade-offs. Mass transit systems, for example, may be direct contributors of GHG emissions while lowering net emissions once the benefits offered by the system are factored in. Several companies in the industry generate a substantial share of revenues and profits from clients in carbon-intensive industries and whose future capital expenditures may be at risk due to evolving climate regulations. Downside risks may manifest through project delays, cancellations, and diminished long-term revenue growth opportunities. On the other hand, companies that specialize in infrastructure projects that contribute to GHG mitigation could develop competitive advantages as they continue to focus on these growing markets. As the industry and its customers continue to operate within an uncertain business environment and face increasing environmental and regulatory requirements, assessing and communicating the risks and opportunities stemming from climate change that are embedded in a company's backlog and future business prospects can be helpful for investors in assessing the overall impact of climate change on the business.

## Accounting Metrics

### IF-EN-410b.1. Amount of backlog for (1) hydrocarbon-related projects and (2) renewable energy projects

- 1 The entity shall disclose the amount of its backlog associated with (1) hydrocarbon-related projects.
  - 1.1 Backlog is defined as the value of projects not completed as of the close of the reporting period (i.e., revenue contractually expected in the future but that has not been recognized), or is defined by the entity, consistent with its existing disclosure of backlog. Backlog may also be referred to as revenue backlog or unsatisfied performance obligations.
  - 1.2 Hydrocarbon-related projects are defined as any type of project directly associated with the hydrocarbon value chain, including, but not limited to: hydrocarbon exploration, extraction, development, production, and/or transportation; hydrocarbon infrastructure services and maintenance; hydrocarbon power generation; and hydrocarbon-related downstream services.
    - 1.2.1 Examples of hydrocarbon-related projects include, but are not limited to: any project directly associated with oil, gas, or coal production; transportation; refining; and fossil fuel-based electricity generation.

- 2 If a significant portion of the entity's backlog in hydrocarbon-related projects is associated with natural gas power generation projects, the entity may provide supplemental disclosures describing this proportion of backlog and the sustainability impacts of such projects relative to alternatives or baseline scenarios.
- 3 The entity may provide a description of the sustainability implications of hydrocarbon-related projects, including, but not limited to, project descriptions, categorizations by resource type, expected sustainability impacts, and risks related to project completion and/or conversion to revenue.
- 4 The entity shall disclose the amount of its backlog associated with (2) renewable energy projects.
  - 4.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, consistent with U.S. Environmental Agency Protection (EPA) [definitions](#), such as geothermal, wind, solar, hydro, and biomass.
- 5 The entity shall exclude from its calculations and disclosures of backlog any amount of an order backlog cancellation that re-enters order backlog during the same reporting period as a result of a project owner's successful re-planning of the project.
- 6 The scope of disclosure is limited to projects where the entity provided engineering, architecture, design, construction, installation, planning, consulting, repair, and/or maintenance services, or other similar services.

## **IF-EN-410b.2. Amount of backlog cancellations associated with hydrocarbon-related projects**

- 1 The entity shall disclose the amount of its total backlog associated with hydrocarbon-related projects of any type that was cancelled during the reporting period for any reason.
  - 1.1 Backlog is defined as the value of projects not completed as of the close of the reporting period (i.e., revenue contractually expected in the future but that has not been recognized), or is defined by the entity, consistent with its existing disclosure of backlog. Backlog may also be referred to as revenue backlog or unsatisfied performance obligations.
  - 1.2 Backlog cancellations are defined as the amount of backlog cancelled, reduced, terminated, or deferred such that it no longer meets the definition of backlog, or removed from the backlog for any reason other than conversion to revenue or currency exchange rate fluctuations.
    - 1.2.1 Backlog cancellations include cancellations that occur for any reason, including, but not limited to, a customer's failure to obtain necessary project permitting or financing, a customer's voluntary project cancellation, and reduction in project scope due to financial constraints.
    - 1.2.2 The scope of backlog cancellations excludes cancellations associated with decommissioning projects.
  - 1.3 Hydrocarbon-related projects are defined as any type of project directly associated with the hydrocarbon value chain, including, but not limited to: hydrocarbon exploration, extraction, development, production, and/or transportation; hydrocarbon infrastructure services and maintenance; hydrocarbon power generation; and hydrocarbon-related downstream services.

- 1.3.1 Examples of hydrocarbon-related projects include, but are not limited to: any project directly associated with oil, gas, or coal production; transportation; refining; and fossil fuel-based electricity generation.
- 2 The scope of disclosure is limited to projects where the entity provided engineering, architecture, design, construction, installation, planning, consulting, repair, and/or maintenance services, or other similar services.
- 3 The entity may discuss specific backlog cancellations, including the root cause and corrective actions taken to prevent future backlog cancellations.

### **IF-EN-410b.3. Amount of backlog for non-energy projects associated with climate change mitigation**

- 1 The entity shall disclose the amount of its backlog for non-energy projects associated with climate change mitigation.
  - 1.1 Backlog is defined as the value of projects not completed as of the close of the reporting period (i.e., revenue contractually expected in the future but that has not been recognized), or is defined by the entity, consistent with its existing disclosure of backlog. Backlog may also be referred to as revenue backlog or unsatisfied performance obligations.
  - 1.2 Non-energy projects are defined as projects that are not directly associated with the energy value, where the energy value chain includes, but is not limited to: hydrocarbon exploration, extraction, development, production, and transportation; power generation projects (hydrocarbon and renewable); and energy infrastructure services and maintenance.
  - 1.3 Climate change mitigation is defined by the Intergovernmental Panel on Climate Change (IPCC) as an anthropogenic intervention to reduce the sources or enhance the sinks of greenhouse gases (GHG).
- 2 The scope of disclosure shall only include projects that are significantly motivated by, or undertaken in response to, climate change mitigation. Such climate change mitigation is not required to be the primary project motivation, but it must be a significant motivating factor for project development and implementation.
  - 2.1 Examples of projects that may be associated with climate change mitigation include, but are not limited to: mass transportation systems; alternative, low-carbon transportation systems; carbon capture and storage; hydrocarbon-related decommissioning projects; and energy efficiency infrastructure retrocommissionings.
- 3 The scope of disclosure shall only include projects that provide significant climate change mitigation relative to a baseline scenario, or baseline emissions, defined as the GHG emissions that may occur without project implementation.
  - 3.1 The entity may use or reference all or part of the “[European Investment Bank Induced GHG Footprint](#)” methodology for assessing relative emissions (including absolute emissions and/or baseline emissions).
  - 3.2 The entity may use alternative methodologies or proprietary methodologies for assessing climate change mitigation relative to a baseline scenario or baseline emissions.

- 4 The scope of disclosure shall exclude all backlog directly associated with the energy value chain, which may be equivalent to backlog included in IF-EN-410b.1, with the exception of hydrocarbon-related decommissioning projects.
- 5 The entity may exclude backlog associated with decommissioning projects.
- 6 The scope of disclosure is limited to buildings and infrastructure projects where the entity provided engineering, architecture, design, construction, installation, planning, consulting, repair, and/or maintenance services, or other similar services.

## GAS UTILITIES & DISTRIBUTORS

### Industry Description

The Gas Utilities & Distributors industry is made up of gas distribution and marketing companies. Gas distribution involves operating local, low-pressure pipes to transfer natural gas from larger transmission pipes to end users. Gas marketing companies are gas brokers that aggregate natural gas into quantities that fit the needs of their different customers and then deliver it, generally through other companies' transmission and distribution lines. A relatively smaller portion of this industry is involved in propane gas distribution; therefore this standard is focused on natural gas distribution. Both types of gas are commonly used for heating and cooking by residential, commercial, and industrial customers. In structurally regulated markets, the utility is granted a full monopoly over the distribution and sale of natural gas. A regulator must approve the rates utilities charge to avoid the abuse of their monopoly position. In deregulated markets, distribution and marketing are legally separated and customers have a choice of which company to buy their gas from. In this case, a utility is guaranteed a monopoly only over distribution and is legally required to transmit all gas equitably along its pipes for a fixed fee. Overall, companies in the industry are tasked with providing safe, reliable, low-cost gas, while effectively managing their social and environmental impacts, such as community safety and methane emissions.

Note: The SASB Gas Utilities & Distributors industry does not include gas transmission companies that transport highly pressurized natural gas over long distances from the wellhead. Gas transmission companies are included in the Oil & Gas - Midstream industry (EM-MD) in the Extractives & Minerals Processing sector. Furthermore, the SASB standard for the Gas Utilities & Distributors industry covers activities related only to gas provision and not to electricity provision. Some utilities may operate in both gas and electricity markets. Companies undertaking activities related to electricity generation and/or distribution should also consider the separate SASB Standard for the Electric Utilities & Power Generators industry (IF-EU).

Table 1. Climate-related Disclosure Topics & Accounting Metrics

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
End-Use Efficiency	Percentage of gas utility revenues from rate structures that (1) are decoupled or (2) contain a lost revenue adjustment mechanism (LRAM)	Quantitative	Percentage (%)	IF-GU-420a.1
	Customer gas savings from efficiency measures by market <sup>43</sup>	Quantitative	Million British Thermal Units (MMBtu)	IF-GU-420a.2
Integrity of Gas Delivery	Number of (1) reportable pipeline incidents, (2) Corrective Action Orders (CAO), and (3) Notices of Probable Violation (NOPV) <sup>44</sup>	Quantitative	Number	IF-GU-540a.1

<sup>43</sup>

Note to **IF-GU-420a.2** – The entity shall discuss customer efficiency measures that are required by regulations for each of its relevant markets.

<sup>44</sup>

Note to **IF-GU-540a.1** – The entity shall discuss notable incidents such as those that affected a significant number of customers, created extended disruptions to service, or resulted in serious injury or death.

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Infrastructure	Percentage of distribution pipeline that is (1) cast and/or wrought iron and (2) unprotected steel	Quantitative	Percentage (%) by length	IF-GU-540a.2
	Percentage of gas (1) transmission and (2) distribution pipelines inspected	Quantitative	Percentage (%) by length	IF-GU-540a.3
	Description of efforts to manage the integrity of gas delivery infrastructure, including risks related to safety and emissions	Discussion and Analysis	n/a	IF-GU-540a.4

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of: (1) residential, (2) commercial, and (3) industrial customers served <sup>45</sup>	Quantitative	Number	IF-GU-000.A
Amount of natural gas delivered to: (1) residential customers, (2) commercial customers, (3) industrial customers, and (4) transferred to a third party <sup>46</sup>	Quantitative	Million British Thermal Units (MMBtu)	IF-GU-000.B
Length of gas (1) transmission and (2) distribution pipelines <sup>47</sup>	Quantitative	Kilometers (km)	IF-GU-000.C

<sup>45</sup> Note to **IF-GU-000.A** – The number of customers served for each category shall be considered as the number of meters billed for residential, commercial, and industrial customers.

<sup>46</sup> Note to **IF-GU-000.B** – The amount of natural gas delivered to residential, commercial, and industrial customers shall be disclosed by bundled gas and transportation service only.

<sup>47</sup> Note to **IF-GU-000.C** – Transmission pipeline is defined according to U.S. 49 CFR 192.3 as a pipeline, other than a gathering line, that: transports gas from a gathering line or storage facility to a distribution center, storage facility, or large volume customer that is not downstream from a distribution center; (2) operates at a hoop stress of 20 percent or more of SMYS; or (3) transports gas within a storage field. A distribution pipeline is defined according to 49 CFR 192.3 as a pipeline other than a gathering or transmission line.



# End-Use Efficiency

## Topic Summary

Natural gas produces fewer greenhouse gas (GHG) emissions than other fossil fuels. Its expanded use in the economy is therefore a key strategy for many governments and regulators striving to reduce GHG emissions. Despite the relatively lower emissions, however, the natural gas value chain still produces meaningful levels of GHG emissions overall. As policymakers and regulators look to address climate change, efficient consumption of natural gas will be an important theme over the long term. There is a wide range of measures that utilities can take to promote energy efficiency among their customers, including offering rebates for energy-efficient appliances, weatherizing customers' homes, and educating customers on energy saving methods. How a gas utility stands to gain or lose from the trend toward GHG mitigation is significantly predicated on its regulatory environment. Traditional rate structures generally do not give gas utilities an incentive for energy efficiency and, further, they may economically suffer from reductions in customer demand. This is increasingly driving gas utilities, and their regulators and customers, to pursue alternative ratemaking. Such alternative rate design often "decouples" utility revenues from customer consumption and may also build in explicit incentives for successful utility performance in terms of end-use efficiency and demand reductions. Overall, companies whose strategic plan includes efficiency initiatives that strive to reduce downside risks from demand fluctuations, gain returns on needed investments, and lower costs are more likely to be well positioned to earn stronger risk-adjusted returns over the long term.

## Accounting Metrics

### **IF-GU-420a.1. Percentage of gas utility revenues from rate structures that (1) are decoupled or (2) contain a lost revenue adjustment mechanism (LRAM)**

- 1 The entity shall disclose the percentage of gas utility revenues from (1) revenue decoupled rate structures.
  - 1.1 Revenue decoupled rate structures are defined, according to the U.S. National Association of Regulatory Utility Commissioners in [Decoupling for Electric & Gas Utilities](#) (September 2007), as a rate adjustment mechanism that separates the entity's gas utility's fixed cost recovery from the amount of gas sold—and the utility's revenues are collected based on the regulatory-determined revenue requirement.
    - 1.1.1 Revenue decoupled rate structures may also be referred to as, "revenue regulation" or "revenue cap regulation," where the regulator establishes an allowed revenue requirement and adjusts collections so as to achieve that allowed, or "target," revenue irrespective of actual sales (definition adapted from, [Decoupling Case Studies: Revenue Regulation Implementation in Six States](#), The Regulatory Assistance Project, July 2014).
    - 1.1.2 Additional guidance on the scope of revenue decoupled rate structures is contained in [Alternative Regulation for Emerging Utility Challenges: 2015 Update](#), Edison Electric Institute, November 11, 2015 .
  - 1.2 The scope of decoupled rate structures shall exclude straight fixed-variable rate design and those rate structures that contain a lost revenue adjustment mechanism (LRAM).

- 1.3 The percentage shall be calculated as the total regulated gas utility revenue from revenue decoupled rate structures divided by total regulated gas utility revenue.
- 2 The entity shall disclose the percentage of gas utility revenues from (2) rate structures that contain a LRAM.
  - 2.1 Rate structures that contain a LRAM are defined as volumetric rates that contain a mechanism which allows the entity to recover revenues lost directly resulting from energy conservation, energy efficiency, demand side management, and/or distributed generation programs that are directly managed and/or implemented by the entity.
  - 2.2 Additional guidance on the scope of LRAMs is contained in Alternative Regulation for Emerging Utility Challenges: 2015 Update, Edison Electric Institute, November 11, 2015.
  - 2.3 The scope includes mechanisms that allow the estimation of lost revenues based on the programs' actual impacts, but excludes lost revenues from planned or forecasted programs' impacts (as described in [Alternative Regulation and Ratemaking Approaches for Water Companies](#), The Brattle Group, September 23, 2013—while the referenced resource is intended for water utilities, the concept of LRAMs is similar for gas utilities).
  - 2.4 The percentage shall be calculated as the total regulated gas utility revenue from rate structures that contain a LRAM divided by total regulated gas utility revenue.
- 3 The scope of disclosure is limited to revenues directly resulting from the provision of gas to retail customers by regulated utilities.

## **IF-GU-420a.2. Customer gas savings from efficiency measures by market**

- 1 The entity shall disclose the total amount of gas savings delivered to customers, in million British thermal units (MMBtu), from energy efficiency measures during the reporting period for each of its markets.
  - 1.1 Markets are defined as those operations that are subject to distinct public utility regulatory oversight.
  - 1.2 Gas savings are defined according to the gross savings approach as the changes in energy consumption and/or demand that results from program-related actions taken by participants in an efficiency program, regardless of why they participated.
    - 1.2.1 The entity may list those markets where it reports gas savings on a net savings basis and thus may be different from the figures disclosed here, where net gas savings are defined as changes in consumption that are specifically attributable to an energy efficiency program, and that would not otherwise have happened in the absence of the program.
- 2 Gas savings shall be calculated on a gross basis but consistent with the methodology set forth in national, state, or local evaluation, measurement, and verification (EM&V) regulations where such savings occur, where examples of U.S. state regulations include, but are not limited to:
  - 2.1 California Public Utilities Commission [Decision 09-09-047](#)
  - 2.2 Minnesota [Statutes 216B.241](#)

2.3 New York [Case 07-M-0458](#)

- 3 Where national, state, or local regulations do not exist, the entity shall calculate gas savings consistent with the measurement and verification methods outlined by the U.S. Department of Energy's (DOE) Federal Energy Management Program (FEMP) [M&V Guidelines: Measurement and Verification for Federal Energy Projects, Version 4.0](#).
- 4 The scope of gas savings from efficiency measures includes savings delivered directly by the entity and, where regulations provide, savings substantiated by purchases of efficiency savings credits.
  - 4.1 For any savings from efficiency measures delivered directly by the entity, any efficiency savings credits must be retained (i.e., not sold) and retired on behalf of the entity in order for the entity to claim them as delivered gas savings.
  - 4.2 For efficiency savings credits that are purchased, the agreement must explicitly include and convey that credits be retained and retired on behalf of the entity in order for the entity to claim them.
- 5 Relevant regulations governing efficiency savings credits include the following regulations in the U.S.:
  - 5.1 Connecticut [House Bill 7432](#)
  - 5.2 Nevada [Regulation of Public Utilities Chapter 704](#)
- 6 The entity shall consider guidance on regulations as a normative reference, thus any updates made year-on-year shall be considered updates to this guidance.

Note to **IF-GU-420a.2**

- 1 The entity shall discuss customer efficiency measures that are required by regulations for each of its relevant markets, including a discussion of:
  - 1.1 The amount or percentage of gas savings from efficiency measures required by regulations for each market.
  - 1.2 Instances of noncompliance with gas savings obligations.
    - 1.2.1 In such instances, the entity shall disclose the difference between the gas savings delivered and the amount required by the regulation.
  - 1.3 Gas savings delivered that exceed those required by regulations and that resulted in the entity receiving energy efficiency performance incentives, including the value of any such incentives.
- 2 Relevant regulations include, but are not limited to:
  - 2.1 California Public Utilities Commission [Decision 14-10-046](#)
  - 2.2 Illinois [Public Act 096-0033](#)
  - 2.3 Massachusetts Department of Public Utilities [Three Year Energy Efficiency Plan 15-160 to 15-169](#)
  - 2.4 Minnesota [Statutes 216B.241](#)

- 3 The entity shall discuss the policy mechanisms in place for each market that allows for or incentivizes energy efficiency, including a discussion of the benefits, challenges, and financial impacts associated with such mechanisms.
- 4 Relevant policy mechanisms to discuss include, but are not limited to:
  - 4.1 Deferral decoupling
  - 4.2 Current period decoupling
  - 4.3 Single fixed variable rates
  - 4.4 Lost revenue adjustments
  - 4.5 Energy efficiency feebates
- 5 The entity may discuss incentives it has developed for its customers that promote end-use efficiency, including, but not limited to, energy efficiency rebates, and other measures to subsidize customer energy efficiency.

# Integrity of Gas Delivery Infrastructure

## Topic Summary

Operating a vast network of gas pipelines, equipment, and storage facilities requires a multifaceted, long-term approach to ensuring the integrity of such infrastructure, and the management of related risks. While customers depend on constantly available gas supplies, companies are tasked with managing substantial risks—including those related to human health, property, and greenhouse gas (GHG) emissions—that result from operating gas distribution networks and related infrastructure. Aging infrastructure, inadequate monitoring and maintenance, and other operational factors may lead to gas leaks. Gas leaks can result in safety-related risks, such as losses of containment, which may result in fires or explosions that can be particularly severe in urban areas where companies often operate. Furthermore, gas leaks also result in fugitive emissions (methane), causing adverse environmental impacts. Regulated gas utilities generally incur no direct costs for gas leaks, as the cost of gas is typically passed directly to customers (though this may vary by region). However, gas leaks that result in safety-related risks and/or fugitive emissions may financially impact companies through a variety of regulatory, legal, and product demand channels. Accidents, particularly fatal accidents, can result in claims of negligence against companies, leading to costly court battles and fines. GHG emissions may lead to increased regulatory scrutiny—a critical element directly connected to financial performance, given the importance of regulatory relations—and potential fines and penalties. Importantly, regulated gas utilities can also financially benefit from opportunities for capital investments designed to improve performance and mitigate risks related to safety and emissions. These capital investments may lead to higher rate bases, ultimately benefiting the company and its shareholders. Companies seek to manage such risks through pipeline replacements, regular inspections and monitoring, employee training and emergency preparedness, investments in technology, and other strategies—all typically done by working closely with regulators. In many parts of the country, concerns about aging infrastructure have caused companies in the industry to look for ways to expedite the replacement approval process, especially in cases where pipelines are located near densely populated areas.

## Accounting Metrics

### **IF-GU-540a.1. Number of (1) reportable pipeline incidents, (2) Corrective Action Orders (CAO), and (3) Notices of Probable Violation (NOPV)**

- 1 The entity shall disclose the number of U.S. Department of Transportation (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) reportable pipeline incidents, where:
  - 1.1 Reportable incidents are defined as events that involve a release of gas from a pipeline and that result in one or more of the following consequences: a death or personal injury necessitating in-patient hospitalization; estimated property damage of \$50,000 or more, including losses to the operator, losses to others, or both, but excluding the cost of gas lost; an unintentional estimated gas loss of three million cubic feet or more; or an event that is significant in the judgment of the operator, consistent with the definition provided in U.S. 49 CFR 191.
- 2 The entity shall disclose the number of PHMSA Corrective Action Orders (CAO) received, where:

2.1 A CAO is issued when a particular pipeline facility is found to be hazardous to life, property, or the environment. A corrective action may include suspended or restricted use of the facility, physical inspection, testing, repair, replacement, or other appropriate action, consistent with the definition provided by U.S. 49 CFR 190.233.

3 The entity shall disclose the number of Notices of Probable Violation (NOPV) received, where:

3.1 An NOPV is defined as the beginning of an enforcement proceeding that contains a statement of the provisions of the laws, regulations, or orders that the respondent is alleged to have violated and a statement of the evidence upon which the allegations are based, consistent with the definition provided in U.S. 49 CFR 190.207.

#### Note to **IF-GU-540a.1**

1 The entity shall discuss notable incidents such as those that affected a significant number of customers, created extended disruptions to service, or resulted in a PHMSA "serious incident."

1.1 PHMSA serious incidents are defined as incidents that resulted in a fatality or an injury requiring in-patient hospitalization.

2 For such incidents, the entity may provide:

2.1 A description and cause of the incident

2.2 The total population affected by the incident

2.3 The costs associated with the incident

2.4 Actions taken to mitigate the potential for future service interruptions

2.5 Any other significant outcomes (e.g., legal proceedings, serious injuries, and/or fatalities)

#### **IF-GU-540a.2. Percentage of distribution pipeline that is (1) cast and/or wrought iron and (2) unprotected steel**

1 The entity shall disclose the percentage, by length, in kilometers, of its natural gas pipelines that are (1) cast and/or wrought iron, and separately, (2) unprotected steel.

1.1 A distribution pipeline is defined according to U.S. 49 CFR 192.3 as a pipeline other than a gathering or transmission line, where:

1.1.1 A gathering line is defined as a pipeline that transports gas from a current production facility to a transmission line or main; and

1.1.2 A transmission line is defined as a pipeline, other than a gathering line, that (1) transports gas from a gathering line or storage facility to a distribution center, storage facility, or large-volume customer that is not downstream from a distribution center; (2) operates at a hoop stress of 20 percent or more of the specified minimum yield strength (SMYS); or (3) transports gas within a storage field.

- 1.2 Cast and/or wrought iron is defined as iron that is heated to its melting point and poured into molds and cannot be molded or screwed.
- 1.3 Unprotected steel is defined as steel with no form of corrosion protection.
- 2 The percentage of (1) cast and/or wrought iron distribution pipelines shall be calculated as the total length of cast and/or wrought iron pipelines that the entity owns or operates divided by the total length of distribution pipelines that the entity owns and/or operates.
- 3 The percentage of (2) unprotected steel distribution pipelines shall be calculated as the total length of unprotected steel pipelines that the entity owns or operates divided by the total length of distribution pipelines that the entity owns and/or operates.
- 4 The entity may discuss its pipeline replacement rates, its use of polyethylene pipes, or other efforts to reduce fugitive emissions and leaks and improve the safety of its distribution pipelines.

### **IF-GU-540a.3. Percentage of gas (1) transmission and (2) distribution pipelines inspected**

- 1 The entity shall disclose the percentage, by length, of gas (1) transmission pipelines, and separately, (2) distribution pipelines that were inspected during the reporting period.
  - 1.1 A transmission pipeline is defined, according to U.S. 49 CFR 192.3, as a pipeline, other than a gathering line, that (1) transports gas from a gathering line or storage facility to a distribution center, storage facility, or large volume customer that is not down-stream from a distribution center; (2) operates at a hoop stress of 20 percent or more of the specified minimum yield strength (SMYS); or (3) transports gas within a storage field.
  - 1.2 A distribution pipeline is defined, according to U.S. 49 CFR 192.3, as a pipeline other than a gathering or transmission line.
- 2 Inspection activities include those listed under U.S. 49 CFR 192 for gas pipelines, including:
  - 2.1 Internal inspection tool or tools capable of detecting corrosion and any other threats to which the covered segment is susceptible
  - 2.2 Pressure test(s)
  - 2.3 Direct assessment to address threats of external corrosion, internal corrosion, or stress corrosion racking
  - 2.4 Other technology that an operator demonstrates can provide an equivalent understanding of the condition of the line pipe
    - 2.4.1 If other technologies were used by the entity to conduct inspections per 29 CFR 192 or 29 CFR 195, the entity shall disclose which technology was used.
- 3 The percentage is calculated as the length of gas pipelines inspected divided by the total length of gas pipelines.

### **IF-GU-540a.4. Description of efforts to manage the integrity of gas delivery infrastructure,**

## including risks related to safety and emissions

- 1 The entity shall describe its efforts to manage the integrity of gas delivery infrastructure.
  - 1.1 Gas delivery infrastructure includes, but is not limited to, transmission pipelines, distribution pipelines, storage facilities, compressor stations, metering and regulation stations, and liquid natural gas facilities.
  - 1.2 Efforts may include, but are not limited to, those related to employee training, emergency preparedness, process safety, and asset integrity management.
  - 1.3 Relevant information to provide includes, but is not limited to, the use of standards, industry best practices, benchmarking, and participation in third-party initiatives, which may include, but are not limited to:
    - 1.3.1 The American Gas Association's (AGA) [Peer Review Program](#)
    - 1.3.2 American Petroleum Institute (API) Recommended Practices 1170 and 1171
    - 1.3.3 [Natural Gas Industry Safety Programs](#), as outlined by the American Gas Association
    - 1.3.4 The U.S. Environmental Protection Agency's (EPA) [Natural Gas STAR Program](#)
- 2 The entity shall describe how the it integrates a culture of safety and emergency preparedness throughout its project lifecycles, such as through training, oversight of workforce, rules and guidelines for communicating risks, and use of technology.
  - 2.1 The project lifecycle includes, at a minimum, pipeline design, construction, commissioning, operation, maintenance, and decommissioning.
- 3 The entity shall describe its approach to ensuring pipeline operators are qualified or supervised when performing a covered task, including ongoing reviews of operator qualifications, assurance that unqualified workers are properly supervised, and efforts to maintain a sufficient number of qualified pipeline operators, where:
  - 3.1 Pipeline operators are defined as those people who engage in the transportation of gas, consistent with U.S. 49 CFR 192.3.
  - 3.2 A pipeline operator is considered qualified to perform covered tasks when the individual has been evaluated, can perform the assigned covered task, and can recognize and react to abnormal operating conditions, consistent with the definition provided by U.S. 49 CFR 192.803.
    - 3.2.1 A covered task is defined, consistent with U.S. 49 CFR 192.801, as an activity, identified by the operator, that is performed on a pipeline facility, is an operations or maintenance task, is performed as a requirement of maintaining regulatory compliance, and affects the operation or integrity of a pipeline.
- 4 The entity shall describe efforts to mitigate risks and promote emergency preparedness, such as coordinating with third parties (e.g., sewer line and buried power line developers), performing timely pipeline inspections, repairing aging infrastructure, and maintaining current pipeline operator certifications.
- 5 The entity shall describe its efforts to manage risks related to human health and safety, and emissions, including fugitive emissions and process emissions, that arise out of the integrity of gas delivery infrastructure.



- 5.1 Fugitive emissions are defined as natural gas (primarily methane) emissions resulting from leaks or other types of unintended or irregular releases.
  - 5.2 Process emissions are defined as natural gas emissions resulting from intentional releases.
  - 5.3 Disclosure shall include relevant strategies, plans, and/or targets related to reductions in fugitive emissions and process emissions, the entity's ability to measure such emissions, the activities and investments required to achieve the plans, and any risks or limiting factors that might affect achievement of the plans and/or targets.
- 6 Disclosure may focus broadly on safety and emergency management systems, but shall specifically address operations in high consequence areas and the systems to avoid and manage emergencies, accidents, and incidents that could have catastrophic impacts on human health, the local community, and the environment.
  - 7 The entity shall discuss direct or indirect financial opportunities related to the management of the integrity of gas delivery infrastructure, including but not limited to, improvements to stakeholder relations, opportunities for capital investments, reduction in customer rates through improved operational efficiency, and reduced risks of regulatory or civil fines or settlements.
  - 8 The entity may disclose the following:
    - 8.1 Pipeline replacement rates
    - 8.2 Average response time for gas emergencies
    - 8.3 Open Grade 2 and 2+ leaks
    - 8.4 Fugitive emissions, including the technique(s) it employs to measure leakage, the amount of leakage calculated according to each technique it employs, and the regulations to which its gas leakage is subject.
    - 8.5 Process emissions
    - 8.6 Other efforts designed to reduce emissions and/or improve the safety of its gas delivery infrastructure

## HOME BUILDERS

### Industry Description

The Home Builders industry is comprised of companies that develop new homes and residential communities. Development efforts generally include the acquisition of land, site preparation, the construction of homes, and home sales. The majority of industry activity is focused on the development and sale of single-family homes, which are typically part of company-designed residential communities. A smaller segment is centered on townhomes, condominiums, multi-family housing, and mixed-use development. Many companies in the industry offer financing services to individual homebuyers. The industry is fragmented, as there is a large number of developers of all sizes, which vary in company structure and geographic focus. Listed companies tend to be significantly larger, and more integrated than the numerous privately held home builders.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Land Use & Ecological Impacts	Number of (1) lots and (2) homes delivered on redevelopment sites	Quantitative	Number	IF-HB-160a.1
	Number of (1) lots and (2) homes delivered in regions with High or Extremely High Baseline Water Stress	Quantitative	Number	IF-HB-160a.2
	Total amount of monetary losses as a result of legal proceedings associated with environmental regulations <sup>48</sup>	Quantitative	Reporting currency	IF-HB-160a.3
	Discussion of process to integrate environmental considerations into site selection, site design, and site development and construction	Discussion and Analysis	n/a	IF-HB-160a.4
Design for Resource Efficiency	(1) Number of homes that obtained a certified HERS® Index Score and (2) average score	Quantitative	Number, Index score	IF-HB-410a.1
	Percentage of installed water fixtures certified to WaterSense® specifications	Quantitative	Percentage (%)	IF-HB-410a.2
	Number of homes delivered certified to a third-party multi-attribute green building standard	Quantitative	Number	IF-HB-410a.3
	Description of risks and opportunities related to incorporating resource efficiency into home design, and how benefits are communicated to customers	Discussion and Analysis	n/a	IF-HB-410a.4
Climate Change	Number of lots located in 100-year flood zones	Quantitative	Number	IF-HB-420a.1

<sup>48</sup>

Note to **IF-HB-160a.3** – The entity shall briefly describe the nature, context, and any corrective actions taken as a result of the monetary losses.

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Adaptation	Description of climate change risk exposure analysis, degree of systematic portfolio exposure, and strategies for mitigating risks	Discussion and Analysis	n/a	IF-HB-420a.2

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of controlled lots <sup>49</sup>	Quantitative	Number	IF-HB-000.A
Number of homes delivered <sup>50</sup>	Quantitative	Number	IF-HB-000.B
Number of active selling communities <sup>51</sup>	Quantitative	Number	IF-HB-000.C

<sup>49</sup>

Note to **IF-HB-000.A** – The scope of controlled lots includes all lots owned or contractually available for ownership through option contracts or other equivalent types of contracts as of the last day of the reporting period.

<sup>50</sup>

Note to **IF-HB-000.B** – The scope of homes shall include single-family dwelling units whether detached, attached, or part of multi-family residential buildings.

<sup>51</sup>

Note to **IF-HB-000.C** – The scope of active selling communities includes those communities or developments open for sales with at least five homes or lots remaining to sell as of the last day of the reporting period.

# Land Use & Ecological Impacts

## Topic Summary

Home builders face challenges directly related to the ecological impacts of development activities. Developments often take place on previously undeveloped land, and companies must manage the ecosystem disruption of construction activities as well as the regulations and permitting processes that accompany “greenfield” land development. Regardless of the siting decisions companies make, industry development activities generally carry risks related to land and water contamination, mismanagement of waste, and excessive strain on water resources during the construction and use phases. Violation of environmental regulations can result in costly fines and delays that decrease financial returns while potentially harming reputations. Companies with repeated violations or track records of prior activities with excessive ecological impacts may find it difficult to receive approval from local communities for new developments, thereby decreasing future revenue and market share. Companies that concentrate development efforts in water-stressed regions may see further challenges to permitting approvals, and also face risks related to land or home depreciation due to water shortage concerns. Environmental quality control procedures, “smart growth” strategies (including a focus on redevelopment sites), and conservation strategies may help ensure compliance with environmental laws, and therefore mitigate financial risks, while improving future growth opportunities.

## Accounting Metrics

### **IF-HB-160a.1. Number of (1) lots and (2) homes delivered on redevelopment sites**

- 1 The entity shall (1) disclose the number of controlled lots that are located on redevelopment sites.
  - 1.1 The scope of controlled lots includes all lots owned or contractually available for ownership through option contracts or other equivalent types of contracts.
  - 1.2 The scope of redevelopment sites shall include brownfield and greyfield sites, and shall include sites that meet national, state, or local designations for such terms. In the absence of national, state, or local definitions, the following definitions shall be used:
    - 1.2.1 Redevelopment sites are defined as sites that were previously developed, including the replacement, remodeling, or reuse of existing structures to accommodate new development.
    - 1.2.2 Brownfield sites are defined, consistent with U.S. Environmental Protection Agency (EPA), as “real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.”
    - 1.2.3 Greyfield sites are defined, consistent with the National Association of Home Builders’ (NAHB) Green Home Building Guidelines as, “any site previously developed with at least 50% of the surface area covered with impervious material.”
  - 1.3 The scope of redevelopment sites excludes undeveloped infill sites but includes infill sites to the extent that such sites meet the above definitions of redevelopment, brownfield, or greyfield sites.

- 2 The entity shall disclose (2) the number of homes delivered that were constructed on redevelopment sites.
  - 2.1 The scope of homes shall include single-family dwelling units, whether detached, attached, or part of multi-family residential buildings.

### **IF-HB-160a.2. Number of (1) lots and (2) homes delivered in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall (1) disclose the number of controlled lots located in regions with High or Extremely High Baseline Water Stress.
  - 1.1 The scope of controlled lots includes all lots owned or contractually available for ownership through option contracts or other equivalent types of contracts.
  - 1.2 The entity shall identify controlled lots in locations with High (40–80%) or Extremely High (>80%) Baseline Water Stress with the World Resources Institute’s (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 2 The entity shall disclose (2) the number of homes delivered in regions with High or Extremely High Baseline Water Stress.
  - 2.1 The scope of homes shall include single-family dwelling units whether detached, attached, or part of multi-family residential buildings.

### **IF-HB-160a.3. Total amount of monetary losses as a result of legal proceedings associated with environmental regulations**

- 1 The entity shall disclose the total amount of monetary losses it incurred during the reporting period as a result of legal proceedings associated with environmental regulations, such as those related to: enforcement of laws and regulations on ground- and surface-water contamination; hazardous waste transport, containment, or disposal; air emissions; and public disclosure of contamination events.
- 2 The legal proceedings shall include any adjudicative proceeding in which the entity was involved, whether before a court, a regulator, an arbitrator, or otherwise.
- 3 The losses shall include all monetary liabilities to the opposing party or to others (whether as the result of settlement or verdict after trial or otherwise), including fines and other monetary liabilities incurred during the reporting period as a result of civil actions (e.g., civil judgments or settlements), regulatory proceedings (e.g., penalties, disgorgement, or restitution), and criminal actions (e.g., criminal judgment, penalties, or restitution) brought by any entity (e.g., governmental, business, or individual).
- 4 The scope of monetary losses shall exclude legal and other fees and expenses incurred by the entity in its defense.
- 5 The scope of disclosure shall include, but is not limited to, relevant enforcements related to activities adjudicated by regulators with an enforcement mandate broader than the home builders industry, such as the:
  - 5.1 EU Directive 2008/98/EC on waste ([Waste Framework Directive](#))
  - 5.2 U.S. Clean Water Act

### 5.3 U.S. Resource Conservation and Recovery Act (RCRA)

#### Note to **IF-HB-160a.3**

- 1 The entity shall briefly describe the nature (e.g., judgment or order issued after trial, settlement, guilty plea, deferred prosecution agreement, non-prosecution agreement) and context (e.g., permitting violation) of all monetary losses as a result of legal proceedings.
- 2 The entity shall describe any corrective actions it has implemented as a result of the legal proceedings. This may include, but is not limited to, specific changes in operations, processes, products, business partners, training, or technology.

#### **IF-HB-160a.4. Discussion of process to integrate environmental considerations into site selection, site design, and site development and construction**

- 1 The entity shall provide a discussion of its process used to integrate environmental considerations into site selection, design, and development and construction.
  - 1.1 Environmental considerations include, but are not limited to, ecological impacts, biodiversity impacts, emissions to air, discharges to water, slope disturbance, soil disturbance and erosion, storm water management, waste management, natural resource consumption, and hazardous chemical usage.
- 2 The entity shall describe its approach to the following aspects of site selection:
  - 2.1 The process used to assess the level of ecological sensitivity of sites under consideration for acquisition or development, and how such assessments are incorporated into acquisition and development decisions
  - 2.2 The use of site classifications (e.g., greenfield, greyfield, brownfield, and/or infill sites) in decision-making processes
- 3 The entity shall describe its approach to the following aspects of site design:
  - 3.1 The process used to design sites in order to minimize ecological impacts, including management of slope disturbance, soil disturbance and erosion, storm water, waste, and wildlife habitat impacts
- 4 The entity shall describe its approach to the following aspects of site development and construction:
  - 4.1 The process used to minimize ecological impacts during construction, including management of construction and demolition waste, runoff, soil disturbance and erosion, and hazardous materials
- 5 The entity shall describe its approach to assessing risks associated with environmental considerations and related internal policies, practices, and procedures for managing those risks.
- 6 The entity shall describe its use of codes, guidelines, and standards that address site selection, design, and development and construction, where applicable.
  - 6.1 Relevant codes, guidelines, and standards may include, but are not limited to:

- 6.1.1 2012 ICC 700 National Green Building Standard, “Incentives for Development and Lot Design”
- 6.1.2 U.S. National Association of Home Builders (NAHB) Model Green Home Building Guidelines, Section 1, “Lot Design, Preparation, and Development”
- 6.1.3 U.S. Green Building Council’s (USGBC) LEED® BD+C: Homes, v4, “Construction activity pollution prevention” and “Site selection”

# Design for Resource Efficiency

## Topic Summary

Residential buildings, when occupied, consume significant amounts of energy and water. Companies in the Home Builders industry can improve the resource efficiency of homes over their lifecycle through sustainable design practices and choice of materials. Energy-saving products and techniques such as designing homes for efficient heating and cooling can help to reduce dependence on energy, whether it comes from the electric grid or onsite fuel combustion. These measures, which are intended to improve the resource efficiency of homes, can decrease the costs of home ownership through lower utility bills. Water saving features such as low-flow faucets alleviate strain on local communities, while likely also lowering costs. Homebuyer awareness of the importance of the energy and water efficiency creates a potential for companies to increase demand in their target market, thereby increasing revenue and/or margins. Effectively applying resource efficiency design principles in a cost-effective manner may serve as a competitive advantage, especially when companies are successful in systematically educating customers on the long-term benefits of these homes.

## Accounting Metrics

### **IF-HB-410a.1. (1) Number of homes that obtained a certified HERS® Index Score and (2) average score**

- 1 The entity shall disclose (1) the number of homes that obtained a certified Home Energy Rating System (HERS®) Index Score, or an equivalent standardized home energy rating in non-U.S. markets, during the reporting period.
  - 1.1 The scope of homes shall include single-family dwelling units, whether detached, attached, or part of multi-family residential buildings.
- 2 The entity shall (2) disclose the simple average score of all homes that obtained a certified HERS® Index Score.
  - 2.1 The simple average shall be calculated as the sum of all scores associated with homes that obtained a certified HERS® Index Score during the reporting period divided by the number of homes that obtained a certified HERS® Index Score during the reporting period.
- 3 The scope of disclosure includes all homes that are or were controlled by the entity, regardless of the stage of construction and the stage within the sales cycle.
- 4 The entity may disclose the number of homes delivered that are certified to ENERGY STAR® for Homes or equivalent certification programs.

### **IF-HB-410a.2. Percentage of installed water fixtures certified to WaterSense® specifications**

- 1 The entity shall disclose the percentage of installed water fixtures certified to the U.S. Environmental Protection Agency (EPA) WaterSense® specifications.



- 1.1 A water fixture is defined as a device used for the distribution of water or a device that consumes water.
  - 1.2 The percentage shall be calculated as the number of water fixtures installed during the reporting period that were certified to the U.S. EPA WaterSense® specifications divided by the total number of water fixtures installed.
  - 1.3 The scope of water fixtures includes those that are within an eligible WaterSense® product category. Examples of product categories include bathroom sink faucets and accessories, showerheads, toilets, urinals, irrigation controllers, and pre-rinse spray valves.
- 2 The scope of disclosure includes all water fixtures installed in homes that are or were controlled by the entity, regardless of the stage of construction, the stage within the sales cycle, or the entity that performed such installations.

### **IF-HB-410a.3. Number of homes delivered certified to a third-party multi-attribute green building standard**

- 1 The entity shall disclose the number of homes delivered that were certified to a third-party multi-attribute green building standard designed for homes.
  - 1.1 The scope of third-party multi-attribute green building standards is limited to standards or certifications that are explicitly designed for homes and, at a minimum, that address the following aspects of new home design and construction:
    - 1.1.1 Energy efficiency;
    - 1.1.2 Water conservation;
    - 1.1.3 Material and resource efficiency;
    - 1.1.4 Indoor environmental quality; and
    - 1.1.5 Owner education.
  - 1.2 Examples of third-party multi-attribute green building standards include:
    - 1.2.1 Environments For Living Certified Green®;
    - 1.2.2 ICC 700 National Green Building Standard; and
    - 1.2.3 LEED® for Homes.
- 2 The entity shall disclose the third-party multi-attribute green building standard(s) to which its homes are certified.
- 3 The scope of disclosure includes all homes delivered during the reporting period.
- 4 The entity may discuss other green building or sustainability standards or guidelines that it implements in its home design and construction processes that are not third-party verified.

### **IF-HB-410a.4. Description of risks and opportunities related to incorporating resource**

## **efficiency into home design, and how benefits are communicated to customers**

- 1 The entity shall describe the risks and/or opportunities associated with its approach to integrating environmental considerations into home design, including, where relevant:
  - 1.1 Risks of failing to achieve adequate returns on investments made in technology, and market demand to improve the sustainability performance of homes or earn sustainability certifications
  - 1.2 Risks to market demand associated with the entity's failure to evolve its design approach at the same pace as its peers, resulting in the production of underperforming homes in terms of energy efficiency, water efficiency, and indoor environmental quality
  - 1.3 Risks associated with the ability to cost-effectively build homes that meet evolving building codes
  - 1.4 Opportunities to achieve sales price premiums, capture target market demand, and establish competitive advantages by producing homes with market-leading energy efficiency and water efficiency
  
- 2 The entity shall discuss its strategy to measure and communicate energy efficiency and water efficiency performance improvements to homes, including:
  - 2.1 Measurement of homeowner benefits related to energy and water efficiency, including performance audits, certifications, standards, guidelines, and use of projected energy and water costs and savings relative to a baseline
  - 2.2 Communication of the benefits of resource efficiency to prospective home buyers, including the benefits of resource efficiency performance and certifications, projected energy and water costs and savings, and the integration of resource efficiency into sales and marketing
  
- 3 The entity may provide an analysis of such price increases relative to the cost of improvements in, and third-party certifications of, energy efficiency, water efficiency, and indoor environmental quality. Analysis may additionally include target return rates compared to realized return rates of improvements.

# Climate Change Adaptation

## Topic Summary

The impacts of climate change, including extreme weather events and changing climate patterns, may impact the markets companies select to develop homes and residential communities. Companies with business models that incorporate ongoing assessments of climate change risks, and adapt to such risks, are likely to more effectively grow company value over the long term, partially through reductions in risk. More specifically, strategies focused on home development activities in floodplains and coastal regions that are exposed to extreme weather events, such as flooding, have increased needs for their business models to adapt to climate change, especially considering long-term challenges like flood insurance rates, the financial stability of government-subsidized flood insurance programs, permitting approvals, and financing stipulations. Rising climate risks and the increasing cost of occupying properties in volatile regions may translate into reduced long-term demand, land value depreciation, and concerns over understated long-term costs of home ownership. Additionally, companies that build developments in water-stressed regions risk losing land value and may face problems with permitting approvals. The active assessment of climate change risks and a holistic view of long-term homebuyer demand may enable companies to successfully adapt to such risks.

## Accounting Metrics

### IF-HB-420a.1. Number of lots located in 100-year flood zones

- 1 The entity shall disclose the number of controlled lots that are located in 100-year flood zones.
  - 1.1 100-year flood zones are defined as land areas subject to a one-percent or greater chance of flooding in any given year. Such areas may also be referred to as being subject to the one-percent annual chance flood, the one-percent annual exceedance probability flood, or the 100-year flood.
    - 1.1.1 Examples of 100-year flood zones may include, but are not limited to, coastal flood plains, flood plains along major rivers, and areas subject to flooding from ponding in low-lying areas.
  - 1.2 For controlled lots located in the U.S., 100-year flood zones shall include those land areas designated by the U.S. Federal Emergency Management Agency (FEMA) as special flood hazard areas (SFHA).
    - 1.2.1 SFHAs are defined as land area in the flood plain subject to a one-percent or greater chance of flooding in any given year. The area may be designated in the applicable flood insurance rate map, as per the U.S. National Flood Insurance Program, as Zones A, AO, AH, A1-30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, V1-30, VE, and V. This definition is derived from U.S. 44 CFR 59.1.
  - 1.3 The scope of controlled lots includes all lots owned or contractually available for ownership through option contracts or other equivalent types of contracts.

- 2 The scope of disclosure shall include all of the entity's controlled lots that are located in 100-year flood zones, regardless of the country of their location.
- 3 The entity may disclose its risks, opportunities, and potential impacts resulting from reclassifications of 100-year flood zones, including the risk of expansion of such areas into lots controlled by the entity or its active selling communities.

### **IF-HB-420a.2. Description of climate change risk exposure analysis, degree of systematic portfolio exposure, and strategies for mitigating risks**

- 1 The entity shall describe the significant risks and opportunities that are presented to its business by climate change scenarios.
  - 1.1 The entity shall identify each significant risk and opportunity.
    - 1.1.1 Risks and opportunities may include, but are not limited to, availability of water, extreme weather events, evolving regulation and legislation, home permitting processes, timelines and approvals, and impacts to local economies and infrastructure.
  - 1.2 The entity shall discuss the timeline over which such risks and opportunities are expected to manifest.
  - 1.3 The entity shall disclose the climate change scenarios used to determine the risks and opportunities presented by climate change, where scenarios may include, but are not limited to, the New Policies Scenario, Sustainable Development Scenario, and Current Policies Scenario, as established by the International Energy Agency in its annual World Energy Outlook.
- 2 The entity shall describe its efforts to assess and monitor the impacts of climate change and related strategies to alleviate and/or adapt to any risks and/or utilize any opportunities, where:
  - 2.1 Alleviation strategies may include, but are not limited to: site selection and the incorporation of climate or weather models into such analysis; site selection as it pertains to water scarcity; the strategy and timing of lot acquisitions, permitting, construction, and sales; the use of sales and purchase agreement clauses addressing risks to the entity; and insurance.
  - 2.2 Adaptation strategies may include, but are not limited to: lot design; home design for physical resiliency; contingency plans; and maximizing energy and water efficiency of homes.
- 3 The entity shall discuss its strategies related to the use of physical measures to manage climate change risk (e.g., floodplain avoidance or home design for physical resiliency) and/or financial mechanisms to manage these risks (e.g., the use of insurance or option contracts on lots).

## REAL ESTATE

### Industry Description

The Real Estate industry is composed of companies that own, develop, and generally operate income-producing real estate assets. Companies in this industry are commonly structured as real estate investment trusts (REITs) and operate in a wide range of segments within the real estate industry, including residential, retail, office, health care, industrial, and hotel properties. REITs typically focus on the direct ownership of real estate assets, thereby providing investors with the opportunity to obtain real estate exposure without direct asset ownership and management. Although REITs are often concentrated in one segment of the Real Estate industry, many REITs are diversified through investment in multiple property types.

For tax purposes, real estate companies in the U.S. often prefer to be structured as REITs. To be classified as a REIT, companies must maintain most of their assets in real estate, derive most income from these assets, and distribute a minimum threshold of their annual taxable income to shareholders as dividends, among other requirements. Most U.S.-listed companies in the industry operate exclusively within the U.S., while some companies have broadened their real estate portfolio exposure internationally.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management	Energy consumption data coverage as a percentage of total floor area, by property subsector	Quantitative	Percentage (%) by floor area	IF-RE-130a.1
	(1) Total energy consumed by portfolio area with data coverage, (2) percentage grid electricity, and (3) percentage renewable, by property subsector	Quantitative	Gigajoules (GJ), Percentage (%)	IF-RE-130a.2
	Like-for-like percentage change in energy consumption for the portfolio area with data coverage, by property subsector	Quantitative	Percentage (%)	IF-RE-130a.3
	Percentage of eligible portfolio that (1) has an energy rating and (2) is certified to ENERGY STAR, by property subsector	Quantitative	Percentage (%) by floor area	IF-RE-130a.4
	Description of how building energy management considerations are integrated into property investment analysis and operational strategy	Discussion and Analysis	n/a	IF-RE-130a.5
Water Management	Water withdrawal data coverage as a percentage of (1) total floor area and (2) floor area in regions with High or Extremely High Baseline Water Stress, by property subsector	Quantitative	Percentage (%) by floor area	IF-RE-140a.1
	(1) Total water withdrawn by portfolio area with data coverage and (2) percentage in regions with High or Extremely High Baseline Water Stress, by property subsector	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	IF-RE-140a.2

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
	Like-for-like percentage change in water withdrawn for portfolio area with data coverage, by property subsector	Quantitative	Percentage (%)	IF-RE-140a.3
	Description of water management risks and discussion of strategies and practices to mitigate those risks	Discussion and Analysis	n/a	IF-RE-140a.4
Management of Tenant Sustainability Impacts	(1) Percentage of new leases that contain a cost recovery clause for resource efficiency-related capital improvements and (2) associated leased floor area, by property subsector	Quantitative	Percentage (%) by floor area, Square feet (ft <sup>2</sup> )	IF-RE-410a.1
	Percentage of tenants that are separately metered or submetered for (1) grid electricity consumption and (2) water withdrawals, by property subsector	Quantitative	Percentage (%) by floor area	IF-RE-410a.2
	Discussion of approach to measuring, incentivizing, and improving sustainability impacts of tenants	Discussion and Analysis	n/a	IF-RE-410a.3
Climate Change Adaptation	Area of properties located in 100-year flood zones, by property subsector	Quantitative	Square feet (ft <sup>2</sup> )	IF-RE-450a.1
	Description of climate change risk exposure analysis, degree of systematic portfolio exposure, and strategies for mitigating risks	Discussion and Analysis	n/a	IF-RE-450a.2

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of assets, by property subsector <sup>52</sup>	Quantitative	Number	IF-RE-000.A
Leasable floor area, by property subsector <sup>53</sup>	Quantitative	Square feet (ft <sup>2</sup> )	IF-RE-000.B
Percentage of indirectly managed assets, by property subsector <sup>54</sup>	Quantitative	Percentage (%) by floor area	IF-RE-000.C
Average occupancy rate, by property subsector <sup>55</sup>	Quantitative	Percentage (%)	IF-RE-000.D

<sup>52</sup>

Note to **IF-RE-000.A** – Number of assets shall include the number of distinct real estate property or building assets and is aligned with the 2018 GRESB Real Estate Assessment Reference Guide. Number of assets shall be disclosed separately for each portion of the entity’s portfolio where properties are classified into subsectors that are aligned with the FTSE Nareit Classification Structure. The total number of assets reported across all subsectors can exceed the actual number of assets due to the fact that mixed-use assets can be reported in multiple subsectors.

<sup>53</sup>

Note to **IF-RE-000.B** – Leasable floor area shall be disclosed separately for each portion of the entity’s portfolio where properties are classified into subsectors that are aligned with the FTSE Nareit Classification Structure. Number of units may be used in place of floor area in the Apartments and Lodging/Resorts property subsectors when floor area is not available.

<sup>54</sup>

Note to **IF-RE-000.C** –The definition of “indirectly managed assets” is solely based on the landlord/tenant relationship and is aligned with the 2018 GRESB Real Estate Assessment Reference Guide: “Where a single tenant has the sole authority to introduce and implement operating and/or environmental policies and measures, the tenant should be assumed to have operational control, so [the asset] should be considered to be an Indirectly Managed Asset.” Percentage of indirectly managed assets shall be disclosed separately for each portion of the entity’s portfolio where properties are classified into subsectors that are aligned with the FTSE Nareit Classification Structure.

<sup>55</sup>

Note to **IF-RE-000.D** – Average occupancy rate shall be disclosed separately for each portion of the entity’s portfolio where properties are classified into subsectors that are aligned with the FTSE Nareit Classification Structure.

# Energy Management

## Topic Summary

Real estate assets consume significant amounts of energy, primarily related to space heating, ventilating, air conditioning, water heating, lighting, and the use of equipment and appliances. The type of energy used, magnitude of consumption, and strategies for energy management are highly dependent on the real estate asset class, among other factors. Generally, grid electricity consumption is the predominant form of consumed energy, though on-site fuel combustion and renewable energy production also serve an important roles. Energy costs may be borne by companies in the industry and/or the property occupants; either way, energy management is a significant industry issue. To the extent that the real estate owner assumes direct responsibility for energy costs, such costs often represent significant operating costs, inherently indicating the importance of energy management. Energy pricing volatility and a general trend of electricity price increases, energy-related regulations, wide variations in energy performance across the existing building stock, and opportunities for efficiency improvements through economically attractive capital investments all further point to the importance of energy management. Energy costs assumed by occupants, either in whole or in part, are nonetheless likely to significantly impact companies in the industry, albeit through differing channels. Building energy performance is a notable driver of tenant demand, as it allows them to control operating costs, mitigate the environmental impacts of operations, and, often just as importantly, maintain a reputation for resource conservation. Additionally, real estate owners may be exposed to energy-related regulations even when energy costs are the responsibility of occupants. Overall, companies in the industry that effectively manage the energy performance of their assets may see reduced operating costs and regulatory risks, as well as increased tenant demand, rental rates, and occupancy rates—all of which drive revenue and asset value appreciation. Improving the energy performance of assets is highly dependent on property type and location, target tenant market, local building codes, physical and legal opportunities to deploy distributed renewable energy, ability to measure consumption, and performance of existing building stock, among other factors.

## Accounting Metrics

### IF-RE-130a.1. Energy consumption data coverage as a percentage of total floor area, by property subsector

- 1 The entity shall disclose the percentage of its portfolio, based on total gross floor area, with complete energy consumption data coverage.
  - 1.1 Gross floor area is defined according to the U.S. Environmental Protection Agency (EPA) ENERGY STAR® [definition](#) as “the total property square footage, measured between the principal exterior surfaces of the enclosing fixed walls of the building(s).”
    - 1.1.1 Leasable floor area may be used in place of gross floor area when gross floor area is not available for the relevant area of the portfolio (e.g., a building with an unknown gross floor but a known leasable floor area).
    - 1.1.2 Number of units may be used in place of floor area in the Apartments and Lodging/Resorts property subsectors.

- 1.2 Floor area is considered to have complete energy consumption data coverage when energy consumption data (i.e., energy types and amounts consumed) is obtained by the entity for all types of energy consumed in the relevant floor area during the reporting period, regardless of when such data was obtained.
    - 1.2.1 If such data is not available for one or more types of energy consumed, the relevant floor area shall not be considered to have complete energy consumption data coverage.
  - 1.3 The percentage shall be calculated as the portfolio gross floor area with complete energy consumption data coverage divided by the total portfolio gross floor area for which energy is used.
  - 1.4 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and its tenants, and energy produced by the entity or its tenants (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
- 2 The entity shall disclose energy consumption data coverage separately for each property type in its portfolio, where properties are classified into subsectors that are aligned with the FTSE Nareit Classification Structure, and include the following: Health Care, Self Storage, Industrial, Office, Apartments, Manufactured Homes, Single Family Homes, Shopping Centers, Regional Malls, Free Standing, Lodging/Resorts, Specialty, Data Centers, and Other (any other property type(s) that cannot be classified to any of the previous property subsector classifications).
  - 3 The entity may discuss the comprehensiveness of data coverage if there are coverage variations by energy type. For example, if a portion of floor area consumes electricity and natural gas and the entity has energy consumption data coverage for electricity but not natural gas, the entity does not have complete energy consumption data coverage. However, the entity may disclose the portion of total portfolio gross floor area with partial energy consumption data coverage.
  - 4 The entity may describe the variations in energy consumption data coverage, including the factors that influence it.
    - 4.1 Variations in energy consumption data coverage may occur based on distinctions including, but not limited to:
      - 4.1.1 Base Building, Tenant Space, and Whole Building
      - 4.1.2 Energy Purchased by the Landlord and energy Purchased by Tenants
      - 4.1.3 Managed Assets and Indirectly Managed Assets
      - 4.1.4 Geographical markets
    - 4.2 Relevant factors that influence energy consumption data coverage may include, but are not limited to:
      - 4.2.1 Geographical markets and the applicable enabling or inhibiting laws, regulations, and policies within such markets, including those policies of utilities
      - 4.2.2 Administrative or logistical barriers to obtaining energy consumption data (e.g., lack of integration of utilities' data reporting systems)
      - 4.2.3 Tenant demands around the privacy or proprietary nature of energy consumption data
      - 4.2.4 Property subsectors or other more nuanced classifications of property types



- 4.2.5 Lease structures, including the length in time of leases, the terms applicable to the access of energy consumption data by the entity, and the ability of the entity to influence energy management performance of Tenant Spaces
  - 4.2.6 The entity's perception that its obtainment of Tenant Space energy consumption data may negatively impact tenant demand
- 5 The following terms are defined according to the [2018 GRESB Real Estate Assessment Reference Guide](#):
- 5.1 Base Building is defined as "Energy consumed in supplying central building services to lettable/leasable areas and common areas."
  - 5.2 Tenant Space is defined as "Lettable floor area (both vacant and let/leased areas) that is or can be occupied by tenants."
  - 5.3 Whole Building is defined as "Energy used by tenants and Base Building services to lettable/leasable and common spaces. This should include all energy supplied to the building for the operation of the building and the tenant space."
  - 5.4 Purchased by Landlord is defined as "Energy purchased by the landlord, but consumed by the tenant. This can include energy purchased by the landlord but used for vacant space."
  - 5.5 Purchased by Tenant is defined as "Energy purchased by the tenant. Typically this is data that is not within the participants' immediate control."
  - 5.6 Managed Assets and Indirectly Managed Assets are defined as follows: "This definition of Managed assets and the definition of Indirectly Managed assets are solely based on the landlord/tenant relationship. [Managed and Indirectly Managed Assets are] assets or buildings for which the landlord is determined to have 'operational control' where operational control is defined as having the ability to introduce and implement operating and/or environmental policies and measures. In case both the landlord and tenant have the authority to introduce and implement any or all of the policies mentioned above, the asset or building should be reported as a Managed asset. Where a single tenant has the sole authority to introduce and implement operating and/or environmental policies and measures, the tenant should be assumed to have operational control, so it should be considered to be an Indirectly Managed asset."
- 6 The entity shall consider the 2018 GRESB Real Estate Assessment Reference Guide as a normative reference, thus any updates made year-on-year shall be considered updates to this guidance.

**IF-RE-130a.2. (1) Total energy consumed by portfolio area with data coverage, (2) percentage grid electricity, and (3) percentage renewable, by property subsector**

- 1 The entity shall disclose (1) total energy consumption by the portfolio area for which there is energy consumption data coverage as an aggregate figure, in gigajoules (GJ) or their multiples, where:
  - 1.1 The scope of disclosure includes all property area in the entity's portfolio for which there is energy consumption data coverage, regardless of whether energy is consumed by the Tenant Space or Base Building (including outdoor, exterior, and parking areas) and which party pays for energy expenses.

- 1.2 The scope of disclosure excludes the portion of energy consumed by the portfolio area for which energy consumption data is unavailable.
    - 1.2.1 If energy consumption data is not available for Tenant Space or Whole Building for a property but is available for the Base Building, then the entity shall disclose this energy consumption data.
  - 1.3 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and its tenants, and energy produced by the entity or its tenants (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.4 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
    - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
    - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
    - 3.2 The percentage shall be calculated as renewable energy consumed divided by total energy consumed.
    - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.
      - 3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
      - 3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
      - 3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.
    - 3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:
      - 3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

- 4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data, including electricity from solar or wind energy).
- 5 Energy consumption data shall be disclosed by (a) Base Building and (b) Tenant Space, or (c) Whole Building, or a combination of these.
- 6 The entity shall disclose (1) total energy consumption, (2) percentage grid electricity, and (3) percentage renewable energy, separately for each property type in its portfolio where properties are classified into subsectors that are aligned with the FTSE Nareit Classification Structure and include the following: Health Care, Self Storage, Industrial, Office, Apartments, Manufactured Homes, Single Family Homes, Shopping Centers, Regional Malls, Free Standing, Lodging/Resorts, Specialty, Data Centers, and Other (any other property type(s) that cannot be classified to any of the previous property subsector classifications).
- 7 The entity may describe the variations in energy consumption.

7.1 Variations in energy consumption data coverage may occur based on distinctions including, but not limited to:

- 7.1.1 Base Building, Tenant Space, and Whole Building
- 7.1.2 Energy Purchased by the Landlord and energy Purchased by Tenants
- 7.1.3 Managed Assets and Indirectly Managed Assets
- 7.1.4 Geographical markets

8 The following terms are defined according to the [2018 GRESB Real Estate Assessment Reference Guide](#):

- 8.1 Base Building is defined as “Energy consumed in supplying central building services to lettable/leasable areas and common areas.”
- 8.2 Tenant Space is defined as “Lettable floor area (both vacant and let/leased areas) that is or can be occupied by tenants.”
- 8.3 Whole Building is defined as “Energy used by tenants and Base Building services to lettable/leasable and common spaces. This should include all energy supplied to the building for the operation of the building and the tenant space.”
- 8.4 Purchased by Landlord is defined as “Energy purchased by the landlord, but consumed by the tenant. This can include energy purchased by the landlord but used for vacant space.”
- 8.5 Purchased by Tenant is defined as “Energy purchased by the tenant. Typically this is data that is not within the participants' immediate control.”
- 8.6 Managed Assets and Indirectly Managed Assets are defined as follows: “This definition of Managed assets and the definition of Indirectly Managed assets are solely based on the landlord/tenant relationship. [Managed and

Indirectly Managed Assets are] assets or buildings for which the landlord is determined to have 'operational control' where operational control is defined as having the ability to introduce and implement operating and/or environmental policies and measures. In case both the landlord and tenant have the authority to introduce and implement any or all of the policies mentioned above, the asset or building should be reported as a Managed asset. Where a single tenant has the sole authority to introduce and implement operating and/or environmental policies and measures, the tenant should be assumed to have operational control, so it should be considered to be an Indirectly Managed asset.”

- 9 The entity shall consider the 2018 GRESB Real Estate Assessment Reference Guide as a normative reference, thus any updates made year-on-year shall be considered updates to this guidance.

### **IF-RE-130a.3. Like-for-like percentage change in energy consumption for the portfolio area with data coverage, by property subsector**

- 1 The entity shall disclose the like-for-like percentage change in energy consumption for the portfolio area with data coverage.
  - 1.1 The percentage shall be calculated as energy consumed in the reporting period divided by the energy consumed in the immediately prior reporting period.
  - 1.2 The scope of energy consumption included in the calculation shall be aligned with that outlined in the [2018 GRESB Real Estate Assessment Reference Guide](#) (“Like-for-like Comparison”) as including all energy consumed by properties that were in the entity’s portfolio for both the full reporting period and the immediately prior full reporting period.
    - 1.2.1 Energy consumed by properties that have been acquired, disposed of, under development, or have undergone a major renovation during the reporting period or the immediately prior reporting period shall be excluded.
    - 1.2.2 No correction for changes in the occupancy rate is needed and properties with a high variation in vacancy rates shall be included.
    - 1.2.3 If there is not energy consumption data coverage for either (or both) the reporting period or the immediately prior reporting period, the energy consumed by that relevant portfolio floor area is excluded from the numerator and the denominator in the calculation.
- 2 The scope, methodology, and calculations of energy consumption shall be consistent with IF-RE-130a.2.
- 3 Like-for-like change in energy consumption shall be disclosed by (a) Base Building and (b) Tenant Space, or (c) Whole Building, or a combination of these.
  - 3.1 If like-for-like change in energy consumption data is not available for Tenant Space or Whole Building for a property but is available for the Base Building, then the entity shall disclose this like-for-like change in energy consumption data.

- 4 The entity shall disclose like-for-like change in energy consumption separately for each property type in its portfolio where properties are classified into subsectors that are aligned with the FTSE Nareit Classification Structure and include the following: Health Care, Self Storage, Industrial, Office, Apartments, Manufactured Homes, Single Family Homes, Shopping Centers, Regional Malls, Free Standing, Lodging/Resorts, Specialty, Data Centers, and Other (any other property type(s) that cannot be classified to any of the previous property subsector classifications).
- 5 The entity may disclose the floor area, in square feet, included in the scope of like-for-like percentage change in energy consumption if the scope significantly diverges from the floor area of energy consumption data coverage.
- 6 “Like-for-like” data collection, analysis, and disclosure may be consistent with the approach with which the entity discloses its financial reporting data.
  - 6.1 If the entity discloses its financial reporting data using a concept and methodology similar to “Like-for-like Comparison,” the entity shall describe divergences between the scope of assets and/or floor area used in its financial reporting and its like-for-like change in energy consumption. For example, if additional assets are excluded from the like-for-like change in energy consumption relative to like-for-like financial reporting as a result of data coverage limitations, such inconsistencies shall be described.
- 7 The entity may additionally present like-for-like percentage change in energy consumption on a normalized basis.
  - 7.1 Normalization factors and methodologies may include, but are not limited to, the following which are presented in the [2018 GRESB Real Estate Assessment Reference Guide](#):
    - 7.1.1 Air conditioning and/or natural ventilation
    - 7.1.2 Building age
    - 7.1.3 Degree days
    - 7.1.4 Footfall
    - 7.1.5 Occupancy rate
    - 7.1.6 Operational hours
    - 7.1.7 Weather conditions
    - 7.1.8 Other
  - 7.2 If the entity chooses to additionally disclose normalized like-for-like percentage change in energy consumption, the entity shall provide a brief description of the normalization factor and methodology or its use of a third-party methodology (e.g., “Weather Normalized Energy” as provided by ENERGY STAR Portfolio Manager®).
- 8 The entity may describe the variations in like-for-like percentage change in energy consumption.
  - 8.1 Variations in energy consumption may occur based on distinctions including, but not limited to:
    - 8.1.1 Base Building, Tenant Space, and Whole Building
    - 8.1.2 Energy Purchased by the Landlord and energy Purchased by Tenant;
    - 8.1.3 Managed Assets and Indirectly Managed Assets; and
    - 8.1.4 Geographical markets.

- 9 The following terms are defined according to the [2018 GRESB Real Estate Assessment Reference Guide](#):
- 9.1 Base Building is defined as “Energy consumed in supplying central building services to lettable/leasable areas and common areas.”
  - 9.2 Tenant Space is defined as “Lettable floor area (both vacant and let/leased areas) that is or can be occupied by tenants.”
  - 9.3 Whole Building is defined as “Energy used by tenants and base building services to lettable/leasable and common spaces. This should include all energy supplied to the building for the operation of the building and the tenant space.”
  - 9.4 Purchased by Landlord is defined as “Energy purchased by the landlord, but consumed by the tenant. This can include energy purchased by the landlord but used for vacant space.”
  - 9.5 Purchased by Tenant is defined as “Energy purchased by the tenant. Typically this is data that is not within the participants’ immediate control.”
  - 9.6 Managed Assets and Indirectly Managed Assets are defined as follows: “This definition of Managed assets and the definition of Indirectly Managed assets are solely based on the landlord/tenant relationship. [Managed and Indirectly Managed Assets are] assets or buildings for which the landlord is determined to have 'operational control' where operational control is defined as having the ability to introduce and implement operating and/or environmental policies and measures. In case both the landlord and tenant have the authority to introduce and implement any or all of the policies mentioned above, the asset or building should be reported as a Managed asset. Where a single tenant has the sole authority to introduce and implement operating and/or environmental policies and measures, the tenant should be assumed to have operational control, so it should be considered to be an Indirectly Managed asset.”
- 10 The entity shall consider the 2018 GRESB Real Estate Assessment Reference Guide as a normative reference, thus any updates made year-on-year shall be considered updates to this guidance.

#### **IF-RE-130a.4. Percentage of eligible portfolio that (1) has an energy rating and (2) is certified to ENERGY STAR, by property subsector**

- 1 The entity shall disclose the percentage of the portfolio that has a valid or current energy rating, by gross floor area, where:
- 1.1 Gross floor area is defined according to the U.S. Environmental Protection Agency (EPA) ENERGY STAR® [definition](#) as “the total property square footage, measured between the principal exterior surfaces of the enclosing fixed walls of the building(s).”
  - 1.2 An energy rating is defined according to the [2018 GRESB Real Estate Assessment Reference Guide](#) as a scheme that measures the energy performance of buildings, including schemes solely concerned with measuring energy efficiency performance as well as cases in which an energy rating is an element of a broader scheme measuring environmental performance.
  - 1.3 The percentage shall be calculated as the portfolio gross floor area that has an energy rating divided by the total portfolio gross floor area.

- 1.3.1 The entity may exclude from the denominator the portfolio gross floor area that is ineligible to receive an energy rating based on the property subsector, location (e.g., located in a region in which energy ratings are not an available service), or other specific use characteristics that cause the property to be ineligible.
  - 1.4 The scope of energy rating schemes includes:
    - 1.4.1 ENERGY STAR® for operations in the U.S. and Canada
    - 1.4.2 EU Energy Performance Certificates (EPC) for operations in the European Union
    - 1.4.3 National Australian Built Environment Rating System (NABERS) Energy for operations in Australia
    - 1.4.4 NABERSNZ for operations in New Zealand
    - 1.4.5 Other energy rating schemes that can be demonstrated to have substantially equivalent criteria, methodology, and presentation of results as those schemes stated above
  - 1.5 The scope of energy rating schemes is aligned with the [2018 GRESB Real Estate Assessment Reference Guide](#) in that it “only include[s] energy ratings that were awarded before or during the reporting period (pre-assessments or other unofficial rating schemes are not valid). Some energy ratings are valid for a limited period only—the rating should be officially in effect during the reporting period.”
- 2 The entity may additionally disclose the percentage(s) by energy rating scheme.
  - 3 The entity shall (2) disclose the percentage of its portfolio that is certified to ENERGY STAR®.
    - 3.1 The percentage shall be calculated as the portfolio gross floor area that is certified to ENERGY STAR® in the U.S. divided by the total portfolio gross floor area in the U.S.
      - 3.1.1 For a property to qualify as certified to ENERGY STAR®, the certification must be officially in effect during the reporting period (as aligned with the [2018 GRESB Real Estate Assessment Reference Guide](#)).
      - 3.1.2 The entity may exclude from the denominator the portfolio gross floor area that is ineligible to be certified to ENERGY STAR® based on the property subsector or other specific use characteristics that cause the property to be ineligible.
    - 3.2 If property is located in Canada, the entity may separately disclose the percentage of the portfolio in Canada that is certified to ENERGY STAR®.
      - 3.2.1 The percentage shall be calculated as the portfolio gross floor area that is certified to ENERGY STAR® in Canada divided by the total portfolio gross floor area in Canada.
- 4 The entity shall disclose (1) the percentage of its portfolio that has an energy rating, and (2) the percentage of its portfolio that is certified to ENERGY STAR®, separately for each property type in its portfolio where properties are classified into subsectors that are aligned with the FTSE Nareit Classification Structure and include the following: Health Care, Self Storage, Industrial, Office, Apartments, Manufactured Homes, Single Family Homes, Shopping Centers, Regional Malls, Free Standing, Lodging/Resorts, Specialty, Data Centers, and Other (any other property type(s) that cannot be classified to any of the previous property subsector classifications).

- 5 The entity shall consider the 2018 GRESB Real Estate Assessment Reference Guide as a normative reference, thus any updates made year-on-year shall be considered updates to this guidance.

### **IF-RE-130a.5. Description of how building energy management considerations are integrated into property investment analysis and operational strategy**

- 1 The entity shall describe its strategic approach and the operational processes it uses to integrate energy-related considerations into its analysis of current and future property investments.
- 2 The entity shall describe the following elements of its strategic approach, where relevant:
  - 2.1 The use of energy-reduction targets and performance against those targets;
  - 2.2 The integration of property energy performance into its property acquisition due diligence process—such as if these measures are qualitative in nature (e.g., whether or not the building has an energy rating) or quantitative in nature (e.g., the entity adjusts occupancy rate projections based on energy performance data); and
  - 2.3 Entity-level energy consumption and management policies, applicable across the entity’s portfolio (aligned with 2018 GRESB Real Estate Assessment Q8).
- 3 The entity shall discuss the operational processes it uses, which may include, but are not limited to:
  - 3.1 Management of the technical energy performance of its portfolio; and
  - 3.2 The integration of renewable energy into its portfolio.
- 4 Relevant elements of its technical approach may include, but are not limited to:
  - 4.1 Use of technical building assessments to identify energy efficiency opportunities—including whether such assessments are in-house or external and the general portfolio coverage of such assessments during the last four years (aligned with 2018 GRESB Real Estate Assessment Q16);
  - 4.2 Measures implemented to improve the energy efficiency of the portfolio—including specific measures taken, general portfolio coverage of such measures, and estimated energy savings (aligned with 2018 GRESB Real Estate Assessment Q17);
  - 4.3 Approach to retrocommissionings—including their applicability to the entity’s portfolio, the comprehensiveness of retrocommissionings conducted, general portfolio coverage, and estimated energy savings;
  - 4.4 Use of environmental management systems to measure, manage, and improve the energy performance of buildings and such systems’ alignment with third-party standards or verification (aligned with 2018 GRESB Real Estate Assessment Q21, “Environmental Management Systems”); and
  - 4.5 Use of data management systems to monitor, analyze, and benchmark energy performance of individual buildings, and such systems’ alignment with third-party standards or verification (aligned with 2018 GRESB Real Estate Assessment Q22, “Data Management Systems”).
- 5 The entity shall discuss its strategies relating to energy ratings, benchmarking, and certifications, including their:



- 5.1 Impact on tenant demand within the entity's target market(s)
  - 5.2 Relevance to the property types in its portfolio, such as the subsector(s), locations, and construction (new versus existing stock)
  - 5.3 Costs and benefits associated with obtaining and maintaining an energy rating, benchmark, and certification
  - 5.4 If applicable, the entity shall discuss whether it prefers certifications that are based on ongoing performance (e.g., ENERGY STAR®) or those based on performance-modeled design objectives.
- 6 The entity shall describe its approach to renewable energy generation, which may include, but not is not limited to:
- 6.1 The relevance of on-site and off-site renewable energy generation to the portfolio and energy management strategy
  - 6.2 Technical or legal limitations on the ability to incorporate renewable energy into the portfolio and energy management strategy
  - 6.3 The energy generated from on-site and off-site renewable energy (aligned with 2018 GRESB Real Estate Assessment Q25.3)
- 7 If the entity participates in new construction or major renovations, it shall discuss whether and how it incorporates energy efficiency strategies into design and development.
- 8 The entity shall consider the 2018 GRESB Real Estate Assessment as a normative reference, thus any updates made year-on-year shall be considered updates to this guidance.

# Water Management

## Topic Summary

Buildings consume significant amounts of water in their operations, through water fixtures, building equipment, appliances, and irrigation. Operating costs resulting from water consumption may represent significant costs depending on property type, tenant operations, geographical locations, and other factors. Companies in the industry can be responsible for a building's water costs, or common area water costs, though it is common to allocate all, or a portion, of these costs to occupants. In these arrangements, water management continues to play an important role through tenant demand and regulatory exposure. Tenants may assess the water efficiency of real estate assets in an effort to control operating costs, mitigate environmental impacts of operations, and, often just as importantly, develop a reputation for resource conservation. Additionally, real estate owners may be exposed to water-related regulations even when water costs are the responsibility of occupants. Overall, companies in the industry that effectively manage water efficiency of assets, even when they don't face direct exposure to water costs, may see reduced operating costs and regulatory exposure, as well as increased tenant demand, rental rates, and occupancy rates—all of which drive revenue and asset value appreciation. Long-term historic increases in the costs of water—and expectations of continued increases due to overconsumption and constrained supplies resulting from population growth and shifts, pollution, and climate change—indicate the heightened importance of water management. The ability to improve asset water efficiency is highly dependent on the property type, locational water availability, target tenant market, local building codes, the ability to measure consumption, and the level of current efficiency of existing building stock, among other factors.

## Accounting Metrics

### **IF-RE-140a.1. Water withdrawal data coverage as a percentage of (1) total floor area and (2) floor area in regions with High or Extremely High Baseline Water Stress, by property subsector**

- 1 The entity shall disclose (1) the percentage of its portfolio, based on total gross floor area, with complete water withdrawal data coverage.
  - 1.1 Gross floor area is defined according to the U.S. Environmental Protection Agency (EPA) ENERGY STAR® [definition](#) as “the total property square footage, measured between the principal exterior surfaces of the enclosing fixed walls of the building(s).”
    - 1.1.1 Leasable floor area may be used in place of gross floor area when gross floor area is not available for the relevant area of the portfolio (e.g., a building with an unknown gross floor but a known leasable floor area).
    - 1.1.2 Number of units may be used in place of floor area in the Apartments and Lodging/Resorts property subsectors.
  - 1.2 Floor area is considered to have complete water withdrawal data coverage when water withdrawal data (i.e., amounts withdrawn) is obtained by the entity in the relevant floor area during the reporting period, regardless of when such data was obtained.

- 1.3 The percentage shall be calculated as the portfolio gross floor area with complete water withdrawal data coverage divided by the total portfolio gross floor area for which water is used.
- 1.4 The scope of water withdrawals is aligned with the [2018 GRESB Real Estate Assessment Reference Guide](#), and includes water that was withdrawn from all sources.
  - 1.4.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity shall disclose (2) the percentage of its portfolio, based on gross floor area, located in regions classified as High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress with complete water withdrawal data coverage.
  - 2.1 High or Extremely High Baseline Water Stress shall be determined by the World Resources Institute’s (WRI) Water Risk Atlas tool, [Aqueduct](#).
  - 2.2 The percentage shall be calculated as the portfolio gross floor area located in regions classified as High or Extremely High Baseline Water Stress and that have complete water withdrawal data coverage, divided by the total portfolio gross floor area for which water is used in regions with High or Extremely High Baseline Water Stress.
- 3 The entity shall disclose (1) water withdrawal data coverage, and (2) the percentage of water withdrawal data coverage in regions with High or Extremely High Baseline Water Stress, separately for each property type in its portfolio where properties are classified into subsectors that are aligned with the FTSE Nareit Classification Structure and include the following: Health Care, Self Storage, Industrial, Office, Apartments, Manufactured Homes, Single Family Homes, Shopping Centers, Regional Malls, Free Standing, Lodging/Resorts, Specialty, Data Centers, and Other (any other property type(s) that cannot be classified to any of the previous property subsector classifications).
- 4 The entity may describe the variations in water withdrawal data coverage, including the factors that influence it.
  - 4.1 Variations in water withdrawal data coverage may occur based on distinctions including, but not limited to:
    - 4.1.1 Base Building, Tenant Space, and Whole Building
    - 4.1.2 Water Purchased by the Landlord and water Purchased by Tenants
    - 4.1.3 Managed Assets and Indirectly Managed Assets
    - 4.1.4 Geographical markets
  - 4.2 Relevant factors that influence water withdrawal data coverage may include, but are not limited to:
    - 4.2.1 Geographical markets and the applicable enabling or inhibiting laws, regulations, and policies within such markets, including those policies of utilities;
    - 4.2.2 Geographical markets and the applicability of risks related to water scarcity (and related current or future regulations);
    - 4.2.3 Administrative or logistical barriers to obtaining water withdrawal data (e.g., lack of integration of utilities’ data reporting systems);
    - 4.2.4 Tenant demands around the privacy or proprietary nature of water withdrawal data;

- 4.2.5 Property subsectors or other more nuanced classifications of property types;
  - 4.2.6 Lease structures, including the length in time of leases, the terms applicable to the access of water withdrawal data by the entity, and the ability of the entity to influence water management performance of Tenant Spaces; and
  - 4.2.7 The entity’s perception that its obtainment of Tenant Space water withdrawal data may negatively impact tenant demand.
- 5 The following terms are defined according to the [2018 GRESB Real Estate Assessment Reference Guide](#):
- 5.1 Base Building is defined as water “consumed in supplying central building services to lettable/leasable areas and common areas.”
  - 5.2 Tenant Space is defined as “Lettable floor area (both vacant and let/leased areas) that is or can be occupied by tenants.”
  - 5.3 Whole Building is defined as water “used by tenants and base building services to lettable/leasable and common spaces. This should include all [water] supplied to the building for the operation of the building and the tenant space.”
  - 5.4 Purchased by Landlord is defined as water “purchased by the landlord, but consumed by the tenant. This can include [water] purchased by the landlord but used for vacant space.”
  - 5.5 Purchased by Tenant is defined as water “purchased by the tenant. Typically this is data that is not within the participants’ immediate control.”
  - 5.6 Managed Assets and Indirectly Managed Assets are defined as follows: “This definition of Managed assets and the definition of Indirectly Managed assets are solely based on the landlord/tenant relationship. [Managed and Indirectly Managed Assets are] assets or buildings for which the landlord is determined to have 'operational control' where operational control is defined as having the ability to introduce and implement operating and/or environmental policies and measures. In case both the landlord and tenant have the authority to introduce and implement any or all of the policies mentioned above, the asset or building should be reported as a Managed asset. Where a single tenant has the sole authority to introduce and implement operating and/or environmental policies and measures, the tenant should be assumed to have operational control, so it should be considered to be an Indirectly Managed asset.”
- 6 The entity shall consider the 2018 GRESB Real Estate Assessment Reference Guide as a normative reference, thus any updates made year-on-year shall be considered updates to this guidance.

**IF-RE-140a.2. (1) Total water withdrawn by portfolio area with data coverage and (2) percentage in regions with High or Extremely High Baseline Water Stress, by property subsector**

- 1 The entity shall disclose (1) the total amount of water, in thousands of cubic meters, that was withdrawn by the portfolio area for which there is water withdrawal data coverage.

- 1.1 The scope of disclosure includes all property area in the entity's portfolio for which there is water withdrawal data coverage, regardless of whether water is consumed by the Tenant Space or Base Building (including outdoor, exterior, and parking areas) and which party pays for water expenses.
- 1.2 The scope of disclosure excludes the portion of water consumed by the portfolio area for which water withdrawal data is unavailable.
  - 1.2.1 If water withdrawal data is not available for Tenant Space or Whole Building for a property but is available for the Base Building, then the entity shall disclose this water withdrawal data.
- 1.3 The scope of water withdrawals is aligned with the [2018 GRESB Real Estate Assessment Reference Guide](#), and includes water that was withdrawn from all sources.
  - 1.3.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity shall disclose (2) the percentage of water withdrawn in regions with High (40–80 percent) or Extremely High (> 80 percent) Baseline Water Stress.
  - 2.1 High or Extremely High Baseline Water Stress shall be determined by the World Resources Institute's (WRI) Water Risk Atlas tool, [Aqueduct](#).
  - 2.2 The percentage shall be calculated as the amount of water withdrawn (by volume) in regions with High or Extremely High Baseline Water Stress divided by the total amount of water withdrawn (by volume).
- 3 Water withdrawal data shall be disclosed by (a) Base Building and (b) Tenant Space, or (c) Whole Building, or a combination of these.
- 4 The entity shall disclose (1) total water withdrawn, and (2) percentage in regions with High or Extremely High Baseline Water Stress, separately for each property type in its portfolio where properties are classified into subsectors that are aligned with the FTSE Nareit Classification Structure and include the following: Health Care, Self Storage, Industrial, Office, Apartments, Manufactured Homes, Single Family Homes, Shopping Centers, Regional Malls, Free Standing, Lodging/Resorts, Specialty, Data Centers, and Other (any other property type(s) that cannot be classified to any of the previous property sub sector classifications).
- 5 The entity may describe the variations in water withdrawn.
  - 5.1 Variations in water withdrawn may occur based on distinctions including, but not limited to:
    - 5.1.1 Base Building, Tenant Space, and Whole Building
    - 5.1.2 Water Purchased by the Landlord and water Purchased by Tenant
    - 5.1.3 Managed Assets and Indirectly Managed Assets
    - 5.1.4 Geographical markets
- 6 The following terms are defined according to the 2018 GRESB Real Estate Assessment Reference Guide:

- 6.1 Base Building is defined as, water “consumed in supplying central building services to lettable/leasable areas and common areas.”
  - 6.2 Tenant Space is defined as, “Lettable floor area (both vacant and let/leased areas) that is or can be occupied by tenants.”
  - 6.3 Whole Building is defined as, water “used by tenants and base building services to lettable/leasable and common spaces. This should include all [water] supplied to the building for the operation of the building and the tenant space.”
  - 6.4 Purchased by Landlord is defined as, water “purchased by the landlord, but consumed by the tenant. This can include [water] purchased by the landlord but used for vacant space.”
  - 6.5 Purchased by Tenant is defined as, water “purchased by the tenant. Typically this is data that is not within the participants' immediate control.”
  - 6.6 Managed Assets and Indirectly Managed Assets are defined as follows: “This definition of Managed assets and the definition of Indirectly Managed assets are solely based on the landlord/tenant relationship. [Managed and Indirectly Managed Assets are] assets or buildings for which the landlord is determined to have 'operational control' where operational control is defined as having the ability to introduce and implement operating and/or environmental policies and measures. In case both the landlord and tenant have the authority to introduce and implement any or all of the policies mentioned above, the asset or building should be reported as a Managed asset. Where a single tenant has the sole authority to introduce and implement operating and/or environmental policies and measures, the tenant should be assumed to have operational control, so it should be considered to be an Indirectly Managed asset.”
- 7 The entity shall consider the [2018 GRESB Real Estate Assessment Reference Guide](#) as a normative reference, thus any updates made year-on-year shall be considered updates to this guidance.

### **IF-RE-140a.3. Like-for-like percentage change in water withdrawn for portfolio area with data coverage, by property subsector**

- 1 The entity shall disclose the like-for-like percentage change in water withdrawn for the portfolio area with data coverage.
  - 1.1 The percentage shall be calculated as water withdrawn (by volume) in the reporting period divided by the water withdrawn (by volume) in the immediately prior reporting period.
  - 1.2 The scope of water withdrawn included in the calculation shall be aligned with that outlined in the [2018 GRESB Real Estate Assessment Reference Guide](#) (“Like-for-like Comparison”) as including all water withdrawn by properties that were in the entity’s portfolio for both the full reporting period and the immediately prior full reporting period.
    - 1.2.1 Water withdrawn by properties that have been acquired, disposed of, under development, or have undergone a major renovation during the reporting period or the immediately prior reporting period shall be excluded.
    - 1.2.2 No correction for changes in the occupancy rate is needed and properties with a high variation in vacancy rates shall be included.

- 1.2.3 If there is not water withdrawal data coverage for either (or both) the reporting period or the immediately prior reporting period, the water withdrawn by that relevant portfolio floor area is excluded from the numerator and the denominator in the calculation.
- 2 The scope, methodology, and calculations of water withdrawn shall be consistent with IF-RE-140a.2.
- 3 Like-for-like change in water withdrawn shall be disclosed by (a) Base Building and (b) Tenant Space, or (c) Whole Building, or a combination of these.
  - 3.1 If like-for-like change in water withdrawal data is not available for Tenant Space or Whole Building for a property but is available for the Base Building, then the entity shall disclose this like-for-like water withdrawal data.
- 4 The entity shall disclose like-for-like percentage change in water withdrawn separately for each property type in its portfolio where properties are classified into subsectors that are aligned with the FTSE Nareit Classification Structure and include the following: Health Care, Self Storage, Industrial, Office, Apartments, Manufactured Homes, Single Family Homes, Shopping Centers, Regional Malls, Free Standing, Lodging/Resorts, Specialty, Data Centers, and Other (any other property type(s) that cannot be classified to any of the previous property subsector classifications).
- 5 The entity may disclose the floor area, in square feet, included in the scope of like-for-like percentage change in water withdrawn if the scope significantly diverges from the floor area of water withdrawal data coverage.
- 6 "Like-for-like" data collection, analysis, and disclosure may be consistent with the approach with which the entity discloses its financial reporting data.
  - 6.1 If the entity discloses its financial reporting data using a concept and methodology similar to "Like-for-like Comparison," the entity shall describe divergences between the scope of assets and/or floor area used in its financial reporting and its like-for-like change in water withdrawn. For example, if additional assets are excluded from the like-for-like change in water withdrawn relative to like-for-like financial reporting as a result of data coverage limitations, such inconsistencies shall be described.
- 7 The entity may additionally present like-for-like percentage change in water withdrawn on a normalized basis.
  - 7.1 Normalization factors and methodologies may include, but are not limited to, the following which are presented in the [2018 GRESB Real Estate Assessment Reference Guide](#):
    - 7.1.1 Air conditioning and/or natural ventilation
    - 7.1.2 Building age
    - 7.1.3 Degree days
    - 7.1.4 Footfall
    - 7.1.5 Occupancy rate
    - 7.1.6 Operational hours
    - 7.1.7 Weather conditions
    - 7.1.8 Other

- 7.2 If the entity chooses to additionally disclose normalized like-for-like percentage change in water withdrawn, the entity shall provide a brief description of the normalization factor and methodology or its use of a third-party methodology.
- 8 The entity may describe the variations in like-for-like percentage change in water withdrawn.
- 8.1 Variations in water withdrawn may occur based on distinctions including, but not limited to:
- 8.1.1 Base Building, Tenant Space, and Whole Building
  - 8.1.2 Water Purchased by the Landlord and water Purchased by Tenant
  - 8.1.3 Managed Assets and Indirectly Managed Assets
  - 8.1.4 Geographical markets
- 9 The following terms are defined according to the [2018 GRESB Real Estate Assessment Reference Guide](#):
- 9.1 Base Building is defined as water “consumed in supplying central building services to lettable/leasable areas and common areas.”
- 9.2 Tenant Space is defined as “Lettable floor area (both vacant and let/leased areas).”
- 9.3 Whole Building is defined as water “used by tenants and base building services to lettable/leasable and common spaces. This should include all [water] supplied to the building for the operation of the building and the tenant space.”
- 9.4 Purchased by Landlord is defined as water “purchased by the landlord, but consumed by the tenant. This can include [water] purchased by the landlord but used for vacant space.”
- 9.5 Purchased by Tenant is defined as water “purchased by the tenant. Typically this is data that is not within the participants’ immediate control.”
- 9.6 Managed Assets and Indirectly Managed Assets are defined as follows: “This definition of Managed assets and the definition of Indirectly Managed assets are solely based on the landlord/tenant relationship. [Managed and Indirectly Managed Assets are] assets or buildings for which the landlord is determined to have 'operational control' where operational control is defined as having the ability to introduce and implement operating and/or environmental policies and measures. In case both the landlord and tenant have the authority to introduce and implement any or all of the policies mentioned above, the asset or building should be reported as a Managed asset. Where a single tenant has the sole authority to introduce and implement operating and/or environmental policies and measures, the tenant should be assumed to have operational control, so it should be considered to be an Indirectly Managed asset.”
- 10 The entity shall consider the 2018 GRESB Real Estate Assessment Reference Guide as a normative reference, thus any updates made year-on-year shall be considered updates to this guidance.

#### **IF-RE-140a.4. Description of water management risks and discussion of strategies and**



## practices to mitigate those risks

- 1 The entity shall describe its water management risks associated with water withdrawals, water consumption, and discharge of water and/or wastewater.
  - 1.1 Risks associated with water withdrawals and water consumption include risks to the availability of adequate, clean water resources, including, but not limited to:
    - 1.1.1 Environmental constraints—such as operating in water-stressed regions, drought, concerns of aquatic impingement or entrainment, interannual or seasonal variability, and risks due to the impact of climate change
    - 1.1.2 Regulatory and financial constraints—such as volatility in water costs, stakeholder perceptions and concerns related to water withdrawals (e.g., those from local communities, non-governmental organizations, and regulatory agencies), direct competition with and impact from the actions of other users (e.g., commercial and municipal users), restrictions to withdrawals due to regulations, and constraints on the entity’s ability to obtain and retain water rights or permits
  - 1.2 Risks associated with the discharge of water and/or wastewater, include, but are not limited to, the ability to obtain rights or permits related to discharges, compliance with regulations related to discharges, restrictions to discharges, the ability to maintain control over the temperature of water discharges, liabilities and/or reputational risks, and increased operating costs due to regulation, stakeholder perceptions and concerns related to water discharges (e.g., those from local communities, non-governmental organizations, and regulatory agencies).
- 2 The entity may describe water management risks in the context of:
  - 2.1 How risks may vary by withdrawal source, including surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities; and
  - 2.2 How risks may vary by discharge destinations, including surface water, groundwater, or wastewater utilities.
- 3 The entity may discuss the potential impacts that water management risks may have on its operations and the timeline over which such risks are expected to manifest.
  - 3.1 Impacts may include, but are not limited to, those associated with costs, revenues, liabilities, continuity of operations, and reputation.
- 4 The entity shall discuss its short-term and long-term strategies or plan to mitigate water management risks, including, but not limited to:
  - 4.1 The scope of its strategy, plans, goals and/or targets, such as how they relate to different business units, geographies, or water-consuming operational processes.

- 4.2 Any water management goals and/or targets it has prioritized, and an analysis of performance against those goals and/or targets.
    - 4.2.1 Goals and targets may include, but are not limited to, those associated with reducing water withdrawals, reducing water consumption, reducing water discharges, reducing aquatic impingements, improving the quality of water discharges, and regulatory compliance.
  - 4.3 The activities and investments required to achieve the plans, goals and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 4.4 Disclosure of strategies, plans, goals, and/or targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.
- 5 For water management targets, the entity shall additionally disclose:
- 5.1 Whether the target is absolute or intensity-based, and the metric denominator if it is an intensity-based target.
  - 5.2 The timelines for the water management plans, including the start year, the target year, and the base year.
  - 5.3 The mechanism(s) for achieving the target, including:
    - 5.3.1 Efficiency efforts, such as the use of water recycling and/or closed-loop systems;
    - 5.3.2 Product innovations such as redesigning products or services to require less water;
    - 5.3.3 Process and equipment innovations, such as those that enable the reduction of aquatic impingements or entrainments;
    - 5.3.4 Use of tools and technologies (e.g., the [World Wildlife Fund Water Risk Filter](#), [The Global Water Tool](#), and [Water Footprint Network Footprint Assessment Tool](#)) to analyze water use, risk, and opportunities; and
    - 5.3.5 Collaborations or programs in place with the community or other organizations.
  - 5.4 The percentage reduction or improvement from the base year, where the base year is the first year against which water management targets are evaluated toward the achievement of the target.
- 6 The entity shall discuss whether its water management practices result in any additional lifecycle impacts or tradeoffs in its organization, including tradeoffs in land use, energy production, and greenhouse gas (GHG) emissions, and why the entity chose these practices despite lifecycle tradeoffs.

# Management of Tenant Sustainability Impacts

## Topic Summary

Real estate assets generate significant sustainability impacts, including resource consumption—namely energy and water—waste generation, and impacts on occupant health through indoor environmental quality. While companies in the industry own real estate assets, it is the tenant operations of such assets that is a dominant driver of sustainability impacts produced by the built environment. Tenants may design and construct leased spaces according to their operating needs. In turn, their operations consume significant amounts of energy and water, generate waste, and impact the health of those living, working, shopping, or visiting the properties. While these sustainability impacts are often generated by tenant operations and activities, real estate owners have an important role in influencing tenant sustainability impacts. The manner in which companies in the industry structure their agreements, contracts, and relationships with tenants is instrumental in effectively managing the sustainability impacts of their tenants, and ultimately, the impacts of their assets. Managing tenant sustainability impacts may include mitigating the problem of split incentives by aligning both parties' financial interests with sustainability outcomes, establishing systematic measurement and communication of resource consumption data, creating shared performance goals, and mandating minimum sustainability performance or design requirements, among other strategies. Effective management of tenant sustainability impacts, particularly related to energy, water, and indoor environmental quality, may drive asset value appreciation, increase tenant demand and satisfaction, decrease direct operating costs, and/or decrease risks related to building codes and regulations.

## Accounting Metrics

### **IF-RE-410a.1. (1) Percentage of new leases that contain a cost recovery clause for resource efficiency-related capital improvements and (2) associated leased floor area, by property subsector**

- 1 The entity shall disclose (1) the percentage of new leases that contain a cost recovery clause for resource efficiency-related capital improvements.
  - 1.1 A cost recovery clause for resource efficiency-related capital improvements is defined as a clause in a lease agreement that allows the entity to invest in capital improvements to the energy efficiency and/or water efficiency of properties, while recovering all or a proportion of associated expenditures from tenants, regardless of the mechanism of cost recovery. This definition is generally aligned with:
    - 1.1.1 The Green Lease Leaders application: "Tenant cost recovery clause that can be used for energy efficiency-related capital improvements. This typically means that the list of operating expenses is expanded to include capital expenses intended to save energy, with the annual pass-through amount most often determined either by an amortization schedule or projected savings."
    - 1.1.2 The 2018 GRESB Real Estate Assessment Reference Guide: "Cost recovery clause for energy efficiency-related capital improvements: Allows the landlord to implement energy-efficiency measures during the lease and to recover a proportion or all of those costs from the tenant."

- 1.2 The percentage shall be calculated as the portfolio newly leased floor area associated with leases that contain a cost recovery clause for resource efficiency-related capital improvements divided by total portfolio newly leased floor area.
  - 1.2.1 Number of units may be used in place of floor area in the Apartments and Lodging/Resorts property subsectors.
- 2 The entity shall disclose (2) the leased floor area, in square feet, associated with new leases that contain a cost recovery clause for resource efficiency-related capital improvements.
- 3 The scope of disclosure includes all of the properties in the entity's portfolio that were newly leased during any part of the reporting period, and for which the associated lease was executed between the entity and the tenant.
  - 3.1 If the entity executed lease amendments or letter agreements during the reporting period that contain a cost recovery clause for resource efficiency-related capital improvements, the associated leased floor area shall be included within the scope of disclosure.
- 4 The entity shall disclose (1) the percentage of new leases that contain a cost recovery clause for resource efficiency-related capital improvements, and (2) the associated leased floor area, separately for each property type in its portfolio where properties are classified into subsectors that are aligned with the FTSE Nareit Classification Structure and include the following: Health Care, Self Storage, Industrial, Office, Apartments, Manufactured Homes, Single Family Homes, Shopping Centers, Regional Malls, Free Standing, Lodging/Resorts, Specialty, Data Centers, and Other (any other property type(s) that cannot be classified to any of the previous property subsector classifications).
- 5 The entity may describe whether its standard lease contracts include a cost recovery clause for resource efficiency-related capital improvements (aligned with 2018 GRESB Real Estate Assessment Q39).
- 6 The entity may additionally disclose the percentage of all leases (as opposed to new leases only) in effect as of the last day of the reporting period that contain a cost recovery clause for resource efficiency-related capital improvements, calculated in a manner consistent with the above calculation.
- 7 The entity may provide a brief description of instances when cost recovery clauses for resource efficiency-related capital improvements were exercised, including the extent throughout the portfolio and the financial implications.
- 8 The entity may additionally disclose the amount of actual capital expenditures associated with resource efficiency-related capital improvements that were recovered from tenants during the reporting period through the use of cost recovery clauses in leases.
- 9 The entity shall consider the 2018 GRESB Real Estate Assessment Reference Guide as a normative reference, thus any updates made year-on-year shall be considered updates to this guidance.

**IF-RE-410a.2. Percentage of tenants that are separately metered or submetered for (1) grid electricity consumption and (2) water withdrawals, by property subsector**

- 1 The entity shall disclose the percentage of tenants that are separately metered or submetered for (1) the grid electricity usage resulting from their exclusive electricity consumption.

- 1.1 The percentage shall be calculated as the leasable floor area leased to tenants that are separately metered or submetered for the electricity consumption resulting from their exclusive consumption divided by the total portfolio leasable floor area.
- 2 The entity shall disclose the percentage of tenants that are separately metered or submetered for (2) the water usage resulting from their exclusive water withdrawals.
  - 2.1 The percentage shall be calculated as the leasable floor area leased to tenants that are separately metered or submetered for the water usage resulting from their exclusive withdrawals divided by the total portfolio leasable floor area.
- 3 Number of units may be used in place of floor area in the Apartments and Lodging/Resorts property subsectors.
- 4 The entity shall disclose the percentage of tenants that are separately metered or submetered for their exclusive (1) grid electricity consumption, and (2) water withdrawals, separately for each property type in its portfolio where properties are classified into subsectors that are aligned with the FTSE Nareit Classification Structure and include the following: Health Care, Self Storage, Industrial, Office, Apartments, Manufactured Homes, Single Family Homes, Shopping Centers, Regional Malls, Free Standing, Lodging/Resorts, Specialty, Data Centers, and Other (any other property type(s) that cannot be classified to any of the previous property subsector classifications).

### **IF-RE-410a.3. Discussion of approach to measuring, incentivizing, and improving sustainability impacts of tenants**

- 1 The entity shall discuss its strategy and process for integrating considerations of sustainability into its leases and tenant relationships (e.g., tenant communication, voluntary initiatives, and selection of a third-party property manager, if applicable) in order to measure, incentivize, and improve impacts.
- 2 For the purposes of this disclosure, the scope of sustainability topics includes the following: energy management, water management, and the impacts of properties on tenant health, including indoor environmental quality.
- 3 Relevant strategies to discuss include, but are not limited to:
  - 3.1 The following components, which are generally aligned with the 2018 GRESB Real Estate Assessment Q39.1:
    - 3.1.1 Whether the entity has agreements with its tenants to mutually share energy consumption and/or water withdrawal data
    - 3.1.2 Whether the entity has shared energy consumption and water withdrawal targets
    - 3.1.3 Whether the entity establishes requirements that any tenant works should meet standards provided by the entity related to energy consumption, water efficiency, and indoor environmental quality
    - 3.1.4 Whether the entity establishes requirements that its tenants provide accurate information required for mandatory energy rating schemes
    - 3.1.5 Whether the entity has the ability to prioritize sustainability requirements over minimizing the costs of improvements and adjustments

- 3.2 Whether the entity prioritizes separately metering or submetering tenant energy consumption and water withdrawals, and if so, if the entity also prioritizes its own ability to measure the energy consumption and water withdrawals by its tenants
  - 3.3 Whether the entity prioritizes lease structures that require tenants to pay grid electricity and water utility expenses that are directly based on their actual and exclusive consumption of such resources
- 4 The entity shall include a discussion of its support, participation, and usage of third-party initiatives concerning green leases.
- 4.1 Third-party initiatives concerning green leases include, but are not limited to, green lease templates, principles, requirements, strategies, and educational programs provided by organizations.
  - 4.2 Examples of third-party initiatives concerning green leases include, but are not limited to:
    - 4.2.1 Building Owners and Managers Association International, *Commercial Lease: Guide to Sustainable and Energy Efficient Leasing for High-Performance Buildings*
    - 4.2.2 California Sustainability Alliance, *Green Leases Toolkit*
    - 4.2.3 CMS, *Green Lease Clauses in Europe - A practical approach*
    - 4.2.4 Corporate Realty, Design & Management Institute, *Model Green Lease*
    - 4.2.5 Green Lease Leaders and Green Lease Library (programs jointly operated by the Institute for Market Transformation and the U.S. Department of Energy's Better Building Alliance)
    - 4.2.6 Natural Resources Defense Council, *Energy Efficiency Lease Guidance*
    - 4.2.7 Real Property Association of Canada, *Green Office Leases*
    - 4.2.8 U.S. General Services Administration, *Green Lease Policies and Procedures*
    - 4.2.9 U.S. Green Building Council, *Green Office Guide: Integrating LEED into Your Leasing Process* and *Greening Your Lease*
  - 4.3 The entity shall describe whether third-party initiatives concerning green leases are integrated into its standard lease contracts (generally aligned with GRESB Real Estate Assessment Q39.1).
- 5 The entity shall describe how the lease types it uses (e.g., triple-net or full-service) and their provisions (e.g., cost recovery clauses, tenant fit out guides, utility information sharing, mandatory participation in energy ratings) may influence or incentivize tenant behavior related to sustainability impacts.
- 5.1 The entity may provide a discussion of how such lease structures may impact property values—including tenant demand and the associated rental rates and occupancy rates—over the long term.

# Climate Change Adaptation

## Topic Summary

Climate change affects companies in the industry via frequent or high-impact extreme weather events and changing climate patterns. The manner in which a company's business model is structured to incorporate ongoing assessments of climate change risks, and the adaptation to such risks, is likely to be increasingly connected to company value over the long term. More specifically, investment strategies with assets located on floodplains and in coastal regions that are exposed to inclement weather may have increased needs around risk mitigation and business model adaptation to climate change over the long term. These strategies are especially important in light of the long-term challenges associated with flood insurance rates, the financial stability of government-subsidized flood insurance programs, and financing stipulations or other creditor concerns. Besides insurance, other risk mitigation measures include improvements to physical asset resiliency and lease terms that transfer risk to tenants, although these measures can create their own costs and risks for real estate companies. To ensure long-term growth and protection of shareholder value, companies need to implement climate change adaptation strategies that are comprehensive, account for trade-offs between various risk mitigation strategies, and integrate consideration of all projected costs and benefits over the long term.

## Accounting Metrics

### IF-RE-450a.1. Area of properties located in 100-year flood zones, by property subsector

- 1 The entity shall disclose the total leasable floor area, in square feet, of properties in the entity's portfolio that are located in 100-year flood zones.
  - 1.1 100-year flood zones are defined as land areas subject to a one-percent or greater chance of flooding in any given year. Such areas may also be referred to as being subject to the one-percent annual chance flood, the one-percent annual exceedance probability flood, or the 100-year flood.
    - 1.1.1 Examples of 100-year flood zones may include, but are not limited to, coastal flood plains, flood plains along major rivers, and areas subject to flooding from ponding in low-lying areas.
  - 1.2 For properties located in the U.S., 100-year flood zones shall include those land areas designated by the U.S. Federal Emergency Management Agency (FEMA) as special flood hazard areas (SFHA).
    - 1.2.1 SFHAs are defined as land area in the flood plain subject to a one-percent or greater chance of flooding in any given year. The area may be designated in the applicable flood insurance rate map, as per the U.S. National Flood Insurance Program, as Zones A, AO, AH, A1-30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, V1-30, VE, and V. This definition is derived from U.S. 44 CFR 59.1.
  - 1.3 Number of units may be used in place of floor area in the Apartments and Lodging/Resorts property subsectors when floor area is not available.

- 2 The scope of disclosure shall include all of the entity's properties that are located in 100-year flood zones, regardless of the country of their location.
- 3 The entity shall disclose the total leasable floor area of properties that are located in 100-year flood zones separately for each property type in its portfolio where properties are classified into subsectors that are aligned with the FTSE Nareit Classification Structure and include the following: Health Care, Self Storage, Industrial, Office, Apartments, Manufactured Homes, Single Family Homes, Shopping Centers, Regional Malls, Free Standing, Lodging/Resorts, Specialty, Data Centers, and Other (any other property type(s) that cannot be classified to any of the previous property subsector classifications).
- 4 The entity may separately provide the planned leasable floor area of properties under development or construction that are located in 100-year flood zones.
- 5 The entity may disclose its risk perception and potential impacts resulting from reclassification of 100-year flood zones (e.g., FEMA SFHA reclassifications), including the risk of expansion of such areas into real estate property owned by the entity.

#### **IF-RE-450a.2. Description of climate change risk exposure analysis, degree of systematic portfolio exposure, and strategies for mitigating risks**

- 1 The entity shall describe the significant risks and opportunities that are presented to its business by climate change scenarios.
  - 1.1 The entity shall identify each significant risk and opportunity.
    - 1.1.1 Risks and opportunities may include, but are not limited to, availability of water, extreme weather events, evolving regulation and legislation, impacts on regional infrastructure, impacts on tenant demand, and impacts on local economies and populations, regardless of the impact of physical risks presented to the entity's portfolio.
  - 1.2 The entity shall discuss:
    - 1.2.1 The timeline over which such risks and opportunities are expected to manifest;
    - 1.2.2 How such climate change scenarios may manifest (e.g., effects directly on the entity or effects on the entity's tenants);
    - 1.2.3 How risks and opportunities may differ by property subsector; and
    - 1.2.4 How risks and opportunities may differ by region.
  - 1.3 The entity shall disclose the climate change scenarios used to determine the risks and opportunities presented by climate change, where scenarios may include, but are not limited to, the New Policies Scenario, Sustainable Development Scenario, and Current Policies Scenario, as established by the International Energy Agency in its annual World Energy Outlook.
- 2 The entity shall describe efforts to assess and monitor the impacts of climate change and the related strategies to alleviate and/or adapt to any risks and/or utilize any opportunities.



- 2.1 Alleviation strategies may include, but are not limited to, use of property insurance, flood insurance, lease structures, and lease durations.
  - 2.2 Adaptation strategies may include, but are not limited to, investments in physical asset resiliency and contingency plans.
  - 2.3 The entity shall discuss:
    - 2.3.1 How strategies may differ by property subsector; and
    - 2.3.2 How strategies may differ by region.
- 3 The discussion shall differentiate between physical asset risk and financial risk in order to focus on the risks, opportunities, and alleviation and/or adaptation strategies that are most likely to impact financial value.

## REAL ESTATE SERVICES

### Industry Description

The Real Estate Services industry is composed of companies that provide a range of services to real estate owners, tenants, investors, and developers. Primary services include property management, brokerage, appraisal, and information services for real estate owners. Property management services may include leasing, tenant relations, building maintenance, and building security. Many companies also provide brokerage services, facilitating sales and leasing transactions. Appraisals and other advisory or information services are other specialized services that are commonly provided to clients. Companies in the industry play important roles in the real estate value chain, which is a substantial part of the global economy.

Table 1. *Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Sustainability Services	Revenue from energy and sustainability services <sup>56</sup>	Quantitative	Reporting currency	IF-RS-410a.1
	(1) Floor area and (2) number of buildings under management provided with energy and sustainability services	Quantitative	Square feet (ft <sup>2</sup> ), Number	IF-RS-410a.2
	(1) Floor area and (2) number of buildings under management that obtained an energy rating	Quantitative	Square feet (ft <sup>2</sup> ), Number	IF-RS-410a.3

Table 2. *Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of property management clients, categorized by: (1) tenants and (2) real estate owners	Quantitative	Number	IF-RS-000.A
Floor area under management with owner operational control <sup>57</sup>	Quantitative	Square feet (ft <sup>2</sup> )	IF-RS-000.B
Number of buildings under management with owner operational control <sup>58</sup>	Quantitative	Number	IF-RS-000.C
Number of leases transacted, categorized by: (1) tenants and (2) real estate owners <sup>59</sup>	Quantitative	Number	IF-RS-000.D

<sup>56</sup>

Note to **IF-RS-410a.1** – The entity shall provide a description of the energy and sustainability services it offers.

<sup>57</sup>

Note to **IF-RS-000.B** – The scope of floor area under management with owner operational control shall only include that portion of gross rentable floor area where property management services are provided and for which the real estate owner has operational control, where operational control is defined consistent with the 2018 GRESB® Real Estate Assessment Reference Guide as “having the ability to introduce and implement operating policies, health and safety policies, and/or environmental policies.”

<sup>58</sup>

Note to **IF-RS-000.C** – The scope of buildings under management shall only include distinct buildings or real estate assets where property management services are provided and for which the real estate owner has operational control, where operational control is defined consistent with the 2018 GRESB® Real Estate Assessment Reference Guide as “having the ability to introduce and implement operating policies, health and safety policies, and/or environmental policies.”

<sup>59</sup>

Note to **IF-RS-000.D** – Dual agency transactions shall be included in both the (1) tenants and (2) real estate owners categories. Subleases shall

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of appraisals provided	Quantitative	Number	IF-RS-000.E

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only be included in the (2) real estate owners category.

# Sustainability Services

## Topic Summary

In the Real Estate Services industry, buildings owned or occupied by clients generally have significant sustainability impacts. Buildings, and the activities that take place within them, drive energy consumption, direct and indirect greenhouse gas (GHG) emissions, water consumption, waste generation, and indoor environmental quality concerns that can impact the health of occupants. Companies in the industry have an opportunity to improve the sustainability impacts of buildings and their operations through sustainability-related services. These services may include utility data management, energy procurement, energy and water benchmarking, resource efficiency improvements, activities related to sustainability certifications, and sustainability consulting and training. Companies in the industry can further impact building sustainability by arranging leases that incentivize both owners and tenants to enhance sustainability performance, while yielding financial benefits for both parties. Providing these services can drive new revenue growth and increase client retention; effective sustainability services can benefit owners and/or tenants through improved asset values, increased tenant demand, decreased operating costs, and improved tenant experiences.

## Accounting Metrics

### IF-RS-410a.1. Revenue from energy and sustainability services

- 1 The entity shall disclose its revenue from energy and sustainability services.
  - 1.1 Energy and sustainability services are defined as services provided to clients directly related to resource efficiency (including energy, water, and waste), utility data management, energy procurement, obtaining and retaining sustainability and resource-related certifications, environmental reporting, and corporate sustainability consulting and training.
    - 1.1.1 Examples of energy and sustainability services include, but are not limited to, energy management and performance monitoring (e.g., through sub-meters to measure electric usage); energy, water, and waste benchmarking or ratings-scheme services; advisory services related to renewable energy procurement; services related to LEED, ENERGY STAR®, or other sustainability-related building certifications; energy- and sustainability-related building valuation analysis; and energy- and sustainability-related client training or consulting.
  - 1.2 The scope of energy and sustainability services excludes services that impart improved energy and sustainability performance in an ancillary, indirect, or minimal way, as well as environmental services that are part of the ordinary operation and maintenance of buildings (e.g., facilities maintenance and/or janitorial services).
- 2 The scope of disclosure includes, but is not limited to, services provided to leasing clients, project- and development-service clients, and capital market and investment management clients.

#### Note to IF-RS-410a.1

- 1 The entity shall provide a description of the energy and sustainability services it offers, where relevant information includes, but is not limited to:
  - 1.1 The degree to which energy and sustainability services are integrated into, or distinct from, the entity's base property management services, including, but not limited to, the sales process for such services, the amount of overlap between clients for base property management services and energy and sustainability services, and the level of consistency of contract lengths and terms among base property management services and energy and sustainability services.
  - 1.2 The market dynamics of energy and sustainability services, including competition, risks and opportunities, market share, customer demands and preferences, market growth, and legislative and regulatory impacts.
  - 1.3 Opportunities associated with providing market-leading energy and sustainability services, such as the potential to win a new client based solely on energy and sustainability services, which may lead to additional non-energy and sustainability-related services in the future.
  - 1.4 Risks associated with providing inadequate or insufficient energy and sustainability services, such as the potential to lose a client based on inadequate or insufficient energy and sustainability services.
- 2 The entity may disclose the number of energy- and sustainability-accredited professionals it employs.
- 3 The entity may disclose the estimated energy savings, greenhouse gas (GHG) emissions reductions, water savings, waste reductions, or other performance measurements associated with the results of the energy and sustainability services it provides to clients.

#### **IF-RS-410a.2. (1) Floor area and (2) number of buildings under management provided with energy and sustainability services**

- 1 The entity shall disclose (1) the floor area under management for which it provided energy and/or sustainability-related services during the reporting period.
  - 1.1 Floor area under management is defined as the gross rentable floor area where property management services are provided and for which the real estate owner has operational control.
    - 1.1.1 Operational control is defined, consistent with the 2018 GRESB® Real Estate Assessment Reference Guide, as an instance when the real estate owner has "the ability to introduce and implement operating policies, health and safety policies, and/or environmental policies."
  - 1.2 Energy and sustainability services are defined as services provided to clients directly related to resource efficiency (including energy, water, and waste), utility data management, energy procurement, obtaining and retaining sustainability and resource-related certifications, environmental reporting, and corporate sustainability consulting and training.

- 1.3 The scope of energy and sustainability services excludes services that impart improved energy and sustainability performance in an ancillary, indirect, or minimal way, as well as environmental services that are part of the ordinary operation and maintenance of buildings (e.g., facilities maintenance and/or janitorial services).
- 2 The entity shall disclose (2) the number of buildings for which it provided energy and sustainability-related services during the reporting period.
  - 2.1 Buildings under management is defined as distinct buildings or real estate assets where property management services are provided and where the real estate owner has operational control.
- 3 The scope of disclosure includes the total floor area and all buildings that were actively provided with energy and sustainability services during the reporting period, regardless of the date of inception of such services.

### **IF-RS-410a.3. (1) Floor area and (2) number of buildings under management that obtained an energy rating**

- 1 The entity shall disclose (1) the floor area under management that obtained an energy rating during the reporting period.
  - 1.1 Floor area under management is defined as the gross rentable floor area where property management services are provided and for which the real estate owner has operational control.
    - 1.1.1 Operational control is defined consistent with the 2018 GRESB® Real Estate Assessment Reference Guide as an instance when the real estate owner has “the ability to introduce and implement operating policies, health and safety policies, and/or environmental policies.”
- 2 The entity shall disclose (2) the number of buildings that obtained an energy rating during the reporting period, where:
  - 2.1 The number of buildings under management is defined as distinct buildings or real estate assets where property management services are provided and where the real estate owner has operational control.
  - 2.2 An energy rating is defined, consistent with the 2018 GRESB® Real Estate Assessment Reference Guide, as a scheme that measures the energy performance of buildings.
  - 2.3 The scope of energy rating schemes includes:
    - 2.3.1 ENERGY STAR® for operations in the United States and Canada;
    - 2.3.2 EU Energy Performance Certificates (EPC) for operations in the European Union;
    - 2.3.3 National Australian Build Environment Rating System (NABERS) Energy for operations in Australia;
    - 2.3.4 NABERSNZ for operations in New Zealand;
    - 2.3.5 Government energy efficiency benchmarking; and
    - 2.3.6 Other energy rating schemes that can be demonstrated to have substantially equivalent criteria, methodology, and presentation of results to those schemes above.

- 3 The scope of disclosure is aligned with the 2018 GRESB® Real Estate Assessment Reference Guide in that it “only include[s] energy ratings that were awarded before or during the reporting period (pre-assessments or other unofficial forms of pre-certification are not valid). Some energy ratings are valid for a limited period only—the rating should be effective and official during the reporting period.”
- 4 The entity shall consider the GRESB® Real Estate Assessment Reference Guide as a normative reference, thus any updates made year-on-year shall be considered updates to this guidance.

## WASTE MANAGEMENT

### Industry Description

The Waste Management industry includes companies that collect, store, dispose of, recycle, or treat various forms of waste from residential, commercial, and industrial clients. Types of waste include municipal solid waste, hazardous waste, recyclable materials, and compostable or organic materials. Major companies are commonly vertically integrated, providing a range of services from waste collection to landfilling and recycling, while others provide specialized services such as treating medical and industrial wastes. Waste-to-energy operations are a distinct industry segment. Certain industry players also provide environmental engineering and consulting services, mostly to large industrial clients.

Table 1. *Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	(1) Gross global Scope 1 emissions, percentage covered under (2) emissions-limiting regulations, and (3) emissions-reporting regulations	Quantitative	Metric tons (t) CO <sub>2</sub> -e, Percentage (%)	IF-WM-110a.1
	(1) Total landfill gas generated, (2) percentage flared, (3) percentage used for energy	Quantitative	Million British Thermal Units (MMBtu), Percentage (%)	IF-WM-110a.2
	Discussion of long-term and short-term strategy or plan to manage Scope 1 and lifecycle emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	IF-WM-110a.3
Fleet Fuel Management	(1) Fleet fuel consumed, (2) percentage natural gas, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	IF-WM-110b.1
	Percentage of alternative fuel vehicles in fleet	Quantitative	Percentage (%)	IF-WM-110b.2

Table 2. *Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of customers by category: (1) municipal, (2) commercial, (3) industrial, (4) residential, and (5) other <sup>60</sup>	Quantitative	Number	IF-WM-000.A
Vehicle fleet size	Quantitative	Number	IF-WM-000.B
Number of: (1) landfills, (2) transfer stations, (3) recycling centers, (4) composting centers, (5) incinerators, and (6) all other facilities <sup>61</sup>	Quantitative	Number	IF-WM-000.C

<sup>60</sup>

Note to **IF-WM-000.A** – The scope of “residential” shall only include those residential customers that have direct contracts with the entity. For the purposes of this disclosure, residential customers serviced through contracts with a municipality shall be considered in the “municipal” category. The scope of each customer type shall be consistent with the entity’s financial reporting.

<sup>61</sup>

Note to **IF-WM-000.C** – Landfills include landfills that are active and landfills owned by the company that are closed. The scope of “all other facilities” excludes corporate offices. The scope of each customer type shall be consistent with the entity’s financial reporting.



ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Total amount of materials managed, by customer category: (1) municipal, (2) commercial, (3) industrial, (4) residential, and (5) other <sup>62</sup>	Quantitative	Metric tons (t)	IF-WM-000.D

<sup>62</sup>

Note to **IF-WM-000.D** – "Managed" is defined as the handling of discarded materials, whether those materials are treated or not. The scope of "residential" shall only include those residential customers that have direct contracts with the entity. For the purposes of this disclosure, residential customers serviced through contracts with a municipality shall be considered in the "municipal" category. The scope of each customer type shall be consistent with the entity's financial reporting.

# Greenhouse Gas Emissions

## Topic Summary

Landfill gas is a significant anthropogenic contributor to global greenhouse gas (GHG) emissions because it contains highly potent methane. As a result, landfill gas is frequently required to be limited by regulators. These emissions can be reduced through a variety of control technologies that require significant capital expenditures: landfill gas collection efficiency improvements, control devices, and increased methane oxidization. Methane collected through capture systems can be combusted in a flare, an engine, or a turbine to dramatically reduce the overall toxicity and potency of raw emissions. Landfill gas capture is particularly important for owners and operators of large landfills that have been the target of regulation. Companies that operate in the waste-to-energy segment of the industry are able to lower lifecycle emissions of waste through decreased future emissions from landfills and displaced energy generation, but face increased Scope 1 emissions from the operation of waste-to-energy facilities. Overall, GHG emissions pose regulatory risks for the industry, with potential impacts on operational costs and capital expenditures. There is also the potential for revenue generation through the sale of natural gas and energy from waste-to-energy facilities, as well as the ability to lower fuel purchases by using processed landfill gas to power operations. Performance on this issue can affect a company's ability to secure new permits and/or renew existing ones, which can impact revenue.

## Accounting Metrics

### IF-WM-110a.1. (1) Gross global Scope 1 emissions, percentage covered under (2) emissions-limiting regulations, and (3) emissions-reporting regulations

- 1 The entity shall disclose its (1) gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e), and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:

- 2.1.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)
  - 2.1.2 *Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources* published by the U.S. Environmental Protection Agency (EPA)
  - 2.1.3 India GHG Inventory Program
  - 2.1.4 ISO 14064-1
  - 2.1.5 *Petroleum Industry Guidelines for reporting GHG emissions*, 2nd edition, 2011, published by IPIECA
  - 2.1.6 *Protocol for the quantification of greenhouse gas emissions from waste management activities* published by Entreprises pour l'Environnement (EpE)
- 2.2 GHG emissions data shall be consolidated and disclosed according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the “financial control” approach defined by the GHG Protocol, and the approach published by the Climate Disclosure Standards Board (CDSB) described in REQ-07, “Organisational boundary,” of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).
- 3 The entity shall disclose (2) the percentage of its gross global Scope 1 GHG emissions that are covered under an emissions-limiting regulation or program that is intended to directly limit or reduce emissions, such as cap-and-trade schemes, carbon tax/fee systems, and other emissions control (e.g., command-and-control approach) and permit-based mechanisms.
- 3.1 Examples of emissions-limiting regulations include, but are not limited to:
- 3.1.1 California Cap-and-Trade (California Global Warming Solutions Act)
  - 3.1.2 European Union Emissions Trading Scheme (EU ETS)
  - 3.1.3 Quebec Cap-and-Trade (Draft Bill 42 of 2009)
- 3.2 The percentage shall be calculated as the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e) that are covered under emissions-limiting regulations divided by the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e).
- 3.2.1 For emissions that are subject to multiple emissions-limiting regulations, the entity shall not account for those emissions more than once.
- 3.3 The scope of emissions-limiting regulations excludes emissions covered under voluntary emissions-limiting regulations (e.g., voluntary trading systems), as well as reporting-based regulations [e.g., the U.S. Environmental Protection Agency (EPA) GHG Reporting Program].
- 4 The entity shall disclose (3) the percentage of its gross global Scope 1 GHG emissions that are covered under emissions reporting-based regulations.

- 4.1 Emissions reporting-based regulations are defined as regulations that demand the disclosure of GHG emissions data to regulators and/or the public, but for which there is no limit, cost, target, or controls on the amount of emissions generated (e.g., the U.S. EPA Greenhouse Gas Reporting Program).
- 4.2 The percentage shall be calculated as the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e) that are covered under emissions reporting-based regulations divided by the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e).
  - 4.2.1 For emissions that are subject to multiple emissions reporting-based regulations, the entity shall not account for those emissions more than once.
- 4.3 The scope of emissions reporting-based regulations does not exclude emissions covered under emissions-limiting regulations.
- 5 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 6 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 7 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

**IF-WM-110a.2. (1) Total landfill gas generated, (2) percentage flared, (3) percentage used for energy**

- 1 The entity shall disclose (1) the total amount, in millions of British Thermal Units (MMBtu), of landfill gas generated from its owned or operated facilities.
  - 1.1 Landfill gas is defined, consistent with U.S. 40 CFR 98.6, as gas produced as a result of anaerobic decomposition of waste materials in the landfill.
- 2 The entity shall disclose (2) the percentage of landfill gas that was flared.
  - 2.1 The percentage shall be calculated as the amount (in MMBtu) of landfill gas that was flared divided by the total amount (in MMBtu) of landfill gas generated.
    - 2.1.1 Flared landfill gas includes gas that is flared through air injection and is defined, consistent with U.S. 40 CFR 98.6, as gas that is combusted through the use of an open flame with combustion air provided by uncontrolled ambient air around the flame and/or air that is blown into the flare to induce complete combustion.
- 3 The entity shall disclose (3) the percentage of landfill gas that was used for energy.

- 3.1 The percentage shall be calculated as the amount (in MMBtu) of landfill gas that was captured and used for energy divided by the total amount (in MMBtu) of landfill gas generated.
  - 3.1.1 Landfill gas used for energy includes gas that is combusted for use in on-site energy or heat production, conveyed through pipelines for off-site combustion, and any other on-site or off-site use as a fuel.
- 4 The entity shall use the calculation methodology in U.S. 40 CFR 98.340-348 Subpart HH to calculate the amount of landfill gas generated, the percentage flared, and the percentage used for energy.

### **IF-WM-110a.3. Discussion of long-term and short-term strategy or plan to manage Scope 1 and lifecycle emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined according to *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard*, Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 2 The entity shall discuss how lifecycle GHG emissions factor into its management of Scope 1 emissions and overall business strategy.
  - 2.1 Relevant aspects to discuss include, but are not limited to:
    - 2.1.1 The trade-offs between lifecycle emissions and Scope 1 emissions
    - 2.1.2 How such trade-offs are evaluated within the context of the entity's business strategy and operational areas of focus (e.g., landfill gas management, waste-to-energy, recycling, composting)
    - 2.1.3 The extent to which the trade-offs factor into the entity's business strategy, including identified areas of opportunity for growth and its capital expenditure strategy
    - 2.1.4 Whether the short-term management of Scope 1 emissions or the long-term management of lifecycle emissions is prioritized by the entity
    - 2.1.5 The impact of waste-to-energy (WTE) operations on lifecycle emissions versus Scope 1 emissions
  - 2.2 The entity may disclose related quantitative measures, which may include, but are not limited to:
    - 2.2.1 Avoided emissions (e.g., Protocol for the quantification of greenhouse gas emissions from waste management activities published by Entreprises pour l'Environnement)
    - 2.2.2 Estimated future Scope 1 emissions from landfills

- 3 The entity shall discuss risks and opportunities arising out of lifecycle emissions and Scope 1 emissions, including, but not limited to:
  - 3.1 Risks arising out of future Scope 1 emissions over the long-term resulting from landfills
  - 3.2 Risks arising out of short-term increases in Scope 1 emissions resulting from WTE facilities
  - 3.3 Opportunities arising out of long-term decreases in lifecycle emissions resulting from WTE facilities, recycling, and composting
  
- 4 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 4.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 4.2 Whether the target is absolute- or intensity-based, and the metric denominator, if it is an intensity-based target;
  - 4.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated toward the achievement of the target;
  - 4.4 The timelines for the reduction activity, including the start year, the target year, and the base year;
  - 4.5 The mechanism(s) for achieving the target; and
  - 4.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset.
  
- 5 The entity shall discuss the activities and investments required to achieve the plans and targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
- 6 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as how they relate to different business units, geographies, or emissions sources.
- 7 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
- 8 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

# Fleet Fuel Management

## Topic Summary

Many companies in the Waste Management industry own and operate large vehicle fleets for waste collection and transfer. The fuel consumption of vehicle fleets is a significant industry expense, both in terms of operating costs and associated capital expenditures. Fossil fuel consumption can contribute to environmental impacts, including climate change and pollution. These environmental impacts have the potential to affect waste management companies through regulatory exposure and the competitiveness of new contract proposals. Hedging fuel purchases is a common tool used to manage fleet-fuel risks; however, more and more waste management companies are upgrading to more fuel-efficient fleets or switching to natural gas vehicles. A cleaner-burning fleet may also be seen as more favorable by communities living near waste management facilities with heavy traffic.

## Accounting Metrics

### IF-WM-110b.1. (1) Fleet fuel consumed, (2) percentage natural gas, (3) percentage renewable

- 1 The entity shall disclose (1) the total amount of fuel consumed by its fleet vehicles as an aggregate figure, in gigajoules (GJ).
  - 1.1 The calculation methodology for fuel consumed shall be based on actual fuel consumed as opposed to design parameters.
  - 1.2 Acceptable calculation methodologies for fuel consumed include, but are not limited to, methodologies based on:
    - 1.2.1 Adding fuel purchases made during the reporting period to beginning inventory at the start of the reporting period, less any fuel inventory at the end of the reporting period
    - 1.2.2 Tracking fuel consumed by vehicle
    - 1.2.3 Tracking fuel expenses
- 2 The entity shall disclose (2) the percentage of fuel consumed that is natural gas.
  - 2.1 The percentage shall be calculated as the amount of natural gas consumed (in GJ) divided by the total amount of fuel consumed (in GJ).
- 3 The entity shall disclose (3) the percentage of fuel consumed that was renewable fuel.
  - 3.1 Renewable fuel is defined, consistent with the U.S. Renewable Fuel Standard (U.S. 40 CFR 80.1401), as fuel that meets all of the following requirements:
    - 3.1.1 Produced from renewable biomass;
    - 3.1.2 Used to replace or reduce the quantity of fossil fuel present in a transportation fuel, heating oil, or jet fuel; and

- 3.1.3 Has lifecycle greenhouse gas (GHG) emissions that are at least 20 percent less than baseline lifecycle GHG emissions, unless the fuel is exempt from this requirement pursuant to U.S. 40 CFR 80.1403.
  - 3.2 The scope of renewable fuel includes fuel that qualifies for Renewable Identification Numbers (RINs) under the U.S. Renewable Fuel Standard.
  - 3.3 The percentage shall be calculated as the amount of renewable fuel consumed (in GJ) divided by the total amount of fuel consumed (in GJ).
- 4 The scope of disclosure is limited to fuel consumed by vehicles owned or operated by the entity.
- 5 In calculating energy consumption from fuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change, the U.S. Department of Energy, or the U.S. Energy Information Agency.
- 6 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage.

#### **IF-WM-110b.2. Percentage of alternative fuel vehicles in fleet**

- 1 The entity shall disclose the percentage of its fleet vehicles that are alternative fuel vehicles.
  - 1.1 Alternative fuel vehicles are defined by the U.S. Energy Policy Act and the U.S. Natural Defense Authorization Act of 2008 as vehicles powered by biodiesel, denatured alcohol, electricity, hydrogen, methanol, mixtures containing up to 85 percent methanol or denatured ethanol, natural gas, or propane (liquefied petroleum gas). Alternative energy vehicles also include any vehicle achieving a significant reduction in petroleum consumption, advanced lean burn technology vehicles, fuel cell vehicles, and hybrid electric vehicles.
  - 1.2 The percentage shall be calculated as the number of alternative energy vehicles in its fleet divided by the total number of vehicles in its fleet.



## WATER UTILITIES & SERVICES

### Industry Description

Companies in the Water Utilities & Services industry own and operate water supply and wastewater treatment systems (generally structured as regulated utility businesses), or provide operational and other specialized water services to system owners (usually market-based operations). Water supply systems include the sourcing, treatment, and distribution of water to residences, businesses, and other entities such as governments. Wastewater systems collect and treat wastewater, including sewage, graywater, industrial waste fluids, and stormwater runoff, before discharging the resulting effluent back into the environment.

Note: The scope of the Water Utilities & Services industry (IF-WU) excludes water services that fall into the category of infrastructure design and development. These activities fall within the Engineering & Construction Services industry (IF-EC).

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	IF-WU-130a.1
Distribution Network Efficiency	Water main replacement rate <sup>63</sup>	Quantitative	Rate	IF-WU-140a.1
	Volume of non-revenue real water losses	Quantitative	Thousand cubic meters (m <sup>3</sup> )	IF-WU-140a.2
End-Use Efficiency	Percentage of water utility revenues from rate structures that are designed to promote conservation and revenue resilience	Quantitative	Percentage (%)	IF-WU-420a.1
	Customer water savings from efficiency measures, by market <sup>64</sup>	Quantitative	Cubic meters (m <sup>3</sup> )	IF-WU-420a.2
Water Supply Resilience	Total water sourced from regions with High or Extremely High Baseline Water Stress, percentage purchased from a third party	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	IF-WU-440a.1
	Volume of recycled water delivered to customers	Quantitative	Thousand cubic meters (m <sup>3</sup> )	IF-WU-440a.2
	Discussion of strategies to manage risks associated with the quality and availability of water resources	Discussion and Analysis	n/a	IF-WU-440a.3
Network	Wastewater treatment capacity located in 100-year flood zones	Quantitative	Cubic meters (m <sup>3</sup> ) per day	IF-WU-450a.1

<sup>63</sup>

Note to **IF-WU-140a.1** – The entity shall discuss the use of and challenges associated with planned and corrective maintenance in its distribution system.

<sup>64</sup>

Note to **IF-WU-420a.2** – The entity shall discuss customer efficiency measures that are required by regulations for each of its relevant markets.

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Resiliency & Impacts of Climate Change	(1) Number and (2) volume of sanitary sewer overflows (SSO), (3) percentage of volume recovered	Quantitative	Number, Cubic meters (m <sup>3</sup> ), Percentage (%)	IF-WU-450a.2
	(1) Number of unplanned service disruptions, and (2) customers affected, each by duration category <sup>65</sup>	Quantitative	Number	IF-WU-450a.3
	Description of efforts to identify and manage risks and opportunities related to the impact of climate change on distribution and wastewater infrastructure	Discussion and Analysis	n/a	IF-WU-450a.4

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of: (1) residential, (2) commercial, and (3) industrial customers served, by service provided <sup>66</sup>	Quantitative	Number	IF-WU-000.A
Total water sourced, percentage by source type <sup>67</sup>	Quantitative	Cubic meters (m <sup>3</sup> ), Percentage (%)	IF-WU-000.B
Total water delivered to: (1) residential, (2) commercial, (3) industrial, and (4) all other customers <sup>68</sup>	Quantitative	Thousand cubic meters (m <sup>3</sup> )	IF-WU-000.C
Average volume of wastewater treated per day, by (1) sanitary sewer, (2) stormwater, and (3) combined sewer	Quantitative	Cubic meters (m <sup>3</sup> ) per day	IF-WU-000.D
Length of (1) water mains and (2) sewer pipe	Quantitative	Kilometers (km)	IF-WU-000.E

<sup>65</sup>

Note to **IF-WU-450a.3** – The entity shall discuss notable service disruptions such as those that affected a significant population or those of extended duration.

<sup>66</sup>

Note to **IF-WU-000.A** – The number of customers served shall be defined, consistent with the *2017 AWWA Utility Benchmarking: Performance Management for Water and Wastewater*, published by American Water Works Association, as the number of individual service agreements for water or wastewater services at single properties, where an individual may own more than one property and be counted as a customer more than once. The entity may disclose additional customer types if such customer types exist that do not fall within the scope of the customer types described above. Disclosure of the number of customers by customer type shall additionally be broken out by the number of customers (in each customer type) provided with water services, and separately, provided with wastewater services. The entity may additionally disclose the number of customers (in each customer type) by other types of services.

<sup>67</sup>

Note to **IF-WU-000.B** – Water sourced shall be disclosed by the direct source in which the entity obtains water, as classified by the following water source types: groundwater, surface water, ocean water, recycled water, water purchased from third parties, and other sources.

<sup>68</sup>

Note to **IF-WU-000.C** – The amount of water delivered includes drinking water, industrial process water, and recycled water.

# Energy Management

## Topic Summary

Companies in the Water Utilities & Services industry require significant energy inputs for the withdrawal, conveyance, treatment, and distribution or discharge of potable water and wastewater. Utility operating costs are directly related to energy use, which is typically a company's largest operating cost after purchased water, chemicals, and labor. Purchased grid electricity is the most common energy input. In more remote locations, on-site generation is used to power equipment. The inefficient use of purchased grid electricity creates environmental externalities, such as Scope 2 greenhouse gas emissions. Regulations that address environmental concerns are likely to affect the future grid energy mix, leading to increases in prices. Additionally, climate change is also expected to impact grid reliability, and affect the availability of water resources. As a result, the energy intensity of water utilities is likely to increase in the future as water sources become more difficult to access. Alternative water treatment, such as recycling and desalination, can also require more energy. Together with decisions about the use of alternative fuels, renewable energy, and on-site electricity generation, energy efficiency can play an important role in influencing both the cost and the reliability of the energy supply.

## Accounting Metrics

### **IF-WU-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.

- 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.
  - 3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.
- 3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:
  - 3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;
  - 3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.
- 4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).
- 5 The scope of disclosure includes all water, wastewater, and stormwater operations and services.
  - 5.1 The entity may break out its disclosures by water, wastewater, and/or stormwater services.

# Distribution Network Efficiency

## Topic Summary

Water utilities develop, maintain, and operate complex interconnected infrastructure networks that include extensive pipelines, canals, reservoirs, and pump stations. Significant volumes of water are lost in the distribution network (called "non-revenue water," as it is a distributed volume of water that is not reflected in customer billings). This water is lost primarily because of infrastructure failures and inefficiencies, such as leaking pipes and service connections. Non-revenue real water losses may negatively impact financial performance, raise customer rates, and squander water and other resources such as energy and treatment chemicals. Conversely, improvements to infrastructure and operating processes can limit non-revenue losses, positively impacting revenues and possibly reducing costs. Efficiently directing operational and maintenance expenses or capital expenditures to distribution systems—primarily pipeline and service connection repair, refurbishment, or replacement—can improve company value and provide strong investment returns.

## Accounting Metrics

### IF-WU-140a.1. Water main replacement rate

- 1 The entity shall disclose its water main replacement rate for the distribution system(s) that it owns and/or operates.
  - 1.1 The distribution system is defined, consistent with the definition provided by the American Water Works Association's (AWWA) *Water-Distribution Research and Applied Development Needs*, as including all water utility components for the distribution of finished or potable water to customers or other users. This includes the distribution of water for non-potable uses, including fire suppression.
- 2 The percentage shall be calculated as the total length of pipe replaced during the reporting period divided by the total length of water mains in its distribution system.
  - 2.1 The scope of water main replacements includes complete main replacements, as well as rehabilitations and/or renewals that substantially extend the life of the water main.
  - 2.2 The scope of water main replacements excludes water main repairs.
- 3 The scope of disclosure is limited to water operations and services (i.e., wastewater and stormwater services are excluded).

#### Note to IF-WU-140a.1

- 1 The entity shall describe the use of and challenges associated with planned and corrective maintenance in its distribution system, where:
  - 1.1 Corrective maintenance is defined, consistent with the *2017 American Water Works Association (AWWA) Utility Benchmarking: Performance Management for Water and Wastewater*, as all maintenance undertaken after asset failure.

- 1.2 Planned maintenance is defined, consistent with the *2017 AWWA Utility Benchmarking: Performance Management for Water and Wastewater*, as all regular maintenance activities undertaken in advance of asset failure.
- 2 Relevant challenges to describe include, but are not limited to, the impacts of corrosion and soil properties on pipe materials (e.g., cast iron, ductile iron, polyvinyl chloride, and wood), the entity's ability to finance maintenance and replacement through rate adjustments, and the age of the current distribution network.

## **IF-WU-140a.2. Volume of non-revenue real water losses**

- 1 The entity shall disclose the amount, in cubic meters, of non-revenue real water losses from the distribution system.
  - 1.1 Non-revenue real water losses are defined, consistent with the [American Water Works Association \(AWWA\) Water Audits and Loss Control Program, Fourth Edition \(M36 Manual\)](#), as the physical water losses, which are not billed and produce no revenue, from the pressurized system and the utility's storage tanks up to the point of customer consumption, which is the customer meter for those utilities that meter their customers. In unmetered systems, the delineation is the point at which the customer becomes responsible for customer service connection piping maintenance and repairs. Real losses include leakage from mains and service connections and storage tank overflows.
  - 1.2 The entity shall consider guidance such as the AWWA M36 Manual as normative references, thus any updates made year-on-year shall be considered updates to this guidance.
- 2 The entity shall calculate the amount of non-revenue real water losses according to national, state, or local regulations where such loss occurs. Relevant guidance includes, but is not limited to:
  - 2.1 California [Senate Bill 555](#)
  - 2.2 Texas [Water Code Section 16.012](#)
  - 2.3 Georgia [Senate Bill 370](#)
- 3 The scope of disclosure is limited to water operations and services (i.e., wastewater and stormwater services are excluded).
- 4 Where national, state, or local regulations do not exist, the entity shall calculate the amount of real losses according to voluntary initiatives, where relevant guidance includes, but is not limited to:
  - 4.1 [The AWWA M36 Manual](#)
- 5 The entity may disclose the technique(s) it employs to measure non-revenue water from real losses and the amount calculated according to each technique it employs.

# End-Use Efficiency

## Topic Summary

Water efficiency and conservation at the consumer level, whether a product of government mandates, environmental consciousness, or demographic trends, is increasingly important for long-term resource availability and the financial performance of the water supply segment of the industry. The end-use efficiency topic addresses how utilities work with regulators to mitigate revenue declines in the context of the increasing need for resource efficiency. Water efficiency mechanisms, including rate decoupling, can ensure that a utility's revenue can adequately cover its fixed costs and provide the desired levels of returns regardless of sales volume, while simultaneously incentivizing customers to conserve water. Efficiency mechanisms can better align utilities' economic incentives with environmental and social interests, including resource efficiency, lower rates, and increased capital investments in infrastructure. Water utilities are able to manage their exposure to the impact of rate mechanisms through positive regulatory relations, forward-looking rate cases that incorporate efficiency, and a strong execution of efficiency strategy.

## Accounting Metrics

### **IF-WU-420a.1. Percentage of water utility revenues from rate structures that are designed to promote conservation and revenue resilience**

- 1 The entity shall disclose the percentage of water utility revenues from rate structures that are designed to promote conservation and revenue resilience.
  - 1.1 The scope of rate structures that are designed to promote conservation and revenue resilience is limited to rate structures that are explicitly and intentionally designed to:
    - 1.1.1 Financially incentivize customers to reduce water consumption and/or improve water efficiency; and
    - 1.1.2 Improve the revenue resilience of the water utility, primarily in circumstances of declining average customer water use and/or improving average customer water efficiency.
  - 1.2 The scope of rate structures that are designed to promote conservation and revenue resilience includes, but is not limited to, revenue decoupled rate structures.
    - 1.2.1 Revenue decoupled rate structures are defined according to the U.S. National Association of Regulatory Utility Commissioners in [Decoupling for Electric & Gas Utilities](#) (September 2007), as a rate adjustment mechanism that separates the utility's fixed cost recovery from the volume sold—and the utility's revenues are collected based on the regulatory determined revenue requirement.
    - 1.2.2 Revenue decoupled rate structures may also be referred to as, "revenue regulation" or "revenue cap regulation," where the regulator establishes an allowed revenue requirement and adjusts collections so as to achieve that allowed, or 'target,' revenue irrespective of actual sales (definition adapted from [Decoupling](#)

[Case Studies: Revenue Regulation Implementation in Six States](#), The Regulatory Assistance Project, July 2014).

1.2.3 Additional guidance on the scope of revenue decoupled rate structures is contained in [Alternative Regulation and Ratemaking Approaches for Water Companies](#), The Brattle Group, September 23, 2013.

1.3 The scope of rate structures that are designed to promote conservation and revenue resilience includes, but is not limited to, rate structures that contain a lost revenue adjustment mechanism (LRAM).

1.3.1 Rate structures that contain an LRAM are defined as volumetric rates that contain a mechanism which allows the entity to recover revenues lost directly resulting from water conservation, water efficiency, and/or demand side management programs that are directly managed and/or implemented by the entity.

1.3.2 Additional guidance on the scope of revenue decoupled rate structures is contained in [Alternative Regulation and Ratemaking Approaches for Water Companies](#), The Brattle Group, September 23, 2013.

1.3.3 The scope of LRAM includes mechanisms that allow the estimation of lost revenues based on the programs' actual impacts, but excludes lost revenues from planned or forecasted programs impacts (as described in [Alternative Regulation and Ratemaking Approaches for Water Companies](#), The Brattle Group, September 23, 2013).

1.4 The scope of rate structures that are designed to promote conservation and revenue resilience excludes straight fixed-variable rate design, absent other rate mechanisms that are explicitly designed to promote conservation.

2 The percentage shall be calculated as the regulated water utility revenue from rate structures that are designed to promote conservation and revenue resilience divided by total regulated water utility revenue.

3 The scope of disclosure is limited to water operations and services (i.e., wastewater and stormwater services are excluded).

## **IF-WU-420a.2. Customer water savings from efficiency measures, by market**

1 The entity shall disclose the total volume of water savings, in cubic meters, from water efficiency measures installed or otherwise supported by the entity during the reporting period for each of its markets.

1.1 Markets are defined as those operations that are subject to distinct public utility regulatory oversight.

2 Water savings shall be defined according to the gross savings approach as the changes in water consumption and/or demand that result from program-related actions taken by participants in an efficiency program, regardless of why they participated.

2.1 The entity should list those markets where it reports water savings on a net savings basis, and thus may be different from the figures disclosed here.

2.1.1 Net water savings are defined as changes in consumption that are specifically attributable to a water efficiency program and that would not otherwise have happened in the absence of the program.



3 Water savings shall be calculated on a gross basis but consistent with the methodology set forth in state or local evaluation, measurement, and verification (EM&V) regulations where such savings occur. Relevant regulations include, but are not limited to:

3.1 California Public Utilities Commission [Decision 07-12-050](#)

4 Where state or local regulations do not exist, the entity shall calculate water savings in a manner consistent with the measurement and verification methods outlined by Efficiency Valuation Organization's (EVO) [International Performance Measurement and Verification Protocol: Concepts and Options for Determining Energy and Water Savings, Volume 1](#) (IPM&V Protocol).

5 The entity shall consider the EVO IPM&V Protocol and state regulations as normative references, thus any updates made year-on-year shall be considered updates to this guidance.

6 The scope of disclosure is limited to water operations and services (i.e., wastewater and stormwater services are excluded).

#### Note to **IF-WU-420a.2**

1 The entity shall describe customer efficiency measures that are required by regulations for each of its relevant markets, including a discussion of:

1.1 The amount or percentage of water savings from efficiency measures required by regulations for each market

1.2 Instances of non-compliance with water savings obligations

1.2.1 In such instances, the entity shall disclose the difference between the water savings delivered and the amount required by the regulation

1.3 Water savings delivered that exceed those required by regulations that resulted in the entity receiving energy efficiency performance incentives, including the value of any such incentives

2 Relevant regulations include, but are not limited to:

2.1 The California [Water Conservation Act of 2009](#)

3 The entity shall describe the forms of regulation in each market that allow for or incentivize water efficiency, including a discussion of the benefits, challenges, and financial impacts associated with such regulations.

4 Relevant policy mechanisms to discuss include, but are not limited to:

4.1 Deferral decoupling

4.2 Current period decoupling

4.3 Single fixed variable rates

4.4 Lost revenue adjustments

4.5 Water efficiency feebates

- 5 The entity may describe incentives it has developed for its customers that promote end-use efficiency, including, but not limited to, dynamic pricing, water efficiency rebates, and other measures to subsidize customer water efficiency.
- 6 The entity may describe voluntary initiatives, such as the [U.S. Environmental Protection Agency WaterSense](#) program, that it has engaged in to manage end-user water efficiency.

# Water Supply Resilience

## Topic Summary

Water supply systems obtain water from groundwater and surface water sources. Water supplies may either be accessed directly or purchased from a third party, often a government entity. Water scarcity, water source contamination, infrastructure failures, regulatory restrictions, competing users, and overconsumption by customers are all factors that can jeopardize access to sufficient water supplies. These issues, combined with an increasing risk of extreme and frequent drought conditions due to climate change, may lead to inadequate supplies or mandated water restrictions. The related financial impacts may manifest in different ways, depending on rate structure, but are most likely to impact company value through decreased revenue. Water supply challenges may also lead to increases in the price of purchased water, which could result in higher operating costs. Failures of critical infrastructure such as aqueducts and canals, which could result from events such as earthquakes, are capable of presenting catastrophic risks to customers of the water supply system and could inflict untold financial consequences. Companies are able to mitigate water supply risks (and the resulting financial risks) through diversification of water supplies, sustainable withdrawal levels, technological and infrastructure improvements, contingency planning, positive relations with regulators and other major users, as well as rate structures.

## Accounting Metrics

### **IF-WU-440a.1. Total water sourced from regions with High or Extremely High Baseline Water Stress, percentage purchased from a third party**

- 1 The entity shall disclose the amount of fresh water, in thousands of cubic meters, that was sourced from all sources in regions with High (40-80 percent) or Extremely High (>80 percent) Baseline Water Stress.
  - 1.1 Water sources include surface water (including water from wetlands, rivers, and lakes), groundwater, and wholesale water purchased from a third party.
  - 1.2 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 1.3 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
  - 1.4 High or Extremely High Baseline Water Stress shall be classified by the World Resources Institute's (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 2 The entity shall disclose the percentage of fresh water sourced in regions with High or Extremely High Baseline Water Stress that was purchased from a third party.
  - 2.1 The percentage shall be calculated as the amount of fresh water sourced in regions with High or Extremely High Baseline Water Stress (in thousands of cubic meters) that was purchased from a third party divided by the total

amount of fresh water sourced in regions with High or Extremely High Baseline Water Stress (in thousands of cubic meters).

### **IF-WU-440a.2. Volume of recycled water delivered to customers**

- 1 The entity shall disclose the volume, in cubic meters, of water it has recycled and delivered to its customers.
- 2 Recycled water shall be defined as wastewater that has been treated to meet specific water quality criteria with the intent of being used for a range of purposes, including, but not limited to:
  - 2.1 Potable reuse, such as direct augmentation of the drinking water supply and indirect augmentation of a drinking water source where an environmental buffer precedes drinking water treatment
    - 2.1.1 Water recycled for potable reuse shall be treated to the standards established through the Safe Drinking Water Act.
  - 2.2 Non-potable reuse, such as recreational landscape irrigation, agricultural reuse, industrial process reuse, and environmental reuse (e.g., wetland enhancement and groundwater recharge)
- 3 The amount of recycled water delivered shall be calculated as the amount of water that meets the quality standards for approved uses of recycled water as set forth through the state and local regulations where the recycling occurs. Examples of such regulations include, but are not limited to:
  - 3.1 California State Water Resources Control Board: [Regulations Related to Recycled Water](#)
  - 3.2 Florida Administrative Code [Chapter 62-610](#) and [Chapter 62-600](#)
  - 3.3 Arizona Administrative Code [Title 18, Chapter 11, Article 3: Reclaimed Water Quality Standards](#)
- 4 Where state regulations have not established criteria for wastewater recycling but where such practices are legal, recycled water shall meet the Suggested Regulatory Guidelines as set forth in Chapter 4.4.2 of the U.S. Environmental Protection Agency's (EPA) [2012 Guidelines for Water Reuse](#).

### **IF-WU-440a.3. Discussion of strategies to manage risks associated with the quality and availability of water resources**

- 1 The entity shall identify and describe its significant risks associated with the quality and availability of, and access to, water resources, including a discussion of its strategies to manage such risks.
  - 1.1 Relevant information to provide includes, but is not limited to:
    - 1.1.1 Environmental constraints—such as water resources in water-stressed regions, drought, interannual or seasonal variability, severe weather events, risks due to the impact of climate change, and any impacts or risks associated with contaminated sources

- 1.1.2 Regulatory, infrastructure, and financial constraints—such as reliance on key infrastructure to obtain water, risk of restrictions to obtaining sufficient water due to regulations or the entity’s ability to obtain and retain water rights, permits, and allocations, and stakeholder perceptions and concerns related to water sources (e.g., those from local communities, non-governmental organizations, and regulatory agencies).
    - 1.1.3 How risks may vary by water source—including surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater, or wholesale water supplies.
- 2 The entity shall include a description of the potential impacts that these risks may have on its operations and the timeline over which such risks are expected to manifest.
  - 2.1 Impacts may include, but are not limited to, those associated with costs, revenues, liabilities, continuity of operations, access to water, and reputation.
- 3 The entity shall provide a discussion of its short-term and long-term strategy or plans to manage these risks, including the following, where relevant:
  - 3.1 Diversification of water sources
  - 3.2 Contingency planning in the event of critical infrastructure failure
  - 3.3 The use of alternative, watershed-based approaches to align overall infrastructure decisions with overall watershed goals, as described in [Effective Utility Management: A Primer for Water and Wastewater Utilities](#)
  - 3.4 The scope of its strategy, plans, or targets, such as whether they pertain differently to different business units (e.g., residential versus industrial), geographies, or regulatory frameworks (e.g., rate structures and/or mandated water-use restrictions)
  - 3.5 The activities and investments established to address water sourced from areas of water stress or scarcity and any risks or limiting factors that might affect the ability to address water scarcity
  - 3.6 The efforts to secure and retain reliable long-term water supplies through senior water rights, permits, and/or allocations, including the entity’s ability to secure water (e.g., through purchase from a third party) should it not be able to retain sufficient allocations
- 4 Disclosure of strategies, plans, and infrastructure investments shall be limited to activities that were ongoing (active) or reached completion during the reporting period.
- 5 Disclosure of strategies, plans, and infrastructure investments shall be limited to activities that were ongoing (active) or reached completion during the reporting period.
- 6 The entity shall discuss if its management of water scarcity results in any additional lifecycle impacts or tradeoffs—including tradeoffs in land use (e.g., development of water storage facilities such as reservoirs), energy consumption, and greenhouse gas (GHG) emissions—and why the entity chose these practices despite lifecycle tradeoffs.

# Network Resiliency & Impacts of Climate Change

## Topic Summary

Climate change is likely to create business uncertainty for water supply systems and wastewater systems due to potential impacts on infrastructure and operations. Climate change can lead to increased water stress, more frequent severe weather events, reduced water quality, and rising sea levels that could impair utility assets or the ability to operate. Water supply and wastewater disposal are basic services for which maintaining continuity is of utmost importance. The increasing frequency and severity of storms challenge water and wastewater treatment facilities, and can affect continuity of service. Intense precipitation may lead to sewage volumes that exceed the capacity of treatment facilities, resulting in the release of untreated effluent. Minimizing current and future risks of service disruptions and inadequate service quality can require additional capital expenditures and operational expenses. As climate change leads to a greater likelihood of extreme weather events, companies that address these risks through redundancies and strategic planning will be better able to serve customers and protect shareholder value.

## Accounting Metrics

### IF-WU-450a.1. Wastewater treatment capacity located in 100-year flood zones

- 1 The entity shall disclose the capacity, in cubic meters per day, of its wastewater treatment facilities that are located in 100-year flood zones.
  - 1.1 100-year flood zones are defined as land areas subject to a one-percent or greater chance of flooding in any given year. Such areas may also be referred to as being subject to the one-percent annual chance flood, the one-percent annual exceedance probability flood, or the 100-year flood.
    - 1.1.1 Examples of 100-year flood zones may include, but are not limited to, coastal flood plains, flood plains along major rivers, and areas subject to flooding from ponding in low-lying areas.
  - 1.2 For water treatment facilities located in the U.S., 100-year flood zones shall include those land areas designated by the U.S. Federal Emergency Management Agency (FEMA) as special flood hazard areas (SFHA).
    - 1.2.1 SFHAs are defined as land area in the flood plain subject to a one-percent or greater chance of flooding in any given year. The area may be designated in the applicable flood insurance rate map, as per the U.S. National Flood Insurance Program, as Zones A, AO, AH, A1-30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, V1-30, VE, and V. This definition is derived from U.S. 44 CFR 59.1.
- 2 The scope of disclosure shall include all of the entity's wastewater treatment facilities that are located in 100-year flood zones, regardless of the country of their location.

**IF-WU-450a.2. (1) Number and (2) volume of sanitary sewer overflows (SSO), (3) percentage of volume recovered**

- 1 The entity shall disclose the (1) number of sanitary sewer overflows (SSO) originating from sewer systems under the entity's operational control.
  - 1.1 SSOs are defined, consistent with the [Sewage Overflow Community Right-To-Know Act](#), as overflows, spills, releases, or diversions of wastewater from a sanitary sewer system.
  - 1.2 Where regulations do not require reporting of SSOs, the entity shall disclose the calculation methodology or combination of methodologies used, where relevant methodologies include, but are not limited to:
    - 1.2.1 Duration and flow rate comparison method
    - 1.2.2 Upstream lateral connections method
    - 1.2.3 Continuous flow metering
- 2 The entity shall disclose the (2) volume, in cubic meters, of SSOs originating from sewer systems under the entity's operational control.
  - 2.1 The volume of SSOs shall be calculated according to the methodologies used for regulatory reporting in the corresponding jurisdiction.
- 3 The entity shall report the (3) percentage of SSOs recovered, by volume.
  - 3.1 The percentage shall be calculated as the volume, in cubic meters, of sewage discharged to the environment through SSOs that was recovered divided by the total amount of sewage discharged to the environment through SSOs.
  - 3.2 The recovered volume is defined as the amount of sewage discharged that was captured and returned to the sanitary sewer system, private lateral, or collection system.
  - 3.3 The volume of SSOs recovered shall be calculated according to the methodologies used for regulatory reporting in the corresponding jurisdiction.
  - 3.4 Where regulations do not require reporting the recovery of SSOs, the entity shall disclose the calculation methodology or combination of methodologies used, where relevant methodologies include, but are not limited to:
    - 3.4.1 Measured volume method
    - 3.4.2 Visual estimation method
- 4 The entity may describe programs and initiatives—including those programs overseen by national, state, and local governments, and those developed internally by the entity—that it is involved in to reduce the number and volume of SSOs and its efforts to mitigate any such occurrences.

**IF-WU-450a.3. (1) Number of unplanned service disruptions, and (2) customers affected, each**

## by duration category

- 1 The entity shall disclose the (1) number of unplanned service disruptions to its drinking water supply services and (2) the total number of customers affected by such disruptions.
  - 1.1 An unplanned service disruption shall be defined according to the applicable local regulations where the disruption occurred.
  - 1.2 In cases where regulations to define disruptions do not exist, disruptions shall be considered as incidents of complete water shutoff, low flow restrictions, boil-water advisories, and water main flushing, and excludes those incidents when a reduction of service occurs but normal activities (e.g., dishwashing, showering, laundry washing, and toilet flushing) are maintained.
  - 1.3 The scope of unplanned service disruptions shall be limited to those disruptions that were not planned or scheduled and those disruptions exceeding the scheduled duration of disruption.
    - 1.3.1 A scheduled disruption shall be defined according to local regulations where the disruption occurred. Where such regulations do not exist, a scheduled disruption shall be considered a disruption for which the entity has provided a minimum of 24 hours advance notification.
  - 1.4 Customers are defined, consistent with the *2017 American Water Works Association (AWWA) Utility Benchmarking: Performance Management for Water and Wastewater*, as the number of individual service agreements for water services at single properties, where an individual may own more than one property and be counted as a customer more than once.
- 2 The entity shall disclose the number of unplanned service disruptions and the number of customers affected, by the length of duration category.
  - 2.1 The length of duration categories are: under 4 hours, between 4 and 12 hours, or 12 hours or more.
  - 2.2 The duration of a disruption is defined, consistent with the *2017 AWWA Utility Benchmarking: Performance Management for Water and Wastewater*, as the time taken for all unplanned or emergency corrective activities by all utility employees and contractors working for the utility after discovery of an unplanned service disruption.
- 3 The scope of disclosure is limited to water operations and services (i.e., wastewater and stormwater services are excluded).
- 4 The entity may separately disclose the number of disruptions that were intentionally planned or scheduled by the entity, the number of customers affected, and the duration of those disruptions.

### Note to IF-WU-450a.3

- 1 The entity shall discuss notable service disruptions such as those that affected a significant number of customers or those of extended duration.
- 2 For such disruptions, the entity should provide:
  - 2.1 Description and cause of the service disruptions;



- 2.2 The costs associated with the service disruptions;
- 2.3 Actions taken to mitigate the potential for future service disruptions; and
- 2.4 Any other significant outcomes (e.g., legal proceedings).

#### **IF-WU-450a.4. Description of efforts to identify and manage risks and opportunities related to the impact of climate change on distribution and wastewater infrastructure**

- 1 The entity shall describe its efforts to identify and manage risks and opportunities associated with the impact of climate change on its water distribution and wastewater infrastructure.
  - 1.1 Risks include, among others, threats to the entity's physical infrastructure as a consequence of climate change-related events (e.g., rising sea levels, increasing storm intensity, and impacts of drought) that could result in service disruption(s).
  - 1.2 Opportunities include the need for infrastructure improvements within the entity's current service area and the opportunity to expand its services through the water infrastructure.
- 2 The entity shall describe how it identifies and prioritizes the potential for risks to, and vulnerabilities of, its water distribution and wastewater infrastructure.
  - 2.1 Relevant risks and vulnerabilities to describe include, but are not limited to, those relating to the age, geographic location, and physical qualities of the entity's distribution infrastructure.
  - 2.2 Relevant efforts to discuss include involvement in climate change adaptation and mitigation programs, including the U.S. Environmental Protection Agency's (EPA) [Creating Resilient Water Utilities](#).
- 3 The entity shall describe its efforts to manage the risks and opportunities associated with its water distribution and wastewater infrastructure, including, but not limited to, infrastructure development, current storm tracking, global gridded climate models, and the use of redundant systems to assure service continuity.
- 4 The scope of disclosure includes all water, wastewater, and stormwater operations and services.
  - 4.1 The entity may break out its disclosures by water, wastewater and/or stormwater services.
- 5 The entity may describe its efforts to manage risks and opportunities associated with its distribution network in the context of the rate case and rate making political environment, including the effects on the entity's ability to expand, maintain, and enhance the resiliency of its distribution network.

## BIOFUELS

### Industry Description

The Biofuels industry consists of companies that produce biofuels and process raw materials for production. Biofuels are manufactured using organic feedstocks and are used primarily as transportation fuels. Companies typically source feedstocks, which include food, oil crops, and animal products, from agricultural product distributors. Ethanol and biodiesel are the most widely produced biofuels, while other types include biogas, biohydrogen, and synthetic biofuels, produced from a variety of organic feedstocks. Biofuels companies' customers are chiefly fuel-blending and fuel-supply companies, including major integrated oil companies. While biofuels are produced worldwide, the publicly listed companies in the Biofuels industry operate primarily in the U.S., though some have minor operations abroad, notably in India, Brazil, and South Korea. Government regulations related to the use of renewable fuel are a significant demand driver in the industry.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Water Management in Manufacturing	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	RR-BI-140a.1
	Description of water management risks and discussion of strategies and practices to mitigate those risks	Discussion and Analysis	n/a	RR-BI-140a.2
	Number of incidents of non-compliance associated with water quality permits, standards, and regulations	Quantitative	Number	RR-BI-140a.3
Lifecycle Emissions Balance	Lifecycle greenhouse gas (GHG) emissions, by biofuel type	Quantitative	Grams of CO <sub>2</sub> -e per megajoule (MJ)	RR-BI-410a.1
Sourcing & Environmental Impacts of Feedstock Production	Discussion of strategy to manage risks associated with environmental impacts of feedstock production	Discussion and Analysis	n/a	RR-BI-430a.1
	Percentage of biofuel production third-party certified to an environmental sustainability standard	Quantitative	Percentage (%) of gallons	RR-BI-430a.2
Management of the Legal & Regulatory Environment	Amount of subsidies received through government programs	Quantitative	Reporting currency	RR-BI-530a.1
	Discussion of corporate positions related to government regulations and/or policy proposals that address environmental and social factors affecting the industry	Discussion and Analysis	n/a	RR-BI-530a.2

# Water Management in Manufacturing

## Topic Summary

Biofuel refining is typically water-intensive. Biorefineries require water for feedstock processing, fermentation, distillation, and cooling. Although water use at biorefineries is modest relative to the quantities consumed during feedstock crop production, it is concentrated, and thus may have impacts on local water resources. Facilities may also generate wastewater containing salts, organic compounds, dissolved solids, phosphorus, and other substances, requiring wastewater treatment. Biofuel refineries may also be exposed to the risk of reduced water availability and related cost increases or operational disruption. Extraction of water from certain areas for the purposes of refining, as well as contamination of water supplies due to refining operations, could also create regulatory risk and tensions with local communities. Water efficiency in operations and the proper treatment of effluents are therefore important factors for the performance of biofuels companies.

## Accounting Metrics

### **RR-BI-140a.1. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.
  - 1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, wastewater obtained from other entities, municipal water supplies, or other water utilities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 2.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:
    - 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 3.1.2 Water that is directly or indirectly incorporated into the product or service;
    - 3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.

- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

## **RR-BI-140a.2. Description of water management risks and discussion of strategies and practices to mitigate those risks**

- 1 The entity shall describe its water management risks associated with water withdrawals, water consumption, and discharge of water and/or wastewater.
  - 1.1 Risks associated with water withdrawals and water consumption include risks to the availability of adequate, clean water resources, including, but not limited to:
    - 1.1.1 Environmental constraints—such as operating in water-stressed regions, drought, concerns of aquatic impingement or entrainment, interannual or seasonal variability, and risks due to the impact of climate change.
    - 1.1.2 Regulatory and financial constraints—such as volatility in water costs, stakeholder perceptions and concerns related to water withdrawals (e.g., those from local communities, non-governmental organizations, and regulatory agencies), direct competition with and impact from the actions of other users (e.g., commercial and municipal users), restrictions to withdrawals due to regulations, and constraints on the entity’s ability to obtain and retain water rights or permits.
  - 1.2 Risks associated with the discharge of water and/or wastewater, include, but are not limited to, the ability to obtain rights or permits related to discharges, compliance with regulations related to discharges, restrictions to discharges, the ability to maintain control over the temperature of water discharges, liabilities and/or reputational risks, and increased operating costs due to regulation, stakeholder perceptions and concerns related to water discharges (e.g., those from local communities, non-governmental organizations, and regulatory agencies).
- 2 The entity may describe water management risks in the context of:
  - 2.1 How risks may vary by withdrawal source, including surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities; and
  - 2.2 How risks may vary by discharge destinations, including surface water, groundwater, or wastewater utilities.
- 3 The entity may discuss the potential impacts that water management risks may have on its operations and the timeline over which such risks are expected to manifest.

- 3.1 Impacts may include, but are not limited to, those associated with costs, revenues, liabilities, continuity of operations, and reputation.
- 4 The entity shall discuss its short-term and long-term strategies or plan to mitigate water management risks, including, but not limited to:
  - 4.1 The scope of its strategy, plans, goals and/or targets, such as how they relate to different business units, geographies, or water-consuming operational processes.
  - 4.2 Any water management goals and/or targets it has prioritized, and an analysis of performance against those goals and/or targets.
    - 4.2.1 Goals and targets may include, but are not limited to, those associated with reducing water withdrawals, reducing water consumption, reducing water discharges, reducing aquatic impingements, improving the quality of water discharges, and regulatory compliance.
  - 4.3 The activities and investments required to achieve the plans, goals and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 4.4 Disclosure of strategies, plans, goals, and/or targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.
- 5 For water management targets, the entity shall additionally disclose:
  - 5.1 Whether the target is absolute or intensity-based, and the metric denominator if it is an intensity-based target.
  - 5.2 The timelines for the water management plans, including the start year, the target year, and the base year.
  - 5.3 The mechanism(s) for achieving the target, including:
    - 5.3.1 Efficiency efforts, such as the use of water recycling and/or closed-loop systems;
    - 5.3.2 Product innovations such as redesigning products or services to require less water;
    - 5.3.3 Process and equipment innovations, such as those that enable the reduction of aquatic impingements or entrainments;
    - 5.3.4 Use of tools and technologies (e.g., the [World Wildlife Fund Water Risk Filter](#), [The Global Water Tool](#), and [Water Footprint Network Footprint Assessment Tool](#)) to analyze water use, risk, and opportunities; and
    - 5.3.5 Collaborations or programs in place with the community or other organizations.
  - 5.4 The percentage reduction or improvement from the base year, where the base year is the first year against which water management targets are evaluated toward the achievement of the target.
- 6 The entity shall discuss whether its water management practices result in any additional lifecycle impacts or tradeoffs in its organization, including tradeoffs in land use, energy production, and greenhouse gas (GHG) emissions, and why the entity chose these practices despite lifecycle tradeoffs.

### **RR-BI-140a.3. Number of incidents of non-compliance associated with water quality permits, standards, and regulations**

- 1 The entity shall disclose the total number of instances of non-compliance, including violations of a technology-based standard and exceedances of quality-based standards.
- 2 The scope of disclosure includes incidents governed by national, state, and local statutory permits and regulations, including, but not limited to, the discharge of a hazardous substance, violation of pretreatment requirements, or total maximum daily load (TMDL) exceedances.
- 3 The scope of disclosure shall only include incidents of non-compliance that resulted in a formal enforcement action(s).
  - 3.1 Formal enforcement actions are defined as governmental actions that address a violation or threatened violation of water quality laws, regulations, policies, or orders, and can result in administrative penalty orders, administrative orders, and judicial actions, among others. For example, the U.S. Environmental Protection Agency (EPA) provides guidance on the scope of formal enforcement actions in, [Informal and Formal Actions, Summary Guidance and Portrayal on EPA Websites](#).
- 4 Violations shall be disclosed, regardless of their measurement methodology or frequency. These include violations for:
  - 4.1 Continuous discharges, limitations, standards, and prohibitions that are generally expressed as maximum daily, weekly average, and monthly averages.
  - 4.2 Non-continuous discharges and limitations that are generally expressed in terms of frequency, total mass, maximum rate of discharge, and mass or concentration of specified pollutants.

# Lifecycle Emissions Balance

## Topic Summary

The rapid growth in global biofuels production is due in large part to government energy policies that seek to reduce net GHG emissions from transportation fuels and reduce dependence on fossil fuels. Most major renewable-fuel policies worldwide require that biofuels achieve lifecycle GHG emissions reductions relative to a fossil-fuel baseline to qualify for renewable fuel-mandate thresholds. The biofuel lifecycle emission calculation can include indirect and direct emissions from feedstock crop production and land use, fuel refining, fuel and feedstock transport, and vehicle exhaust emissions. Biofuel producers can directly influence net emissions during the refining process through energy management (fuel use), process innovations, and by using feedstocks with lower emissions profiles. Fuel products that achieve a reduction in net emissions can qualify as advanced biofuels, which, based on existing biofuels mandates in the U.S. and Europe, may be subject to increased demand in the future. Biofuel companies that cost-effectively reduce the net carbon emissions of their products may gain a competitive product advantage, leading to revenue growth and increased market share.

## Accounting Metrics

### RR-BI-410a.1. Lifecycle greenhouse gas (GHG) emissions, by biofuel type

- 1 The entity shall disclose its lifecycle GHG emissions (in grams of CO<sub>2</sub>-e per megajoule) for each biofuel category it produces, calculated according to the EPA Renewable Fuel Standard 2 (RFS2) requirements, where:
  - 1.1 Lifecycle GHG emissions are defined in the U.S. Clean Air Act (CCA) Section 211(o)(1) as the aggregate quantity of GHG emissions (including direct emissions and significant indirect emissions, such as significant emissions from land-use changes) related to the full fuel lifecycle, including all stages of fuel and feedstock production and distribution, from feedstock generation or extraction through the distribution and delivery of the finished fuel, to the ultimate consumer and use of the fuel, where the mass values for all GHGs are adjusted to account for their relative global warming potential.
  - 1.2 The entity shall disclose its lifecycle GHG emissions for each biofuel type that it produces, where biofuel types include the following, which are disclosed in RR-BI-000.B and based on the EPA's Renewable Fuel Standard categories: (1) renewable fuel, (2) advanced biofuel, (3) biomass-based diesel, and (4) cellulosic biofuel.
- 2 The entity may disclose all applicable lifecycle GHG emissions results, including those calculated for the California Air Resources Board Low Carbon Fuel Standard Program, the European Union Renewable Energy Directive, and the Roundtable on Sustainable Biomaterials (RSB) certification, if results from any of these calculations are materially different than the results from the EPA RFS2 calculation.

# Sourcing & Environmental Impacts of Feedstock Production

## Topic Summary

The Biofuels industry utilizes a variety of plant-based feedstocks as raw materials for production. Most companies purchase feedstocks from agricultural producers and distributors. A growing proportion of the world's arable land is now occupied by biofuel crops. Unsustainable cultivation practices can have negative environmental externalities, including deforestation and biodiversity loss, soil degradation, and water pollution. These factors could adversely affect feedstock crop yields over the short- and long-term. This, in turn, could influence the price and availability of feedstocks for biofuels producers. Consequently, vetting the sustainability of supply chains, such as through certifications or engagement with suppliers, is an important consideration for biofuels producers.

## Accounting Metrics

### RR-BI-430a.1. Discussion of strategy to manage risks associated with environmental impacts of feedstock production

- 1 The entity shall discuss its strategy to manage the environmental impacts and regulatory risks associated with feedstock production, where risks may include, but are not limited to:
  - 1.1 Risks to feedstock supply and pricing created by climate change impacts such as increased likelihood of extreme weather events, decreased availability of clean water resources, increased competition for arable land, and decreased crop yields due to temperature increases.
  - 1.2 Long-term risks to feedstock supply associated with suppliers' impacts on environmental health including those on biodiversity and soil health that may be due to monoculture practices and/or fertilizer and pesticide use.
  - 1.3 Constraints created by regulation such as compliance with sustainability criteria in renewable fuel mandates (including RFS2 in the U.S. and the Renewable Energy Directive in the EU); potential regulatory limits on the types of land where feedstock can be grown; potential limits on what qualifies as renewable biomass; potential for reduction or loss of public or political support for biofuel mandates due to environmental impacts of feedstock production; and resistance to the use of genetically modified organisms (GMOs).
- 2 The scope of this disclosure excludes risks associated with the lifecycle GHG emissions, which are addressed in RR-BI-410a.1, respectively.
- 3 If the entity identifies availability of clean water resources as a risk to feedstock supply and/or pricing, it shall discuss its vulnerability to feedstock growing regions with water stress and how it manages the risk of price variability due to sourcing feedstock from these regions.
  - 3.1 The entity should identify its known sources of feedstock from growing regions with High (40—80 percent) or Extremely High (>80%) Baseline Water Stress using the World Resources Institute's (WRI) Water Risk Atlas tool, [Aqueduct](#).



- 4 The entity shall describe its approach to managing risks and/or opportunities associated with feedstock production, including constraints created by regulation, and limits on availability and price.
  - 4.1 Relevant strategies to discuss include sourcing from feedstock producers that are third-party certified to environmental sustainability standards, diversification of suppliers, using feedstock procurement criteria to choose suppliers for varied feedstocks with fewer environmental impacts or greater adaptability to the effects of environmental externalities (e.g., drought-tolerant or disease-resistant feedstocks), supplier audits, sourcing from regions where the entity has greater control over feedstock sources, and expenditures on research and development (R&D) for alternative and substitute feedstocks that are less susceptible to environmental externalities.
  - 4.2 The entity should disclose the sustainability criteria it uses to assess its feedstock suppliers.

#### **RR-BI-430a.2. Percentage of biofuel production third-party certified to an environmental sustainability standard**

- 1 The entity shall calculate the percentage as the amount of biofuel produced, in gallons, that is third-party certified to an environmental sustainability standard divided by the total amount of biofuel produced (in gallons).
- 2 Environmental sustainability standards include Bonsucro, the Council on Sustainable Biomass Production (CSBP), International Sustainability & Carbon Certification, Roundtable on Sustainable Biomaterials (RSB), and Roundtable on Responsible Soy (RTRS), as well as other standards with equivalent criteria.
  - 2.1 At a minimum, standards should include the following environmental sustainability topics:
    - 2.1.1 GHG and other air emissions, water consumption and quality, soil health, fertilizer and pesticide use, land-use change, biodiversity, and waste management.
- 3 The entity should disclose the certification schemes to which its biofuel is certified and the percentage of production certified to each scheme.

# Management of the Legal & Regulatory Environment

## Topic Summary

The Biofuels industry is highly dependent on government policies and regulations, which create market demand and incentivize supply with tax breaks and other support for feedstock production. The Biofuels industry therefore supports certain regulations and policies related to renewable fuel policy, production tax credits, and feedstock production. While regulatory support can result in positive short-term gains by supporting the biofuels market, the potential long-term adverse environmental impacts from feedstock and biofuels production may result in a reversal of beneficial policies, leading to a more uncertain regulatory environment. Consequently, biofuels companies could benefit from developing a clear strategy for engaging regulators that is aligned with long-term sustainable business outcomes and that accounts for environmental externalities.

## Accounting Metrics

### RR-BI-530a.1. Amount of subsidies received through government programs

- 1 The entity shall disclose the amount of subsidies it received through government programs during the reporting year, where subsidies include tax credits such as blending and production tax credits, funding for projects such as research and development, import tariffs, direct payments, capital grants, loans and loan guarantees, and any other monetary support received from government departments or programs.
- 2 Government programs include those worldwide at national, regional, state, and local levels.
- 3 The entity may disclose the type of biofuel subsidies received and the amount of each where types of biofuel subsidies can include, but are not limited to, blending and production tax credits, capital grants, direct payments, loans and loan guarantees, surcharges or tariffs on competing products, and funding for projects such as research and development.
- 4 The entity shall disclose the amount of subsidies as an aggregate amount that was recognized during the reporting year, regardless of the accounting method (e.g., deferral method, flow-through method, or non- U.S. GAAP methods for investment tax credits).

### RR-BI-530a.2. Discussion of corporate positions related to government regulations and/or policy proposals that address environmental and social factors affecting the industry

- 1 The entity shall identify risks and opportunities it faces related to legislation, regulation, and/or rulemaking, (hereafter referred to collectively as “legal and regulatory environment”) related to environmental and social factors that may have a significant financial impact.
  - 1.1 The scope shall include existing, emerging, and known future risks and opportunities.
  - 1.2 The scope shall include risks and opportunities that may exist domestically and internationally at the national, state, and local level.

- 1.3 The regulatory environment related to material environmental and social factors includes those related to non-greenhouse gas air emissions, greenhouse gas emissions, water withdrawals and effluents, feedstock sourcing, and process and employee safety.
  
- 2 Relevant risks include, but are not limited to, risk of increased compliance costs, risk of policy reversal (e.g., risks associated with changes to existing environmental regulations), risk of loss of financial incentives (e.g., reduction or elimination of tax deductions), risk to reputation due to entity's stance and actions related to the legal and regulatory environment, risk that the legal and regulatory environment may not be aligned with long-term strategy, and risk of misalignment with the expectations of customers, investors, and other stakeholders.
  
- 3 Relevant opportunities include, but are not limited to, improved financial conditions (e.g., through policies that incentivize biofuel manufacturing activities), improved community relations due to the entity's stance and actions related to the legal and regulatory environment, and other benefits due to alignment of the legal and regulatory environment with the entity's long-term strategy.
  
- 4 The entity shall discuss its efforts to manage risks and opportunities associated with each aspect of the legal and regulatory environment associated with the topics included in the SASB Biofuels standard that are relevant to the entity's business and may have a significant financial impact.
  
- 5 In addition to its efforts to influence the legal and regulatory environment, the entity shall discuss its overall strategy to manage risks and opportunities associated with each aspect of the legal and regulatory environment it has identified.
  - 5.1 Any changes it has made or plans to make to its business structure or model
  - 5.2 The development of new technologies or services
  - 5.3 Any changes it has made or plans to make to its operational process, control, or organizational structures

## FORESTRY MANAGEMENT

### Industry Description

The Forestry Management industry consists of companies that own and/or manage natural and planted forestry lands and timber tracts, or operate non-retail tree nurseries and rubber plantations. The industry conducts its operations on lands that can be company-owned or leased from public or private landowners. Companies typically sell timber to wood products manufacturers, pulp and paper producers, energy producers, and a variety of other customers. The industry's largest companies operate primarily in and are domiciled in the U.S. and Canada. Some have international operations including in Brazil and New Zealand. While some integrated companies may also operate sawmills, wood products facilities, or pulp and paper facilities, sustainability issues arising from these activities are addressed in SASB's Building Products & Furnishings (CG-BP) and Pulp & Paper Products (RR-PP) industry standards.

**Table 1. Climate-related Disclosure Topics & Accounting Metrics**

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Ecosystem Services & Impacts	Area of forestland certified to a third-party forest management standard, percentage certified to each standard <sup>69</sup>	Quantitative	Acres (ac), Percentage (%)	RR-FM-160a.1
	Area of forestland with protected conservation status	Quantitative	Acres (ac)	RR-FM-160a.2
	Area of forestland in endangered species habitat	Quantitative	Acres (ac)	RR-FM-160a.3
	Description of approach to optimizing opportunities from ecosystem services provided by forestlands	Discussion and Analysis	n/a	RR-FM-160a.4
Climate Change Adaptation	Description of strategy to manage opportunities for and risks to forest management and timber production presented by climate change	Discussion and Analysis	n/a	RR-FM-450a.1

**Table 2. Activity Metrics**

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Area of forestland owned, leased, and/or managed by the entity	Quantitative	Acres (ac)	RR-FM-000.A
Aggregate standing timber inventory <sup>70</sup>	Quantitative	Cubic meters (m <sup>3</sup> )	RR-FM-000.B

<sup>69</sup>

Note to **RR-FM-160a.1** – The entity shall describe forestry management practices for non-certified forestlands, and for any forest management certifications that were suspended or terminated, the entity shall disclose the number, associated acreage, and stated reason for suspension or termination.

<sup>70</sup>

Note to **RR-FM-000.B** – The entity may additionally note if it uses other units of measure to define its standing timber inventory, and it shall disclose any conversion factors used.

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Timber harvest volume <sup>71</sup>	Quantitative	Cubic meters (m <sup>3</sup> )	RR-FM-000.C

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<sup>71</sup>

Note to **RR-FM-000.C** – The entity may additionally note if it uses other units of measure to define its timber harvest volume, and it shall disclose any conversion factors used.

# Ecosystem Services & Impacts

## Topic Summary

Along with their timber output, forests provide valuable ecosystem services including carbon sequestration, wildlife habitat, water purification and storage, soil formation, and recreational opportunities. Meanwhile, in many regions, regulations related to water quality and endangered species protection, as well as harvesting rights that are contingent upon environmental preservation, can create operational risks for companies. As such, protecting or enhancing ecosystem services within managed forestlands could mitigate reputational, demand, and operational risks related to the potential adverse environmental impacts of forestry. Companies increasingly utilize third-party certification to demonstrate sustainable forestry management practices that serve to enhance the value and productivity of their forest assets, as well as to meet rising customer demand for sustainably produced forest products.

## Accounting Metrics

### **RR-FM-160a.1. Area of forestland certified to a third-party forest management standard, percentage certified to each standard**

- 1 The entity shall disclose its total forestland area, in acres, that is certified to a third-party forest management standard, where:
  - 1.1 The scope includes forestlands owned, leased, and/or managed by the entity.
  - 1.2 Third-party forest management standards are those that certify that forests are harvested in a sustainable manner and cover environmental and social criteria including legal compliance, land rights, community and worker relations, environmental impact and biodiversity, forest management plans and practices, land use, wildlife habitat conservation, and water conservation, among others.
  - 1.3 Third-party forest management certifications include, but are not limited to, those promulgated by the following organizations (or the equivalent):
    - 1.3.1 American Tree Farm System (ATFS)
    - 1.3.2 Forest Stewardship Council (FSC)
    - 1.3.3 Programme for the Endorsement of Forest Certification (PEFC)
    - 1.3.4 Forest certification systems endorsed by the PEFC
    - 1.3.5 Sustainable Forest Initiative (SFI)
- 2 If a forestland area is certified to multiple certification standards, the entity shall not account for the acreage more than once when calculating the total forestland area certified to a third-party forest management standard.
- 3 The entity shall disclose the percentage of the total certified forestland that is certified to each forest management standard (e.g., FSC, SFI, PEFC, and ATFS) and indicate the associated certification(s) (e.g., FSC Forest Management Certification, SFI Forest Management Standard, PEFC Sustainable Forest Management certification, or ATFS Individual Third-Party certification).

- 3.1 The entity shall calculate the percentage of forestland certified to each forest management standard as the number of acres that are third-party certified to the respective standard divided by the total number of certified acres owned, leased, and/or managed by the entity.
- 4 The entity shall disclose the percentage of acres that are certified to multiple certification schemes.

Note to **RR-FM-160a.1**

- 1 The entity shall provide a brief description of its forestry management practices implemented for non-certified forestlands owned, leased, and/or managed by the entity.
- 2 The entity may discuss:
  - 2.1 The topics and criteria addressed by the practices(s), such as: forest productivity and health, protection from ecological and biodiversity impacts, protection of water resources, noise impacts, discharges to water, protection of special sites, plantation farming, harvesting techniques, use of monocultures, use of genetically modified organisms (GMOs), chemical usage, community involvement, indigenous communities, and aesthetics and recreation, among others
  - 2.2 How the entity enforces the sustainable forestry management plans in its non-certified forestlands, including the type and frequency of inspections
  - 2.3 The underlying references for its forestry management plan(s) for non-certified forestlands, including the degree to which its forest management practices are aligned with criteria outlined in third-party sustainable forestry management standards and [ASTM D7480, Guide for Evaluating the Attributes of a Forest Management Plan](#); whether these references are codes, guidelines, standards, or regulations; and whether they were developed by the entity, an industry, organization, a third-party organization (e.g., a non-governmental organization), a governmental agency, or some combination of these groups
- 3 Where policies and practices to ensure sustainable forest management differ significantly by forestland, the entity shall describe differences for each non-certified forestland and indicate the percentage of acres to which they were applied.
- 4 The entity shall disclose whether any forest management certifications were involuntarily suspended or terminated during the reporting period (i.e., for failure to meet the standard or resolve major non-conformities).
- 5 The entity shall disclose which certification(s) was suspended or terminated, the total acreage of land for which certification was suspended or terminated, the reason stated by the certification body or bodies for why the certification was suspended or terminated, and any other explanatory information about the suspension or termination.
- 6 The entity may discuss any relevant corrective actions that it has put in place in response to a certification being suspended or terminated.

**RR-FM-160a.2. Area of forestland with protected conservation status**

- 1 The entity shall disclose the area of its owned, leased, and/or managed forestland (by acreage) that has protected conservation status, where an area is considered to have protected conservation status if it is located within any of the following:

1.1 Areas legally designated as protected by government regulation, including national parks, national wildlife refuge sites, wilderness areas, state forests, state parks, and areas under conservation easement, as well as sites categorized as such by NatureServe and State Natural Resource Agencies, and agencies associated with the network of Natural Heritage or Conservation Data Centers, or Natura 2000 sites.

1.1.1 These sites may be listed in the World Database of Protected Areas (WDPA) and mapped on [ProtectedPlanet.net](https://www.protectedplanet.net).

2 The scope includes areas of conservation status that are actively managed by or for the entity and excludes areas of conservation status that are exclusively set aside for conservation and are not actively managed.

2.1 The scope includes areas of conservation status that are government-owned and managed by the entity.

3 The entity may disclose the percentage of the area of forestland with protected conservation status that is certified to a third-party forest management standard.

4 The entity may discuss the likelihood of a change to the area of its owned, leased, and/or managed forestland that is considered to have protected conservation status.

5 The entity may separately identify forestland areas with additional ecological, biodiversity, or conservation designations, such as those listed by the [A-Z Guide of Areas of Biodiversity Importance](#) prepared by the United Nations Environment Programme's World Conservation Monitoring Centre (UNEP-WCMC).

### **RR-FM-160a.3. Area of forestland in endangered species habitat**

1 The entity shall disclose the area of its owned, leased, and/or managed forestland (by acreage) that is located in endangered species habitat.

2 Forestlands are considered to be an endangered species habitat if a species that is classified by national, state, or local law as endangered or threatened inhabits the entity's forestlands.

3 The scope of disclosure includes forestlands owned, leased, and/or managed by the entity.

4 An endangered species is defined in the U.S. Endangered Species Act as any species that is in danger of extinction throughout all or a significant portion of its range.

5 A threatened species is defined in the U.S. Endangered Species Act as any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

6 Endangered species habitats includes critical habitat areas where the entity owns, leases, and/or manages forestlands that are officially designated by applicable state and/or federal regulations including:

6.1 The U.S. Endangered Species Act

6.2 The Canada Species at Risk Act

6.3 Applicable regulatory endangered species lists in the regions where the entity owns, leases, and/or manages forestlands

7 The entity may disclose the types of endangered or threatened species in its forestlands.



- 8 The entity shall disclose whether there is any overlap between the areas identified in RR-FM-160a.2 and RR-FM-160a.3.
- 9 The entity may provide discussion around forestlands that are located in endangered species habitats, but present low risk to biodiversity or ecosystem services.
- 10 The entity may discuss the likelihood of a change to the area of its owned, leased, and/or managed forestland that is considered to be an endangered species habitat.
  - 10.1 Discussion includes, but is not limited to:
    - 10.1.1 Whether there are endangered or threatened species habitat(s) near, but not currently in, the entity's forestlands, and whether the habitat(s) could overlap with the entity's forestlands
    - 10.1.2 Whether there are species in or near the entity's forestlands that are classified as endangered or threatened in non-government regulatory lists, but not currently by government regulatory lists, and whether these species may be classified as endangered or threatened by a regulatory endangered species list
    - 10.1.3 Whether the current endangered or threatened species habitat in the entity's forestlands is expected to change and/or expand in the future
  - 10.2 The entity may disclose the likelihood of these changes occurring and the area of its forestlands that could be affected.

#### **RR-FM-160a.4. Description of approach to optimizing opportunities from ecosystem services provided by forestlands**

- 1 The entity shall discuss its strategy to optimize the opportunities created by the ecosystem services that its forestlands provide, where:
  - 1.1 Ecosystem services are defined by the Millennium Ecosystem Assessment as the benefits obtained from ecosystems, which include: provisioning services (i.e., goods or products obtained from ecosystems), such as food, fresh water, timber, and fiber; regulating services (i.e., benefits obtained from an ecosystem's control of natural processes), such as climate, erosion, and pollination; cultural services (i.e., nonmaterial benefits obtained from an ecosystem), such as recreational and spiritual benefits; and supporting services (i.e., services that maintain the other ecosystem services), such as nutrient cycling, primary production, and water cycling.
  - 1.2 Opportunities from effective ecosystem services management can include higher land value, increased productivity and timber yield, direct payments for timber and non-timber forest products, and improved relationships with stakeholders.
- 2 For ecosystems services that the entity currently does not receive direct payments for, the entity shall describe its approach to managing these ecosystem services. The discussion shall include:
  - 2.1 The type(s) of ecosystem service(s) the entity currently manages, where types of ecosystem services include, but are not limited to: air quality, soil stabilization and erosion control, and cultural value.

- 2.2 The entity's management actions, including decisions about harvesting, management of conservation areas or areas of high biodiversity, or conserving forested watershed.
- 3 For the ecosystem services that the entity does receive direct payments for, the entity may disclose the amount the entity receives for non-timber ecosystem goods and services and the type of compensation it receives, which can include:
  - 3.1 Public payments to landowners (from the government);
  - 3.2 Voluntary payments to landowners (from businesses, individuals, and non-governmental organizations); and
  - 3.3 Compliance-driven payments (payments made to comply with government regulations).
- 4 The entity may disclose whether it expects the revenues received from these non-timber or timber ecosystem services to change in the future and the methods or models used to develop these scenarios, including the use of global models or scientific research provided by governmental and non-governmental organizations.
- 5 The entity may discuss how management of non-timber ecosystem services is expected to affect tree growth and timber yield.

# Climate Change Adaptation

## Topic Summary

Global climate change may create long-term business uncertainty for some forestry management companies. Variations in precipitation patterns and temperatures, more frequent extreme weather events and forest fires, and an increased prevalence of tree diseases and pests could adversely impact timberlands through increased mortality or diminished productivity. Conversely, climate change could also facilitate forest productivity through increased atmospheric carbon dioxide, a longer growing season, moderating temperatures in high latitudes, greater precipitation, and expanded geographic ranges for some species, positively impacting forest productivity. In light of such variability, companies could benefit from identifying and understanding potential long-term impacts of climate change on the productivity of forestlands, and adjusting forestry management strategies to optimize the productivity of their forestland assets.

## Accounting Metrics

### RR-FM-450a.1. Description of strategy to manage opportunities for and risks to forest management and timber production presented by climate change

- 1 The entity shall discuss the risks and/or opportunities that are presented by climate change scenarios to its owned, leased, and/or managed forestlands, including, where relevant, those presented by:
  - 1.1 Physical impacts including, but not limited to: increased temperatures, changes in growth rates, changes in seasonality, availability of water, pest migration, increased frequency of fires, and increased frequency of extreme weather events
  - 1.2 Existing and potential legislation and regulation related to climate change, including those that limit emissions, tax emissions, set up cap-and-trade systems, affect the demand for the entity's products, or otherwise affect the entity
  - 1.3 International accords relating to climate change
  - 1.4 Indirect consequences of regulation or business trends, including legal, technological, or other developments related to climate change
  - 1.5 Other political and social risks, such as increased harvesting restrictions, or stakeholder perceptions or concerns (e.g., those from local communities, non-governmental organizations, and regulatory agencies)
- 2 Disclosure shall be additional but complementary to the U.S. SEC's Commission Guidance Regarding Disclosure Related to Climate Change.
- 3 For each of the risks and/or opportunities identified, the entity shall provide the following:
  - 3.1 A description of the risk or opportunity, including an explanation and qualitative assessment of current and anticipated (long-term and short-term) significant risks or opportunities associated with climate change
    - 3.1.1 Disclosure corresponds to CDSB Climate Change Reporting Framework 4.9, 4.10, and 4.11.

- 3.2 Strategic analysis of the long-term and short-term impact climate change actually and potentially has on the entity's strategic objectives
  - 3.2.1 Disclosure corresponds to CDSB Climate Change Reporting Framework 4.6.
- 3.3 The potential impact (direct or indirect) the risk or opportunity may have on the entity's business, and the projected magnitude of the impact
  - 3.3.1 Where the entity has quantified the potential financial impacts of the risk or opportunity (Disclosure corresponds to CDSB Climate Change Reporting Framework 4.7.)
- 3.4 The timeframe in which the risk or opportunity is expected to manifest
  - 3.4.1 Disclosure corresponds to CDSB Climate Change reporting framework 4.11.
- 3.5 The likelihood that the risk or opportunity will manifest
  - 3.5.1 Disclosure corresponds to CDP Climate Change Questionnaire CC5.1 and CC6.1.
- 4 The entity shall discuss how potential climate change risks or opportunities may vary among the following, and how it prioritizes the risks and opportunities identified (disclosure corresponds to CDP Climate Change Questionnaire CC2.1c):
  - 4.1 The geographic regions where the entity owns, leases, and/or manages forestlands
  - 4.2 The entity's products, services, and/or markets
  - 4.3 The types of tree species harvested by the entity
  - 4.4 The entity's plantation forestlands and its natural forestlands
- 5 The entity shall provide a discussion of the scenarios it uses to determine the risks and opportunities presented by climate change, including:
  - 5.1 The methods or models used to develop these scenarios, including the use of global models or scientific research provided by governmental and non-governmental organizations (e.g., [Intergovernmental Panel on Climate Change Climate Scenario Process](#))
- 6 The entity shall discuss its risk management procedures with respect to climate change risks and opportunities, including:
  - 6.1 How far into the future risks are considered
  - 6.2 The frequency of monitoring
  - 6.3 The entity's alleviation strategies, which may include, but are not limited to: use of insurance; diversification of tree species; actions to strengthen the adaptive capacity of forestlands; strategies to reduce the risk and intensity of pest, disease, and fire outbreaks; or plans to reduce risk and intensity of potential damage

- 6.4 The entity's adaptation strategies, which may include, but are not limited to: improving ecosystem management and biodiversity; monitoring changes; developing tolerant tree varieties; and optimizing the timing of planting and harvesting
- 6.5 The costs associated with these actions
  - 6.5.1 Disclosure corresponds with CDSB Climate Change Reporting Framework 4.12.
- 6.6 Disclosure corresponds to CDP Climate Change Questionnaire CC2.1.

## FUEL CELLS & INDUSTRIAL BATTERIES

### Industry Description

The Fuel Cells & Industrial Batteries industry consists of companies that manufacture fuel cells for energy production and energy storage equipment such as batteries. Manufacturers in this industry mainly sell products to companies for varied energy-generation and energy-storage applications and intensities, from commercial business applications to large-scale energy projects for utilities. Companies in the industry typically have global operations and sell products to a global marketplace.

Note: For the purposes of SASB standards, this industry does not include fuel cells or batteries used in light automotive vehicle applications. See SASB standards for the Auto Parts industry (TR-AP) for details on reporting this business segment. This industry also does not include non-industrial batteries for personal consumer use, which are classified under the Household & Personal Products industry (CG-HP).

**Table 1. Climate-related Disclosure Topics & Accounting Metrics**

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	RR-FC-130a.1
Product Efficiency	Average storage capacity of batteries, by product application and technology type	Quantitative	Specific energy (Wh/kg)	RR-FC-410a.1
	Average energy efficiency of fuel cells as (1) electrical efficiency and (2) thermal efficiency, by product application and technology type	Quantitative	Percentage (%)	RR-FC-410a.2
	Average battery efficiency as coulombic efficiency, by product application and technology type	Quantitative	Percentage (%)	RR-FC-410a.3
	Average operating lifetime of fuel cells, by product application and technology type	Quantitative	Hours (h)	RR-FC-410a.4
	Average operating lifetime of batteries, by product application and technology type	Quantitative	Number of cycles	RR-FC-410a.5

**Table 2. Activity Metrics**

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of units sold	Quantitative	Number	RR-FC-000.A
Total storage capacity of batteries sold	Quantitative	Megawatts (MW)	RR-FC-000.B
Total energy production capacity of fuel cells sold	Quantitative	Megawatts (MW)	RR-FC-000.C

# Energy Management

## Topic Summary

Manufacturing in the Fuel Cells & Industrial Batteries industry requires energy to power machines and cooling, ventilation, lighting, and product-testing systems. Purchased electricity can represent a major share of the energy sources used in the industry and can account for a notable proportion of the total cost of materials and value added. Various sustainability factors are contributing to an increase in the cost of conventional electricity while making alternative sources cost-competitive. Energy efficiency efforts can have a significant positive impact on operational efficiency and profitability, especially given the fact that many companies operate on relatively low or negative margins. By improving the efficiency of the manufacturing process and exploring alternative energy sources, fuel cell and industrial battery companies can reduce both their indirect environmental impacts and their operating expenses.

## Accounting Metrics

### **RR-FC-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a

Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).



# Product Efficiency

## Topic Summary

Both customer demand and regulatory requirements are driving innovation in energy-efficient products with lower environmental impacts and lower total cost of ownership. Therefore, research and development in the Fuel Cells & Industrial Batteries industry that drive energy and thermal efficiency and enhance storage capacities can lower barriers to adoption. Advances in battery technology to increase storage capabilities and improve charging efficiencies, while lowering costs for customers, are critical for the integration of renewable energy technologies into the grid. Fuel cell and industrial battery manufacturers that are able to improve efficiency in the use phase will be able to increase revenues and market share, pressured by stricter environmental regulations, high energy costs, and customer preferences.

## Accounting Metrics

### **RR-FC-410a.1. Average storage capacity of batteries, by product application and technology type**

- 1 The entity shall disclose the average storage capacity of batteries by product application and technology type, weighted by unit sales volume per product application and technology type.
  - 1.1 Storage capacity shall be measured as the specific energy, or gravimetric energy density, of batteries, and is calculated as the ratio of nominal energy in watt-hours to the mass of the product in kilograms: watt-hours / kilograms (Wh/kg).
- 2 The entity shall measure and disclose performance in accordance with the applicable product application and/or technology type standard(s), and shall disclose the standard(s) utilized for performance measurement.
  - 2.1 Applicable standard(s) may include SAE J240—Automotive storage batteries and SAE J2185—Heavy-duty storage batteries.
- 3 The entity shall disclose performance by the following application types, where applicable: portable, motive, stationary, and “all other,” each further categorized by the following technology types, where applicable: lead-based, nickel-based, lithium-based, sodium-based, and “all other.”
  - 3.1 The entity may include additional categories of application types and/or technology types where appropriate, including categories for new products with low sales volumes but strategic importance in terms of product efficiency or other attributes.

### **RR-FC-410a.2. Average energy efficiency of fuel cells as (1) electrical efficiency and (2)**

## **thermal efficiency, by product application and technology type**

- 1 The entity shall disclose the average energy efficiency of fuel cells as (1) electrical efficiency and (2) thermal efficiency, weighted by unit sales volume per product application and technology type.
  - 1.1 Electrical efficiency is calculated as net electricity produced divided by total fuel energy input.
  - 1.2 Thermal efficiency is calculated as net useful power output divided by total fuel energy input.
  - 1.3 The entity shall use lower heating values (LHV) in the calculation of electrical efficiency and thermal efficiency, and shall disclose the heating values used.
  
- 2 The entity shall measure and disclose electrical and thermal efficiency in accordance with standard(s) applicable to the product application and/or technology type.
  - 2.1 Applicable standard(s) may include IEC 62282-3-200—Stationary fuel cell power systems and SAE J2615—Testing Performance of Fuel Cell Systems for Automotive Applications.
  - 2.2 The entity shall disclose the standard(s) utilized for energy efficiency measurements.
  
- 3 The entity shall disclose electrical and thermal efficiency by the following application types, where applicable: portable, motive, stationary, and “all other,” each further categorized by the following technology types, where applicable: direct methanol (DMFC), polymer electrolyte (PEM), alkaline (AFC), phosphoric acid (PAFC), molten carbonate (MCFC), solid oxide fuel cell (SOFC), and “all other.”
  - 3.1 The entity may include additional categories of application types and/or technology types where appropriate, including categories for new products with low sales volumes but strategic importance in terms of product efficiency or other attributes.
  
- 4 The entity may disclose any other fuel cell outputs that have economic value (e.g., hydrogen), including an appropriate measurement of sales-weighted average value, by product application and technology type.

## **RR-FC-410a.3. Average battery efficiency as coulombic efficiency, by product application and technology type**

- 1 The entity shall disclose the average energy efficiency of batteries as coulombic efficiency, weighted by unit sales volume per product application and technology type.
  - 1.1 Coulombic efficiency is calculated as energy removed from a battery during discharge divided by the energy used during charging to restore the original capacity.
  
- 2 The entity shall measure and disclose coulombic efficiency in accordance with standard(s) applicable to the product application and/or technology type.
  - 2.1 Applicable standard(s) may include SAE J240—Automotive storage batteries and SAE J2185—Heavy-duty storage batteries.

- 3 The entity shall disclose coulombic efficiency by the following application types, where applicable: portable, motive, stationary, and “all other,” each further categorized by the following technology types, where applicable: lead-based, nickel-based, lithium-based, sodium-based, and “all other.”
  - 3.1 The entity may include additional categories of application types and/or technology types where appropriate, including categories for new products with low sales volumes but strategic importance in terms of product efficiency or other attributes.

#### **RR-FC-410a.4. Average operating lifetime of fuel cells, by product application and technology type**

- 1 The entity shall disclose the average operating lifetime of fuel cells, weighted by unit sales volume per product application and technology type.
  - 1.1 Operating lifetime of fuel cells is calculated as operating hours until 20% net power degradation occurs.
- 2 The entity shall measure and disclose operating lifetime in accordance with standard(s) applicable to the product application and/or technology type.
  - 2.1 Applicable standard(s) may include IEC 62282-3-200—Stationary fuel cell power systems and SAE J2615—Testing Performance of Fuel Cell Systems for Automotive Applications.
- 3 The entity shall disclose operating lifetime by the following application types, where applicable: portable, motive, stationary, and “all other,” each further categorized by the following technology types, where applicable: direct methanol (DMFC), polymer electrolyte (PEM), alkaline (AFC), phosphoric acid (PAFC), molten carbonate (MCFC), solid oxide fuel cell (SOFC), and “all other.”
  - 3.1 The entity may include additional categories of application types and/or technology types, where appropriate, including categories for new products with low sales volumes but strategic importance in terms of product efficiency or other attributes.

#### **RR-FC-410a.5. Average operating lifetime of batteries, by product application and technology type**

- 1 The entity shall disclose the average operating lifetime of batteries, weighted by unit sales volume per product application and technology type.
  - 1.1 The operating lifetime of batteries is calculated as the number of times the battery can be fully charged and discharged, or “cycles,” until 20% capacity degradation occurs.
- 2 The entity shall measure and disclose operating lifetime in accordance with standard(s) applicable to the product application and/or technology type.

- 2.1 Applicable standard(s) may include SAE J240—Automotive storage batteries and SAE J2185—Heavy-duty storage batteries.
- 3 The entity shall disclose performance by the following application types, where applicable: portable, motive, stationary, and “all other,” each further categorized by the following technology types, where applicable: lead-based, nickel-based, lithium-based, sodium-based, and “all other.”
  - 3.1 The entity may include additional categories of application types and/or technology types where appropriate, including categories for new products with low sales volumes but strategic importance in terms of product efficiency or other attributes.

## PULP & PAPER PRODUCTS

### Industry Description

The Pulp & Paper Products industry consists of companies that manufacture a range of wood pulp and paper products, including pulp fiber, paper packaging and sanitary paper, office paper, newsprint, and paper for industrial applications. Companies in the industry typically function as business-to-business entities and may have operations in multiple countries, such as the U.S., Canada, and Brazil. While some integrated companies own or manage timber tracts and are engaged in forest management, sustainability issues arising from these activities are addressed in SASB's Forestry Management (RR-FM) industry standard.

Table 1. Climate-related Disclosure Topics & Accounting Metrics

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions	Quantitative	Metric tons (t) CO <sub>2</sub> -e	RR-PP-110a.1
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	RR-PP-110a.2
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage from biomass, (4) percentage from other renewable energy <sup>72</sup>	Quantitative	Gigajoules (GJ), Percentage (%)	RR-PP-130a.1
Water Management	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	RR-PP-140a.1
	Description of water management risks and discussion of strategies and practices to mitigate those risks	Discussion and Analysis	n/a	RR-PP-140a.2
Supply Chain Management	Percentage of wood fiber sourced from (1) third-party certified forestlands and percentage to each standard and (2) meeting other fiber sourcing standards and percentage to each standard <sup>73</sup>	Quantitative	Percentage (%) by weight	RR-PP-430a.1
	Amount of recycled and recovered fiber procured <sup>74</sup>	Quantitative	Metric tons (t)	RR-PP-430a.2

<sup>72</sup>

Note to **RR-PP-130a.1** – The entity shall discuss risks and uncertainties associated with the use of biomass for energy.

<sup>73</sup>

Note to **RR-PP-430a.1** – The entity shall discuss due diligence practices for fiber that is not from certified forestlands or certified to other fiber sourcing standards.

<sup>74</sup>

Note to **RR-PP-430a.2** – The entity shall discuss its strategy to incorporate environmental lifecycle analyses into decisions to source recycled and recovered fiber versus virgin fiber.

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Pulp production	Quantitative	Air-dried metric tons (t)	RR-PP-000.A
Paper production	Quantitative	Air-dried metric tons (t)	RR-PP-000.B
Total wood fiber sourced <sup>75</sup>	Quantitative	Metric tons (t)	RR-PP-000.C

<sup>75</sup>

Note to **RR-PP-000.C** – The scope of wood-fiber-based raw materials includes all inputs that are processed to be sold as a finished good, including recycled raw materials, virgin raw materials, and goods that will be consumed directly in the production process and excluding biomass for energy use.

# Greenhouse Gas Emissions

## Topic Summary

The manufacturing of pulp and paper products generates direct greenhouse gas (GHG) emissions associated with the combustion of fossil fuels and biomass in stationary and mobile engines, cogeneration boilers, and other processing equipment. Companies in this industry also typically use significant amounts of carbon-neutral biomass for their energy needs, the use of which can reduce the costs associated with purchasing fossil fuels, as well as mitigate regulatory risk associated with carbon emissions. Emissions associated with fossil fuel sources can create regulatory compliance costs, depending on the magnitude of emissions and the prevailing emissions regulations. Companies that cost-effectively manage GHG emissions through greater energy efficiency, the use of alternative fuels, or manufacturing process improvements can benefit from improved operating efficiency and reduced regulatory compliance costs.

## Accounting Metrics

### RR-PP-110a.1. Gross global Scope 1 emissions

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalent (CO<sub>2</sub>-e), and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:
    - 2.1.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)
    - 2.1.2 *Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources* published by the U.S. Environmental Protection Agency (EPA)
    - 2.1.3 India GHG Inventory Program
    - 2.1.4 ISO 14064-1

- 2.1.5 Petroleum Industry Guidelines for reporting GHG emissions, 2nd edition, 2011, published by IPIECA
- 2.1.6 Protocol for the quantification of greenhouse gas emissions from waste management activities published by Entreprises pour l'Environnement (EpE)

2.2 GHG emissions data shall be consolidated and disclosed according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the “financial control” approach defined by the GHG Protocol, and the approach published by the Climate Disclosure Standards Board (CDSB) described in REQ-07, “Organisational boundary,” of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).

- 3 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 4 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 5 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

## **RR-PP-110a.2. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 2.2 Whether the target is absolute- or intensity-based, and the metric denominator, if it is an intensity-based target;
  - 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated toward the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;



- 2.5 The mechanism(s) for achieving the target; and
  - 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset.
- 
- 3 The entity shall discuss the activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as whether they pertain differently to different business units, geographies, or emissions sources.
  - 5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
  - 6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

# Energy Management

## Topic Summary

Pulp and paper products manufacturing is energy-intensive. In most facilities, energy is derived primarily from the combustion of biomass and fossil fuels, while purchased electricity may also be used in some facilities. Decisions regarding the generation of electricity on-site versus sourcing it from the grid, as well as the use of biomass and other renewable energy, can create trade-offs related to the energy supply's cost and reliability for operations and the extent of the regulatory risk from Scope 1 or other air emissions. The manner in which a company manages its energy efficiency, its reliance on different types of energy and the associated sustainability risks, and its ability to access alternative energy sources is likely to mitigate impacts of energy cost variability.

## Accounting Metrics

### **RR-PP-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage from biomass, (4) percentage from other renewable energy, (5) total self-generated energy**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that was supplied by biomass.
  - 3.1 The percentage shall be calculated as biomass energy consumption divided by total energy consumption.
- 4 For the purposes of this disclosure, the scope of renewable energy from biomass sources is limited to the following:
  - 4.1 Energy from biomass sources that meets at least one of the following criteria:
    - 4.1.1 Certification to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System)

4.1.2 Classification as an “eligible renewable” according to the Green-e Energy National Standard Version 2.5 (2014)

4.1.3 Eligibility for a state Renewable Portfolio Standard

5 The entity shall disclose (4) the percentage of energy it consumed that was renewable energy, excluding biomass energy.

5.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, and hydro.

5.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.

5.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

5.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

5.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

5.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

5.4 For the purposes of this disclosure, the scope of renewable energy from hydro sources is limited to sources that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard.

6 The entity shall disclose (5) the amount of energy self-generated by the entity as an aggregate figure, in gigajoules (GJ).

6.1 The entity may disclose the amount of self-generated energy that it sold to an electric utility or end-use customer.

6.2 The entity may disclose the amount of self-generated energy that was renewable energy, where renewable energy is defined above.

7 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

**Note to RR-PP-130a.1**

1 The entity shall describe risks and uncertainties associated with the use of biomass as an energy source, and it shall describe how it manages those risks.

2 Risks and uncertainties associated with the use of biomass as an energy source can include, but are not limited to:

- 2.1 Risks from air emissions (such as oxides of nitrogen and sulfur), including costs to comply with emissions restrictions and reputational impacts from violations.
- 2.2 Regulatory risks, including financial impacts associated with compliance with potential biogenic carbon dioxide regulations or reputational impacts associated with biomass failing to meet the definition of eligible renewable energy in a state Renewable Portfolio Standard.
- 2.3 Sourcing risks, including reputational risks associated with a lack of transparency about whether purchased biomass was sustainably harvested.

# Water Management

## Topic Summary

Pulp and paper products manufacturing is typically a water-intensive process, with water use occurring during in materials processing, process cooling, and steam generation at on-site energy plants. Companies require ample, stable water supplies and may produce large volumes of wastewater, the majority of which is treated and returned to the environment. Process water typically contains dissolved organic compounds and other solids, underscoring the importance of water treatment. In addition to water effluents, water availability is an important consideration for the industry, as water scarcity could result in higher supply costs, supply disruptions, or tension with local water users. Companies can adopt various strategies to address water supply and treatment issues, such as cost-effectively enhancing the recycling of process water, improving production techniques to lower water intensity, and ensuring compliance with water-effluent regulations.

## Accounting Metrics

### **RR-PP-140a.1. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.
  - 1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 2.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:
    - 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 3.1.2 Water that is directly or indirectly incorporated into the entity's product or service;
    - 3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.

- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

## **RR-PP-140a.2. Description of water management risks and discussion of strategies and practices to mitigate those risks**

- 1 The entity shall describe its water management risks associated with water withdrawals, water consumption, and discharge of water and/or wastewater.
  - 1.1 Risks associated with water withdrawals and water consumption include risks to the availability of adequate, clean water resources, including, but not limited to:
    - 1.1.1 Environmental constraints—such as operating in water-stressed regions, drought, concerns of aquatic impingement or entrainment, interannual or seasonal variability, and risks due to the impact of climate change
    - 1.1.2 Regulatory and financial constraints—such as volatility in water costs, stakeholder perceptions and concerns related to water withdrawals (e.g., those from local communities, non-governmental organizations, and regulatory agencies), direct competition with and impact from the actions of other users (e.g., commercial and municipal users), restrictions to withdrawals due to regulations, and constraints on the entity’s ability to obtain and retain water rights or permits
  - 1.2 Risks associated with the discharge of water and/or wastewater, include, but are not limited to, the ability to obtain rights or permits related to discharges, compliance with regulations related to discharges, restrictions to discharges, the ability to maintain control over the temperature of water discharges, liabilities and/or reputational risks, and increased operating costs due to regulation, stakeholder perceptions and concerns related to water discharges (e.g., those from local communities, non-governmental organizations, and regulatory agencies).
- 2 The entity may describe water management risks in the context of:
  - 2.1 How risks may vary by withdrawal source, including surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities; and
  - 2.2 How risks may vary by discharge destinations, including surface water, groundwater, or wastewater utilities.
- 3 The entity may discuss the potential impacts that water management risks may have on its operations and the timeline over which such risks are expected to manifest.

- 3.1 Impacts may include, but are not limited to, those associated with costs, revenues, liabilities, continuity of operations, and reputation.
- 4 The entity shall discuss its short-term and long-term strategies or plan to mitigate water management risks, including, but not limited to:
  - 4.1 The scope of its strategy, plans, goals and/or targets, such as how they relate to different business units, geographies, or water-consuming operational processes.
  - 4.2 Any water management goals and/or targets it has prioritized, and an analysis of performance against those goals and/or targets.
    - 4.2.1 Goals and targets may include, but are not limited to, those associated with reducing water withdrawals, reducing water consumption, reducing water discharges, reducing aquatic impingements, improving the quality of water discharges, and regulatory compliance.
  - 4.3 The activities and investments required to achieve the plans, goals and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 4.4 Disclosure of strategies, plans, goals, and/or targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.
- 5 For water management targets, the entity shall additionally disclose:
  - 5.1 Whether the target is absolute or intensity-based, and the metric denominator if it is an intensity-based target.
  - 5.2 The timelines for the water management plans, including the start year, the target year, and the base year.
  - 5.3 The mechanism(s) for achieving the target, including:
    - 5.3.1 Efficiency efforts, such as the use of water recycling and/or closed-loop systems;
    - 5.3.2 Product innovations such as redesigning products or services to require less water.
    - 5.3.3 Process and equipment innovations, such as those that enable the use of less water in manufacturing or operations;
    - 5.3.4 The use of tools and technologies (e.g., the [World Wildlife Fund Water Risk Filter](#), [The Global Water Tool](#), and [Water Footprint Network Footprint Assessment Tool](#)) to analyze water use, risk, and opportunities; and
    - 5.3.5 Collaborations or programs in place with the community or other organizations.
  - 5.4 The percentage reduction or improvement from the base year, where the base year is the first year against which water management targets are evaluated toward the achievement of the target.
- 6 The entity shall discuss whether its water management practices result in any additional lifecycle impacts or tradeoffs in its organization, including tradeoffs in land use, energy production, and greenhouse gas (GHG) emissions, and why the entity chose these practices despite lifecycle tradeoffs.

# Supply Chain Management

## Topic Summary

Pulp and paper products companies source wood and wood fiber from forestry management companies, paper fiber recyclers, and forests that the companies themselves manage. Supply-chain risks include decreased productivity of forestlands due to management practices or climate change, regulations addressing sustainable forest management, and reputational impacts. To mitigate such risks and satisfy growing customer demand for sustainably sourced fiber and paper products, manufacturers implement forest certification and fiber chain-of-custody standards which verify that virgin and recycled fiber originate from sustainably managed forests. In addition, pulp and paper manufacturers face trade-offs from the use of recovered fiber. Products with recycled content are increasingly in demand, providing a possible avenue for product differentiation, while using recycled fiber can minimize the need for virgin fiber. Conversely, manufacturing products with a greater recycled content can increase waste generation and energy consumption, while recycled fiber can be costlier, given demand-supply gaps. Therefore, companies can benefit by optimizing recycled fiber use to balance its environmental and economic trade-offs.

## Accounting Metrics

### **RR-PP-430a.1. Percentage of wood fiber sourced from (1) third-party certified forestlands and percentage to each standard and (2) meeting other fiber sourcing standards and percentage to each standard**

- 1 The entity shall disclose the percentage of its total wood-fiber-based materials that have been sourced from forestlands that are certified to forest management standards, where:
  - 1.1 Third-party forest management standards are those that certify that forests are harvested in a sustainable manner and that cover environmental and social criteria including legal compliance, land rights, community and worker relations, environmental impact and biodiversity, forest management plans and practices, land use, wildlife habitat conservation, and water conservation, among others.
  - 1.2 Third-party forest management certifications include, but are not limited to, those promulgated by the following organizations (or the equivalent):
    - 1.2.1 American Tree Farm System (ATFS) (i.e., ATFS Certification)
    - 1.2.2 Forest Stewardship Council (FSC) (i.e., FSC Forest Management and Chain of Custody certifications)
    - 1.2.3 Programme for the Endorsement of Forest Certification (PEFC) (i.e., PEFC Chain of Custody certifications)
    - 1.2.4 Forest certification systems endorsed by the PEFC
    - 1.2.5 Sustainable Forest Initiative (SFI) (i.e., SFI Forest Management and Chain of Custody certifications)
  - 1.3 The scope of wood-fiber-based materials includes all inputs that are processed to be sold as a finished good, including recycled raw materials, virgin raw materials, and goods that will be consumed directly in the production process and excluding biomass for energy.



- 2 The percentage of wood-fiber-based materials from third-party certified forestlands shall be calculated as the total weight (in air dried metric tons) of the entity's wood-fiber-based materials that have been sourced from third-party certified forestlands divided by the total weight (in air dried metric tons) of wood-fiber-based materials sourced.
- 3 The entity shall disclose the percentage of the total wood-fiber-based materials from third-party certified forestlands that is certified to each standard (e.g., FSC Chain of Custody, PEFC Chain of Custody, and SFI Chain of Custody).
  - 3.1 The entity shall calculate the percentage of wood-fiber-based materials certified to each standard as the amount of wood-fiber-based materials that is third-party certified to the respective standard divided by the total amount of wood fiber sourced by the entity.
  - 3.2 Where wood-fiber is certified to multiple third-party certifications, the entity shall include the amount of such fiber in its calculations for each relevant certification.
- 4 The entity shall disclose the percentage of its total wood-fiber-based materials that is sourced from non-third-party certified forestlands but meets other fiber sourcing standards, including, but not limited to:
  - 4.1 Responsible fiber sourcing standards (e.g., SFI Fiber Sourcing Standard)
  - 4.2 Controlled wood standards (e.g., FSC Controlled Wood Certification, PEFC Controlled Wood)
  - 4.3 Recycled fiber standards that include post- and pre-consumer reclaimed material (e.g., PEFC Controlled Sources, FSC Recycled Label, and SFI Recycled Label)
  - 4.4 Any other due diligence standards that cover sourcing requirements for fiber from non-certified forestlands
- 5 For fiber from non-certified forestlands that meets multiple fiber sourcing standards, the entity shall not account for the weight more than once when calculating the total percentage of fiber from non-certified forestlands that meets other fiber sourcing standards.
- 6 The entity shall disclose the percentage of wood fiber that meets each sourcing standard (e.g., FSC Controlled Wood, SFI Fiber Sourcing Standard, and PEFC Controlled Sources).
  - 6.1 Where wood-fiber meets multiple sourcing standards, the entity shall include the amount of such fiber in its calculations for each relevant sourcing standard.

Note to **RR-PP-430a.1**

- 1 The entity shall discuss its due diligence practices for fiber that is not from certified forestlands or certified to other fiber sourcing standards and its policies to verify the forestry management and harvesting practices of suppliers, which may include codes of conduct, audits, and/or contracts, among others.
- 2 The entity shall disclose how it verifies that its non-certified fiber includes criteria for the following:
  - 2.1 Wood legality and compliance with the Lacey Act of 1990 (16 U.S.C. §§ 3371–3378);
  - 2.2 Wood sourced from areas of protected conservation status or high biodiversity value;
  - 2.3 Logging in or near areas of endangered species habitat;
  - 2.4 Logging in or near areas of indigenous peoples' land;

- 2.5 The forestry management and harvesting practices of suppliers, including reviews of environmental impact assessments or forestry management plans;
  - 2.6 The use of genetically modified organisms (GMOs), pesticides, or other chemicals in forests; and
  - 2.7 Criteria outlined in the definition of SFI “controversial sources,” the definition of FSC “controlled wood,” or the equivalent.
- 3 The entity may also disclose the sources of its wood fiber (e.g., from corporate, private, or federally owned forestlands and whether fiber is grown domestically or internationally) and the potential risks associated with procuring fiber from these sources.

### **RR-PP-430a.2. Amount of recycled and recovered fiber procured**

- 1 The entity shall disclose the amount of recycled and recovered fiber it procured in metric tons from suppliers as well as recycled and recovered fiber it obtained directly through collection programs.
- 2 Recycled content is defined, consistent with definitions in ISO 14021:1999, “Environmental labels and declarations—Self-declared environmental claims (Type II environmental labelling),” as the portion, by mass, of recycled or recovered material in a product or packaging, where only pre-consumer and post-consumer materials shall be considered as recycled content, and where:
  - 2.1 Recycled material is defined as material that has been reprocessed from recovered (or reclaimed) material by means of a manufacturing process and made into a final product or a component for incorporation into a product.
  - 2.2 Recovered material is defined as material that would have otherwise been disposed of as waste or used for energy recovery, but has instead been collected and recovered (or reclaimed) as a material input, in lieu of new primary material, for a recycling or manufacturing process.
  - 2.3 Pre-consumer material is defined as material that has been diverted from the waste stream during a manufacturing process. Excluded is reutilization of materials such as rework, regrind, or scrap that are generated in a process and are capable of being reclaimed within the same process that generated them.
  - 2.4 Post-consumer material is defined as material generated by households or by commercial, industrial, and institutional facilities in their role as end-users of a product that can no longer be used for its intended purpose. This includes returns of material from the distribution chain.
  - 2.5 Fiber shall be considered recycled or recovered if it meets the SFI definition of [recycled content](#), the FSC definition of [reclaimed material](#), or the PEFC definition of [recycled wood and fibres](#).

#### **Note to RR-PP-430a.2**

- 1 The entity shall discuss its strategy to incorporate environmental lifecycle analyses into decisions to source recycled and recovered fiber versus virgin fiber.
  - 1.1 An environmental lifecycle tradeoff is defined as an environmental benefit or consequence of choosing to source one type of fiber over another.

- 1.1.1 Environmental lifecycle benefits from using recycled and recovered fiber can include, but are not limited to, reducing the need for deforestation, reducing GHG emissions from paper in landfills, and reducing landfill waste.
  - 1.1.2 Environmental lifecycle consequences of using recycled and recovered fiber can include increased resource consumption and generation of air emissions during the transportation and processing of fiber.
- 2 The entity shall discuss how lifecycle tradeoff assessments are incorporated into its fiber sourcing decisions, including how the following risks and opportunities are managed:
  - 2.1 Costs of recycled and recovered materials;
  - 2.2 Constraints related to accessing the necessary supply of recycled and recovered fiber;
  - 2.3 Recycling infrastructure needed by the entity or external paper collection facilities;
  - 2.4 Consumer behavior to improve recovery of paper for recycling;
  - 2.5 Virgin wood-fiber sourcing risks;
  - 2.6 Improving paper recovery rates;
  - 2.7 Regulation related to consumer recycling or minimum recycled content usage;
  - 2.8 Quality of fiber needed for products and the intended use of fiber for different product segments;
  - 2.9 Product innovation opportunities; and
  - 2.10 Increased revenue and reputational benefits related to products with recycled or recovered content.
- 3 The entity may disclose a breakdown of its recycled and recovered fiber use by product segment.

## SOLAR TECHNOLOGY & PROJECT DEVELOPERS

### Industry Description

The Solar Technology & Project Developers industry comprises companies that manufacture solar energy equipment, including solar photovoltaic (PV) modules, polysilicon feedstock, solar thermal electricity-generation systems, solar inverters, and other related components. Companies may also develop, build, and manage solar energy projects and offer financing or maintenance services to customers. Two primary technologies are utilized in the industry: PV and concentrated solar power (CSP). Within solar PV, there are two main technologies: crystalline silicon-based solar and thin-film solar, which includes panels made using copper indium gallium selenide and cadmium telluride. The primary markets for solar panels are residential, non-residential (commercial and industrial), and utility-scale projects. Companies in the industry operate globally.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management in Manufacturing	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	RR-ST-130a.1
Water Management in Manufacturing	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	RR-ST-140a.1
	Description of water management risks and discussion of strategies and practices to mitigate those risks	Discussion and Analysis	n/a	RR-ST-140a.2
Management of Energy Infrastructure Integration & Related Regulations	Description of risks associated with integration of solar energy into existing energy infrastructure and discussion of efforts to manage those risks	Discussion and Analysis	n/a	RR-ST-410a.1
	Description of risks and opportunities associated with energy policy and its impact on the integration of solar energy into existing energy infrastructure	Discussion and Analysis	n/a	RR-ST-410a.2

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Total capacity of photovoltaic (PV) solar modules produced <sup>76</sup>	Quantitative	Megawatts (MW)	RR-ST-000.A
Total capacity of completed solar energy systems <sup>77</sup>	Quantitative	Megawatts (MW)	RR-ST-000.B

<sup>76</sup> Note to **RR-ST-000.A** – PV solar modules are defined in accordance with the U.S. DOE Solar Energy Glossary: photovoltaic (PV) module.

<sup>77</sup> Note to **RR-ST-000.B** – Solar energy systems are defined as any system that converts sunlight into electrical energy, in accordance with the U.S. DOE Solar Energy Glossary, including, but not limited to, “photovoltaic (PV) system” and “solar thermal electric systems.” Completed systems

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Total project development assets <sup>78</sup>	Quantitative	Reporting currency	RR-ST-000.C

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are defined by the entity, consistent with its existing public disclosure of completed systems.

<sup>78</sup>

Note to **RR-ST-000.C** – Project development assets are defined by the entity, consistent with its existing public disclosure of project development assets, regardless of terminology used by the entity (e.g., “Project assets,” “Project assets—plants and land,” “Solar Energy Systems Held for Development and Sale,” etc.). At a minimum, project development assets include assets that are associated with solar energy systems that are under development or fully developed, owned by the entity, and held for sale or intended to be sold to a third party prior to the execution of a definitive sales agreement, and assets that consist primarily of capitalized costs incurred in connection with the development of solar energy systems.

# Energy Management in Manufacturing

## Topic Summary

Solar panel manufacturing typically uses electrical energy purchased from the grid. Energy can account for a considerable share of the total cost of production. In light of rising energy costs and regulatory uncertainty surrounding the future of fossil-based energy, companies that diversify their energy sources may be better able to manage the associated risks and maintain a reliable energy supply. Companies that minimize their energy use through effective energy management can reduce costs and gain a competitive advantage through operational efficiency and competitive pricing of products. This is particularly important given the intense price competition within the solar technology industry.

## Accounting Metrics

### **RR-ST-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

- 3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.
- 3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:
- 3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;
  - 3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.
- 4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

# Water Management in Manufacturing

## Topic Summary

Solar photovoltaic panel manufacturing can be water-intensive, and ultra-pure water is a critical input in some processes. The manufacturing process can also generate wastewater, which must be treated before disposal or reuse, and can therefore result in operating costs and additional capital expenditures. Furthermore, depending on their location, solar equipment manufacturing facilities may be exposed to the risk of reduced water availability (scarcity) and related cost increases or operational disruptions. The use of local water resources is a risk that can generate tension with local water users, potentially disrupting manufacturing operations and adversely impacting brand value. To mitigate water supply and treatment risks, companies can adopt various strategies such as recycling process water, improving production techniques to lower water intensity, and improving water treatment systems.

## Accounting Metrics

### **RR-ST-140a.1. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.
  - 1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 2.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:
    - 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 3.1.2 Water that is directly or indirectly incorporated into the entity's product or service;
    - 3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.



- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

## **RR-ST-140a.2. Description of water management risks and discussion of strategies and practices to mitigate those risks**

- 1 The entity shall describe its water management risks associated with water withdrawals, water consumption, and discharge of water and/or wastewater.
  - 1.1 Risks associated with water withdrawals and water consumption include risks to the availability of adequate, clean water resources, including, but not limited to:
    - 1.1.1 Environmental constraints—such as operating in water-stressed regions, drought, concerns of aquatic impingement or entrainment, interannual or seasonal variability, and risks due to the impact of climate change
    - 1.1.2 Regulatory and financial constraints—such as volatility in water costs, stakeholder perceptions and concerns related to water withdrawals (e.g., those from local communities, non-governmental organizations, and regulatory agencies), direct competition with and impact from the actions of other users (e.g., commercial and municipal users), restrictions to withdrawals due to regulations, and constraints on the entity’s ability to obtain and retain water rights or permits
  - 1.2 Risks associated with the discharge of water and/or wastewater, include, but are not limited to, the ability to obtain rights or permits related to discharges, compliance with regulations related to discharges, restrictions to discharges, the ability to maintain control over the temperature of water discharges, liabilities and/or reputational risks, and increased operating costs due to regulation, stakeholder perceptions and concerns related to water discharges (e.g., those from local communities, non-governmental organizations, and regulatory agencies).
- 2 The entity may describe water management risks in the context of:
  - 2.1 How risks may vary by withdrawal source, including surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities; and
  - 2.2 How risks may vary by discharge destinations, including surface water, groundwater, or wastewater utilities.
- 3 The entity may discuss the potential impacts that water management risks may have on its operations and the timeline over which such risks are expected to manifest.

- 3.1 Impacts may include, but are not limited to, those associated with costs, revenues, liabilities, continuity of operations, and reputation.
- 4 The entity shall discuss its short-term and long-term strategies or plan to mitigate water management risks, including, but not limited to:
  - 4.1 The scope of its strategy, plans, goals and/or targets, such as how they relate to different business units, geographies, or water-consuming operational processes.
  - 4.2 Any water management goals and/or targets it has prioritized, and an analysis of performance against those goals and/or targets.
    - 4.2.1 Goals and targets may include, but are not limited to, those associated with reducing water withdrawals, reducing water consumption, reducing water discharges, reducing aquatic impingements, improving the quality of water discharges, and regulatory compliance.
  - 4.3 The activities and investments required to achieve the plans, goals and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 4.4 Disclosure of strategies, plans, goals, and/or targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.
- 5 For water management targets, the entity shall additionally disclose:
  - 5.1 Whether the target is absolute or intensity-based, and the metric denominator if it is an intensity-based target.
  - 5.2 The timelines for the water management plans, including the start year, the target year, and the base year.
  - 5.3 The mechanism(s) for achieving the target, including:
    - 5.3.1 Efficiency efforts, such as the use of water recycling and/or closed-loop systems;
    - 5.3.2 Product innovations such as redesigning products or services to require less water;
    - 5.3.3 Process and equipment innovations, such as those that enable the reduction of aquatic impingements or entrainments;
    - 5.3.4 Use of tools and technologies (e.g., the [World Wildlife Fund Water Risk Filter](#), [The Global Water Tool](#), and [Water Footprint Network Footprint Assessment Tool](#)) to analyze water use, risk, and opportunities; and
    - 5.3.5 Collaborations or programs in place with the community or other organizations.
  - 5.4 The percentage reduction or improvement from the base year, where the base year is the first year against which water management targets are evaluated toward the achievement of the target.
- 6 The entity shall discuss whether its water management practices result in any additional lifecycle impacts or trade-offs in its organization, including trade-offs in land use, energy production, and greenhouse gas (GHG) emissions, and why the entity chose these practices despite lifecycle trade-offs.

# Management of Energy Infrastructure Integration & Related Regulations

## Topic Summary

Companies in the industry have faced challenges in establishing solar energy as a cost-competitive means of energy production and GHG reduction, and have thus encountered difficulty in capturing a greater share of global energy generation. In order to promote greater adoption of solar, the industry can benefit by preventing systemic disruptions to the existing energy infrastructure and essential energy services. Companies are innovating to overcome the technical challenges of increasing solar integration with the grid. They are also engaging with regulatory agencies and policymakers to reduce regulatory barriers to the adoption of solar energy, many of which are emerging due to the concern around increasing overall grid electricity costs and grid disruptions. Solar companies are investing in innovative technologies to reduce hardware and installation costs, and are working toward business-model innovation to reduce the cost of capital and facilitate the purchase of solar energy systems. Solar technology companies can improve their competitiveness through deploying one or more of these strategies successfully to ensure their ability to scale over the long term.

## Accounting Metrics

### RR-ST-410a.1. Description of risks associated with integration of solar energy into existing energy infrastructure and discussion of efforts to manage those risks

- 1 The entity shall describe risks, challenges, and barriers surrounding the integration of solar energy into the existing energy infrastructure in terms of its products and services.
  - 1.1 Relevant information to provide may include, but is not limited to:
    - 1.1.1 Technological barriers to increased integration of solar energy, such as limited transmission network connectivity, lack of access to high-capacity transmission networks, variability in interconnection standards, and inverter interconnection requirements;
    - 1.1.2 Operational barriers to increased integration of solar energy, such as curtailment and challenges associated with the variable nature of solar energy; and
    - 1.1.3 Customer motivations for seeking increased integration of solar energy, such as economic advantages, regulatory compliance, risk mitigation, and public perception or reputational risk.
- 2 The entity shall discuss its strategy and approach to design, development, and sales in order to integrate solar energy into the existing energy infrastructure.
  - 2.1 Relevant strategies and approaches may include, but are not limited to:
    - 2.1.1 Technical product design;
    - 2.1.2 Development of new products or product components (e.g., smart inverters);

- 2.1.3 Technical innovation designed to reduce the cost of solar energy modules and/or systems;
  - 2.1.4 Third-party partnerships and product integrations;
  - 2.1.5 Project design (e.g., project siting in regions with reduced curtailment risk);
  - 2.1.6 Project risk transfer (e.g., power purchase agreements (PPAs) with curtailment caps);
  - 2.1.7 Marketing and sales (e.g., focus on regions or customer segments with less grid integration risk);
  - 2.1.8 The incorporation of energy storage technology, or “smart grid” technology, into solar energy systems, whether through proprietary technological development or collaboration with third parties;
  - 2.1.9 Products designed to operate “off-grid” or as part of “micro-grids;”
  - 2.1.10 Innovation designed to decrease solar energy’s levelized cost of energy (LCOE) through the reduction in “soft costs,” including financing, leasing, customer acquisition, and development costs; and
  - 2.1.11 Innovation designed to increase the total addressable solar energy market.
- 2.2 Relevant information to provide includes, but is not limited to:
- 2.2.1 Whether the entity pursues multiple approaches;
  - 2.2.2 Whether the entity’s approach differs by market;
  - 2.2.3 The intensity of R&D requirements for the entity’s approach and strategy;
  - 2.2.4 The level of competition relative to the entity’s approach and strategy; and
  - 2.2.5 How the entity evaluates the success of its approach.
- 3 The scope of disclosure shall include all of the entity’s solar energy-related products, product components, projects, project development efforts, and services, as well as the associated marketing and sales strategies, in the markets in which the entity operates.
- 4 The entity may describe how energy infrastructure influences the establishment of sales targets, strategies for specific product categories, technologies or marketing practices in specific regions, research and development (R&D) objectives, and partnerships.

**RR-ST-410a.2. Description of risks and opportunities associated with energy policy and its impact on the integration of solar energy into existing energy infrastructure**

- 1 The entity shall discuss its risks and opportunities associated with energy policy and the impact energy policy has on the integration of solar energy into existing energy infrastructure, where:
- 1.1 Relevant risks and opportunities may include, but are not limited to:
    - 1.1.1 Direct or indirect government subsidization of solar energy;
    - 1.1.2 International trade policy disputes and agreements;
    - 1.1.3 Public policies that establish minimum requirements for renewable energy generation (e.g., renewable portfolio standards);
    - 1.1.4 Public policies that affect the monetization of solar energy generation, including, but not limited to, net metering, time-of-use rates, feed-in tariffs, utility fixed fees, and renewable energy priority dispatch;

- 1.1.5 Public policies that affect the financing and tax structure of solar energy, including, but not limited to, investment tax credits, property-assessed clean energy, loan guarantees, and depreciation schedules;
  - 1.1.6 Public policies pertaining to any external social costs created by distributed solar energy generation;
  - 1.1.7 Policies pertaining to electricity transmission, including, but not limited to, regional transmission planning, interconnected transmission networks, interconnection standards, and high-capacity transmission networks;  
and
  - 1.1.8 Replacements to aging energy-generation and transmission infrastructure.
- 2 The entity shall identify risks and opportunities it faces related to legislation, regulation, rule-making, and the overall political environment (hereafter referred to collectively as “regulatory and political environment”) related to energy policy and the integration of solar energy into energy infrastructure.
- 2.1 The scope shall include existing, emerging, and known future risks and opportunities.
  - 2.2 The scope shall include risks and opportunities that may exist at the local, state, and national levels, international governmental organizations, and regulatory organizations.
    - 2.2.1 The scope shall include the relevant policies of utilities, rule-makers, and regulators.
- 3 Relevant information to provide includes, but is not limited to, the impact on demand for the entity’s solar energy products and services and the impact on business viability related to risks and opportunities associated with energy policy and the impact energy policy has on the integration of solar energy into the existing energy infrastructure.

## WIND TECHNOLOGY & PROJECT DEVELOPERS

### Industry Description

The Wind Technology & Project Developers industry comprises companies that manufacture wind turbines, blades, towers, and other components of wind power systems. Companies that develop, build, and manage wind energy projects are also included within the scope of this industry. Manufacturers may also offer post-sale maintenance and support services. Turbines can be installed onshore or offshore, which can cause differences in wind-generating capacity and create challenges in project development for each type of installation. Most major wind technology companies operate globally.

Table 1. *Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Materials Efficiency	Top five materials consumed, by weight	Quantitative	Metric tons (t)	RR-WT-440b.1
	Average top head mass per turbine capacity, by wind turbine class	Quantitative	Metric tons per megawatts (t/MW)	RR-WT-440b.2
	Description of approach to optimize materials efficiency of wind turbine design	Discussion and Analysis	n/a	RR-WT-440b.3

Table 2. *Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of delivered wind turbines, by wind turbine class <sup>79</sup>	Quantitative	Number	RR-WT-000.A
Aggregate capacity of delivered wind turbines, by wind turbine class <sup>80</sup>	Quantitative	Megawatts (MW)	RR-WT-000.B
Amount of turbine backlog <sup>81</sup>	Quantitative	Reporting currency	RR-WT-000.C
Aggregate capacity of turbine backlog <sup>82</sup>	Quantitative	Megawatts (MW)	RR-WT-000.D

<sup>79</sup>

Note to **RR-WT-000.A** – Wind turbine class is defined by the International Electrotechnical Commission’s IEC 61400-1, Edition 3.0—Design requirements. Wind turbine class shall be determined by the rating of the turbine.

<sup>80</sup>

Note to **RR-WT-000.B** – Wind turbine class is defined by the International Electrotechnical Commission’s IEC 61400-1, Edition 3.0—Design requirements. Wind turbine class shall be determined by the rating of the turbine.

<sup>81</sup>

Note to **RR-WT-000.C** – Turbine backlog is defined by the entity, consistent with its existing public disclosure of order backlog. Turbine backlog excludes any backlog amounts resulting from operating and maintenance agreements or other service agreements.

<sup>82</sup>

Note to **RR-WT-000.D** – Turbine backlog is defined by the entity, consistent with its existing public disclosure of order backlog. Turbine backlog excludes any backlog amounts resulting from operating and maintenance agreements or other service agreements.

# Materials Efficiency

## Topic Summary

The Wind Technology & Project Developers industry's long-term success depends on its ability to produce energy at a comparatively lower cost than other energy sources. Steel and other materials purchases are one of the largest cost components of turbines and inputs such as steel have exhibited price volatility in the past. In recent years, wind turbines have grown in size, in terms of both the tower height and the swept area of the rotor, to improve energy output and increase the potential for wind energy production in more areas. To achieve this expansion cost-effectively, companies can employ innovative methods to increase turbine output while using materials more efficiently. This could influence companies' competitiveness and market share, costs of production, and operational risks related to the supply and price volatility of raw materials, as well as the ability of the industry to scale.

## Accounting Metrics

### RR-WT-440b.1. Top five materials consumed, by weight

- 1 For each of the following wind turbine classes, the entity shall disclose the weight, in metric tons, of the five materials consumed in the greatest amounts, by weight, in delivered wind turbines during the reporting period.
- 2 The scope of disclosure includes materials weights in the final delivered turbine, including the nacelle, blades, and tower, and excludes the weight of materials consumed in production (e.g., waste), freight, storage, and installation (e.g., foundation).
- 3 Materials may include, but are not limited to, aluminum, carbon fiber, copper, fiberglass, iron, or steel.
- 4 The entity may disclose the weight of the five materials consumed in the greatest amounts by wind turbine class.
  - 4.1 Wind turbine classes are defined by the International Electrotechnical Commission's IEC 61400-1, Edition 3.0—Design requirements:
    - 4.1.1 IEC Wind Turbine Class I
    - 4.1.2 IEC Wind Turbine Class II
    - 4.1.3 IEC Wind Turbine Class III
    - 4.1.4 IEC Wind Turbine Class IV
    - 4.1.5 IEC Wind Turbine Class S
    - 4.1.6 Turbulence characteristics
    - 4.1.7 Mixed class (e.g., IEC Wind Turbine Class I / II)
    - 4.1.8 Onshore
    - 4.1.9 Offshore
- 5 The entity may disclose additional materials weights that may represent significant materials costs, supply chain risks, or exposure to pricing volatility.

## **RR-WT-440b.2. Average top head mass per turbine capacity, by wind turbine class**

- 1 For each of the following wind turbine classes, the entity shall disclose the average top head mass per turbine capacity of turbines delivered during the reporting period, weighted by turbine deliveries per wind turbine class.
  - 1.1 Wind turbine classes are defined by the International Electrotechnical Commission's IEC 61400-1, Edition 3.0— Design requirements:
    - 1.1.1 IEC Wind Turbine Class I
    - 1.1.2 IEC Wind Turbine Class II
    - 1.1.3 IEC Wind Turbine Class III
    - 1.1.4 IEC Wind Turbine Class IV
    - 1.1.5 IEC Wind Turbine Class S
  - 2 Wind turbine class shall be determined by the rating of the turbine.
  - 3 Average top head mass per turbine capacity shall be calculated as the mass of the top head in metric tons divided by turbine capacity in megawatts (MW).
    - 3.1 The top head shall include the turbine nacelle and the turbine rotor.
    - 3.2 The top head shall exclude the blades.
    - 3.3 Turbine capacity is the rated turbine capacity, defined as the maximum output (generation) of a wind turbine, in megawatts (MW), also referred to as "nameplate capacity."
  - 4 The entity may disclose performance in additional wind turbine classes, including the following:
    - 4.1 Turbulence characteristics
    - 4.2 Mixed class (e.g., IEC Wind Turbine Class I / II)
    - 4.3 Onshore
    - 4.4 Offshore

## **RR-WT-440b.3. Description of approach to optimize materials efficiency of wind turbine design**

- 1 The entity shall describe its approach to improving the materials efficiency of wind turbines, including design considerations and materials selection to optimize:
  - 1.1 Amount of materials consumed
  - 1.2 Capacity and capacity factor by materials consumed
  - 1.3 Lifespan
- 2 The scope of disclosure shall include materials selection and modifications to wind turbine design as well as operational control software (e.g., SCADA systems) that may increase the materials efficiency of wind turbines.



- 2.1 Materials selection includes, but is not limited to, priorities in materials selection, emphasis on materials innovation and development, materials risk assessments, and objectives around materials consumption.
- 2.2 Modifications to wind turbine design include, but are not limited to, innovation in design to reduce materials consumption through reduced turbine weights or tower weights, innovation in design to increase turbine capacity or capacity factor relative to materials consumption, strategies to reduce waste created in turbine manufacturing, and design to reduce materials consumed in installation of wind turbines (e.g., foundation).

## AEROSPACE & DEFENSE

### Industry Description

Companies in the Aerospace & Defense industry include manufacturers of commercial aircraft, aircraft parts, aerospace and defense products, as well as defense prime contractors. Commercial aircraft manufacturers represent approximately one quarter of industry revenues and sell mainly to commercial airlines and governments. Aerospace and defense parts manufacturers represent the largest segment of the industry by total revenue, selling primarily to governments. Both aerospace and defense manufacturers operate globally and serve a global customer base. Defense primes represent approximately one quarter of total industry revenues and manufacture products including military aircraft, space vehicles, missile systems, ammunition, small arms, naval ships, and other commercial and military vehicles. Their customers consist of various government agencies and related businesses with global operations. The defense prime category also includes firearms manufacturers that sell to law enforcement agencies, businesses, distributors, retailers, and consumers. Key sustainability topics within the industry include the energy efficiency and emissions profile of products and management of manufacturing energy and waste.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	RT-AE-130a.1
Fuel Economy & Emissions in Use-phase	Revenue from alternative energy-related products	Quantitative	Reporting currency	RT-AE-410a.1
	Description of approach and discussion of strategy to address fuel economy and greenhouse gas (GHG) emissions of products	Discussion and Analysis	n/a	RT-AE-410a.2

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Production by reportable segment <sup>83</sup>	Quantitative	Number	RT-AE-000.A
Number of employees	Quantitative	Number	RT-AE-000.B

<sup>83</sup>

Note to **RT-AE-000.A** – Production should be disclosed as the number of units produced by product category, where relevant product categories include (1) ground vehicles, (2) aircraft, (3) marine vehicles, (4) vehicle and aircraft components, and (5) space and weapons systems.

# Energy Management

## Topic Summary

Energy is a critical input to the manufacturing processes of aerospace and defense companies. Purchased electricity represents the largest share of energy expenditures in the industry, followed by purchased fuels. The type of energy used, magnitude of consumption, and energy management strategies depends on the type of products manufactured. A company's energy mix, including the use of electricity generated on-site, grid-sourced electricity, and the use of alternative energy, can play an important role in influencing the cost and reliability of energy supply, and ultimately affect the company's cost structure and regulatory risk.

## Accounting Metrics

### **RT-AE-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

- 3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.
- 3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:
- 3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;
  - 3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.
- 4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

# Fuel Economy & Emissions in Use-phase

## Topic Summary

Customer preferences and regulatory drivers are increasing the demand for energy-efficient and reduced-emissions products in the Aerospace & Defense industry. Many of the industry's products are powered by fossil fuels and release greenhouse gases (GHGs) and other air emissions during use. As the designers and manufacturers of most of the global aerospace and defense transportation fleet, companies in this industry have a unique opportunity to support many industries and government agencies that are striving to meet GHG emissions and fuel-management goals and imperatives. Products with higher fuel economy and lower use-phase emissions may be well positioned to capture expanding market share and adapt to changing customer preferences and regulations around fuel economy and emissions.

## Accounting Metrics

### RT-AE-410a.1. Revenue from alternative energy-related products

- 1 The entity shall disclose its total revenue from the sale of alternative energy-related products, where:
  - 1.1 Alternative energy-related products include products such as vehicles, vehicle components, and stationary power generation equipment that rely on alternative fuel or energy as a primary means of propulsion and/or energy production.
  - 1.2 Alternative energy and fuel includes:
    - 1.2.1 Renewable fuel and energy, which is defined as that from sources that are capable of being replenished in a short time through ecological cycles, such as geothermal, wind, solar, hydroelectric, and biomass (including ethanol, first-generation biofuels, and advanced biofuels)
    - 1.2.2 Hydrogen fuel and fuel cells including those that operate using natural gas, propane, and methanol
  - 1.3 Electric, hybrid electric, and dual-fueled products for which one of the fuel sources is an alternative fuel shall be considered within the scope of disclosure.

### RT-AE-410a.2. Description of approach and discussion of strategy to address fuel economy and greenhouse gas (GHG) emissions of products

- 1 The entity shall describe its approach and discuss its strategies for improving the fuel economy and reducing the use-phase greenhouse gas (GHG) emissions of its products.
- 2 Relevant aspects of the approach and strategy include improvements to existing products and technologies, the introduction of new technologies, research and development efforts into advanced technologies, and partnerships with peers, academic institutions, and/or customers (including governmental customers).

- 3 Relevant technologies to describe include, but are not limited to, those related to materials design and engineering, advanced powertrains, renewable fuels, energy storage and batteries, aerodynamic design, and products and fuels that otherwise result in reduced GHG emissions, where:
  - 3.1 Advanced powertrain technologies include vehicles and vehicle components that are electric, hybrid electric, plug-in hybrid, dual-fuel, and zero-emissions (e.g., fuel cell).
  - 3.2 Renewable fuels and energy technologies are those that operate on sources that are capable of being replenished in a short time through ecological cycles, including geothermal, wind, solar, hydroelectric, and biomass (including ethanol, first-generation biofuels, and advanced biofuels).
  - 3.3 Products that result in reduced GHG emissions include any vehicle or technology that achieves a significant reduction in petroleum consumption as well as advanced lean burn technology vehicles and technologies, as described in the [U.S. National Defense Authorization Act of 2008](#).
  - 3.4 Fuels that result in reduced GHG emissions further include denatured alcohol, methanol, mixtures containing up to 85 percent methanol or denatured ethanol, natural gas, and propane (liquefied petroleum gas), as described in the [U.S. Energy Policy Act \(EP Act\) of 2005](#).
  - 3.5 Where relevant, the entity shall discuss the technologies it is prioritizing to improve the fuel economy and reduce the GHG emissions of its products, such as the specific type of fuel systems it is developing (e.g., hybrid, electric, or fuel cell).
- 4 The entity shall describe the factors influencing these efforts, such as meeting civil customer demand, alignment with industry initiatives, and/or meeting requirements of federal procurement programs and initiatives, where:
  - 4.1 Relevant programs and initiatives to describe include, but are not limited to, [U.S. Executive Order 13693](#) and the [International Civil Aviation Organization Resolution A38-18](#).
- 5 The entity may describe the benchmarks it uses to measure improvements in product fuel efficiency for relevant vehicles and/or vehicle system segments, including a description of targets for fuel efficiency improvements.
- 6 The entity may provide measurements of fuel efficiency and fuel efficiency improvements for its relevant vehicle and/or vehicle systems segments.
  - 6.1 Measurements of fuel efficiency and fuel efficiency improvements may include:
    - 6.1.1 Inherent fuel efficiency measurements, such as miles per gallon for vehicles and vessels and 1/Specific Air Range for aerospace vehicles
    - 6.1.2 Year-over-year fuel efficiency improvements
- 7 The entity may discuss how customer demand and requirements affect fuel efficiency measures and improvements, where relevant.

## CHEMICALS

### Industry Description

Companies in the Chemicals industry transform organic and inorganic feedstocks into more than 70,000 diverse products with a range of industrial, pharmaceutical, agricultural, housing, automotive, and consumer applications. The industry is commonly segmented into basic (commodity) chemicals, agricultural chemicals, and specialty chemicals. Basic chemicals, the largest segment by volume produced, include bulk polymers, petrochemicals, inorganic chemicals, and other industrial chemicals. Agricultural chemicals include fertilizers, crop chemicals, and agricultural biotechnology. Specialty chemicals include paints and coatings, agrochemicals, sealants, adhesives, dyes, industrial gases, resins, and catalysts. Larger firms may produce basic, agricultural, and specialty chemicals, while most companies are specialized. Chemicals companies typically manufacture and sell products globally.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations	Quantitative	Metric tons (t) CO <sub>2</sub> -e, Percentage (%)	RT-CH-110a.1
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	RT-CH-110a.2
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable, (4) total self-generated energy <sup>84</sup>	Quantitative	Gigajoules (GJ), Percentage (%)	RT-CH-130a.1
Water Management	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	RT-CH-140a.1
	Number of incidents of non-compliance associated with water quality permits, standards, and regulations	Quantitative	Number	RT-CH-140a.2
	Description of water management risks and discussion of strategies and practices to mitigate those risks	Discussion and Analysis	n/a	RT-CH-140a.3
Product Design for Use-phase Efficiency	Revenue from products designed for use-phase resource efficiency	Quantitative	Reporting currency	RT-CH-410a.1

<sup>84</sup>

Note to **RT-CH-130a.1** – The entity shall discuss its efforts to reduce energy consumption and/or improve energy efficiency throughout the production processes.

# Greenhouse Gas Emissions

## Topic Summary

Chemical manufacturing generates direct (Scope 1) greenhouse gas (GHG) emissions from the combustion of fossil fuels in manufacturing and cogeneration processes, as well as process emissions from the chemical transformation of feedstocks. GHG emissions can create regulatory compliance costs or penalties and operating risks for chemicals companies. However, resulting financial impacts will vary depending on the magnitude of emissions and the prevailing emissions regulations. The industry may be subject to increasingly stringent regulations as nations seek to limit or reduce emissions. Companies that cost-effectively manage GHG emissions through greater energy efficiency, the use of alternative fuels, or manufacturing process advances may benefit from improved operating efficiency and reduced regulatory risk, among other financial benefits.

## Accounting Metrics

### RT-CH-110a.1. Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e), and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:
    - 2.1.1 Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources published by the U.S. Environmental Protection Agency (EPA)
    - 2.1.2 India GHG Inventory Program
    - 2.1.3 ISO 14064-1
    - 2.1.4 Petroleum Industry Guidelines for reporting GHG emissions, 2nd edition, 2011, published by IPIECA



- 2.1.5 Protocol for the quantification of greenhouse gas emissions from waste management activities published by Entreprises pour l'Environnement (EpE)
  - 2.1.6 WBCSD Guidance for Accounting & Reporting Corporate GHG Emissions in the Chemical Sector Value Chain
  - 2.2 GHG emissions data shall be consolidated and disclosed according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the "financial control" approach defined by the GHG Protocol, and the approach published by the Climate Disclosure Standards Board (CDSB) described in REQ-07, "Organisational boundary," of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).
- 3 The entity shall disclose the percentage of its gross global Scope 1 GHG emissions that are covered under an emissions-limiting regulation or program that is intended to directly limit or reduce emissions, such as cap-and-trade schemes, carbon tax/fee systems, and other emissions control (e.g., command-and-control approach) and permit-based mechanisms.
- 3.1 Examples of emissions-limiting regulations include, but are not limited to:
    - 3.1.1 California Cap-and-Trade (California Global Warming Solutions Act)
    - 3.1.2 European Union Emissions Trading Scheme (EU ETS)
    - 3.1.3 Quebec Cap-and-Trade (Draft Bill 42 of 2009)
  - 3.2 The percentage shall be calculated as the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e) that are covered under emissions-limiting regulations divided by the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e).
    - 3.2.1 For emissions that are subject to multiple emissions-limiting regulations, the entity shall not account for those emissions more than once.
  - 3.3 The scope of emissions-limiting regulations excludes emissions covered under voluntary emissions-limiting regulations (e.g., voluntary trading systems), as well as reporting-based regulations [e.g., the U.S. Environmental Protection Agency (EPA) GHG Reporting Program].
- 4 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 5 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 6 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

## **RT-CH-110a.2. Discussion of long-term and short-term strategy or plan to manage Scope 1**

## **emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined according to *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 2.2 Whether the target is absolute- or intensity-based, and the metric denominator, if it is an intensity-based target;
  - 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated toward the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;
  - 2.5 The mechanism(s) for achieving the target; and
  - 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset.
- 3 The entity shall discuss the activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
- 4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as how they relate to different business units, geographies, or emissions sources.
- 5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
- 6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

# Energy Management

## Topic Summary

Chemical manufacturing is typically energy-intensive, with energy used to power processing units, cogeneration plants, machinery, and non-manufacturing facilities. The type of energy used, magnitude of consumption, and energy management strategies depends on the type of products manufactured. Typically, fossil fuels including natural gas and natural gas liquids are the predominant form of non-feedstock energy used, while purchased electricity may also represent a significant share. Therefore, energy purchases can represent a significant share of production costs. A company's energy mix may include energy generated onsite, purchased grid electricity and fossil fuels, and renewable and alternative energy. Tradeoffs in the use of such energy sources include cost, reliability of supply, related water use and air emissions, and regulatory compliance and risk. As such, a company's energy intensity and energy sourcing decisions may affect its operating efficiency and risk profile over time.

## Accounting Metrics

### **RT-CH-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable, (4) total self-generated energy**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a

Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the Green-e Framework for Renewable Energy Certification, Version 1.0 (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

4 The entity shall disclose (4) the amount of energy self-generated by the entity as an aggregate figure, in gigajoules (GJ).

4.1 The entity may disclose the amount of self-generated energy that it sold to an electric utility or end-use customer.

4.2 The entity may disclose the amount of self-generated energy that was renewable energy, where renewable energy is defined above.

5 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

Note to **RT-CH-130a.1**

1 The entity shall discuss its efforts to reduce energy consumption and/or improve energy efficiency throughout the manufacturing and production processes.

2 The entity shall discuss implementation of Green Chemistry Principle 6, “[Design for Energy Efficiency](#),” including, where relevant, efforts such as conducting reactions at ambient temperature and pressure, reducing key materials that require energy-intensive processing (e.g., distillation and drying), using excess steam and heat to generate energy, improving catalytic processes, and other process improvements that result in gains in energy efficiency.

- 2.1 Relevant strategies to discuss include the use of incremental improvement, the implementation of best practice technology, the use of emerging technologies, and the development of “game changers,” consistent with the [International Council of Chemical Associations \(ICCA\) Technology Road Map](#).
- 3 The entity may disclose the aggregate energy savings (in gigajoules) achieved through such efforts and processes.

# Water Management

## Topic Summary

Water is a critical input in chemicals production and is used primarily for cooling, steam generation, and feedstock processing. Long-term historic increases in water scarcity and cost, and expectations of continued increases—due to overconsumption and constrained supplies, resulting from population growth and shifts, pollution, and climate change—indicate the heightened importance of water management. Water scarcity can result in a higher risk of operational disruption for companies with water-intensive operations and can also increase water procurement costs and capital expenditures. Meanwhile, chemical manufacturing can generate process wastewater that must be treated before disposal. Non-compliance with water quality regulations may result in regulatory compliance and mitigation costs or legal expenses stemming from litigation. Reducing water use and consumption through increased efficiency and other water management strategies may lead to lower operating costs over time and may mitigate financial impacts of regulations, water supply shortages, and community-related disruptions of operations.

## Accounting Metrics

### **RT-CH-140a.1. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.
  - 1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 2.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:
    - 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 3.1.2 Water that is directly or indirectly incorporated into the entity's product or service;

3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.

- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

### **RT-CH-140a.2. Number of incidents of non-compliance associated with water quality permits, standards, and regulations**

- 1 The entity shall disclose the total number of instances of non-compliance, including violations of a technology-based standard and exceedances of quantity and/or quality-based standards.
- 2 The scope of disclosure includes incidents governed by national, state, and local statutory permits and regulations, including, but not limited to, the discharge of a hazardous substance, violation of pretreatment requirements, or total maximum daily load (TMDL) exceedances.
- 3 The scope of disclosure shall only include incidents of non-compliance that resulted in a formal enforcement action (s).
  - 3.1 Formal enforcement actions are defined as governmental actions that address a violation or threatened violation of water quantity and/or quality laws, regulations, policies, or orders, and can result in administrative penalty orders, administrative orders, and judicial actions, among others. For example, the U.S. Environmental Protection Agency (EPA) provides guidance on the scope of formal enforcement actions in, [Informal and Formal Actions, Summary Guidance and Portrayal on EPA Websites](#).
- 4 Violations shall be disclosed, regardless of their measurement methodology or frequency. These include violations for:
  - 4.1 Continuous discharges, limitations, standards, and prohibitions that are generally expressed as maximum daily, weekly average, and monthly averages
  - 4.2 Non-continuous discharges and limitations that are generally expressed in terms of frequency, total mass, maximum rate of discharge, and mass or concentration of specified pollutants

### **RT-CH-140a.3. Description of water management risks and discussion of strategies and practices to mitigate those risks**

- 1 The entity shall describe its water management risks associated with water withdrawals, water consumption, and discharge of water and/or wastewater.

- 1.1 Risks associated with water withdrawals and water consumption include risks to the availability of adequate, clean water resources, including, but not limited to:
  - 1.1.1 Environmental constraints—such as operating in water-stressed regions, drought, concerns of aquatic impingement or entrainment, interannual or seasonal variability, and risks due to the impact of climate change
  - 1.1.2 Regulatory and financial constraints—such as volatility in water costs, stakeholder perceptions and concerns related to water withdrawals (e.g., those from local communities, non-governmental organizations, and regulatory agencies), direct competition with and impact from the actions of other users (e.g., commercial and municipal users), restrictions to withdrawals due to regulations, and constraints on the entity’s ability to obtain and retain water rights or permits
- 1.2 Risks associated with the discharge of water and/or wastewater, include, but are not limited to, the ability to obtain rights or permits related to discharges, compliance with regulations related to discharges, restrictions to discharges, the ability to maintain control over the temperature of water discharges, liabilities and/or reputational risks, and increased operating costs due to regulation, stakeholder perceptions and concerns related to water discharges (e.g., those from local communities, non-governmental organizations, and regulatory agencies).
- 2 The entity may describe water management risks in the context of:
  - 2.1 How risks may vary by withdrawal source, including surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities; and
  - 2.2 How risks may vary by discharge destinations, including surface water, groundwater, or wastewater utilities.
- 3 The entity may discuss the potential impacts that water management risks may have on its operations and the timeline over which such risks are expected to manifest.
  - 3.1 Impacts may include, but are not limited to, those associated with costs, revenues, liabilities, continuity of operations, and reputation.
- 4 The entity shall discuss its short-term and long-term strategies or plan to mitigate water management risks, including, but not limited to:
  - 4.1 The scope of its strategy, plans, goals and/or targets, such as how they relate to different business units, geographies, or water-consuming operational processes.
  - 4.2 Any water management goals and/or targets it has prioritized, and an analysis of performance against those goals and/or targets.
    - 4.2.1 Goals and targets may include, but are not limited to, those associated with reducing water withdrawals, reducing water consumption, reducing water discharges, reducing aquatic impingements, improving the quality of water discharges, and regulatory compliance.



- 4.3 The activities and investments required to achieve the plans, goals and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 4.4 Disclosure of strategies, plans, goals, and/or targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.
- 5 For water management targets, the entity shall additionally disclose:
- 5.1 Whether the target is absolute or intensity-based, and the metric denominator if it is an intensity-based target.
  - 5.2 The timelines for the water management plans, including the start year, the target year, and the base year.
  - 5.3 The mechanism(s) for achieving the target, including:
    - 5.3.1 Efficiency efforts, such as the use of water recycling and/or closed-loop systems;
    - 5.3.2 Product innovations such as redesigning products or services to require less water;
    - 5.3.3 Process and equipment innovations, such as those that enable the reduction of aquatic impingements or entrainments;
    - 5.3.4 Use of tools and technologies (e.g., the [World Wildlife Fund Water Risk Filter](#), [The Global Water Tool](#), and [Water Footprint Network Footprint Assessment Tool](#)) to analyze water use, risk, and opportunities; and
    - 5.3.5 Collaborations or programs in place with the community or other organizations.
  - 5.4 The percentage reduction or improvement from the base year, where the base year is the first year against which water management targets are evaluated toward the achievement of the target.
- 6 The entity shall discuss whether its water management practices result in any additional lifecycle impacts or tradeoffs in its organization, including tradeoffs in land use, energy production, and greenhouse gas (GHG) emissions, and why the entity chose these practices despite lifecycle tradeoffs.

# Product Design for Use-phase Efficiency

## Topic Summary

As increasing resource scarcity and regulations drive the need for greater materials efficiency and lower energy consumption and emissions, the Chemicals industry stands to benefit from developing products that enhance customer efficiency. From reducing automobile emissions through materials optimization to improving the performance of building insulation, chemical industry products can enhance efficiency across a multitude of applications. Companies that develop cost-effective solutions to address customers' needs for improved efficiency can therefore benefit from increased revenues and market share, stronger competitive positioning, and enhanced brand value.

## Accounting Metrics

### RT-CH-410a.1. Revenue from products designed for use-phase resource efficiency

- 1 The entity shall disclose its total revenue from products that are designed to increase resource efficiency during their use-phase.
  - 1.1 Products designed to increase resource efficiency are defined as those that — through their use — can be shown to improve energy efficiency, eliminate or lower greenhouse gas (GHG) emissions, reduce raw materials consumption, increase product longevity, and/or reduce water consumption.
  - 1.2 The use-phase is defined as the course over which the entity's product is used by a customer or consumer as a final product and/or the course over which the entity's product is used by a customer or consumer to generate a final product (e.g., in a manufacturing or production process).
- 2 A product shall be considered to have been designed to increase use-phase resource efficiency if documentation shows that the entity has tested, modeled, or otherwise established the increase to resource efficiency its product delivers during its use phase.
  - 2.1 The scope of disclosure includes products that eliminate emissions during the use-phase, the need for a raw material, or the need for a process component like water.
  - 2.2 The scope of disclosure includes products that impart an incremental improvement to resource efficiency, insofar as the entity can demonstrate that the improvement is meaningful, such as through alignment with the milestones set forth in Section 5, "Key Sectors" of the European Commission's [Road Map to a Resource Efficient Europe](#) and/or with EU Directive 2012/27/EU.
  - 2.3 The scope of disclosure excludes products that impart improved resource efficiency in an ancillary, indirect, or minimal way (e.g., a conventional product that is slightly lighter than the previous generation of the product).
- 3 Examples of products that increase resource efficiency include, but are not limited to, insulation materials, high-albedo paints and coating, fuel additives that result in more efficient combustion, energy-efficient lighting materials, additives or

materials that extend the useful-life of use-phase products, materials that enable vehicle lightweighting (e.g., polymers to replace metals), biofuels, solar films, solar shingles, and other renewable energy materials.

## CONTAINERS & PACKAGING

### Industry Description

The Containers & Packaging industry converts raw materials, including metal, plastic, paper, and glass, into semi-finished or finished packaging products. Companies produce a wide range of products, including: corrugated cardboard packaging, food and beverage containers, bottles for household products, aluminum cans, steel drums, and other forms of packaging. Companies in the industry typically function as business-to-business entities and many operate globally.

Table 1. *Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations	Quantitative	Metric tons (t) CO <sub>2</sub> -e, Percentage (%)	RT-CP-110a.1
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	RT-CP-110a.2
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable, (4) total self-generated energy	Quantitative	Gigajoules (GJ), Percentage (%)	RT-CP-130a.1
Water Management	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	RT-CP-140a.1
	Description of water management risks and discussion of strategies and practices to mitigate those risks	Quantitative	n/a	RT-CP-140a.2
	Number of incidents of non-compliance associated with water quality permits, standards, and regulations	Quantitative	Number	RT-CP-140a.3
Waste Management	Amount of hazardous waste generated, percentage recycled <sup>85</sup>	Quantitative	Metric tons (t), Percentage (%)	RT-CP-150a.1
Supply Chain Management	Total wood fiber procured, percentage from certified sources	Quantitative	Metric tons (t), Percentage (%)	RT-CP-430a.1
	Total aluminum purchased, percentage from certified sources	Quantitative	Metric tons (t), Percentage (%)	RT-CP-430a.2

<sup>85</sup>

Note to **RT-CP-150a.1** – The entity shall disclose the legal or regulatory framework(s) used to define hazardous waste and recycled hazardous waste, and the amounts of waste defined in accordance with each applicable framework.

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Amount of production, by substrate <sup>86</sup>	Quantitative	Metric tons (t)	RT-CP-000.A
Percentage of production as: (1) paper/wood, (2) glass, (3) metal, and (4) plastic	Quantitative	Percentage (%) by revenue	RT-CP-000.B
Number of employees	Quantitative	Number	RT-CP-000.C

<sup>86</sup>

Note to **RT-CP-000.A** – Relevant substrates include paper and/or wood fiber, glass, metal, and petroleum-based substrates (i.e., polymers).

# Greenhouse Gas Emissions

## Topic Summary

The Containers & Packaging industry generates direct (Scope 1) greenhouse gas (GHG) emissions from the combustion of fossil fuels in manufacturing and cogeneration processes. GHG emissions can create regulatory compliance costs or penalties and operating risks for companies in the industry. However, resulting financial impacts will vary depending on the magnitude of emissions and the prevailing emissions regulations. The industry may be subject to increasingly stringent regulations as nations seek to limit or reduce emissions. Companies that cost-effectively manage GHG emissions through greater energy efficiency, the use of alternative fuels, or manufacturing process advances could benefit from improved operating efficiency and reduced regulatory risk, among other financial benefits.

## Accounting Metrics

### RT-CP-110a.1. Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e), and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:
    - 2.1.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)
    - 2.1.2 *Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources* published by the U.S. Environmental Protection Agency (EPA)
    - 2.1.3 India GHG Inventory Program
    - 2.1.4 ISO 14064-1

- 2.1.5 Petroleum Industry Guidelines for reporting GHG emissions, 2nd edition, 2011, published by IPIECA
- 2.1.6 Protocol for the quantification of greenhouse gas emissions from waste management activities published by Entreprises pour l'Environnement (EpE)
- 2.2 GHG emissions data shall be consolidated and disclosed according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the "financial control" approach defined by the GHG Protocol, and the approach published by the Climate Disclosure Standards Board (CDSB) described in REQ-07, "Organisational boundary," of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).
- 3 The entity shall disclose the percentage of its gross global Scope 1 GHG emissions that are covered under an emissions-limiting regulation or program that is intended to directly limit or reduce emissions, such as cap-and-trade schemes, carbon tax/fee systems, and other emissions control (e.g., command-and-control approach) and permit-based mechanisms.
  - 3.1 Examples of emissions-limiting regulations include, but are not limited to:
    - 3.1.1 California Cap-and-Trade (California Global Warming Solutions Act)
    - 3.1.2 European Union Emissions Trading Scheme (EU ETS)
    - 3.1.3 Quebec Cap-and-Trade (Draft Bill 42 of 2009)
  - 3.2 The percentage shall be calculated as the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e) that are covered under emissions-limiting regulations divided by the total amount of gross global Scope 1 GHG emissions (CO<sub>2</sub>-e).
    - 3.2.1 For emissions that are subject to multiple emissions-limiting regulations, the entity shall not account for those emissions more than once.
  - 3.3 The scope of emissions-limiting regulations excludes emissions covered under voluntary emissions-limiting regulations (e.g., voluntary trading systems), as well as reporting-based regulations [e.g., the U.S. Environmental Protection Agency (EPA) GHG Reporting Program].
- 4 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 5 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 6 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

## **RT-CP-110a.2. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined according to *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, Revised Edition* (GHG Protocol), March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 2.2 Whether the target is absolute- or intensity-based, and the metric denominator, if it is an intensity-based target;
  - 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated toward the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;
  - 2.5 The mechanism(s) for achieving the target; and
  - 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset.
- 3 The entity shall discuss the activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
- 4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as how they relate to different business units, geographies, or emissions sources.
- 5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
- 6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.



# Energy Management

## Topic Summary

Containers and packaging manufacturing is energy-intensive, with energy used to power processing units, cogeneration plants, machinery, and non-manufacturing facilities. The type of energy used, magnitude of consumption, and energy management strategies depend on the type of products manufactured. Typically, fossil fuels such as natural gas and biomass are the predominant form of energy used, while purchased electricity may also represent a significant share. Therefore, energy purchases can represent a significant share of production costs. A company's energy mix may include energy generated onsite, purchased grid electricity and fossil fuels, and renewable and alternative energy. Trade-offs in the use of such energy sources include cost, reliability of supply, related water use and air emissions, and regulatory compliance and risk. As such, a company's energy intensity and energy sourcing decisions can affect its operating efficiency and risk profile over time.

## Accounting Metrics

### **RT-CP-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable, (4) total self-generated energy**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a

Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the [Green-e Framework for Renewable Energy Certification, Version 1.0](#) (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

4 The entity shall disclose (4) the amount of energy self-generated by the entity as an aggregate figure, in gigajoules (GJ).

4.1 The entity may disclose the amount of self-generated energy that it sold to an electric utility or end-use customer.

5 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

# Water Management

## Topic Summary

Containers and packaging manufacturing requires water for various stages of production, including in raw-materials processing, process cooling, and steam generation at onsite cogeneration plants. Long-term historic increases in water scarcity and cost, and expectations of continued increases—due to overconsumption and constrained supplies, resulting from population growth and shifts, pollution, and climate change—indicate the heightened importance of water management. Water scarcity can result in a higher risk of operational disruption for companies with water-intensive operations and can also increase water procurement costs and capital expenditures. Meanwhile, containers and packaging manufacturing can generate process wastewater that must be treated before disposal. Non-compliance with water quality regulations may result in regulatory compliance and mitigation costs or legal expenses stemming from litigation. Reducing water use and consumption through increased efficiency and other water management strategies can lead to lower operating costs over time and can mitigate financial impacts of regulations, water supply shortages, and community-related disruptions of operations.

## Accounting Metrics

### **RT-CP-140a.1. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.
  - 1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 2.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:
    - 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 3.1.2 Water that is directly or indirectly incorporated into the entity's product or service;

3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.

- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

## **RT-CP-140a.2. Description of water management risks and discussion of strategies and practices to mitigate those risks**

- 1 The entity shall describe its water management risks associated with water withdrawals, water consumption, and discharge of water and/or wastewater.
  - 1.1 Risks associated with water withdrawals and water consumption include risks to the availability of adequate, clean water resources, including, but not limited to:
    - 1.1.1 Environmental constraints—such as operating in water-stressed regions, drought, concerns of aquatic impingement or entrainment, interannual or seasonal variability, and risks due to the impact of climate change
    - 1.1.2 Regulatory and financial constraints—such as volatility in water costs, stakeholder perceptions and concerns related to water withdrawals (e.g., those from local communities, non-governmental organizations, and regulatory agencies), direct competition with and impact from the actions of other users (e.g., commercial and municipal users), restrictions to withdrawals due to regulations, and constraints on the entity’s ability to obtain and retain water rights or permits
  - 1.2 Risks associated with the discharge of water and/or wastewater, include, but are not limited to, the ability to obtain rights or permits related to discharges, compliance with regulations related to discharges, restrictions to discharges, the ability to maintain control over the temperature of water discharges, liabilities and/or reputational risks, and increased operating costs due to regulation, stakeholder perceptions and concerns related to water discharges (e.g., those from local communities, non-governmental organizations, and regulatory agencies).
- 2 The entity may describe water management risks in the context of:
  - 2.1 How risks may vary by withdrawal source, including surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities; and
  - 2.2 How risks may vary by discharge destinations, including surface water, groundwater, or wastewater utilities.

- 3 The entity may discuss the potential impacts that water management risks may have on its operations and the timeline over which such risks are expected to manifest.
  - 3.1 Impacts may include, but are not limited to, those associated with costs, revenues, liabilities, continuity of operations, and reputation.
- 4 The entity shall discuss its short-term and long-term strategies or plan to mitigate water management risks, including, but not limited to:
  - 4.1 The scope of its strategy, plans, goals and/or targets, such as how they relate to different business units, geographies, or water-consuming operational processes.
  - 4.2 Any water management goals and/or targets it has prioritized, and an analysis of performance against those goals and/or targets.
    - 4.2.1 Goals and targets may include, but are not limited to, those associated with reducing water withdrawals, reducing water consumption, reducing water discharges, reducing aquatic impingements, improving the quality of water discharges, and regulatory compliance.
  - 4.3 The activities and investments required to achieve the plans, goals and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 4.4 Disclosure of strategies, plans, goals, and/or targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.
- 5 For water management targets, the entity shall additionally disclose:
  - 5.1 Whether the target is absolute or intensity-based, and the metric denominator if it is an intensity-based target.
  - 5.2 The timelines for the water management plans, including the start year, the target year, and the base year.
  - 5.3 The mechanism(s) for achieving the target, including:
    - 5.3.1 Efficiency efforts, such as the use of water recycling and/or closed-loop systems;
    - 5.3.2 Product innovations such as redesigning products or services to require less water;
    - 5.3.3 Process and equipment innovations, such as those that enable the reduction of aquatic impingements or entrainments;
    - 5.3.4 Use of tools and technologies (e.g., the [World Wildlife Fund Water Risk Filter](#), [The Global Water Tool](#), and [Water Footprint Network Footprint Assessment Tool](#)) to analyze water use, risk, and opportunities; and
    - 5.3.5 Collaborations or programs in place with the community or other organizations.
  - 5.4 The percentage reduction or improvement from the base year, where the base year is the first year against which water management targets are evaluated toward the achievement of the target.

- 6 The entity shall discuss whether its water management practices result in any additional lifecycle impacts or tradeoffs in its organization, including tradeoffs in land use, energy production, and greenhouse gas (GHG) emissions, and why the entity chose these practices despite lifecycle tradeoffs.

### **RT-CP-140a.3. Number of incidents of non-compliance associated with water quality permits, standards, and regulations**

- 1 The entity shall disclose the total number of instances of non-compliance, including violations of a technology-based standard and exceedances of a quality-based standard.
- 2 The scope of disclosure includes incidents governed by national, state, and local statutory permits and regulations, including, but not limited to, the discharge of a hazardous substance, violation of pretreatment requirements, or total maximum daily load (TMDL) exceedances.
- 3 The scope of disclosure shall only include incidents of non-compliance that resulted in a formal enforcement action(s).
  - 3.1 Formal enforcement actions are defined as statutorily recognized actions that address a violation or threatened violation of water quality laws, regulations, policy or orders, and include administrative penalty orders, administrative orders, and judicial actions, among others. For example, the U.S. EPA provides guidance on the scope of formal enforcement actions in, [Informal and Formal Actions, Summary Guidance and Portrayal on EPA Websites](#).
- 4 Violations, regardless of their measurement methodology or frequency, shall be disclosed. These include:
  - 4.1 Continuous discharges, limitations, standards, and prohibitions that are generally expressed as maximum daily, weekly average, and monthly averages.
  - 4.2 Non-continuous discharges, limitations that are generally expressed in terms of frequency, total mass, maximum rate of discharge, and mass or concentration of specified pollutants.

# Waste Management

## Topic Summary

Containers and packaging manufacturing may generate hazardous process waste, including, but not limited to, heavy metals, spent acids, catalysts, and wastewater treatment sludge. Companies face regulatory and operational challenges in managing waste, as some wastes are subject to regulations pertaining to its transport, treatment, storage, and disposal. Waste management strategies include reduced generation, effective treatment and disposal, and recycling and recovery, where possible. Such activities, while requiring initial investment or operating costs, can lower companies' long-term cost structure and mitigate the risk of remediation liabilities or regulatory penalties.

## Accounting Metrics

### RT-CP-150a.1. Amount of hazardous waste generated, percentage recycled

- 1 The entity shall calculate and disclose the total amount of hazardous waste generated, in metric tons.
  - 1.1 Hazardous wastes are defined per the legal or regulatory framework(s) applicable within the jurisdiction(s) where the waste is generated.
- 2 The entity shall calculate and disclose the percentage of hazardous waste recycled as the total weight of hazardous waste generated that was recycled, divided by the total weight of hazardous waste generated.
  - 2.1 Hazardous waste that is reused, reclaimed, and/or remanufactured shall be considered within the scope of recycled.
  - 2.2 Recycled, reused, reclaimed, and remanufactured hazardous waste is defined per the legal or regulatory framework(s) applicable within the jurisdiction where the waste is generated.
  - 2.3 Materials incinerated, including for energy recovery, shall not be considered within the scope of recycled.
    - 2.3.1 Energy recovery is defined as the use of combustible waste as a means to generate energy through direct incineration, with or without other waste, but with recovery of the heat.
    - 2.3.2 The entity may separately disclose the percentage of hazardous waste generated that was incinerated.
- 3 The entity may use the U.S. [Resources Conservation and Recovery Act \(RCRA\)](#) or the EU [Waste Framework Directive \(Directive 2008/98/EC on waste, including its subsequent amendments\)](#), for the purposes of defining hazardous waste and/or recycled hazardous waste for operations located in jurisdictions that lack applicable legal or regulatory definitions.

#### Note to RT-CP-150a.1

- 1 The entity shall disclose the legal or regulatory framework(s) used to define hazardous waste and recycled hazardous waste, and the amounts defined in accordance with each applicable framework.

- 1.1 For example, if the entity's operations fall under the jurisdiction of the EU Waste Framework Directive (Directive 2008/98/EC on waste, including its subsequent amendments), and therefore, the Waste Framework Directive was used to define all hazardous waste and recycled hazardous waste, the entity shall specify this in its disclosures of the amount of hazardous waste generated and the percentage recycled.



# Supply Chain Management

## Topic Summary

Containers and packaging manufacturing utilizes large quantities of raw materials including wood fiber and aluminum. Sustainable production of these materials is an important supply chain consideration for companies in the industry, as adverse environmental impacts could increase materials costs and affect the brand value of containers and packaging companies. In order to mitigate such risks, companies can implement supply chain vetting practices and implement third-party standards within internal operations and suppliers that certify that the materials they procure were produced in a sustainable manner. Additionally, such actions can raise brand value and meet customer demand for sustainably produced packaging products, providing access to new markets and growth opportunities.

## Accounting Metrics

### RT-CP-430a.1. Total wood fiber procured, percentage from certified sources

- 1 The entity shall disclose the total weight (in metric tons) of wood-fiber-based raw materials procured during the reporting period.
  - 1.1 The scope of raw materials includes all inputs that are processed to be sold as a finished good, including recycled raw materials, virgin raw materials, and goods that will be consumed directly in the production process.
- 2 The percentage shall be calculated as the total weight (in metric tons) of its wood-fiber-based raw materials that are certified to a responsible sourcing standard divided by the total weight (in metric tons) of wood-fiber-based raw materials, where responsible sourcing certifications include those promulgated by the following organizations (or the equivalent):
  - 2.1 American Tree Farm System (ATFS)
  - 2.2 Forest Stewardship Council (FSC) (i.e., FSC 100% label and FSC Mixed Sources and FSC Recycled labels)
  - 2.3 Programme for the Endorsement of Forest Certification (PEFC) (i.e., PEFC Certified and PEFC Recycled labels)
  - 2.4 Sustainable Forest Initiative (SFI) (i.e., SFI Chain of Custody and SFI Certified Sourcing labels)
- 3 The entity may disclose separately the percent of fiber that is certified to each relevant responsible sourcing standard (e.g., FSC, SFI, PEFC, and ATFS) and relevant standards (e.g., FSC 100% label, FSC Mixed Sources and FSC Recycled labels, SFI Chain of Custody and SFI Certified Sourcing labels, and PEFC Certified and PEFC Recycled labels).
- 4 For fiber that is certified to multiple schemes, the entity shall not account for the fiber weight more than once.

### RT-CP-430a.2. Total aluminum purchased, percentage from certified sources

- 1 The entity shall disclose the total weight (in metric tons) of aluminum-based raw materials purchased during the reporting period.

- 1.1 The scope of raw materials includes all inputs that are processed to be sold as a finished good, including recycled raw materials, virgin raw materials, and goods that will be consumed directly in the production process.
- 2 The percentage shall be calculated as the total weight (in metric tons) of its aluminum-based raw materials that are certified to a responsible sourcing standard divided by the total weight of aluminum-based raw materials.
- 3 Responsible sourcing certification includes that promulgated by the Aluminum Stewardship Initiative (ASI) (i.e., Performance Standard Version 1 and Chain of Custody Standard Draft 2) or certification to an equivalent standard.
- 4 For aluminum that is certified to multiple schemes, the entity shall not account for the weight more than once.

## ELECTRICAL & ELECTRONIC EQUIPMENT

### Industry Description

The Electrical & Electronic Equipment industry consists of companies that develop and manufacture a broad range of electric components, including power generation equipment, energy transformers, electric motors, switchboards, automation equipment, heating and cooling equipment, lighting, and transmission cables. These include: non-structural commercial and residential building equipment, such as Heating, Ventilation, and Air Conditioning (HVAC) systems, lighting fixtures, security devices, and elevators; electrical power equipment; traditional power generation and transmission equipment; renewable energy equipment; industrial automation controls; measurement instruments; and electrical components used for industrial purposes, such as coils, wires, and cables. Companies in this mature and competitive industry operate globally and typically generate a significant portion of their revenue from outside the country of their domicile.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	RT-EE-130a.1
Product Lifecycle Management	Percentage of products by revenue that contain IEC 62474 declarable substances <sup>87</sup>	Quantitative	Percentage (%) by revenue	RT-EE-410a.1
	Percentage of eligible products, by revenue, that meet ENERGY STAR <sup>®</sup> criteria	Quantitative	Percentage (%) by revenue	RT-EE-410a.2
	Revenue from renewable energy-related and energy efficiency-related products	Quantitative	Reporting currency	RT-EE-410a.3

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of units produced by product category <sup>88</sup>	Quantitative	Number	RT-EE-000.A
Number of employees	Quantitative	Number	RT-EE-000.B

<sup>87</sup>

Note to **RT-EE-410a.1** – Disclosure shall include a discussion of approach to managing the use of IEC 62474 declarable substances.

<sup>88</sup>

Note to **RT-EE-000.A** – Production should be disclosed as number of units produced by product category, where relevant product categories include energy generation, energy delivery, and lighting and indoor climate control electronics.

# Energy Management

## Topic Summary

Electrical and electronic equipment companies may use significant amounts of energy. Purchased electricity represents the largest share of energy expenditures in the industry, followed by purchased fuels. The type of energy used, magnitude of consumption, and energy management strategies depends on the type of products manufactured. A company's energy mix, including the use of electricity generated on-site, grid-sourced electricity, and the use of alternative energy, can play an important role in lowering the cost and increasing the reliability of energy supply, and ultimately affect the company's cost structure and exposure to regulatory shifts.

## Accounting Metrics

### **RT-EE-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

- 3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.
- 3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:
- 3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;
  - 3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.
- 4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

# Product Lifecycle Management

## Topic Summary

Electrical and electronic equipment companies face increasing challenges and opportunities associated with environmental and social externalities that stem from the use of their products. Regulations are incentivizing companies to reduce or eliminate the use of harmful chemicals in their products. To a lesser extent, regulations and customers are driving companies to lower the environmental footprint of their products in the use phase, primarily in terms of energy intensity. Electrical and electronic equipment companies that develop cost-effective products and solutions for energy efficiency can benefit from increased revenues and market share, stronger competitive positioning, and enhanced brand value. Similarly, products with reduced chemical safety concerns can provide opportunities for increased market share.

## Accounting Metrics

### RT-EE-410a.1. Percentage of products by revenue that contain IEC 62474 declarable substances

- 1 The entity shall disclose the percentage of products sold during the reporting period that contain IEC 62474 declarable substances.
  - 1.1 A product contains a declarable substance if, according to International Electrotechnical Commission's [IEC 62474 – Material Declaration for Products of and for the Electrotechnical Industry](#), it contains an amount of the substance above the “reporting threshold,” is within the scope of the “reporting application” identified, and for which the “reporting requirement” is mandatory, according to IEC 62474.
  - 1.2 The entity shall calculate the percentage as the revenue from products sold that contain a declarable substance(s) divided by total revenue from products sold.
- 2 The scope of disclosure includes all products, including products from an entity not required to declare, or otherwise make declarations, according to IEC 62474.

#### Note to RT-EE-410a.1

- 1 The entity shall discuss its approach to managing its use of substances listed as declarable substance groups or declarable substances in IEC 62474, including a discussion of specific operational processes during which use of these substances is considered and a discussion of actions the entity has taken to manage the use of these substances.
- 2 Relevant management approaches and actions to describe include, but are not limited to:
  - 2.1 Product design criteria for the exclusion of substances (e.g., banned substances lists)
  - 2.2 Use of material substitution assessments, materials and parts procurement guidelines, product safety testing, product declarations (e.g., material safety data sheets), and product labeling

- 3 If the entity assesses and manages the impact of known or potentially toxic substances with reference to other regulations, industry norms, or accepted chemical lists, it may choose to identify those practices, and it shall describe the degree of overlap with IEC 62474.

### **RT-EE-410a.2. Percentage of eligible products, by revenue, that meet ENERGY STAR® criteria**

- 1 The entity shall disclose the percentage of eligible products, by revenue, that meet ENERGY STAR® criteria.
  - 1.1 The entity shall calculate the percentage as: the revenue from products meeting the requirements for ENERGY STAR® certification divided by total revenue from products eligible for ENERGY STAR® certification.
  - 1.2 Eligible products are those in a product category for which ENERGY STAR® certification exists, which includes the following electrical and electronic equipment product categories: uninterruptible power supply products, heating and cooling and ventilation equipment, and lighting and fans.
- 2 The scope of disclosure includes products meeting the criteria of the most current version of the applicable ENERGY STAR® standard.
  - 2.1 If the entity has products certified to a previous version of an ENERGY STAR® standard, it shall disclose this information, including the version of the standard to which its products are certified, a breakdown of how many products are certified to that version of the standard, and its timelines to achieve certification to the most current version of the standard.

### **RT-EE-410a.3. Revenue from renewable energy-related and energy efficiency-related products**

- 1 The entity shall disclose its total revenue from renewable energy-related and energy efficiency-related products.
- 2 Renewable energy-related products are defined as products and/or systems that enable the incorporation of renewable energy into established energy infrastructure, where:
  - 2.1 Renewable energy is defined as energy derived from sources that are capable of being replenished in a short time through ecological cycles, such as geothermal, wind, solar, hydroelectric, and biomass (including ethanol, first-generation biofuels, and advanced biofuels).
  - 2.2 Examples of products and systems include, but are not limited to, turbine controllers, relays, switchgears, solar PV fuses, SCADA systems, interconnection technologies, and other balance of plant equipment designed for renewable energy applications.
  - 2.3 The scope of products and systems is limited to those that enable the integration of renewable energy into established energy infrastructure and grids; it excludes revenue from the sale and/or installation of renewable energy generation hardware such as wind turbines, solar photovoltaic modules, and solar thermal electricity generation equipment.
- 3 A product shall be considered to have been designed to increase energy efficiency if documentation shows that the entity has tested, modeled, or otherwise established an increase in energy efficiency during the product's use phase.

- 3.1 Examples of products that increase energy efficiency include, but are not limited to: smart grid technologies and infrastructure (e.g., demand response systems, distribution automation, smart inverters, or advanced metering equipment); smart home and intelligent building control products; flexible alternating current transmission systems; and low-loss transformers.
- 3.1.1 Smart grid is defined as a modernization of the electricity delivery systems so as to monitor, protect, and automatically optimize the operation of its interconnected elements—from the central and distributed generation through the transmission network and the distribution system, to industrial users and building automation systems, and to energy storage installations and to end-use consumers, consistent with the National Institute of Standards and Technology (NIST) [Smart Grid Interoperability Standards](#).
- 3.2 The scope of disclosure includes products that impart an incremental improvement to energy efficiency, insofar as the entity can demonstrate that the improvement is meaningful, such as through alignment with the milestones set forth in Section 5, “Key Sectors” of the European Commission’s Road Map to a Resource Efficient Europe and/or with EU Directive 2012/27/EU, and/or through conformance with energy efficiency standards such as the International Electrotechnical Commission’s (IEC) IE2 High Efficiency, IE3 Premium Efficiency, and IE4 Super Premium Efficiency.
- 3.3 The scope of disclosure excludes products that impart improved resource efficiency in an ancillary, indirect, or minimal way (e.g., a conventional product that is slightly lighter than the previous generation of the product).



## INDUSTRIAL MACHINERY & GOODS

### Industry Description

The Industrial Machinery & Goods industry manufactures equipment for a variety of industries including construction, agriculture, energy, utility, mining, manufacturing, automotive, and transportation. Products include engines, earth-moving equipment, trucks, tractors, ships, industrial pumps, locomotives, and turbines. Machinery manufacturers utilize large amounts of raw materials for production, including steel, plastics, rubber, paints, and glass. Manufacturers may also perform the machining and casting of parts before final assembly. Demand in the industry is closely tied to industrial production, while government emissions standards and customer demand are driving innovations to improve energy efficiency and limit air emissions during product use.

Table 1. Climate-related Disclosure Topics & Accounting Metrics

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	RT-IG-130a.1
Fuel Economy & Emissions in Use-phase	Sales-weighted fleet fuel efficiency for medium- and heavy-duty vehicles	Quantitative	Gallons per 1,000 ton-miles	RT-IG-410a.1
	Sales-weighted fuel efficiency for non-road equipment	Quantitative	Gallons per hour	RT-IG-410a.2
	Sales-weighted fuel efficiency for stationary generators	Quantitative	Watts per gallon	RT-IG-410a.3
	Sales-weighted emissions of: (1) nitrogen oxides (NO <sub>x</sub> ) and (2) particulate matter (PM) for: (a) marine diesel engines, (b) locomotive diesel engines, (c) on-road medium- and heavy-duty engines, and (d) other non-road diesel engines <sup>89</sup>	Quantitative	Grams per kilowatt-hour	RT-IG-410a.4

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of units produced by product category <sup>90</sup>	Quantitative	Number	RT-IG-000.A
Number of employees	Quantitative	Number	RT-IG-000.B

<sup>89</sup>

Note to **RT-IG-410a.4** – The entity shall discuss its strategies and approach to managing fleet fuel economy and emissions risks and opportunities.

<sup>90</sup>

Note to **RT-IG-000.A** – At a minimum, the entity should indicate the number of units produced for the following product categories: (1) vehicles and agricultural and construction equipment, (2) engines and power generation equipment, and (3) parts and components.

# Energy Management

## Topic Summary

Energy is a critical input in industrial machinery manufacturing. Purchased electricity represents the largest share of energy expenditures in the industry, followed by purchased fuels. The type of energy used, magnitude of consumption, and energy management strategies depends on the type of products manufactured. A company's energy mix, including the use of electricity generated on-site, grid-sourced electricity, and the use of alternative energy, can play an important role in influencing the cost and reliability of energy supply, and ultimately affect the company's cost structure and regulatory risk.

## Accounting Metrics

### RT-IG-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

- 3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.
- 3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:
- 3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;
  - 3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.
- 4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

# Fuel Economy & Emissions in Use-phase

## Topic Summary

Many of the Industrial Machinery & Goods industry's products are powered by fossil fuels and therefore release greenhouse gases (GHGs) and other air emissions during use. Customer preferences for improved fuel economy combined with regulations addressing emissions are increasing the demand for energy-efficient and lower-emission products in the industry. As such, companies that develop products with these characteristics may be well-positioned to capture expanding market share, reduce regulatory risk, and improve brand value.

## Accounting Metrics

### RT-IG-410a.1. Sales-weighted fleet fuel efficiency for medium- and heavy-duty vehicles

- 1 The entity shall disclose its sales-weighted average fleet fuel efficiency for medium- and heavy-duty vehicles, where:
  - 1.1 Fleet fuel efficiency is defined as the average fuel economy of its medium- and heavy-duty commercial vehicles, weighted by the number of each sold during the reporting period and measured in gallons per 1,000 ton-miles.
  - 1.2 The scope of disclosure includes vehicles in the fleet that weigh 8,500 pounds or more, and which are covered under the U.S. Heavy Duty (HD) National Program, including combination tractors (commonly known as semi-trucks), heavy-duty pickup trucks and vans, and vocational vehicles.
  - 1.3 Where fleet averages are calculated by model year for regulatory purposes, the entity shall use these performance data.
  - 1.4 In the absence of regulatory guidance on calculating a fleet average, the entity shall calculate performance based on the fuel economy of vehicles sold during the reporting period, weighted by sales volume.
- 2 The entity shall disclose the sales-weighted fuel efficiency requirement for its medium- and heavy-duty vehicles, pursuant to U.S. HD National Program Fuel Consumption Standards, as issued and regulated by the U.S. National Highway Traffic Safety Administration (NHTSA) and U.S. Environmental Protection Agency (EPA).

### RT-IG-410a.2. Sales-weighted fuel efficiency for non-road equipment

- 1 The entity shall disclose its sales-weighted average fuel efficiency for its non-road equipment and vehicles, where:
  - 1.1 Fuel efficiency is defined as the average fuel economy of its non-road equipment, weighted by the number of each unit sold during the reporting period and measured in gallons of fuel consumed per hour of operation (gallons per hour).
    - 1.1.1 In calculating gallons per hour, the entity shall use the model-rated fuel efficiency value for each piece of equipment where available.

1.1.2 Where model-rated fuel efficiency values are not available, the entity shall calculate a gallons-per-hour operational efficiency for the equipment, assuming normal, reasonable operating conditions (e.g., for load factor, speed, and environmental conditions).

1.2 Non-road equipment includes, but is not limited to, excavators and other construction equipment, farm tractors and other agricultural equipment, heavy forklifts, airport ground service equipment, and utility equipment such as generators, pumps, and compressors.

### **RT-IG-410a.3. Sales-weighted fuel efficiency for stationary generators**

1 The entity shall disclose the sales-weighted average fuel efficiency of its stationary generators, where:

1.1 Sales-weighted fuel efficiency is the average fuel efficiency of stationary generators sold during the reporting period, measured in watts per gallon.

2 Sales-weighted fuel efficiency is calculated as the harmonic mean of design fuel efficiency in watts per gallon, where:

2.1 The harmonic mean captures the average amount of fuel needed by each generator to produce a given amount of power.

2.2 The harmonic mean is the reciprocal of the average of the reciprocal values.

### **RT-IG-410a.4. Sales-weighted emissions of: (1) nitrogen oxides (NO<sub>x</sub>) and (2) particulate matter (PM) for: (a) marine diesel engines, (b) locomotive diesel engines, (c) on-road medium- and heavy-duty engines, and (d) other non-road diesel engines**

1 The entity shall disclose the sales-weighted average emissions of (1) nitrogen oxides (NO<sub>x</sub>) and (2) particulate matter (PM) for each of the following product categories: (a) marine diesel engines, (b) locomotive diesel engines, (c) on-road heavy-duty engines, and (d) other non-road diesel engines, where:

1.1 Emissions are calculated as the average emissions of (1) NO<sub>x</sub> and (2) PM for engines, weighted by the number of each sold during the reporting period and measured in grams per kilowatt hour.

1.2 Marine diesel engines are defined as those that are addressed within the scope of [U.S. 40 CFR Part 1042](#), [40 CFR Part 94](#), [40 CFR Part 89](#), or non-U.S. equivalent.

1.3 Locomotive diesel engines are defined as those that are addressed within the scope of [U.S. 40 CFR Part 1033](#), or non-U.S. equivalent.

1.4 On-road heavy-duty engines are defined as those that are addressed within the scope of [U.S. 40 CFR Chapter 1 Subchapter C Part 86](#), or non-U.S. equivalent.

1.5 Other non-road diesel engines are defined as those that are addressed within the scope of [U.S. 40 CFR Part 1039](#), or non-U.S. equivalent, and typically include excavators and other construction equipment, farm tractors and other agricultural equipment, heavy forklifts, airport ground service equipment, and utility equipment such as generators, pumps, and compressors.

- 1.6 Emissions shall be calculated according to the test method described in [U.S. 40 CFR Part 1065](#), or non-U.S. equivalent.
  - 1.7 The entity may disclose if any products do not meet current emission standards established in the above-referenced U.S. 40 CFR Part 1042, 40 CFR Part 94, and 40 CFR Part 89 for marine diesel engines; 40 CFR Part 1033 for locomotive diesel engines; 40 CFR Part 86 Subpart A for heavy-duty on-road engines; 40 CFR Part 1039 for other non-road diesel engines, or non-U.S. equivalents.
- 2 The entity may discuss its progress toward, and readiness for, future U.S. federal- and state-level, or non-U.S. equivalent, emissions standards that could affect its products.

**Note to RT-IG-410a.4**

- 1 The entity shall discuss its strategies and approach to managing fleet fuel economy and emissions risks and opportunities.
- 2 Relevant aspects of the approach and strategy to discuss include improvements to existing products and technologies, the introduction of new technologies, research and development efforts into advanced technologies, and partnerships with peers, academic institutions, and/or customers (including governmental customers).

## CASINOS & GAMING

### Industry Description

Publicly held casinos and gaming companies operate gambling facilities and/or platforms, including brick-and-mortar casinos, riverboat casinos, online gambling websites, and racetracks. The broader industry in the U.S. is dominated by privately held Native American casinos, which significantly outnumber publicly held casinos. Native American casinos are generally owned and operated by tribes, but sometimes can be managed by commercial casino operators or other management companies. The industry is characterized by high levels of regulatory oversight, which represents the main barrier to entry for new operators. Fewer than half of U.S. states have legalized commercial casinos in some form, although industry regulation varies significantly worldwide.

Note: Select companies in the Casinos & Gaming industry are also engaged in activities of the Hotels & Lodging and/or Restaurants industries. The SASB Standards for such activities are outlined in the Hotels & Lodging and Restaurants standards. For the purposes of this standard, it is assumed that casinos and gaming companies are engaged solely in operating gambling facilities and providing online gaming services, and therefore issues such as water management and food safety, which may be material for companies that have significant hotel and restaurant operations, are not covered by this industry standard.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	SV-CA-130a.1

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of tables	Quantitative	Number	SV-CA-000.A
Number of slots	Quantitative	Number	SV-CA-000.B
Number of active online gaming customers <sup>91</sup>	Quantitative	Number	SV-CA-000.C
Total area of gaming floor	Quantitative	Square meters (m <sup>2</sup> )	SV-CA-000.D

<sup>91</sup>

Note to **SV-CA-000.C** – The number of active customers shall be considered as the number for which there was at least one financial transaction (bet, deposit, withdraw) with real currency within the reporting period, where real currency is defined by the [U.S. Financial Crimes Enforcement Network](#).

# Energy Management

## Topic Summary

With many facilities open 24 hours a day, the Casinos & Gaming industry requires a large amount of energy to operate. Casino facilities often have few windows and therefore rely on their buildings' mechanical systems for heating, ventilation, air-conditioning (HVAC), and lighting. Fossil fuel-based energy production and consumption contribute to significant environmental impacts, including climate change and pollution, and have the potential to impact casino companies' results of operations. It is becoming increasingly important for companies that rely on electricity consumption for their operations to manage energy efficiency as well as energy availability, including the risks and opportunities associated with energy sourcing from fossil fuels and/or from renewable and alternative energy sources.

## Accounting Metrics

### **SV-CA-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a



Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

## HOTELS & LODGING

### Industry Description

The Hotels & Lodging industry is composed of companies that provide overnight accommodation, including hotels, motels, and inns. It is a competitive industry that is primarily comprised of large hotel chains and in which customers base purchase decisions on a wide range of factors including quality and consistency of services, availability of locations, price, and loyalty program offers. Businesses are often structured in one or more of the following ways: direct revenue from hotel services, including room rental and food and beverage sales; management and franchise services with fee revenue from property management; and vacation residential ownership with revenue from sales of residential units.

Note: Select companies in the Hotels & Lodging industry are also engaged in activities of the Restaurants industry. The SASB standards for such activities are outlined in the Restaurants industry standards. For the purposes of this standard, it is assumed that hotels and lodging companies do not provide food and beverage services, and therefore issues such as food safety, waste, and sourcing, which may be material for companies that offer food and beverages, are not covered by this industry standard.

Table 1. *Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	SV-HL-130a.1
Water Management	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	SV-HL-140a.1
Climate Change Adaptation	Number of lodging facilities located in 100-year flood zones	Quantitative	Number	SV-HL-450a.1

Table 2. *Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of available room-nights	Quantitative	Number	SV-HL-000.A
Average occupancy rate <sup>92</sup>	Quantitative	Rate	SV-HL-000.B
Total area of lodging facilities <sup>93</sup>	Quantitative	Square meters (m <sup>2</sup> )	SV-HL-000.C
Number of lodging facilities and the percentage that are: (1) managed, (2) owned and leased, (3) franchised	Quantitative	Number, Percentage (%)	SV-HL-000.D

<sup>92</sup> Note to **SV-HL-000.B** – Measured as number of (1) occupied room-nights divided by (2) available room-nights across all properties.

<sup>93</sup> Note to **SV-HL-000.C** – The scope includes facilities that were owned, operated, leased, or franchised during any portion of the reporting period.

# Energy Management

## Topic Summary

Hotel buildings require a significant amount of energy resources to operate, which represent a substantial portion of hotel operating expenses. The majority of the industry's electricity usage is commercially purchased. This purchased electricity indirectly leads to the release of greenhouse gas (GHG) emissions, which is a large contributor to climate change. Companies in the industry are implementing energy management best practices in order to reduce operating expenses and environmental impacts and to improve their reputations with guests, who are increasingly concerned about environmental sustainability.

## Accounting Metrics

### **SV-HL-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

- 3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.
- 3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:
- 3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;
  - 3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.
- 4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data, including electricity from solar or wind energy).

# Water Management

## Topic Summary

Hotel buildings require a relatively large amount of water resources to operate. While water is not the industry's greatest operating cost, reduced water availability or significant price increases could impact financial results. This impact may be particularly acute in water-stressed region due to supply constraints. Companies in the industry are implementing water management best practices in order to reduce operating expenses and environmental impacts and improve to their reputations with guests, who are increasingly concerned about environmental sustainability.

## Accounting Metrics

### **SV-HL-140a.1. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.
  - 1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the U.S. [Geological Survey](#).
  - 2.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the total amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:
    - 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 3.1.2 Water that is directly or indirectly incorporated into the entity's product or service;
    - 3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.
- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute's (WRI) Water Risk Atlas tool, [Aqueduct](#).

- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

# Climate Change Adaptation

## Topic Summary

Hotels operating in climate change-exposed areas may be impacted by physical climate risks including inclement weather and flooding. Inclement weather may damage property and disrupt operations, thereby reducing asset values and revenues. In addition, hotels may face higher insurance premiums for buildings located in coastal regions or may be unable to insure their properties. Hotel operators will likely need to adapt to shifting climate trends such as rising sea levels, hurricanes, and flooding in order to maintain their climate-exposed revenue-generating properties.

## Accounting Metrics

### SV-HL-450a.1. Number of lodging facilities located in 100-year flood zones

- 1 The entity shall disclose the number of its lodging facilities that are located in 100-year flood zones.
  - 1.1 100-year flood zones are defined as land areas subject to a one-percent or greater chance of flooding in any given year. Such areas may also be referred to as being subject to the one-percent annual chance flood, the one-percent annual exceedance probability flood, or the 100-year flood.
    - 1.1.1 Examples of 100-year flood zones may include, but are not limited to, coastal flood plains, flood plains along major rivers, and areas subject to flooding from ponding in low-lying areas.
  - 1.2 For lodging facilities located in the U.S., 100-year flood zones shall include those land areas designated by the U.S. Federal Emergency Management Agency (FEMA) as special flood hazard areas (SFHA).
    - 1.2.1 SFHAs are defined as land area in the flood plain subject to a one-percent or greater chance of flooding in any given year. The area may be designated in the applicable flood insurance rate map, as per the U.S. National Flood Insurance Program, as Zones A, AO, AH, A1-30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, V1-30, VE, and V. This definition is derived from U.S. 44 CFR 59.1.
- 2 The scope of disclosure shall include all of the entity's lodging facilities that are located in 100-year flood zones, regardless of the country of their location.

## LEISURE FACILITIES

### Industry Description

The Leisure Facilities industry is comprised of companies that operate entertainment, travel, and recreation facilities and services. Companies in this industry operate amusement parks, movie theaters, ski resorts, sports stadiums, and athletic clubs and other venues. Leisure facilities companies mainly generate revenue by providing live, digital, and/or interactive entertainment to millions of guests and customers annually across various locations.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	SV-LF-130a.1

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Attendance <sup>94</sup>	Quantitative	Number	SV-LF-000.A
Number of customer-days <sup>95</sup>	Quantitative	Number	SV-LF-000.B

<sup>94</sup>

Note to **SV-LF-000.A** – Attendance is the total number of visits by customers to any leisure facility in the entity's portfolio that is branded by the operator (i.e., licensed) or in which it has controlling ownership.

<sup>95</sup>

Note to **SV-LF-000.B** – Customer-days is the aggregate total amount of time customers spent visiting any leisure facility in the entity's portfolio, calculated as the sum of the visitation time of each customer. For facilities that sell day passes (e.g., amusement parks), but do not track entry and exit times, the hours of operation open to guests can be used for estimation. For facilities that sell single unit entry passes (e.g., movie theaters), the average visitation time can be used for estimation.



# Energy Management

## Topic Summary

Leisure facilities companies operate large outdoor and indoor facilities that may consume a significant amount of energy. Most of the industry's electricity usage is commercially purchased, which indirectly leads to the release of greenhouse gas (GHG) emissions, a significant contributor to climate change. Companies in the industry are implementing energy management best practices in order to reduce operating expenses and environmental impacts and to improve their reputation with guests, who are increasingly concerned about environmental sustainability.

## Accounting Metrics

### **SV-LF-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

- 3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.
- 3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:
- 3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;
  - 3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.
- 4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

## ELECTRONIC MANUFACTURING SERVICES & ORIGINAL DESIGN MANUFACTURING

### Industry Description

The Electronic Manufacturing Services (EMS) & Original Design Manufacturing (ODM) industry consists of two main segments. EMS companies provide assembly, logistics, and after-market services for original equipment manufacturers. The ODM segment of the industry provides engineering and design services for original equipment manufacturers and may own significant intellectual property. Although EMS & ODM companies produce equipment for a variety of sectors, the industry is closely associated with the Hardware industry, which consists of companies that design technology hardware products such as personal computers, consumer electronics, and storage devices for both personal consumers and businesses.

Note: The Electronic Manufacturing Services & Original Design Manufacturing industry does not include the design of technology hardware products. Companies that design and manufacture technology hardware products should consider the separate SASB Hardware Industry Standard (TC-HW) in addition to the SASB Electronic Manufacturing Services & Original Design Manufacturing Industry Standard (TC-ES).

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Water Management	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	TC-ES-140a.1
Product Lifecycle Management	Weight of end-of-life products and e-waste recovered, percentage recycled	Quantitative	Metric tons (t), Percentage (%)	TC-ES-410a.1

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of manufacturing facilities	Quantitative	Number	TC-ES-000.A
Area of manufacturing facilities	Quantitative	Square feet (ft <sup>2</sup> )	TC-ES-000.B
Number of employees	Quantitative	Number	TC-ES-000.C

# Water Management

## Topic Summary

The manufacturing of computers, computer components, and other electronics requires significant volumes of water. Water is becoming a scarce resource around the globe, due to increasing consumption from population growth and rapid urbanization, and reduced supplies due to climate change. Without careful planning, water scarcity can result in higher supply costs, social tensions with local communities and governments, and/or loss of access to water in water-scarce regions thereby presenting a critical risk to production, and thus revenues. Electronic Manufacturing Services (EMS) & Original Design Manufacturing (ODM) companies that are able to increase the efficiency of water use during manufacturing can reduce operating costs and maintain a lower risk profile, ultimately impacting cost of capital and market valuation. Furthermore, firms that prioritize reducing water use and greater efficiency can face lower regulatory risks as local, regional, and national environmental laws place increasing emphasis on resource conservation.

## Accounting Metrics

### TC-ES-140a.1. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.
  - 1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 2.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:
    - 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 3.1.2 Water that is directly or indirectly incorporated into the entity's product or service;
    - 3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.

- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

# Product Lifecycle Management

## Topic Summary

Companies in the Electronic Manufacturing Services (EMS) & Original Design Manufacturing (ODM) industry, along with the industry's customers such as hardware companies, face increasing challenges associated with environmental externalities attributed to product manufacturing, transport, use, and disposal. Rapid obsolescence of hardware products exacerbates such externalities. The industry's products commonly contain hazardous materials, making safe end-of-life disposal a critical aspect to manage. Companies unable to minimize the environmental externalities of their products may face increased regulatory costs as local, regional, and national environmental laws place increasing emphasis on resource conservation and waste management. Through product innovation that facilitates end-of-life product recovery and the use of less-impactful materials, EMS & ODM manufacturers can achieve improvements in lifecycle impacts, reduce regulatory risk, and realize cost savings.

## Accounting Metrics

### TC-ES-410a.1. Weight of end-of-life products and e-waste recovered, percentage recycled

- 1 The entity shall disclose the weight, in metric tons, of end-of-life material that was recovered, including through reverse logistics services, recycling services, product take-back programs, and refurbishment services.
  - 1.1 End-of-life material that was recovered is defined as products, materials, and parts, including electronic waste material (e-waste), that at the end of their useful life would have otherwise been disposed of as waste or used for energy recovery, but have instead been collected.
  - 1.2 The scope of end-of-life material that was recovered includes materials physically handled by the entity.
  - 1.3 The scope of end-of-life material that was recovered includes materials that the entity did not take physical possession of, but were collected by a third party for the expressed purpose of reuse, recycling, or refurbishment.
  - 1.4 The scope of end-of-life material that was recovered excludes materials that have been collected for repair or that are in-warranty and subject to recall.
- 2 The entity shall disclose the percentage of end-of-life material that was recovered and subsequently recycled.
  - 2.1 The percentage shall be calculated as the weight of end-of-life material that was recovered and subsequently recycled divided by the total weight of end-of-life material that was recovered.
  - 2.2 Recycled material (including remanufactured material) is defined as waste material that has been reprocessed or treated by means of production or manufacturing processes and made into a final product or a component for incorporation into a product.
  - 2.3 The scope of recycled material includes material that was reused or reclaimed.
    - 2.3.1 Reused material is defined as recovered products or components of products that are used for the same purpose for which they were conceived, including products donated and/or refurbished by the entity or by third parties.

- 2.3.2 Reclaimed material is defined as material processed to recover or regenerate a usable product.
  - 2.4 The scope of recycled material includes primary recycled material, co-products (outputs of equal value to primary recycled materials), by-products (outputs of lesser value to primary recycled materials), and material sent externally for further recycling.
  - 2.5 The scope of recycled material excludes portions of products and materials that are disposed of in landfills.
- 3 Electronic waste material (e-waste) shall be considered recycled only if the entity can demonstrate that this material was transferred to entities with third-party certification to a standard for e-waste recycling such as Basel Action Network's e-Steward® standard or the U.S. EPA's Responsible Recycling Practices (R2) standard.
- 3.1 The entity shall disclose the standard(s) with which the entities it has transferred e-waste to are compliant.

## HARDWARE

### Industry Description

The Hardware industry consists of companies that design and sell technology hardware products, including computers, consumer electronics, communications equipment, storage devices, components, and peripherals. Many companies in the industry rely heavily on the Electronic Manufacturing Services & Original Design Manufacturing (EMS & ODM) industry for manufacturing services. The industry is expected to continue to grow as the use of technology rapidly grows, especially from consumers in emerging markets.

Note: Companies engaged in activities of the Software & IT Services industry (TC-SI), Internet Media & Services (TC-IM) industry, and/or the EMS & ODM industry (TC-ES) should consider the separate SASB standards for these industries.

Table 1. Climate-related Disclosure Topics & Accounting Metrics

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Product Lifecycle Management	Percentage of products by revenue that contain IEC 62474 declarable substances <sup>96</sup>	Quantitative	Percentage (%)	TC-HW-410a.1
	Percentage of eligible products, by revenue, meeting the requirements for EPEAT registration or equivalent <sup>97</sup>	Quantitative	Percentage (%)	TC-HW-410a.2
	Percentage of eligible products, by revenue, meeting ENERGY STAR <sup>®</sup> criteria	Quantitative	Percentage (%)	TC-HW-410a.3
	Weight of end-of-life products and e-waste recovered, percentage recycled	Quantitative	Metric tons (t), Percentage (%)	TC-HW-410a.4

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of units produced by product category <sup>98</sup>	Quantitative	Number	TC-HW-000.A
Area of manufacturing facilities	Quantitative	Square feet (ft <sup>2</sup> )	TC-HW-000.B
Percentage of production from owned facilities	Quantitative	Percentage (%)	TC-HW-000.C

<sup>96</sup>

Note to **TC-HW-410a.1** – Disclosure shall include a discussion of the approach to managing the use of IEC 62474 declarable substances.

<sup>97</sup>

Note to **TC-HW-410a.2** – Disclosure shall include a discussion of efforts to incorporate environmentally focused principles into product design.

<sup>98</sup>

Note to **TC-HW-000.A** – The entity shall indicate the number of units produced during the reporting period whether they were manufactured in its own facilities or they were produced by contract manufacturers or suppliers. Disclosure shall be according to the following product categories: Communications Equipment, Components, Computer Hardware, Computer Peripherals, Computer Storage, Consumer Electronics, Other Hardware, Printing & Imaging, and Transaction Management Systems.



# Product Lifecycle Management

## Topic Summary

Companies in the Hardware industry face increasing challenges associated with environmental and social externalities attributed to product manufacturing, transport, use, and disposal. Rapid obsolescence of hardware products exacerbates the externalities. Companies are therefore designing more products with the entire lifecycle in mind. Specific considerations include energy efficiency of products, hazardous material inputs, and designing for and facilitating safe end-of-life disposal and recycling. Companies that prioritize designing and manufacturing products with improved environmental and social impacts can avoid costs associated with externalities, and are more likely to grow consumer demand and market share, while eliminating potentially harmful materials. Furthermore, companies that are able to minimize environmental and social externalities of products will be less exposed to increasing regulation and costs, such as those related to extended producer responsibility.

## Accounting Metrics

### TC-HW-410a.1. Percentage of products by revenue that contain IEC 62474 declarable substances

- 1 The entity shall disclose percentage of its products sold during the reporting period that contain declarable substances.
  - 1.1 A product is considered to contain a declarable substance if, according to International Electrotechnical Commission's [IEC 62474 – Material Declaration for Products of and for the Electrotechnical Industry](#), the product contains an amount of the declarable substance that is:
    - 1.1.1 Above the “reporting threshold”
    - 1.1.2 Within the scope of the “reporting application” identified
    - 1.1.3 Within mandatory “reporting requirement”
  - 1.2 The entity shall calculate the percentage as the revenue from electrical, electronic, and related technology products sold that contain a declarable substance(s) divided by total revenue from electrical, electronic, and related technology products sold.
- 2 The scope of disclosure includes all electrical, electronic, and related technology products, including products from a company not required to declare, or otherwise making declarations, according to IEC 62474.

#### Note to TC-HW-410a.1

- 1 The entity shall describe its approach to managing the use of substances that appear as declarable substance groups or declarable substances in IEC 62474, including a discussion of specific operational processes during which use of these substances is considered and the actions the entity has taken to manage the use of these substances.
  - 1.1 Relevant management approaches and actions to describe may include, but are not limited to:

- 1.1.1 Product design criteria for the exclusion of substances (e.g., banned substances lists)
  - 1.1.2 Use of material substitution assessments, materials and parts procurement guidelines, product safety testing, product declarations (e.g., material safety data sheets), and product labeling
- 2 If the entity assesses and manages the impact of known or potentially toxic substances with reference to other regulations, industry norms, or accepted chemical lists, it may identify those practices, and it shall describe the degree of overlap with IEC 62474.

## **TC-HW-410a.2. Percentage of eligible products, by revenue, meeting the requirements for EPEAT registration or equivalent**

- 1 The entity shall disclose the percentage of its products sold during the reporting period that meet the requirements for Electronic Product Environmental Assessment Tool (EPEAT) registration or an equivalent standard.
- 1.1 A product meets the requirements of EPEAT registration if it appears on the [EPEAT Registry](#), or the entity can otherwise demonstrate that the product meets these requirements.
  - 1.2 Standards that are equivalent to EPEAT include those that have criteria and requirements covering substantially similar topics, such as addressing:
    - 1.2.1 Reduction or elimination of environmentally sensitive materials
    - 1.2.2 Material selection and declaration
    - 1.2.3 Design for end-of-life
    - 1.2.4 Product longevity or lifecycle extension
    - 1.2.5 Energy conservation
    - 1.2.6 End-of-life management
    - 1.2.7 Corporate performance
    - 1.2.8 Packaging
  - 1.3 Examples of standards that are equivalent to EPEAT include, but are not limited to, the Total Cost of Ownership (TCO) Development fourth generation family of standards.
- 2 The entity shall calculate the percentage as the revenue from products sold during the reporting period that meet the requirements for EPEAT registration, or an equivalent standard, divided by total revenue from products eligible for EPEAT registration.
- 2.1 Eligible products are those in a product category for which EPEAT registration exists, which includes desktop computers, notebook computers, computer displays, and mobile phones.
  - 2.2 Product categories not currently within the scope of EPEAT registration but for which there is an equivalent standard may be considered eligible products.

Note to **TC-HW-410a.2**

- 1 The entity shall describe its approach to incorporating environmentally focused principles into product design.
  - 1.1 Examples of environmentally focused principles or criteria include those outlined in International Electrotechnical Commission's (IEC) Environmentally Conscious Design (IEC-62430 or IEC-62075) or U.S. Environmental Protection Agency's Design for Environment (DfE).
  - 1.2 The discussion shall include, but is not limited to:
    - 1.2.1 Elimination of toxic substances
    - 1.2.2 Use of recycled materials
    - 1.2.3 Reduction of packaging
    - 1.2.4 Design for consolidated shipping
    - 1.2.5 Design of low energy consumption products
    - 1.2.6 Design for product take-back
    - 1.2.7 Labeling for recycling
    - 1.2.8 Elimination or replacement of materials that are subject to resource scarcity (e.g., cobalt and rare earth elements)

### **TC-HW-410a.3. Percentage of eligible products, by revenue, meeting ENERGY STAR® criteria**

- 1 The entity shall disclose percentage of its revenue from products meeting ENERGY STAR® criteria.
  - 1.1 The entity shall calculate the percentage as the revenue from products sold meeting the requirements for ENERGY STAR® certification divided by total revenue from products eligible for ENERGY STAR® certification.
    - 1.1.1 Eligible products are those in a product category for which ENERGY STAR® certification exists, which includes the following electronics and office equipment product categories: Audio/Video Equipment, Battery Charging Systems, Computers, Data Center Storage, Displays, Enterprise Servers, Imaging Equipment, Set-top Boxes and Cable Boxes, Large Network Equipment, Small Network Equipment, Telephony, Televisions, and Uninterruptible Power Supplies.
- 2 The scope of disclosure includes products meeting the criteria of the most current version of the applicable ENERGY STAR® standard.
  - 2.1 If the entity has products certified to a previous version of an ENERGY STAR® standard it shall disclose this information, including which version of the standard its products are certified to, a breakdown of how many products are certified to that version of the standard, and its timelines to achieve certification to the most current version of the standard.

#### **TC-HW-410a.4. Weight of end-of-life products and e-waste recovered, percentage recycled**

- 1 The entity shall disclose the weight, in metric tons, of end-of-life material that was recovered, including through reverse logistics services, recycling services, product take-back programs, and refurbishment services.
  - 1.1 End-of-life material that was recovered is defined as products, materials, and parts, including electronic waste material (e-waste), that at the end of their useful life would have otherwise been disposed of as waste or used for energy recovery, but have instead been collected.
  - 1.2 The scope of end-of-life material that was recovered includes materials physically handled by the entity.
  - 1.3 The scope of end-of-life material that was recovered also includes materials that the entity did not take physical possession of, but were collected by a third party for the expressed purpose of reuse, recycling, or refurbishment.
  - 1.4 The scope of end-of-life material that was recovered excludes materials that have been collected for repair or that are in-warranty and subject to recall.
  
- 2 The entity shall disclose the percentage of end-of-life material that was recovered and subsequently recycled.
  - 2.1 The percentage shall be calculated as the weight of end-of-life material that was recovered and subsequently recycled divided by the total weight of end-of-life material that was recovered.
  - 2.2 Recycled material (including remanufactured material) is defined as waste material that has been reprocessed or treated by means of production or manufacturing processes and made into a final product or a component for incorporation into a product.
  - 2.3 The scope of recycled material includes material that was reused or reclaimed.
    - 2.3.1 Reused material is defined as recovered products or components of products that are used for the same purpose for which they were conceived, including products donated and/or refurbished by the entity or by third parties.
    - 2.3.2 Reclaimed material is defined as material processed to recover or regenerate a usable product.
  - 2.4 The scope of recycled material includes primary recycled material, co-products (outputs of equal value to primary recycled materials), by-products (outputs of lesser value to primary recycled materials), and material sent externally for further recycling.
  - 2.5 The scope of recycled material excludes portions of products and materials that are disposed of in landfills.
  - 2.6 Electronic waste material (e-waste) shall be considered recycled only if the entity can demonstrate that this material was transferred to entities with third-party certification to a standard for e-waste recycling such as Basel Action Network's e-Steward® standard or the U.S. EPA's Responsible Recycling Practices (R2) standard.
    - 2.6.1 The entity shall disclose the standard(s) with which the entities it has transferred e-waste to are compliant.

## INTERNET MEDIA & SERVICES

### Industry Description

The Internet Media & Services industry consists of two main segments. The Internet Media segment includes companies providing search engines and internet advertising channels, online gaming, and online communities such as social networks, as well as content, usually easily searchable, such as educational, medical, health, sports, or news content. The Internet-based Services segment includes companies selling services mainly through the Internet. The industry generates revenues primarily from online advertising, on usually free content, with other sources of revenue being subscription fees, content sales, or sale of user information to interested third parties.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Environmental Footprint of Hardware Infrastructure	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	TC-IM-130a.1
	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	TC-IM-130a.2
	Discussion of the integration of environmental considerations into strategic planning for data center needs	Discussion and Analysis	n/a	TC-IM-130a.3

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Entity-defined measure of user activity <sup>99</sup>	Quantitative	See note	TC-IM-000.A
(1) Data processing capacity, (2) percentage outsourced <sup>100</sup>	Quantitative	See note	TC-IM-000.B
(1) Amount of data storage, (2) percentage outsourced <sup>101</sup>	Quantitative	Petabytes, Percentage (%)	TC-IM-000.C

<sup>99</sup>

Note to **TC-IM-000.A** – The entity shall define and disclose a basic measure of customer activity suitable for its business activities. This may include, but is not limited to, sales transactions, purchase transactions, number of searches, monthly active users, or page views.

<sup>100</sup>

Note to **TC-IM-000.B** – Data processing capacity shall be reported in units of measure typically tracked by the entity or used as the basis for contracting software and IT services, such as Million Service Units (MSUs), Million Instructions per Second (MIPS), Mega FloatingPoint Operations per Second (MFLOPS), compute cycles, or other. Alternatively, the entity may disclose owned and outsourced data processing needs in other units of measure, such as rack space or data center square footage. The percentage outsourced shall include On-Premise cloud services, those that are hosted on Public Cloud, and those that are residing in Colocation Data Centers.

<sup>101</sup>

Note to **TC-IM-000.C** – The percentage outsourced shall include On-Premise cloud services, those that are hosted on Public Cloud, and those that are residing in Colocation Data Centers.

# Environmental Footprint of Hardware Infrastructure

## Topic Summary

With the Internet & Media Services industry providing a growing amount of content and service offerings, companies in this industry increasingly own, operate, or rent more data centers and other hardware. Thus, the management of the energy and water use associated with IT hardware infrastructure is of great importance to shareholder value. Data centers need to be powered continuously. Disruptions to the energy supply can have a material impact on operations, depending on the magnitude and timing of the disruption. Companies face a trade-off between energy and water consumption due to data center cooling needs. Cooling data centers with water instead of chillers is a means of improving energy efficiency, but it can lead to dependence on significant local water resources. Decisions about data center specifications are important for managing costs, obtaining a reliable supply of energy and water, and lowering reputational risks, particularly as there is an increasing global regulatory focus on climate change and as opportunities arise from innovations in energy efficiency and renewable energy.

## Accounting Metrics

### TC-IM-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase

agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

5 The entity may disclose the trailing twelve-month (TTM) weighted average power usage effectiveness (PUE) for its data centers.

5.1 PUE is defined as the ratio of the total amount of power used by a computer data center facility to the amount of power delivered to computing equipment.

5.2 If disclosing PUE, the entity shall follow the guidance and calculation methodology described in *PUE™: A Comprehensive Examination of the Metric* (2014), published by ASHRAE and The Green Grid Association.

## **TC-IM-130a.2. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**

1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.

- 1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 2.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:
    - 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 3.1.2 Water that is directly or indirectly incorporated into the entity's product or service;
    - 3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.
- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute's (WRI) Water Risk Atlas tool, [Aquaduct](#).
- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

### **TC-IM-130a.3. Discussion of the integration of environmental considerations into strategic planning for data center needs**

- 1 The entity shall describe its approach to the integration of environmental considerations, including energy and water use, into strategic planning for data centers.
- 2 Discussion shall include, but is not limited to, how environmental factors impact the entity's decisions regarding the siting, design, construction, refurbishment, and operations of data centers.
  - 2.1 Environmental factors and criteria may include, but are not limited to:
    - 2.1.1 Location-based environmental factors, such as regional humidity, average temperature, and water availability.



2.1.2 Environmental regulations, such as energy efficiency standards and national- or state-level carbon legislation on pricing, and carbon intensity of grid electricity.

3 The scope of disclosure includes considerations for existing owned data centers, development of new data centers, and outsourcing of data center services, where relevant.

## SEMICONDUCTORS

### Industry Description

The Semiconductors industry includes companies that design or manufacture semiconductor devices, integrated circuits, their raw materials and components, or capital equipment. Some companies in the industry provide outsourced manufacturing, assembly, or other services for designers of semiconductor devices.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	(1) Gross global Scope 1 emissions and (2) amount of total emissions from perfluorinated compounds	Quantitative	Metric tons (t) CO <sub>2</sub> -e	TC-SC-110a.1
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	TC-SC-110a.2
Energy Management in Manufacturing	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	TC-SC-130a.1
Water Management	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	TC-SC-140a.1
Product Lifecycle Management	Percentage of products by revenue that contain IEC 62474 declarable substances <sup>102</sup>	Quantitative	Percentage (%)	TC-SC-410a.1
	Processor energy efficiency at a system-level for: (1) servers, (2) desktops, and (3) laptops <sup>103</sup>	Quantitative	Various, by product category	TC-SC-410a.2

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Total production <sup>104</sup>	Quantitative	See note	TC-SC-000.A
Percentage of production from owned facilities	Quantitative	Percentage (%)	TC-SC-000.B

<sup>102</sup>

Note to **TC-SC-410a.1** – Disclosure shall include a discussion of efforts to minimize usage of these substances.

<sup>103</sup>

Note to **TC-SC-410a.2** – Disclosure shall include a discussion of efforts to design for new and emerging usage patterns with respect to energy efficiency in all product categories (i.e., applications for servers, desktops, laptops, workstations, netbooks, tablets, mobile phones, and storage).

<sup>104</sup>

Note to **TC-SC-000.A** – The entity shall disclose total production from its own manufacturing facilities and those with which it contracts for manufacturing services. For semiconductor equipment manufacturers the total production shall be reported on a per unit basis. For semiconductor device manufacturers the total production shall be reported consistent with International SEMATECH Manufacturing Initiative’s Semiconductor Key Environment Performance Indicators Guidance, Technology Transfer #09125069A-ENG.

# Greenhouse Gas Emissions

## Topic Summary

Companies in the Semiconductors industry generate greenhouse gas (GHG) emissions, particularly those from perfluorinated compounds, from semiconductor manufacturing operations. GHG emissions can create regulatory compliance costs and operating risks for semiconductors companies, although resulting financial impacts will vary depending on the magnitude of emissions and the prevailing emissions regulations. Companies that cost-effectively manage GHG emissions through greater energy efficiency, the use of alternative chemicals, or manufacturing process advances could benefit from improved operating efficiency and reduced regulatory risk.

## Accounting Metrics

### TC-SC-110a.1. (1) Gross global Scope 1 emissions and (2) amount of total emissions from perfluorinated compounds

- 1 The entity shall disclose its (1) gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e), calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 The entity shall disclose its (2) gross global Scope 1 GHG emissions, in metric tons of CO<sub>2</sub>-e, originated from perfluorinated compounds.
- 3 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 3.1 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:
    - 3.1.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)
    - 3.1.2 *Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources* published by the U.S. Environmental Protection Agency (EPA)
    - 3.1.3 India GHG Inventory Program

3.1.4 ISO 14064-1

3.1.5 *Petroleum Industry Guidelines for reporting GHG emissions*, 2nd edition, 2011, published by IPIECA

3.1.6 *Protocol for the quantification of greenhouse gas emissions from waste management activities* published by Entreprises pour l'Environnement (EpE)

3.2 GHG emissions data shall be consolidated and disclosed according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the “financial control” approach defined by the GHG Protocol, and the approach published by the Climate Disclosure Standards Board (CDSB) described in REQ-07, “Organisational boundary,” of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).

- 4 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 5 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 6 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

## **TC-SC-110a.2. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined according to *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.3 The entity shall specifically discuss its strategy or plan to manage Scope 1 GHG emissions that originate from perfluorinated compounds.
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 2.2 Whether the target is absolute- or intensity-based, and the metric denominator, if it is an intensity-based target;

- 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated toward the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;
  - 2.5 The mechanism(s) for achieving the target; and
  - 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset.
- 3 The entity shall discuss the activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
- 3.1 Relevant activities and investments may include, but are not limited to, energy efficiency efforts, demand-response programs, and development of renewable energy portfolios consistent with the [IPCC Fifth Assessment Report: Climate Change 2014: Mitigation of Climate Change, Contribution of Working Group III](#).
- 4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as how they relate to different business units, geographies, or emissions sources.
- 5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
- 6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

# Energy Management in Manufacturing

## Topic Summary

Energy is a critical input for manufacturing semiconductor devices. The price of conventional grid electricity and volatility of fossil fuel prices may increase as a result of evolving climate change regulations and new incentives for energy efficiency and renewable energy, among other factors, while alternative energy sources become more cost-competitive. Decisions regarding energy sourcing and type, as well as the use of alternative energy, can create trade-offs related to the energy supply's cost and reliability for operations. As industry innovation adds complexity to manufacturing processes, new technologies to manufacture semiconductors are likely to consume more energy unless companies invest in the energy efficiency of their operations. The manner in which a company manages energy efficiency, its reliance on different types of energy and the associated sustainability risks, and its ability to access alternative energy sources is likely to impact financial performance.

## Accounting Metrics

### TC-SC-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a

Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

# Water Management

## Topic Summary

Water is critical to the semiconductor production process, which requires significant volumes of “ultra-pure” water for cleaning purposes, to avoid trace molecules from affecting product quality. As manufacturing becomes more complex, companies in the industry are finding it important to reduce the use of ultra-pure water. Water is becoming a scarce resource around the world, due to increasing consumption from population growth and rapid urbanization, and reduced supplies due to climate change. Furthermore, water pollution in developing countries makes available water supplies unusable or expensive to treat. Without careful planning, water scarcity can result in higher supply costs, social tensions with local communities and governments, and/or loss of access to water in water-scarce regions thereby presenting a critical risk to production. Semiconductor companies that are able to increase the efficiency of water use during manufacturing will maintain a lower risk profile and face lower regulatory risks as local, regional, and national environmental laws place increasing emphasis on resource conservation.

## Accounting Metrics

### TC-SC-140a.1. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.
  - 1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 2.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:
    - 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 3.1.2 Water that is directly or indirectly incorporated into the entity’s product or service;
    - 3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.



- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

# Product Lifecycle Management

## Topic Summary

As an increasing number of devices become connected to each other and to the Internet, semiconductor companies face greater demand for products that will enable higher computing power and lower energy costs. Semiconductor machinery and device manufacturers can reduce the environmental and human health impacts of their products by increasing the energy-efficiency of equipment and chips and reducing the amount of harmful materials in products. As consumer demand grows for energy-efficient devices that enable a longer battery life, reduce heat output, and allow end users to lower energy bills, semiconductor manufacturers that meet this need can gain a competitive advantage, driving revenues and market share growth. Companies can also benefit from working to reduce and eventually eliminate the use of toxic materials from chips destined for consumer devices, which has implications for the end-of-life management of electronic waste, an issue of growing legislative importance in many countries.

## Accounting Metrics

### TC-SC-410a.1. Percentage of products by revenue that contain IEC 62474 declarable substances

- 1 The entity shall disclose percentage of its products sold during the reporting period that contain declarable substances.
  - 1.1 A product is considered to contain a declarable substance if, according to International Electrotechnical Commission's [IEC 62474 – Material Declaration for Products of and for the Electrotechnical Industry](#), the product contains an amount of the declarable substance that is:
    - 1.1.1 Above the “reporting threshold”
    - 1.1.2 Within the scope of the “reporting application” identified
    - 1.1.3 Within mandatory “reporting requirement”
  - 1.2 The entity shall calculate the percentage as the revenue from electrical, electronic, and related technology products sold that contain a declarable substance(s) divided by total revenue from electrical, electronic, and related technology products sold.
- 2 The scope of disclosure includes all electrical, electronic, and related technology products, including products from a company not required to declare, or otherwise making declarations, according to IEC 62474.

#### Note to TC-SC-410a.1

- 1 The entity shall describe its approach to managing the use of substances that appear as declarable substance groups or declarable substances in IEC 62474, including a discussion of specific operational processes during which use of these substances is considered as well as a discussion of actions the entity has taken to manage the use of these substances.

- 1.1 Relevant management approaches and actions to describe may include, but are not limited to:
  - 1.1.1 Product design criteria for the exclusion of substances (e.g., banned substances lists)
  - 1.1.2 Use of material substitution assessments, materials and parts procurement guidelines, product safety testing, product declarations (e.g., material safety data sheets), and product labeling
- 2 If the entity assesses and manages the impact of known or potentially toxic substances with reference to other regulations, industry norms, or accepted chemical lists, it may identify those practices, and it shall describe the degree of overlap with IEC 62474.

## **TC-SC-410a.2. Processor energy efficiency at a system-level for: (1) servers, (2) desktops, and (3) laptops**

- 1 The entity shall disclose the energy efficiency of its processors based on benchmarked performance per watt of energy consumed for (1) servers, (2) desktops, and (3) laptops, using the following parameters:
  - 1.1 Representative product: The entity shall calculate performance using a representative product for each product category (i.e., servers, desktops, laptops), where representative product would typically be the entity's bestselling specification of processor in the product category. If the entity determines its representative product differently, it shall explain the criteria it used in this determination.
  - 1.2 System-level testing: Testing shall be conducted—and disclosure shall be made—at the system-level for a computer integrating the entity's processor and not at a component-level. The entity shall conduct testing using a representative computer system structure, such as the bestselling system using the entity's processor or one that is widely commercially available.
  - 1.3 Specified benchmark: At a minimum the entity shall disclose performance to the benchmarks defined below for each product category; the entity may disclose performance to additional benchmarks.
- 2 As described below, the entity shall conduct testing and disclose performance, depending on product category, consistent with guidance provided by:
  - 2.1 The Standard Performance Evaluation Corporation (SPEC)
  - 2.2 MobileMark®
- 3 For (1) servers the entity shall conduct testing according to the SPEC Power SPECpower\_sss2008 and disclose the results as: overall ssj\_ops/watt
- 4 For (2) desktop computers the entity shall conduct testing according to the SPEC CPU2006 benchmark and disclose results as both:
  - 4.1 SPECspeed2017\_int\_base score/watt
  - 4.2 SPECspeed2017\_fp\_basescore/watt
- 5 For (3) laptops the entity shall conduct testing according to the MobileMark® 2014 v1.5 and disclose results as both:

5.1 Performance qualification score

5.2 Battery life score (in minutes)

6 The entity shall consider the references to guidance provided by SPEC and MobileMark® as normative references, thus any future updates made to them shall be considered updates to this guidance.

7 The entity may additionally disclose energy efficiency performance for other product categories, for which a benchmark is not specified above (e.g., workstations, netbooks, tablets, mobile phones, and storage), using a relevant benchmark.

7.1 The entity shall describe the parameters it used to select and test to applicable benchmarks.

**Note to TC-SC-410a.2**

1 The entity shall discuss how it incorporates product energy efficiency considerations into design for new and emerging usage patterns in all relevant product categories.

1.1 The discussion may include, but is not limited to, how, in the entity's view, the energy efficiency of processors is influenced by factors such as growth of new product categories (e.g., machine-to-machine communication), new usage patterns (e.g., increased data consumption via mobile devices), purchasing specifications (e.g., ENERGY STAR®), or consumer demand (e.g., environmentally conscious consumers).

## SOFTWARE & IT SERVICES

### Industry Description

The Software & Information Technology (IT) Services industry offers products and services globally to retail, business, and government customers, and includes companies involved in the development and sales of applications software, infrastructure software, and middleware. The industry is generally competitive, but with dominant players in some segments. While relatively immature, the industry is characterized by high-growth companies that place a heavy emphasis on innovation and depend on human and intellectual capital. The industry also includes IT services companies delivering specialized IT functions, such as consulting and outsourced services. New industry business models include cloud computing, software as a service, virtualization, machine-to-machine communication, big data analysis, and machine learning. Additionally, brand value is key for companies in the industry to scale and achieve network effects, whereby wide adoption of a particular software product leads to self-perpetuating growth in sales.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	CODE
Environmental Footprint of Hardware Infrastructure	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	TC-SI-130a.1
	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	TC-SI-130a.2
	Discussion of the integration of environmental considerations into strategic planning for data center needs	Discussion and Analysis	TC-SI-130a.3
Managing Systemic Risks from Technology Disruptions	Number of (1) performance issues and (2) service disruptions; (3) total customer downtime <sup>105</sup>	Quantitative	TC-SI-550a.1
	Description of business continuity risks related to disruptions of operations	Discussion and Analysis	TC-SI-550a.2

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
(1) Number of licenses or subscriptions, (2) percentage cloud-based	Quantitative	Number, Percentage (%)	TC-SI-000.A
(1) Data processing capacity, (2) percentage outsourced <sup>106</sup>	Quantitative	See note	TC-SI-000.B

<sup>105</sup>

Note to **TC-SI-550a.1** – Disclosure shall include a description of each significant performance issue or service disruption and any corrective actions taken to prevent future disruptions.

<sup>106</sup>

Note to **TC-SI-000.B** – Data processing capacity shall be reported in units of measure typically tracked by the entity or used as the basis for contracting software and IT services, such as Million Service Units (MSUs), Million Instructions per Second (MIPS), Mega Floating-Point Operations per Second (MFLOPS), compute cycles, or other. Alternatively, the entity may disclose owned and outsourced data processing needs in other units of measure, such as rack space or data center square footage. The percentage outsourced shall include On-Premise cloud services, those that are hosted on Public Cloud, and those that are residing in Colocation Data Centers.

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
(1) Amount of data storage, (2) percentage outsourced <sup>107</sup>	Quantitative	Petabytes, Percentage (%)	TC-SI-000.C

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<sup>107</sup>

Note to **TC-SI-000.C** – The percentage outsourced shall include On-Premise cloud services, those that are hosted on Public Cloud, and those that are residing in Colocation Data Centers.

# Environmental Footprint of Hardware Infrastructure

## Topic Summary

With the growth of cloud-based service offerings, companies in this industry own, operate, or rent increasingly more data centers and other hardware; thus, managing the energy and water use associated with IT hardware infrastructure is important to shareholder value. Data centers need to be powered continuously, and disruptions to the energy supply can have a material impact on operations, depending on the magnitude and timing of the disruption. Companies face a tradeoff between energy and water consumption due to data center cooling needs; cooling data centers with water instead of chillers is a means of improving energy efficiency, but it can lead to dependence on significant local water resources. Decisions about data center specifications are important for managing costs, obtaining a reliable supply of energy and water, and lowering reputational risks, particularly as there is an increasing global regulatory focus on climate change and as opportunities arise from innovations in energy efficiency and renewable energy.

## Accounting Metrics

### TC-SI-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase

agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0 (2017)* or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

5 The entity may disclose the trailing twelve-month (TTM) weighted average power usage effectiveness (PUE) for its data centers.

5.1 PUE is defined as the ratio of the total amount of power used by a computer data center facility to the amount of power delivered to computing equipment.

5.2 If disclosing PUE, the entity shall follow the guidance and calculation methodology described in *PUE™: A Comprehensive Examination of the Metric (2014)*, published by ASHRAE and The Green Grid Association.

## **TC-SI-130a.2. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress**

1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.



- 1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids per the [U.S. Geological Survey](#).
  - 2.2 Water obtained from a water utility in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:
    - 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 3.1.2 Water that is directly or indirectly incorporated into the entity's product or service;
    - 3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.
- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute's (WRI) Water Risk Atlas tool, [Aqueduct](#).
- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

### **TC-SI-130a.3. Discussion of the integration of environmental considerations into strategic planning for data center needs**

- 1 The entity shall describe its approach to the integration of environmental considerations, including energy and water use, into strategic planning for data centers.
- 2 Discussion shall include, but is not limited to, how environmental factors impact the entity's decisions regarding the siting, design, construction, refurbishment, and operations of data centers.
  - 2.1 Environmental factors and criteria may include, but are not limited to:
    - 2.1.1 Location-based environmental factors, such as regional humidity, average temperature, and water availability.

2.1.2 Environmental regulations, such as energy efficiency standards and national- or state-level carbon legislation on pricing, and carbon intensity of grid electricity.

3 The scope of disclosure includes considerations for existing owned data centers, development of new data centers, and outsourcing of data center services, where relevant.

# Managing Systemic Risks from Technology Disruptions

## Topic Summary

With trends toward increased cloud computing and use of Software as a Service (SaaS), software and IT service providers need to ensure they have robust infrastructure and policies in place to minimize disruptions to their services. Disruptions such as programming errors or server downtime have the potential to generate systemic risks, as computing and data storage functions move from individual company servers in various industries to data centers of cloud-computing service providers. The risks are heightened particularly if the affected customers are in sensitive sectors, such as financial institutions or utilities, which are considered critical national infrastructure. Companies' investments in improving the reliability and quality of their IT infrastructure and services are likely to affect their ability to attract and retain customers, thereby impacting revenues and opportunities in new markets.

## Accounting Metrics

### TC-SI-550a.1. Number of (1) performance issues and (2) service disruptions; (3) total customer downtime

- 1 The entity shall disclose (1) the number of performance issues in software and information technology (IT) services provided to customers.
  - 1.1 Performance issues are defined as any planned or unplanned downtime causing an interruption, of more than 10 minutes but less than or equal to 30 minutes, in the provision of cloud-based services to customers.
  - 1.2 Performance issues include, but are not limited to, those caused by technical failures, programming errors, cyber attacks, weather events, or natural disasters at hosting facilities.
- 2 The entity shall disclose (2) the number of service disruptions in software and IT services provided to customers.
  - 2.1 Service disruptions are defined as any planned or unplanned downtime causing an interruption of more than 30 minutes in provision of cloud-based services to customers.
  - 2.2 Service disruptions include, but are not limited to, those caused by technical failures, programming errors, cyber attacks, weather events, or natural disasters at hosting facilities.
- 3 The entity shall disclose (3) the total customer downtime related to performance issues and service disruptions in software and IT services provided to customers.
  - 3.1 Total customer downtime is defined as the interruption duration of each service disruption multiplied by the number of software and IT services licenses affected, reported in license-days. For context, the entity shall indicate the licensing basis (e.g., number of seats, number of CPU cores, number of cloud subscriptions) and whether the licenses are consumption-based or capacity based.

Note to TC-SI-550a.1

- 1 For each significant service disruption, the entity shall disclose the duration of the disruption, the extent of impact, and the root cause, as well as any corrective actions taken to prevent future disruptions. Where material, the entity shall indicate the associated cost incurred, such as remediation costs to correct technology or process issues, as well as any liability costs.
- 2 A service disruption is considered significant if the cost to correct is material or if it is disruptive to a large number of customers or fundamental business operations in a manner that affects time to market, revenue capture, or other material parameters.

## **TC-SI-550a.2. Description of business continuity risks related to disruptions of operations**

- 1 The entity shall describe potential business continuity risks associated with technology disruptions affecting operations.
  - 1.1 Examples of disruptions include, but are not limited to, those caused by technical failures, programming errors, cyber attacks, weather events, or natural disasters at hosting facilities.
- 2 The entity shall discuss measures it implements to address business continuity risks, such as technologies or processes that reduce impacts from disruptions, enhance the resilience of systems, insure against loss, or provide redundancies to critical business operations.
- 3 The entity shall identify which critical business operations support cloud-based services, and shall further note whether those operations are owned or outsourced.
- 4 The entity may discuss estimated amount of potential loss, probability of that loss, and the associated time frame. These estimates may be based on insurance figures or other third-party or internal assessments of potential loss.

## TELECOMMUNICATION SERVICES

### Industry Description

The Telecommunication Services industry consists of wireless and wireline telecommunications companies, as well as companies that provide cable and satellite services. The wireless services segment provides direct communication through radio-based cellular networks and operates and maintains the associated switching and transmission facilities. The wireline segment provides local and long distance voice communication via the Public Switched Telephone Network. Wireline carriers also offer voice over internet protocol (VoIP) telephone, television, and broadband internet services over an expanding network of fiber optic cables. Cable providers distribute television programming from cable networks to subscribers. They typically also provide consumers with video services, high-speed internet service, and VoIP. These services are traditionally bundled into packages that provide subscribers with easier payment options than paying for each service separately. Satellite companies distribute TV programming through broadcasting satellites orbiting the Earth or through ground stations. Companies serve customers primarily in their domestic markets, although some companies operate in several countries.

Table 1. *Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Environmental Footprint of Operations	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	TC-TL-130a.1
Managing Systemic Risks from Technology Disruptions	(1) System average interruption frequency and (2) customer average interruption duration <sup>108</sup>	Quantitative	Disruptions per customer, Hours per customer	TC-TL-550a.1
	Discussion of systems to provide unimpeded service during service interruptions	Discussion and Analysis	n/a	TC-TL-550a.2

Table 2. *Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of wireless subscribers <sup>109</sup>	Quantitative	Number	TC-TL-000.A
Number of wireline subscribers <sup>110</sup>	Quantitative	Number	TC-TL-000.B
Number of broadband subscribers <sup>111</sup>	Quantitative	Number	TC-TL-000.C

<sup>108</sup>

Note to **TC-TL-550a.1** – Disclosure shall include a description of each significant performance issue or service disruption and any corrective actions taken to prevent future disruptions.

<sup>109</sup>

Note to **TC-TL-000.A** – Wireless subscribers are defined as those customers that contract with the entity for mobile services, which include cellular phone service and/or wireless data service.

<sup>110</sup>

Note to **TC-TL-000.B** – Wireline subscribers are defined as those customers that contract with the entity for fixed line phone services.

<sup>111</sup>

Note to **TC-TL-000.C** – Broadband subscribers are defined as those customers that contract with the entity for fixed line cable and internet services, which include WiFi connections.

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Network traffic	Quantitative	Petabytes	TC-TL-000.D

# Environmental Footprint of Operations

## Topic Summary

Individual telecommunication services companies consume substantial amounts of energy. Depending on the source of energy and the efficiency of its generation, electricity consumption by telecom network infrastructure can contribute significantly to environmental externalities, such as climate change, creating sustainability risks for the industry. Although network equipment and data centers are becoming more energy-efficient, their overall energy consumption is increasing with the expansion in telecommunications infrastructure and data traffic. The way in which telecommunication services companies manage their overall energy efficiency or intensity, their reliance on different types of energy, and their ability to access alternative sources of energy will become increasingly material as the global regulatory focus on climate change increases, bringing with it incentives for energy efficiency and renewable energy as well as pricing of greenhouse gas emissions (GHG). Since expenditures on energy can be significant in the industry, companies that are able to improve the energy-efficiency of their operation are likely to see cost savings and higher profit margins.

## Accounting Metrics

### TC-TL-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.

- 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.
  - 3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
  - 3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.
- 3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:
  - 3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;
  - 3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.
- 4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).
- 5 The entity may disclose the trailing twelve-month (TTM) weighted average power usage effectiveness (PUE) for its data centers.
  - 5.1 PUE is defined as the ratio of the total amount of power used by a computer data center facility to the amount of power delivered to computing equipment.
  - 5.2 If disclosing PUE, the entity shall follow the guidance and calculation methodology described in *PUE™: A Comprehensive Examination of the Metric* (2014), published by ASHRAE and The Green Grid Association.



# Managing Systemic Risks from Technology Disruptions

## Topic Summary

Given the systemic importance of telecommunications networks, systemic or economy-wide disruption may be created if the network infrastructure of telecommunication services companies is unreliable and prone to business continuity risks. As the frequency of extreme weather events associated with climate change increases, telecommunication services companies will face growing physical threats to network infrastructure, with potentially significant social or systemic impacts. In the absence of resilient and reliable infrastructure, companies may face lost revenue associated with service outages and unplanned capital expenditures to repair damaged or compromised equipment. Companies that successfully implement measures to address business continuity risks, including an identification of critical business operations, or to enhance resilience of the system are likely to substantially reduce their risk exposure and, hence, lower their cost of capital. While implementation of such measures may have upfront costs, companies are likely to see long-term benefits in terms of lower remediation expenses in cases of high-impact disruptions.

## Accounting Metrics

### TC-TL-550a.1. (1) System average interruption frequency and (2) customer average interruption duration

- 1 The entity shall disclose (1) system average interruption frequency as the average number of disruptions per customer.
  - 1.1 Average interruption frequency shall be calculated as the total number of customer interruptions divided by the total number of customers served.
    - 1.1.1 The number of customer interruptions is the sum for all interruptions of the number of customer accounts that experienced an interruption in service during each incident (i.e., counting customer accounts multiple times if they experienced multiple service interruptions throughout the year).
    - 1.1.2 The number of customers served is the number of unique customer accounts with active service during the reporting period.
- 2 The entity shall disclose (2) customer average interruption duration as the average number of hours per customer.
  - 2.1 Average interruption duration shall be calculated as the sum for all interruptions of the total downtime (in hours) of each interruption divided by the number of customer accounts affected by each interruption.
    - 2.1.1 The number of customers served is the number of unique customer accounts with active service during the reporting period.
- 3 The scope of disclosure is restricted to:
  - 3.1 Wireline communications services

- 3.2 Wireless communications services
- 3.3 Internet service provider (ISP) services

**Note to TC-TL-550a.1**

- 1 For each significant service interruption, the entity shall disclose the duration of the disruption, the extent of impact, and the root cause, as well as any corrective actions taken to prevent future disruptions.
  - 1.1 Where relevant, the entity shall indicate costs incurred, such as those due to organizational change, training, or technology expenditures required for remediation, lost revenues, payment of warranties, or cost associated with breach of contract.
  - 1.2 A service interruption is considered significant if it meets the thresholds set forth in Part 4 of the U.S. Federal Communication Commission's (FCC) rules (47 C.F.R. Part 4) for reporting as part of the Network Outage Reporting System (NORS).

**TC-TL-550a.2. Discussion of systems to provide unimpeded service during service interruptions**

- 1 The entity shall discuss business continuity risks associated with technology disruptions affecting operations.
  - 1.1 Examples of disruptions include, but are not limited to, those caused by technical failures, programming errors, cyber attacks, weather events, or natural disasters at hosting facilities. .
- 2 The entity shall discuss measures to address business continuity risks, including an identification of critical business operations and redundancies or other measures implemented to enhance resilience of the system or to reduce impact, including insurance against loss.
- 3 The entity may discuss estimated amount of potential loss, probability of that loss, and the associated timeframe. These estimates may be based on insurance figures or other third-party or internal assessments of potential loss.

## AIR FREIGHT & LOGISTICS

### Industry Description

Air freight and logistics companies provide freight services and transportation logistics to both businesses and individuals. There are three main industry segments: air freight transportation, post and courier services, and transportation logistics services. Companies in the industry earn revenue from one or more of the segments and range from non-asset-based to asset-heavy. Transportation logistics services include contracting with road, rail, marine, and air freight companies to select and hire appropriate transportation. Services can also include customs brokerage, distribution management, vendor consolidation, cargo insurance, purchase-order management, and customized logistics information. The industry is key to global trade, granting it a degree of demand stability.

Table 1. Climate-related Disclosure Topics & Accounting Metrics

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions	Quantitative	Metric tons (t) CO <sub>2</sub> -e	TR-AF-110a.1
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	TR-AF-110a.2
	Fuel consumed by (1) road transport, percentage (a) natural gas and (b) renewable, and (2) air transport, percentage (a) alternative and (b) sustainable	Quantitative	Gigajoules (GJ), Percentage (%)	TR-AF-110a.3
Supply Chain Management	Total greenhouse gas (GHG) footprint across transport modes	Quantitative	Metric tons (t) CO <sub>2</sub> -e per ton-kilometer	TR-AF-430a.2

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Revenue ton kilometers (RTK) for: (1) road transport and (2) air transport <sup>112</sup>	Quantitative	RTK	TR-AF-000.A
Load factor for: (1) road transport and (2) air transport <sup>113</sup>	Quantitative	Rate	TR-AF-000.B
Number of employees, number of truck drivers	Quantitative	Number	TR-AF-000.C

<sup>112</sup>

Note to **TR-AF-000.A** – Revenue ton kilometers (RTK) is defined as one metric ton of revenue traffic transported one kilometer. RTK is computed by multiplying the vehicle-kilometers traveled on each leg by the number of tons of revenue traffic carried on that leg.

<sup>113</sup>

Note to **TR-AF-000.B** – Load factor is a measure of capacity utilization and is calculated as kilometers traveled by cargo divided by total kilometers traveled.

# Greenhouse Gas Emissions

## Topic Summary

Companies in the Air Freight & Logistics industry generate direct greenhouse gas (GHG) emissions that contribute to climate change. Emissions are generated from fuel combustion by both air and road freight operations. Given the altitude of the emissions from jet fuel, air freight makes an especially potent contribution to climate change. Management of GHG emissions is likely to affect air freight and logistics companies' cost structure over time, as emissions are tied directly to fuel use, and thus to operating expenses. Fuel efficiency and the use of alternative fuels offers a way for companies to reduce fuel costs and/or limit exposure to volatile fuel pricing, future regulatory costs, and other consequences of GHG emissions. While newer aircraft and trucks are generally more fuel-efficient, existing fleets may be retrofitted. Capital investments in more fuel-efficient airplanes and/or vehicles and emerging fuel-management technology may potentially reduce ongoing fuel expenses and improve profitability. It can also help companies potentially capture market share of customers seeking low-carbon shipping solutions.

## Accounting Metrics

### TR-AF-110a.1. Gross global Scope 1 emissions

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalent (CO<sub>2</sub>-e), and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:
    - 2.1.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)
    - 2.1.2 *Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources* published by the U.S. Environmental Protection Agency (EPA)
    - 2.1.3 India GHG Inventory Program

2.1.4 ISO 14064-1

2.1.5 Petroleum Industry Guidelines for reporting GHG emissions, 2nd edition, 2011, published by IPIECA

2.1.6 Protocol for the quantification of greenhouse gas emissions from waste management activities published by Entreprises pour l'Environnement (EpE)

2.2 GHG emissions data shall be consolidated and disclosed according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the “financial control” approach defined by the GHG Protocol, and the approach published by the Climate Disclosure Standards Board (CDSB) described in REQ-07, “Organisational boundary,” of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).

- 3 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 4 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 5 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

## **TR-AF-110a.2. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined according to *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 2.2 Whether the target is absolute- or intensity-based, and the metric denominator, if it is an intensity-based target;
  - 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated toward the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;

- 2.5 The mechanism(s) for achieving the target; and
  - 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset.
- 3 The entity shall discuss the activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
    - 3.1 Relevant aviation-related activities and investments may include, but are not limited to, fuel optimization efforts such as the use of ground power and pre-conditioned air rather than auxiliary power units (APU) when parked at gate, adjusting flight speed to optimize fuel efficiency, route design (e.g., NextGen), use of winglets, reduction in aircraft weight, and upgrading of the fleet with new aircraft.
    - 3.2 Relevant road transportation-related activities and investments may include, but are not limited to, fuel optimization efforts such as route and load optimization, adoption of technology such as engine and powertrain efficiency and aerodynamic improvements, use of electric- or natural gas-powered vehicles, weight reduction, improved tire rolling resistance, hybridization, and automatic engine shutdown.
  - 4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as how they relate to different business units, geographies, or emissions sources.
  - 5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
  - 6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

**TR-AF-110a.3. Fuel consumed by (1) road transport, percentage (a) natural gas and (b) renewable, and (2) air transport, percentage (a) alternative and (b) sustainable**

- 1 The entity shall disclose the amount of fuel consumed as an aggregate figure, in gigajoules (GJ), broken down by (1) road transport-related operations, and separately, (2) air transport-related operations.
  - 1.1 The calculation methodology for fuel consumed shall be based on actual fuel consumed as opposed to design parameters.
  - 1.2 Acceptable calculation methodologies for fuel consumed include, but are not limited to, methodologies based on:
    - 1.2.1 Adding fuel purchases made during the reporting period to beginning inventory at the start of the reporting period, less any fuel inventory at the end of the reporting period
    - 1.2.2 Tracking fuel consumed by vehicles
    - 1.2.3 Tracking fuel expenses
- 2 In disclosing fuel consumed by (1) road transport-related operations, the entity shall additionally disclose the percentage of fuel consumed that is (a) natural gas.

- 2.1 The percentage shall be calculated as the amount of fuel consumed by road transport-related operations that was natural gas (in GJ) divided by the total amount of fuel consumed by road transport-related operations (in GJ).
- 3 In disclosing fuel consumed by (1) road transport-related operations, the entity shall additionally disclose the percentage of fuel consumed that is (b) renewable fuel.
  - 3.1 Renewable fuel is defined by the U.S. Renewable Fuel Standard (U.S. 40 CFR 80.1401), as fuel that meets all of the following requirements:
    - 3.1.1 Produced from renewable biomass;
    - 3.1.2 Used to replace or reduce the quantity of fossil fuel present in a transportation fuel, heating oil, or jet fuel; and
    - 3.1.3 Has lifecycle greenhouse gas (GHG) emissions that are at least 20 percent less than baseline lifecycle GHG emissions, unless the fuel is exempt from this requirement pursuant to U.S. 40 CFR 80.1403.
  - 3.2 The scope of renewable fuel includes fuel that qualifies for Renewable Identification Numbers (RINs) under the U.S. Renewable Fuel Standard.
  - 3.3 The percentage shall be calculated as the amount of renewable fuel consumed by road transport-related operations (in GJ) divided by the total amount of fuel consumed by road transport-related operations (in GJ).
- 4 In disclosing fuel consumed by (2) air transport-related operations, the entity shall additionally disclose the percentage of fuel consumed that is (a) alternative fuel.
  - 4.1 Alternative fuel is defined by the [International Civil Aviation Organization](#) (ICAO) as fuel from sources other than petroleum that has the potential to generate lower carbon emissions than petroleum-based fuel on a life cycle basis.
  - 4.2 The percentage shall be calculated as the amount of alternative fuel consumed by air transport-related operations (in GJ) divided by the total amount of fuel consumed by air transport-related operations (in GJ).
- 5 In disclosing fuel consumed by (2) air transport-related operations, the entity shall additionally disclose the percentage of fuel consumed that was (b) sustainable fuel.
  - 5.1 Sustainable fuel is defined as a subset of alternative fuel that meets all of the following criteria described by ICAO:
    - 5.1.1 Achieves net greenhouse gas (GHG) emissions reduction on a life cycle basis;
    - 5.1.2 Avoids competition with food and water through utilization of marginal or unviable land; and
    - 5.1.3 Contributes to local social and economic development, such as through expanded employment and revitalized infrastructure.
  - 5.2 The percentage shall be calculated as the amount of sustainable fuel consumed by air transport-related operations (in GJ) divided by the total amount of fuel consumed by air transport-related operations (in GJ).

- 6 The scope of disclosure is limited to fuel directly consumed by the entity.
- 7 In calculating energy consumption from fuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change, the U.S. Department of Energy, or the U.S. Energy Information Agency.
- 8 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels).



# Supply Chain Management

## Topic Summary

Many companies in the Air Freight & Logistics industry contract with large, complex networks of asset-based third-party providers to provide freight transportation services to their customers. Contracting is especially common among companies providing freight forwarding, logistics, brokerage, and intermodal services. These contractors range across all modes of transport such as motor carriers, railroads, air freight, and ocean carriers. Companies need to manage the relationships with their contractors in order to ensure that contractor actions that lead to environmental or social impacts do not result in material adverse effects on their own operations, such as decreased brand value. At the same time, companies that are able to offer low-carbon logistics solutions may capture market share from customers seeking to reduce the carbon footprint of their shipments.

## Accounting Metrics

### TR-AF-430a.2. Total greenhouse gas (GHG) footprint across transport modes

- 1 The entity shall disclose the complete tank-to-wheels greenhouse gas (GHG) footprint in metric tons of CO<sub>2</sub>-e per metric ton-kilometer.
- 2 Tank-to-wheels emissions relate to vehicle processes and exclude upstream emissions associated with primary energy production (i.e., well-to-tank emissions).
  - 2.1 The entity shall calculate its disclosure according to EN 16258:2012, Methodology for calculation and declaration of energy consumption and GHG emissions of transport services (freight and passengers).
    - 2.1.1 Calculations shall be consistent with the methodology used to calculate the “tank-to-wheels GHG emissions (Gt)” result that is described in EN 16258:2012.
    - 2.1.2 Determination of transportation system scope, boundaries, and any necessary allocations shall be consistent with the methodology described in EN 16258:2012.
- 3 The scope of disclosure includes emissions from all freight transportation and logistics activities, including those from the entity’s own assets (Scope 1) and those from contract carriers and outsourced freight forwarding services.
- 4 The scope of disclosure includes emissions from all modes of transportation, such as road freight, air freight, barge transport, marine transport, and rail transport.
- 5 Consistent with EN 16258:2012, disclosure may be based on calculations from a mix of categories of emissions values (i.e., specific measured values, transport operator vehicle-type- or route-type-specific values, transport operator fleet values, and default values).
- 6 Where relevant and necessary for interpretation of disclosure, the entity shall describe its allocation methods, emissions values, boundaries, mix of transport services used, and other information.

## AIRLINES

### Industry Description

The Airlines industry is comprised of companies that provide air transportation globally to passengers for both leisure and business purposes. This includes commercial full-service, low-cost, and regional airlines. Full-service carriers typically use a hub-and-spoke model to design their routes within countries and internationally. Low-cost carriers usually offer a smaller number of routes as well as no-frills service to their customers. Regional carriers typically operate under contract to full-service carriers, expanding the network of the larger carriers. Many airline companies also have a cargo segment in their operations from which they generate additional revenue. It is common within the industry for companies to form partnerships or join alliances in order to increase network size. Operating as an alliance allows airlines to offer customers access to international or otherwise underserved itineraries on multiple airlines under one ticket. At the same time, airlines share some overhead costs and increase their competitive position in the global market without having to operate outside their home country.

Table 1. *Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions	Quantitative	Metric tons (t) CO <sub>2</sub> -e	TR-AL-110a.1
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	TR-AL-110a.2
	(1) Total fuel consumed, (2) percentage alternative, (3) percentage sustainable	Quantitative	Gigajoules (GJ), Percentage (%)	TR-AL-110a.3

Table 2. *Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Available seat kilometers (ASK) <sup>114</sup>	Quantitative	ASK	TR-AL-000.A
Passenger load factor <sup>115</sup>	Quantitative	Rate	TR-AL-000.B
Revenue passenger kilometers (RPK) <sup>116</sup>	Quantitative	RPK	TR-AL-000.C
Revenue ton kilometers (RTK) <sup>117</sup>	Quantitative	RTK	TR-AL-000.D

<sup>114</sup>

Note to **TR-AL-000.A** – Available seat kilometers (ASK) is defined as the maximum potential cumulative kilometers traveled by passengers (i.e., kilometers traveled by occupied and unoccupied seats).

<sup>115</sup>

Note to **TR-AL-000.B** – Load factor is a measure of capacity utilization and is calculated as passenger kilometers traveled divided by available seat kilometers.

<sup>116</sup>

Note to **TR-AL-000.C** – Revenue passenger kilometers (RPK) is defined as the cumulative total kilometers traveled by revenue passengers. A revenue passenger is passenger for whose transportation an air carrier receives commercial remuneration.

<sup>117</sup>

Note to **TR-AL-000.D** – Revenue ton kilometers (RTK) is defined as one metric ton of revenue traffic transported one kilometer. RTK is

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of departures	Quantitative	Number	TR-AL-000.E
Average age of fleet	Quantitative	Years	TR-AL-000.F

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computed by multiplying the aircraft kilometers flown on each flight stage by the number of metric tons of revenue traffic carried on that flight stage (e.g., passengers, baggage, freight, and mail).

# Greenhouse Gas Emissions

## Topic Summary

As a result of its heavy reliance on hydrocarbon fuels, the Airlines industry generates a significant amount of emissions, over 99 percent of which are in the form of carbon dioxide (CO<sub>2</sub>). The industry is thus subject to compliance costs and risks associated with climate change mitigation policies. The main sources of greenhouse gas (GHG) emissions for airlines companies are aircraft fuel use and emissions, ground equipment, and facility electricity. Aircraft fuel use is the largest contributor to total emissions from the industry, and fuel management is a critical part of reducing emissions. Management of the environmental impacts of fuel usage includes increasing fuel efficiency through fleet upgrades, retrofits, and optimization of flight speed and route design as well as and incorporating alternative and sustainable fuels. These initiatives require capital expenditures, but in the long-run can reduce fuel costs and decrease a company's exposure to the risks of GHG emissions programs and regulations.

## Accounting Metrics

### TR-AL-110a.1. Gross global Scope 1 emissions

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalent (CO<sub>2</sub>-e), and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:
    - 2.1.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)
    - 2.1.2 *Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources* published by the U.S. Environmental Protection Agency (EPA)
    - 2.1.3 India GHG Inventory Program
    - 2.1.4 ISO 14064-1

- 2.1.5 Petroleum Industry Guidelines for reporting GHG emissions, 2nd edition, 2011, published by IPIECA
  - 2.1.6 Protocol for the quantification of greenhouse gas emissions from waste management activities published by Entreprises pour l'Environnement (EpE)
- 2.2 GHG emissions data shall be consolidated and disclosed according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the “financial control” approach defined by the GHG Protocol, and the approach published by the Climate Disclosure Standards Board (CDSB) described in REQ-07, “Organisational boundary,” of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).
- 3 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 4 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 5 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

**TR-AL-110a.2. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
- 1.1 Scope 1 emissions are defined according to *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
- 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 2.2 Whether the target is absolute- or intensity-based, and the metric denominator, if it is an intensity-based target;
  - 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated toward the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;
  - 2.5 The mechanism(s) for achieving the target; and

- 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset.
- 3 The entity shall discuss the activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 3.1 Relevant activities and investments may include, but are not limited to, fuel optimization efforts such as the use of ground power and pre-conditioned air rather than auxiliary power units (APU) when parked at gate, adjusting flight speed to optimize fuel efficiency, route design (e.g., NextGen), use of winglets, reduction in aircraft weight, and upgrading of the fleet with new aircraft.
- 4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as how they relate to different business units, geographies, or emissions sources.
- 5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
- 6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

### **TR-AL-110a.3. (1) Total fuel consumed, (2) percentage alternative, (3) percentage sustainable**

- 1 The entity shall disclose (1) the total amount of fuel consumed from all sources as an aggregate figure, in gigajoules (GJ).
  - 1.1 The calculation methodology for fuel consumed shall be based on actual fuel consumed as opposed to design parameters.
  - 1.2 Acceptable calculation methodologies for fuel consumed include, but are not limited to, methodologies based on:
    - 1.2.1 Adding fuel purchases made during the reporting period to beginning inventory at the start of the reporting period, less any fuel inventory at the end of the reporting period
    - 1.2.2 Tracking fuel consumed by vehicles
    - 1.2.3 Tracking fuel expenses
- 2 The entity shall disclose (2) the percentage of fuel consumption that is alternative fuel.
  - 2.1 Alternative fuel is defined by the [International Civil Aviation Organization \(ICAO\)](#) as fuel from sources other than petroleum that has the potential to generate lower carbon emissions than petroleum-based fuel on a life cycle basis.
  - 2.2 The percentage shall be calculated as the amount of alternative fuel consumed (in GJ) divided by the total amount of fuel consumed (in GJ).
- 3 The entity shall disclose (3) the percentage of fuel consumed that is sustainable fuel.

- 3.1 Sustainable fuel is defined as a subset of alternative fuel that meets all of the following criteria described by ICAO:
  - 3.1.1 Achieves net greenhouse gas (GHG) emissions reduction on a life cycle basis;
  - 3.1.2 Avoids competition with food and water through utilization of marginal or unviable land; and
  - 3.1.3 Contributes to local social and economic development, such as through expanded employment and revitalized infrastructure.
- 3.2 The percentage shall be calculated as the amount of sustainable fuel consumed (in GJ) divided by the total amount of fuel consumed (in GJ).
- 4 The scope of disclosure is limited to fuel directly consumed by the entity. In calculating energy consumption from fuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change, the U.S. Department of Energy, or the U.S. Energy Information Agency.
- 5 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels).

## AUTO PARTS

### Industry Description

Companies in the Auto Parts industry supply motor vehicle parts and accessories to original equipment manufacturers (OEM). Auto parts companies typically specialize in the manufacturing and assembly of certain parts or accessories, such as engine exhaust systems, alternative drivetrains, hybrid systems, catalytic converters, aluminum wheels (rims), tires, rearview mirrors, and onboard electrical and electronic equipment. Although the larger automotive industry includes several tiers of suppliers that provide parts and raw materials used to assemble motor vehicles, the scope of SASB's Auto Parts industry includes only Tier 1 suppliers that supply parts directly to OEMs. The scope of the industry excludes captive suppliers, such as engine and stamping facilities, that are owned and operated by OEMs. Similarly, it excludes Tier 2 suppliers, which provide inputs for the Auto Parts industry.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	TR-AP-130a.1
Design for Fuel Efficiency	Revenue from products designed to increase fuel efficiency and/or reduce emissions	Quantitative	Reporting currency	TR-AP-410a.1

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of parts produced	Quantitative	Number	TR-AP-000.A
Weight of parts produced	Quantitative	Metric tons (t)	TR-AP-000.B
Area of manufacturing plants	Quantitative	Square meters (m <sup>2</sup> )	TR-AP-000.C



# Energy Management

## Topic Summary

Most of the energy consumed in the automobile manufacturing process happens in the supply chain. The use of electricity and fossil fuels by auto parts manufacturers in their production processes results in direct and indirect emissions of greenhouse gases (GHGs). Purchased electricity represents a major share of the energy used in the Auto Parts industry. Sustainability initiatives such as incentives for energy efficiency and renewable energy are making alternative sources of energy more cost-competitive. Regulators and consumers are also pressuring the industry to reduce GHG emissions. Therefore, it is becoming increasingly important for companies in energy-intensive industries to manage the cost and reliability risks associated with their overall energy efficiency, their reliance on different types of energy, and their access to alternative energy sources.

## Accounting Metrics

### TR-AP-130a.1. (1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from grid electricity.
  - 2.1 The percentage shall be calculated as purchased grid electricity consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a

Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.

3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.

3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.

3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:

3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;

3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0 (2017)* or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.

4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

# Design for Fuel Efficiency

## Topic Summary

Automobile manufacturers are increasingly demanding motor parts and components that can help reduce the fuel consumption of the vehicles they sell. Fuel-efficient components and parts play a vital role in reducing tailpipe emissions of automobiles through energy efficiency gains and contributions to weight reductions, among other factors. Auto parts companies that can design and manufacture such parts will be better positioned to increase sales to auto manufacturers that are increasingly facing stricter environmental regulations and customer preferences for more environmentally friendly cars.

## Accounting Metrics

### TR-AP-410a.1. Revenue from products designed to increase fuel efficiency and/or reduce emissions

- 1 The entity shall disclose its total revenue from products that are designed to increase fuel efficiency and/or reduce emissions during their use phase.
  - 1.1 Products designed to increase fuel efficiency and/or reduce emissions are defined as those that the entity has tested, modeled, or otherwise shown to improve fuel efficiency and/or eliminate or lower emissions of greenhouse gases (GHG), nitrogen oxide (NO<sub>x</sub>), particulate matter (PM), sulfur oxides (SO<sub>x</sub>), and other air pollutants during their use phase.
  - 1.2 The use phase is defined as the course over which the product is used by a customer or consumer as a final product and/or to generate a final product (e.g., in a manufacturing or production process).
  - 1.3 The scope of disclosure includes products that impart an incremental improvement to fuel efficiency and/or emission reduction, insofar as the entity can demonstrate that the improvement is meaningful, such as through alignment with the milestones set forth in Section 5, “Key Sectors / Ensuring efficient mobility” of the European Commission’s Road Map to a Resource Efficient Europe and/or with EU Directive 2012/27/EU (Energy Efficiency Directive).
  - 1.4 The scope of disclosure excludes products that offer improved fuel efficiency and/or reduced emissions in an ancillary or indirect way (e.g., a conventional product that is slightly lighter than the previous generation of the product).
- 2 Examples of products that may increase fuel efficiency and/or reduce emissions include, but are not limited to, those relating to: electrification of auxiliary systems such as oil and water pumps, waste heat recovery, improved aerodynamics, hybrid and advanced fuel technologies, improvements to combustion efficiency, idle reduction, alternative cooling systems, electric power steering, hybrid-enabled braking technologies, low rolling resistance (LRR) new and retread tire technologies, and engine management systems/products.
- 3 For products designed to both increase fuel efficiency and reduce emissions, the entity shall only account for the products’ revenue once.

## AUTOMOBILES

### Industry Description

The Automobiles industry includes companies that manufacture passenger vehicles, light trucks, and motorcycles. Industry players design, build, and sell vehicles that run using a range of traditional and alternative fuels and powertrains. They sell these vehicles to dealers for consumer retail sales as well as sell directly to fleet customers, including car rental and leasing companies, commercial fleets, and governments. Due to the global nature of this industry, nearly all companies have manufacturing facilities, assembly plants, and service locations in several countries around the world. The Automobiles industry is highly concentrated, with a few large manufacturers and a diversified supply chain. Given the industry's reliance on natural resources and sensitivity to the business cycle, revenues are typically cyclical.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Fuel Economy & Use-phase Emissions	Sales-weighted average passenger fleet fuel economy, by region	Quantitative	Mpg, L/km, gCO <sub>2</sub> /km, km/L	TR-AU-410a.1
	Number of (1) zero emission vehicles (ZEV), (2) hybrid vehicles, and (3) plug-in hybrid vehicles sold	Quantitative	Number	TR-AU-410a.2
	Discussion of strategy for managing fleet fuel economy and emissions risks and opportunities	Discussion and Analysis	n/a	TR-AU-410a.3

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of vehicles manufactured	Quantitative	Number	TR-AU-000.A
Number of vehicles sold	Quantitative	Number	TR-AU-000.B

# Fuel Economy & Use-phase Emissions

## Topic Summary

The combustion of petroleum-based fuels by motor vehicles accounts for a significant share of greenhouse gas (GHG) emissions that contribute to global climate change. It also generates local air pollutants such as nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOCs), and particulate matter (PM), which can threaten human health and the environment. In this context, vehicle emissions are increasingly of concern to consumers and regulators around the world. While use-phase emissions are downstream from auto manufacturers, regulations often focus on auto manufacturers to help reduce these emissions, such as through fuel economy standards. More stringent emissions standards and changing consumer demands are driving the expansion of markets for electric vehicles and hybrids, as well as for conventional vehicles with high fuel efficiency. Moreover, manufacturers are innovating by designing vehicles made with lighter-weight materials to improve fuel efficiency. Companies that can meet current fuel-efficiency and emissions standards and continue to innovate to meet or exceed future regulatory standards in different markets are likely to strengthen their competitive position and expand their market share, while mitigating the risk of reduced demand for conventional vehicles.

## Accounting Metrics

### TR-AU-410a.1. Sales-weighted average passenger fleet fuel economy, by region

- 1 The entity shall disclose the average fuel economy of its passenger and light-duty vehicle fleet, weighted for the footprint of vehicles sold, by geographic region.
  - 1.1 The average fuel economy shall be calculated by model year as required for regulatory purposes.
  - 1.2 In the absence of regulatory guidance on calculating a fleet average, the entity shall calculate performance based on the fuel economy of vehicles sold during the reporting period weighted by sales volume.
  - 1.3 The calculation shall be made on a fleet-average basis regardless of whether regulations are based on vehicle weight.
- 2 The entity shall disclose the percentage by geographic region.
  - 2.1 Geographic regions are defined as the regions for which the entity conducts segment financial reporting and which are subject to fleet fuel economy, fuel consumption, or emissions standards.
- 3 Disclosure may be provided in different units for each geographic region, including, but not limited to:
  - 3.1 Grams of carbon dioxide per kilometer (gCO<sub>2</sub> / km) for (1) passenger cars and (2) light commercial vehicles sold in the European Union
  - 3.2 Liters of petrol per kilometer (L / km) for passenger vehicles sold in Japan

- 3.3 Miles per gallon (mpg) for (1) domestic passenger cars, (2) imported passenger cars, and (3) light trucks sold in the U.S. and subject to Corporate Average Fuel Economy (CAFE) standards, where these vehicle categories are defined in U.S. 49 CFR Part 523
- 3.4 Kilometers per liter (km / L) for passenger vehicles sold in New Zealand
- 4 The scope of disclosure shall include all vehicles subject to national passenger vehicle standards for fleet fuel economy, fuel consumption, or emissions.
- 5 The entity may disclose fleet performance for other vehicle segments such as:
  - 5.1 Cargo vehicles in Japan
  - 5.2 Heavy-duty vehicles in the U.S.
  - 5.3 Light commercial vehicles in the EU

### **TR-AU-410a.2. Number of (1) zero emission vehicles (ZEV), (2) hybrid vehicles, and (3) plug-in hybrid vehicles sold**

- 1 The entity shall disclose the number of vehicles sold during the reporting period that can be classified as: (1) zero emission vehicles (ZEV), (2) hybrid vehicles, and (3) plug-in hybrid electric vehicles.
  - 1.1 ZEVs are vehicles driven only by an electric motor that are powered by advanced-technology batteries or hydrogen fuel cell, and have no tailpipe emissions over their entire lifetime under any and all possible operational modes and conditions.
  - 1.2 Hybrid vehicles (hybrid electric vehicle or HEVs) are vehicles that can draw propulsion energy from both of the following on-vehicle sources of stored energy: (a) a consumable fuel and (b) an energy storage device such as a battery, capacitor, or flywheel.
  - 1.3 Plug-in hybrid electric vehicles are vehicles that offer electric driving with an electric motor powered by a large battery pack that is charged by plugging into a source of electricity.
- 2 The scope of disclosure includes all vehicles sold globally that are eligible to be classified in accordance with the above guidance.

### **TR-AU-410a.3. Discussion of strategy for managing fleet fuel economy and emissions risks and opportunities**

- 1 The entity shall discuss its strategy for improving the fuel economy and reducing the use-phase emissions of its fleet.
  - 1.1 Use-phase emissions include greenhouse gasses and air pollutants such as carbon dioxide, nitrogen oxides, volatile organic compounds, and particulate matter.

- 2 Relevant aspects of the strategy include improvements to existing vehicles and technologies, the introduction of new technologies, research and development efforts into advanced technologies, and partnerships with peers, academic institutions, and/or customers.
- 3 Relevant technologies include, but are not limited to, those related to materials design and engineering, advanced powertrains, renewable fuels, energy storage and batteries, aerodynamic design, fuel injection systems, particulate filters, and products and fuels that otherwise result in reduced emissions.
  - 3.1 Advanced powertrain technologies include vehicles and vehicle components that are electric, hybrid electric, plug-in hybrid, dual-fuel, and zero-emissions (e.g., fuel cell).
  - 3.2 Renewable fuels and energy technologies are those that operate on sources that are capable of being replenished in a short time through ecological cycles, including biomass (including ethanol, first-generation biofuels, and advanced biofuels).
  - 3.3 Products that result in reduced emissions include any vehicle or technology that achieves a significant reduction in fuel consumption.
  - 3.4 Fuels that result in reduced emissions further include biodiesel, ethanol, natural gas, propane, and hydrogen, as described in the U.S. [Energy Policy Act of 2005](#).
  - 3.5 Internal combustion engines include those equipped with technology (e.g., selective catalytic reduction) to reduce nitrogen oxide emissions.
  - 3.6 Particulate filters (e.g., wall-flow filter or partial flow filter) include those that reduce emissions (including carbon monoxide, hydrocarbons, and particulate matter).
    - 3.6.1 Where relevant, the entity shall discuss the technologies it is prioritizing to improve the fuel economy and reduce emissions of its vehicles, such as the specific type of fuel systems it is developing (e.g., hybrid, electric, or fuel cell).
- 4 The entity shall discuss the factors influencing fuel economy and emissions efforts, such as meeting customer demand and/or meeting regulatory requirements of the markets it operates in, or plans to operate in.
  - 4.1 Relevant programs and initiatives include, but are not limited to:
    - 4.1.1 California Low-Emission Vehicle Program – LEV III
    - 4.1.2 China VI emission standard
    - 4.1.3 Euro 6 standards for light duty vehicles
    - 4.1.4 U.S. Clean Air Act
    - 4.1.5 U.S. Corporate Average Fuel Economy (CAFE) standards
- 5 The entity shall discuss whether it is meeting fuel economy and use-phase regulatory obligations, whether such existing regulations require future improvements, progress toward meeting such regulations, and strategies to maintain compliance with emerging regulations.
- 6 The scope of disclosure includes all vehicles subject to national and local vehicle standards.

- 7 The entity may discuss the benchmarks it uses to measure improvements in fuel economy and emissions reductions, including targets for fuel economy improvements and emissions reductions.



## CAR RENTAL & LEASING

### Industry Description

Companies in this industry rent or lease passenger vehicles to customers. Car rentals are typically for periods of less than a month, while leases are for a year or more. The industry includes car-sharing business models where rentals are measured hourly and typically include subscription fees. Car rental companies operate out of airport locations, which serve business and leisure travelers, and out of neighborhood locations, which mostly provide repair-shop and weekend rentals. The industry is concentrated, with several dominant market players, who operate globally using a franchise model. The growth of public transit and ride-sharing services in major metropolitan areas may represent a threat to the long-term profitability of the Car Rental & Leasing industry if customers chose to hail rides or take public transit rather than rent vehicles.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Fleet Fuel Economy & Utilization	Rental day-weighted average rental fleet fuel economy, by region	Quantitative	Mpg, L/km, gCO <sub>2</sub> /km, km/L	TR-CR-410a.1
	Fleet utilization rate	Quantitative	Rate	TR-CR-410a.2

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Average vehicle age	Quantitative	Months	TR-CR-000.A
Total available rental days <sup>118</sup>	Quantitative	Days	TR-CR-000.B
Average rental fleet size <sup>119</sup>	Quantitative	Number of vehicles	TR-CR-000.C

<sup>118</sup>

Note to **TR-CR-000.B** – The total number of available rental days is the number of 24-hour periods—or portions thereof—that vehicles were offered for rental during the reporting period.

<sup>119</sup>

Note to **TR-CR-000.C** – The average rental fleet size is the simple average of the maximum number of vehicles available for rental each month during the reporting period.

# Fleet Fuel Economy & Utilization

## Topic Summary

By providing fuel-efficient and alternative fuel vehicles, car rental and leasing companies can enhance the environmental sustainability of their operations while also achieving financial benefits. Consumer demand for more efficient vehicles is growing, motivated by both environmental stewardship and the lower operating costs associated with fuel efficiency. In addition to providing fuel-efficient and low-emission fleets, companies in the industry are adapting to changing vehicle needs by providing car-sharing services. In urban settings, car sharing is an attractive alternative to vehicle ownership that reduces congestion and the environmental impacts associated with private ownership of vehicles. By maximizing fleet utilization rates through car-sharing, companies can enhance business efficiency.

## Accounting Metrics

### TR-CR-410a.1. Rental day-weighted average rental fleet fuel economy, by region

- 1 The entity shall disclose the average fuel economy of its passenger vehicle rental fleet, weighted for the rental days of each vehicle model during the reporting period, by geographic region.
  - 1.1 The average fuel economy shall be calculated as the rental day-weighted harmonic mean of vehicle fuel efficiency.
    - 1.1.1 The harmonic mean is calculated as the reciprocal of the average of the reciprocals.
    - 1.1.2 Rental day weighting is performed by incorporating into calculations a factor for the fraction of total rental days for which each vehicle model accounted.
- 2 The entity shall disclose the average fuel economy of its passenger vehicle rental fleet by geographic region.
  - 2.1 Geographic regions are defined as the regions for which the entity conducts segment financial reporting and which are subject to fleet fuel economy, fuel consumption, or emissions standards.
- 3 Disclosure may be provided in different units for each geographic region, including, but not limited to:
  - 3.1 Grams of CO<sub>2</sub> per kilometer (gCO<sub>2</sub> / km) for (1) passenger cars and (2) light commercial vehicles in the European Union
  - 3.2 Liters of petrol per kilometer (L / km) for passenger vehicles in Japan
  - 3.3 Miles per gallon (mpg) for (1) domestic passenger cars, (2) imported passenger cars, and (3) light trucks in the U.S. that are subject to Corporate Average Fuel Economy (CAFE) standards, where these vehicle categories are defined in U.S. 49 CFR Part 523
  - 3.4 Kilometers per liter (km / L) for passenger vehicles in New Zealand
- 4 The scope of disclosure shall include all vehicles subject to national passenger vehicle standards for fleet fuel economy, fuel consumption, or emissions.

- 5 The entity may disclose fleet fuel economy for other vehicle segments such as:
  - 5.1 Cargo vehicles in Japan
  - 5.2 Heavy-duty vehicles in the U.S.
  - 5.3 Light commercial vehicles in the EU

#### **TR-CR-410a.2. Fleet utilization rate**

- 1 The entity shall disclose its fleet utilization rate.
  - 1.1 The rate shall be calculated as the total number of rental days divided by the total number of available rental days.
    - 1.1.1 Rental days are defined as the number of 24-hour periods—or portions thereof—that vehicles were rented.
    - 1.1.2 Available rental days are defined as the number of 24-hour periods—or portions thereof—that vehicles were offered for rental during the reporting period. This figure shall exclude the time when vehicles were undergoing inspection, cleaning, or maintenance, and any time when they were subject to recall.
- 2 The scope of disclosure includes vehicles at all of the entity's rental locations, including airport locations, off-airport locations, and vehicles in the entity's car-sharing fleet.

## CRUISE LINES

### Industry Description

The Cruise Lines industry comprises companies that provide passenger transportation and leisure entertainment, including deep sea cruises and river cruises. The industry is dominated by a few large companies. Cruises aim to provide a luxury resort experience for thousands of passengers at a time. The Cruise Lines industry has often been the fastest-growing segment of the travel industry, but is very cyclical.

**Table 1. Climate-related Disclosure Topics & Accounting Metrics**

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions	Quantitative	Metric tons (t) CO <sub>2</sub> -e	TR-CL-110a.1
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	TR-CL-110a.2
	(1) Total energy consumed, (2) percentage heavy fuel oil, (3) percentage onshore power supply (OPS), (4) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	TR-CL-110a.3
	Average Energy Efficiency Design Index (EEDI) for new ships	Quantitative	Grams of CO <sub>2</sub> per ton-nautical mile	TR-CL-110a.4

**Table 2. Activity Metrics**

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Available lower berth kilometers (ALB-KM) <sup>120</sup>	Quantitative	ALB-KM	TR-CL-000.A
Average passenger cruise days (APCD) <sup>121</sup>	Quantitative	APCD	TR-CL-000.B
Number of shipboard employees <sup>122</sup>	Quantitative	Number	TR-CL-000.C
Cruise passengers <sup>123</sup>	Quantitative	Number	TR-CL-000.D
Number of vessel port calls	Quantitative	Number	TR-CL-000.E

<sup>120</sup>

Note to **TR-CL-000.A** – Available lower berth (ALB) is a measure of the standard capacity of a cruise ship, usually assuming two people per available cabin. It accounts for changes in fleet size, itineraries, and passenger capacity. Available lower berth kilometers (ALB-KM) are computed by multiplying ALB on each leg by the number of kilometers traveled on that leg.

<sup>121</sup>

Note to **TR-CL-000.B** – Average passenger cruise days (APCD) is computed as the number of available lower berths on a ship multiplied by the number of days that those berths are available to passengers during the reporting period.

<sup>122</sup>

Note to **TR-CL-000.C** – Shipboard employees are those employees who work aboard the entity's vessels (including direct and contract employees) during the reporting period.

<sup>123</sup>

Note to **TR-CL-000.D** – Cruise passengers is the number of passengers aboard the entity's vessels, excluding employees.



# Greenhouse Gas Emissions

## Topic Summary

Cruise lines generate emissions mainly from the combustion of diesel in ship engines. The industry's reliance on heavy fuel oil ("bunker fuel") is of material concern due to rising fuel costs and intensifying greenhouse gas (GHG) regulations. Evolving environmental regulations are driving the adoption of more fuel-efficient engines, engine retrofits, and the use of cleaner-burning fuels. Fuel constitutes a major expense for industry players, providing a further incentive for investing in upgrades or retrofits to boost fuel efficiency. In addition, violation of GHG regulations can lead to fines and compliance costs.

## Accounting Metrics

### TR-CL-110a.1. Gross global Scope 1 emissions

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalent (CO<sub>2</sub>-e), and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:
    - 2.1.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)
    - 2.1.2 *Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources* published by the U.S. Environmental Protection Agency (EPA)
    - 2.1.3 India GHG Inventory Program
    - 2.1.4 ISO 14064-1
    - 2.1.5 *Petroleum Industry Guidelines for reporting GHG emissions*, 2nd edition, 2011, published by IPIECA
    - 2.1.6 *Protocol for the quantification of greenhouse gas emissions from waste management activities* published by Entreprises pour l'Environnement (EpE)

- 2.2 GHG emissions data shall be consolidated and disclosed according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the “financial control” approach defined by the GHG Protocol, and the approach published by the Climate Disclosure Standards Board (CDSB) described in REQ-07, “Organisational boundary,” of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).
- 3 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 4 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 5 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

## **TR-CL-110a.2. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined according to *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 2.2 Whether the target is absolute- or intensity-based, and the metric denominator, if it is an intensity-based target;
  - 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated toward the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;
  - 2.5 The mechanism(s) for achieving the target; and
  - 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset.

- 3 The entity shall discuss the activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 3.1 Relevant activities and investments may include, but are not limited to, route optimization, use of alternative fuels and energy sources, system improvements, optimization of ship operation, improving efficiency through ship design and propulsion systems (including hull and propeller improvements), and upgrading the fleet with new ships.
- 4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as how they relate to different business units, geographies, or emissions sources.
- 5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
- 6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

**TR-CL-110a.3. (1) Total energy consumed, (2) percentage heavy fuel oil, (3) percentage onshore power supply (OPS), (4) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from heavy fuel oil.
  - 2.1 Heavy fuel oils are defined per the U.S. Energy Information Administration as heavier oils that remain after distillate fuel oils and lighter hydrocarbons are distilled away in refinery operations, and which conform to ASTM Specifications D 396 and D 975 and Federal Specification VV-F-815C, including:
    - 2.1.1 No. 5 Residual fuel oil, a residual fuel oil of medium viscosity, also known as “Navy Special” and defined in Military Specification MIL-F-859E, including Amendment 2 (NATO Symbol F-770)
    - 2.1.2 No. 6 Residual fuel oil, which includes Bunker C fuel oil
  - 2.2 The percentage shall be calculated as heavy fuel oil consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is onshore power supply (OPS).



- 3.1 OPS includes the shoreside electrical power consumed by a ship at berth while its main and auxiliary engines are turned off.
  - 3.2 The percentage shall be calculated as OPS consumption divided by total energy consumption.
- 4 The entity shall disclose (4) the percentage of energy it consumed that is renewable energy.
- 4.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 4.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 4.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.
    - 4.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
    - 4.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
    - 4.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.
  - 4.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:
    - 4.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;
    - 4.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.
- 5 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

#### **TR-CL-110a.4. Average Energy Efficiency Design Index (EEDI) for new ships**

- 1 The entity shall disclose the average Energy Efficiency Design Index (EEDI) for new ships in grams of carbon dioxide per ton-nautical mile.
  - 1.1 An EEDI value is the product of power installed, specific fuel consumption, and carbon conversion, divided by the product of available capacity and vessel speed at design load.
  - 1.2 The entity shall calculate the average EEDI as a simple average of the EEDI value of all new ships added to the entity's fleet during the reporting period.
    - 1.2.1 New ships are limited to those built after 2013 and for which the International Maritime Organization (IMO) has adopted EEDI as a metric.
  - 1.3 The entity shall follow calculation methodologies outlined in IMO MEPC 66/21/Add.1, Annex 5, [2014 Guidelines on the Method of Calculation of the Attained Energy Efficiency Design Index \(EEDI\) For New Ships](#).

## MARINE TRANSPORTATION

### Industry Description

The Marine Transportation industry consists of companies that provide deep-sea, coastal, and/or river-way freight shipping services. It is of strategic importance to international trade and its revenues are tied to macroeconomic cycles. Key activities include transportation of containerized and bulk freight, including consumer goods and a wide range of commodities, and transportation of chemicals and petroleum products in tankers. Due to the global scope of the industry, companies operate in many countries and under diverse legal and regulatory frameworks.

Table 1. *Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions	Quantitative	Metric tons (t) CO <sub>2</sub> -e	TR-MT-110a.1
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	TR-MT-110a.2
	(1) Total energy consumed, (2) percentage heavy fuel oil, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	TR-MT-110a.3
	Average Energy Efficiency Design Index (EEDI) for new ships	Quantitative	Grams of CO <sub>2</sub> per ton-nautical mile	TR-MT-110a.4

Table 2. *Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of shipboard employees <sup>124</sup>	Quantitative	Number	TR-MT-000.A
Total distance traveled by vessels	Quantitative	Nautical miles (nm)	TR-MT-000.B
Operating days <sup>125</sup>	Quantitative	Days	TR-MT-000.C
Deadweight tonnage <sup>126</sup>	Quantitative	Thousand deadweight tons	TR-MT-000.D
Number of vessels in total shipping fleet	Quantitative	Number	TR-MT-000.E

<sup>124</sup>

Note to **TR-MT-000.A** – Shipboard employees are those employees who work aboard the entity’s vessels (including direct and contract employees) during the reporting period.

<sup>125</sup>

Note to **TR-MT-000.C** – Operating days are calculated as the number of available days in a reporting period minus the aggregate number of days that the vessels are off-hire due to unforeseen circumstances (i.e., a measure of days in a reporting period during which vessels actually generate revenue).

<sup>126</sup>

Note to **TR-MT-000.D** – Deadweight tonnage is the sum, for all of the entity’s vessels, of the difference in displacement in deadweight tons between the light displacement and the actual loaded displacement.

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of vessel port calls	Quantitative	Number	TR-MT-000.F
Twenty-foot equivalent unit (TEU) capacity	Quantitative	TEU	TR-MT-000.G

# Greenhouse Gas Emissions

## Topic Summary

Marine transportation companies generate emissions mainly from the combustion of diesel in ship engines. The industry's reliance on heavy fuel oil ("bunker fuel") is of material concern due to rising fuel costs and intensifying greenhouse gas (GHG) regulations. The industry is among the most fuel efficient of the major transportation modes in terms of fuel use per ton shipped. However, due to the size of the industry, its contribution to the global GHG inventory is still significant. Recent environmental regulations are driving the adoption of more fuel-efficient engines and the use of cleaner-burning fuels. Fuel constitutes a major expense for industry players, providing a further incentive for investing in upgrades or retrofits to boost fuel efficiency.

## Accounting Metrics

### TR-MT-110a.1. Gross global Scope 1 emissions

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e), and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:
    - 2.1.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)
    - 2.1.2 *Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources* published by the U.S. Environmental Protection Agency (EPA)
    - 2.1.3 India GHG Inventory Program
    - 2.1.4 ISO 14064-1
    - 2.1.5 *Petroleum Industry Guidelines for reporting GHG emissions*, 2nd edition, 2011, published by IPIECA

2.1.6 Protocol for the quantification of greenhouse gas emissions from waste management activities published by Entreprises pour l'Environnement (EpE)

2.2 GHG emissions data shall be consolidated and disclosed according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the “financial control” approach defined by the GHG Protocol, and the approach published by the Climate Disclosure Standards Board (CDSB) described in REQ-07, “Organisational boundary,” of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).

- 3 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 4 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 5 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

## **TR-MT-110a.2. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined according to *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 2.2 Whether the target is absolute- or intensity-based, and the metric denominator, if it is an intensity-based target;
  - 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated toward the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;
  - 2.5 The mechanism(s) for achieving the target; and

- 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset.
- 3 The entity shall discuss the activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 3.1 Relevant activities and investments may include, but are not limited to, route optimization, use of alternative fuels and energy sources, system improvements, optimization of ship operation, improving efficiency through ship design and propulsion systems (including hull and propeller improvements), and upgrading the fleet with new ships.
- 4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as how they relate to different business units, geographies, or emissions sources.
- 5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
- 6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

**TR-MT-110a.3. (1) Total energy consumed, (2) percentage heavy fuel oil, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of energy it consumed as an aggregate figure, in gigajoules (GJ).
  - 1.1 The scope of energy consumption includes energy from all sources, including energy purchased from sources external to the entity and energy produced by the entity itself (self-generated). For example, direct fuel usage, purchased electricity, and heating, cooling, and steam energy are all included within the scope of energy consumption.
  - 1.2 The scope of energy consumption includes only energy directly consumed by the entity during the reporting period.
  - 1.3 In calculating energy consumption from fuels and biofuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change (IPCC), the U.S. Department of Energy (DOE), or the U.S. Energy Information Administration (EIA).
- 2 The entity shall disclose (2) the percentage of energy it consumed that was supplied from heavy fuel oil.
  - 2.1 Heavy fuel oils are defined per the U.S. Energy Information Administration as heavier oils that remain after distillate fuel oils and lighter hydrocarbons are distilled away in refinery operations, and which conform to ASTM Specifications D 396 and D 975 and Federal Specification VV-F-815C, including:
    - 2.1.1 No. 5 Residual fuel oil, a residual fuel oil of medium viscosity, also known as “Navy Special” and defined in Military Specification MIL-F-859E, including Amendment 2 (NATO Symbol F-770)
    - 2.1.2 No. 6 Residual fuel oil, which includes Bunker C fuel oil

- 2.2 The percentage shall be calculated as heavy fuel oil consumption divided by total energy consumption.
- 3 The entity shall disclose (3) the percentage of energy it consumed that is renewable energy.
  - 3.1 Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, such as geothermal, wind, solar, hydro, and biomass.
  - 3.2 The percentage shall be calculated as renewable energy consumption divided by total energy consumption.
  - 3.3 The scope of renewable energy includes renewable fuel the entity consumed, renewable energy the entity directly produced, and renewable energy the entity purchased, if purchased through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs) or Guarantees of Origin (GOs), a Green-e Energy Certified utility or supplier program, or other green power products that explicitly include RECs or GOs, or for which Green-e Energy Certified RECs are paired with grid electricity.
    - 3.3.1 For any renewable electricity generated on-site, any RECs and GOs must be retained (i.e., not sold) and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
    - 3.3.2 For renewable PPAs and green power products, the agreement must explicitly include and convey that RECs and GOs be retained or replaced and retired or cancelled on behalf of the entity in order for the entity to claim them as renewable energy.
    - 3.3.3 The renewable portion of the electricity grid mix that is outside of the control or influence of the entity is excluded from the scope of renewable energy.
  - 3.4 For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources is limited to the following:
    - 3.4.1 Energy from hydro sources is limited to those that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard;
    - 3.4.2 Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered eligible sources of supply according to the *Green-e Framework for Renewable Energy Certification, Version 1.0* (2017) or Green-e regional standards, and/or materials that are eligible for an applicable state renewable portfolio standard.
- 4 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels) and conversion of kilowatt hours (kWh) to GJ (for energy data including electricity from solar or wind energy).

#### **TR-MT-110a.4. Average Energy Efficiency Design Index (EEDI) for new ships**

- 1 The entity shall disclose the average Energy Efficiency Design Index (EEDI) for new ships in grams of carbon dioxide per ton-nautical mile.



- 1.1 An EEDI value is the product of power installed, specific fuel consumption, and carbon conversion, divided by the product of available capacity and vessel speed at design load.
- 1.2 The entity shall calculate the average EEDI as a simple average of the EEDI value of all new ships added to the entity's fleet during the reporting period
  - 1.2.1 New ships are limited to those built after 2013 and for which the International Maritime Organization (IMO) has adopted EEDI as a metric.
- 1.3 The entity shall follow calculation methodologies outlined in IMO MEPC 66/21/Add.1, Annex 5, [2014 Guidelines on the Method of Calculation of the Attained Energy Efficiency Design Index \(EEDI\) For New Ships](#).

## RAIL TRANSPORTATION

### Industry Description

The Rail Transportation industry consists of companies that provide rail freight shipping and support services. Key activities include shipping containerized and bulk freight, including consumer goods and commodities. Rail companies typically own, maintain, and operate their rail networks, which may require significant capital expenditures. The U.S. operates the longest railroad network in the world, followed closely by Russia, China, India, Canada, Germany, and France. The industry exhibits economies of density due to its network effects, lending itself to natural monopoly conditions. Together with the large sunk costs of rail infrastructure, this provides a competitive advantage to incumbent firms in the industry and creates barriers to entry for new firms.

Note: The scope of the Rail Transportation industry does not include passenger rail transportation.

Table 1. Climate-related Disclosure Topics & Accounting Metrics

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions	Quantitative	Metric tons (t) CO <sub>2</sub> -e	TR-RA-110a.1
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	TR-RA-110a.2
	Total fuel consumed, percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	TR-RA-110a.3

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of carloads transported <sup>127</sup>	Quantitative	Number	TR-RA-000.A
Number of intermodal units transported <sup>128</sup>	Quantitative	Number	TR-RA-000.B
Track miles <sup>129</sup>	Quantitative	Miles	TR-RA-000.C
Revenue ton miles (RTM) <sup>130</sup>	Quantitative	RTM	TR-RA-000.D

<sup>127</sup>

Note to **TR-RA-000.A** – The scope of disclosure includes all carloads that the entity transported in conjunction with the shipping of freight (including freight that is not containerized) for its customers.

<sup>128</sup>

Note to **TR-RA-000.B** – Intermodal units include shipping containers and truck trailers that can be transported across modes of transportation.

<sup>129</sup>

Note to **TR-RA-000.C** – Track miles include route miles (the total extent of routes available for trains to operate) and take into account multiple track routes such that each route mile with double track is considered two track miles.

<sup>130</sup>

Note to **TR-RA-000.D** – A revenue ton mile (RTM) is defined as one ton of revenue traffic transported one mile. Revenue ton miles are calculated by multiplying the miles traveled on each leg by the number of tons of revenue traffic carried on that leg.

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of employees	Quantitative	Number	TR-RA-000.E

# Greenhouse Gas Emissions

## Topic Summary

The Rail Transportation industry generates emissions mainly through the combustion of diesel in locomotive engines. Despite relatively low emissions compared to other transportation industries, fuel management has implications for companies in the industry in terms of operating costs and regulatory compliance. Greenhouse gases (GHGs) including carbon dioxide (CO<sub>2</sub>) are of particular importance to government regulators concerned about climate change. Intensifying regulation of locomotive exhaust emissions and high fuel costs provide incentives for rail companies to invest in fuel efficiency enhancements to manage emissions. This can increase operational efficiency and impact the cost structure of rail companies, with chronic and acute impacts on value and competitive position both within the industry and compared to other modes of transport.

## Accounting Metrics

### TR-RA-110a.1. Gross global Scope 1 emissions

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e), and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:
    - 2.1.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)
    - 2.1.2 *Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources* published by the U.S. Environmental Protection Agency (EPA)
    - 2.1.3 India GHG Inventory Program
    - 2.1.4 ISO 14064-1
    - 2.1.5 *Petroleum Industry Guidelines for reporting GHG emissions*, 2nd edition, 2011, published by IPIECA

2.1.6 Protocol for the quantification of greenhouse gas emissions from waste management activities published by Entreprises pour l'Environnement (EpE)

2.2 GHG emissions data shall be consolidated and disclosed according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the “financial control” approach defined by the GHG Protocol, and the approach published by the Climate Disclosure Standards Board (CDSB) described in REQ-07, “Organisational boundary,” of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).

- 3 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 4 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 5 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

## **TR-RA-110a.2. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined according to *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 2.2 Whether the target is absolute- or intensity-based, and the metric denominator, if it is an intensity-based target;
  - 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated toward the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;
  - 2.5 The mechanism(s) for achieving the target; and

- 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset.
- 3 The entity shall discuss the activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 3.1 Relevant activities and investments may include, but are not limited to, operational improvements (such as decreased idling, trip optimization, and maximizing loads) and fleet enhancements (such as new engines, fuel optimization technology and aerodynamic fleet modifications, and upgrading the fleet with new locomotives).
- 4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as how they relate to different business units, geographies, or emissions sources.
- 5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
- 6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

### **TR-RA-110a.3. Total fuel consumed, percentage renewable**

- 1 The entity shall disclose the total amount of fuel consumed from all sources as an aggregate figure, in gigajoules (GJ).
  - 1.1 The calculation methodology for fuel consumed shall be based on actual fuel consumed as opposed to design parameters.
  - 1.2 Acceptable calculation methodologies for fuel consumed include, but are not limited to, methodologies based on:
    - 1.2.1 Adding fuel purchases made during the reporting period to beginning inventory at the start of the reporting period, less any fuel inventory at the end of the reporting period
    - 1.2.2 Tracking fuel consumed by vehicles
    - 1.2.3 Tracking fuel expenses
- 2 The entity shall disclose the percentage of fuel consumed that is renewable fuel.
  - 2.1 Renewable fuel is defined by the U.S. Renewable Fuel Standard (U.S. 40 CFR 80.1401), as fuel that meets all of the following requirements:
    - 2.1.1 Produced from renewable biomass;
    - 2.1.2 Used to replace or reduce the quantity of fossil fuel present in a transportation fuel, heating oil, or jet fuel; and
    - 2.1.3 Has lifecycle greenhouse gas (GHG) emissions that are at least 20 percent less than baseline lifecycle GHG emissions, unless the fuel is exempt from this requirement pursuant to U.S. 40 CFR 80.1403.

- 2.2 The scope of renewable fuel includes fuel that qualifies for Renewable Identification Numbers (RINs) under the U.S. Renewable Fuel Standard.
  - 2.3 The percentage shall be calculated as the amount of renewable fuel consumed (in GJ) divided by the total amount of fuel consumed (in GJ).
- 3 The scope of disclosure only includes fuel directly consumed by the entity.
  - 4 In calculating energy consumption from fuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change, the U.S. Department of Energy, or the U.S. Energy Information Agency.
  - 5 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels).

## ROAD TRANSPORTATION

### Industry Description

The Road Transportation industry consists of companies that provide long- and short-haul freight trucking services. Key activities include the shipment of containerized and bulk freight, including consumer goods and a wide variety of commodities. The industry is commonly broken down into two categories: truckload (vehicles carrying the goods of only one customer) and less-than-truckload (vehicles carrying the goods of multiple customers). Owner-operators comprise the vast majority of the industry due to the relative ease of entry, while a few large operators maintain market share through contracts with major shippers. Large companies often subcontract with owner-operators to supplement their owned fleet.

*Table 1. Climate-related Disclosure Topics & Accounting Metrics*

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions	Quantitative	Metric tons (t) CO <sub>2</sub> -e	TR-RO-110a.1
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	TR-RO-110a.2
	(1) Total fuel consumed, (2) percentage natural gas, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	TR-RO-110a.3

*Table 2. Activity Metrics*

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Revenue ton miles (RTM) <sup>131</sup>	Quantitative	RTM	TR-RO-000.A
Load factor <sup>132</sup>	Quantitative	Number	TR-RO-000.B
Number of employees, number of truck drivers	Quantitative	Number	TR-RO-000.C

<sup>131</sup>

Note to **TR-RO-000.A** – A revenue ton mile (RTM) is defined as one ton of revenue traffic transported one mile. Revenue ton-miles are computed by multiplying the miles traveled on each leg by the number of tons of revenue traffic carried on that leg.

<sup>132</sup>

Note to **TR-RO-000.B** – Load factor is a measure of capacity utilization and is calculated as cargo miles traveled divided by total miles traveled.



# Greenhouse Gas Emissions

## Topic Summary

The Road Transportation industry generates emissions mainly through the combustion of diesel and other fuels in truck engines. Greenhouse gases (GHGs) including carbon dioxide (CO<sub>2</sub>) are of particular importance to government regulators concerned about climate change and to consumers demanding low-carbon or carbon-neutral transportation solutions. As GHG emissions from trucks constitute a significant portion of transportation-related emissions, the industry is a focal point for regulations to limit GHG emissions. Changes to operations that increase fuel efficiency offer an effective way for companies to reduce fuel costs while also limiting exposure to volatile fuel pricing, regulatory costs, and other consequences of GHG emissions. While newer trucks are more fuel-efficient, measures can be taken to improve efficiency and reduce emissions in existing fleets.

## Accounting Metrics

### TR-RO-110a.1. Gross global Scope 1 emissions

- 1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
  - 1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalents (CO<sub>2</sub>-e), and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the [Intergovernmental Panel on Climate Change \(IPCC\) Fifth Assessment Report \(2014\)](#).
  - 1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.
- 2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 2.1 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:
    - 2.1.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)
    - 2.1.2 *Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources* published by the U.S. Environmental Protection Agency (EPA)
    - 2.1.3 India GHG Inventory Program
    - 2.1.4 ISO 14064-1
    - 2.1.5 *Petroleum Industry Guidelines for reporting GHG emissions*, 2nd edition, 2011, published by IPIECA

2.1.6 Protocol for the quantification of greenhouse gas emissions from waste management activities published by Entreprises pour l'Environnement (EpE)

2.2 GHG emissions data shall be consolidated and disclosed according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the “financial control” approach defined by the GHG Protocol, and the approach published by the Climate Disclosure Standards Board (CDSB) described in REQ-07, “Organisational boundary,” of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018).

- 3 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- 4 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- 5 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

## **TR-RO-110a.2. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets**

- 1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.
  - 1.1 Scope 1 emissions are defined according to *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).
  - 1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:
  - 2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
  - 2.2 Whether the target is absolute- or intensity-based, and the metric denominator, if it is an intensity-based target;
  - 2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated toward the achievement of the target;
  - 2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;
  - 2.5 The mechanism(s) for achieving the target; and

- 2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively or the target or base year has been reset.
- 3 The entity shall discuss the activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 3.1 Relevant activities and investments may include, but are not limited to, fuel optimization efforts such as route and load optimization, adoption of technology such as engine and powertrain efficiency and aerodynamic improvements, use of electric- or natural gas-powered vehicles, weight reduction, improved tire rolling resistance, hybridization, and automatic engine shutdown.
- 4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as how they relate to different business units, geographies, or emissions sources.
- 5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international, or sectoral programs.
- 6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

**TR-RO-110a.3. (1) Total fuel consumed, (2) percentage natural gas, (3) percentage renewable**

- 1 The entity shall disclose (1) the total amount of fuel consumed from all sources as an aggregate figure, in gigajoules (GJ).
  - 1.1 The calculation methodology for fuel consumed shall be based on actual fuel consumed as opposed to design parameters.
  - 1.2 Acceptable calculation methodologies for fuel consumed include, but are not limited to, methodologies based on:
    - 1.2.1 Adding fuel purchases made during the reporting period to beginning inventory at the start of the reporting period, less any fuel inventory at the end of the reporting period
    - 1.2.2 Tracking fuel consumed by vehicles
    - 1.2.3 Tracking fuel expenses
- 2 The entity shall disclose (2) the percentage of fuel consumed that is natural gas.
  - 2.1 The percentage shall be calculated as the amount of natural gas consumed (in GJ) divided by the total amount of fuel consumed (in GJ).
- 3 The entity shall disclose (3) the percentage of fuel consumed that is renewable fuel.
  - 3.1 Renewable fuel is defined by the U.S. Renewable Fuel Standard (U.S. 40 CFR 80.1401), as fuel that meets all of the following requirements:

- 3.1.1 Produced from renewable biomass;
  - 3.1.2 Used to replace or reduce the quantity of fossil fuel present in a transportation fuel, heating oil, or jet fuel;  
and
  - 3.1.3 Has lifecycle greenhouse gas (GHG) emissions that are at least 20 percent less than baseline lifecycle GHG emissions, unless the fuel is exempt from this requirement pursuant to U.S. 40 CFR 80.1403.
- 3.2 The scope of renewable fuel includes fuel that qualifies for Renewable Identification Numbers (RINs) under the U.S. Renewable Fuel Standard.
  - 3.3 The percentage shall be calculated as the amount of renewable fuel consumed (in GJ) divided by the total amount of fuel consumed (in GJ).
- 4 The scope of disclosure only includes fuel directly consumed by the entity.
  - 5 In calculating energy consumption from fuels, the entity shall use higher heating values (HHV), also known as gross calorific values (GCV), which are directly measured or taken from the Intergovernmental Panel on Climate Change, the U.S. Department of Energy, or the U.S. Energy Information Agency.
  - 6 The entity shall apply conversion factors consistently for all data reported under this disclosure, such as the use of HHVs for fuel usage (including biofuels).

