



**SASB
STANDARDS**

Now part of IFRS Foundation

Fuel Cells & Industrial Batteries

Sustainability Accounting Standard

RENEWABLE RESOURCES & ALTERNATIVE ENERGY SECTOR

Sustainable Industry Classification System® (SICS®) RR-FC

Under Stewardship of the International Sustainability Standards Board

INDUSTRY STANDARD | VERSION 2023-12



sasb.org

ABOUT THE SASB STANDARDS

As of August 2022, the International Sustainability Standards Board (ISSB) of the IFRS Foundation assumed responsibility for the SASB Standards. The ISSB has committed to maintain, enhance and evolve the SASB Standards and encourages preparers and investors to continue to use the SASB Standards.

IFRS S1 *General Requirements for Disclosure of Sustainability-related Financial Information* (IFRS S1) requires entities to refer to and consider the applicability of disclosure topics in the SASB Standards when identifying sustainability-related risks and opportunities that could reasonably be expected to affect an entity's prospects. Similarly, IFRS S1 requires entities to refer to and consider the applicability of metrics in the SASB Standards when determining what information to disclose regarding sustainability-related risks and opportunities.

In June 2023, the ISSB amended climate-related topics and metrics in the SASB Standards to align them with the industry-based guidance accompanying IFRS S2 *Climate-related Disclosures*. In December 2023, the ISSB amended the non-climate-related topics and metrics in connection with the International Applicability of SASB Standards project.

Effective Date

This version 2023-12 of the Standard is effective for all entities for annual periods beginning or after January 1, 2025. Early adoption is permitted for all entities.

Table of Contents

INTRODUCTION..... 4

 Overview of SASB Standards..... 4

 Use of the Standards 5

 Industry Description 5

Sustainability Disclosure Topics & Metrics..... 6

 Energy Management 8

 Workforce Health & Safety 10

 Product Efficiency 13

 Product End-of-life Management 16

 Materials Sourcing 19

INTRODUCTION

Overview of SASB Standards

The SASB Standards are a set of 77 industry-specific sustainability accounting standards (“SASB Standards” or “Industry Standards”), categorised pursuant to the [Sustainable Industry Classification System[®] \(SICS[®]\)](#).

SASB Standards include:

1. **Industry descriptions** – which are intended to help entities identify applicable industry guidance by describing the business models, associated activities and other common features that characterise participation in the industry.
2. **Disclosure topics** – which describe specific sustainability-related risks or opportunities associated with the activities conducted by entities within a particular industry.
3. **Metrics** – which accompany disclosure topics and are designed to, either individually or as part of a set, provide useful information regarding an entity’s performance for a specific disclosure topic.
4. **Technical protocols** – which provide guidance on definitions, scope, implementation and presentation of associated metrics.
5. **Activity metrics** – which quantify the scale of specific activities or operations by an entity and are intended for use in conjunction with the metrics referred to in point 3 to normalise data and facilitate comparison.

Entities using the SASB Standards as part of their implementation of ISSB Standards should consider the relevant ISSB application guidance.

For entities using the SASB Standards independently from ISSB Standards, the [SASB Standards Application Guidance](#) establishes guidance applicable to the use of all Industry Standards and is considered part of the Standards. Unless otherwise specified in the technical protocols contained in the Industry Standards, the guidance in the SASB Standards Application Guidance applies to the definitions, scope, implementation, compilation and presentation of the metrics in the Industry Standards.

Historically, the [SASB Conceptual Framework](#) set out the basic concepts, principles, definitions and objectives that guided the SASB Standards Board in its approach to setting standards for sustainability accounting.

Use of the Standards

SASB Standards are intended to aid entities in disclosing information about sustainability-related risks and opportunities that could reasonably be expected to affect the entity's cash flows, its access to finance or cost of capital over the short, medium or long term. An entity determines which Industry Standard(s) and which disclosure topics are relevant to its business, and which associated metrics to report. In general, an entity should use the SASB Standard specific to its primary industry as identified in [SICS[®]](#). However, companies with substantial business in multiple SICS[®] industries should refer to and consider the applicability of the disclosure topics and associated metrics in additional SASB Standards.

The disclosure topics and associated metrics contained in this Standard have been identified as those that are likely to be useful to investors. However, the responsibility for making materiality judgements and determinations rests with the reporting entity.

Industry Description

Fuel Cells & Industrial Batteries industry entities manufacture fuel cells for energy production and energy storage equipment such as batteries. Manufacturers in this industry mainly sell products to entities for varied energy-generation and energy-storage applications and intensities, from commercial business applications to large-scale energy projects for utilities. Entities in the industry typically have global operations and sell products to a global marketplace.

Note: This industry excludes fuel cells or batteries used in light automotive vehicle applications. See the Auto Parts (TR-AP) industry for reporting this business segment. This industry also excludes non-industrial batteries for personal consumer use, which are classified under the Household & Personal Products (CG-HP) industry.

SUSTAINABILITY DISCLOSURE TOPICS & METRICS

Table 1. Sustainability Disclosure Topics & Metrics

TOPIC	METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management	(1) Total energy consumed, (2) percentage grid electricity and (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	RR-FC-130a.1
Workforce Health & Safety	(1) Total recordable incident rate (TRIR) and (2) fatality rate for (a) direct employees and (b) contract employees	Quantitative	Rate	RR-FC-320a.1
	Description of efforts to assess, monitor, and reduce exposure of workforce to human health hazards	Discussion and Analysis	n/a	RR-FC-320a.2
Product Efficiency	Average storage capacity of batteries, by product application and technology type	Quantitative	Specific energy (Wh/kg)	RR-FC-410a.1
	Average energy efficiency of fuel cells as (1) electrical efficiency and (2) thermal efficiency, by product application and technology type	Quantitative	Percentage (%)	RR-FC-410a.2
	Average battery efficiency as coulombic efficiency, by product application and technology type	Quantitative	Percentage (%)	RR-FC-410a.3
	Average operating lifetime of fuel cells, by product application and technology type	Quantitative	Hours (h)	RR-FC-410a.4
	Average operating lifetime of batteries, by product application and technology type	Quantitative	Number of cycles	RR-FC-410a.5
Product End-of-life Management	Percentage of products sold that are recyclable or reusable	Quantitative	Percentage (%) by weight	RR-FC-410b.1
	(1) Weight of end-of-life material recovered, (2) percentage recycled	Quantitative	Metric tonnes (t), Percentage (%)	RR-FC-410b.2
	Description of approach to manage use, reclamation, and disposal of hazardous materials	Discussion and Analysis	n/a	RR-FC-410b.3
Materials Sourcing	Description of the management of risks associated with the use of critical materials	Discussion and Analysis	n/a	RR-FC-440a.1

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of units sold	Quantitative	Number	RR-FC-000.A

continued...

...continued

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Total storage capacity of batteries sold	Quantitative	Megawatt-hours (MWh)	RR-FC-000.B
Total energy production capacity of fuel cells sold	Quantitative	Megawatt-hours (MWh)	RR-FC-000.C

Energy Management

Topic Summary

Manufacturing in the Fuel Cells & Industrial Batteries industry requires energy to power machines and cooling, ventilation, lighting and product-testing systems. Purchased electricity is a major share of the energy sources used in the industry and accounts for a notable proportion of the total cost of materials and value added. Various sustainability factors are increasing the cost of conventional electricity while making alternative sources cost-competitive. Energy efficiency efforts may have a significant positive impact on operational efficiency and profitability, especially because many entities operate on relatively low or negative margins. By improving manufacturing process efficiency and exploring alternative energy sources, fuel cell and industrial battery entities may reduce both their indirect environmental impacts and their operating expenses.

Metrics

RR-FC-130a.1. (1) Total energy consumed, (2) percentage grid electricity and (3) percentage renewable

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

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

Workforce Health & Safety

Topic Summary

Fuel cell and industrial battery manufacturing workers may be exposed to hazardous substances or workplace accidents that can have chronic or acute health impacts. Entities may face litigation because of injuries or chronic health impacts from working in fuel cell and battery manufacturing or recycling facilities. Entities that develop and implement strong safety processes and internal controls, 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.

Metrics

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

- 1 The entity shall disclose (1) its total recordable incident rate (TRIR) for work-related injuries and illnesses.
 - 1.1 An injury or illness is considered a recordable incident if it results in death, days away from work, restricted work or transfer to another job, medical treatment beyond first aid, or loss of consciousness. Additionally, a significant injury or illness diagnosed by a physician or other licensed health care professional is considered a recordable incident, even if it does not result in death, days away from work, restricted work or job transfer, medical treatment beyond first aid, or loss of consciousness.
 - 1.1.1 First aid is defined as emergency care or treatment for an ill or injured person before regular medical aid can be provided.
 - 1.1.2 The entity may use applicable jurisdictional criteria for definitions of a recordable incident and a non-recordable incident such as first aid. The entity shall disclose the legal, regulatory or industry framework used as the source for these criteria and definitions.
- 2 The entity shall disclose (2) its fatality rate for work-related fatalities.
- 3 All disclosed rates shall be calculated as: $(\text{statistic count} \times 200,000) / \text{total number of hours worked by all employees in the year reported}$.
 - 3.1 The '200,000' in the rate calculation represents the total number of hours 100 full-time workers working 40 hours per week for 50 weeks per year can provide annually.
- 4 The scope of the disclosure includes work-related incidents only.
 - 4.1 Work-related incidents are injuries and illnesses resulting from events or exposures in the work environment.
 - 4.2 The work environment is the establishment and other locations where one or more employees are working or are present as a condition of their employment.

- 4.3 The work environment includes not only physical locations, but also the equipment or materials used by the employee during the course of work.
- 4.4 Incidents that occur while an employee is travelling are work-related if, at the time of the injury or illness, the employee was engaged in work activities in the interest of the employer.
- 4.5 A work-related incident must be a new case, not a previously recorded injury or illness being updated.
- 5 The entity shall disclose the rates for each of these categories of employee:
 - 5.1 direct employees, defined as individuals on the entity's payroll, whether they are full-time, short service, part-time, executive, labour, salary, seasonal, migrant or hourly employees.
 - 5.2 contract employees, defined as individuals who are not on the entity's payroll, but whom the entity supervises or manages, including independent contractors and those employed by third parties (for example, temp agencies and labour brokers).
- 6 The scope of the disclosure includes all employees regardless of employee location and type of employment.

RR-FC-320a.2. Description of efforts to assess, monitor, and reduce exposure of workforce to human health hazards

- 1 The entity shall describe efforts to assess, monitor and reduce the exposure of employees to human health hazards, which may include solvents, corrosives, lead (and its compounds), arsenic (and its compounds), cadmium and sulphuric acid, as well as known or suspected carcinogens, teratogens and mutagens, and efforts to reduce the occurrence of events such as fires, explosions, freeze burns and electrocution.
- 2 The entity shall describe its management approach in the context of short-term (acute) risks and long-term (chronic) risks.
- 3 Relevant efforts to describe may include 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 alternatives to hazardous materials.
- 4 The entity 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.
- 5 The workforce includes any personnel conducting company business on behalf of the entity, including all direct employees and contract employees.
 - 5.1 Direct employees are defined as individuals on the entity's payroll, whether they are full-time, short service, part-time, executive, labour, salary, seasonal, migrant or hourly employees.
 - 5.2 Contract employees are defined as individuals who are not on the entity's payroll, but whom the entity supervises or manages, including independent contractors and those employed by third parties (for example, temp agencies and labour brokers).

- 6 The scope of the workforce shall include employees and contract employees in manufacturing or recycling plants but may discuss other members of the workforce, as relevant.
- 7 The entity may discuss entity policies regarding maximum workforce BLL thresholds and testing frequencies, including these aspects:
 - 7.1 How the entity ensures compliance with maximum workforce BLL thresholds and testing frequencies as established by regulatory agencies and governmental or nongovernmental organisations, such as OSHA and the American Conference of Governmental Industrial Hygienists (ACGIH).
 - 7.2 Whether any elements of entity policies are more stringent than regulatory requirements.
 - 7.3 Whether policies differ across locations with varying regulatory requirements.
 - 7.4 How policies are responsive to evolving regulatory requirements.
- 8 The entity may discuss performance in adhering to maximum workforce BLL thresholds and testing frequencies as established by entity policies or applicable regulations, including any legal or regulatory fines or settlements and instances of non-compliance.

Product Efficiency

Topic Summary

Both customer demand and regulatory requirements are driving innovation in energy-efficient products with lower environmental impacts and lower total cost of ownership. Therefore, research and development in the Fuel Cells & Industrial Batteries industry that drive energy and thermal efficiency and enhance storage capacities may lower barriers to adoption. Advances in battery technology to increase storage capabilities and improve charging efficiencies, while reducing costs for customers, are critical for the integration of renewable energy technologies into the grid. Pressured by stricter environmental regulations, high energy costs and customer preferences, fuel cell and industrial battery manufacturers that improve efficiency in the use phase may increase revenue and market share.

Metrics

RR-FC-410a.1. Average storage capacity of batteries, by product application and technology type

- 1 The entity shall disclose the average storage capacity of batteries by product application and technology type, weighted by unit sales volume per product application and technology type.
 - 1.1 Storage capacity shall be measured as the specific energy, or gravimetric energy density, of batteries, and is calculated as the ratio of nominal energy in watt-hours to the mass of the product in kilogrammes: watt-hours / kilogrammes (Wh/kg).
- 2 The entity shall measure and disclose performance in accordance with the applicable product application or technology type standard(s), and it shall disclose the standard(s) used for performance measurement.
 - 2.1 Applicable standard(s) include SAE J240—Automotive storage batteries and SAE J2185—Heavy-duty storage batteries.
- 3 The entity shall disclose performance by these application types, if applicable: portable, motive, stationary and ‘all other’, each further categorised by these technology types, if applicable: lead-based, nickel-based, lithium-based, sodium-based and all other types.
 - 3.1 The entity may include additional categories of application types or technology types if appropriate, including categories for new products with low sales volumes, but strategic importance in terms of product efficiency or other attributes.

RR-FC-410a.2. Average energy efficiency of fuel cells as (1) electrical efficiency and (2) thermal efficiency, by product application and technology type

- 1 The entity shall disclose the average energy efficiency of fuel cells as (1) electrical efficiency and (2) thermal efficiency, weighted by unit sales volume per product application and technology type.
 - 1.1 Electrical efficiency is calculated as net electricity produced divided by total fuel energy input.

- 1.2 Thermal efficiency is calculated as net useful power output divided by total fuel energy input.
- 1.3 The entity shall use lower heating values (LHV) in the calculation of electrical efficiency and thermal efficiency, and it shall disclose the heating values used.
- 2 The entity shall measure and disclose electrical and thermal efficiency in accordance with standard(s) applicable to the product application or technology type.
 - 2.1 Applicable standard(s) may include: IEC 62282-3-200—Stationary fuel cell power systems and SAE J2615—Testing Performance of Fuel Cell Systems for Automotive Applications.
 - 2.2 The entity shall disclose the standard(s) used for energy efficiency measurements.
- 3 The entity shall disclose electrical and thermal efficiency by these application types, if applicable: portable, motive, stationary and 'all other', each further categorised by these technology types, if applicable: direct methanol (DMFC), polymer electrolyte (PEM), alkaline (AFC), phosphoric acid (PAFC), molten carbonate (MCFC), solid oxide fuel cell (SOFC) and all other types.
 - 3.1 The entity may include additional categories of application types or technology types if appropriate, including categories for new products with low sales volumes, but strategic importance in terms of product efficiency or other attributes.
- 4 The entity may disclose any other fuel cell outputs that have economic value (for example, hydrogen), including an appropriate measurement of sales-weighted average value, by product application and technology type.

RR-FC-410a.3. Average battery efficiency as coulombic efficiency, by product application and technology type

- 1 The entity shall disclose the average energy efficiency of batteries as coulombic efficiency, weighted by unit sales volume per product application and technology type.
 - 1.1 Coulombic efficiency is calculated as energy removed from a battery during discharge divided by the energy used during charging to restore the original capacity.
- 2 The entity shall measure and disclose coulombic efficiency in accordance with standard(s) applicable to the product application or technology type.
 - 2.1 Applicable standard(s) include SAE J240—Automotive storage batteries and SAE J2185—Heavy-duty storage batteries.
- 3 The entity shall disclose coulombic efficiency by these application types, if applicable: portable, motive, stationary and 'all other', each further categorised by these technology types, if applicable: lead-based, nickel-based, lithium-based, sodium-based and all other types.
 - 3.1 The entity may include additional categories of application types or technology types if appropriate, including categories for new products with low sales volumes, but strategic importance in terms of product efficiency or other attributes.

RR-FC-410a.4. Average operating lifetime of fuel cells, by product application and technology type

- 1 The entity shall disclose the average operating lifetime of fuel cells, weighted by unit sales volume per product application and technology type.
 - 1.1 Operating lifetime of fuel cells is calculated as operating hours until 20% net power degradation occurs.
- 2 The entity shall measure and disclose operating lifetime in accordance with standard(s) applicable to the product application or technology type.
 - 2.1 Applicable standard(s) may include IEC 62282-3-200—Stationary fuel cell power systems and SAE J2615—Testing Performance of Fuel Cell Systems for Automotive Applications.
- 3 The entity shall disclose operating lifetime by these application types, if applicable: portable, motive, stationary and ‘all other’, each further categorised by these technology types, if applicable: direct methanol (DMFC), polymer electrolyte (PEM), alkaline (AFC), phosphoric acid (PAFC), molten carbonate (MCFC), solid oxide fuel cell (SOFC) and all other types.
 - 3.1 The entity may include additional categories of application types or technology types, if appropriate, including categories for new products with low sales volumes, but strategic importance in terms of product efficiency or other attributes.

RR-FC-410a.5. Average operating lifetime of batteries, by product application and technology type

- 1 The entity shall disclose the average operating lifetime of batteries, weighted by unit sales volume per product application and technology type.
 - 1.1 The operating lifetime of batteries is calculated as the number of times the battery can be fully charged and discharged, or ‘cycles’, until 20% capacity degradation occurs.
- 2 The entity shall measure and disclose operating lifetime in accordance with standard(s) applicable to the product application or technology type.
 - 2.1 Applicable standard(s) include SAE J240—Automotive storage batteries and SAE J2185—Heavy-duty storage batteries.
- 3 The entity shall disclose performance by these application types, if applicable: portable, motive, stationary and ‘all other’, each further categorised by these technology types, if applicable: lead-based, nickel-based, lithium-based, sodium-based and all other types.
 - 3.1 The entity may include additional categories of application types or technology types if appropriate, including categories for new products with low sales volumes, but strategic importance in terms of product efficiency or other attributes.

Product End-of-life Management

Topic Summary

As the rate of adoption of fuel cells and industrial batteries increases and more products reach their end of life, designing products to facilitate end-of-life management and maximise materials efficiency may become increasingly important. Fuel cells and batteries may contain hazardous substances, which must be properly discarded because they can pose human health or environmental risks. The emergence of several laws regarding the end-of-life phase of batteries recently has increased 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 an important element for increasing recovery rates to reduce the lifecycle impacts of fuel cells and batteries. Furthermore, given the input-price volatility and resource constraints of some raw materials, fuel cell and industrial battery entities that develop take-back and recycling systems and reuse recovered materials in manufacturing may increase their long-term operational efficiency and improve their risk profile.

Metrics

RR-FC-410b.1. Percentage of products sold that are recyclable or reusable

- 1 The entity shall disclose the percentage of products, by weight, that are reusable or recyclable, where:
 - 1.1 Reusable is defined as a product or packaging conceived and designed to accomplish, within its lifecycle, a specific number of trips, rotations, or uses for the same purpose for which it was conceived, consistent with definitions in ISO 14021 *Environmental labels and declarations—Self-declared environmental claims (Type II environmental labelling)*.
 - 1.2 Recyclable is defined as a product or packaging that can be diverted from the waste stream through available processes and programmes and can be collected, processed and returned to use in the form of raw materials or products, consistent with definitions in ISO 14021.
- 2 For products or product materials partially made of recyclable or reusable materials, the entity shall classify the portion of the material that is recyclable or reusable based on a calculation (or estimate, if appropriate) of the weight of each portion.
- 3 A product or its components shall be considered recyclable or reusable if one or more of these elements apply:
 - 3.1 A product or package can be collected, separated, or otherwise recovered from the waste stream through an established recycling programme for reuse or use in manufacturing or for assembling another item.
 - 3.2 When recycling facilities are available to a substantial majority (60%) of consumers, communities where the item is sold, or commercial and industrial customers through established collection infrastructure (public or private), the entity may consider the product (or product component) recyclable without a qualification.
 - 3.3 When recycling facilities are available to less than a substantial majority of customers or communities where the product is sold, the entity shall only consider the product (or product components) recyclable if it makes the appropriate qualification to its customers.

- 3.4 For items partially made of recyclable components, the entity 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 (for example, the size, shape or assembly method).

RR-FC-410b.2. (1) Weight of end-of-life material recovered, (2) percentage recycled

- 1 The entity shall disclose (1) the weight, in metric tonnes, of materials recovered, including those recovered through recycling services, product take-back programmes and refurbishment services, such that:
 - 1.1 the scope of the disclosure shall include products, materials and parts at the end of their useful life that would have otherwise been discarded as waste or used for energy recovery, but they have instead been collected;
 - 1.2 the scope of the disclosure shall include both materials physically handled by the entity and materials of which the entity does not take physical possession, but for which it has contracted with a third party the task of collection for the express purpose of reuse, recycling or refurbishment; and
 - 1.3 the scope of the disclosure shall exclude products and parts that are in warranty and have been collected for repairs.
- 2 The entity shall disclose (2) the percentage recycled, which is calculated as the weight of incoming material reused or reclaimed, plus the weight of material recycled or remanufactured (through treatment or processing) by the entity, plus the weight of material sent externally for further recycling, divided by the total weight of incoming recovered material, such that:
 - 2.1 a material is recycled if it is used, reused or reclaimed;
 - 2.2 reclaimed materials are defined as materials processed to recover or regenerate a usable product;
 - 2.3 reused materials are defined as recovered products or components of products used for the same purpose for which they were conceived;
 - 2.4 recycled and remanufactured materials are defined as waste materials reprocessed or treated through production or manufacturing processes and made into a final product or a component for incorporation into a product.
 - 2.5 materials sent for further recycling include those materials transferred to a third party for the express purpose of reuse, recycling, or refurbishment;
 - 2.6 the scope of recycled and remanufactured products includes primary recycled materials, co-products (outputs of equal value to primary recycled materials) and by-products (outputs of lesser value than primary recycled materials);
 - 2.7 portions of products and materials discarded in landfills are not considered recycled;
 - 2.8 only the portions of products directly incorporated into new products, co-products, or by-products shall be included in the percentage recycled; and

2.9 materials incinerated, including for energy recovery, are not considered reused, recycled, or reclaimed.

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

3 Electronic waste material (e-waste) shall be considered recycled only if the entity can demonstrate that this material was transferred to entities with third-party certification to a standard for e-waste recycling such as the e-Stewards® Standard for Responsible Recycling and Reuse of Electronic Equipment or the Responsible Recycling Practices (R2) Standard for Electronic Recyclers.

3.1 The entity shall disclose the standards with which the entities to which it has transferred e-waste are compliant.

RR-FC-410b.3. Description of approach to manage use, reclamation, and disposal of hazardous materials

1 The entity shall discuss its strategies to manage the use of hazardous materials, where:

1.1 Hazardous materials include both hazardous secondary materials and waste that meets the definition of hazardous waste under the applicable jurisdictional legal or regulatory framework where the waste was generated.

1.1.1 The entity may use definitions from the United Nations Environment Programme's (UNEP) *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal*.

1.2 Hazardous secondary materials are defined as a secondary spent material, by-product or sludge that, when discarded, would be identified as hazardous waste under local jurisdictional framework(s), or, if not addressed in the jurisdictional regulations, then in accordance with the Basel Convention.

1.3 Hazardous materials include those that display these characteristics: ignitability, corrosivity, reactivity or toxicity.

1.4 The entity shall disclose the frameworks used to define hazardous secondary materials and waste.

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

3 The entity shall describe its approach to design and its process to ensure proper and safe disposal or reclamation and recycling of hazardous materials at the product end-of-life stage, including take-back programmes and direct contracts with third-party hazardous waste reclamation services.

4 The entity shall describe the root cause and its corrective actions for any incidences when its use, reclamation or disposal of hazardous materials deviated from its expected outcomes, such as those resulting in a release into the environment, regulatory non-compliance, or human health and safety impacts.

Materials Sourcing

Topic Summary

Manufacturing some types of industrial batteries and fuel cells requires an available supply of materials such as lithium, cobalt, nickel and platinum. Access to these materials is critical for the continuous development and scaling of clean energy technologies like fuel cells and industrial batteries. Limited global resources of these critical materials, as well as their concentration in countries that may have relatively limited governance and regulatory structures or are subject to geopolitical tensions, expose entities to the risk of supply-chain disruptions and input-price increases or volatility. At the same time, competition from other industries that use the same critical materials or employ fuel cell and battery technologies may exacerbate supply risks. Fuel cell and industrial battery entities with strong supply-chain standards and the ability to adapt to increasing resource scarcity may protect shareholder value better. Entities that reduce the use of critical materials and secure supply of the materials they do use may mitigate potential financial effects because of supply disruptions, volatile input prices, and reputational and regulatory risks.

Metrics

RR-FC-440a.1. Description of the management of risks associated with the use of critical materials

- 1 The entity shall describe how it manages the risks associated with the use of critical materials in its products, including physical limits on availability and access, changes in price, and regulatory and reputational risks, in which:
 - 1.1 a critical material is defined as a material both essential in use and subject to the risk of supply restriction; and
 - 1.2 examples of critical materials include:
 - 1.2.1 antimony, cobalt, fluorspar, gallium, germanium, graphite, indium, magnesium, niobium, tantalum and tungsten;
 - 1.2.2 platinum group metals (platinum, palladium, iridium, rhodium, ruthenium and osmium); and
 - 1.2.3 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).
- 2 The entity shall identify the critical materials that present a significant risk to its operations, the type of risks they represent and the strategies the entity uses to mitigate the risks.
 - 2.1 Relevant strategies may include diversification of suppliers, stockpiling of materials, development or procurement of alternative and substitute materials, and investments in recycling technology for critical materials.

- 3 All disclosure shall be sufficient such that it is specific to the risks the entity faces, but that disclosure itself would not compromise the entity's ability to maintain confidential information.
- 3.1 For example, if an entity determines not to identify a specific critical material that presents a significant risk to its operations because of the competitive harm that could result from the disclosure, the entity shall disclose the existence of such risks, the type of risks and the strategies used to mitigate the risks, but the entity is not required to disclose the relevant critical material.



**SASB
STANDARDS**

Now part of IFRS Foundation