



SUSTAINABILITY ACCOUNTING STANDARD
RENEWABLE RESOURCES & ALTERNATIVE ENERGY SECTOR

BIOFUELS

Sustainability Accounting Standard

Sustainable Industry Classification System™ (SICS™) #RR0101
Prepared by the
Sustainability Accounting Standards Board®

July 2015

Exposure Draft Standard for Public Comment

BIOFUELS

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 non-profit organization. Through 2016, SASB is developing standards for more than 80 industries in 10 sectors.

About this Standard

This Standard is an exposure draft presented for public review and comment. This version is not intended for implementation.

The public comment period lasts for 90 days, beginning on Tuesday, July 7th, 2015, and ending on Monday, October 5th, 2015. The Standard is subject to change thereafter.

For instructions on providing comments to SASB, [please click here](#).

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INTRODUCTION

Purpose & Structure

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

SASB Sustainability Accounting 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 Standards identify sustainability topics at an industry level, which may constitute material information—depending on a company’s specific operating context—for a company within that industry. SASB Standards are intended to provide guidance to company management, which is ultimately responsible for determining which information is material and should therefore be included in its Form 10-K or 20-F and other periodic SEC filings.

SASB Standards provide companies with standardized sustainability metrics designed to communicate performance on industry level sustainability topics. When making disclosure on sustainability topics, companies can use SASB Standards to help ensure that disclosure is standardized and therefore decision-useful, relevant, comparable, and complete.

SASB Standards are intended to constitute “suitable criteria” as defined by AT 101.23 - 32¹ and referenced in AT 701², as having the following attributes:

- *Objectivity*—Criteria should be free from bias.
- *Measurability*—Criteria should permit reasonably consistent measurements, qualitative or quantitative, of subject matter.
- *Completeness*—Criteria should be sufficiently complete so that those relevant factors that would alter a conclusion about subject matter are not omitted.
- *Relevance*—Criteria should be relevant to the subject matter.

Industry Description

The Biofuels industry comprises companies that produce biofuels and process the raw materials for production. Biofuels are made from plant- or animal-based organic materials and are used primarily as transportation fuels. Companies typically source feedstocks, which include food and oil crops, from agricultural product distributors. Ethanol and biodiesel are the most widely produced biofuels. Other types include biogas, biohydrogen, and synthetic biofuels. First-generation biofuels are those derived from a variety of common edible or nonedible crops and made through common fermentation, distillation, and esterification technologies. Second-generation biofuels are made strictly from nonedible crops or the nonedible parts of food crops or other plant material, called cellulosic feedstocks. Third-generation biofuels, a nascent market, are produced using algae and advanced technologies. Second- and third-generation biofuels are commonly referred to as advanced biofuels. The Biofuels industry’s customers are chiefly fuel-blending and fuel-supply companies, including major integrated oil companies. Biofuels are produced

¹ http://pcaobus.org/Standards/Attestation/Pages/AT101.aspx#at_101_fn7

² <http://pcaobus.org/Standards/Attestation/Pages/AT701.aspx>

worldwide and the market for them is international. Companies in the Biofuels industry that are publicly listed in the U.S. primarily operate in the U.S., though some have operations abroad—notably in India, Brazil, and South Korea. While production is largely domestic, the market for biofuels is international.

Guidance for Disclosure of Sustainability Topics in SEC Filings

1. Industry-Level Sustainability Topics

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

- Air Quality
- Water Management
- Product Formulation & Impact on Food Markets
- Lifecycle Emissions Balance
- Management of the Legal & Regulatory Environment
- Operational Safety, Emergency Preparedness, and Response
- Sourcing & Environmental Impacts of Feedstock Production

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.”^{3, 4}

SASB has attempted to identify those sustainability topics that are reasonably likely to have a material effect on the financial condition or operating performance of companies within each SICs industry. SASB recognizes, however, that each company is ultimately responsible for determining what information should be disclosed within the context of Regulation S-K and other guidance.

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.”

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

³ TSC Industries v. Northway, Inc., 426 U.S. 438 (1976).

⁴ C.F.R. 229.303(item 303)(a)(3)(ii).

The SEC has provided guidance for companies to use in determining whether a trend or uncertainty should be disclosed. The two-part assessment prescribed by the SEC, based on probability and magnitude, can be applied to the topics included within this standard:

- 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.

3. Sustainability Accounting Standard Disclosures in Form 10-K

a. Management's Discussion and Analysis

For purposes of comparability and usability, companies should consider making disclosure on sustainability topics in the MD&A, in a sub-section titled **"Sustainability Accounting Standards Disclosures."**⁵

b. Other Relevant Sections of Form 10-K

In addition to the MD&A section, it may be relevant for companies to disclose sustainability information in other sections of Form 10-K, including, but not limited to:

- **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.

⁵ [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."

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/>.

Guidance on Accounting for Sustainability Topics

For each sustainability topic included in the Biofuels industry Sustainability Accounting Standard, SASB identifies accounting metrics.

SASB recommends that each company consider using these sustainability accounting metrics when preparing disclosures on the sustainability topics identified herein;

As appropriate—and consistent with Rule 12b-20⁶—when disclosing a sustainability topic identified by this Standard, 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 **relative performance** with respect to its peers;
- 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 also consider sustainability topics that SASB has identified for those industries and disclose the associated SASB accounting metrics.

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.

⁶ 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.”

Users of the SASB Standards

The SASB Standards are intended to provide guidance 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),⁷ 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. 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.

Scope of Disclosure

Unless otherwise specified, SASB recommends:

- That a registrant disclose on sustainability issues and metrics for itself and for entities that are consolidated for financial reporting purposes as defined by accounting principles generally accepted in the United States for consistency with other accompanying information within SEC filings⁸
- 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 the effect of sustainability topics on the company's financial condition or operating performance (typically, this disclosure would be limited to risks and opportunities associated with these entities).

Reporting Format

Use of Financial Data

In instances where accounting metrics, activity metrics, and technical protocols in this standard incorporate financial data (e.g., revenues, cost of sales, expenses recorded and disclosed for fines, etc.), such financial data shall be prepared in accordance with the accounting principles generally accepted in the United States of America ("US GAAP") and be consistent with the corresponding financial data reported within the registrant's SEC filings. Should accounting metrics, activity metrics and technical protocols in this standard incorporate disclosure of financial data that is not prepared in accordance with US GAAP, the registrant shall disclose such information in accordance with the SEC Regulation G.

⁷ 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.

⁸ See US GAAP consolidation rules (Section 810).

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 an investor relying on SASB accounting metrics 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.⁹

Where relevant, SASB recommends specific activity metrics that—at a minimum—should accompany SASB accounting metric disclosures.

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Biofuel production capacity	Quantitative	Millions of gallons (gal)	RR0101-A
Amount of feedstock consumed	Quantitative	Metric tons (t)	RR0101-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 reliance on data from third-party reporting systems and technologies, 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.

⁹ *Improving Business Reporting: Insights into Enhancing Voluntary Disclosures*, FASB Business Reporting Research Project, January 29, 2001.

Estimates

SASB recognizes that scientifically-based estimates, such as the reliance on certain conversion factors or the exclusion of *de minimis* values, may occur 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.

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."

The following sections contain the disclosure guidance associated with each accounting metric such as guidance on definitions, scope, accounting, compilation, and presentation.

The term "shall" is used throughout this document to indicate those elements that reflect requirements of the Standard. The terms "should" and "may" are used to indicate guidance, which, although not required, provides a recommended means of disclosure.

Table 1. Sustainability Disclosure Topics & Accounting Metrics

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Air Quality	Air emissions for the following pollutants: NO _x (excluding N ₂ O), SO _x , volatile organic compounds (VOCs), particulate matter (PM), and hazardous air pollutants (HAPs)	Quantitative	Metric tons (t)	RR0101-01
	Number of incidents of non-compliance with air quality permits, standards, and regulations	Quantitative	Number	RR0101-02
Water Management	(1) Total water withdrawn and (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Cubic meters (m ³), Percentage (%)	RR0101-03
	Discussion of water management risks and description of strategies and practices to mitigate those risks	Discussion and Analysis	n/a	RR0101-04
	Number of incidents of non-compliance with water quality permits, standards, and regulations	Quantitative	Number	RR0101-05
Product Formulation & Impact on Food Markets	Production of (1) conventional biofuel, (2) advanced non-corn-starch biofuels, (3) advanced cellulosic biofuels, and (4) biomass-based diesel	Quantitative	Millions of gallons (gal)	RR0101-06
	Top five feedstocks used for biofuels production and amount of each	Quantitative	Metric tons (t)	RR0101-07
	Percentage of feedstock grown in food-insecure regions	Quantitative	Percentage (%) by spend	RR0101-08
Lifecycle Emissions Balance	Lifecycle greenhouse gas (GHG) emissions by biofuel type	Quantitative	Grams of CO ₂ -e per megajoule (MJ)	RR0101-09
Management of the Legal & Regulatory Environment	Amount of subsidies received through government programs	Quantitative	U.S. Dollars (\$)	RR0101-10
	Discussion of positions on the regulatory and political environment related to environmental and social factors and description of efforts to manage risks and opportunities presented	Discussion and Analysis	n/a	RR0101-11

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

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Operational Safety, Emergency Preparedness, and Response	Process Safety Incidents Count (PSIC), Process Safety Total Incident Rate (PSTIR), and Process Safety Incident Severity Rate (PSISR) ¹⁰	Quantitative	Number, Rate	RR0101-12
Sourcing & Environmental Impacts of Feedstock Production	Description of strategy to manage environmental risks associated with feedstock sourcing	Discussion and Analysis	n/a	RR0101-13
	Percentage of biofuel production third-party certified to an environmental sustainability standard	Quantitative	Percentage (%) of gallons	RR0101-14
	Percentage of feedstock sourced from regions with High or Extremely High Baseline Water Stress	Quantitative	Percentage (%) by spend	RR0101-15

¹⁰ Note to **RR0101-12**—The registrant 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, operator training, etc.).

Air Quality

Description

Biofuels refineries generate air emissions—including hazardous air pollutants, criteria air pollutants, and volatile organic compounds—that can cause adverse human health and environmental impacts. Some primary substances of concern include particles less than 10 or 2.5 microns in diameter (known as, particulate matter 10 and 2.5, respectively), nitrogen oxides, carbon monoxide, and sulfur dioxide. Companies that violate emissions standards can face regulatory compliance costs and penalties, as well as higher operating and capital expenditures for emissions-abatement technologies and process improvements. Air emissions permit violations can also result in permit restrictions or delays from state and local agencies, affecting the construction or expansion of biofuels manufacturing facilities.

Accounting Metrics

RR0101-01. Air emissions for the following pollutants: NO_x (excluding N₂O), SO_x, volatile organic compounds (VOCs), particulate matter (PM), and hazardous air pollutants (HAPs)

.01 The registrant shall disclose its emissions of air pollutants (in metric tons) 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.

.02 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 NO_x.
- Oxides of sulfur (SO₂ and SO₃) reported as SO_x.
- 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, that participates in atmospheric photochemical reactions, except those designated by the U.S. Environmental Protection Agency (EPA) as having negligible photochemical reactivity.
 - Where regional and national definitions supersede EPA regulations, such as EC Directive 1999/13/EC and Schedule 1 of the Canadian Environmental Protection Act 1999, the registrant may refer to the relevant regulations on VOCs.
- Particulate matter (PM); reported as the sum of PM₁₀ and PM_{2.5}, or all particulates less than 10 micrometers in diameter.
- Hazardous air pollutants (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, and are listed here.

.03 This scope does not include CO₂, CH₄, and N₂O.

.04 Air emissions data shall be consolidated according to the approach with which the registrant consolidates its financial reporting data.

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

RR0101-02. Number of incidents of non-compliance with air quality permits, standards, and regulations

.06 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.

.07 The scope of disclosure includes incidents governed by federal, state, and local statutory permits and regulations including, but not limited to, the Clean Air Act and other state or local air quality legislation.

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

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

- For continuous emissions, limitations, standards, and prohibitions that are generally expressed as maximum daily, weekly, and monthly averages.
- For non-continuous emissions, limitations that are generally expressed in terms of frequency, total mass, maximum rate of discharge, and mass or concentrations of specified pollutants.
- False or inaccurate reporting.
- Failure to obtain permits.

Water Management

Description

Biofuel refining is water intensive. Biorefineries utilize water for feedstock washing and processing, fermentation and distillation, and process cooling systems. Facilities may also generate wastewater contaminated with salts, organic compounds, dissolved solids, phosphorus, and chlorine, all of which, if not properly treated, can affect water quality and aquatic life. Depending on their location, biofuel refineries may be exposed to the risk of reduced water availability and related cost increases or operational disruption, as water is becoming a scarce resource worldwide. Furthermore, companies could also face permit restrictions and delays from state and local agencies in the event of water-discharge permit violations. The extraction of water from sensitive areas for the purpose of refining, or the contamination of water supplies due to refining operations, could also create tensions with local communities, affecting facility construction, operations, or expansion. Water efficiency in operations and the proper treatment of effluents are therefore important factors for the financial performance of biofuels companies.

Accounting Metrics

RR0101-03. (1) Total water withdrawn and (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress

- .10 The registrant shall disclose the amount of water (in thousands of cubic meters) that was withdrawn from all sources, where:
- Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the organization, wastewater obtained from other entities, municipal water supplies, or other water utilities.
- .11 The registrant may choose to disclose the portion of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources, where:
- 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 in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- .12 The registrant shall disclose the amount of water (in thousands of cubic meters) that was consumed in its operations, where water consumption is defined as:
- Water that evaporates during withdrawal, usage, and discharge;
 - Water that is directly or indirectly incorporated into the product or service; and

- 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.

.13 The registrant shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80%) or Extremely High (>80%) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, Aqueduct (publicly available online [here](#)).

.14 The registrant shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.

.15 The registrant shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

RR0101-04. Discussion of water management risks and description of strategies and practices to mitigate those risks

.16 The registrant shall discuss its risks associated with water withdrawals, water consumption, and discharge of water to the environment and describe how it manages these risks.

.17 The registrant shall discuss, where applicable, risks to the availability of adequate, clean water resources.

- Relevant information to provide includes, but is not limited to:
 - Environmental constraints, such as operating in water-stressed regions, drought, interannual or seasonal variability, and risks due to the impact of climate change.
 - External 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 (commercial and municipal), restrictions to withdrawals due to regulations, and constraints on the registrant’s ability to obtain and retain water rights or permits.
 - How risks may vary by withdrawal source, including wetlands, rivers, lakes, oceans, groundwater, rainwater, municipal water supplies, or supply from other water utilities.

.18 The registrant shall discuss, where applicable, risks associated with its discharge of wastewater.

- Relevant information to provide includes, but is not limited to:
 - Environmental constraints, such as the ability to maintain compliance with regulations focused on the quality of effluent discharged to the environment, the ability to eliminate existing and emerging pollutants of concern, and the ability to maintain control over runoff and storm water discharges.
 - External constraints, such as increased liability and/or reputational risks, restrictions to discharges and/or 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), and the ability to obtain discharge rights or permits.

- How risks may vary by discharges to different destinations, including wetlands, rivers, lakes, oceans, groundwater, rainwater, municipal water supplies, or other water utilities.

.19 The registrant should include a discussion of the potential impacts that these risks may have on its operations and the timeline over which such risks are expected to manifest.

- Impacts may include, but are not limited to, those associated with costs, revenues, liabilities, continuity of operations, and reputation.

.20 The registrant shall provide a description of its short-term and long-term strategy or plan to manage these risks, including the following, where relevant:

- Any water management targets it has set, and an analysis of performance against those targets.
 - Water management targets can include water management goals that the registrant prioritizes to manage its risks and opportunities associated with water withdrawal, consumption, or discharge.
 - Targets can include, but are not limited to, those associated with reducing water withdrawals, reducing water consumption, reducing water discharges, and improving the quality of wastewater discharges.
- The scope of its strategy, plans, or targets, such as whether they pertain differently to different business units, geographies, or water-consuming operational processes.
- The activities and investments required to achieve the plans and targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.

.21 For water management targets, the registrant shall additionally disclose:

- The percentage reduction or improvements 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.
- Whether the target is absolute or intensity based, and the metric denominator if it is an intensity-based target.
- The timelines for the water management plans, including the start year, the target year, and the base year.
- The mechanism(s) for achieving the target, including:
 - Efficiency efforts, such as the use of water recycling and/or closed-loop systems

- Product innovations such as redesigning products or services to require less water
 - Process and equipment innovations, such as those that enable the use of less water in manufacturing or operations
 - The use of tools and technologies (e.g., the [World Wildlife Fund Water Risk Filter](#), [WRI/WBCSD Global Water Tool](#), and [Water Footprint Network Footprint Assessment Tool](#)) to analyze water use, risk, and opportunities
 - Collaborations or programs in place with the community or other organizations
- .22 Disclosure of strategies, plans, and targets shall be limited to activities that were ongoing (active) or reached completion during the fiscal year.
- .23 The registrant shall discuss if its water management practices result in any additional lifecycle impacts or tradeoffs in its organization, including tradeoffs in land use, energy consumption, and greenhouse gas (GHG) emissions, and why the registrant chose these practices despite lifecycle tradeoffs.

RR0101-05. Number of incidents of non-compliance with water quality permits, standards, and regulations

- .24 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.
- .25 The scope of disclosure includes incidents governed by federal, 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.
- .26 An incident of non-compliance shall be disclosed regardless of whether it resulted in an enforcement action (e.g., fine, warning letter, etc.).
- .27 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, 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.

Additional Resources

GRI-Global Reporting Initiative (GRI G4)

CDP 2015 Water Questionnaire

CEO Water Mandate

Global Water Footprint Assessment Standard

Product Formulation & Impact on Food Markets

Description

A rising share of food crops such as corn and soy is diverted toward biofuels production worldwide. In addition, the use of inedible crop-based feedstocks could indirectly affect food production by displacing food crops on arable lands. There is a debate over the potential resultant influence on global food prices, availability, and security. Nonetheless, government and public concern is mounting over the rapid growth of biofuel production and its impacts on food markets. In certain regions, government policy has attempted to address these concerns by progressively increasing regulatory requirements for the volume of biofuels from non-food-crop sources blended with transport fuels; in the European Union, some policies limit the share of crop-based fuel as a percentage of total biofuels production. Given the industry's reliance on food-crop feedstocks, these policy shifts introduce risks and opportunities. The ability to use alternative, non-food-crop feedstocks may become a key competitive driver in the industry, while companies that depend on traditional feedstocks may experience limited or reduced policy support for the production of first-generation biofuels, affecting demand or production costs.

Accounting Metrics

RR0101-06. Production of (1) conventional biofuel, (2) advanced non-corn-starch biofuels, (3) biomass-based diesel, and (4) advanced cellulosic biofuels

.28 The registrant shall disclose its production of biofuel (in millions of gallons) within each of the following categories, as identified and defined by CFR §80.14, Title 40—Regulation of Fuels and Fuel Additives, Subpart M—Renewable Fuel Standard:

- Conventional biofuel, defined as ethanol derived from corn starch that achieves a 20 percent GHG emissions reduction compared to baseline lifecycle GHG emissions.
- Advanced biofuel, defined as renewable fuel, other than ethanol derived from corn starch, that has lifecycle GHG emissions that are at least 50 percent less than baseline lifecycle GHG emissions.
- Biomass-based diesel, defined as a renewable fuel that has lifecycle GHG emissions that are at least 50 percent less than baseline lifecycle GHG emissions and meets all of the requirements of paragraph (1) of this definition:
 - Is a transportation fuel, transportation fuel additive, heating oil, or jet fuel;
 - Meets the definition of either biodiesel or non-ester renewable diesel;
 - Is registered as a motor vehicle fuel or fuel additive under 40 CFR part 79, if the fuel or fuel additive is intended for use in a motor vehicle; and
 - Renewable fuel that is co-processed with petroleum is not biomass-based diesel.

- Cellulosic biofuel, defined as renewable fuel derived from any cellulose, hemi-cellulose, or lignin that has lifecycle GHG emissions that are at least 60 percent less than the baseline lifecycle GHG emissions.
 - Cellulosic diesel is defined as any renewable fuel that meets both the definitions of cellulosic biofuel and biomass-based diesel, as defined in section 80.1401. Cellulosic diesel includes heating oil and jet fuel made from cellulosic feedstocks.

.29 For the purposes of this metric, renewable fuel is defined as a fuel which meets all of the following requirements:

- Fuel that is produced from renewable biomass;
- Fuel that is used to replace or reduce the quantity of fossil fuel present in a transportation fuel, heating oil, or jet fuel;
- Fuel that has lifecycle GHG emissions that are at least 20 percent less than baseline lifecycle GHG emissions, unless the fuel is exempt from this requirement pursuant to §80.1403; and
- Ethanol covered by this definition shall be denatured as required and defined in 27 CFR parts 19 through 21.

RR0101-07. Top five feedstocks used for biofuels production and amount of each

.30 The registrant shall disclose the five feedstocks it consumed in the greatest quantities for biofuel production during the fiscal year and the amount of each of the feedstock that was used, in air-dried metric tons.

.31 The scope of feedstocks are those that meet the definition of renewable biomass according to CFR §80.1401, Title 40—Regulation of Fuels and Fuel Additives, Subpart M- Renewable Fuel Standard—Definitions including, but not limited to:

- Planted crops, such as corn, soybeans, sugarcane, and rapeseed
- Algae
- Tree residue and trimmings
- Animal waste material and animal byproducts
- Yard waste
- Food waste such as recycled cooking and trap grease

.32 Feedstock consumption shall be calculated as purchases of feedstock plus beginning inventory less ending inventory, in air-dried metric tons.

- The amount may include any incidental, *de minimis* contaminants that are impractical to remove and are related to customary feedstock production and transport.

RR0101-08. Percentage of feedstock grown in food-insecure regions

.33 The registrant shall disclose the percentage of the feedstock that it purchased (by value, in U.S. dollars) that was grown in food-insecure regions, where:

- Food insecurity is defined by the U.S. Department of Agriculture (USDA) as consistent access to adequate food being limited by a lack of money and other resources at times during the year.
- The registrant shall use the International Food Policy Research Institute [Global Hunger Index](#) to identify regions of food insecurity. Food-insecure regions are those with a “Serious” or worse ranking on the GHI index.

.34 The percentage shall be calculated as the amount of feedstock, in U.S. dollars, that was purchased from a food-insecure region divided by the total amount of feedstock purchased, in U.S. dollars.

.35 Where applicable, the registrant may include a discussion of how feedstock it sources that is grown in food-insecure regions is or is not in direct competition with other crops in the region(s).

.36 The registrant may choose to describe how it is demonstrating a positive contribution towards local food security conditions in food-insecure regions where it operates, in relation to the four pillars of food security developed by the UN Food and Agriculture Organization (food availability, food access, food utilization, and food stability).

Additional References

eCFR §80.14, Title 40—Regulation of Fuels and Fuel Additives, Part 80—Regulation of Fuels and Fuel Additives, Subpart M—[Renewable Fuel Standard](#)

Congressional Research Service, [Renewable Fuel Standard \(RFS\): Overview and Issues](#), March 14, 2013.

Roundtable on Sustainable Biomaterials [Food Security Guidelines](#) RSB-GUI-01-006-01 (version 2.2)

Lifecycle Emissions Balance

Description

The rapid growth in global biofuels production is due in large part to government energy policies, which seek to reduce net greenhouse gas (GHG) emissions from transportation fuels. Most major government renewable fuel policies worldwide require that biofuels achieve lifecycle GHG emissions reductions relative to a petroleum-fuel baseline in order to qualify for renewable-fuel-mandate thresholds. The biofuel lifecycle emission calculation can include indirect and direct emissions from feedstock crop production and land use, fuel refining, fuel and feedstock transport, and vehicle exhaust emissions. Biofuel producers directly influence net emissions during the refining process through energy management (fuel use) and process innovation. Furthermore, companies may reduce lifecycle emissions by using feedstocks with lower emissions profiles. Fuel products that achieve a reduction in net emissions can qualify as advanced biofuels, which are expected to constitute an increasing share of production based on existing biofuels mandates. Companies may also be able to garner financial incentives from the sale of advanced fuels. Thus, biofuel companies that cost-effectively reduce the net carbon emissions of their products may gain a competitive advantage, leading to revenue growth and increased market share.

Accounting Metrics

RR0101-09. Lifecycle greenhouse gas (GHG) emissions by biofuel type

.37 The registrant shall disclose its lifecycle GHG emissions (in grams of CO₂-e per megajoule) for each biofuel category it produces, as required by the the EPA Renewable Fuel Standard 2 (RFS2) calculation, where:

- Lifecycle GHG emissions are defined in the U.S. Clean Air Act Section 211(o)(1) as the aggregate quantity of GHG emissions (including direct emissions and significant indirect emissions, such as significant emissions from land-use changes) related to the full fuel lifecycle, including all stages of fuel and feedstock production and distribution, from feedstock generation or extraction through the distribution and delivery and use of the finished fuel to the ultimate consumer, where the mass values for all GHGs are adjusted to account for their relative global warming potential.
- The registrant shall disclose its lifecycle GHG emissions for each biofuel type that it produces, where biofuel types are based on the U.S. EPA's Renewable Fuel Standard categories and include (1) conventional biofuel, (2) advanced non-corn-starch biofuels, (3) advanced cellulosic biofuels, and (4) biomass-based diesel, and which are disclosed in RR0101-06.

.38 The registrant should disclose all applicable lifecycle GHG emissions results, including those calculated for the California Air Resources Board Low Carbon Fuel Standard Program, the European Union Renewable Energy Directive, and the Roundtable on Sustainable Biomaterials (RSB) certification, if results from any of these calculations are materially different than the results from the EPA RFS2 calculation.

Management of the Legal & Regulatory Environment

Description

Biofuels companies' interaction with the regulatory environment includes political contributions and lobbying, which can be directed toward issues with sustainability implications. The Biofuels industry is heavily dependent on government policies, which create market demand through the Renewable Fuel Standard in the U.S. and similar programs elsewhere, and incentivize supply through tax breaks and other support for feedstock production. The Biofuels industry therefore engages in strategic political and regulatory lobbying related to renewable fuel policy, production tax credits, and feedstock production. Depending on the type of feedstock they rely on, individual companies could be impacted differently, based on how government support for specific types of biofuels evolves. Corporate lobbying is particularly relevant for U.S. markets, where financial contributions and lobbying by registered lobbyists are legally recognized ways of engaging with policymakers. While successful lobbying can result in positive short-term gains by supporting the biofuels market, the potential long-term adverse environmental and social impacts from feedstock and biofuels production may result in a reversal of these benefits to reflect the balance of corporate and public interest in those issues, leading to a more burdensome or uncertain regulatory environment. More specifically, traditional biofuels are linked to potential negative environmental and social impacts, resulting in attempts to reduce or remove the support for such fuels and to increase support for advanced biofuels. However, advanced biofuels, while potentially creating fewer negative externalities, are yet to be produced on a commercial scale in many cases. It is likely in traditional biofuels producers' long-term interests, therefore, to support regulations that account for externalities while working to reduce the externalities of their own feedstock and production. For advanced biofuels, long-term policy support might depend on taking into account the viability of supply and any negative externalities that such fuels themselves may create. Consequently, biofuels companies could benefit from developing a clear strategy for engaging policymakers and regulators that is aligned with long-term sustainable business outcomes and that accounts for societal and environmental externalities. Through a combination of their strategy for engaging with regulators and their management of sustainability issues relevant to the industry, and focused on positive societal outcomes, companies will likely be better prepared for medium- to long-term regulatory adjustments, thereby reducing business uncertainty.

Accounting Metrics

RR0101-10. Amount of subsidies received through government programs

- .39 The registrant shall disclose the amount of subsidies (in U.S. dollars) it received through government programs during the reporting year, where subsidies include tax credits such as blending and production tax credits, funding for projects such as research and development, import tariffs, direct payments, capital grants, loans and loan guarantees, and any other monetary support received from government departments or programs.
- .40 Government programs include those in the U.S. and internationally at national, regional, and local levels.
- .41 The registrant should disclose the type of biofuel subsidies received and the amount of each.
- .42 The registrant shall disclose the amount of subsidies as an aggregate amount that was recognized during the reporting year, regardless of the accounting method (e.g. deferral method, flow-through method, or non-US GAAP methods for investment tax credits, etc.)

RR0101-11. Discussion of positions on the regulatory and political environment related to environmental and social factors and description of efforts to manage risks and opportunities presented

.43 The registrant shall identify risks and opportunities it faces related to legislation, regulation, rule making, actions of individual politicians, and the overall political environment (hereafter referred to collectively as “regulatory and political environment”) related to environmental and social factors.

- The scope shall include existing, emerging, and known future risks and opportunities.
- The scope shall include risks and opportunities that may exist within the U.S. at the local, state, and federal level.
- The registrant may discuss risks and opportunities in international markets.
- The regulatory and political environment related to environmental and social factors includes that which address biodiversity, emissions and effluents, toxic substances, climate change, immigration, food safety, wages, intellectual property, and financial regulations

.44 Relevant risks include, but are not limited to, risk of increased compliance costs, risk of policy reversal (e.g., trade protections), risk of loss of financial incentives (e.g., reduction or elimination of subsidies, tax incentives, grants, etc.), risk to reputation due to registrant’s stance and actions related to the regulatory and political environment, risk that the regulatory and political environment may not be aligned with long-term strategy, and risk of misalignment with customers’, investors’, and other stakeholders’ expectations.

.45 Relevant opportunities include, but are not limited to, improved financial conditions (e.g., through trade protections, financial subsidies, tax benefits, etc.), preferential market status (including federal contracts) due to environmental and social practices that are aligned with regulatory and political environment, improved access to human capital, enhanced brand reputation due to registrant’s stance and actions related to the regulatory and political environment, and other benefits due to alignment of regulatory and political environment with long-term strategy.

.46 For each risk and opportunity associated with the regulatory and political environment the registrant has identified, it shall disclose:

- For specific pieces of legislation, regulation, or candidates, whether its position is of support or opposition.
- For general environmental and social topics such as climate change, immigration, and other topics associated with the general lobbying issue codes defined by The Lobbying Disclosure Act of 1995, a description of the type of regulation or legislation that it supports or opposes.

.47 The registrant shall discuss its efforts to manage risks and opportunities associated with each aspect of the regulatory and political environment it has identified in RR0101-11, where relevant efforts to discuss include the use of each of the following:

- Direct lobbying or “the attempt to influence a legislative body through communication with a member or employee of a legislative body, or with a government official who participates in formulating legislation.”
- Grass roots lobbying or “the attempt to influence legislation by attempting to affect the opinion of the public with respect to the legislation and encouraging the audience to take action with respect to the legislation.”
- 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 may be used (where permitted) for lobbying, to make campaign contributions, or to otherwise exert influence on a political campaign or ballot measure
 - The scope includes political organizations, classified under Section 527 of the Internal Revenue Code, that seek to influence the “selection, nomination, election, or appointment of any individual to Federal, State, or local public office or office in a political organization, or the election of Presidential electors.”
 - The scope includes advocacy organizations, commonly classified as social welfare organizations under Section 501(c)(4) of the Internal Revenue Code.
- Other interactions with regulators and regulatory agencies, such as through legislative testimony, employment of former members of congress, regulatory agencies, and other public servants.
- Any direct or indirect political expenditure (one-time or recurring) that must be reported to the Federal Election Commission (FEC), the Internal Revenue Service (IRS), or a state disclosure agency.

.48 In addition to its efforts to influence the regulatory and political environment, the registrant shall discuss its overall strategy to manage risks and opportunities associated with each aspect of the regulatory and political environment it has identified, such as the following other actions or activities:

- Any changes it has made or plans to make to its business structure or model;
- The development of new technologies or services; and
- Any changes it has made or plans to make to its operational process, control, or organizational structures.

.49 With respect to the emerging or potential future regulatory and political environment the registrant shall discuss its view of:

- Which outcome is most likely to come to fruition;
- The likelihood the outcome will occur (i.e., a qualitative assessment of certainty or uncertainty);
- The time horizon over which it expects the outcome to occur; and
- The expected magnitude of the impact (e.g., a one time, acute impact on costs, an ongoing moderate impact on ability to retain employees, etc.).

.50 The registrant should describe if its stance may align or differ with its peers, other companies, and with the official stance of its trade organization(s) and discuss any relevant reasons for alignment or divergence.

.51 The registrant may choose to disclose the total amount of political spending and a list of the recipients, 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.

Operational Safety, Emergency Preparedness, and Response

Description

Biofuel production presents operational safety hazards because of the use of flammable and explosive substances, high temperatures, and pressurized equipment. Process safety incidents can significantly damage facilities, injure workers, and affect ecosystems and local communities. Damaged facilities can be inoperable for extended periods, resulting in lost revenues and large capital expenditures for repairs. Furthermore, those companies perceived to be at a greater risk for process safety incidents may have a higher cost of capital. In addition, injuries could result in regulatory penalties and litigation. Therefore, companies with a strong safety culture and operational safety oversight can more effectively detect and respond to such incidents, mitigating potential financial risks and improving operational efficiency.

Accounting Metrics

RR0101-12. Process Safety Incidents Count (PSIC), Process Safety Total Incident Rate (PSTIR), and Process Safety Incident Severity Rate (PSISR)

.52 The registrant 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](#)":

- PSIC, defined as the total (annual) count of all incidents that meet the definition of a Tier-1 PSI per ANSI/API RP 754.
- PSTIR, defined as the cumulative (annual) count of incidents normalized by man hours and calculated as the PSIC multiplied by 200,000 and divided by the total annual hours worked by employees, contractors, and subcontractors.
- PSISR, defined as the cumulative (annual) severity-weighted rate of process safety incidents and 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.

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

.54 The registrant may choose to separately 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."

Note to **RR0101-12**

.55 The registrant 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, operator training, etc.).

Sourcing & Environmental Impacts of Feedstock Production

Description

The Biofuels industry utilizes a variety of plant-based feedstocks as raw materials for production. Most companies producing first- or second-generation biofuels purchase feedstocks from agricultural producers and distributors. A growing proportion of the world's arable land is now occupied by biofuel crops; some of this land is being converted from forestland or rangeland. The cultivation of certain feedstock crops may involve intensive fertilizer use, chemical use, and irrigation. Unsustainable cultivation practices can have negative environmental externalities, including deforestation and biodiversity loss, soil degradation, and water pollution (the implications of biofuel feedstock cultivation on global food markets is discussed in the Product Formulation & Impacts on Food Markets disclosure topic). These factors could adversely affect feedstock crop yields over the long term, influencing the price and availability of feedstocks for biofuels producers. Furthermore, environmental externalities could result in negative reputational impacts and potentially reduce critical public and political support for biofuel mandates. Consequently, vetting supply chain sustainability and engaging with suppliers to the greatest extent possible are important considerations for biofuels producers.

Accounting Metrics

RR0101-13. Description of strategy to manage environmental risks associated with feedstock sourcing

.56 The registrant shall discuss its strategy to manage environmental risks and potential supply chain constraints associated with its feedstock sourcing, where:

- Environmental supply chain risks and potential supply chain constraints may include, but are not limited to:
 - Constraints that may affect feedstock yield, such as the impacts of climate change (e.g., changing temperatures, water stress, etc.); the ability of suppliers to obtain adequate water resources; and deteriorating biodiversity or soil health.
 - Constraints that may affect reputation, such as resistance to the use of genetically modified organisms (GMOs), fertilizer or pesticide use, monoculture farming, or land-use impacts; violations of environmental regulations; and any other environmental externalities that could reduce public or political support for biofuel mandates.

.57 The registrant shall discuss its approach to reducing supply chain risk and the strategies it uses to mitigate those risks, where relevant strategies to discuss include:

- The diversification of suppliers, choosing suppliers for varied feedstocks with fewer environmental externalities or greater adaptability to the effects of climate change, supplier training programs on environmental management best practices, using feedstock procurement criteria, audits or certifications of suppliers' environmental practices, and expenditures on research and development (R&D) for alternative and substitute feedstocks.

.58 The registrant may choose to discuss its progress on Global Bioenergy Partnership Sustainability [Indicators for Bioenergy](#), the National Resource Defense Council [Biofuel Sustainability Performance Guidelines](#), or performance on other initiatives aimed at improving sustainable feedstock production.

RR0101-14. Percentage of biofuel production third-party certified to an environmental sustainability standard

.59 The registrant shall calculate the percentage as the amount of biofuel produced (in gallons) that is third-party certified to an environmental sustainability standard divided by the total amount of biofuel produced (in gallons).

.60 Examples of environmental sustainability standards include the Roundtable on Sustainable Biomaterials (RSB), Bonsucro, and International Sustainability & Carbon Certification, as well as other standards with equivalent criteria.

- At a minimum, standards include the following environmental sustainability topics:
 - Greenhouse gas (GHG) and other air emissions, water consumption and quality, soil health, fertilizer and pesticide use, land-use change, biodiversity, and waste management.

.61 The registrant should disclose the certification schemes to which its biofuel is certified and the percentage of production certified to each scheme.

RR0101-15. Percentage of feedstock sourced from regions with High or Extremely High Baseline Water Stress

.62 The registrant shall disclose the percentage, by value in U.S. dollars, of the feedstock that it purchased during the reporting year that was grown in a region with High or Extremely High Baseline Water Stress.

.63 Using the WRI Water Risk Atlas tool, Aqueduct (publicly available online [here](#)), the registrant shall analyze all of its known feedstock sources for water risks and identify sources that are in a location with High (40–80%) or Extremely High (>80%) Baseline Water Stress.

.64 The percentage is calculated as the total cost, in U.S. dollars, of feedstock it purchased that was grown in locations of High or Extremely High Baseline Water Stress divided by the total cost of feedstock purchased.

.65 The registrant shall disclose the feedstock acquired for use in its products regardless of whether the registrant grew its own feedstock, purchased the feedstock directly, or if its suppliers purchased the feedstock.

.66 Should the registrant be unable to identify or collect data pertaining to all feedstock suppliers, the registrant shall disclose the percentage of feedstock for which source region and water risks are unknown.

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SUSTAINABILITY ACCOUNTING STANDARD
RENEWABLE RESOURCES & ALTERNATIVE ENERGY SECTOR

SOLAR ENERGY

Sustainability Accounting Standard

Sustainable Industry Classification System™ (SICS™) #RR0102
Prepared by the
Sustainability Accounting Standards Board®

July 2015

Exposure Draft Standard for Public Comment

SOLAR ENERGY

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 non-profit organization. Through 2016, SASB is developing standards for more than 80 industries in 10 sectors.

About this Standard

This Standard is an exposure draft presented for public review and comment. This version is not intended for implementation.

The public comment period lasts for 90 days, beginning on Tuesday, July 7th, 2015, and ending on Monday, October 5th, 2015. The Standard is subject to change thereafter.

For instructions on providing comments to SASB, [please click here](#).

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INTRODUCTION

Purpose & Structure

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

SASB Sustainability Accounting 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 Standards identify sustainability topics at an industry level, which may constitute material information—depending on a company’s specific operating context—for a company within that industry. SASB Standards are intended to provide guidance to company management, which is ultimately responsible for determining which information is material and should therefore be included in its Form 10-K or 20-F and other periodic SEC filings.

SASB Standards provide companies with standardized sustainability metrics designed to communicate performance on industry level sustainability topics. When making disclosure on sustainability topics, companies can use SASB Standards to help ensure that disclosure is standardized and therefore decision-useful, relevant, comparable, and complete.

SASB Standards are intended to constitute “suitable criteria” as defined by AT 101.23 - 32¹ and referenced in AT 701², as having the following attributes:

- *Objectivity*—Criteria should be free from bias.
- *Measurability*—Criteria should permit reasonably consistent measurements, qualitative or quantitative, of subject matter.
- *Completeness*—Criteria should be sufficiently complete so that those relevant factors that would alter a conclusion about subject matter are not omitted.
- *Relevance*—Criteria should be relevant to the subject matter.

Industry Description

The Solar Energy industry comprises companies that manufacture solar energy equipment, including solar photovoltaic (PV) modules, polysilicon feedstock, solar thermal electricity-generation equipment, solar inverters, and other related components. Companies may also develop, build, and manage solar energy projects and offer financing or maintenance services to customers. There are two primary technologies utilized in the industry, PV and concentrated solar (CSP), with PV accounting for a majority of projects. Within solar PV there are two main technologies: crystalline silicon-based solar and “thin film” solar, which includes panels made from copper indium gallium selenide (CIGS) and cadmium telluride (CdTe). The primary markets for solar panels are residential, non-residential (commercial and industrial), and utility-scale projects. Companies in the industry operate globally.

¹ http://pcaobus.org/Standards/Attestation/Pages/AT101.aspx#at_101_fn7

² <http://pcaobus.org/Standards/Attestation/Pages/AT701.aspx>

Guidance for Disclosure of Sustainability Topics in SEC Filings

1. Industry-Level Sustainability Topics

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

- Energy Management in Manufacturing
- Water Management in Manufacturing
- Hazardous Materials Management
- Community & Ecological Impacts of Project Development
- Management of Energy Infrastructure Integration & Related Regulations
- Product Lifecycle Management
- Sensitive Materials Sourcing

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.”^{3, 4}

SASB has attempted to identify those sustainability topics that are reasonably likely to have a material effect on the financial condition or operating performance of companies within each SICs industry. SASB recognizes, however, that each company is ultimately responsible for determining what information should be disclosed within the context of Regulation S-K and other guidance.

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.”

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

The SEC has provided guidance for companies to use in determining whether a trend or uncertainty should be disclosed. The two-part assessment prescribed by the SEC, based on probability and magnitude, can be applied to the topics included within this standard:

- 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.

³ TSC Industries v. Northway, Inc., 426 U.S. 438 (1976).

⁴ C.F.R. 229.303(item 303)(a)(3)(ii).

- 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.

3. Sustainability Accounting Standard Disclosures in Form 10-K

a. Management’s Discussion and Analysis

For purposes of comparability and usability, companies should consider making disclosure on sustainability topics in the MD&A, in a sub-section titled **“Sustainability Accounting Standards Disclosures.”**⁵

b. Other Relevant Sections of Form 10-K

In addition to the MD&A section, it may be relevant for companies to disclose sustainability information in other sections of Form 10-K, including, but not limited to:

- **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/>.

⁵ [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 for Sustainability Topics

For each sustainability topic included in the Fuel Cells & Industrial Batteries industry Sustainability Accounting Standard, SASB identifies accounting metrics.

SASB recommends that each company consider using these sustainability accounting metrics when preparing disclosures on the sustainability topics identified herein;

As appropriate—and consistent with Rule 12b-20⁶—when disclosing a sustainability topic identified by this Standard, 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 **relative performance** with respect to its peers;
- 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 \(SICSTM\)](#). If a registrant generates significant revenue from multiple industries, SASB recommends that it also consider sustainability topics that SASB has identified for those industries and disclose the associated SASB accounting metrics.

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.

Users of the SASB Standards

The SASB Standards are intended to provide guidance 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),⁷ 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. 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.

⁶ 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.”

⁷ 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 that are consolidated for financial reporting purposes as defined by accounting principles generally accepted in the United States for consistency with other accompanying information within SEC filings;⁸
- 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 the effect of sustainability topics on the company's financial condition or operating performance (typically, this disclosure would be limited to risks and opportunities associated with these entities).

Reporting Format

Use of Financial Data

In instances where accounting metrics, activity metrics, and technical protocols in this standard incorporate financial data (e.g., revenues, cost of sales, expenses recorded and disclosed for fines, etc.), such financial data shall be prepared in accordance with the accounting principles generally accepted in the United States of America ("US GAAP") and be consistent with the corresponding financial data reported within the registrant's SEC filings. Should accounting metrics, activity metrics and technical protocols in this standard incorporate disclosure of financial data that is not prepared in accordance with US GAAP, the registrant shall disclose such information in accordance with the SEC Regulation G.

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).

⁸ See US GAAP consolidation rules (Section 810).

Activity metrics disclosed should:

- Convey contextual information that would not otherwise be apparent from SASB accounting metrics.
- Be deemed generally useful for an investor relying on SASB accounting metrics 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.⁹

Where relevant, SASB recommends specific activity metrics that—at a minimum—should accompany SASB accounting metric disclosures.

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Total capacity of PV solar modules sold	Quantitative	Megawatts	RR0102-A
Total capacity of PV solar modules produced	Quantitative	Megawatts	RR0102-B
Total capacity of completed solar energy systems	Quantitative	U.S. Dollars	RR0102-C

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 reliance on data from third-party reporting systems and technologies, 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 occur 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.

⁹ *Improving Business Reporting: Insights into Enhancing Voluntary Disclosures*, FASB Business Reporting Research Project, January 29, 2001.

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.

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.”

The following sections contain the disclosure guidance associated with each accounting metric such as guidance on definitions, scope, accounting, compilation, and presentation.

The term “shall” is used throughout this document to indicate those elements that reflect requirements of the Standard. The terms “should” and “may” are used to indicate guidance, which, although not required, provides a recommended means of disclosure.

Table 1. Sustainability Disclosure Topics & Accounting Metrics

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management in Manufacturing	Total energy consumed, percentage grid electricity, percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	RR0102-01
Water Management in Manufacturing	(1) Total water withdrawn and (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Cubic meters (m ³), Percentage (%)	RR0102-02
	Discussion of water management risks and description of strategies and practices to mitigate those risks	Discussion and Analysis	n/a	RR0102-03
Hazardous Materials Management	Amount of hazardous waste, percentage recycled	Quantitative	Metric tons (t), Percentage (%)	RR0102-04
	Number and aggregate quantity of reportable spills, quantity recovered ¹⁰	Quantitative	Number, Kilograms (kg)	RR0102-05
Community & Ecological Impacts of Project Development	Project development asset impairments associated with community or ecological impacts	Quantitative	U.S. Dollars (\$)	RR0102-06
	Description of solar energy system project development efforts to address community and ecological impacts	Discussion and Analysis	n/a	RR0102-07
Management of Energy Infrastructure Integration & Related Regulations	Average price of solar energy (1) PV modules and (2) completed systems	Quantitative	U.S. Dollars per watt (\$/W)	RR0102-08
	Discussion of risks and opportunities associated with energy policy and integration of solar energy into energy infrastructure	Discussion and Analysis	n/a	RR0102-09
Product Lifecycle Management	Weight of recycled, remanufactured, or reused materials consumed in products sold	Quantitative	Metric tons (t)	RR0102-10
	Percentage of products sold that are recyclable or reusable	Quantitative	Percentage (%)	RR0102-11
	Weight of end-of-life material recovered, percentage of recovered materials that are recycled	Quantitative	Metric tons (t), Percentage (%)	RR0102-12
	Discussion of approach to manage use, reclamation, and disposal of hazardous materials	Discussion and Analysis	n/a	RR0102-13

¹⁰ Note to **RR0102-05**—The registrant shall discuss its long-term activities to remediate spills that occurred in years prior to the reporting period but for which remediation activities are ongoing.

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

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Sensitive Materials Sourcing	Percentage of tungsten, tin, tantalum, and gold smelters within the supply chain that are verified conflict-free	Quantitative	Percentage (%)	RR0102-14
	Discussion of the management of environmental risks associated within the polysilicon supply chain	Discussion and Analysis	n/a	RR0102-15
	Discussion of the management of risks associated with the use of conflict minerals	Discussion and Analysis	n/a	RR0102-16

Energy Management in Manufacturing

Description

Solar panel manufacturing requires significant use of electricity, typically purchased from the grid, which can account for a significant share of the total cost of materials. Climate change regulation and rising energy demand are contributing to rising prices for conventional electricity sources. It is therefore increasingly important for companies in energy-intensive industries to manage overall energy efficiency as well as reliance on different types of energy and associated risks. Dependence on different energy sources can also affect the reliability of energy supply, which could be particularly relevant in emerging markets. The most energy-intensive part of the solar manufacturing process involves purifying and crystallizing the silicon and producing silicon wafers. The overhead energy use of facilities is also high. Thin film, which does not involve the silicon purifying process, has lower energy requirements, which can contribute to its relatively lower price. Firms that can minimize their energy costs through effective energy management can gain a competitive advantage through operational efficiency and competitive pricing of products. This is particularly important due to the low margins of solar energy companies, as well as intense price competition. Companies may obtain the additional reputational benefit of lowering energy payback time, which is the amount of time it takes a panel to produce the energy it took to manufacture it.

Accounting Metrics

RR0102-01. Total energy consumed, percentage grid electricity, percentage renewable

- .01 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.
- .02 In calculating energy consumption from fuels and biofuels, the registrant 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).
- .03 The registrant shall disclose purchased grid electricity consumption as a percentage of its total energy consumption.
- .04 The registrant shall disclose renewable energy consumption as a percentage of its total energy consumption.

.05 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 on-site, 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.¹¹
- Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, consistent with EPA [definitions](#), such as geothermal, wind, solar, hydro, and biomass.

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

- Energy from hydro sources that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard.
- Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered “eligible renewables” according to the Green-e Energy National Standard Version 2.5 (2014), and materials that are eligible for a state Renewable Portfolio Standard.

.07 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 (for energy data including electricity from solar or wind energy).

¹¹ SASB recognizes that RECs reflect the environmental attributes of renewable energy that have been introduced to the grid.

Water Management in Manufacturing

Description

Solar photovoltaic panel manufacturing can be water-intensive. Ultra-pure water may be a critical input in some processes. The manufacturing process can also generate high volumes of contaminated wastewater, which must be treated before disposal or reuse. Wastewater treatment and disposal can result in high operating costs and additional capital expenditures. The contamination of local water resources is a risk in some regions, especially where environmental regulation is less stringent. This can generate tension with local water users, potentially disrupting manufacturing operations, and can have an adverse impact on brand value. In addition to water contamination, solar manufacturing facilities may, depending on their location, be exposed to the risk of reduced water availability and related cost increases or operational disruption, as water is becoming a scarce resource around the world. Companies can adopt various strategies to address water supply and treatment issues, such as recycling process water, improving production techniques to lower water intensity, and installing water treatment systems to preempt more stringent water effluent regulation.

Accounting Metrics

RR0102-02. (1) Total water withdrawn and (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress

- .08 The registrant shall disclose the amount of water (in thousands of cubic meters) that was withdrawn from all sources, where:
- Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the registrant, wastewater obtained from other entities, municipal water supplies, or supply from other water utilities.
- .09 The registrant may choose to disclose the portion of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources, where:
- 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 in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.
- .10 The registrant shall disclose the amount of water (in thousands of cubic meters) that was consumed in its operations, where water consumption is defined as:
- Water that evaporates during withdrawal, usage, and discharge;
 - Water that is directly or indirectly incorporated into the registrant's product or service; and
 - 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.

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

RR0102-03. Discussion of water management risks and description of strategies and practices to mitigate those risks

- .14 The registrant shall discuss its risks associated with water withdrawals, water consumption, and discharge of water to the environment and describe how it manages these risks.
- .15 The registrant shall discuss, where applicable, risks to the availability of adequate, clean water resources.
 - Relevant information to provide includes, but is not limited to:
 - Environmental constraints, such as operating in water-stressed regions, drought, interannual or seasonal variability, and risks due to the impact of climate change.
 - External 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 (commercial and municipal), restrictions to withdrawals due to regulations, and constraints on the registrant’s ability to obtain and retain water rights or permits.
 - How risks may vary by withdrawal source, including wetlands, rivers, lakes, oceans, groundwater, rainwater, municipal water supplies, or supply from other water utilities.
- .16 The registrant shall discuss, where applicable, risks associated with its discharge of wastewater.
 - Relevant information to provide includes, but is not limited to:
 - Environmental constraints, such as the ability to maintain compliance with regulations focused on the quality of effluent discharged to the environment, the ability to eliminate existing and emerging pollutants of concern, and the ability to maintain control over runoff and storm water discharges.
 - External constraints, such as increased liability and/or reputational risks, restrictions to discharges and/or 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), and the ability to obtain discharge rights or permits.
 - How risks may vary by discharges to different sources, including wetlands, rivers, lakes, oceans, groundwater, rainwater, municipal water supplies, or other water utilities.

.17 The registrant should include a discussion of the potential impacts that these risks may have on its operations and the timeline over which such risks are expected to manifest.

- Impacts may include, but are not limited to, those associated with costs, revenues, liabilities, continuity of operations, and reputation.

.18 The registrant shall provide a description of its short-term and long-term strategy or plan to manage these risks, including the following, where relevant:

- Any water management targets it has set, and an analysis of performance against those targets.
 - Water management targets can include water management goals that the registrant prioritizes to manage its risks and opportunities associated with water withdrawal, consumption, or discharge.
 - Targets can include, but are not limited to, those associated with reducing water withdrawals, reducing water consumption, reducing water discharges, and improving the quality of wastewater discharges.
- The scope of its strategy, plans, or targets, such as whether they pertain differently to different business units, geographies, or water-consuming operational processes.
- The activities and investments required to achieve the plans and targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.

.19 For water management targets, the registrant shall additionally disclose:

- 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.
- Whether the target is absolute or intensity based, and the metric denominator if it is an intensity-based target.
- The timelines for the water management plans, including the start year, the target year, and the base year.
- The mechanism(s) for achieving the target, including:
 - Efficiency efforts, such as the use of water recycling and/or closed-loop systems
 - Product innovations such as redesigning products or services to require less water
 - Process and equipment innovations, such as those that enable the use of less water in manufacturing or operations

- Use of tools and technologies (e.g., the [World Wildlife Fund Water Risk Filter](#), [WRI/WBCSD Global Water Tool](#), and [Water Footprint Network Footprint Assessment Tool](#)) to analyze water use, risk, and opportunities
- Collaborations or programs in place with the community or other organizations

.20 Disclosure of strategies, plans, and targets shall be limited to activities that were ongoing (active) or reached completion during the fiscal year.

.21 The registrant shall discuss if its water management practices result in any additional lifecycle impacts or tradeoffs in its organization, including tradeoffs in land use, energy consumption, and greenhouse gas (GHG) emissions, and why the registrant chose these practices despite lifecycle tradeoffs.

Additional Resources

GRI-Global Reporting Initiative (GRI G4)
CDP 2015 Water Questionnaire
CEO Water Mandate
Global Water Footprint Assessment Standard

Hazardous Materials Management

Description

Solar panel manufacturing involves the use of a number of hazardous chemicals that can cause human health and environmental harm if they are not properly managed. Common thin-film technologies can utilize hazardous substances such as cadmium, gallium arsenide, and copper indium gallium diselenide, which require careful handling during the manufacturing process. The cleaning of the semiconductor surface in silicon PV manufacturing can involve the use of chemicals such as hydrochloric acid, sulfuric acid, and hydrogen fluoride. Hazardous materials management is an important factor in preserving the Solar Energy industry's reputation as an environmentally sustainable energy source. Hazardous waste handling and disposal generate ongoing pollution-abatement costs and capital expenditures. In addition, improper treatment or disposal of hazardous process materials could result in contamination of local water or land, potentially harming brand value or resulting in regulatory penalties. Effective management of hazardous materials, including through reduction, reuse, recycling, and safe storage and disposal, can lower operating costs and mitigate potential regulatory penalties or reputational damage.

Accounting Metrics

RR0102-04. Amount of hazardous waste, percentage recycled

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

- Hazardous waste includes both hazardous secondary materials, per 40 CFR 260.10, and 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), per 40 CFR 261.3.
- Hazardous wastes include those that display the following characteristics: ignitability, corrosivity, reactivity, or toxicity.

.23 The percentage recycled shall be calculated as the weight of hazardous waste material that was reused or reclaimed, 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 hazardous waste material, where:

- Reclaimed materials are defined as materials processed to recover or regenerate a usable product, consistent with [RCRA hazardous waste regulation](#). Common hazardous waste reclamation activities involve recovery of spent solvents (e.g., recovery of acetone) or metals (e.g., recovery of lead).
- 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.
- Materials sent for further recycling include those materials that are transferred to a third party for the express purpose of reuse, recycling, or refurbishment.

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

.24 Electronic waste material (e-waste) shall be considered recycled only if the registrant can demonstrate that this material was transferred to entities with third-party certification to a standard for e-waste recycling, such as Basel Action Network's e-Steward® standard or the U.S. EPA's Responsible Recycling Practices (R2) standard.

- The registrant shall disclose the standard(s) with which the entities it has transferred e-waste to are compliant.

RR0102-05. Number and aggregate quantity of reportable spills, quantity recovered

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

- Reportable spills are defined as any release of a hazardous substance in an amount equal to or greater than the reportable quantity as listed in Table 302.4 in 40 CFR Part 302.4 of the U.S. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), including consideration of reportable quantities of mixtures and solutions as defined under 40 CFR Part 302.6 (b)(1).
- The number of reportable spills shall include any leaks, emissions, discharges, injections, disposals, and abandonment releases over time, counted once at the time identified, consistent with CERCLA definition of release (42 USC 9601(22)) and guidelines for reporting requirements (40 CFR Part 302).
- The aggregate quantity reported shall represent the total quantity of material released to the environment, and shall not be reduced by the amount of such hazardous substances that are subsequently recovered, evaporated, or otherwise lost.
- The scope of disclosure includes all spills, even those in jurisdictions that are not subject to regulation under CERCLA.

.26 The registrant shall calculate the quantity of spills recovered as the quantity of spilled 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.

- .27 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.
- .28 The registrant may choose to separately indicate spills that occurred in the past, such as those that resulted from abandoned, legacy, or decommissioned operations but that were identified and disclosed during the fiscal year.

Note to **RR0102-05**

- .29 Where applicable, the registrant shall discuss its activities to remediate spills that occurred in years prior to the disclosure period but for which remediation activities are ongoing and long term.
- .30 Relevant activities include, but are not limited to, land-use controls, site monitoring, site maintenance, and continued cleanup.

Additional References

For guidance on the “legitimate recycling” of hazardous waste see 40 CFR 260.43.

Community & Ecological Impacts of Project Development

Description

Many large publicly listed solar energy companies are involved in project development, including the evaluation and acquisition of land rights, site permitting, and engagement with stakeholders. Successful development is contingent on securing the approval of environmental permits and permission from local governments and communities. Siting of medium or large solar installations in ecologically sensitive areas, including endangered species habitats, can render environmental permitting more difficult and costly. Project development may also be affected by local land-use laws and community opposition to projects due to their environmental and community impacts, such as noise and threatened property values. CSP projects may face opposition due to their significant land footprint and concerns over impacts on local water resources. These factors can slow or disrupt the development process, possibly resulting in higher costs, lost revenues, or impaired project assets. Companies with robust strategies for environmental impact assessment and mitigation and community engagement can reduce the risk of project delays, increasing the likelihood of successful project completion.

Accounting Metrics

RR0102-06. Project development asset impairments associated with community or ecological impacts

.31 The registrant shall disclose the amount of project development assets, in U.S. dollars, that were subject to impairment during the fiscal year for reasons related to, or associated with, in whole or in part, community or ecological impacts of the project under development, where:

- Project assets are defined by the registrant, consistent with its existing public disclosure of project assets, regardless of terminology used by the registrant (e.g., “Project assets,” “Project assets—plants and land,” “Solar Energy Systems Held for Development and Sale,” etc.). At a minimum, project assets meet the following criteria:
 - Solar energy systems held for development and sale prior to the execution of a definitive sales agreement; and
 - Capitalizable costs incurred to construct solar energy systems.
- Project asset impairments are defined by the registrant, consistent with its existing public disclosure of project asset impairments.
- Project asset impairments for reasons related to, or associated with, community and/or ecological impact are defined as those impairments that can reasonably be determined to relate to the following:
 - Community opposition to solar energy system project development or operations, including, but not limited to, opposition related to land use, purported property valuation impacts, visual aesthetics, and safety of human health or property;
 - Ecological impact or risks of ecological impact of solar energy system project development or operations, including, but not limited to, risks to wildlife or habitat loss.

- Project asset impairments for reasons related to, or associated with, community and/or ecological impact includes impairments resulting from voluntary or involuntary actions taken relating, in whole or in part, to community and/or ecological impact, including the following:
 - Inability to obtain necessary permits, approvals, financing, or other requirements; and
 - Voluntary decisions to abandon, delay, alter, or scale back projects.

.32 The registrant may choose to disclose project asset impairments by solar energy system capacity.

.33 The registrant may choose to discuss specific project asset impairments, including root cause and corrective actions to reduce the risk of future project asset impairments due to community or ecological impacts.

RR0102-07. Description of solar energy system project development efforts to address community and ecological impacts

.34 The registrant shall describe its efforts to address community and ecological impacts of solar energy system development and operation during solar energy system project development, where:

- Community impacts may include, but are not limited to, land use, purported property valuation impacts, visual aesthetics, and safety of human health or property.
- Ecological impacts may include, but are not limited to, risk of habitat disruption, water stress, land-use requirements, and ecological impacts of construction.

.35 The scope of disclosure shall include all solar energy system projects under development, or under consideration for development, regardless of actual or intended ownership.

.36 The scope of disclosure shall include efforts, activities, and strategies related to project siting, project design, stakeholder engagement, and engagement with regulatory authorities or other permitting authorities.

.37 The registrant should describe its efforts to eliminate or mitigate community risks and address community concerns and/or efforts to communicate project benefits and expected impacts, including, but not limited to:

- The use of social impact assessment (SIA) that evaluates, manages, and mitigates risks.
- Efforts to engage with stakeholders, build consensus, and collaborate with communities.
- Efforts to create benefits for communities through the projects.
- New and emerging technologies expected to be incorporated into the project that may improve impacts.

Management of Energy Infrastructure Integration & Related Regulations

Description

The Solar Energy industry continues to benefit from accommodative government renewable energy policy worldwide, fostered in large part by the desire to transition to a low-carbon energy economy. Regulatory developments, such as the EPA's Clean Power Plan, are likely to support continued solar expansion. However, cost effectiveness, realized through a lower levelized cost of solar energy, is critical to the continued policy support and adoption of solar for greenhouse gas (GHG) mitigation and energy security. Furthermore, the expected increase in the amount of solar energy that reaches the electrical grid presents challenges for existing physical and regulatory infrastructure. There are concerns that this could affect the flexibility, cost structure, and reliability of the grid, among other social costs of distributed generation. These outcomes could adversely affect existing utility ratepayers. Such concerns could undermine policy support for solar energy and increase integration barriers for solar customers. The industry's interaction with electric utilities and energy regulators is a critical channel through which it influences regulations that can play an important role in the pace and scale of solar adoption. As energy is an essential service, management of relations with utility providers and policymakers should be aligned with reduced disruptions to existing electricity infrastructure or smoother transitions to new energy systems. Alignment of lobbying efforts with these long-term societal interests could serve to reduce business uncertainty and the potential for regulatory hurdles. At the same time, in order to reduce grid disruptions and make solar cost competitive without extensive government support, companies are engaging in innovations to reduce hardware and installation costs, investing in R&D and partnerships to create energy storage or other technologies, and working toward business model innovation to reduce the cost of capital and facilitate the purchase of solar energy systems. A solar energy company's strategy to manage integration with energy infrastructure and related regulations can influence its long-term business viability, drive revenue growth, and mitigate regulatory risk.

Accounting Metrics

RR0102-08. Average price of solar energy (1) PV modules and (2) completed systems

.38 The registrant shall calculate the average price of solar energy during the fiscal year, based on (1) solar energy PV module sales and (2) completed solar energy systems.

- Solar energy PV module sales shall be calculated as the total sales price of solar energy PV module sales, in U.S. dollars, divided by the total rated capacity of solar energy PV module sales, in watts (\$/W).
 - Solar energy PV modules are defined in accordance with the U.S. Department of Energy (DOE) [Solar Energy Glossary](#): photovoltaic (PV) module.¹²
- Completed solar energy systems shall be calculated as the total sales price of completed solar energy systems, in U.S. dollars, divided by the total rated capacity of completed solar energy systems, in watts (\$/W).

¹² For additional reference see IEC/TS 61836 Ed. 3.0, "Solar photovoltaic energy systems—Terms, definitions and symbols."

- Solar energy systems are defined as any system that converts sunlight into electrical energy, in accordance with the U.S. DOE [Solar Energy Glossary](#), including, but not limited to, “photovoltaic (PV) system” and “solar thermal electric systems.”¹³
 - Completed systems are defined by the registrant, consistent with its existing public disclosure of completed systems.
- Rated capacity is defined as the maximum output (generation) of solar energy systems, in watts (W), also referred to as nameplate capacity, measured in accordance with an applicable standard, including, but not limited to, IEC 61215, IEC 61646, or IEC 62108.
- .39 Where the registrant utilizes leases to customers, the registrant shall use an appropriate methodology for calculating the implied sales price, and the registrant shall disclose the methodology used.
- .40 The scope of disclosure shall include (1) solar energy PV module sales and (2) completed solar energy systems that occurred during the fiscal year.
- .41 The registrant shall not double-count any (1) solar energy PV module sale or (2) completed solar energy system in either (1) or (2).
- .42 The scope of disclosure shall exclude intercompany transactions and completed solar energy systems retained by the registrant.
- .43 The registrant may disclose performance by category of customer, where:
- Category of customer may include: utilities, independent power developers and producers, distributors, contractors and installers, commercial and industrial companies, and residential customers.

RR0102-09. Discussion of risks and opportunities associated with energy policy and integration of solar energy into energy infrastructure

- .44 The registrant shall discuss its risks and opportunities associated with the integration of solar energy systems into the electricity grid, where:
- Relevant risks include, but are not limited to, the variable nature of solar energy generation, curtailment risk, limited transmission network connectivity, lack of access to high-capacity transmission networks, and variability in interconnection standards; and
 - Relevant opportunities include, but are not limited to, regional transmission planning; interconnected transmission networks; state, federal and regional connection standards; and expected replacements of ageing energy generation infrastructure.

¹³ For additional reference see IEC/TS 61836 Ed. 3.0, “Solar photovoltaic energy systems—Terms, definitions and symbols.”

.45 The registrant shall identify risks and opportunities it faces related to legislation, regulation, rule-making, actions of individual politicians, and the overall political environment (hereafter referred to collectively as “regulatory and political environment”) related to energy policy and integration of solar energy into energy infrastructure.

- The scope shall include existing, emerging, and known future risks and opportunities.
- The scope shall include risks and opportunities that may exist within the U.S. at the local, state, and federal level, foreign governments, and international governmental organizations.

.46 Relevant information to provide includes, but is not limited to, the impact on demand for the registrant’s solar energy products and services or on business viability associated with:

- Direct or indirect government subsidization of solar energy;
- International trade policy disputes and agreements;
- Public policies that establish minimum requirements for renewable energy generation (e.g., renewable portfolio standards);
- Public policies that affect the monetization of solar energy generation, including, but not limited to, net metering, time-of-use rates, feed-in tariffs, utility fixed fees, and renewable energy priority dispatch;
- Public policies that affect the financing and tax structure of solar energy, including, but not limited to, investment tax credits, property-assessed clean energy, loan guarantees, and depreciation schedules; and
- Public policies pertaining to any external social costs created by distributed solar energy generation.

.47 The registrant shall provide a description of its short-term and long-term strategy or plan to manage these risks and opportunities, including the following, where relevant:

- Efforts to influence the regulatory and political environment, including, but not limited to:
 - Direct lobbying, or “the attempt to influence a legislative body through communication with a member or employee of a legislative body, or with a government official who participates in formulating legislation.”
 - Grassroots lobbying, or “the attempt to influence legislation by attempting to affect the opinion of the public with respect to the legislation and encouraging the audience to take action with respect to the legislation.”
 - 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 may be used (where permitted) for lobbying, campaign contributions, or in ways that otherwise exert influence on a political campaign or ballot measure
 - Other interactions with regulatory agencies, including public utilities commissions, such as through legislative testimony.
 - Any direct or indirect political expenditure (one-time or recurring) that must be reported to the Federal Election Commission (FEC), the Internal Revenue Service (IRS), or a state disclosure agency.
- The development of new technologies, including, but not limited to:
 - Innovation designed to reduce the cost of solar energy modules and/or systems;
 - The incorporation of energy storage technology, or “smart grid” technology, into solar energy systems, whether through proprietary technological development or collaboration with third parties; and
 - Solar energy systems designed to operate “off-grid” or as part of “micro-grids.”
 - Business model innovation, including, but not limited to:
 - Innovation designed to decrease solar energy’s levelized cost of energy (LCOE) through the reduction in “soft costs,” including financing, leasing, customer acquisition, and development costs; and
 - Innovation designed to increase the total addressable solar energy market.

Product Lifecycle Management

Description

Solar panels contain hazardous substances as well as materials of high economic value. Reduced use of hazardous materials as well as materials recovery and recycling are important in order to lower environmental impacts from waste streams and from the extraction of virgin materials. Due to the rapid expansion of solar energy in recent years, increasing volumes of panels are expected to reach the end of their useful life in the medium term. Manufacturers are required by law in some regions to take financial responsibility for their products at the end-of-life stage, including collection and recycling. Bans on hazardous substances, such as brominated flame retardants, used in solar panels could pose additional regulatory challenges in some regions. Any revenue contraction from additional end-user costs for hazardous waste disposal could have a significant effect on profits. The issue also has the potential to cause the industry reputational damage in the medium to long term. Management of these risks could involve innovative design to use fewer hazardous inputs and improve recyclability of panels and components. Furthermore, as more modules reach the end of their life and this issue likely receives more legislative attention, being able to offer take-back and recycling services in a cost-effective manner could become an important differentiator between companies. This could increase the revenue of companies with a robust system in place to handle end-of-life recycling. Companies could also benefit from lower costs by reusing recovered materials in their manufacturing processes.

Accounting Metrics

RR0102-10. Weight of recycled, remanufactured, or reused materials consumed in products sold

- .48 The registrant shall disclose the weight, in metric tons, of raw materials consumed in products sold during the fiscal year that are derived from recycled, remanufactured, or reused content.
- .49 Recycled and remanufactured materials are defined as waste materials that have been reprocessed or treated by means of production or manufacturing processes and made into a final product or a component for incorporation into a product.
- The scope of recycled and remanufactured products includes primary recycled materials, co-products (outputs of equal value to primary recycled materials), and by-products (outputs of lesser value than primary recycled materials).
 - The scope of disclosure includes recycling conducted by the registrant or by third parties through direct contract with the registrant.
 - 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 weight recycled.
- .50 Reused materials are defined as those recovered products or components of products that are used for the same purpose for which they were conceived.

.51 The weight of recycled, remanufactured, or reused materials shall be calculated as the weight of incoming material that was reused in products sold plus the weight of material recycled or remanufactured, through treatment or processing by the registrant or a third party, in products sold.

RR0102-11. Percentage of products sold that are recyclable or reusable

.52 The registrant shall disclose the percentage of products, by weight (in metric tons), that are reusable or recyclable, where:

- “Reusable” is defined as a product or packaging that has been conceived and designed to accomplish, within its lifecycle, a certain number of trips, rotations, or uses for the same purpose for which it was conceived, consistent with definitions in ISO 14021:1999, *Environmental labels and declarations—Self-declared environmental claims (Type II environmental labelling)*.
- “Recyclable” is defined a product or packaging that can be diverted from the waste stream through available processes and programs and can be collected, processed, and returned to use in the form of raw materials or products, consistent with definitions in ISO 14021:1999, *Environmental labels and declarations—Self-declared environmental claims (Type II environmental labelling)*.

.53 For products or product materials that are partially made of recyclable or reusable materials, the registrant shall classify the portion of the material that is recyclable or reusable based on a calculation (or estimate, where appropriate) of the weight of each portion.

.54 A product or its components shall be considered recyclable or reusable if this claim is aligned with 16 CFR Part 260, Guides for the Use of Environmental Marketing Claims; Final Rule, (also known as the “FTC Green Guides”), including the following elements:

- A product or package shall not be marketed as recyclable unless it can be collected, separated, or otherwise recovered from the waste stream through an established recycling program for reuse or use in manufacturing or assembling another item.
- When recycling facilities are available to a substantial majority (i.e., 60 percent) of consumers or communities where the item is sold, the registrant may consider the product (or product component) recyclable without a qualification.
- When recycling facilities are available to less than a substantial majority of customers or communities where the product is sold, the registrant shall only consider the product (or product components) recyclable if it makes the appropriate qualification to its customers.
- For items that are partially made of recyclable components, the registrant shall only consider those components recyclable if (a) it clearly and prominently qualifies the recyclable claim to avoid deception about which portions are recyclable, and (b) no components significantly limit the ability to disassemble and recycle the product or components of the product (e.g., the size, shape, or assembly method).

RR0102-12. Weight of end-of-life material recovered, percentage of recovered materials that are recycled

.55 The registrant shall disclose the weight, in metric tons, of materials recovered, including those recovered through recycling services, product take-back programs, and refurbishment services, where:

- The scope of disclosure shall include products, materials, and parts at the end of their useful life that would have otherwise been disposed of as waste or used for energy recovery, but have instead been collected.
- The scope of disclosure shall include both materials physically handled by the registrant and materials of which the registrant does not take physical possession, but for which it has contracted with a third party the task of collection for the expressed purpose of reuse, recycling, or refurbishment.
- The scope of disclosure excludes products and parts that are in warranty and have been collected for repairs.

.56 The percentage recycled shall be calculated as the weight of incoming material that was reused or reclaimed, plus the weight of material recycled or remanufactured (through treatment or processing) by the registrant, plus the weight of material sent externally for further recycling, divided by the total weight of incoming recovered material, where:

- A material is recycled if it is used, reused, or reclaimed.
- Reclaimed materials are defined as those processed to recover or regenerate a usable product.
- 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 a component for incorporation into a product.
- Materials sent for further recycling include those materials that are transferred to a third party for the express purpose of reuse, recycling, or refurbishment.
- The scope of recycled and remanufactured products includes primary recycled materials, co-products (outputs of equal value to primary recycled materials), and by-products (outputs of lesser value than primary recycled materials).
- 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 incinerated, including for energy recovery, are not considered reused, recycled, or reclaimed. 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.

.57 Electronic waste material (e-waste) shall be considered recycled only if the registrant can demonstrate that this material was transferred to entities with third-party certification to a standard for e-waste recycling such as Basel Action Network's e-Steward® standard or the U.S. EPA's Responsible Recycling Practices (R2) standard.

- The registrant shall disclose the standard(s) to which the entities it has transferred e-waste to are compliant.

RR0103-13. Discussion of approach to manage use, reclamation, and disposal of hazardous materials

.58 The registrant shall discuss its strategies to manage the use of hazardous materials, where:

- Hazardous materials includes both hazardous secondary materials, per 40 CFR 260.10, and waste that meets the definition of hazardous waste under Subtitle C of the U.S. EPA's RCRA, per 40 CFR 261.3.
- Hazardous materials include those that display the following characteristics: ignitability, corrosivity, reactivity, or toxicity.

.59 The registrant should identify which hazardous materials are used, its approach to design for reducing use or substituting with non-hazardous materials, and its strategies to mitigate risks associated with the use of hazardous materials.

.60 The registrant shall discuss its approach to design and strategies to increase the disposal or reclamation of hazardous materials in the product end-of-life stage, including take-back programs and direct contracts with third-party hazardous waste reclamation services.

.61 The registrant shall discuss any incidences of non-compliance with relevant hazardous materials regulations, including the use, handling, labeling or disposal of hazardous materials.

Sensitive Materials Sourcing

Description

Materials such as tin and polysilicon used in solar panels can have negative environmental and social impacts in the supply chain. The purification process of polysilicon, the main input in a majority of solar panels, creates a harmful wastewater by-product called silicon tetrachloride. Equipment to recycle this wastewater to extract silicon is available but expensive, and not all polysilicon refiners utilize it. The improper disposal of such waste in the supply chain has been associated with killing fish and wildlife, destroying farmland, and causing higher cancer rates. These supply chain impacts could affect the reputation of listed solar energy companies, potentially hurting their revenue growth prospects. In addition, suppliers may be required to curtail production due to violations of environmental regulations, which could, in turn, disrupt production at solar manufacturing plants. Furthermore, solar energy companies are required to comply with U.S. regulations and face other pressures to track and eliminate the use of minerals responsible for conflict in the Democratic Republic of Congo. Some solar panels contain all four of the “conflict” minerals (tin, tantalum, tungsten, and gold), although many contain only tin. In addition to facing reputational and regulatory risks from sourcing tin from conflict-torn areas, solar energy companies face competition from increasing global demand for tin from other sectors. Along with supply constraints, this can result in significant price increases and supply chain risks. Companies can minimize negative externalities of sourcing sensitive materials like polysilicon and conflict minerals and protect themselves from related risks by creating transparency of their supply chains, working actively to source materials from reliable suppliers or regions that have minimal environmental or social risks, and supporting research for alternative inputs. Solar panel manufacturers could also benefit from ensuring that their supply chain is “conflict-free.”

Accounting Metrics

RR0102-14. Percentage of tungsten, tin, tantalum, and gold smelters within the supply chain that are verified conflict-free

.62 The registrant shall calculate the percentage as the number of tungsten, tin, tantalum, and gold smelters and/or refineries within its supply chain that are verified to be conflict-free divided by the total number of tungsten, tin, tantalum, and gold smelters and/or refineries within its supply chain.

.63 A smelter or refiner is considered to be conflict-free if it can demonstrate compliance with:

- The Electronic Industry Citizenship Coalition (EICC) and Global e-Sustainability Initiatives (GeSI) Conflict-Free Smelter Program (CFSP) assessment protocols.
- The Responsible Jewellery Council’s (RJC) Chain-of-Custody (CoC) Standard.

.64 A smelter or refinery is considered to be within the registrant’s supply chain if it supplies, or is approved to supply, tungsten, tin, tantalum, or gold that is contained in any product the registrant manufactures or contracts to be manufactured.

- The scope includes smelters or refineries that supply material directly to the registrant as well as those that supply material to any of its suppliers of raw materials, components, or subassemblies.

RR0102-15. Discussion of the management of environmental risks associated within the polysilicon supply chain

- .65 The registrant shall discuss its strategic approach to managing the environmental risks associated within the polysilicon supply chain, including suppliers' noncompliance with environmental regulations and proper disposal and handling of waste, including tetrachloride.
- .66 Relevant strategies to discuss include due diligence practices, supply chain auditing, supply chain engagement, codes of conduct, and partnerships with industry groups or nongovernmental development organizations.
- .67 The registrant shall describe its process for corrective actions in the event of noncompliance with environmental regulations in the supply chain, including the use of alternative suppliers.
- .68 The registrant should identify which materials present a risk to its operations, which type of risk they represent (e.g., regulatory compliance, reputational risk, physical limits on availability and access), and the strategies the registrant uses to mitigate the risk.

RR0102-16. Discussion of the management of risks associated with the use of conflict minerals

- .69 The registrant shall discuss its strategic approach to managing its risks associated with the use of critical materials and conflict minerals in its products, including physical limits on availability and access, price, and reputational risks, where:
 - Conflict minerals are defined as tungsten, tin, tantalum, and gold.
- .70 The registrant should identify which minerals present a risk to its operations, which type of risk they represent, and the strategies the registrant uses to mitigate the risk.
- .71 Relevant strategies to discuss include due diligence practices, supply chain auditing, supply chain engagement, and partnerships with industry groups or nongovernmental development organizations.

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SUSTAINABILITY ACCOUNTING STANDARD
RENEWABLE RESOURCES & ALTERNATIVE ENERGY SECTOR

WIND ENERGY

Sustainability Accounting Standard

Sustainable Industry Classification System™ (SICS™) #RR0103
Prepared by the
Sustainability Accounting Standards Board®

July 2015

Exposure Draft Standard for Public Comment

WIND ENERGY

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 non-profit organization. Through 2016, SASB is developing standards for more than 80 industries in 10 sectors.

About this Standard

This Standard is an exposure draft presented for public review and comment. This version is not intended for implementation.

The public comment period lasts for 90 days, beginning on Tuesday, July 7th, 2015, and ending on Monday, October 5th, 2015. The Standard is subject to change thereafter.

For instructions on providing comments to SASB, [please click here](#).

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INTRODUCTION

Purpose & Structure

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

SASB Sustainability Accounting 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 Standards identify sustainability topics at an industry level, which may constitute material information—depending on a company’s specific operating context—for a company within that industry. SASB Standards are intended to provide guidance to company management, which is ultimately responsible for determining which information is material and should therefore be included in its Form 10-K or 20-F and other periodic SEC filings.

SASB Standards provide companies with standardized sustainability metrics designed to communicate performance on industry level sustainability topics. When making disclosure on sustainability topics, companies can use SASB Standards to help ensure that disclosure is standardized and therefore decision-useful, relevant, comparable, and complete.

SASB Standards are intended to constitute “suitable criteria” as defined by AT 101.23 - 32¹ and referenced in AT 701², as having the following attributes:

- *Objectivity*—Criteria should be free from bias.
- *Measurability*—Criteria should permit reasonably consistent measurements, qualitative or quantitative, of subject matter.
- *Completeness*—Criteria should be sufficiently complete so that those relevant factors that would alter a conclusion about subject matter are not omitted.
- *Relevance*—Criteria should be relevant to the subject matter.

Industry Description

The Wind Energy industry comprises companies that manufacture wind turbines, blades, towers, and other components of wind power systems. Companies that develop, build, and manage wind energy projects are also included within the scope of this industry, but few companies publicly listed in the U.S. operate primarily in this segment. SASB standards for the Wind Energy industry therefore focus on the manufacturing segment. Manufacturers also offer post-sale maintenance and support services. Turbines are installed onshore or offshore, which can cause differences in wind-generating capacity and project-development challenges for each type of installation. Wind energy companies operate globally.

¹ http://pcaobus.org/Standards/Attestation/Pages/AT101.aspx#at_101_fn7

² <http://pcaobus.org/Standards/Attestation/Pages/AT701.aspx>

Guidance for Disclosure of Sustainability Topics in SEC Filings

1. Industry-Level Sustainability Topics

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

- Design to Mitigate Community & Ecological Impacts
- Design for Materials Efficiency
- Sensitive & Critical Materials Sourcing
- Safety of Wind Farm Operations

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.”^{3, 4}

SASB has attempted to identify those sustainability topics that are reasonably likely to have a material effect on the financial condition or operating performance of companies within each SICs industry. SASB recognizes, however, that each company is ultimately responsible for determining what information should be disclosed within the context of Regulation S-K and other guidance.

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.”

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

The SEC has provided guidance for companies to use in determining whether a trend or uncertainty should be disclosed. The two-part assessment prescribed by the SEC, based on probability and magnitude, can be applied to the topics included within this standard:

- 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.

³ TSC Industries v. Northway, Inc., 426 U.S. 438 (1976).

⁴ C.F.R. 229.303(item 303)(a)(3)(ii).

3. Sustainability Accounting Standard Disclosures in Form 10-K

a. Management's Discussion and Analysis

For purposes of comparability and usability, companies should consider making disclosure on sustainability topics in the MD&A, in a sub-section titled **"Sustainability Accounting Standards Disclosures."**⁵

b. Other Relevant Sections of Form 10-K

In addition to the MD&A section, it may be relevant for companies to disclose sustainability information in other sections of Form 10-K, including, but not limited to:

- **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/>.

⁵ [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 for Sustainability Topics

For each sustainability topic included in the Wind Energy industry Sustainability Accounting Standard, SASB identifies accounting metrics.

SASB recommends that each company consider using these sustainability accounting metrics when preparing disclosures on the sustainability topics identified herein;

As appropriate—and consistent with Rule 12b-20⁶—when disclosing a sustainability topic identified by this Standard, 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 **relative performance** with respect to its peers;
- 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 \(SICSTM\)](#). If a registrant generates significant revenue from multiple industries, SASB recommends that it also consider sustainability topics that SASB has identified for those industries and disclose the associated SASB accounting metrics.

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.

Users of the SASB Standards

The SASB Standards are intended to provide guidance 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),⁷ 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. 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.

⁶ 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.”

⁷ 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 that are consolidated for financial reporting purposes as defined by accounting principles generally accepted in the United States for consistency with other accompanying information within SEC filings;⁸
- 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 the effect of sustainability topics on the company's financial condition or operating performance (typically, this disclosure would be limited to risks and opportunities associated with these entities).

Reporting Format

Use of Financial Data

In instances where accounting metrics, activity metrics, and technical protocols in this standard incorporate financial data (e.g., revenues, cost of sales, expenses recorded and disclosed for fines, etc.), such financial data shall be prepared in accordance with the accounting principles generally accepted in the United States of America ("US GAAP") and be consistent with the corresponding financial data reported within the registrant's SEC filings. Should accounting metrics, activity metrics and technical protocols in this standard incorporate disclosure of financial data that is not prepared in accordance with US GAAP, the registrant shall disclose such information in accordance with the SEC Regulation G.

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).

⁸ See US GAAP consolidation rules (Section 810).

Activity metrics disclosed should:

- Convey contextual information that would not otherwise be apparent from SASB accounting metrics.
- Be deemed generally useful for an investor relying on SASB accounting metrics 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.⁹

Where relevant, SASB recommends specific activity metrics that—at a minimum—should accompany SASB accounting metric disclosures.

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of delivered wind turbines, by wind turbine class ¹⁰	Quantitative	Number	RR0103-A
Capacity of delivered wind turbines, by wind turbine class ¹¹	Quantitative	Watts (W)	RR0103-B
Amount of backlog	Quantitative	U.S. Dollars (\$)	RR0103-C
Capacity of backlog	Quantitative	Watts (W)	RR0103-D
Warranty costs and service-and-maintenance costs	Quantitative	U.S. Dollars (\$)	RR0103-E

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 reliance on data from third-party reporting systems and technologies, 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 occur for certain quantitative disclosures. Where appropriate, SASB does not discourage the

⁹ *Improving Business Reporting: Insights into Enhancing Voluntary Disclosures*, FASB Business Reporting Research Project, January 29, 2001.

¹⁰ Note to **RR0103-A**—Wind turbine class is defined by the International Electrotechnical Commission's IEC 61400-1, Edition 3.0—Design requirements. Wind turbine class shall be determined by the rating of the turbine.

¹¹ Note to **RR0103-B**—*Ibid*.

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.

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."

The following sections contain the disclosure guidance associated with each accounting metric such as guidance on definitions, scope, accounting, compilation, and presentation.

The term "shall" is used throughout this document to indicate those elements that reflect requirements of the Standard. The terms "should" and "may" are used to indicate guidance, which, although not required, provides a recommended means of disclosure.

Table 1. Sustainability Disclosure Topics & Accounting Metrics

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Design to Mitigate Community & Ecological Impacts	Average A-weighted sound power level of wind turbines, by wind turbine class	Quantitative	dB(A)	RR0103-01
	Backlog cancellations associated with community or ecological impacts	Quantitative	U.S. Dollars (\$)	RR0103-02
	Description of turbine design efforts to address ecological and community impacts of wind energy production	Discussion and Analysis	n/a	RR0103-03
Design for Materials Efficiency	Top five materials consumed, each by wind turbine class	Quantitative	Metric tons (t)	RR0103-04
	Average turbine (1) weight scaling relationship and (2) weight to specific power relationship, by wind turbine class	Quantitative	Rate in (t/m ³), rate in (t/(W/m ²))	RR0103-05
	Discussion of design approach to optimize the materials efficiency of wind turbines	Discussion and Analysis	n/a	RR0103-06
Sensitive & Critical Materials Sourcing	Percentage of materials costs for critical materials	Quantitative	Percentage (%)	RR0103-07
	Percentage of tungsten, tin, tantalum, and gold smelters within the supply chain that are verified conflict-free	Quantitative	Percentage (%)	RR0103-08
	Discussion of the management of risks associated with the use of critical materials and conflict minerals	Discussion and Analysis	n/a	RR0103-09
Safety of Wind Farm Operations	(1) Total recordable injury rate (TRIR) and (2) fatality rate for (a) direct employees and (b) contract employees	Quantitative	Rate	RR0103-10
	Warranty and service-and-maintenance costs associated with accidents	Quantitative	U.S. Dollars (\$)	RR0103-11

Design to Mitigate Community & Ecological Impacts

Description

Wind farm development involves siting and land acquisition, permitting, and engagement with local stakeholders to address concerns about potential environmental or community impacts. There may be concerns among neighboring communities regarding the noise from turbines and the impacts on quality of life. Offshore developments could affect the marine ecosystem and birds, sometimes including endangered species. Obtaining environmental and construction permits for projects can be slowed or prevented if community members or regulators have concerns about the community or ecological impacts of the development. Wind project approval and construction success directly affects equipment manufacturers through demand for turbines. While manufacturers do not typically control the project approval process, they can design their products to minimize ecological and community impacts, including designing quieter turbines or turbines that have less impact on wildlife. These measures could facilitate project approvals and give wind energy manufacturers a competitive advantage and potentially increase their market share over time.

Accounting Metrics

RR0103-01. Average A-weighted sound power level of wind turbines, by wind turbine class

- .01 The registrant shall disclose, by wind turbine class, the average A-weighted sound power level of turbines delivered during the fiscal year, weighted by the total number of turbine deliveries per wind turbine class.
- .02 A-weighted sound power level shall be calculated according to the International Electrotechnical Commission's IEC 61400-11, Edition 3.0—Acoustic noise measurement techniques.
- .03 The registrant shall disclose performance by the following wind turbine classes as they are defined by the International Electrotechnical Commission's IEC 61400-1, Edition 3.0—Design requirements:
 - IEC Wind Turbine Class I
 - IEC Wind Turbine Class II
 - IEC Wind Turbine Class III
 - IEC Wind Turbine Class IV
 - IEC Wind Turbine Class S
- .04 Wind turbine class shall be determined by the rating of the turbine.
- .05 The registrant may choose to disclose performance in additional wind turbine classes, including the following:
 - Turbulence characteristics
 - Mixed class (e.g., IEC Wind Turbine Class I / II)

- Onshore
- Offshore

RR0103-02. Backlog cancellations associated with community or ecological impacts

.06 The registrant shall disclose the amount of its order backlog, in U.S. dollars, that was subject to cancellation during the fiscal year for reasons related to or associated with community or ecological impacts, where:

- Order backlog is defined by the registrant, consistent with its existing public disclosure of order backlog.
- Order backlog cancellations are defined as the amount of the order backlog canceled, reduced, terminated, deferred such that it no longer meets the registrant’s definition of order backlog, or removed from the order backlog for any reason other than conversion to revenue or foreign exchange rate fluctuations.
 - Order backlog cancellations include those that occur for reasons including, but not limited to, customer’s failure to obtain necessary project permitting, customer’s voluntary project cancellation, and reduction in project scope due to financial constraints.
- Order backlog cancellations for reasons related to or associated with community or ecological impact are defined as those cancellations that can reasonably be determined to relate, in whole or in part, to:
 - Community opposition to customer wind turbine project development or operations, including, but not limited to, opposition related to noise emissions, land use, visual aesthetics, and safety of human health or property; or
 - Ecological impact or risks of ecological impact of customer wind turbine project development or operations, including, but not limited to, risks to wildlife or habitat loss.

.07 The registrant may choose to disclose order backlog cancellations by wind turbine capacity.

.08 The registrant may choose to discuss specific order backlog cancellations, including root cause and corrective actions to prevent future order backlog cancellations.

RR0103-03. Description of turbine design efforts to address ecological and community impacts of wind energy production

.09 The registrant shall describe turbine design efforts used to address ecological and community impacts of wind energy production, where:

- Ecological impacts may include, but are not limited to, risk of bird and bat deaths, land-use requirements, and ecological impact of construction.
- Community impacts may include, but are not limited to, noise emissions, visual aesthetics, land-use requirements, and safety of human health and property.

- .10 The scope of disclosure shall include physical technologies and modifications to wind turbine design as well as operational control software (e.g., SCADA systems) that may mitigate ecological and community impacts.
- Physical technologies include, but are not limited to, blade heating elements, wildlife detection technologies (e.g., radar), and wildlife deterrent technologies (e.g., ultrasonic transmitters).
 - Modifications to wind turbine design include, but are not limited to, sudden curtailment capabilities, resilience for sudden curtailments, integration of wildlife risk mitigation into cut-in speed management, and aesthetic design to mitigate wildlife risk and community opposition.
- .11 The registrant may choose to discuss its role in wind project siting, if applicable. Elements to discuss include the extent of the registrant's role in siting analysis and/or selection and the incorporation of ecological and community impacts into siting analysis and/or selection.

Design for Materials Efficiency

Description

The Wind Energy industry's long-term success depends upon its ability to produce energy at a comparatively lower cost than other energy sources. Steel is one of the largest cost components of turbines and has exhibited price volatility in the past. The extraction and production of steel and other materials used in turbine construction can have environmental consequences, including greenhouse gas (GHG) emissions. At the same time, over the past several years, wind turbines have grown rapidly in size, both in terms of the tower height and the swept area of the rotor, to improve energy output and increase the potential for wind energy production in more areas. To achieve this expansion cost effectively, however, companies can find innovative methods to increase turbine tower height and swept areas while more efficiently using steel and other expensive materials. Design decisions might also determine the ease of transport of larger components. These factors could influence companies' competitiveness and market share, costs of production, and operational risks related to the supply and price volatility of raw materials, and could affect the ability of the wind energy industry to scale up. Design for materials efficiency is also vital to maintaining the low lifecycle environmental footprint of the industry.

Accounting Metrics

RR0103-04. Top five materials consumed, each by wind turbine class

.12 For each of the following wind turbine classes, the registrant shall disclose the weight, in metric tons, of the five heaviest materials in delivered wind turbines during the fiscal year.

- Wind turbine classes are defined by the International Electrotechnical Commission's IEC 61400-1, Edition 3.0—Design requirements:
 - IEC Wind Turbine Class I
 - IEC Wind Turbine Class II
 - IEC Wind Turbine Class III
 - IEC Wind Turbine Class IV
 - IEC Wind Turbine Class S

.13 Wind turbine class shall be determined by the rating of the turbine.

.14 The scope of disclosure includes material weights for parts, components, and commodities in the final delivered turbine and excludes the weight of materials consumed in production (e.g., waste), freight, storage, and installation (e.g., foundation).

- Materials may include, but are not limited to, steel, iron, copper, aluminum, fiberglass, or carbon fiber.

.15 The registrant shall disclose performance in the following table format:

Table 2. Weight of Top Five Materials Consumed, by Wind Turbine Class

IEC Wind Turbine Class	Turbines Delivered	Material 1	Material 2	Material 3	Material 4	Material 5	Material 6
	Number	t	t	t	t	t	t
IEC I							
IEC II							
IEC III							

.16 The registrant may choose to disclose weight of five heaviest materials in additional wind turbine classes, including the following:

- Turbulence characteristics
- Mixed class (e.g., IEC Wind Turbine Class I / II)
- Onshore
- Offshore

.17 The registrant may choose to disclose additional material weights that may represent significant materials costs, supply chain risks, or exposure to pricing volatility.

RR0103-05. Average turbine (1) weight scaling relationship and (2) weight to specific power relationship, by wind turbine class

.18 For each of the following wind turbine classes, the registrant shall disclose the average (1) weight scaling relationship and (2) weight to specific power relationship of wind turbines delivered during the fiscal year, weighted by turbine deliveries per wind turbine class:

- Wind turbine classes are defined by the International Electrotechnical Commission’s IEC 61400-1, Edition 3.0—Design requirements:
 - IEC Wind Turbine Class I
 - IEC Wind Turbine Class II
 - IEC Wind Turbine Class III
 - IEC Wind Turbine Class IV
 - IEC Wind Turbine Class S

- .19 Wind turbine class shall be determined by the rating of the turbine.
- .20 The registrant may choose to disclose relationships in additional wind turbine classes, including the following:
- Turbulence characteristics
 - Mixed class (e.g., IEC Wind Turbine Class I / II)
 - Onshore
 - Offshore
- .21 The registrant shall calculate the weight scaling relationship as: turbine weight / (rotor swept area * hub height).
- Rotor swept area is defined as the area, in square meters, of the circle swept by the turbine blades.
 - Hub height is defined as the distance, in meters, from the turbine platform to the rotor shaft.
 - Weight scaling relationship shall be disclosed in metric tons per cubic meters.
- .22 The registrant shall calculate the weight to specific power relationship as: turbine weight divided by turbine specific power.
- Turbine specific power is calculated as turbine capacity divided by rotor swept area.
 - Turbine capacity is the rated turbine capacity, defined as the maximum output (generation) of a wind turbine, in watts (W), also referred to as “nameplate capacity.”
 - Weight to specific power relationship shall be disclosed in metric tons per the product of watts and square meters.
- .23 The scope of turbine weight includes material weights for parts, components, and commodities in the final delivered turbine and excludes the weight of materials consumed in production (e.g., waste), freight, storage, and installation (e.g., foundation).

.24 The registrant shall disclose the direct inputs into turbine weight (1) scaling relationship and (2) specific power relationship, and summarize its findings in the following table format:

Table 2. Average Turbine (1) Weight Scaling Relationship and (2) Weight to Specific Power Relationship

IEC Wind Turbine Class	Turbines Delivered	Weight	Capacity	Rotor Swept Area	Hub Height	Specific Power	Weight Scaling Relationship	Weight to Specific Power Relationship
	Number	t	W	m ²	m	Wm ²	t/m ³	t/(W/m ²)
IEC I								
IEC II								
IEC III								

RR0103-06. Discussion of design approach to optimize the materials efficiency of wind turbines.

.25 The registrant shall discuss its approach to improving the materials efficiency of wind turbines, including design considerations and materials selection to optimize:

- Weight of materials consumed;
- Cost of materials consumed;
- Capacity and capacity factor by materials consumed; and
- Lifespan.

.26 The scope of disclosure shall include materials selection and modifications to wind turbine design as well as operational control software (e.g., SCADA systems) that may increase the materials efficiency of wind turbines.

- Materials selection includes, but is not limited to, priorities in materials selection, emphasis on materials innovation and development, materials risk assessments, and objectives around materials consumption.
- Modifications to wind turbine design include, but are not limited to, innovation in design to reduce materials consumption, innovation in design to increase turbine capacity or capacity factor, strategies to reduce waste created in turbine manufacturing, and design to reduce materials consumed in installation of wind turbines (e.g., foundation).

Sensitive & Critical Materials Sourcing

Description

Wind energy companies source sensitive raw materials from global supply chains for use in turbines, including critical rare earth minerals such as neodymium and dysprosium, and sensitive “conflict” minerals, which include tin, tantalum, tungsten, and gold. Direct drive turbines, which are being increasingly used for their reliability, can require significantly more rare earth minerals than more traditional drive trains. The extraction and production of sensitive and critical materials can have negative environmental and social impacts, including effects on human health of hazardous waste by-products and contribution to conflict in and near the Democratic Republic of the Congo. Governmental support of this industry is a key demand driver, placing wind energy firms at a particularly high reputational risk if they are connected to the sourcing of minerals associated with violence, illness, and environmental degradation. Wind energy firms are also exposed to the risk of supply chain disruptions and input price increases or volatility from the use of such materials. These risks arise from a low substitution ratio, concentration of deposits in a few countries, geopolitical considerations, and competition from other industries. Companies are also required to comply with U.S. regulations and external pressure to track and eliminate conflict materials in supply chains. Companies can minimize negative externalities and protect themselves from related operational and reputational risks through creating transparency in their supply chains, working actively to source materials from reliable suppliers or regions that have minimal environmental or social risks associated with them, and supporting research for alternative inputs.

Accounting Metrics

RR0103-07. Percentage of materials costs for critical materials

.27 The registrant shall calculate the percentage as: the cost of raw materials that contain critical materials divided by total cost of raw materials.

- The scope of disclosure includes materials costs for parts, components, commodities, associated freight, and storage, and excludes those for overhead, labor, recalls, warranties, or other costs of goods sold.

.28 A critical material is defined, consistent with the National Research Council’s “Minerals, Critical Minerals, and the U.S. Economy,” as one that is both essential in use and subject to the risk of supply restriction.

.29 At a minimum, the scope of critical materials includes the following minerals and metals:

- Antimony, cobalt, fluorspar, gallium, germanium, graphite, indium, magnesium, niobium, tantalum, and tungsten;
- Platinum group metals (platinum, palladium, iridium, rhodium, ruthenium, and osmium); and
- Rare earth elements, which include yttrium, scandium, lanthanum, and the lanthanides (cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, and lutetium).

RR0103-08. Percentage of tungsten, tin, tantalum, and gold smelters within the supply chain that are verified conflict-free

.30 The registrant shall calculate the percentage as the number of tungsten, tin, tantalum, and gold smelters and/or refineries within its supply chain that are verified to be conflict-free divided by the total number of tungsten, tin, tantalum, and gold smelters and/or refineries within its supply chain.

.31 A smelter or refiner is considered to be conflict-free if it can demonstrate compliance with:

- The Electronic Industry Citizenship Coalition (EICC) and Global e-Sustainability Initiatives (GeSI) Conflict-Free Smelter Program (CFSP) assessment protocols.
- The Responsible Jewellery Council's (RJC) Chain-of-Custody (CoC) Standard.

.32 A smelter or refinery is considered to be within the registrant's supply chain if it supplies, or is approved to supply, tungsten, tin, tantalum, or gold that is contained in any product the registrant manufactures or contracts to be manufactured.

- The scope includes smelters or refineries that supply material directly to the registrant as well as those that supply material to any of its suppliers of raw materials, components, or subassemblies.

RR0103-09. Discussion of the management of risks associated with the use of critical materials and conflict minerals

.33 The registrant shall discuss its strategic approach to managing its risks associated with usage of critical materials and conflict minerals in its products, including physical limits on availability, access, price, and reputational risks, where:

- A critical material is defined, consistent with the National Research Council's "Minerals, Critical Minerals, and the U.S. Economy," as one that is both essential in use and subject to the risk of supply restriction. At a minimum, the scope of critical materials includes the following minerals and metals defined by the National Research Council:
 - Antimony, cobalt, fluorspar, gallium, germanium, graphite, indium, magnesium, niobium, tantalum, and tungsten;
 - Platinum group metals (platinum, palladium, iridium, rhodium, ruthenium, and osmium); and
 - Rare earth elements, which include yttrium, scandium, lanthanum, and the lanthanides (cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, and lutetium).
- Conflict minerals are defined as tungsten, tin, tantalum, and gold.

.34 The registrant should identify which materials and minerals present a risk to its operations, which type of risk they represent, and the strategies the registrant uses to mitigate the risk.

- .35 For critical materials, relevant strategies to discuss include diversification of suppliers, stockpiling of materials, expenditures in research and development (R&D) for alternative and substitute materials, and investments in recycling technology for critical materials.
- .36 For conflict minerals, relevant strategies to discuss include due diligence practices, supply chain auditing, supply chain engagement, and partnerships with industry groups or nongovernmental development organizations.

Safety of Wind Farm Operations

Description

Many wind turbine manufacturers offer higher-margin operations and maintenance (O&M) services for wind farm owners or operators together with the sales of their products. These activities may include installation, maintenance, monitoring, and repairing turbine installations. Wind farm operations can be affected by accidents, impacting not only employees and contractors of wind energy companies and project owners, but also property and persons located near wind farms. Accidents may occur due to failure of blades and major components from fires, poor maintenance, extreme weather, design defects, or poor quality control in turbine manufacturing. Furthermore, employees and contractors working on O&M services are exposed to physical dangers including falls from height, electrical hazards, and moving mechanical parts. Product design and the quality of O&M services are therefore critical for the safety of wind farm operations, with the potential to affect company reputations and demand for products and services. Operational downtime and impacts on wind farm insurance costs as a result of frequent or high-magnitude accidents have the potential to add to the total costs of operating wind farms. Wind farm owners or developers may therefore consider the safety record of turbine and service providers in their requests for tender. A company's product and service safety record can also affect warranty claims. Companies that can improve turbine safety and safety during O&M can potentially reduce operating and extraordinary expenses and increase their market share.

Accounting Metrics

RR0103-10. (1) Total recordable injury rate (TRIR) and (2) fatality rate for (a) direct employees and (b) contract employees

- .37 Registrants whose workforce is entirely U.S.-based shall disclose their total recordable injury rate (TRIR) and fatality rate, as calculated and reported in Occupational Safety and Health Administration (OSHA) Form 300.
- OSHA guidelines provide details for the determination of whether an event is a recordable occupational incident as well as definitions for exemptions for incidents that occur in the work environment, but are not occupational.
- .38 Registrants whose workforce includes non-U.S.-based employees shall calculate their TRIR according to the U.S. Bureau of Labor Statistics guidance and/or using the U.S. Bureau of Labor Statistics calculator.
- .39 The registrant shall disclose its TRIR separately for its direct employees and for contract employees, where:
- Direct employees are all those employees on the registrant's payroll, whether they are labor, executive, hourly, salary, part-time, seasonal, or migrant workers.
 - Contract employees are those who are not on the registrant's payroll, but who are supervised by the registrant on a day-to-day basis, including independent contractors and those employed by third parties (e.g., temp agencies, labor brokers, etc.).
- .40 The scope includes all employees, domestic and foreign.
- .41 Rates shall be calculated as (statistic count / total hours worked) * 200,000.

RR0103-11. Warranty and service-and-maintenance costs associated with accidents

.42 The registrant shall calculate the amount as the actual warranty costs and service-and-maintenance costs associated with, connected to, or resulting from wind turbine accidents.

- An accident is defined according to the National Safety Council as an undesired event that results in personal injury or property damage.
- Actual warranty costs are costs incurred resulting from warranties the registrant may provide for its delivered wind turbines, regardless of warranty provisions.
- Service-and-maintenance costs are costs incurred resulting from contracts relating to the service and/or maintenance of the registrant's delivered wind turbines.
- Examples of accidents that may result in actual warranty costs or service-and-maintenance costs include wind turbine blade breakage, fires, and structural failures.

.43 The scope of disclosure includes delivered wind turbines with effective warranties or service-and-maintenance contracts.

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SUSTAINABILITY ACCOUNTING STANDARD
RENEWABLE RESOURCES & ALTERNATIVE ENERGY SECTOR

FUEL CELLS & INDUSTRIAL BATTERIES

Sustainability Accounting Standard

Sustainable Industry Classification System™ (SICS™) #RR0104
Prepared by the
Sustainability Accounting Standards Board®

July 2015

Exposure Draft Standard for Public Comment

FUEL CELLS & INDUSTRIAL BATTERIES

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 non-profit organization. Through 2016, SASB is developing standards for more than 80 industries in 10 sectors.

About this Standard

This Standard is an exposure draft presented for public review and comment. This version is not intended for implementation.

The public comment period lasts for 90 days, beginning on Tuesday, July 7th, 2015, and ending on Monday, October 5th, 2015. The Standard is subject to change thereafter.

For instructions on providing comments to SASB, [please click here](#).

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INTRODUCTION

Purpose & Structure

This document contains the SASB Sustainability Accounting Standard (SASB Standard) for the Fuel Cells & Industrial Batteries industry.

SASB Sustainability Accounting 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 Standards identify sustainability topics at an industry level, which may constitute material information—depending on a company’s specific operating context—for a company within that industry. SASB Standards are intended to provide guidance to company management, which is ultimately responsible for determining which information is material and should therefore be included in its Form 10-K or 20-F and other periodic SEC filings.

SASB Standards provide companies with standardized sustainability metrics designed to communicate performance on industry level sustainability topics. When making disclosure on sustainability topics, companies can use SASB Standards to help ensure that disclosure is standardized and therefore decision-useful, relevant, comparable, and complete.

SASB Standards are intended to constitute “suitable criteria” as defined by AT 101.23 -. 32¹ and referenced in AT 701², as having the following attributes:

- *Objectivity*—Criteria should be free from bias.
- *Measurability*—Criteria should permit reasonably consistent measurements, qualitative or quantitative, of subject matter.
- *Completeness*—Criteria should be sufficiently complete so that those relevant factors that would alter a conclusion about subject matter are not omitted.
- *Relevance*—Criteria should be relevant to the subject matter.

Industry Description

The Fuel Cells & Industrial Batteries industry is composed of two distinct segments of alternative energy technology providers: companies that manufacture fuel cells for energy production and companies that manufacture energy storage equipment, such as batteries, that is primarily used for industrial or utility-scale purposes. Manufacturers in this industry primarily sell products to other companies for use in varied energy-generation and storage applications, from commercial business applications to large-scale energy projects for utilities. Companies listed on U.S. exchanges or traded over the counter are primarily headquartered in the U.S. but have global operations and sell products worldwide.

¹ http://pcaobus.org/Standards/Attestation/Pages/AT101.aspx#at_101_fn7

² <http://pcaobus.org/Standards/Attestation/Pages/AT701.aspx>

Note: For the purposes of SASB standards, this industry does not include fuel cells or batteries used in light automotive vehicle applications. See SASB Standards for Auto Parts for details on reporting this business segment. This industry also does not include non-industrial batteries for personal consumer use, which are classified under the Household & Personal Products industry.

Guidance for Disclosure of Sustainability Topics in SEC Filings

1. Industry-Level Sustainability Topics

For the Fuel Cells & Industrial Batteries industry, SASB has identified the following sustainability disclosure topics:

- Energy Management
- Workforce Health & Safety
- Product Efficiency
- Product Design & End-of-Life Management
- Sensitive & Critical Materials Sourcing

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.”^{3, 4}

SASB has attempted to identify those sustainability topics that are reasonably likely to have a material effect on the financial condition or operating performance of companies within each SICs industry. SASB recognizes, however, that each company is ultimately responsible for determining what information should be disclosed within the context of Regulation S-K and other guidance.

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.”

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

The SEC has provided guidance for companies to use in determining whether a trend or uncertainty should be disclosed. The two-part assessment prescribed by the SEC, based on probability and magnitude, can be applied to the topics included within this standard:

- 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.

³ TSC Industries v. Northway, Inc., 426 U.S. 438 (1976).

⁴ C.F.R. 229.303(item 303)(a)(3)(ii).

- 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.

3. Sustainability Accounting Standard Disclosures in Form 10-K

a. Management’s Discussion and Analysis

For purposes of comparability and usability, companies should consider making disclosure on sustainability topics in the MD&A, in a sub-section titled **“Sustainability Accounting Standards Disclosures.”**⁵

b. Other Relevant Sections of Form 10-K

In addition to the MD&A section, it may be relevant for companies to disclose sustainability information in other sections of Form 10-K, including, but not limited to:

- **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/>.

⁵ [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 for Sustainability Topics

For each sustainability topic included in the Fuel Cells & Industrial Batteries industry Sustainability Accounting Standard, SASB identifies accounting metrics.

SASB recommends that each company consider using these sustainability accounting metrics when preparing disclosures on the sustainability topics identified herein;

As appropriate—and consistent with Rule 12b-20⁶—when disclosing a sustainability topic identified by this Standard, 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 **relative performance** with respect to its peers;
- 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 \(SICSTM\)](#). If a registrant generates significant revenue from multiple industries, SASB recommends that it also consider sustainability topics that SASB has identified for those industries and disclose the associated SASB accounting metrics.

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.

Users of the SASB Standards

The SASB Standards are intended to provide guidance 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),⁷ 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. 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.

⁶ 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.”

⁷ 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 that are consolidated for financial reporting purposes as defined by accounting principles generally accepted in the United States for consistency with other accompanying information within SEC filings;⁸
- 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 the effect of sustainability topics on the company's financial condition or operating performance (typically, this disclosure would be limited to risks and opportunities associated with these entities).

Reporting Format

Use of Financial Data

In instances where accounting metrics, activity metrics, and technical protocols in this standard incorporate financial data (e.g., revenues, cost of sales, expenses recorded and disclosed for fines, etc.), such financial data shall be prepared in accordance with the accounting principles generally accepted in the United States of America ("US GAAP") and be consistent with the corresponding financial data reported within the registrant's SEC filings. Should accounting metrics, activity metrics and technical protocols in this standard incorporate disclosure of financial data that is not prepared in accordance with US GAAP, the registrant shall disclose such information in accordance with the SEC Regulation G.

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).

⁸ See US GAAP consolidation rules (Section 810).

Activity metrics disclosed should:

- Convey contextual information that would not otherwise be apparent from SASB accounting metrics.
- Be deemed generally useful for an investor relying on SASB accounting metrics 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.⁹

Where relevant, SASB recommends specific activity metrics that—at a minimum—should accompany SASB accounting metric disclosures.

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of units sold	Quantitative	Number	RR0104-A
Total storage capacity of batteries sold	Quantitative	Watts (W)	RR0104-B
Total energy production capacity of fuel cells sold	Quantitative	Watts (W)	RR0104-C

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 reliance on data from third-party reporting systems and technologies, 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 occur 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.

⁹ *Improving Business Reporting: Insights into Enhancing Voluntary Disclosures*, FASB Business Reporting Research Project, January 29, 2001.

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.

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.”

The following sections contain the disclosure guidance associated with each accounting metric such as guidance on definitions, scope, accounting, compilation, and presentation.

The term “shall” is used throughout this document to indicate those elements that reflect requirements of the Standard. The terms “should” and “may” are used to indicate guidance, which, although not required, provides a recommended means of disclosure.

Table 1. Sustainability Disclosure Topics & Accounting Metrics

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management	Total energy consumed, percentage grid electricity, percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	RR0104-01
Workforce Health & Safety	(1) Total recordable injury rate (TRIR) and (2) fatality rate	Quantitative	Rate	RR0104-02
	Discussion of efforts to assess, monitor, and reduce exposure of workforce to human health hazards	Discussion and Analysis	n/a	RR0104-03
Product Efficiency	Average (1) specific power and (2) specific energy, by product application and technology type	Quantitative	Specific power (W/kg), Specific energy (Wh/kg)	RR0104-04
	Average energy efficiency of fuel cells as (1) electrical efficiency and (2) thermal efficiency, by product application and technology type	Quantitative	Percentage (%)	RR0104-05
	Average energy efficiency of batteries as coulombic efficiency, by product application and technology type	Quantitative	Percentage (%)	RR0104-06
	Average operating lifetime of fuel cells, by product application and technology type	Quantitative	Hours (h)	RR0104-07
	Average operating lifetime of batteries, by product application and technology type	Quantitative	Number of cycles	RR0104-08
Product Design & End-of-Life Management	Weight of recycled, remanufactured, or reused materials consumed in products sold	Quantitative	Metric tons (t)	RR0104-09
	Percentage of products sold that are recyclable or reusable	Quantitative	Percentage (%) by weight	RR0104-10
	Weight of end-of-life material recovered, percentage of recovered materials that are recycled	Quantitative	Metric tons (t), Percentage (%)	RR0104-11
	Discussion of approach to manage use, reclamation, and disposal of hazardous materials	Discussion and Analysis	n/a	RR0104-12
Sensitive & Critical Materials Sourcing	Percentage of materials costs for critical materials	Quantitative	Percentage (%)	RR0104-13
	Percentage of tungsten, tin, tantalum, and gold smelters within the supply chain that are verified conflict-free	Quantitative	Percentage (%)	RR0104-14
	Discussion of the management of risks associated with the use of critical materials and conflict minerals	Discussion and Analysis	n/a	RR0104-15

Energy Management

Description

Manufacturing and research and development (R&D) in the Fuel Cells & Industrial Batteries industry requires significant energy consumption to power cooling, ventilation, lighting, and product testing systems. Purchased electricity can represent a major share of the energy sources used in the industry and can account for a notable proportion of the total cost of materials and value added. Various sustainability factors are contributing to an increase in the cost of conventional electricity while making alternative sources cost competitive. These factors include greenhouse gas (GHG) emissions pricing, incentives for energy efficiency and renewable energy, and risks associated with nuclear energy and its increasingly limited license to operate. Energy efficiency efforts can have a significant positive impact on operational efficiency and profitability, especially due to the fact that many companies operate on relatively low or negative margins. By improving energy efficiency in the manufacturing process and exploring the use of alternative energy sources, including using their own products to power their facilities, fuel cell and industrial battery companies can achieve cost savings, some of which could be passed through to reduce the costs of fuel cells and batteries for customers and improve commercial viability.

Accounting Metrics

RR0104-01. Total energy consumed, percentage grid electricity, percentage renewable

- .01 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 (except for fleet vehicles), purchased electricity, and heating, cooling, and steam energy.
- .02 In calculating energy consumption from fuels and biofuels, the registrant 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).
- .03 The registrant shall disclose purchased grid electricity consumption as a percentage of its total energy consumption.
- .04 The registrant shall disclose renewable energy consumption as a percentage of its total energy consumption.

.05 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 on-site, 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.¹⁰
- Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, consistent with the U.S. Environmental Protection Agency's (EPA) [definitions](#), such as geothermal, wind, solar, hydro, and biomass.

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

- Energy from hydro sources that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard.
- Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered "eligible renewables" according to the Green-e Energy National Standard Version 2.5 (2014), and materials that are eligible for a state Renewable Portfolio Standard.

.07 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 (for energy data including electricity from solar or wind energy).

¹⁰ SASB recognizes that RECs reflect the environmental attributes of renewable energy that have been introduced to the grid.

Workforce Health & Safety

Description

Fuel cell and industrial battery manufacturing workers may be exposed to hazardous substances or workplace accidents that can have chronic or acute health impacts. Chronic health impacts can develop as a result of repeated or prolonged exposure to hazardous substances. Since lead is a key component in many traditional batteries and is absorbed into the body by ingestion or inhalation, battery plant workers can be subject to lead toxicity, which can have a variety of physical and mental health impacts. While injury rates are generally low in this industry relative to others, companies have faced regulatory action due to violations of health and safety standards. Companies could also face litigation as a result of fatalities or chronic health impacts from working in fuel cell and battery manufacturing or recycling facilities. Companies that develop a strong safety culture, including through providing health and safety training, protective gear, improved ventilation, and regular health monitoring, can improve workforce health and safety performance and mitigate regulatory and litigation risks.

Accounting Metrics

RR0104-02. (1) Total recordable injury rate (TRIR) and (2) fatality rate

- .08 Registrants whose workforce is entirely U.S.-based shall disclose their TRIR and fatality rate as calculated and reported in the Occupational Safety and Health Administration's (OSHA) Form 300.
 - OSHA guidelines provide details on determining whether an event is a recordable occupational incident and definitions for exemptions for incidents that occur in the work environment but are not occupational.
- .09 Registrants whose workforce includes non-U.S.-based employees shall calculate their TRIR and fatality rate according to the U.S. Bureau of Labor Statistics [guidance](#) and/or using the U.S. Bureau of Labor Statistics [calculator](#).
- .10 The registrant shall disclose its TRIR and fatality rate for all employees, including direct full-time employees, contract employees, and seasonal and migrant employees.
- .11 The scope includes all employees, domestic and foreign.
- .12 Rates shall be calculated as: $(\text{statistic count} / \text{total hours worked}) * 200,000$.

RR0104-03. Discussion of efforts to assess, monitor, and reduce exposure of workforce to human health hazards.

- .13 The registrant shall discuss efforts to assess, monitor, and reduce the exposure of employees to human health hazards including, but not limited to, solvents, corrosives, lead (and its compounds), arsenic (and its compounds), cadmium, and sulfuric acid, as well as known or suspected carcinogens, teratogens, and mutagens, and efforts to reduce the occurrence of events including, but not limited to, fires, explosions, freeze burns, and electrocution.

- .14 The registrant shall describe its management approach in the context of short-term (i.e., acute) risks and long-term (i.e., chronic) risks.
- .15 Relevant efforts to discuss include, but are not limited to, risk assessments, risk monitoring, participation in long-term health studies, implementation of technology to control worker exposure, worker use of personal protective equipment (PPE), automation of processes, and phasing out, substituting, or using alternative materials.
- .16 The registrant shall include a description of risk monitoring policies as they apply to workforce lead exposure, including the monitoring of workforce blood lead levels (BLL) where lead exposure may exist.
- .17 The registrant may choose to discuss company policies regarding maximum BLL thresholds and frequency of BLL testing, including compliance with regulatory or industry association maximum BLL thresholds and testing frequency, such as OSHA and the American Conference of Governmental Industrial Hygienists (ACGIH).
- .18 The scope of the workforce shall focus on employees and contract employees in manufacturing or recycling plants but should discuss other members of the workforce as relevant.

Product Efficiency

Description

Design decisions in the Fuel Cells & Industrial Batteries industry can drive energy and thermal efficiency and enhanced storage capacities in the product-use phase. There is increasing customer demand and regulatory support for energy-efficient products with lower environmental impacts and reduced total cost of ownership. The widespread adoption of fuel cell technologies, in particular, can be limited due to their high costs relative to competing energy sources. Together, these factors are driving fuel cell and industrial battery manufacturers to improve use-phase charging and thermal efficiency of products as well as operating lifetimes. Improved efficiencies could help lower total costs of ownership, a key driver of competitiveness. As the rate of adoption of fuel cells and industrial batteries increases, it will become increasingly important to ensure that product design is maximized for efficient energy production or storage. In particular, cost-effective advances in battery technology to increase storage capabilities and improve charging efficiencies critical to the integration of renewable energy technologies into the grid. Fuel cell and industrial battery manufacturers that are able to improve product efficiency in the use phase will be able to satisfy growing demand, pressured by stricter environmental regulations, high energy costs, and customer preferences.

Accounting Metrics

RR0104-04. Average (1) specific power and (2) specific energy, by product application and technology type.

.19 The registrant shall disclose the average (1) specific power and (2) specific energy, by product application and technology type, weighted by unit sales volume per product application and technology type.

- Specific power, or gravimetric power density, is calculated as the ratio of maximum available rated power in watts to the mass of the product in kilograms: watts / kilograms (W/kg).
- Specific energy, or gravimetric energy density, is calculated as the ratio of nominal energy in watt-hours to the mass of the product in kilograms: watt-hours / kilograms (Wh/kg).

.20 The registrant shall disclose performance by, at minimum, the following application types, where applicable: portable, motive, and stationary, each further categorized by the following technology types:

- Batteries shall be categorized by, at minimum, the following technology types, where applicable: lead-based, nickel-based, lithium-based, sodium-based, and “all other.”
- Fuel cells shall be categorized by, at minimum, the following technology types, where applicable: direct methanol (DMFC), polymer electrolyte (PEM), alkaline (AFC), phosphoric acid (PAFC), molten carbonate (MCFC), solid oxide fuel cell (SOFC), and “all other.”
- The registrant may include additional categories of application types and/or technology types, where appropriate, including categories for new products with low sales volumes but strategic importance in terms of product efficiency or other attributes.

- .21 The registrant shall measure and disclose performance in accordance with the applicable product application and/or technology type standard(s), and shall disclose the standard(s) utilized for performance measurement.
- Applicable standard(s) may include IEC 62282-3-200—Stationary fuel cell power systems, SAE J2615—Testing Performance of Fuel Cell Systems for Automotive Applications, SAE J240—Automotive storage batteries, and SAE J2185—Heavy-duty storage batteries.
- .22 The registrant may exclude stationary batteries and stationary fuel cells from disclosure under RR0104-04 if such performance measurements are deemed not applicable to the product application type. This may apply to industrial or utility scale stationary batteries and fuel cells.

RR0104-05. Average energy efficiency of fuel cells as (1) electrical efficiency and (2) thermal efficiency, by product application and technology type

- .23 The registrant shall disclose the average energy efficiency of fuel cells as (1) electrical efficiency and (2) thermal efficiency, weighted by unit sales volume per product application and technology type.
- Electrical efficiency is calculated as net electricity produced divided by total fuel energy input.
 - Thermal efficiency is calculated as net useful power output divided by total fuel energy input.
 - The registrant may use lower heating values (LHV) or higher heating values (HHV) in the calculation of electrical efficiency and thermal efficiency, and shall disclose the heating values used.
- .24 The registrant should disclose any other fuel cell outputs that have economic value, including an appropriate measurement of sales-weighted average value, by product application and technology type.
- .25 The registrant shall measure and disclose performance in accordance with the applicable product application and/or technology type standard(s), and shall disclose the standard(s) utilized for performance measurement.
- Applicable standard(s) may include IEC 62282-3-200—Stationary fuel cell power systems and SAE J2615—Testing Performance of Fuel Cell Systems for Automotive Applications.
- .26 The registrant shall disclose performance by, at minimum, the following application types, where applicable: portable, motive, and stationary, each further categorized by, at minimum, the following technology types, where applicable: direct methanol (DMFC), polymer electrolyte (PEM), alkaline (AFC), phosphoric acid (PAFC), molten carbonate (MCFC), solid oxide fuel cell (SOFC), and “all other.”

RR0104-06. Average energy efficiency of batteries as coulombic efficiency, by product application and technology type

- .27 The registrant shall disclose the average energy efficiency of batteries as coulombic efficiency, weighted by unit sales volume per product application and technology type.
- Coulombic efficiency is calculated as energy removed from a battery during discharge divided by the energy used during charging to restore the original capacity.

.28 The registrant shall measure and disclose performance in accordance with the applicable product application and/or technology type standard(s), and shall disclose the standard(s) utilized for performance measurement.

- Applicable standard(s) may include SAE J240—Automotive storage batteries and SAE J2185—Heavy-duty storage batteries.

.29 The registrant shall disclose performance by, at minimum, the following application types, where applicable: portable, motive, and stationary, each further categorized by, at minimum, the following technology types, where applicable: lead-based, nickel-based, lithium-based, sodium-based, and “all other.”

RR0104-07. Average operating lifetime of fuel cells, by product application and technology type

.30 The registrant shall disclose the average operating lifetime of fuel cells, weighted by unit sales volume per product application and technology type.

- Operating lifetime of fuel cells is calculated as operating hours until 20% net power degradation occurs.

.31 The registrant shall measure operating life in accordance with applicable product application and/or technology type standard(s), and shall disclose the standard(s) utilized for performance measurement.

- Applicable standard(s) may include IEC 62282-3-200—Stationary fuel cell power systems and SAE J2615—Testing Performance of Fuel Cell Systems for Automotive Applications.

.32 The registrant shall disclose performance by, at minimum, the following application types, where applicable: portable, motive, and stationary, each further categorized by, at minimum, the following technology types, where applicable: direct methanol (DMFC), polymer electrolyte (PEM), alkaline (AFC), phosphoric acid (PAFC), molten carbonate (MCFC), solid oxide fuel cell (SOFC), and “all other.”

RR0104-08. Average operating lifetime of batteries, by product application and technology type

.33 The registrant shall disclose the average operating lifetime of batteries, weighted by unit sales volume per product application and technology type.

- Operating lifetime of batteries is calculated as the number of times the battery can be fully charged and discharged, or cycles, until 20% capacity degradation occurs.

.34 The registrant shall measure operating life in accordance with applicable product application and/or technology type standard(s), and shall disclose the standard(s) utilized for performance measurement.

- Applicable standard(s) may include SAE J240—Automotive storage batteries and SAE J2185—Heavy-duty storage batteries.

.35 The registrant shall disclose performance by, at minimum, the following application types, where applicable: portable, motive, and stationary, each further categorized by, at minimum, the following technology types, where applicable: lead-based, nickel-based, lithium-based, sodium-based, and “all other.”

Product Design & End-of-Life Management

Description

As the rate of adoption of fuel cells and industrial batteries increases and as more products reach the end-of-life stage, it will become increasingly important to ensure that product design is maximized for end-of-life management and materials efficiency. Fuel cells and batteries contain hazardous materials, which, at the end of these products' useful life, can leach into the environment if products are improperly disposed of. This can pose significant human health and environmental risks, with possible regulatory impacts for companies in some regions. The recent emergence of laws regarding the end-of-life phase of batteries has heightened the importance of the issue, creating potential added costs of managing risks as well as opportunities through regulatory incentives. Effective design for disassembly and reuse or recycling will be key to accelerating product recovery rates at the end-of-life stage in order to reduce the lifecycle impacts of fuel cells and batteries and mitigate the strain of new production on natural resources. Furthermore, given input price volatility and resource constraints for materials such as platinum, fuel cell and industrial battery companies that are able to develop take-back and recycling systems and reuse some of the recovered materials in manufacturing are likely to increase their long-term operational efficiency and improve their risk profile.

Accounting Metrics

RR0104-09. Weight of recycled, remanufactured, or reused materials consumed in products sold

- .36 The registrant shall disclose the weight, in metric tons, of raw materials consumed in products sold during the fiscal year that are derived from recycled, remanufactured, or reused content.
- .37 Recycled and remanufactured materials are defined as waste materials that have been reprocessed or treated by means of production or manufacturing processes and made into a final product or a component for incorporation into a product.
- The scope of recycled and remanufactured products includes primary recycled materials, co-products (outputs of equal value to primary recycled materials), and by-products (outputs of lesser value than primary recycled materials).
 - The scope of disclosure includes recycling conducted by the registrant or by third parties through direct contract with the registrant.
 - 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 weight recycled.
- .38 Reused materials are defined as those recovered products or components of products that are used for the same purpose for which they were conceived.
- .39 The weight of recycled, remanufactured, or reused materials shall be calculated as the weight of incoming material that was reused in products sold plus the weight of material recycled or remanufactured, through treatment or processing by the registrant or a third party, in products sold.

RR0104-10. Percentage of products sold that are recyclable or reusable

.40 The registrant shall disclose the percentage of products, by weight (in metric tons), that are reusable or recyclable, where:

- “Reusable” is defined as a product or packaging that has been conceived and designed to accomplish, within its lifecycle, a certain number of trips, rotations, or uses for the same purpose for which it was conceived, consistent with definitions in ISO 14021:1999, *Environmental labels and declarations—Self-declared environmental claims (Type II environmental labelling)*.
- “Recyclable” is defined a product or packaging that can be diverted from the waste stream through available processes and programs and can be collected, processed, and returned to use in the form of raw materials or products, consistent with definitions in ISO 14021:1999, *Environmental labels and declarations—Self-declared environmental claims (Type II environmental labelling)*.

.41 For products or product materials that are partially made of recyclable or reusable materials, the registrant shall classify the portion of the material that is recyclable or reusable based on a calculation (or estimate, where appropriate) of the weight of each portion.

.42 A product or its components shall be considered recyclable or reusable if this claim is aligned with 16 CFR Part 260, Guides for the Use of Environmental Marketing Claims; Final Rule, (also known as the “FTC Green Guides”), including the following elements:

- A product or package shall not be marketed as recyclable unless it can be collected, separated, or otherwise recovered from the waste stream through an established recycling program for reuse or use in manufacturing or assembling another item.
- When recycling facilities are available to a substantial majority (i.e., 60 percent) of consumers or communities where the item is sold, the registrant may consider the product (or product component) recyclable without a qualification.
- When recycling facilities are available to less than a substantial majority of customers or communities where the product is sold, the registrant shall only consider the product (or product components) recyclable if it makes the appropriate qualification to its customers.
- For items that are partially made of recyclable components, the registrant shall only consider those components recyclable if (a) it clearly and prominently qualifies the recyclable claim to avoid deception about which portions are recyclable, and (b) no components significantly limit the ability to disassemble and recycle the product or components of the product (e.g., the size, shape, or assembly method).

RR0104-11. Weight of end-of-life material recovered, percentage of recovered materials that are recycled

.43 The registrant shall disclose the weight, in metric tons, of materials recovered, including those recovered through recycling services, product take-back programs, and refurbishment services, where:

- The scope of disclosure shall include products, materials, and parts at the end of their useful life that would have otherwise been disposed of as waste or used for energy recovery, but have instead been collected.
- The scope of disclosure shall include both materials physically handled by the registrant and materials of which the registrant does not take physical possession, but for which it has contracted with a third party the task of collection for the expressed purpose of reuse, recycling, or refurbishment.
- The scope of disclosure excludes products and parts that are in warranty and have been collected for repairs.

.44 The percentage recycled shall be calculated as the weight of incoming material that was reused or reclaimed, plus the weight of material recycled or remanufactured (through treatment or processing) by the registrant, plus the weight of material sent externally for further recycling, divided by the total weight of incoming recovered material, where:

- A material is recycled if it is used, reused, or reclaimed.
- Reclaimed materials are defined as materials processed to recover or regenerate a usable product.
- Reused materials are defined as 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 a component for incorporation into a product.
- Materials sent for further recycling include those materials that are transferred to a third party for the express purpose of reuse, recycling, or refurbishment.
- The scope of recycled and remanufactured products includes primary recycled materials, co-products (outputs of equal value to primary recycled materials), and by-products (outputs of lesser value than primary recycled materials).
- 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 incinerated, including for energy recovery, are not considered reused, recycled, or reclaimed. 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.

.45 Electronic waste material (e-waste) shall be considered recycled only if the registrant can demonstrate that this material was transferred to entities with third-party certification to a standard for e-waste recycling such as Basel Action Network's e-Steward® standard or the U.S. EPA's Responsible Recycling Practices (R2) standard.

- The registrant shall disclose the standard(s) to which the entities it has transferred e-waste to are compliant.

RR0104-12. Discussion of approach to manage use, reclamation, and disposal of hazardous materials

.46 The registrant shall discuss its strategies to manage the use of hazardous materials, where:

- Hazardous materials include both hazardous secondary materials, per 40 CFR 260.10, and waste that meets the definition of hazardous waste under Subtitle C of the U.S. EPA's Resource Conservation and Recovery Act (RCRA), per 40 CFR 261.3.
- Hazardous materials include those that display the following characteristics: ignitability, corrosivity, reactivity, or toxicity.

.47 The registrant should identify which hazardous materials are used, its approach to design for reducing use or substituting with non-hazardous materials, and its strategies to mitigate risks associated with the use of hazardous materials.

.48 The registrant shall discuss its approach to design and strategies to increase the disposal or reclamation of hazardous materials at the product end-of-life stage, including take-back programs and direct contracts with third-party hazardous waste reclamation services.

.49 The registrant shall discuss any incidences of non-compliance with relevant hazardous materials regulations, including the use, handling, labeling, or disposal of hazardous materials.

Sensitive & Critical Materials Sourcing

Description

Rare earth elements and other critical materials are used in several different types of fuel cells and industrial batteries. Platinum, cobalt, and lead are particularly costly and resource-constrained inputs for this industry. Fuel cell and industrial battery companies are exposed to the risk of supply chain disruptions, input price increases or volatility, and damage to brand reputation from the use of critical rare earth or sensitive “conflict” minerals (which include tin, tantalum, tungsten, and gold) are used in their products. The extraction and production of materials can have negative environmental and social impacts, including contribution to conflict in and near the Democratic Republic of the Congo. Sourcing and price risks for sensitive and critical materials can arise from a low substitution ratio, concentration of deposits in only a few countries, geopolitical considerations, and competition for critical resources from other industries. Companies are also required to comply with U.S. regulations and face other pressures to track and eliminate conflict materials in supply chains. Companies that are able to limit the use of critical and conflict materials through R&D, as well as vetting the supply of the materials they do use through strong supply chain standards, will not only minimize environmental and social externalities related to extraction but also protect themselves from supply disruptions and volatile input prices. Fuel cell and industrial battery manufacturers could also benefit from ensuring that their supply chain is “conflict-free.”

Accounting Metrics

RR0104-13. Percentage of materials costs for critical materials

.50 The registrant shall calculate the percentage as the cost of raw materials that contain critical materials divided by total cost of raw materials.

- The scope of disclosure includes materials costs for parts, components, commodities, associated freight, and storage, and excludes those for overhead, labor, recalls, warranties, or other costs of goods sold.

.51 A critical material is defined, consistent with the National Research Council’s “Minerals, Critical Minerals, and the U.S. Economy,” as one that is both essential in use and subject to the risk of supply restriction.

.52 At a minimum, the scope of critical materials includes the following minerals and metals:

- Antimony, cobalt, fluor spar, gallium, germanium, graphite, indium, magnesium, niobium, tantalum, and tungsten;
- Platinum group metals (platinum, palladium, iridium, rhodium, ruthenium, and osmium); and
- Rare earth elements, which include yttrium, scandium, lanthanum, and the lanthanides (cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, and lutetium).

RR0104-14. Percentage of tungsten, tin, tantalum, and gold smelters within the supply chain that are verified conflict-free

.53 The registrant shall calculate the percentage as the number of tungsten, tin, tantalum, and gold smelters and/or refineries within its supply chain that are verified to be conflict-free divided by the total number of tungsten, tin, tantalum, and gold smelters and/or refineries within its supply chain.

.54 A smelter or refiner is considered to be conflict-free if it can demonstrate compliance with:

- The Electronic Industry Citizenship Coalition (EICC) and Global e-Sustainability Initiatives (GeSI) Conflict-Free Smelter Program (CFSP) assessment protocols.
- The Responsible Jewellery Council's (RJC) Chain-of-Custody (CoC) Standard.

.55 A smelter or refinery is considered to be within the registrant's supply chain if it supplies, or is approved to supply, tungsten, tin, tantalum, or gold that is contained in any product the registrant manufactures or contracts to be manufactured.

- The scope includes smelters or refineries that supply material directly to the registrant as well as those that supply material to any of its suppliers of raw materials, components, or subassemblies.

RR0104-15. Discussion of the management of risks associated with the use of critical materials and conflict minerals

.56 The registrant shall discuss its strategic approach to managing its risks associated with the use of critical materials and conflict minerals in its products, including physical limits on availability and access, price, and reputational risks, where:

- A critical material is defined, consistent with the National Research Council's "Minerals, Critical Minerals, and the U.S. Economy," as one that is both essential in use and subject to the risk of supply restriction. At a minimum, the scope of critical materials includes the following minerals and metals defined by the National Research Council:
 - Antimony, cobalt, fluorspar, gallium, germanium, graphite, indium, magnesium, niobium, tantalum, and tungsten;
 - Platinum group metals (platinum, palladium, iridium, rhodium, ruthenium, and osmium); and
 - Rare earth elements, which include yttrium, scandium, lanthanum, and the lanthanides (cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, and lutetium).
- Conflict minerals are defined as tungsten, tin, tantalum, and gold.

.57 The registrant should identify which materials and minerals present a risk to its operations, which type of risk they represent, and the strategies the registrant uses to mitigate the risk.

- .58 For critical materials, relevant strategies to discuss include diversification of suppliers, stockpiling of materials, expenditures in research and development (R&D) for alternative and substitute materials, and investments in recycling technology for critical materials.
- .59 For conflict minerals, relevant strategies to discuss include due diligence practices, supply chain auditing, supply chain engagement, and partnerships with industry groups or nongovernmental development organizations.

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SUSTAINABILITY ACCOUNTING STANDARD
RENEWABLE RESOURCES & ALTERNATIVE ENERGY SECTOR

FORESTRY & LOGGING

Sustainability Accounting Standard

Sustainable Industry Classification System™ (SICS™) #RR0201
Prepared by the
Sustainability Accounting Standards Board®

July 2015

Exposure Draft Standard for Public Comment

FORESTRY & LOGGING

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 non-profit organization. Through 2016, SASB is developing standards for more than 80 industries in 10 sectors.

About this Standard

This Standard is an exposure draft presented for public review and comment. This version is not intended for implementation.

The public comment period lasts for 90 days, beginning on Tuesday, July 7th, 2015, and ending on Monday, October 5th, 2015. The Standard is subject to change thereafter.

For instructions on providing comments to SASB, [please click here](#).

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INTRODUCTION

Purpose & Structure

This document contains the SASB Sustainability Accounting Standard (SASB Standard) for the Forestry & Logging industry.

SASB Sustainability Accounting 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 Standards identify sustainability topics at an industry level, which may constitute material information—depending on a company’s specific operating context—for a company within that industry. SASB Standards are intended to provide guidance to company management, which is ultimately responsible for determining which information is material and should therefore be included in its Form 10-K or 20-F and other periodic SEC filings.

SASB Standards provide companies with standardized sustainability metrics designed to communicate performance on industry level sustainability topics. When making disclosure on sustainability topics, companies can use SASB Standards to help ensure that disclosure is standardized and therefore decision-useful, relevant, comparable, and complete.

SASB Standards are intended to constitute “suitable criteria” as defined by AT 101.23 -. 32¹ and referenced in AT 701², as having the following attributes:

- *Objectivity*—Criteria should be free from bias.
- *Measurability*—Criteria should permit reasonably consistent measurements, qualitative or quantitative, of subject matter.
- *Completeness*—Criteria should be sufficiently complete so that those relevant factors that would alter a conclusion about subject matter are not omitted.
- *Relevance*—Criteria should be relevant to the subject matter.

Industry Description

The Forestry & Logging industry is composed of companies that manage forests, plant and tree nurseries, and rubber plantations; conduct logging operations; and produce timber. The industry operates natural-growth and plantation-style timberlands, which can be company-owned or leased from public or private landowners. The industry includes companies structured as real estate investment trusts focused on forestry operations. Companies typically sell timber to pulp and paper producers, wood building products manufacturers, energy producers, and a variety of other customers. The industry’s largest U.S.-listed companies primarily operate in and are domiciled in the U.S. and Canada, while some have international operations.

¹ http://pcaobus.org/Standards/Attestation/Pages/AT101.aspx#at_101_fn7

² <http://pcaobus.org/Standards/Attestation/Pages/AT701.aspx>

Guidance for Disclosure of Sustainability Topics in SEC Filings

1. Industry-Level Sustainability Topics

For the Forestry & Logging industry, SASB has identified the following sustainability disclosure topics:

- Ecosystem Services & Impacts
- Workforce Health & Safety
- Community Relations & Rights of Indigenous Peoples
- Climate Change Adaptation of Forestlands

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.”^{3, 4}

SASB has attempted to identify those sustainability topics that are reasonably likely to have a material effect on the financial condition or operating performance of companies within each SICs industry. SASB recognizes, however, that each company is ultimately responsible for determining what information should be disclosed within the context of Regulation S-K and other guidance.

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.”

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

The SEC has provided guidance for companies to use in determining whether a trend or uncertainty should be disclosed. The two-part assessment –prescribed by the SEC, based on probability and magnitude, can be applied to the topics included within this standard:

- 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.

³ TSC Industries v. Northway, Inc., 426 U.S. 438 (1976).

⁴ C.F.R. 229.303(item 303)(a)(3)(ii).

- 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.

3. Sustainability Accounting Standard Disclosures in Form 10-K

a. Management’s Discussion and Analysis

For purposes of comparability and usability, companies should consider making disclosure on sustainability topics in the MD&A, in a sub-section titled **“Sustainability Accounting Standards Disclosures.”**⁵

b. Other Relevant Sections of Form 10-K

In addition to the MD&A section, it may be relevant for companies to disclose sustainability information in other sections of Form 10-K, including, but not limited to:

- **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/>.

⁵ [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 for Sustainability Topics

For each sustainability topic included in the Forestry & Logging industry Sustainability Accounting Standard, SASB identifies accounting metrics.

SASB recommends that each company consider using these sustainability accounting metrics when preparing disclosures on the sustainability topics identified herein;

As appropriate—and consistent with Rule 12b-20⁶—when disclosing a sustainability topic identified by this Standard, 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 **relative performance** with respect to its peers;
- 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 \(SICSTM\)](#). If a registrant generates significant revenue from multiple industries, SASB recommends that it also consider sustainability topics that SASB has identified for those industries and disclose the associated SASB accounting metrics.

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.

Users of the SASB Standards

The SASB Standards are intended to provide guidance 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),⁷ 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. 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.

⁶ 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.”

⁷ 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 that are consolidated for financial reporting purposes as defined by accounting principles generally accepted in the United States for consistency with other accompanying information within SEC filings⁸
- 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 the effect of sustainability topics on the company's financial condition or operating performance (typically, this disclosure would be limited to risks and opportunities associated with these entities).

Reporting Format

Use of Financial Data

In instances where accounting metrics, activity metrics, and technical protocols in this standard incorporate financial data (e.g., revenues, cost of sales, expenses recorded and disclosed for fines, etc.), such financial data shall be prepared in accordance with the accounting principles generally accepted in the United States of America ("US GAAP") and be consistent with the corresponding financial data reported within the registrant's SEC filings. Should accounting metrics, activity metrics and technical protocols in this standard incorporate disclosure of financial data that is not prepared in accordance with US GAAP, the registrant shall disclose such information in accordance with the SEC Regulation G.

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).

⁸ See US GAAP consolidation rules (Section 810).

Activity metrics disclosed should:

- Convey contextual information that would not otherwise be apparent from SASB accounting metrics.
- Be deemed generally useful for an investor relying on SASB accounting metrics 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.⁹

Where relevant, SASB recommends specific activity metrics that—at a minimum—should accompany SASB accounting metric disclosures.

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Area of forestland (a) owned, (b) leased, and (c) managed	Quantitative	Acres	RR0201-A
Percentage of forestland area that is (a) plantation forest and (b) natural forest	Quantitative	Percentage (%) of acres	RR0201-B
Aggregate standing timber inventory ¹⁰	Quantitative	Cubic meters (m ³)	RR0201-C
Timber harvest volume ¹¹	Quantitative	Cubic meters (m ³)	RR0201-D

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 reliance on data from third-party reporting systems and technologies, 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 occur for certain quantitative disclosures. Where appropriate, SASB does not discourage the

⁹ *Improving Business Reporting: Insights into Enhancing Voluntary Disclosures*, FASB Business Reporting Research Project, January 29, 2001.

¹⁰ Note to **RR0201-C**—The registrant may additionally note if it uses other units of measure to define its standing timber inventory, and it shall disclose any conversion factors used.

¹¹ Note to **RR0201-D**—The registrant may additionally note if it uses other units of measure to define its timber harvest volume, and it shall disclose any conversion factors used.

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.

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."

The following sections contain the disclosure guidance associated with each accounting metric such as guidance on definitions, scope, accounting, compilation, and presentation.

The term "shall" is used throughout this document to indicate those elements that reflect requirements of the Standard. The terms "should" and "may" are used to indicate guidance, which, although not required, provides a recommended means of disclosure.

Table 1. Sustainability Disclosure Topics & Accounting Metrics

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Ecosystem Services & Impacts	Area of forestland certified to a third-party forest management standard, percentage certified to each standard ¹²	Quantitative	Acres, Percentage (%)	RR0201-01
	Area of forestland with protected conservation status	Quantitative	Acres	RR0201-02
	Area of forestland in or near endangered species habitat	Quantitative	Acres	RR0201-03
	Discussion of approach to managing risks and opportunities from ecosystem services provided by forestlands	Discussion and Analysis	n/a	RR0201-04
Community Relations & Rights of Indigenous Peoples	Area of forestland in or near indigenous land	Quantitative	Acres	RR0201-05
	Discussion of engagement processes and due diligence practices with respect to human rights, indigenous rights, and the local community	Discussion and Analysis	n/a	RR0201-06
Workforce Health & Safety	(1) Total recordable injury rate (TRIR) and (2) fatality rate	Quantitative	Rate	RR0201-07
Climate Change Adaptation of Forestlands	Discussion of strategy to manage opportunities and risks to forest management and timber production presented by climate change	Discussion and Analysis	n/a	RR0201-08

¹² Note to **RR0201-01**—The registrant shall a) include a description of environmental management policies and practices for non-certified forestland and b) when applicable, disclose the number of forest management certifications that were revoked, the acres of land where certification was revoked, and the reason the certification was revoked.

Ecosystem Services & Impacts

Description

Forests provide valuable ecosystem services in addition to their timber output, including the capacity to sequester carbon dioxide, enhance biodiversity, preserve wetlands, improve water availability and quality, and provide recreational opportunities. However, companies managing forests may face trade-offs between the various uses of forests and timber resources. Timber extraction currently has a well-established market, but it has the potential to degrade ecosystems or endanger species in the absence of action to mitigate such impacts. In developed economies such as the U.S. and Canada, stringent regulations related to biodiversity and endangered species protection, as well as the presence of harvesting rights that are contingent on biodiversity preservation, can create operational risks for companies in this industry. Some U.S.-listed companies have forestry operations in emerging markets such as Brazil, where land use and ecological impacts can be significant. Besides impacts on forest productivity and yields, unsustainable forest management can affect the industry's reputation, permitting for timber extraction, and companies' license to operate. Protecting or enhancing ecosystems within forestlands not only can help mitigate reputational, demand, and operational risks related to the potential negative ecological impacts of timber extraction, but also could enable companies to extract additional value from their forestlands through revenues for other ecosystem services—such as fees for recreational uses or watershed protection. Strong management of ecosystem services and impacts can therefore help secure long-term timber supplies and additional revenues, strengthen relationships with key stakeholders, facilitate expansion, and reduce environmental and social externalities. Forestry and logging companies increasingly utilize third-party certification to demonstrate sustainable forest management practices that serve to enhance the value and productivity of their forest assets as well as to meet rising customer demand for sustainably produced forest products.

Accounting Metrics

RR0201-01. Area of forestland certified to a third-party forest management standard, percentage certified to each standard

.01 The registrant shall disclose its forestland area, in acres, that is certified to a third-party forest management standard, where:

- Third-party forest management standards are those that certify that forests are harvested in a sustainable manner and that cover environmental and social criteria including legal compliance, land rights, community and worker relations, environmental impact and biodiversity, forest management plans and practices, land use, wildlife habitat conservation, and water conservation, among others.
- Third-party forest management certifications include those promulgated by the following organizations (or the equivalent):
 - Forest Stewardship Council (FSC)
 - Sustainable Forest Initiative (SFI)
 - Programme for the Endorsement of Forest Certification (PEFC)
 - American Tree Farm System (ATFS)

- .02 The registrant shall calculate the percentage as the number of its forestland acres that are third-party certified divided by the total number of forestland acres owned, leased, and managed by the company.
- The scope includes forestlands owned, leased, and managed by the company.
- .03 If forestlands are certified to multiple schemes, the registrant shall not account for the acreage more than once when calculating the total percentage of forestland area certified to a third-party forest management standard.
- .04 The registrant shall disclose separately the percentage of acres that is certified to each relevant forest management standard (e.g., FSC, SFI, PEFC, and ATFS) and the relevant certifications (e.g., FSC Forest Management Certification, SFI Forest Management Standard, PEFC Sustainable Forest Management certification, ATFS Individual Third-Party certification).
- The registrant shall indicate whether a forestland area is certified to multiple certification schemes, and identify the respective certifications for each area.

Note to **RR0201-01**

- .05 Where relevant, the registrant shall disclose if any forest management certifications lapsed or were revoked during the fiscal year.
- .06 The registrant shall disclose the total number of certifications that were revoked, which certification(s) was revoked, the total acreage of land for which certification was revoked, and the reason stated by the certification body or bodies for why the certification was revoked.

Note to **RR0201-01**

- .07 The registrant shall provide a brief description of its environmental management plan(s) implemented in non-certified forestlands, including, where relevant:
- Lifecycle stages to which the plan(s) apply, such as: pre-bid (when the registrant is considering acquisition of a site), exploration and appraisal, site development, and harvesting.
 - The topics addressed by the plan(s), such as: ecological and biodiversity impacts, noise impacts, discharges to water, plantation farming, harvesting techniques, use of monocultures, use of genetically modified organisms (GMO), and chemical usage, among others.
 - The underlying references for its plan(s), including whether they are codes, guidelines, standards, or regulations and whether they were developed by the registrant, an industry organization, a third-party organization (e.g., a non-governmental organization), a governmental agency, or some combination of these groups.
- .08 The scope includes forestlands owned, leased, and managed by the registrant.
- .09 Where environmental management policies and practices differ significantly by forestland, the registrant shall describe differences for each forestland and indicate the percentage to which they were applied.

.10 Where applicable and relevant, the registrant shall describe specific policies and practices that apply to areas with protected conservation status and/or areas of critical habitat, which are defined by the International Finance Corporation (IFC) as:

- Areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered and/or Endangered species; (ii) habitat of significant importance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species and/or congregatory species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes.¹³

.11 The registrant shall disclose the degree to which its policies and practices are aligned with the International Finance Corporation's (IFC) Performance Standards on Environmental and Social Sustainability, January 1, 2012, specifically including:

- Performance Standard 1 – Assessment and Management of Environmental and Social Risks and Impacts.
- Performance Standard 3 – Resource Efficiency and Pollution Prevention.
- Performance Standard 4 – Community Health, Safety, and Security.
- Performance Standard 6 – Biodiversity Conservation and Sustainable Management of Living Natural Resources.

RR0201-02. Area of forestland with protected conservation status

.12 The registrant shall disclose the area of its forestland (by acreage) that has protected conservation status, where protected conservation status includes lands protected by international bodies, third-party organizations, or federal, regional, and local government.

.13 An area is considered to be of protected conservation status if it is located within:

- National parks
- International Union for Conservation of Nature (IUCN) Protected Areas (categories I-VI)
- Ramsar Wetlands of International Importance
- UNESCO World Heritage sites
- Biosphere Reserves recognized within the framework of UNESCO's Man and the Biosphere (MAB) Programme
- Natura 2000 sites

¹³ International Finance Corporation (IFC), Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*, January 1, 2012.

- Other areas where discharges are restricted or subject to local agreements
- Sites that meet the IUCN's definition of a protected area: "A protected area is a clearly defined geographical space, recognized, dedicated, and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values"
 - These sites may be listed in the World Database of Protected Areas (WDPA) and mapped on ProtectedPlanet.net

.14 The scope includes forestland owned, leased, and managed by the registrant.

.15 The scope includes protected lands that are set aside for conservation and not actively logged as well as protected lands that are actively logged by the registrant.

RR0201-03. Area of forestland in or near endangered species habitat

.16 Forestlands are considered to be in endangered species habitat if they are in or near:

- Areas where IUCN Red List of Threatened Species that are classified as Critically Endangered (CR) or Endangered (EN) are extant;
 - A species is considered extant in an area if it is a resident, present during breeding or non-breeding season, or if it makes use of the area for passage.
- Critical habitat areas of species listed on the U.S. Endangered Species Act are threatened or endangered;
- Critical habitat areas of species listed on the Canada Species at Risk Act;
- Critical habitat areas of species that meet any other relevant endangered species lists.

.17 For the purposes of this disclosure, "near" is defined as within five kilometers (km) of the boundary of an area of endangered species habitat.

.18 The scope of disclosure includes forestlands owned, leased, and managed by the registrant.

.19 The registrant may disclose the types of endangered species in or near its forestlands.

.20 The registrant shall disclose if there is any overlap between the areas identified in RR0201-02 and RR0201-03.

RR0201-04. Discussion of approach to managing risks and opportunities from ecosystem services provided by forestlands

.21 The registrant shall discuss its approach to managing the risks and opportunities created by the ecosystem services that its forestlands provide, where:

- Ecosystem services are [defined](#) by the United Nations Environment Program as the benefits obtained from ecosystems, which include provisioning services such as food and water; regulating services such as flood and disease control; cultural services such as spiritual, recreational, and cultural benefits; and supporting services, such as nutrient cycling, that maintain the conditions for life on Earth. Ecosystem services provided by forestlands can include monetary benefits derived from the actual use of a good or service as well as passive/non-use values, including:
 - Watershed services (such as water quantity and quality)
 - Soil stabilization and erosion control
 - Air quality
 - Climate regulation
 - Carbon sequestration
 - Biodiversity
 - Recreation and tourism (such as fishing, hunting, and hiking)
 - Non-timber commercial forest products
 - Cultural values (including aesthetic value, passive use, and cultural heritage)

.22 The discussion shall include:

- The type(s) of ecosystem service(s) it currently benefits from, and how the registrant's operations optimize the benefits received.
- How the registrant manages risks associated with ecosystem services in its forestlands, where management actions can include decisions about harvesting, management of conservation areas or areas of high biodiversity, or conserving forested watershed.
 - Risks from ineffective ecosystem services management can include decreased forest productivity and timber yields, reputational concerns (e.g., those from local communities, non-governmental organizations, and regulatory agencies), permitting or harvesting restrictions, inability to capture revenues from timber and non-timber forest products, and loss of forestry management certifications.

- Opportunities from effective ecosystem services management can include higher land value, increased productivity and timber yield, direct payments for timber and non-timber forest products, and improved relationships with stakeholders.
 - The methods or models used to develop scenarios for ecosystem services, including the use of global models or scientific research provided by governmental and non-governmental organizations.
- .23 The registrant may choose to disclose the amount (in U.S. dollars) it receives for non-timber ecosystem goods and services from its forestlands, by category and type of compensation.
- .24 The registrant may choose to disclose the types of compensation mechanisms it receives for ecosystem services, by category, including:
- Public payments and support services
 - Private contracts or payments for use of forestlands or for maintaining ecosystem health
 - Tax incentives and subsidies
 - Trading of emissions-related rights or credits under a regulatory cap
- .25 If revenue or other payments are currently not being received or valued by the registrant, the registrant should disclose the specific areas within its forestlands that have the most potential to capture current or future revenue from ecosystem goods or services, including the projected potential revenues (in U.S. dollars) or value and when the registrant expects to realize these revenues.

Community Relations & Rights of Indigenous Peoples

Description

Forests contribute to the livelihoods of millions of people worldwide. Millions of indigenous peoples are fully dependent on forests, and others depend on forests for income and food. Thus, effective relations and engagement with local communities and indigenous populations is of critical importance to forestry and logging companies. Communities may be affected by forestry and logging operations as a result of environmental degradation or the competition for natural resources such as land and water. Indigenous peoples, with limited capacity to defend their unique rights and interests, may be especially vulnerable. Concerns over indigenous peoples' rights arise in both developed countries such as Canada and emerging markets such as Brazil—both key forestry regions. The rights of indigenous peoples are being more formally recognized worldwide, which could create risks for companies that poorly manage community relations. Conversely, forestry and logging companies can provide benefits to community stakeholders through employment opportunities, revenue sharing, and increased commerce. Tension with communities and indigenous populations can affect a company's ability to obtain logging permits or gain physical access to timberlands, affecting long-term growth. Sustainable forestry certifications incorporate the considerations of community relations and the rights of indigenous peoples, which can influence reputations and demand for the products of forestry and logging companies. Companies can adopt various community engagement strategies to manage the risks and opportunities associated with community rights and interests, such as gaining the consent of local stakeholders and integrating communities into their operations. A strong engagement process can mitigate the risk of protests, adverse legal rulings, and the loss of the ability to operate in or near indigenous peoples' lands.

Accounting Metrics

RR0201-05. Acres of forestland in or near indigenous land

- .26 The registrant shall disclose the area (by acreage) of its owned, leased, and managed forestlands that are located in or near areas that are considered to be indigenous peoples' land.
- .27 Indigenous lands are defined as those occupied by those who self-identify as indigenous, and likely have one or more of the following characteristics based on the working definition of "Indigenous Peoples" adopted by the United Nations:
- Historical continuity with pre-colonial and/or pre-settler societies
 - Strong link to territories and surrounding natural resources
 - Distinct social, economic, or political systems
 - Distinct language, culture, and beliefs
 - Form non-dominant groups of society
 - Resolve to maintain and reproduce ancestral environments and systems as distinctive peoples and communities

.28 For the purposes of this disclosure, "near" is defined as within five km of the recognized boundary of an area considered to be indigenous land.

RR0201-06. Discussion of engagement processes and due diligence practices with respect to human rights, indigenous rights, and the local community

.29 The registrant shall describe its due diligence practices and procedures with respect to indigenous rights of communities in which it operates or intends to operate, including:

- Upholding ILO Convention No. 169.
- Use of free, prior, and informed consent (or consultation) processes.

.30 The registrant shall describe its due diligence practices and procedures with respect to human rights, including:

- Upholding the fundamental International Labour Organization (ILO) conventions on freedom of association (No. 87), collective bargaining (No. 98), forced labor (No. 29, No. 105), child labor (No. 138, No. 182), fair wages (No. 100), and discrimination (No. 111)
- Implementation of the UN Guiding Principles on Business and Human Rights, specifically Human Rights Due Diligence (Principle 17a-c)
- Implementation of Voluntary Principles on Security and Human Rights

.31 The registrant shall describe its processes and practices with respect to the communities in areas where it conducts business, including practices to protect:

- Economic rights and interests, including the right to employment, fair wages, payment transparency, and respect of infrastructure and agricultural land.
- Environmental rights and interests, including the right to clean local air and water, as well as safe discharge and disposal of waste.
- Social rights and interests, including the right to adequate health care, education, and housing.
- Cultural rights and interests, including the right to protection of places of cultural significance (e.g., sacred sites or burial sites).

.32 The discussion shall include how practices apply to business partners, such as contractors, sub-contractors, suppliers, and joint venture partners.

Additional References

Sustainable Forest Management Network, [*Partnerships Between First Nations and the Forest Sector: A National Survey*](#), Clifford Hickey and Mark Nelson, January 2005.

Workforce Health & Safety

Description

Forestry and logging workers are exposed to physical risks such as the use of cutting tools, falling timber, heavy machinery and moving parts, excessive noise, working at heights, unstable and rough terrain, and exposure to the elements. These acute safety risks can lead to fatalities or serious injuries; the industry has one of the highest fatality rates among all U.S. industries. Workplace injuries can create a variety of financial impacts, including lost work days, operational downtime, higher healthcare or worker compensation costs, lower worker morale, personal injury litigation, and regulatory penalties. Companies that maintain a strong safety culture, including through workforce training, proper equipment and safety procedures, and incentives for strong safety performance, can mitigate downside risks related to accidents and improve operational efficiency.

Accounting Metrics

RR0201-07. (1) Total recordable injury rate (TRIR) and (2) fatality rate

- .33 Registrants whose workforce is entirely U.S.-based shall disclose their total recordable injury rate (TRIR) and fatality rate, as calculated and reported in Occupational Safety and Health Administration (OSHA) Form 300.
- OSHA guidelines provide details for the determination of whether an event is a recordable occupational incident as well as definitions for exemptions for incidents that occur in the work environment, but are not occupational.
- .34 Registrants whose workforce includes non-U.S.-based employees shall calculate their TRIR according to the U.S. Bureau of Labor Statistics guidance and/or using the U.S. Bureau of Labor Statistics calculator.
- .35 The scope includes all employees, domestic and foreign.
- .36 The scope of disclosure includes direct employees and contract employees, where:
- Direct employees are all those employees on the registrant's payroll, whether they are labor, executive, hourly, salary, part-time, seasonal, or migrant workers.
 - Contract employees are those who are not on the registrant's payroll, but who are supervised by the registrant on a day-to-day basis, including independent contractors and those employed by third parties (e.g., temp agencies, labor brokers, etc.).
- .37 Rates shall be calculated as: (statistic count / total hours worked) * 200,000.

Climate Change Adaptation of Forestlands

Description

Global climate change creates a known long-term business uncertainty for forestry and logging companies due to potential adverse and beneficial impacts on forest productivity. Warmer average global temperatures are expected to lead to variations in precipitation patterns and temperatures that could result in more frequent extreme weather events, forest fires, increased prevalence of tree diseases and pests, and other detrimental outcomes. Conversely, climate change could also facilitate tree growth through increased atmospheric carbon, a longer growing season, moderating temperatures in high latitudes, greater precipitation, and an expanded geographic range. Therefore, companies are likely to experience variations in the productivity of their timber assets, directly affecting the quantity of salable products and the value of timber assets. These impacts are location-dependent, emphasizing the need for tailored responses to climate change risks and opportunities across different forest regions. Given the long-term investment of resources and the time required to grow timber, the effects of climate change are likely to have significant financial impacts over time. Impacts may also be acute, especially those from forest fires and pests, and create significant financial damage in the absence of adequate insurance. Firms can better manage climate change's effects by proactively addressing its potential impacts. This may include undertaking research on the potential impacts of climate change on their forest and timber assets and implementing adaptive forest management strategies such as alternative planting methods and tree species selection.

Accounting Metrics

RR0201-08. Discussion of strategy to manage opportunities and risks to forest management and timber production presented by climate change

.38 The registrant shall discuss the risks and/or opportunities that are presented by climate change scenarios to its forestlands, including, where relevant:

- Identification of the physical risks presented by climate change, including, but not limited to, increased temperatures, changes in growth rates, changes in seasonality, availability of water, pest migration, increased frequency of fires, and increased frequency of extreme weather events.
- Identification of political and social risks, such as pollution from human activities affecting forestlands, increased harvesting restrictions, changing regulations, or stakeholder perceptions or concerns (e.g., those from local communities, non-governmental organizations, and regulatory agencies).

.39 The registrant shall provide:

- A breakdown, by acreage, of the geographic location of the registrant's forestlands, identification of the potential climate change risks or opportunities that may manifest within each of these regions, and the percentage of the registrant's forestlands that could be affected by these risks or opportunities.
- A breakdown, by volume, of the types of tree species harvested for timber in the registrant's forestlands, identification of the potential risks or opportunities presented by climate change that

may manifest among these different species, and the percentage of the registrant's timber yield that could be affected by these risks or opportunities.

- Where relevant, the registrant shall discuss how risks and opportunities may vary between the registrant's plantation forestlands and its natural forestlands.

.40 The registrant shall provide a discussion of the relative priority among the disclosed risks and opportunities that may affect its forestlands, tree species, or timber yields.

.41 The timeline over which such risks and opportunities are expected to manifest.

.42 The registrant shall provide a discussion of the scenarios used to determine the risks and opportunities presented by climate change, including:

- How such scenarios will manifest and the potential implications that this would have on its forestlands (e.g., how the area, health, vitality, and biodiversity of its forestlands may be affected).
- The methods or models used to develop these scenarios, including the use of global models or scientific research provided by governmental and non-governmental organizations (e.g., [Intergovernmental Panel on Climate Change Climate Scenario Process](#)).

.43 The registrant shall discuss efforts to assess and monitor the impacts of climate change and the related strategies to alleviate and/or adapt to any risks and/or utilize any opportunities, where:

- Alleviation strategies include, but are not limited to, use of insurance, actions to strengthen the adaptive capacity of forestlands, strategies to reduce the risk and intensity of pest, disease, and fire outbreaks, or plans to reduce risk and intensity of potential damage.
- Adaptation strategies include, but are not limited to, improving ecosystem management and biodiversity, monitoring changes, developing tolerant tree varieties, and optimizing the timing of planting and harvesting.

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Sustainability Accounting Standard

Sustainable Industry Classification System™ (SICS™) #RR0202
Prepared by the
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July 2015

Exposure Draft Standard for Public Comment

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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 non-profit organization. Through 2016, SASB is developing standards for more than 80 industries in 10 sectors.

About this Standard

This Standard is an exposure draft presented for public review and comment. This version is not intended for implementation.

The public comment period lasts for 90 days, beginning on Tuesday, July 7th, 2015, and ending on Monday, October 5th, 2015. The Standard is subject to change thereafter.

For instructions on providing comments to SASB, [please click here](#).

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INTRODUCTION

Purpose & Structure

This document contains the SASB Sustainability Accounting Standard (SASB Standard) for the Pulp & Paper Products industry.

SASB Sustainability Accounting 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 Standards identify sustainability topics at an industry level, which may constitute material information—depending on a company’s specific operating context—for a company within that industry. SASB Standards are intended to provide guidance to company management, which is ultimately responsible for determining which information is material and should therefore be included in its Form 10-K or 20-F and other periodic SEC filings.

SASB Standards provide companies with standardized sustainability metrics designed to communicate performance on industry level sustainability topics. When making disclosure on sustainability topics, companies can use SASB Standards to help ensure that disclosure is standardized and therefore decision-useful, relevant, comparable, and complete.

SASB Standards are intended to constitute “suitable criteria” as defined by AT 101.23 - 32¹ and referenced in AT 701², as having the following attributes:

- *Objectivity*—Criteria should be free from bias.
- *Measurability*—Criteria should permit reasonably consistent measurements, qualitative or quantitative, of subject matter.
- *Completeness*—Criteria should be sufficiently complete so that those relevant factors that would alter a conclusion about subject matter are not omitted.
- *Relevance*—Criteria should be relevant to the subject matter.

Industry Description

The Pulp & Paper Products industry consists of companies that produce a range of wood pulp and paper products including wood pulp fiber, groundwood paper, office paper, newsprint, and paper for industrial applications. Companies in the industry typically function as business-to-business entities and may have international operations. While some companies may own or operate timberlands, these activities are outside the scope of SASB’s Pulp & Paper Products standard; forestry and logging activities are covered by SASB’s Forestry & Logging standard.

¹ http://pcaobus.org/Standards/Attestation/Pages/AT101.aspx#at_101_fn7

² <http://pcaobus.org/Standards/Attestation/Pages/AT701.aspx>

Guidance for Disclosure of Sustainability Topics in SEC Filings

1. Industry-Level Sustainability Topics

For the Pulp & Paper Products industry, SASB has identified the following sustainability disclosure topics:

- Greenhouse Gas Emissions
- Air Quality
- Energy Management
- Water Management
- Wood & Fiber Sourcing & Recovery

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.”^{3, 4}

SASB has attempted to identify those sustainability topics that are reasonably likely to have a material effect on the financial condition or operating performance of companies within each SICs industry. SASB recognizes, however, that each company is ultimately responsible for determining what information should be disclosed within the context of Regulation S-K and other guidance.

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.”

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

The SEC has provided guidance for companies to use in determining whether a trend or uncertainty should be disclosed. The two-part assessment prescribed by the SEC, based on probability and magnitude, can be applied to the topics included within this standard:

- 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.

³ TSC Industries v. Northway, Inc., 426 U.S. 438 (1976).

⁴ C.F.R. 229.303(item 303)(a)(3)(ii).

- 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.

3. Sustainability Accounting Standard Disclosures in Form 10-K

a. Management’s Discussion and Analysis

For purposes of comparability and usability, companies should consider making disclosure on sustainability topics in the MD&A, in a sub-section titled **“Sustainability Accounting Standards Disclosures.”**⁵

b. Other Relevant Sections of Form 10-K

In addition to the MD&A section, it may be relevant for companies to disclose sustainability information in other sections of Form 10-K, including, but not limited to:

- **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/>.

⁵ [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 for Sustainability Topics

For each sustainability topic included in the Pulp & Paper Products industry Sustainability Accounting Standard, SASB identifies accounting metrics.

SASB recommends that each company consider using these sustainability accounting metrics when preparing disclosures on the sustainability topics identified herein;

As appropriate—and consistent with Rule 12b-20⁶—when disclosing a sustainability topic identified by this Standard, 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 **relative performance** with respect to its peers;
- 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 also consider sustainability topics that SASB has identified for those industries and disclose the associated SASB accounting metrics.

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.

Users of the SASB Standards

The SASB Standards are intended to provide guidance 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),⁷ 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. 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.

⁶ 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.”

⁷ 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 that are consolidated for financial reporting purposes as defined by accounting principles generally accepted in the United States for consistency with other accompanying information within SEC filings⁸
- 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 the effect of sustainability topics on the company's financial condition or operating performance (typically, this disclosure would be limited to risks and opportunities associated with these entities).

Reporting Format

Use of Financial Data

In instances where accounting metrics, activity metrics, and technical protocols in this standard incorporate financial data (e.g., revenues, cost of sales, expenses recorded and disclosed for fines, etc.), such financial data shall be prepared in accordance with the accounting principles generally accepted in the United States of America ("US GAAP") and be consistent with the corresponding financial data reported within the registrant's SEC filings. Should accounting metrics, activity metrics and technical protocols in this standard incorporate disclosure of financial data that is not prepared in accordance with US GAAP, the registrant shall disclose such information in accordance with the SEC Regulation G.

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).

⁸ See US GAAP consolidation rules (Section 810).

Activity metrics disclosed should:

- Convey contextual information that would not otherwise be apparent from SASB accounting metrics.
- Be deemed generally useful for an investor relying on SASB accounting metrics 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.⁹

Where relevant, SASB recommends specific activity metrics that—at a minimum—should accompany SASB accounting metric disclosures.

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Pulp production	Quantitative	Air-dried metric tons (t)	RR0202-A
Paper production	Quantitative	Air-dried metric tons (t)	RR0202-B
Total wood fiber purchased ¹⁰	Quantitative	Metric tons (t)	RR0202-C

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 reliance on data from third-party reporting systems and technologies, 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 occur 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.

⁹ *Improving Business Reporting: Insights into Enhancing Voluntary Disclosures*, FASB Business Reporting Research Project, January 29, 2001.

¹⁰ Note to **RR0202-C**—The scope of wood fiber-based raw materials includes all inputs that are processed to be sold as a finished good, including recycled raw materials, virgin raw materials, and goods that will be consumed directly in the production process, excluding biomass for energy use.

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.

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."

The following sections contain the disclosure guidance associated with each accounting metric such as guidance on definitions, scope, accounting, compilation, and presentation.

The term "shall" is used throughout this document to indicate those elements that reflect requirements of the Standard. The terms "should" and "may" are used to indicate guidance, which, although not required, provides a recommended means of disclosure.

Table 1. Sustainability Disclosure Topics & Accounting Metrics

TOPIC	ACCOUNTING METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions	Quantitative	Metric tons (t) CO ₂ -e	RR0202-01
	Biogenic carbon dioxide emissions ¹¹	Quantitative	Metric tons (t) CO ₂ -e	RR0202-02
	Description of long-term and short-term strategy or plan to manage Scope 1 emissions, emission-reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	RR0202-03
Air Quality	Air emissions for the following pollutants: NO _x (excluding N ₂ O), SO _x , volatile organic compounds (VOCs), particulate matter (PM), and hazardous air pollutants (HAPs)	Quantitative	Metric tons (t)	RR0202-04
	Number of incidents of non-compliance with air quality permits, standards, and regulations	Quantitative	Number	RR0202-05
Energy Management	Total energy consumed, percentage grid electricity, percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	RR0202-06
Water Management	(1) Total water withdrawn and (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Cubic meters (m ³), Percentage (%)	RR0202-07
	Discussion of water management risks and description of management strategies and practices to mitigate those risks	Discussion and Analysis	n/a	RR0202-08
	Number of incidents of non-compliance with water quality permits, standards, and regulations	Quantitative	Number	RR0202-09
Wood & Fiber Sourcing & Recovery	Percentage of wood fiber purchased (1) from third-party certified forestlands, by standard, and (2) percentage meeting other fiber sourcing standards, by standard	Quantitative	Percentage (%) by weight	RR0202-10
	Amount of recycled and recovered fiber procured ¹²	Quantitative	Metric tons (t)	RR0202-11
	Discussion of strategy to manage opportunities and risks to wood and fiber sourcing presented by climate change	Discussion and Analysis	n/a	RR0202-12

¹¹ Note to **RR0202-02**—The registrant shall discuss the implications of its biogenic emissions with respect to the overall carbon cycle, including whether its biogenic CO₂ emissions are carbon neutral.

¹² Note to **RR0202-11**—The registrant shall discuss any environmental lifecycle tradeoffs between use of recycled and recovered fiber versus virgin fiber in its products, and how these assessments are incorporated into wood fiber-sourcing decisions.

Greenhouse Gas Emissions

Description

The Pulp & Paper Products industry generates significant direct greenhouse gas (GHG) emissions, contributing to climate change and creating additional regulatory risks for companies due to climate change mitigation policies. Specifically, emissions-reduction regulations can significantly increase companies' costs and capital expenditures. Direct greenhouse gases are produced by the combustion of fossil fuels and biomass in stationary and mobile internal combustion engines, cogeneration boilers, and other processing equipment. Cogeneration is commonly used to improve energy efficiency on-site. Companies in this industry typically utilize significant amounts of biomass for their energy needs; such biomass may be sourced from residuals generated during operations. GHG emissions from the use of biomass are generally not covered by regulatory regimes, as biomass is considered carbon neutral. The use of biomass can therefore largely reduce the costs associated with purchasing fossil fuels, as well as mitigate regulatory risks under the current guidelines. Regulatory authorities such as the U.S. Environmental Protection Agency, however, are currently assessing the role of biogenic emissions from stationary sources, creating uncertainty about the scope of future GHG regulations. The relative size of the Pulp & Paper Products industry's biogenic emissions suggests that this is a serious consideration and must be managed carefully. In the event that the neutrality consideration for biomass emissions were to change in the future, this could result in additional emissions reporting, mitigation, or offset obligations. Reducing GHG emissions through improved energy efficiency, the use of energy sources with lower lifecycle emissions relative to fossil fuels, or process advances can lower costs and protect companies from further regulations that limit or put a price on carbon emissions.

Accounting Metrics

RR0202-01. Gross global Scope 1 emissions

.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) Fifth Assessment Report (2013).
- 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 (2015) and REQ-11 of the Climate Disclosure Standards Board (CDSB) *Climate Change Reporting Framework* (CCRF) (2015).

.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”).
 - The approach detailed in REQ-1, “Organizational boundary setting for GHG emissions reporting,” of the CDSB CCRF (2015).
- .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 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.
- .06 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.
- .07 The registrant should discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, mass balance calculations, etc.
- .08 The registrant should consult the most recent version of each document referenced in this standard at the time disclosure occurs.

RR0202-02. Biogenic carbon dioxide emissions

- .09 The registrant shall disclose its carbon dioxide (CO₂) emissions (i.e., emissions from the combustion of biomass), where:
- Biogenic CO₂ emissions are defined by the U.S. Environmental Protection Agency (EPA) as CO₂ emissions related to the natural carbon cycle, as well as those resulting from the combustion, harvest, digestion, fermentation, decomposition, or processing of biologically based materials, where:
 - The carbon cycle is defined as the flow of carbon in various forms through the atmosphere, ocean, terrestrial biosphere, and lithosphere.

- Biologically based materials (or “biogenic materials”) are defined as non-fossilized and biodegradable organic materials originating from modern or contemporarily grown plants, animals, or microorganisms (including products, by-products, residues, and wastes from agriculture, forestry, and related industries, as well as the non-fossilized and biodegradable organic fractions of industrial and municipal wastes, including gases and liquids recovered from the decomposition of non-fossilized and biodegradable organic material) and excluding materials such as peat, coal, petroleum, natural gas, and other products that are derived from biogenic materials but are considered non-renewable during the time frame relevant to policymaking.

.10 Examples of biogenic CO₂ emissions include:

- CO₂ derived from combustion of biological material, including forest-derived and agriculture-derived feedstocks
- CO₂ from the combustion of biogas collected through biological decomposition of waste in landfills, wastewater treatment, or manure-management processes
- CO₂ from combustion of the biological fraction of municipal solid waste or biosolids

.11 The registrant shall calculate and disclose its biogenic CO₂ emissions using the biogenic assessment factor (BAF) equation and methodology outlined in sections 2.1 through 2.7, “Biogenic Assessment Factor Equation”, of the U.S. EPA’s [Framework for Assessing Biogenic CO₂ Emissions from Stationary Sources](#).

Note to **RR0202-02**

.12 The registrant shall discuss the implications of its biogenic emissions with respect to the overall carbon cycle, including whether its biogenic CO₂ emissions are carbon neutral, based on the considerations outlined by the EPA’s [Framework for Assessing Biogenic CO₂ Emissions from Stationary Sources](#) and the WRI/WBCSD GHG Protocol.

.13 Relevant discussion topics include, but are not limited to:

- The carbon flux of the forestlands where the biomass originated
- The type of biomass used
- The source(s) of the biomass
- The area of forestlands used to grow the biomass
- The percentage of the biomass burned by the registrant (by weight) that was cut on land not owned by the registrant
- Whether the biomass was grown, harvested, and combusted in a carbon neutral manner

RR0202-03. Description of long-term and short-term strategy or plan to manage Scope 1 emissions, including emission-reduction targets and an analysis of performance against those targets

.14 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., E.U. 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.

.15 For emission-reduction targets, the registrant shall disclose:

- The percentage of emissions within the scope of the reduction plan;
- The percentage reduction from the base year;
 - The base year is the first year against which emissions are evaluated toward 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; and
- The mechanism(s) for achieving the target, such as energy-efficiency efforts, energy source diversification, carbon capture and storage, etc.

.16 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.

.17 Disclosure corresponds with:

- CDSB CCRF (2015) REQ-9, "Management actions."
- CDP questionnaire (2015) CC3, "Targets and Initiatives."

Air Quality

Description

In addition to emitting GHGs, pulp and paper mills emit regulated air emissions, including sulfur dioxide, particulate matter, chlorine dioxide, methanol, ammonia, and acetaldehyde, which are linked with significant human health and environmental impacts. The sources of emissions include cogeneration fuel boilers, pulp and paper pressure chambers, wood chip pulping, pulping chemical recovery, and process engines. While emissions of hazardous substances from the industry have declined considerably in recent years, it is still among the largest industrial emitters of air toxics. Because of the industry's high emissions levels, air pollution abatement expenditures can be significant, while increasingly stringent air-quality regulations raise the likelihood of higher costs in the future. Noncompliance with emissions regulations can result in regulatory fines and may require the installation of costly emissions-reduction equipment. Therefore, companies that can cost-effectively reduce harmful air emissions could improve operational efficiency, benefit from a lower cost structure, and decrease regulatory risk.

Accounting Metrics

RR0202-04. Air emissions for the following pollutants: NO_x (excluding N₂O), SO_x, volatile organic compounds (VOCs), particulate matter (PM), and hazardous air pollutants (HAPs)

.18 The registrant shall disclose its emissions of air pollutants (in metric tons) 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.

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

- Oxides of nitrogen (including NO and NO₂ and excluding N₂O) reported as NO_x.
- Oxides of sulfur (SO₂ and SO₃) reported as SO_x.
- 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, that participates in atmospheric photochemical reactions, except those designated by the EPA as having negligible photochemical reactivity.
 - Where regional and national definitions supersede EPA regulations, such as EC Directive 1999/13/EC and Schedule 1 of the Canadian Environmental Protection Act 1999, the registrant may refer to the relevant regulations on VOCs.
- Particulate matter (PM), reported as the sum of PM₁₀ and PM_{2.5}, or all particulates less than 10 micrometers in diameter.
- Hazardous air pollutants (HAPs), 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.

- .20 This scope does not include CO₂, CH₄, and N₂O, which are disclosed in RR0202-01 as Scope 1 GHG emissions.
- .21 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 RR0202-01.
- .22 The registrant should discuss the calculation methodology for its emissions disclosure, such as whether data are from continuous emissions monitoring systems (CEMS), engineering calculations, mass balance calculations, etc.

RT0202-05. Number of incidents of non-compliance with air quality permits, standards, and regulations

- .23 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.
- .24 The scope of disclosure includes incidents governed by federal, state, and local statutory permits and regulations including, but not limited to, the Clean Air Act and other state or local air quality legislation.
- .25 An incident of non-compliance shall be disclosed regardless of whether it resulted in an enforcement action (e.g., fine, warning letter, etc.).
- .26 Violations, regardless of their measurement methodology or frequency, shall be disclosed. These include:
- For continuous emissions, limitations, standards, and prohibitions that are generally expressed as maximum daily, weekly, and monthly averages.
 - For non-continuous emissions, limitations that are generally expressed in terms of frequency, total mass, maximum rate of discharge, and mass or concentrations of specified pollutants.
 - False or inaccurate reporting.
 - Failure to obtain permits.

Energy Management

Description

Pulp and paper manufacturing is energy-intensive, and energy can account for a significant share of operating costs. In most facilities, energy is derived from the direct combustion of biomass and fossil fuels (leading to the regulatory risks covered under the disclosure topic Greenhouse Gas Emissions) and purchased from the electrical grid. The price volatility of fossil fuels and conventional grid electricity can increase as a result of evolving climate change regulations and new incentives for energy efficiency and renewable energy, among other factors, while alternative energy sources become cost-competitive. Decisions regarding generating electricity on-site versus sourcing it from the grid, as well as the use of alternative and biomass energy, can create trade-offs related to the energy supply's cost and reliability for operations and the extent of the regulatory risk from Scope 1 emissions. In this context, the potential regulatory consequences of using biomass energy must be considered. The manner in which a company manages its energy efficiency, its reliance on different types of energy and the associated sustainability risks, and its ability to access alternative energy sources is likely to significantly impact its financial performance.

Accounting Metrics

RR0202-06. Total energy consumed, percentage grid electricity, percentage from renewables

- .27 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.
- .28 In calculating energy consumption from fuels and biofuels, the registrant 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).
- .29 The registrant shall disclose purchased grid electricity consumption as a percentage of its total energy consumption.
- .30 The registrant shall disclose renewable energy consumption as a percentage of its total energy consumption.

.31 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 on-site, 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.
- Renewable energy is defined as energy from sources that are replenished at a rate greater than or equal to their rate of depletion, consistent with EPA [definitions](#), such as geothermal, wind, solar, hydro, and biomass.

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

- Energy from hydro sources that are certified by the Low Impact Hydropower Institute or that are eligible for a state Renewable Portfolio Standard.
- Energy from biomass sources is limited to materials certified to a third-party standard (e.g., Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification, or American Tree Farm System), materials considered “eligible renewables” according to the Green-e Energy National Standard Version 2.5 (2014), and materials that are eligible for a state Renewable Portfolio Standard.

.33 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 (for energy data including electricity from solar or wind energy).

.34 The registrant may disclose the types of renewable energy it used as a percentage of the total renewable energy consumed (i.e., percentage of renewable energy from (a) biomass, (b) wind energy, (c) solar energy, etc.).

Water Management

Description

Pulp and paper production is a water-intensive process. Water is used primarily in raw materials processing, process cooling, and steam generation at on-site cogeneration plants. Companies require ample, stable water supplies and produce large volumes of wastewater, which is commonly treated on-site and discharged into the environment. Process water is typically rich in dissolved organic compounds and other solids that can harm ecosystems, underscoring the importance of water treatment, which can be costly. Water contamination results in regulatory risks, including penalties for violations. In addition to water contamination, water availability is an increasing concern for the industry. The majority of the industry's water needs is met by surface water withdrawals. Water is becoming a scarce resource around the world, given increasing consumption due to population growth and rapid urbanization, and reduced supplies due to climate change. Water scarcity can result in higher supply costs, supply disruptions, and tension with local water users. Pulp and paper manufacturing facilities, depending on their location, may be exposed to these risks. Companies can adopt various strategies to address water supply and treatment issues, such as cost-effectively enhancing the recycling of process water, improving production techniques to lower water intensity, and ensuring compliance with water effluent regulations.

Accounting Metrics

RR0202-07. (1) Total water withdrawn and (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress

.35 The registrant shall disclose the amount of water (in thousands of cubic meters) that was withdrawn from all sources, where:

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

.36 The registrant may choose to disclose the portion of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources, where:

- 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 in compliance with U.S. [National Primary Drinking Water Regulations](#) can be assumed to meet the definition of fresh water.

.37 The registrant shall disclose the amount of water (in thousands of cubic meters) that was consumed in its operations, where water consumption is defined as:

- Water that evaporates during withdrawal, usage, and discharge;
- Water that is directly or indirectly incorporated into the product or service;

- 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.

.38 The registrant shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80%) or Extremely High (>80%) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, Aqueduct (publicly available online [here](#)).

.39 The registrant shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.

.40 The registrant shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

RR0202-08. Discussion of water management risks and description of strategies and practices to mitigate those risks

.41 The registrant shall discuss its risks associated with water withdrawals, water consumption, and discharge of water to the environment and describe how it manages these risks.

.42 The registrant shall discuss, where applicable, risks to the availability of adequate, clean water resources.

- Relevant information to provide includes, but is not limited to:
 - Environmental constraints, such as operating in water-stressed regions, drought, interannual or seasonal variability, and risks due to the impact of climate change.
 - External 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 (commercial and municipal), restrictions to withdrawals due to regulations, and the ability to obtain and retain water rights or permits.
 - How risks may vary by withdrawal source, including wetlands, rivers, lakes, oceans, groundwater, rainwater, municipal water supplies, or supply from other water utilities.

.43 The registrant shall discuss, where applicable, risks associated with its discharge of wastewater.

- Relevant information to provide includes, but is not limited to:
 - Environmental constraints, such as the ability to maintain compliance with regulations focused on the quality of effluent discharged to the environment, the ability to eliminate existing and emerging pollutants of concern, and the ability to maintain control over runoff and storm water discharges.
 - External constraints, such as increased liability and/or reputational risks, restrictions to discharges and/or 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), and the ability to obtain discharge rights or permits.

- How risks may vary by discharges to different destinations, including wetlands, rivers, lakes, oceans, groundwater, rainwater, municipal water supplies, or other water utilities.

.44 The registrant should include a discussion of the potential impacts that these risks may have on its operations and the timeline over which such risks are expected to manifest.

- Impacts may include, but are not limited to, those associated with costs, revenues, liabilities, continuity of operations, and reputation.

.45 The registrant shall provide a description of its short-term and long-term strategy or plan to manage these risks, including the following, where relevant:

- Any water management targets it has set, and an analysis of performance against those targets.
 - Water management targets can include water management goals that the registrant prioritizes to manage its risks and opportunities associated with water withdrawal, consumption, or discharge.
 - Targets can include, but are not limited to, those associated with reducing water withdrawals, reducing water consumption, reducing water discharges, and improving water discharge quality.
- The scope of its strategy, plans, or targets, such as whether they pertain differently to different business units, geographies, or water-consuming operational processes.
- The activities and investments required to achieve the plans and targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.

.46 For water management targets, the registrant shall additionally disclose:

- The percentage reduction or improvements 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.
- Whether the target is absolute or intensity based, and the metric denominator if it is an intensity-based target.
- The timelines for the water management plans, including the start year, the target year, and the base year.
- The mechanism(s) for achieving the target, including:
 - Efficiency efforts, such as the use of water recycling and/or closed-loop systems
 - Product innovations such as redesigning products or services to require less water
 - Process and equipment innovations, such as those that enable the use of less water in manufacturing or operations

- The use of tools and technologies (e.g., the [World Wildlife Fund Water Risk Filter](#), [WRI/WBCSD Global Water Tool](#), and [Water Footprint Network Footprint Assessment Tool](#)) to analyze water use, risk, and opportunities
 - Collaborations or programs in place with the community or other organizations
- .47 Disclosure of strategies, plans, and targets shall be limited to activities that were ongoing (active) or reached completion during the fiscal year.
- .48 The registrant may choose to discuss if its water management decisions and practices incorporate consideration of any additional lifecycle impacts or environmental tradeoffs for the registrant, including tradeoffs associated with land-use impacts, energy consumption, and GHG emissions.

RR0202-09. Number of incidents of non-compliance with water quality permits, standards, and regulations

- .49 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.
- .50 The scope of disclosure includes incidents governed by federal, 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.
- .51 An incident of non-compliance shall be disclosed regardless of whether it resulted in an enforcement action (e.g., fine, warning letter, etc.).
- .52 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, 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.

Wood & Fiber Sourcing & Recovery

Description

Pulp and paper products manufacturers source wood and wood fiber from forestry and logging companies, paper fiber recyclers, and forests that companies themselves manage. The potential for adverse environmental and social externalities in forestry and logging operations, such as deforestation and harm to endangered species or impacts on indigenous communities, can create reputational and operational impacts for pulp and paper companies. To mitigate supply chain risk and satisfy growing customer demand for sustainably sourced fiber and paper products, pulp and paper manufacturers utilize certification of forests and fiber chain-of-custody standards, which verify that virgin and recycled fiber originate from sustainably managed forests. Pulp and paper companies can benefit financially from robust fiber-sourcing guidelines and by encouraging or assisting their suppliers to engage in sustainable forestry practices, including through supporting group certification of smaller timber producers. In addition, pulp and paper manufacturers face trade-offs from the use of recycled fiber. As with certified products, those with recycled content are increasingly in demand. Using recycled fiber can minimize the need for virgin fiber, potentially reducing adverse externalities from timber production, as well as divert paper waste streams, thereby lowering landfill GHG emissions. Companies could also benefit from preempting regulations designed to extend the product end-of-life responsibility to manufacturers. Conversely, manufacturing products with a greater recycled content can increase waste generation and energy consumption, while recycled fiber can be more costly to purchase, given demand-supply gaps. Therefore, companies could benefit from a lifecycle approach that includes optimizing recycled fiber use to balance its environmental and economic trade-offs.

Accounting Metrics

RR0202-10. Percentage of wood fiber purchased (1) from third-party certified forestlands, by standard, and (2) percentage meeting other fiber sourcing standards, by standard

.53 The percentage shall be calculated as the total weight (in air dried metric tons) of the registrant's wood-fiber-based raw materials that have been sourced from third-party certified forestlands divided by the total weight (in air dried metric tons) of wood-fiber-based raw materials purchased, where certified fiber includes that from forestlands certified to standards promulgated by the following organizations (or the equivalent):

- Forest Stewardship Council (FSC) (i.e., FSC Forest Management and Chain of Custody certifications),
- Sustainable Forest Initiative (SFI) (i.e., SFI Forest Management and Chain of Custody labels),
- Programme for the Endorsement of Forest Certification (PEFC) (i.e., PEFC Certified).

.54 The scope of wood-fiber-based raw materials includes all inputs that are processed to be sold as a finished good, including recycled raw materials, virgin raw materials, and goods that will be consumed directly in the production process, excluding biomass for energy.

.55 For fiber that is certified to multiple schemes, the registrant shall not account for the weight more than once when calculating the total percentage of fiber certified to a third-party forest management standard.

- .56 The registrant shall disclose the amount of wood fiber certified to each relevant certification (e.g., FSC Chain of Custody, SFI Chain of Custody (certified forest content), and PEFC Certified).
- The registrant shall indicate whether fiber is certified to multiple certification schemes, and identify the respective certifications.
- .57 The registrant shall disclose the percentage of the total wood fiber purchased from non-certified forestlands that meets other fiber sourcing standards, including:
- Responsible fiber sourcing standards (e.g., SFI Certified Fiber Sourcing Standard);
 - Controlled wood standards (e.g., FSC Controlled Wood Certification, PEFC Controlled Wood);
 - Recycled fiber standards that include post- and pre-consumer reclaimed material (e.g., PEFC Recycled Label, FSC Recycled Label); and
 - Any other due diligence standards that cover fiber sourcing requirements for fiber from non-certified forestlands.
- .58 For fiber from non-certified forestlands that meets multiple fiber sourcing standards, the registrant shall not account for the weight more than once when calculating the total percentage of fiber from non-certified forestlands that meets other fiber sourcing standards.
- .59 The registrant shall disclose the percentage of wood fiber that meets each relevant sourcing standard (e.g., FSC Controlled Wood, SFI Fiber Sourcing Standard, PEFC Recycled, etc.).
- The registrant shall indicate whether fiber meets multiple fiber sourcing standards, and identify the respective standards.
- .60 The registrant shall disclose if at a minimum its fiber sourcing standards for fiber from non-certified forestlands meets the following criteria:
- Wood legality and compliance with the Lacey Act of 1990 (16 U.S.C. §§ 3371–3378)
 - Wood sourced from areas of protected conservation status or high biodiversity value
 - Logging in or near areas of endangered species habitat
 - Policies to verify forestry management and harvesting practices of suppliers, including reviews of environmental impact assessments or forestry management plans
 - The use of genetically modified organisms (GMOs), pesticides, or other chemicals in forests
- .61 The registrant shall discuss its approach to verifying compliance with its fiber sourcing standards for fiber from non-certified forestlands, which may include codes of conduct, audits, and/or contracts, among others.

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

RR0202-11. Amount of recycled and recovered fiber procured

.63 The registrant shall disclose the amount of recycled and recovered fiber it procured (in metric tons) from suppliers as well as recycled and recovered fiber it obtained directly through collection programs.

.64 Recycled content is defined, consistent with definitions in ISO 14021:1999, “Environmental labels and declarations—Self-declared environmental claims (Type II environmental labelling),” as the portion, by mass, of recycled or recovered material in a product or packaging, where only pre-consumer and post-consumer materials shall be considered as recycled content, and where:

- Recycled material is defined as material that has been reprocessed from recovered (or reclaimed) material by means of a manufacturing process and made into a final product or a component for incorporation into a product.
- Recovered material is defined as material that would have otherwise been disposed of as waste or used for energy recovery, but has instead been collected and recovered (or reclaimed) as a material input, in lieu of new primary material, for a recycling or manufacturing process.
- Pre-consumer material is defined as material that has been diverted from the waste stream during a manufacturing process. Excluded is reutilization of materials such as rework, regrind, or scrap that are generated in a process and are capable of being reclaimed within the same process that generated them.
- Post-consumer material is defined as material generated by households or by commercial, industrial, and institutional facilities in their role as end-users of the product that can no longer be used for its intended purpose. This includes returns of material from the distribution chain.
- Fiber shall be considered recycled or recovered if it meets the SFI definition of [recycled content](#) or the FSC definition of [reclaimed material](#).

Note to RR0202-11

.65 The registrant shall discuss any environmental lifecycle tradeoffs between use of recycled and recovered fiber versus virgin fiber in its products, where:

- An environmental lifecycle tradeoff is defined as an environmental benefit or consequence of sourcing one type of fiber over another.
 - Environmental lifecycle benefits from using recycled and recovered fiber can include, but are not limited to, reducing the need for deforestation, lower GHG emissions from paper in landfills and reducing landfill waste.
 - Environmental lifecycle consequences of using recycled and recovered fiber can include increased resource consumption and air emissions during the transportation and processing of fiber.

.66 The registrant shall discuss how lifecycle tradeoff assessments are incorporated into its fiber sourcing decisions, including how the following risks and opportunities are managed:

- Costs of recycled and recovered materials
- Constraints related to accessing the necessary supply of recycled and recovered fiber
- Necessary recycling infrastructure needed by the registrant, or by external paper collection facilities
- Consumer behavior to improve recovery of paper for recycling
- Virgin wood fiber sourcing risks
- Improving paper recovery rates
- Regulation related to consumer recycling or minimum recycled content usage
- Quality of fiber needed for products
- Product innovation opportunities
- Increased revenue and reputational benefits related to products with recycled or recovered content

RR0202-12. Discussion of strategy to manage opportunities and risks to wood and fiber sourcing presented by climate change

.67 The registrant shall discuss the risks and opportunities that are presented by climate change scenarios to its wood and fiber sourcing, including, where relevant:

- Identification of the physical risks presented by climate change, including, but not limited to, increased temperatures, changes in growth rates, changes in seasonality, availability of water, pest migration, changes in the frequency of fires, and increased frequency of extreme weather events that could affect the availability and yield of wood and fiber.
- Identification of political and social risks, such as pollution from human activities affecting forestlands, increased harvesting restrictions, changing regulations, or stakeholder perceptions or concerns (e.g., those from local communities, non-governmental organizations, and regulatory agencies).

.68 The registrant shall provide:

- A breakdown of the geographic location of the forestlands from which it procures from, identification of the potential climate change risks or opportunities that may manifest within each of these regions, and the percentage of the forestlands that could be affected by these risks or opportunities.
- A breakdown of the types of tree species the registrant procures for wood fiber, identification of the potential risks or opportunities presented by climate change that may manifest among these

different species, and the percentage of the registrant's wood and fiber supply that could be affected by these risks or opportunities.

- Where relevant, a discussion of how risks and opportunities may vary between the source(s) (i.e., plantation forestlands and natural forestlands) of forestlands the registrant procures from.

.69 The registrant shall provide a discussion of the relative priority among the disclosed risks and opportunities that may affect the forestlands and tree species it relies upon for wood and fiber.

.70 The timeline over which such risks and opportunities are expected to manifest.

.71 The registrant shall provide a discussion of the scenarios used to determine the risks and opportunities to wood fiber sourcing presented by climate change, including:

- How such scenarios will manifest and the potential implications that this would have on its forestlands (e.g., how the area, health, vitality, and biodiversity of its forestlands may be affected).
- The methods or models used to develop these scenarios, including the use of global models or scientific research provided by governmental and non-governmental organizations (e.g., [Intergovernmental Panel on Climate Change Climate Scenario Process](#)).

.72 The registrant shall discuss efforts to assess and monitor the impacts of climate change and the related strategies to alleviate and/or adapt to any risks and/or utilize any opportunities, where:

- Alleviation strategies include, but are not limited to, improving supplier engagement in sustainable management practices and supply chain diversification.
- Adaptation strategies include, but are not limited to, monitoring of changes, research and development into alternate products and fibers, increased use of recycled content, and production efficiencies, among others.

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