



March 2022

Exposure Draft

IFRS[®] Sustainability Disclosure Standard

[Draft] IFRS S2 Climate-related Disclosures
Appendix B Industry-based disclosure requirements

Volume B42—Fuel Cells & Industrial Batteries

Comments to be received by 29 July 2022



This industry from Appendix B Industry-based disclosure requirements accompanies the Exposure Draft ED/2022/S2 *Climate-related Disclosures* (published March 2022; see separate booklet). It is published by the International Sustainability Standards Board (ISSB) for comment only. Comments need to be received by 29 July 2022 and should be submitted by email to commentletters@ifrs.org or online at <https://www.ifrs.org/projects/open-for-comment/>.

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Introduction

This volume is part of Appendix B of [draft] IFRS S2 Climate-related Disclosures and is an integral part of that [draft] Standard. It has the same authority as the other parts of that [draft] Standard.

This volume sets out the requirements for identifying, measuring and disclosing information related to an entity's significant climate-related risks and opportunities that are associated with specific business models, economic activities and other common features that characterise participation in this industry.

The industry-based disclosure requirements are derived from SASB Standards (see paragraphs B10–B12 of [Draft] IFRS S2 *Climate-related Disclosures*). Amendments to the SASB Standards, described in paragraph B11, are marked up for ease of reference. New text is underlined and deleted text is struck through. The metric codes used in SASB Standards have also been included, where applicable, for ease of reference. For additional context regarding the industry-based disclosure requirements contained in this volume, including structure and terminology, application and illustrative examples, refer to Appendix B paragraphs B3–B17.

Fuel Cells & Industrial Batteries

Industry Description

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

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

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, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	RR-FC-130a.1
Product Efficiency	Average storage capacity of batteries, by product application and technology type	Quantitative	Specific energy (Wh/kg)	RR-FC-410a.1
	Average energy efficiency of fuel cells as (1) electrical efficiency and (2) thermal efficiency, by product application and technology type	Quantitative	Percentage (%)	RR-FC-410a.2
	Average battery efficiency as coulombic efficiency, by product application and technology type	Quantitative	Percentage (%)	RR-FC-410a.3
	Average operating lifetime of fuel cells, by product application and technology type	Quantitative	Hours (h)	RR-FC-410a.4
	Average operating lifetime of batteries, by product application and technology type	Quantitative	Number of cycles	RR-FC-410a.5

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of units sold	Quantitative	Number	RR-FC-000.A
Total storage capacity of batteries sold	Quantitative	Megawatts (MW)	RR-FC-000.B
Total energy production capacity of fuel cells sold	Quantitative	Megawatts (MW)	RR-FC-000.C

Energy Management

Topic Summary

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

Metrics

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

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

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

Product Efficiency

Topic Summary

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

Metrics

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

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

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

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

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

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

- 1 The entity shall disclose the average energy efficiency of batteries as coulombic efficiency, weighted by unit sales volume per product application and technology type.
 - 1.1 Coulombic efficiency is calculated as energy removed from a battery during discharge divided by the energy used during charging to restore the original capacity.
- 2 The entity shall measure and disclose coulombic efficiency in accordance with standard(s) applicable to the product application and/or technology type.
 - 2.1 Applicable standard(s) may include SAE J240—Automotive storage batteries and SAE J2185—Heavy-duty storage batteries.
- 3 The entity shall disclose coulombic efficiency by the following application types, where applicable: portable, motive, stationary, and “all other,” each further categorized by the following technology types, where applicable: lead-based, nickel-based, lithium-based, sodium-based, and “all other.”

- 3.1 The entity may include additional categories of application types and/or technology types where appropriate, including categories for new products with low sales volumes but strategic importance in terms of product efficiency or other attributes.

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

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

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

- 1 The entity shall disclose the average operating lifetime of batteries, weighted by unit sales volume per product application and technology type.
 - 1.1 The operating lifetime of batteries is calculated as the number of times the battery can be fully charged and discharged, or “cycles,” until 20% capacity degradation occurs.
- 2 The entity shall measure and disclose operating lifetime in accordance with standard(s) applicable to the product application and/or technology type.
 - 2.1 Applicable standard(s) may include SAE J240—Automotive storage batteries and SAE J2185—Heavy-duty storage batteries.
- 3 The entity shall disclose performance by the following application types, where applicable: portable, motive, stationary, and “all other,” each further categorized by the following technology types, where applicable: lead-based, nickel-based, lithium-based, sodium-based, and “all other.”

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- 3.1 The entity may include additional categories of application types and/or technology types where appropriate, including categories for new products with low sales volumes but strategic importance in terms of product efficiency or other attributes.