RESOURCE TRANSFORMATION SECTOR

CHEMICALS

Sustainability Accounting Standard

Sustainable Industry Classification System® (SICS®) RT-CH

Prepared by the
Sustainability Accounting Standards Board

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CHEMICALS

Sustainability Accounting Standard

About SASB

The SASB Foundation was founded in 2011 as a not-for-profit, independent standards-setting organization. The SASB Foundation's mission is to establish and maintain industry-specific standards that assist companies in disclosing financially material, decision-useful sustainability information to investors.

The SASB Foundation operates in a governance structure similar to the structure adopted by other internationally recognized bodies that set standards for disclosure to investors, including the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB). This structure includes a board of directors ("the Foundation Board") and a standards-setting board ("the Standards Board" or "the SASB"). The Standards Board develops, issues, and maintains the SASB standards. The Foundation Board oversees the strategy, finances and operations of the entire organization, and appoints the members of the Standards Board.

The Foundation Board is not involved in setting standards, but is responsible for overseeing the Standards Board's compliance with the organization's due process requirements. As set out in the SASB *Rules of Procedure,* the SASB's standards-setting activities are transparent and follow careful due process, including extensive consultation with companies, investors, and relevant experts.

The SASB Foundation is funded by a range of sources, including contributions from philanthropies, companies, and individuals, as well as through the sale and licensing of publications, educational materials, and other products. The SASB Foundation receives no government financing and is not affiliated with any governmental body, the FASB, the IASB, or any other financial accounting standards-setting body.

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INTRODUCTION

Purpose of SASB Standards

The SASB's use of the term "sustainability" refers to corporate activities that maintain or enhance the ability of the company to create value over the long term. Sustainability accounting reflects the governance and management of a company's environmental and social impacts arising from production of goods and services, as well as its governance and management of the environmental and social capitals necessary to create long-term value. The SASB also refers to sustainability as "ESG" (environmental, social, and governance), though traditional corporate governance issues such as board composition are not included within the scope of the SASB's standards-setting activities.

SASB standards are designed to identify a minimum set of sustainability issues most likely to impact the operating performance or financial condition of the typical company in an industry, regardless of location. SASB standards are designed to enable communications on corporate performance on industry-level sustainability issues in a cost-effective and decision-useful manner using existing disclosure and reporting mechanisms.

Businesses can use the SASB standards to better identify, manage, and communicate to investors sustainability information that is financially material. Use of the standards can benefit businesses by improving transparency, risk management, and performance. SASB standards can help investors by encouraging reporting that is comparable, consistent, and financially material, thereby enabling investors to make better investment and voting decisions.

Overview of SASB Standards

The SASB has developed a set of 77 industry-specific sustainability accounting standards ("SASB standards" or "industry standards"), categorized pursuant to SASB's Sustainable Industry Classification System® (SICS®). Each SASB standard describes the industry that is the subject of the standard, including any assumptions about the predominant business model and industry segments that are included. SASB standards include:

1. **Disclosure topics** – A minimum set of industry-specific disclosure topics reasonably likely to constitute material information, and a brief description of how management or mismanagement of each topic may affect value creation.

2. **Accounting metrics** – A set of quantitative and/or qualitative accounting metrics intended to measure performance on each topic.

3. **Technical protocols** – Each accounting metric is accompanied by a technical protocol that provides guidance on definitions, scope, implementation, compilation, and presentation, all of which are intended to constitute suitable criteria for third-party assurance.

4. **Activity metrics** – A set of metrics that quantify the scale of a company's business and are intended for use in conjunction with accounting metrics to normalize data and facilitate comparison.

Furthermore, the *SASB Standards Application Guidance* establishes guidance applicable to the use of all industry standards and is considered part of the standards. Unless otherwise specified in the technical protocols contained in the industry standards, the guidance in the SASB Standards Application Guidance applies to the definitions, scope, implementation, compilation, and presentation of the metrics in the industry standards.

The *SASB Conceptual Framework* sets out the basic concepts, principles, definitions, and objectives that guide the Standards Board in its approach to setting standards for sustainability accounting. The *SASB Rules of Procedure* is focused on the governance processes and practices for standards setting.

Use of the Standards

SASB standards are intended for use in communications to investors regarding sustainability issues that are likely to impact corporate ability to create value over the long term. Use of SASB standards is voluntary. A company determines which standard(s) is relevant to the company, which disclosure topics are financially material to its business, and which associated metrics to report, taking relevant legal requirements into account[1]. In general, a company would use the SASB standard specific to its primary industry as identified in SICS® . However, companies with substantial business in multiple SICS® industries can consider reporting on these additional SASB industry standards.

It is up to a company to determine the means by which it reports SASB information to investors. One benefit of using SASB standards may be achieving regulatory compliance in some markets. Other investor communications using SASB information could be sustainability reports, integrated reports, websites, or annual reports to shareholders. There is no guarantee that SASB standards address all financially material sustainability risks or opportunities unique to a company's business model.

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.

[1] **Legal Note**: SASB standards are not intended to, and indeed cannot, replace any legal or regulatory requirements that may be applicable to a reporting entity's operations.

SUSTAINABILITY DISCLOSURE TOPICS & ACCOUNTING METRICS

Table 1. Sustainability 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_2-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
Air Quality	Air emissions of the following pollutants: (1) NO_X (excluding N_2O), (2) SO_X, (3) volatile organic compounds (VOCs), and (4) hazardous air pollutants (HAPs)	Quantitative	Metric tons (t)	RT-CH-120a.1
Energy Management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable, (4) total self-generated energy [2]	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^3), 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
Hazardous Waste Management	Amount of hazardous waste generated, percentage recycled[3]	Quantitative	Metric tons (t), Percentage (%)	RT-CH-150a.1
Community Relations	Discussion of engagement processes to manage risks and opportunities associated with community interests	Discussion and Analysis	n/a	RT-CH-210a.1
Workforce Health & Safety	(1) Total recordable incident rate (TRIR) and (2) fatality rate for (a) direct employees and (b) contract employees	Quantitative	Rate	RT-CH-320a.1
	Description of efforts to assess, monitor, and reduce exposure of employees and contract workers to long-term (chronic) health risks	Discussion and Analysis	n/a	RT-CH-320a.2

[2] 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.

[3] Note to **RT-CH-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.

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Product Design for Use-phase Efficiency	Revenue from products designed for use-phase resource efficiency	Quantitative	Reporting currency	RT-CH-410a.1
Safety & Environmental Stewardship of Chemicals	(1) Percentage of products that contain Globally Harmonized System of Classification and Labeling of Chemicals (GHS) Category 1 and 2 Health and Environmental Hazardous Substances, (2) percentage of such products that have undergone a hazard assessment	Quantitative	Percentage (%) by revenue, Percentage (%)	RT-CH-410b.1
	Discussion of strategy to (1) manage chemicals of concern and (2) develop alternatives with reduced human and/or environmental impact	Discussion and Analysis	n/a	RT-CH-410b.2
Genetically Modified Organisms	Percentage of products by revenue that contain genetically modified organisms (GMOs)	Quantitative	Percentage (%) by revenue	RT-CH-410c.1
Management of the Legal & Regulatory Environment	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	RT-CH-530a.1
Operational Safety, Emergency Preparedness & Response	Process Safety Incidents Count (PSIC), Process Safety Total Incident Rate (PSTIR), and Process Safety Incident Severity Rate (PSISR)[4]	Quantitative	Number, Rate	RT-CH-540a.1
	Number of transport incidents[5]	Quantitative	Number	RT-CH-540a.2

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Production by reportable segment[6]	Quantitative	Cubic meters (m^3) and/or metric tons (t)	RT-CH-000.A

[4] Note to **RT-CH-540a.1** – The entity shall describe incidents with a severity rating of 1 or 2, including their root cause, outcomes, and corrective actions implemented in response.

[5] Note to **RT-CH-540a.2** – The entity shall describe significant transport incidents, including their root causes, outcomes, and corrective actions implemented in response.

[6] Note to **RT-CH-000.A** – Production should be disclosed for each of the entity's reportable segments, where products and service segments are determined according to FASB ASC 280-10 and production is reported as weight for solid products and volume for liquid and gas products.

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_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3).

1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalents (CO_2-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_2-e) that are covered under emissions-limiting regulations divided by the total amount of gross global Scope 1 GHG emissions (CO_2-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_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3).

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.

Air Quality

Topic Summary

In addition to greenhouse gases (GHGs), chemical manufacturing may produce air emissions including, sulfur dioxides (SOx), nitrogen oxides (NOx), and Hazardous Air Pollutants (HAPs). As with GHGs, these emissions typically stem from the combustion of fuels and the processing of feedstocks. Relative to other industries, the Chemicals industry is a more significant source of some of these emissions. Companies face operating costs, regulatory compliance costs, regulatory penalties in the event of non-compliance, and capital expenditures related to emissions management, while related financial impacts will vary depending on the magnitude of emissions and the prevailing regulations. As such, active management of the issue through technological process improvements or other strategies may mitigate such impacts, improving financial performance and enhancing brand value.

Accounting Metrics

RT-CH-120a.1. Air emissions of the following pollutants: (1) NO_X (excluding N_2O), (2) SO_X, (3) volatile organic compounds (VOCs), and (4) hazardous air pollutants (HAPs)

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_X), reported as NO_X.

2.1 The scope of NO_X includes NO and NO_2, but excludes N_2O.

3 The entity shall disclose its emissions of (2) oxides of sulfur (SO_X), reported as SO_X.

3.1 The scope of SO_X includes SO_2 and SO_3.

4 The entity shall disclose its emissions of (3) non-methane volatile organic compounds (VOCs).

4.1 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.

4.1.1 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.

4.1.2 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.

5 The entity shall disclose its emissions of (4) hazardous air pollutants (HAPs).

5.1 HAPs are defined by the EPA as those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects.

5.1.1 The EPA provides a list of HAPs in "The Clean Air Act Amendments of 1990 List of Hazardous Air Pollutants."

6 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

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.

Hazardous Waste Management

Topic Summary

Chemical 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 their 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, may lower companies' long-term cost structure and mitigate the risk of remediation liabilities or regulatory penalties.

Accounting Metrics

RT-CH-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-CH-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.

Community Relations

Topic Summary

Chemical companies are important economic contributors to many communities, providing employment opportunities and community development through taxes and capital generation. Meanwhile, issues including environmental policy, community health, and process safety are key issues with important regulatory, operational, financial, and reputational implications for companies. Environmental externalities including air emissions and water use can affect human health of those living near chemical facilities over the long term. Meanwhile, process safety incidents can endanger community health and safety, leading to regulatory penalties, legal action, and mitigation costs. Consequently, chemicals companies can benefit from building strong relationships with communities in order to mitigate potential operating disruption, reduce regulatory risk, retain top employees, lower the risk of litigation expenses in the event of process safety incidents, and ensure a strong social license to operate. Companies can adopt various community engagement strategies, such as developing community engagement plans, establishing codes and guidelines to ensure alignment of the organization's interests with those of their surrounding communities, or conducting impact assessments to evaluate projects and mitigate potential adverse impacts.

Accounting Metrics

RT-CH-210a.1. Discussion of engagement processes to manage risks and opportunities associated with community interests

1 The entity shall discuss its processes, procedures, and practices to manage risks and opportunities associated with community interests in areas where it conducts business, including:

1.1 The specific community interests addressed, which include, but are not limited to:

1.1.1 Economic and labor interests such as capital generation, employment, wages, and infrastructure development

1.1.2 Environmental interests such as those relating to natural resources (e.g., energy and water, management of air emissions and waste, facility process safety, safe chemicals management, and transport incidents)

1.2 The underlying references for the entity's processes and procedures, including whether they 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.

2 The entity may describe its efforts to mitigate community-related risks and address community concerns, including:

2.1 Initiatives that enable mutual value creation for companies and the communities in which they operate, including "shared" or "blended" value projects that provide quantifiable benefits to the community and the entity

2.2 The use of environmental impacts assessments (EIA) and social impact assessments (SIA) that evaluate, manage, and mitigate risks

2.3 Engagement with local communities through Community Advisory Panels or equivalent channels

2.4 The implementation of element 3.7 of the Responsible Care® Management System and the Responsible Care® Process Safety Code, including: consideration of communications and community recovery needs; participation in the development, implementation and maintenance of community emergency preparedness plans; and an appropriate process for responding to raw material, product, process, waste material and transportation incidents.

3 The entity may report the share of its operations that have undergone environmental or social impact assessments.

4 The entity may describe its efforts to address environmental justice concerns in communities in areas where the entity operates as well as potential operating impacts from regulatory or community action to address environmental justice.

4.1 Environmental Justice is defined per the U.S. Environmental Protection Agency's Technical Guidance for Assessing Environmental Justice in Regulatory Analysis.

5 The discussion may address how practices apply to business partners such as contractors, sub-contractors, suppliers, and joint venture partners to the extent permissible under the terms of any contractual agreements, and without revealing confidential, proprietary or sensitive information.

Workforce Health & Safety

Topic Summary

Employees in chemicals manufacturing facilities face health and safety risks from exposure to heavy machinery, harmful substances, high temperatures and pressure, and electrical hazards, among others. Creating an effective safety culture is critical to proactively mitigate safety impacts, which could result in financial consequences, including higher healthcare costs, litigation, and work disruption. By maintaining a safe work environment and promoting a culture of safety, companies can minimize safety-related expenses and potentially improve productivity.

Accounting Metrics

RT-CH-320a.1. (1) Total recordable incident rate (TRIR) and (2) fatality rate for (a) direct employees and (b) contract employees

1 The entity shall disclose its total recordable incident rate (TRIR) for work-related injuries and illnesses.

1.1 An injury or illness is considered a recordable incident if it results in any of the following: death, days away from work, restricted work or transfer to another job, medical treatment beyond first aid, or loss of consciousness. Additionally, a significant injury or illness diagnosed by a physician or other licensed health care professional is considered a recordable incident, even if it does not result in death, days away from work, restricted work or job transfer, medical treatment beyond first aid, or loss of consciousness. This definition is derived from U.S. 29 CFR 1904.7.

1.2 The U.S. Occupational Safety and Health Administration (OSHA) provides additional resources for determining if injuries or illnesses are considered recordable incidents in its guidance for OSHA Forms 300, 300A, and 301.

2 The entity shall disclose its fatality rate for work-related fatalities.

3 Rates shall be calculated as: (statistic count × 200,000) / hours worked

3.1 The U.S. Bureau of Labor Statistics (BLS) provides additional guidance for the calculation of rates in, "How to Compute a Firm's Incidence Rate for Safety Management" and "Incidence Rate Calculator and Comparison Tool."

4 The scope of disclosure includes work-related incidents only.

4.1 OSHA guidance for Forms 300, 300A, and 301 provides guidance on determining whether an incident is work-related, as well as definitions for exemptions for incidents that occur in the work environment but are not work-related.

5 The entity shall disclose the rates by each of the following employee categories:

5.1 Direct employees, defined as those employees on the entity's payroll, whether they are full-time, part-time, executive, labor, salary, hourly, or seasonal employees.

5.2 Contract employees, defined as those who are not on the entity's payroll, but who are supervised by the entity on a day-to-day basis, including independent contractors and those employed by third parties (e.g., temp agencies and labor brokers).

6 The scope of disclosure includes all employees regardless of employee location.

RT-CH-320a.2. Description of efforts to assess, monitor, and reduce exposure of employees and contract workers to long-term (chronic) health risks

1 The entity shall discuss its approach to assess, monitor, and reduce exposure of its workforce to long-term (i.e., chronic) human health risks consistent with the definition by the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (29 CFR 1910.1200), including, but not limited to:

1.1 Corrosives

1.2 Hepatoxins

1.3 Nephrotoxins

1.4 Neurotoxins

1.5 Sensitizers

1.6 Known or suspected carcinogens, teratogens, mutagens, and reprotoxins

2 The workforce includes any personnel conducting company business on behalf of the entity, including all direct employees and contract employees.

2.1 Direct employees are defined as those employees on the entity's payroll, whether they are full-time, part-time, executive, labor, salary, hourly or seasonal employees.

2.2 Contract employees are defined as those who are not on the entity's payroll, but who are supervised by the entity on a day-to-day basis, including independent contractors and those employed by third parties (e.g., temp agencies and labor brokers).

3 The scope of disclosure shall focus on the company's workforce in production facilities, but may include all employees and contractors, as relevant.

4 Relevant efforts to describe include, but are not limited to:

4.1 Automation of processes

4.2 Completion of occupational exposure limit reviews

4.3 Implementation of technology to control worker exposure

4.4 Risk assessments participation in long-term health studies

4.5 Worker use of personal protective equipment

4.6 Phasing out, substituting, or using alternative materials

5 The entity may describe its implementation of relevant safety management systems, including, but not limited to, the measurement of safety and health performance through metrics and obtaining third-party verification of compliance with relevant safety standards (e.g., ANSI Z400.1/Z129.1-2010 - Hazardous Workplace Chemicals - Hazard Evaluation and Safety Data Sheet and Precautionary Labeling Preparation and Responsible Care 14001 Responsible Care Management System).

Additional References

OSHA Hazard Communication Standard (29 CFR 1910.1200): https://www.osha.gov/dsg/hazcom/ghd053107.html

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.

Safety & Environmental Stewardship of Chemicals

Topic Summary

Product safety and stewardship is a critical issue for companies in the Chemicals industry. The potential for human health or environmental impacts of chemicals during the use-phase can influence product demand and regulatory risk, which in turn can affect revenues and result in higher operating expenses, regulatory compliance costs, and mitigation. The industry can therefore mitigate regulatory risk and grow market share by developing innovative approaches to manage the potential impacts of products during the use phase, including developing alternative products with reduced toxicity. This could contribute to shareholder value through improved competitive positioning, greater market share, reduced regulatory risks, and higher brand value.

Accounting Metrics

RT-CH-410b.1. (1) Percentage of products that contain Globally Harmonized System of Classification and Labeling of Chemicals (GHS) Category 1 and 2 Health and Environmental Hazardous Substances, (2) percentage of such products that have undergone a hazard assessment

1 The entity shall disclose (1) the percentage of its products, by revenue, that contain Globally Harmonized System of Classification and Labeling of Chemicals (GHS) Category 1 and 2 Health and Environmental Hazardous substances, where:

1.1 GHS Health Hazards include the following criteria: Acute Toxicity, Skin Corrosion/Irritation, Serious Eye Damage/Eye Irritation, Respiratory or Skin Sensitization, Germ Cell Mutagenicity, Carcinogenicity, Reproductive Toxicology, Target Organ Systemic Toxicity – Single Exposure, Target Organ Systemic Toxicity, or Repeated Exposure Aspiration Toxicity.

1.2 GHS Environmental hazardous include the following criteria: Acute aquatic toxicity, chronic aquatic toxicity, bioaccumulation potential, or rapid degradability.

1.3 The entity shall refer to the definitions provided by the GHS System for Classification and Labeling of Chemicals.

2 The entity shall calculate and disclose the percentage as the revenue from products that contain substances meeting the criteria of GHS Health & Environmental Hazardous Substances categories 1 and 2 divided by total revenue from all products.

2.1 The entity shall follow the criteria pertaining to mixtures as established in the GHS guidance.

3 The entity shall disclose (2) the percentage of its products containing Globally Harmonized System of Classification and Labeling of Chemicals Category 1 and 2 Hazardous Substances that have undergone a hazard assessment.

3.1 The percentage shall be calculated as the revenue from products that contain GHS Category 1 and 2 Health and Environmental Hazardous Substances that have undergone a risk assessment divided by the total revenue from products that contain GHS Category 1 and 2 Health and Environmental Hazardous Substances.

3.2 A hazard assessment is defined as a process to identify, implement, document and communicate health, safety, and environmental measures to manage risk so that products can be safely used for their intended purposes.

3.2.1 Tools used for conducting hazard assessments include, but are not limited to: the American Chemistry Council's Responsible Care® Product Safety Code; the U.S. EPA's Toxic Substances Control Act (TSCA) Work Plan: the International Council of Chemical Associations (ICCA) GPS: REACH chemical safety assessments: the United Nations Environment Programme's Strategic Approach to International Chemicals Management; and ISO/RC 14001.

3.3 The entity shall disclose the methodologies used to conduct the hazard assessments of its products.

4 The scope of disclosure includes all products and materials manufactured by the entity.

RT-CH-410b.2. Discussion of strategy to (1) manage chemicals of concern and (2) develop alternatives with reduced human and/or environmental impact

1 The entity shall (1) discuss its strategy and approach to managing the production of materials, chemicals, and substances that may be of human health and/or environmental concern to consumers, customers (e.g., retailers and commercial buyers), regulators, and/or others (e.g., non-governmental organizations or scientific researchers).

1.1 "Materials, chemicals, and substances" includes individual compounds, classes of chemicals, and categories of chemicals.

1.2 The entity shall discuss, at a minimum, how it assesses materials and chemicals for hazard characteristics and risk traits, including the operational processes it employs for these assessments and other actions it takes to manage hazards and risks.

1.3 Relevant operational processes may include, but are not limited to, product formulation and design, product safety testing, risk characterization, prioritization of product risks, product labeling, product declarations (e.g., material safety data sheets), sharing of information on product risks, accountability for chemicals management within the entity's organization, communication processes used to share product information within the entity's supply chain, and management of new information on product risks.

1.4 Relevant actions to discuss may include the exclusion of substances (e.g., use of banned substances lists), use of material substitution assessments, use of tools and management practices, or any other methods that consider the usage of materials, chemicals, and substances of concern.

1.4.1 Actions to discuss may include, but are not limited to, efforts to implement the U.S. EPA's TSCA Work Plan, the American Chemistry Council's Responsible Care® Product Safety Code, and the United Nations Environment Programme's Strategic Approach to International Chemicals Management.

1.5 The entity shall discuss its production and use of chemicals listed under Globally Harmonized System of Classification and Labeling of Chemicals (GHS) Category 1 and Category 2 Health and Environmental Hazardous Substances. Where relevant, the entity may additionally discuss its production and use of chemicals that:

1.5.1 Contain Registration, Evaluation, Authorisation, and Restriction of Chemical (REACH) substances of very high concern (SVHC)

1.5.2 Are classified as (a) extremely hazardous or (b) highly hazardous by the World Health Organization

1.5.3 Appear on California's Proposition 65 list of carcinogens and reproductive toxins, Washington State's List of Chemicals of High Concern to Children

1.5.4 Appear on other equivalent state and country regulations on chemicals of concern

2 The entity shall (2) discuss its strategy and approach to developing alternative processes and chemicals that reduce or avoid the use of substances that may be of human health and/or environmental concern to consumers, customers (e.g., retailers and commercial buyers), regulators, and/or others (e.g., non-governmental organizations or scientific researchers).

2.1 Relevant actions to discuss may include the use of chemicals listed as safer alternatives (e.g., U.S. EPA Safer Chemical Ingredients List), use of alternative assessments (e.g., GreenScreen® For Safer Chemicals), and other tools or methods that inform the entity's development of alternative processes and chemicals.

2.2 The entity shall discuss how it addresses relevant aspects of the 12 Principles of Green Chemistry, where relevant.

2.2.1 The scope of discussion may include how the entity reduces hazardous chemical synthesis (Principle 3), designs safer chemicals (Principle 4), uses safer solvents and auxiliaries (Principle 5), reduces derivatives (Principle 8), and designs for degradation (Principle 10).

2.2.2 The scope of discussion may include specific production processes and products that have incorporated these principles.

Genetically Modified Organisms

Topic Summary

Some chemical companies produce crop seeds developed using genetically modified organism (GMO) technology. GMO technology has improved the yields of certain crops, including corn and soy, by altering the crop's resistance to pesticides and herbicides and improving drought tolerance, among other factors. At the same time, consumers and regulators in some areas have expressed concern over the use of GMO technology due to perceived health, environmental, and social impacts of GMO cultivation and consumption. Thus, companies that employ such technology face both market opportunities and risks related to its use. The adoption of GMO crop technology is significant in the U.S., while in other regions, including in the European Union and China, regulators have implemented bans, quotas, or labeling requirements on GMO-based products. Such product bans or labeling requirements may lower revenues or increase costs for manufacturers, while regulatory and public perception can affect reputational risk. As such, companies that effectively respond to market drivers related to GMO products can mitigate risks and capitalize on opportunities.

Accounting Metrics

RT-CH-410c.1. Percentage of products by revenue that contain genetically modified organisms (GMOs)

1 The entity shall disclose the percentage of its products, by revenue, that contain genetically modified organisms (GMOs), where:

1.1 GMOs are defined as organisms, with the exception of human beings, in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination, consistent with EU Directive 2001/18/EC.

2 The scope of disclosure includes GMOs that are defined by, applicable regulations that include, but are not limited to:

2.1 EU Directive 2001/18/EC

2.2 Regulation EC 1829/2003

2.3 U.S. Agricultural Marketing Act, amended per Public Law 114-216

3 The percentage shall be calculated as the revenue from products that contain GMOs divided by total revenue from all products.

Management of the Legal & Regulatory Environment

Topic Summary

The Chemicals industry faces strict regulation governing air emissions, water discharge, chemical safety, and process safety, among other issues. Anticipating and adapting to regulatory developments, both in the short and long term, is a critical issue for the industry, as regulatory developments can significantly affect product demand, manufacturing costs, and brand value. Therefore, companies with a clear strategy for managing the regulatory environment that aligns corporate performance with sustainable environmental outcomes and accounts for societal externalities could benefit from reduced regulatory uncertainty, stronger brand value, and improved competitive positioning.

Accounting Metrics

RT-CH-530a.1. 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 which 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 local, state, and federal level.

1.3 The regulatory environment related to environmental and social factors includes, but is not limited to, those related to non-greenhouse gas emissions, greenhouse gas emissions, water withdrawals and effluents, hazardous waste, community impacts, product lifecycle management and safety, and process and employee safety.

2 Relevant risks include, but are not limited to:

2.1 Risk of increased compliance costs

2.2 Risk of policy reversal (e.g., risks associated with changes to existing environmental regulations)

2.3 Risk of loss of financial incentives (e.g., reduction or elimination of tax deductions)

2.4 Risk to reputation due to entity's stance and actions related to the legal and regulatory environment

2.5 Risk that the legal and regulatory environment may not be aligned with long-term strategy

2.6 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 chemical 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 Chemicals 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, which may include, but is not limited to:

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

Operational Safety, Emergency Preparedness & Response

Topic Summary

Health, safety, and emergency management is a critical issue for companies in the Chemicals industry. Technical failure, human error, or external factors such as weather can lead to accidental releases of chemical substances into the environment at processing facilities or during storage and transportation. Furthermore, the combustible nature of chemical substances, combined with the high operating temperatures and pressures involved in manufacturing, elevates the risk of explosions, hazardous spills, or other emergency situations. Such events can harm workers or people in nearby communities through the release of harmful air emissions and chemical substances, and may also adversely impact the environment. Companies may face operational disruptions, damage to facilities, reputational harm, and increased regulatory compliance and remediation costs in the event of a process incident. As such, strong management of process safety can reduce operational downtime, mitigate costs and regulatory risk, and ensure workforce productivity.

Accounting Metrics

RT-CH-540a.1. Process Safety Incidents Count (PSIC), Process Safety Total Incident Rate (PSTIR), and Process Safety Incident Severity Rate (PSISR)

1 The entity shall disclose its process safety performance using the following indicators, consistent with the process safety reporting element of the American Chemistry Council's (ACC) Responsible Care® program, further defined in the Center for Chemical Process Safety's "Process Safety Leading and Lagging Metrics":

1.1 Process Safety Incidents Count (PSIC) is defined as the total (annual) count of all incidents that meet the definition of a Tier 1 PSI per ANSI/API RP 754.

1.2 Process Safety Total Incident Rate (PSTIR), which is defined as the cumulative (annual) count of incidents normalized by man hours, is calculated as the PSIC multiplied by 200,000 and divided by the total annual hours worked by employees, contractors, and subcontractors.

1.3 Process Safety Incident Severity Rate (PSISR), which is defined as the cumulative (annual) severity-weighted rate of process safety incidents, is calculated as the Total Severity Score for all Process Safety Incidents multiplied by 200,000 and divided by the total annual hours worked by employees, contractors, and subcontractors.

2 The scope of disclosure includes Process Safety Incidents occurring at company-owned or -operated facilities.

3 The entity may separately disclose equivalent rates for Tier 2 Process Safety Events, as defined by ANSI/API RP 754 and Center for Chemical Process Safety's "Process Safety Leading and Lagging Metrics."

Note to **RT-CH-540a.1**

1 The entity shall describe incidents with a severity rating of 1 or 2, including their root cause, outcomes, and corrective actions implemented in response (e.g., technology improvements and/or operator training).

RT-CH-540a.2. Number of transport incidents

1 The entity shall disclose the total number of transport incidents, where transport incidents are defined consistent with national regulations:

1.1 For operations in the U.S., transport incidents are those that require a U.S. Department of Transportation 5800 report.

1.2 For operations in the EU, transport incidents are those that require a report based on the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) criteria.

1.3 For operations in other jurisdictions, transport incidents are defined in accordance with the nationally recognized definition, consistent with the International Council of Chemical Association's (ICCA) Guidance for Reporting Performance.

2 Where a national definition does not exist, a reportable transport incident is defined, irrespective of the chemical products contribution, as an incident when one of the following has occurred, consistent with the ICCA Guidance for Reporting Performance:

2.1 A death or injury leading to intensive medical treatment, a stay in hospital of at least one day, or an absence from work of more than three days

2.2 Any release of more than 50 kg/L of dangerous goods or more than 1,000 kg/L of non-dangerous goods

2.3 Any damage of more than 50,000 Euro (including environmental cleanup) resulting from a transport incident

2.4 An incident leading to direct involvement of authorities and/or emergency services, evacuation of people, or closure of public traffic routes for at least three hours

3 The entity shall report distribution incidents for all modes of product transport (e.g., road, rail, or ship).

4 The scope of disclosure includes all distributions for which the entity has direct oversight as well as those contracted by the entity to a third party (i.e., Tier 1 contracts).

Note to **RT-CH-540a.2**

1 The entity shall describe significant transport incidents, including their root causes, outcomes, and corrective actions implemented in response (e.g., technology improvements or driver training).

1.1 Significant transport incidents are considered those that require immediate notice of a hazardous materials incident to a governmental authority, consistent with 49 CFR 171.15.

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