



SUSTAINABILITY ACCOUNTING STANDARD
RESOURCE TRANSFORMATION SECTOR

CHEMICALS

Sustainability Accounting Standard

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Sustainable Industry Classification System™ (SICS™) #RT0101

Prepared by the
Sustainability Accounting Standards Board®

OCTOBER 2014
EXPOSURE DRAFT FOR PUBLIC COMMENT

CHEMICALS

Sustainability Accounting Standard

About SASB

The Sustainability Accounting Standards Board (SASB) provides sustainability accounting standards for use by publicly listed corporations in the U.S. in disclosing material sustainability information for the benefit of investors and the public. SASB standards are designed for disclosure in mandatory filings to the Securities and Exchange Commission (SEC), such as the Form 10-K and 20-F. SASB is an independent 501(c)3 nonprofit organization. Through 2016, SASB is developing standards for more than 80 industries in 10 sectors.

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SUSTAINABILITY ACCOUNTING STANDARDS BOARD

75 Broadway, Suite 202
San Francisco, CA 94111
415.830.9220

info@sasb.org

www.sasb.org

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INTRODUCTION

Purpose & Structure

This document contains the SASB Sustainability Accounting Standard (SASB Standard) for the Chemicals industry.

SASB Standards are comprised of **(1) disclosure guidance and (2) accounting standards on sustainability topics** for use by U.S. and foreign public companies in their annual filings (Form 10-K or 20-F) with the U.S. Securities and Exchange Commission (SEC). To the extent relevant, SASB Standards may also be applicable to other periodic mandatory filings with the SEC, such as the Form 10-Q, Form S-1, and Form 8-K.

SASB's disclosure guidance identifies sustainability topics at an industry level, which may be material— depending on a company's specific operating context— to a company within that industry.

Each company is ultimately responsible for determining which information is material and is therefore required to be included in its Form 10-K or 20-F and other periodic SEC filings.

SASB's accounting standards provide companies with standardized accounting metrics to account for performance on industry-level sustainability topics. When making disclosure on sustainability topics, companies adopting SASB's accounting standards will help to ensure that disclosure is standardized and therefore useful, relevant, comparable, and auditable.

Industry Description

Companies in the Chemicals industry have global operations/production facilities to transform organic and inorganic feedstocks into more than 70,000 diverse chemical products with a range of industrial, pharmaceutical, agricultural, housing, automotive, and consumer applications. The Chemicals industry is commonly segmented into basic (commodity) chemicals, agricultural chemicals, and specialty chemicals. Basic chemicals, the largest segment, includes 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. As the global middle class expands, demand for consumer goods will likely grow, driving increased chemical production. A dynamic regulatory environment, rapid innovation, and increased production in developing nations will underlie key sustainability trends within the industry.

Guidance for Disclosure of Material Sustainability Topics in SEC Filings

1. Industry-Level Sustainability Disclosure Topics

For the Chemicals industry, SASB has identified the following sustainability disclosure topics:

- Greenhouse Gas Emissions
- Energy Management
- Air Quality
- Water Management
- Hazardous Materials Management
- Employee Health & Safety
- Product Lifecycle Management & Innovation
- Political Spending
- Operational Safety, Emergency Management & Response

2. Company-Level Determination and Disclosure of Material Sustainability Topics

Sustainability disclosures are governed by the same laws and regulations that govern disclosures by securities issuers generally. According to the U.S. Supreme Court, a fact is material if, in the event such fact is omitted from a particular disclosure, there is “a substantial likelihood that the disclosure of the omitted fact would have been viewed by the reasonable investor as having significantly altered the ‘total mix’ of the information made available.”^{1,2}

SASB has attempted to identify those sustainability topics that it believes may be material for all companies within each SICS industry. SASB recognizes, however, that each company is ultimately responsible for determining what is material to it.

Regulation S-K, which sets forth certain disclosure requirements associated with Form 10-K and other SEC filings, requires companies, among other things, to describe in the Management’s Discussion and Analysis of Financial Condition and Results of Operations (MD&A) section of Form 10-K “any known trends or uncertainties that have had or that the registrant reasonably expects will have a material favorable or unfavorable impact on net sales or revenues or income from continuing operations. If the registrant knows of events that will cause a material change in the relationship between costs and revenues (such as known future increases in costs of labor or materials or price increases or inventory adjustments), the change in the relationship shall be disclosed.”²

Furthermore, Instructions to Item 303 state that the MD&A “shall focus specifically on material events and uncertainties known to management that would cause reported financial information not to be necessarily indicative of future operating results or of future financial condition.”²

In determining whether a trend or uncertainty should be disclosed, the SEC has stated that management should use a two-part assessment based on probability and magnitude:

First, a company is not required to make disclosure about a known trend or uncertainty if its management determines that such trend or uncertainty is not reasonably likely to occur.

Second, if a company’s management cannot make a reasonable determination of the likelihood of an event or uncertainty, then disclosure is required unless management determines that a material effect on the registrant’s financial condition or results of operation is not reasonably likely to occur.

¹ TSC Industries v. Northway, Inc., 426 U.S. 438 (1976).

² C.F.R. 229.303(item 303)(a)(3)(ii).

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3. Sustainability Accounting Standard Disclosures in Form 10-K

a. Management's Discussion and Analysis

Companies should consider making disclosure on sustainability topics as a complete set in the MD&A, in a subsection titled "**Sustainability Accounting Standards Disclosures.**"³

b. Other Relevant Sections of Form 10-K

In addition to the MD&A section, companies should consider disclosing sustainability information in other sections of Form 10-K as relevant, including:

Description of business—Item 101 of Regulation S-K requires a company to provide a description of its business and its subsidiaries. Item 101(c)(1)(xii) expressly requires disclosure regarding certain costs of complying with environmental laws:

Appropriate disclosure also shall be made as to the material effects that compliance with Federal, State and local provisions which have been enacted or adopted regulating the discharge of materials into the environment, or otherwise relating to the protection of the environment, may have upon the capital expenditures, earnings and competitive position of the registrant and its subsidiaries.

Legal proceedings—Item 103 of Regulation S-K requires companies to describe briefly any material pending or contemplated legal proceedings. Instructions to Item 103 provide specific disclosure requirements for administrative or judicial proceedings arising from laws and regulations that target discharge of materials into the environment or that are primarily for the purpose of protecting the environment.

Risk factors—Item 503(c) of Regulation S-K requires filing companies to provide a discussion of the most significant factors that make an investment in the registrant speculative or risky, clearly stating the risk and specifying how a particular risk affects the particular filing company.

c. Rule 12b-20

Securities Act Rule 408 and Exchange Act Rule 12b-20 require a registrant to disclose, in addition to the information expressly required by law or regulation, "such further material information, if any, as may be necessary to make the required statements, in light of the circumstances under which they are made, not misleading."

More detailed guidance on disclosure of material sustainability topics can be found in the **SASB Conceptual Framework**, available for download via <http://www.sasb.org/approach/conceptual-framework/>.

³ SEC [Release Nos. 33-8056; 34-45321; FR-61] [Commission Statement about Management's Discussion and Analysis of Financial Condition and Results of Operations](#): "We also want to remind registrants that disclosure must be both useful and understandable. That is, management should provide the most relevant information and provide it using language and formats that investors can be expected to understand. Registrants should be aware also that investors will often find information relating to a particular matter more meaningful if it is disclosed in a single location, rather than presented in a fragmented manner throughout the filing."

Guidance on Accounting of Material Sustainability Topics

For sustainability disclosure topics in the Chemicals industry, SASB identifies accounting metrics.

SASB recommends that each company consider using these sustainability accounting metrics when disclosing its performance with respect to each of the sustainability topics it has identified as material.

As appropriate—and consistent with Rule 12b-20⁴—for each sustainability topic, companies should consider including a narrative description of any material factors necessary to ensure completeness, accuracy, and comparability of the data reported. Where not addressed by the specific accounting metrics, but relevant, the registrant should discuss the following, related to the topic:

- The registrant's **strategic approach** to managing performance on material sustainability issues;

- The registrant's competitive positioning;

- The **degree of control** the registrant has;

- Any measures the registrant has undertaken or plans to undertake to improve performance; and

- Data for the registrant's **last three completed fiscal years** (when available).

SASB recommends that registrants use SASB Standards specific to their primary industry as identified in the [Sustainable Industry Classification System \(SICS™\)](#). If a registrant generates significant revenue from multiple industries, SASB recommends that it consider the materiality of the sustainability issues that SASB has identified for those industries and disclose the associated SASB accounting metrics.

Users of the SASB Standards

The SASB Standards are intended for companies that engage in public offerings of securities registered under the Securities Act of 1933 (the Securities Act) and those that issue securities registered under the Securities Exchange Act of 1934 (the Exchange Act),⁵ for use in SEC filings, including, without limitation, annual reports on Form 10-K (Form 20-F for foreign issuers), quarterly reports on Form 10-Q, current reports on Form 8-K, and registration statements on Forms S-1 and S-3. Nevertheless, disclosure with respect to the SASB Standards is not required or endorsed by the SEC or other entities governing financial reporting, such as FASB, GASB, or IASB.

⁴ SEC Rule 12b-20: "In addition to the information expressly required to be included in a statement or report, there shall be added such further material information, if any, as may be necessary to make the required statements, in the light of the circumstances under which they are made, not misleading."

⁵ Registration under the Securities Exchange Act of 1934 is required (1) for securities to be listed on a national securities exchange, such as the New York Stock Exchange, the NYSE Amex, and the NASDAQ Stock Market, or (2) if (A) the securities are equity securities, and are held by more than 2,000 persons (or 500 persons who are not accredited investors) and (B) the company has more than \$10 million in assets.

Scope of Disclosure

Unless otherwise specified, SASB recommends:

That a registrant disclose on sustainability issues and metrics for itself and for entities in which the registrant has a controlling interest and therefore are consolidated for financial reporting purposes (controlling interest is generally defined as ownership of 50% or more of voting shares);⁶

That for consolidated entities, disclosures be made, and accounting metrics calculated, for the whole entity, regardless of the size of the minority interest; and

That information from unconsolidated entities not be included in the computation of SASB accounting metrics. A registrant should disclose, however, information about unconsolidated entities to the extent that the registrant considers the information necessary for investors to understand its performance with respect to sustainability issues (typically, this disclosure would be limited to risks and opportunities associated with these entities).

Reporting Format

Activity Metrics and Normalization

SASB recognizes that normalizing accounting metrics is important for the analysis of SASB disclosures.

SASB recommends that a registrant disclose any basic business data that may assist in the accurate evaluation and comparability of disclosure, to the extent that they are not already disclosed in the Form 10-K (e.g., revenue, EBITDA, etc.).

Such data—termed “activity metrics”—may include high-level business data such as total number of employees, quantity of products produced or services provided, number of facilities, or number of customers. It may also include industry-specific data such as plant capacity utilization (e.g., for specialty chemical companies), number of transactions (e.g., for Internet media and services companies), hospital bed days (e.g., for health care delivery companies), or proven and probable reserves (e.g., for oil and gas exploration and production companies).

Activity metrics disclosed should:

Convey contextual information that would not otherwise be apparent from SASB accounting metrics.

Be deemed generally useful for users of SASB accounting metrics (e.g., investors) in performing their own calculations and creating their own ratios.

Be explained and consistently disclosed from period to period to the extent they continue to be relevant. However, a decision to make a voluntary disclosure in one period does not obligate a continuation of that disclosure if it is no longer relevant or if a better metric becomes available.

⁶ See US GAAP consolidation rules (Section 810).
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Where relevant, SASB recommends specific activity metrics that—at a minimum—should accompany SASB accounting metric disclosures.

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Amount of chemical production (i.e. throughput)	Quantitative	Cubic Meters (m ³) and/or Tons (t) ⁷	RT0101-A
Number of employees, percentage in manufacturing role	Quantitative	Number, Percentage (%)	RT0101-B

Units of Measure

Unless specified, disclosures should be reported in International System of Units (SI units).

Uncertainty

SASB recognizes that there may be inherent uncertainty when disclosing certain sustainability data and information. This may be related to variables such as the imperfectness of third-party reporting systems or the unpredictable nature of climate events. Where uncertainty around a particular disclosure exists, SASB recommends that the registrant should consider discussing its nature and likelihood.

Estimates

SASB recognizes that scientifically-based estimates, such as the reliance on certain conversion factors or the exclusion of *de minimis* values, may be necessary for certain quantitative disclosures. Where appropriate, SASB does not discourage the use of such estimates. When using an estimate for a particular disclosure, SASB expects that the registrant discuss its nature and substantiate its basis.

Timing

Unless otherwise specified, disclosure shall be for the registrant's fiscal year.

Limitations

There is no guarantee that SASB Standards address all sustainability impacts or opportunities associated with a sector, industry, or company, and therefore, a company must determine for itself the topics—sustainability-related or otherwise—that warrant discussion in its SEC filings.

Disclosure under SASB Standards is voluntary. It is not intended to replace any legal or regulatory requirements that may be applicable to user operations. Where such laws or regulations address legal or regulatory topics, disclosure under SASB Standards is not meant to supersede those requirements. Disclosure according to SASB Standards shall not be construed as demonstration of compliance with any law, regulation, or other requirement.

SASB Standards are intended to be aligned with the principles of materiality enforced by the SEC. However, SASB is not affiliated with or endorsed by the SEC or other entities governing financial reporting, such as FASB, GASB, or IASB.

⁷ Because chemicals may be sold by weight or by volume, the registrant shall disclose the amount of product in relevant units.

Forward-looking Statements

Disclosures on sustainability topics can involve discussion of future trends and uncertainties related to the registrant's operations and financial condition, including those influenced by external variables (e.g., environmental, social, regulatory, and political). Companies making such disclosures should familiarize themselves with the safe harbor provisions of Section 27A of the Securities Act and Section 21E of the Exchange Act, which preclude civil liability for material misstatements or omissions in such statements if the registrant takes certain steps, including, among other things, identifying the disclosure as "forward-looking" and accompanying such disclosure with "meaningful cautionary statements identifying important factors that could cause actual results to differ materially from those in the forward-looking statements."

Assurance

In disclosing to SASB Standards, it is expected that registrants disclose with the same level of rigor, accuracy, and responsibility as they apply to all other information contained in their SEC filings.

SASB encourages registrants to use independent assurance (attestation); for example, an Examination Engagement to AT Section 101.

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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 a regulatory program	Quantitative	Metric tons CO ₂ -e, Percentage	RT0101-01
	Description 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	RT0101-02
Energy Management	Total energy consumed, percentage grid electricity, percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	RT0101-03
Air Quality	Air emissions for the following pollutants: NO _x (excluding N ₂ O), SO _x , and volatile organic compounds (VOCs)	Quantitative	Metric tons	RT0101-04
	Number of production facilities in or near areas of dense population	Quantitative	Number	RT0101-05
Water Management	Total water withdrawn, percentage recycled, percentage in regions with High or Extremely High Baseline Water Stress	Quantitative	Cubic Meters (m ³), Percentage (%)	RT0101-06
	Number of incidents of non-compliance with water quality permits, standards, and regulations	Quantitative	Number	RT0101-07
Hazardous Materials Management	Amount of hazardous waste, percentage recycled	Quantitative	Tons (t), Percentage (%)	RT0101-08
	Number and aggregate quantity of reportable releases and spills, quantity recovered	Quantitative	Number, Kilograms (kg)	RT0101-09
Employee Health & Safety	(1) Total recordable injury rate and (2) fatality rate for (a) full-time employees and (b) contract employees	Quantitative	Rate	RT0101-10
	Discussion of efforts to assess, monitor, and reduce exposure of employees and contract workers to long-term (chronic) health risks	Discussion and Analysis	n/a	RT0101-11

Table 1. Sustainability Disclosure Topics & Accounting Metrics (cont.)

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Product Lifecycle Management & Innovation	Percentage of raw materials from renewable resources	Quantitative	Percentage (%) by weight	RT0101-12
	Percentage of products by revenue that qualify as (a) Registration, Evaluation, Authorisation and Restriction of Chemical (REACH) substances of very high concern (SVHC), or (b) Class I World Health Organization (WHO): Acute Toxicity Hazard Categories	Quantitative	Percentage (%) by revenue	RT0101-13
	Percentage of products by revenue that contain genetically modified organisms	Quantitative	Percentage (%) by revenue	RT0101-14
	Amount of legal and regulatory fines and settlements associated with product safety ⁸	Quantitative	U.S. Dollars (\$)	RT0101-15
	Total addressable market and share of market for Green Chemistry-based products	Quantitative	U.S. Dollars (\$), Percentage (%)	RT0101-16
Political Spending	Amount of political campaign spending, lobbying expenditures, and contributions to tax-exempt groups, including trade associations	Quantitative	U.S. Dollars (\$)	RT0101-17
	Five largest political, lobbying, or tax-exempt group expenditures	Quantitative	U.S. Dollars (\$), by recipient	RT0101-18
Operational Safety, Emergency Management & Response	Process Safety Incidents Count (PSIC), Process Safety Total Incident Rate (PSTIR), Process Safety Incident Severity Rate (PSISR)	Quantitative	Number, Rate	RT0101-19
	Challenges to the Safety Systems indicator rate (Tier 3)	Quantitative	Rate	RT0101-20
	Number of transport incidents ⁹	Quantitative	Number	RT0101-21

⁸ Note to RT0101-15 – Disclosure shall include a description of fines and settlements and corrective actions implemented in response to events.

⁹ Note to RT0101-21 – Disclosure shall include a discussion of the severity of impact of transport incidents.

Greenhouse Gas Emissions

Description

Chemical manufacturing facilities often burn large amounts of fossil fuels in manufacturing and cogeneration processes resulting in direct (Scope 1) emissions of greenhouse gases (GHGs). Natural gas, liquefied petroleum gases, and natural gas liquids are the primary energy sources used within the Chemicals industry, which can result in significant environmental externalities, such as climate change. Direct emissions from the use of fossil fuels are a source of corporate risk arising from current and potential future regulations in the U.S. and abroad. Financial impacts on companies will vary depending on the specific location of operations and the prevailing emissions regulations. Companies that cost-effectively reduce GHG emissions from their operations by implementing industry-leading technologies and processes can create operational efficiency. They can mitigate the impact on value from increased fuel costs and regulations that limit—or put a price on—carbon emissions, which are occurring as regulatory and public concerns about climate change are increasing in the U.S. and globally.

Accounting Metrics

RT0101-01. Gross global Scope 1 emissions, percentage covered under a regulatory program

- .01 The registrant shall disclose gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the six GHGs covered under the Kyoto Protocol (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride).
- Emissions of all gases shall be disclosed in metric tons of carbon dioxide equivalents (CO₂-e), calculated in accordance with published global warming potential (GWP) factors. To date, the preferred source for GWP factors is the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report (1995).
 - Gross emissions are GHGs emitted to the atmosphere before accounting for any GHG reduction activities, offsets, or other adjustments for activities in the reporting period that have reduced or compensated for emissions.
 - Disclosure corresponds to section CC8.2 of the Carbon Disclosure Project (CDP) Questionnaire and section 4.25 of the Climate Disclosure Standards Board (CDSB) *Climate Change Reporting Framework* (CCRF).
- .02 Scope 1 emissions are defined by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD) in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard*, Revised Edition, March 2004 (hereafter, the “GHG Protocol”).
- These emissions include direct emissions of GHGs from stationary or mobile sources that include, but are not limited to, equipment, production facilities, office buildings, and transportation (i.e., marine, road, or rail).
- .03 GHG emission data shall be consolidated according to the approach with which the registrant consolidates its financial reporting data, which is generally aligned with:
- The Financial Control approach defined by the GHG Protocol and referenced by the *CDP Guidance for companies reporting on climate change on behalf of investors & supply chain members 2013* (hereafter, the “CDP Guidance”).¹⁰

¹⁰ “An organization has financial control over an operation if it has the ability to direct the financial and operating policies of the operation with a view to gaining economic benefits from its activities. Generally an organization has financial control over an operation for GHG
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- The approach detailed in Section 4.23, “Organizational boundary setting for GHG emissions reporting,” of the CDSB Climate Change Reporting Framework (CCRF).¹¹
- .04 The underlying technical approach to data collection, analysis, and disclosure shall be consistent with the CDP Guidance.
- The registrant shall consider the CDP Guidance as a normative reference, thus any updates made year-on-year shall be considered updates to this guidance.
- .05 The registrant shall disclose the percentage of its emissions that are covered under a regulatory program, such as the European Union Emissions Trading Scheme (EU ETS), Western Climate Initiative (WCI), California Cap-and-Trade (California Global Warming Solutions Act), or other regulatory programs.
- Regulatory programs include cap-and-trade schemes and carbon tax/fee systems.
 - Disclosure shall exclude emissions covered under voluntary trading systems and disclosure-based regulations (e.g., the U.S. Environmental Protection Agency (EPA) mandatory reporting rule).
- .06 The registrant should discuss any change in its emissions from the previous fiscal year, such as if the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.
- .07 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 registrant may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.
- .08 The registrant should discuss the calculation methodology for its emission disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, mass balance calculations, etc.

RT0101-02. Description of long-term and short-term strategy or plan to manage Scope 1 emissions, including emissions reduction targets, and an analysis of performance against those targets

- .09 The registrant shall discuss the following where relevant:
- The scope, such as whether strategies, plans, and/or reduction targets pertain differently to different business units, geographies, or emissions sources;
 - Whether strategies, plans, and/or reduction targets are related to or associated with an emissions disclosure (reporting) or reduction program (e.g., EU ETS, RGGI, WCI, etc.), including regional, national, international, or sectoral programs; and
 - 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.

accounting purposes if the operation is treated as a group company or subsidiary for the purposes of financial consolidation.” *Guidance for companies reporting on climate change on behalf of investors & supply chain members 2013*, p. 95.

¹¹ This is based on the requirements of International Accounting Standards/International Financial Reporting Standards (IAS/IFRS) on consolidation and equity accounting and is consistent with how information relating to entities within a group or interest in joint ventures/associates would be included on consolidated financial statements, as per the CDSB *Climate Change Reporting Framework*.

.10 For emission-reduction targets the registrant shall disclose:

- The percentage of emissions within the scope of the reduction plan;
- The percentage reduction from base year;
 - The base year is the first year against which emissions are evaluated towards the achievement of the target
- Whether the target is absolute or intensity based, and the metric denominator if it is an intensity-based target;
- The timelines for the reduction activity, including the start year, the target year, and the base year. Disclosure shall be limited to activities that were ongoing (active) or reached completion during the fiscal year;
- The mechanism(s) for achieving the target, such as energy efficiency efforts, energy source diversification, carbon capture and storage, etc.

.11 Where necessary, the registrant shall discuss any circumstances in which the target base year emissions have been, or may be, recalculated retrospectively or where the target base year has been reset.

.12 Disclosure corresponds with:

- CDSB Section 4, "Management actions."¹²
- CDP questionnaire "CC3. Targets and Initiatives."

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¹² 4.12, "Disclosure shall include a description of the organization's long-term and short-term strategy or plan to address climate change-related risks, opportunities, and impacts, including targets to reduce GHG emissions and an analysis of performance against those targets." *Climate Change Reporting Framework – Edition 1.1*, October 2012, CDSB.

Energy Management

Description

Fuel combustion onsite contributes to the Chemical industry's direct (Scope 1) GHG emissions, however, electricity purchases from the grid create indirect impacts on the climate through Scope 2 emissions. These firms are highly reliant on energy as an input for value creation. Approximately one third of the industry's total emissions (direct and indirect) are from purchased electricity. Since electricity consumption can indirectly contribute to climate change and air pollution through combustion of fossil fuels at the utility level, the cost of grid electricity may increase to offset carbon pricing of utilities. With manufacturing plants located in multiple regions, the likelihood and impact of climate change regulations will vary depending on the exact location of facilities. The choice between onsite 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 essential for competing in a commodity market driven by global competition; purchased fuels and electricity 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 associated sustainability risks, and its ability to access alternative sources of energy, can therefore be material.

Accounting Metrics

RT0101-03. Total energy consumed, percentage grid electricity, percentage renewable

- .13 The registrant shall disclose total energy consumption from all sources as an aggregate figure in gigajoules or their multiples.
- The scope includes energy purchased from sources external to the organization or produced by the organization itself (self-generated).
 - The scope includes only energy consumed by entities owned or controlled by the organization.
 - The scope includes energy from all sources, including direct fuel usage, purchased electricity, and heating, cooling, and steam energy.
- .14 In calculating energy consumption from fuels and biofuels, the registrant shall use higher heating values (HHV), also known as gross calorific values (GCV), and 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).
- .15 The registrant shall disclose purchased grid electricity consumption as a percentage of its total energy consumption.
- .16 The registrant shall disclose renewable energy consumption as a percentage of its total energy consumption.
- The scope of renewable energy includes renewable fuel the registrant consumes and renewable energy the registrant directly produces, purchases through a renewable power purchase agreement (PPA) that explicitly includes renewable energy certificates (RECs), or for which Green-e Energy Certified RECs are paired with grid electricity.
 - For any renewable electricity generated onsite, any RECs must be retained (i.e., not sold) and retired on behalf of the registrant in order for the registrant to claim them as renewable energy.

- For renewable PPAs, the agreement must explicitly include and convey that RECs be retained and retired on behalf of the registrant in order for the registrant to claim them as renewable energy.
- The renewable portion of the electricity grid mix that is outside of the control or influence of the registrant is excluded from disclosure.¹³

.17 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.

- For the purposes of this disclosure, the scope of renewable energy from hydro and biomass sources are limited to the following:
 - Energy from hydro sources that are certified by the Low Impact Hydropower Institute;
 - Energy from biomass sources is limited to those sources that are considered “eligible renewables” according to the Green-e Energy National Standard Version 2.4, or eligible for a state Renewable Portfolio Standard.

.18 The registrant 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 kWh to gigajoules (including electricity from solar or wind energy).

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¹³ SASB recognizes that RECs reflect the environmental attributes of renewable energy that have been introduced to the grid, and that a premium has been paid by the purchaser of the REC to enable generation of renewable energy beyond any renewable energy already in the grid mix, absent the market for RECs.

Air Quality

Description

Apart from GHGs, which have global impacts, other air emissions from chemical manufacturing can have significant, localized human health and environmental impacts. In general, releases of air pollutants in the Chemicals industry stem from the combustion of fuels and the processing of raw materials. Production of key chemicals, such as sulfuric acid (the most-produced chemical in the U.S.) and nitric acid, used to manufacture fertilizers and organic and inorganic chemicals, generates significant volumes of sulfur dioxide (SO₂) and nitrogen oxides (NO_x). Relative to other industries, the Chemicals industry provides a substantial source of some of these pollutants. Financial impacts on companies will vary depending on the specific location of operations and the prevailing air emissions regulations. Active management of the issue—through technological and process improvements—could allow companies to limit the impacts of increasingly stringent air quality regulations globally. Companies could also benefit from operational efficiencies that could lead to a lower cost structure over time. Human health impacts and financial consequences for chemical companies are likely to be exacerbated the closer a facility is to a local community.

Accounting Metrics

RT0101-04. Air emissions for the following pollutants: NO_x (excluding N₂O), SO_x, and volatile organic compounds (VOCs)

.19 The registrant shall disclose its emissions of air pollutants that are released to the atmosphere as a result of its activities:

- Direct air emissions from stationary or mobile sources that include, but are not limited to, production facilities, office buildings, marine vessels transporting products, and truck fleets.

.20 The registrant shall disclose emissions released to the atmosphere by emissions type. Substances include:

- Oxides of nitrogen (including NO and NO₂ and excluding N₂O) reported as NO₂
- Oxides of sulfur (SO₂ and SO₃) reported as SO₂
- Nonmethane volatile organic compounds (VOCs), defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate, and methane, which participates in atmospheric photochemical reactions, except those designated by the U.S. Environmental Protection Agency (EPA) as having negligible photochemical reactivity

.21 This scope does not include CO₂, CH₄, and N₂O, which are disclosed in RT0101-01 as Scope 1 GHG emissions.

.22 Air emissions data shall be consolidated according to the approach with which the registrant consolidates its financial reporting data, which is aligned with the consolidation approach used for RT0101-01.

.23 The registrant should discuss the calculation methodology for its emission disclosure, such as whether data are from continuous emissions monitoring systems (CEMS), engineering calculations, mass balance calculations, etc.

RT0101-05. Number of production facilities in or near areas of dense population

.24 The registrant shall disclose the number of its production facilities that are located in or near areas of dense population, which are defined as urbanized areas according to U.S. Census Bureau definitions.¹⁴

- Generically, these include urbanized areas with populations greater than 50,000.
- A list of urbanized areas is available based on census results, with the list from 2010 accessible here: <http://www.gpo.gov/fdsys/pkg/FR-2012-03-27/pdf/2012-6903.pdf> .

.25 The scope of disclosure includes production facilities that are located in a census tract or block considered to be in an urbanized area, or are within 49 kilometers of an urbanized area.¹⁵

.26 For production facilities located outside of the U.S., the registrant shall use available census data to determine whether the facility is located in an urbanized area, as defined by the U.S. Census Bureau:

- In the absence of available or accurate census data, the registrant should use international population density data available from the Columbia University/NASA Socioeconomic Data and Applications Center's (SEDAC) Gridded Population of the World (GPW), v3.

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¹⁴ "Federal Register." U.S. Department of Commerce. Vol. 76. No. 164. August 24, 2011.

<http://www.census.gov/geo/reference/pdfs/fedreg/fedregv76n164.pdf>

¹⁵ The 49 km radius is based on definition of "exposed population" from the U.S. EPA's Office of Pollution Prevention and Toxics, User's Manual for RSEI Version 2.3.2., July 2013: "The exposed population is the population that is likely to come in contact with a chemical. The population differs depending on the exposure pathway modeled. For instance, the population exposed to chemicals released to air is the population in a circle with a radius of 49 km surrounding the facility."

Water Management

Description

Water is increasingly becoming a scarce resource, due to population growth, rapid urbanization, and potentially shifting supply due to climate change. Water scarcity can result in higher supply costs and higher risk of shortages for companies with water-intensive operations. Chemical plants use relatively large quantities of water, primarily for cooling, steam generation, and chemical processing. Furthermore, chemical processing can generate process wastewater and surface water runoff, which may be contaminated with metals, suspended solids, extreme pH levels, and hazardous chemicals. Reducing water use and contamination through recycling and other water management strategies could create operational efficiency 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

RT0101-06. Total water withdrawn, percentage recycled, percentage in regions with High or Extremely High Baseline Water Stress

- .27 The registrant shall disclose the amount of water (in thousands of cubic meters) that was withdrawn from fresh water sources for use in operations.
- Fresh water may be defined according to the local statutes and regulations where the registrant operates. Where there is no regulatory definition, fresh water shall be considered to be water that has a solids (TDS) concentration of less than 1000 mg/l per the Water Quality Association [definition](#).
 - Water obtained from a water utility can be assumed to meet the definition of fresh water.¹⁶
- .28 The registrant shall disclose the total amount of water by volume (in thousands of cubic meters) that was recycled during the fiscal year. This figure shall include the amount recycled in closed-loop and open-loop systems.
- Any volume of water reused multiple times shall be counted as recycled each time it is recycled and reused.
- .29 Using the World Resources Institute's (WRI) Water Risk Atlas tool, Aqueduct (publicly available online [here](#)), the registrant shall analyze all of its operations for water risks and identify facilities that are in a location with High (40–80%) or Extremely High (>80%) Baseline Water Stress. Water withdrawn in locations with High or Extremely High Baseline Water Stress shall be indicated as a percentage of the total water withdrawn.
- .30 For the registrant's operations that are not sub-metered in a way that allows direct measurement of water use, estimation is acceptable and shall be disclosed as such.

RT0101-07. Number of incidents of non-compliance with water-quality permits, standards, and regulations

- .31 The registrant shall disclose the total number of instances of non-compliance, including violations of a technology-based standard and exceedances of a quality-based standard.
- .32 The scope of disclosure includes incidents related to statutory permits and regulations or voluntary agreements, standards, or guidelines, such as total maximum daily load (TMDL) exceedances.

¹⁶ <http://water.epa.gov/drink/contaminants/secondarystandards.cfm>

.33 Voluntary standards include, among others, the registrant's own water quality standards (parameters) or "effluent guidelines" from the International Finance Corporation's (IFC) Environmental, Health, and Safety Guidelines as outlined in the following industry-specific guidelines:

- Oleochemicals Manufacturing,
- Nitrogenous Fertilizer Manufacturing,
- Phosphate Fertilizer Manufacturing,
- Petroleum-based Polymers Manufacturing,
- Large Volume Petroleum-based Organic Chemicals Manufacturing,
- Pesticides Formulation, Manufacturing and Packaging,

.34 Typical parameters of concern include total nitrogen, total phosphorous, biological oxygen demand (BOD), total dissolved solids (TDS), oil and grease, total suspended solids (TSS), and pH.

.35 An incident of non-compliance shall be disclosed regardless of whether it resulted in an enforcement action (e.g., fine, warning letter, etc.).

.36 Violations, regardless of their measurement methodology or frequency, shall be disclosed. These include:

- For continuous discharges, limitations, standards, and prohibitions that are generally expressed as maximum daily, weekly average, and monthly averages.
- For non-continuous discharges, limitations that are generally expressed in terms of frequency, total mass, maximum rate of discharge, and mass or concentrations of specified pollutants.

Hazardous Materials Management

Description

Chemical companies face regulatory and operational challenges in managing process waste and in handling and storing products, as many of these substances can be hazardous to human health and the environment. Chemical manufacturing generates wastes subject to different regulations (both within the U.S. and/or internationally), such as the Resource Conservation and Recovery Act (RCRA), which regulates the generation, transport, treatment, storage, and disposal of hazardous and solid waste. Hazardous wastes generated by plants include metals, spent acids, caustics, solid catalysts, wastewater treatment sludge, and residues from tank-cleaning operations. Proper processing and disposal of hazardous waste materials are essential to limiting risk of remediation liabilities, fines, and regulations. In addition, companies that are able to limit the waste of input materials and recycle the waste generated may achieve significant cost savings and improve profitability.

Accounting Metrics

RT0101-08. Amount of hazardous waste, percentage recycled

.37 The amount of hazardous waste shall be calculated in metric tons, where:

- Waste is generally defined as anything for which the registrant has no further use and is discarded or released to the environment.
- Hazardous waste is 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).
- Hazardous wastes include those that display the following characteristics: ignitability, corrosivity, reactivity, or toxicity.

.38 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 registrant, plus the amount sent externally for further recycling, divided by the total weight of waste material, where:

- A hazardous waste is recycled if it is used, reused, or reclaimed. Furthermore, RCRA hazardous waste regulation makes an important distinction between materials that are used or reused without reclamation, and those that must be reclaimed before reuse. A material is *reclaimed* if it is processed to recover a usable product, or if it is regenerated. Common hazardous waste reclamation activities involve recovery of spent solvents (e.g., recovery of acetone) or metals (e.g., recovery of lead).¹⁷
- Reused materials are defined as those recovered products or components of products that are used for the same purpose for which they were conceived.
- 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.
- 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 to

¹⁷ <http://www.epa.gov/solidwaste/hazard/recycling/index.htm>

primary recycled materials).

- 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.
- Materials sent for further recycling include those materials that are transferred to a third party for the expressed purpose of reuse, recycling, or refurbishment.
- Materials incinerated, including for energy recovery, are not considered reused or recycled. 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.

RT0101-09. Number and aggregate quantity of reportable releases and spills, quantity recovered

.39 The registrant shall disclose the total number and quantity (in kilograms) of reportable releases, where:

- Reportable releases are defined as releases of a hazardous substance in an amount equal to or greater than the reportable quantity defined by the U.S. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).
- The number of releases shall represent any spills, leaks, emissions, discharges, injections, disposals, and abandonment releases over time, counted once at the time identified, consistent with CERCLA.
- The aggregate quantity reported shall represent the total estimated quantity released that reached the environment, and shall not be reduced by the amount of such hazardous substance subsequently recovered, evaporated, or otherwise lost, consistent with CERCLA.¹⁸

.40 The registrant may choose to disclose releases to soil and water separately. A release that qualifies as a release to both soil and water should be reported as a single release to water, with the volume properly apportioned to soil and water.

.41 The registrant shall calculate the quantity of releases recovered as the quantity of released hazardous substances (in kilograms) removed from the environment through short-term release response activities, excluding:

- Amounts that were recovered during longer-term remediation at spill sites.
- Amounts that evaporated, burned, or were dispersed.

¹⁸ <http://www.epa.gov/superfund/policy/release/rq/index.htm#info>

Employee Health & Safety

Description

Chemical manufacturing poses inherent dangers to employees. Exposure to chemicals, heat, heavy machinery, and pressurized equipment poses physical risks. Workers are also at risk of inhaling toxic fumes or being in contact with hazardous substances that can have chronic health impacts as a result of repeated or prolonged exposure. Safety culture is critical to proactively guard against accidents or other incidents with negative environmental and social impacts. By maintaining a safe work environment and promoting a culture of safety, companies can minimize risks to their employees and, in turn, avoid direct and indirect costs associated with excessive medical expenses, litigation, work disruptions and insurance fees.

Accounting Metrics

RT0101-10. (1) Total recordable injury rate and (2) fatality rate for (a) full-time employees and (b) contract employees

- .42 For registrants whose workforce is entirely U.S.-based, the registrant shall disclose its total recordable injury rate (TRIR) and fatality rate, as calculated and reported in OSHA Form 300.
- OSHA guidelines provide details on determination of whether an event is a recordable occupational incident, and definitions for exemptions for incidents that occurred in the work environment, but are not occupational.
- .43 For registrants whose workforce includes non-U.S.-based employees, the registrant shall calculate its total recordable injury rate according to the U.S. Bureau of Labor Statistics guidance and/or using the U.S. Bureau of Labor Statistics calculator.
- .44 The registrant shall disclose its TRIR separately for its full-time employees and for contract employees, including independent contractors and those employed by third parties (e.g., temp agencies, labor brokers, etc.).
- .45 The scope includes all employees, domestic and foreign.
- .46 Rates shall be calculated as: $(\text{statistic count} / \text{total hours worked}) * 200,000$.

RT0101-11. Discussion of efforts to assess, monitor, and reduce exposure of employees and contract workers to long-term (chronic) health risks

- .47 The registrant shall discuss efforts to assess, monitor, and reduce exposure of employees to human health hazards including, but not limited to, corrosives, sensitizers, hepatoxins, nephrotoxins, and neurotoxins, as well as known or suspected carcinogens, teratogens, mutagens and reprotoxins, as described by the Occupational Safety and Health Administration (OSHA)¹⁹.
- The scope of disclosure shall focus on employees working in laboratories and production facilities, but should include all employees as relevant.
- .48 Relevant efforts to discuss include, but are not limited to, risk assessments, participation in long-term health studies, completion of occupational exposure limit reviews, implementation of technology to control worker exposure, worker use of personal protective equipment, automation of processes, and phasing out, substituting, or using alternative materials.

¹⁹ OSHA Hazard Communication Standard (29 CFR 1910.1200): <https://www.osha.gov/dsg/hazcom/ghd053107.html>
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.49 The registrant may choose to discuss implementation of relevant aspects of management systems, such as those under the Responsible Care® initiative (of the American Chemistry Council), including progress towards tracking safety and health (S&H) metrics,²⁰ management system (MS) metrics, and obtaining third-party verification.²¹

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²⁰ <http://responsiblecare.americanchemistry.com/Responsible-Care-Program-Elements/Performance-Measures-and-Reporting-Guidance>

²¹ <http://responsiblecare.americanchemistry.com/Responsible-Care-Program-Elements/Management-System-and-Certification>

Product Lifecycle Management & Innovation

Description

Chemical manufacturers face increasing challenges associated with environmental and social externalities attributed to product manufacturing, transport, use, and disposal. Due to the potentially significant environmental and human health impacts from chemicals, legislation and consumer demand continue to emphasize product lifecycle management and green chemistry initiatives. The industry must, therefore, find innovative approaches to lower the negative environmental and health impacts of existing products, and develop new products that can improve the sustainability performance of customers. These innovations include reduced toxicity, enhanced energy and water efficiency, reduced air and greenhouse gas emissions, and sustainable end-of-life disposal. Managing lifecycle impacts of products could contribute to shareholder value through improved competitive positioning, greater market share, lower regulatory demand, and reduced supply chain and health risks.

Accounting Metrics

RT0101-12. Percentage of raw materials from renewable resources

.50 The registrant shall disclose the percentage of raw materials (by weight) for chemical products from renewable resources, where:

- Renewable resources are defined as those which either increase in quantity or otherwise renew over a short (i.e. economically relevant) period of time, such that if the rate of extraction takes account of limitations in the reproductive capacity of the resource, renewables can provide yields over an infinite time horizon.²²
- Examples of raw materials from renewable resources include, but are not limited to, carbohydrates, oils, and/or proteins extracted from common crop sources, such as corn, soy, wheat, and sugar beets, among others.

.51 The percentage is calculated as the total weight of raw materials from renewable resources, divided by the total weight of all raw materials for chemical products.

- The scope of raw materials in the denominator of the percentage calculation includes all inputs that are processed to be sold as a finished good, including renewable feedstocks, hydrocarbon feedstocks, and monomers, among others.

RT0101-13. Percentage of products by revenue that qualify as (a) Registration, Evaluation, Authorisation and Restriction of Chemical (REACH) substances of very high concern (SVHC) and/or (b) Class I World Health Organization (WHO): Acute Toxicity Hazard Categories

.52 The registrant shall disclose the percentage of its chemical products, by revenue, that qualify as Registration, Evaluation, Authorisation and Restriction of Chemical (REACH) substances of very high concern (SVHC) and/or Class I World Health Organization (WHO): Acute Toxicity Hazard Categories, where:

- REACH SVHC list is published in accordance with Article 59(10) of the REACH Regulation, and is found online: <http://echa.europa.eu/candidate-list-table>.
- The percentage is calculated as the revenue from chemical products that are included on the list of REACH SVHC, divided by total revenue from all chemical products.

²² http://www.wto.org/english/res_e/booksp_e/anrep_e/wtr10-2b_e.pdf

- WHO: Acute Toxicity Hazard Categories list is published in alignment with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS), and is found online: http://www.who.int/ipcs/publications/pesticides_hazard_2009.pdf?ua=1
 - The scope of this disclosure includes those chemicals classified as I(a) extremely hazardous or I(b) highly hazardous WHO: Acute Toxicity Hazard Categories as aligned with Category 1 and Category 2 chemicals, respectively in the GHS classification.
- The percentage is calculated as the revenue from chemical products that are included on the list of Class I WHO: Acute Toxicity Hazard Categories, divided by total revenue from all chemical products.

.53 The registrant may also choose to disclose the percentage of its chemical products that are persistent, bioaccumulative, and toxic (PBT), or which are carcinogenic, mutagenic, or reprotoxic (CMR), but which are not currently included on the list of REACH SVHC, where:

- PBT chemicals are defined as substances that remain unaffected in the environment, travel up the food chain due to their tendency to be soluble in fat but not in water, and are poisonous to animals and/or plants.²³
- Carcinogens (C) are defined as substances and preparations that, if inhaled, ingested, or if they penetrate the skin, may induce cancer or increase its incidence.
- Mutagens (M) are defined as substances and preparations that, if they are inhaled, ingested, or if they penetrate the skin, may induce heritable genetic defects or increase their incidence.
- Reprotoxins (R): substances and preparations that, if inhaled, ingested, or if they penetrate the skin, may produce or increase the incidence of non-heritable adverse effects in the progeny and/or an impairment of male or female reproductive functions or capacity.²⁴

RT0101-14. Percentage of products by revenue that contain genetically modified organisms

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

- GMOs are defined as an organism, 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.

.55 The scope of disclosure includes GMOs that are defined by, or subject to, the following:

- EU Directive 2001/18/EC,
- Regulation EC 1829/2003,
- Maine HP 0490 LD 718,
- Vermont H. 112 Act 0120,
- Connecticut House Bill 6527, or
- Other U.S. state or federal regulation, as enacted.

²³ <http://www.businessdictionary.com/definition/persistent-bioaccumulative-and-toxic-PBT.html#ixzz3CTYf8qR2>

²⁴ <https://www.anses.fr/en/content/carcinogenic-mutagenic-and-reprotoxic-substances-cmrs>

.56 The percentage is calculated as the revenue from products that contain GMOs, divided by total revenue from all products.

RT0101-15. Amount of legal and regulatory fines and settlements associated with product safety

.57 The registrant shall disclose the amount (excluding legal fees) of all fines or settlements associated with incidents relating to product safety, including, but not limited to, violations of the Toxic Substances Control Act (TSCA), Federal Insecticide Fungicide and Rodenticide Act (FIFRA), Federal Hazardous Substances Act (FHSA), and Regulation (EC) No 1907/2006 (REACH).

.58 Disclosure shall include civil actions (e.g., civil judgment, settlements, or regulatory penalties) and criminal actions (e.g., criminal judgment, penalties, or restitutions) taken by any entity (government, businesses, or individuals).

Note to RT0101-15

.59 The registrant shall briefly describe the nature (e.g., consent decree, consent agreement, injunction, or sanction) and context (e.g., endangerment of human health, absence of product registration, lack of import and export certification, etc.) of fines and settlements.

.60 The registrant shall describe any corrective actions it has implemented as a result of each incident. These may include, but are not limited to, specific changes in operations, management, processes, products, business partners, training, or technology.

.61 All disclosure shall be sufficient such that it is specific to the risks the registrant faces, but disclosure itself will not compromise the registrant's ability to maintain data privacy and security.

RT0101-16. Total addressable market and share of market for Green Chemistry-based products

.62 The registrant shall provide an estimation of the total addressable market for chemical products that reduce pollution at the source by minimizing or eliminating the hazards of chemical feedstocks, reagents, solvents, and end-use products,²⁵ throughout all lifecycle stages of the value chain, including during materials sourcing, manufacturing, and/or product usage (hereafter, "Green Chemistry-based products").

- Total addressable market is defined as potential revenue (in billions of U.S. dollars), should the registrant capture 100 percent of the market share of the product category (e.g., the global market for reduced environmental impact building products).
- Green Chemistry is defined as the design of chemical products and processes that reduce or eliminate the use or generation of hazardous substances. Green Chemistry applies across the life cycle of a chemical product, including its design, manufacture, use, and ultimate disposal.²⁶

.63 The scope of this disclosure includes products that reduce environmental impacts and improve resource efficiency throughout the value chain, including those products that reduce environmental impact beyond the footprint of the registrant's own operations. Examples include products whose attributes:

- Reduce energy consumption or increase energy efficiency for users, such as by providing improved fuel economy as compared to typical products (e.g. lightweight materials that improve fuel efficiency of automobiles).

²⁵ <http://www2.epa.gov/green-chemistry/basics-green-chemistry#twelve>

²⁶ <http://www2.epa.gov/green-chemistry/basics-green-chemistry#twelve>

- Reduce the amount of water required within the registrant’s supplier’s operations, own operations, or customer operations, as well as use of products by end user.
 - Reduce upstream impacts, such as use of renewable resources, or recycled materials in place of virgin materials.
 - Reduce downstream impacts, such as use of biodegradable chemicals.
 - Incorporate design innovations that lower carbon emissions during manufacturing, such as use of renewable fuels or advanced biofuels,²⁷ energy efficiency improvements, the use of materials requiring less processing, etc.
- .64 If there is a significant difference between the total addressable market and the market that the registrant can serve through its existing or planned capabilities, sales channels, or products (i.e., the serviceable available market) then the registrant should disclose this information.
- .65 The registrant shall disclose the share of the total addressable market for reduced environmental impact products that it currently captures with its products.
- Market share shall be calculated as revenues from these products divided by the size of the total addressable market.
- .66 The registrant 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 (e.g., the market size in 10 years).
- The registrant 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 registrant plans to address over a three-year time horizon.

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²⁷ 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.

Political Spending

Description

Corporate political contributions and lobbying can have sustainability implications for a company and is currently under review by the SEC for disclosure. Within the Chemicals industry, corporate lobbying can influence environmental or human health regulations and legislation that pertain to the manufacture, use, and disposal of chemical substances. The interaction of companies in the Chemicals industry with their legal and regulatory environment can have material impacts on shareholder value, both when they spend significant amounts on related activities such as lobbying and political contributions, and as a result of changes in laws or policies that can have counterproductive long-term impacts. Given the increasing consumer interest in product transparency and health concerns related to chemical toxicity and GMOs, efforts to delay associated policy or legislative changes may prove counterproductive to the industry in the long term by creating regulatory uncertainty, and therefore investment uncertainty, or by imposing higher costs in the future. Efforts to influence environmental laws and regulations may affect companies' reputations and social license to operate. Companies with a well-articulated strategy for engaging with policymakers and regulators—one that is aligned with their goals and activities for long-term sustainable outcomes and also accounts for societal externalities—could benefit from a stronger, long-term license to operate. Such companies will likely be better prepared for medium- to long-term regulatory adjustments that deal with global, high-impact issues.

Accounting Metrics

RT0101-17. Amount of political campaign spending, lobbying expenditures, and contributions to tax-exempt groups, including trade associations

- .67 The registrant shall disclose its total monetary contributions to political campaigns, lobbyists or lobbying organizations, and tax-exempt groups, including trade associations that aim to influence political campaigns or participate in political lobbying
- .68 The scope of disclosure includes the following:
- Political spending, which includes any direct or indirect contributions or expenditures in support of, or opposition to, a candidate for public office or a ballot measure.
 - Any payments made to trade associations or tax-exempt entities that are used to influence a political campaign (including advocacy organizations, commonly classified as social welfare organizations under Section 501(c)(4) of the Internal Revenue Code, or business leagues, chambers of commerce, boards of trade, and similar organizations classified under Section 501(c)(6) of the Internal Revenue Code).
 - Any direct or indirect political expenditure (one-time or recurring) that must be reported to the Federal Election Commission, the Internal Revenue Service, or a state disclosure agency.
 - Any direct or indirect contributions to registered lobbyists or lobbying organizations, including contributions made to trade organizations that contribute to political lobbying efforts.

RT0101-18. Five largest political, lobbying, or tax-exempt group expenditures

- .69 The registrant shall disclose the recipients of its five largest contributions disclosed in RT0101-17, defined as the five largest amounts in aggregate during the fiscal year that were contributed to an individual candidate, organization, ballot measure, or lobbying issue topic.
- .70 The registrant shall disclose the amount (in U.S. dollars) contributed to each individual, organization, ballot measure, or lobbying issue topic.
- .71 The registrant shall consider lobbying issue topics, at a minimum, to be general lobbying issue codes defined by The Lobbying Disclosure Act of 1995, but should include specific lobbying issues where available.

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Operational Safety, Emergency Management & Response

Description

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 common chemicals, such as ammonium nitrate, contributes to the risk of fires and explosions. Companies with poor accident and safety management performance may face disruption to operations and increased compliance and remediation costs. Poor management of the issue can increase contingent liabilities and damage reputation. A strong safety culture and a thorough, systematic approach to safety, risk management, (including emergency preparedness and response), and operational integrity are essential to avoiding accidents.

Accounting Metrics

RT0101-19. Process Safety Incidents Count (PSIC), Process Safety Total Incident Rate (PSTIR), Process Safety Incident Severity Rate (PSISR)

.72 The registrant shall disclose its process safety performance using the following rates,²⁸ consistent with the process safety reporting element of the American Chemistry Council's (ACC) Responsible Care program, where:

- Process Safety Incidents Count (PSIC) reflects the total (annual) count of all incidents that meet the definition of a Tier 1 PSI per ANSI / API RP 754.
- Process Safety Total Incident Rate (PSTIR) reflects the cumulative (annual) count of incidents normalized by man hours. The PSTIR is calculated as the PSIC multiplied by 200,000, divided by the total annual hours worked by employees and contractors.
- Process Safety Incident Severity Rate (PSISR) reflects the cumulative (annual) severity-weighted rate of process safety incidents. The PSISR is calculated as the Total Severity Score for all Process Safety Incidents multiplied by 200,000, divided by the total annual hours worked by employees, contractors, and subcontractors.

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

.74 The registrant may choose to disclose the same incident 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."

.75 The registrant should 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, operator training, etc.).

RT0101-20. Challenges to the Safety Systems indicator rate (Tier 3)

.76 The registrant shall disclose a rate of Tier 3 "challenges to safety systems" using terms, definitions, and guidance from the ANSI/API RP-754 (Section 7.2).

.77 Tier 3 indicators may alternatively be referred to as "near miss" events or "high learning value" events.

.78 A Tier 3 operational situation is defined as a flaw or weakness within internal technical safety systems that led to consequences that fall below the Tier 1 and Tier 2 LOPC impact threshold, such as:

²⁸ These process safety metrics are further defined in the Center for Chemical Process Safety's, "Process Safety Leading and Lagging Metrics," which can be found at: http://www.aiche.org/sites/default/files/docs/pages/CCPS_ProcessSafety_Lagging_2011_2-24.pdf

- Demands on safety systems, which are activations (non-manual) of safety systems designed to prevent or mitigate impacts from losses of primary containment, such as mechanical shutdown equipment or pressure relief devices.
- Safe operating limit excursions, which are breaches of safe operating limits for processes beyond which manual or automatic systems return the process to a predetermined safe state.
- Primary containment inspections or testing results outside acceptable limits, which occur when inspection or testing shows that safe primary containment operating limits have been exceeded and require repairs, replacement, or further testing of equipment.
- Near miss incidents, which are incidents that had the potential to result in an LOPC, but that were avoided by circumstance.

.79 Disclosure may include situations with no actual consequences but the recognition that, in other circumstances, further barriers could have been breached and resulted in a Tier 1 or Tier 2 PSE.

.80 The Tier 3 indicator rate shall be calculated as: (Total Tier 3 Indicator Count / Total Hours Worked) * 200,000.

.81 Total hours worked includes employees and contractors.

RT0101-21. Number of transport incidents

.82 The registrant shall disclose the total number of transport incidents, where transport incidents are defined consistent with national regulations:

- For operations in the US, transport incidents are those that require a U.S. Department of Transportation 5800 report,²⁹
- 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, or
- 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.

.83 Where a national definition does not exist, a reportable transport incident arises, irrespective of the chemical products contribution, when one of the following has occurred, consistent with the ICCA Guidance for Reporting Performance:

- A death or injury leading to intensive medical treatment, a stay in hospital of at least one day, or leading to an absence from work of more than three days.
- Any release of more than 50 kg/L of dangerous goods or more than 1,000 kg/L of non-dangerous goods.
- Any damage of more than 50,000 Euro (including environmental cleanup) resulting from a transport incident.
- An incident leading to direct involvement of authorities and/or emergency services, evacuation of

²⁹ <http://www.ecfr.gov/cgi-bin/text-idx?SID=cb07d6f704eee4d54948aff3ac7004bf&node=se49.2.171.116&rgn=div8>

people, or closure of public traffic routes for at least three hours.

.84 Registrants should report distribution incidents for all modes of product transport (e.g. road, rail, ship, etc.).

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

Note to RT0101-21

.86 The registrant shall describe transport incidents, including their root cause, outcomes, and corrective actions implemented in response (e.g., technology improvements, driver training, etc.).

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SUSTAINABILITY ACCOUNTING STANDARDS BOARD®

75 Broadway, Suite 202
San Francisco, CA 94111
415.830.9220
info@sasb.org

www.sasb.org