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# Exposure Draft

IFRS<sup>®</sup> Sustainability Disclosure Standard

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

Volume B44—Solar Technology & Project Developers

Comments to be received by 29 July 2022



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## Introduction

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*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.

## Solar Technology & Project Developers

### Industry Description

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

### Sustainability Disclosure Topics & Metrics

**Table 1. Sustainability Disclosure Topics & Metrics**

TOPIC	METRIC	CATEGORY	UNIT OF MEASURE	CODE
Energy Management in Manufacturing	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	RR-ST-130a.1
Water Management in Manufacturing	(1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic meters (m <sup>3</sup> ), Percentage (%)	RR-ST-140a.1
	Description of water management risks and discussion of strategies and practices to mitigate those risks	Discussion and Analysis	n/a	RR-ST-140a.2
Management of Energy Infrastructure Integration & Related Regulations	Description of risks associated with integration of solar energy into existing energy infrastructure and discussion of efforts to manage those risks	Discussion and Analysis	n/a	RR-ST-410a.1
	Description of risks and opportunities associated with energy policy and its impact on the integration of solar energy into existing energy infrastructure	Discussion and Analysis	n/a	RR-ST-410a.2

**Table 2. Activity Metrics**

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Total capacity of photovoltaic (PV) solar modules produced <sup>75</sup>	Quantitative	Megawatts (MW)	RR-ST-000.A

*continued...*

<sup>75</sup> Note to RR-ST-000.A – PV solar modules are defined in accordance with the U.S. DOE Solar Energy Glossary: photovoltaic (PV) module.

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ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Total capacity of completed solar energy systems <sup>76</sup>	Quantitative	Megawatts (MW)	RR-ST-000.B
Total project development assets <sup>77</sup>	Quantitative	Reporting currency	RR-ST-000.C

<sup>76</sup> Note to **RR-ST-000.B** – 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.” Completed systems are defined by the entity, consistent with its existing public disclosure of completed systems.

<sup>77</sup> Note to **RR-ST-000.C** – Project development assets are defined by the entity, consistent with its existing public disclosure of project development assets, regardless of terminology used by the entity (e.g., “Project assets,” “Project assets—plants and land,” “Solar Energy Systems Held for Development and Sale,” etc.). At a minimum, project development assets include assets that are associated with solar energy systems that are under development or fully developed, owned by the entity, and held for sale or intended to be sold to a third party prior to the execution of a definitive sales agreement, and assets that consist primarily of capitalized costs incurred in connection with the development of solar energy systems.

## Energy Management in Manufacturing

### Topic Summary

Solar panel manufacturing typically uses electrical energy purchased from the grid. Energy can account for a considerable share of the total cost of production. In light of rising energy costs and regulatory uncertainty surrounding the future of fossil-based energy, companies that diversify their energy sources may be better able to manage the associated risks and maintain a reliable energy supply. Companies that minimize their energy use through effective energy management can reduce costs and gain a competitive advantage through operational efficiency and competitive pricing of products. This is particularly important given the intense price competition within the solar technology industry.

### Metrics

*RR-ST-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.

- 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).

## Water Management in Manufacturing

### Topic Summary

Solar photovoltaic panel manufacturing can be water-intensive, and ultra-pure water is a critical input in some processes. The manufacturing process can also generate wastewater, which must be treated before disposal or reuse, and can therefore result in operating costs and additional capital expenditures. Furthermore, depending on their location, solar equipment manufacturing facilities may be exposed to the risk of reduced water availability (scarcity) and related cost increases or operational disruptions. The use of local water resources is a risk that can generate tension with local water users, potentially disrupting manufacturing operations and adversely impacting brand value. To mitigate water supply and treatment risks, companies can adopt various strategies such as recycling process water, improving production techniques to lower water intensity, and improving water treatment systems.

### Metrics

*RR-ST-140a.1. (1) Total water withdrawn, (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress*

- 1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from all sources.
  - 1.1 Water sources include surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities.
- 2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.
  - 2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. Where there is no legal definition, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids ~~per the U.S. Geological Survey~~.
  - 2.2 Water obtained from a water utility in compliance with ~~U.S. National Primary Drinking Water Regulations~~ jurisdictional drinking water regulations can be assumed to meet the definition of fresh water.
- 3 The entity shall disclose the amount of water, in thousands of cubic meters, that was consumed in its operations.
  - 3.1 Water consumption is defined as:
    - 3.1.1 Water that evaporates during withdrawal, usage, and discharge;
    - 3.1.2 Water that is directly or indirectly incorporated into the entity's product or service;
    - 3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.

- 4 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress as classified by the World Resources Institute's (WRI) Water Risk Atlas tool, Aqueduct.
- 5 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.
- 6 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

*RR-ST-140a.2. Description of water management risks and discussion of strategies and practices to mitigate those risks*

- 1 The entity shall describe its water management risks associated with water withdrawals, water consumption, and discharge of water and/or wastewater.
  - 1.1 Risks associated with water withdrawals and water consumption include risks to the availability of adequate, clean water resources, including, but not limited to:
    - 1.1.1 Environmental constraints—such as operating in water-stressed regions, drought, concerns of aquatic impingement or entrainment, interannual or seasonal variability, and risks due to the impact of climate change
    - 1.1.2 Regulatory and financial constraints—such as volatility in water costs, stakeholder perceptions and concerns related to water withdrawals (e.g., those from local communities, non-governmental organizations, and regulatory agencies), direct competition with and impact from the actions of other users (e.g., commercial and municipal users), restrictions to withdrawals due to regulations, and constraints on the entity's ability to obtain and retain water rights or permits
  - 1.2 Risks associated with the discharge of water and/or wastewater, include, but are not limited to, the ability to obtain rights or permits related to discharges, compliance with regulations related to discharges, restrictions to discharges, the ability to maintain control over the temperature of water discharges, liabilities and/or reputational risks, and increased operating costs due to regulation, stakeholder perceptions and concerns related to water discharges (e.g., those from local communities, non-governmental organizations, and regulatory agencies).
- 2 The entity may describe water management risks in the context of:
  - 2.1 How risks may vary by withdrawal source, including surface water (including water from wetlands, rivers, lakes, and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities, or other entities; and
  - 2.2 How risks may vary by discharge destinations, including surface water, groundwater, or wastewater utilities.

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- 3 The entity may discuss the potential impacts that water management risks may have on its operations and the timeline over which such risks are expected to manifest.
  - 3.1 Impacts may include, but are not limited to, those associated with costs, revenues, liabilities, continuity of operations, and reputation.
- 4 The entity shall discuss its short-term and long-term strategies or plan to mitigate water management risks, including, but not limited to:
  - 4.1 The scope of its strategy, plans, goals and/or targets, such as how they relate to different business units, geographies, or water-consuming operational processes.
  - 4.2 Any water management goals and/or targets it has prioritized, and an analysis of performance against those goals and/or targets.
    - 4.2.1 Goals and targets may include, but are not limited to, those associated with reducing water withdrawals, reducing water consumption, reducing water discharges, reducing aquatic impingements, improving the quality of water discharges, and regulatory compliance.
  - 4.3 The activities and investments required to achieve the plans, goals and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.
  - 4.4 Disclosure of strategies, plans, goals, and/or targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.
- 5 For water management targets, the entity shall additionally disclose:
  - 5.1 Whether the target is absolute or intensity-based, and the metric denominator if it is an intensity-based target.
  - 5.2 The timelines for the water management plans, including the start year, the target year, and the base year.
  - 5.3 The mechanism(s) for achieving the target, including:
    - 5.3.1 Efficiency efforts, such as the use of water recycling and/or closed-loop systems;
    - 5.3.2 Product innovations such as redesigning products or services to require less water;
    - 5.3.3 Process and equipment innovations, such as those that enable the reduction of aquatic impingements or entrainments;
    - 5.3.4 Use of tools and technologies (e.g., the World Wildlife Fund Water Risk Filter, The Global Water Tool, and Water Footprint Network Footprint Assessment Tool) to analyze water use, risk, and opportunities; and
    - 5.3.5 Collaborations or programs in place with the community or other organizations.

- 5.4 The percentage reduction or improvement from the base year, where the base year is the first year against which water management targets are evaluated toward the achievement of the target.
- 6 The entity shall discuss whether its water management practices result in any additional lifecycle impacts or trade-offs in its organization, including trade-offs in land use, energy production, and greenhouse gas (GHG) emissions, and why the entity chose these practices despite lifecycle trade-offs.

## Management of Energy Infrastructure Integration & Related Regulations

### Topic Summary

Companies in the industry have faced challenges in establishing solar energy as a cost-competitive means of energy production and GHG reduction, and have thus encountered difficulty in capturing a greater share of global energy generation. In order to promote greater adoption of solar, the industry can benefit by preventing systemic disruptions to the existing energy infrastructure and essential energy services. Companies are innovating to overcome the technical challenges of increasing solar integration with the grid. They are also engaging with regulatory agencies and policymakers to reduce regulatory barriers to the adoption of solar energy, many of which are emerging due to the concern around increasing overall grid electricity costs and grid disruptions. Solar companies are investing in innovative technologies to reduce hardware and installation costs, and are working toward business-model innovation to reduce the cost of capital and facilitate the purchase of solar energy systems. Solar technology companies can improve their competitiveness through deploying one or more of these strategies successfully to ensure their ability to scale over the long term.

### Metrics

#### *RR-ST-410a.1. Description of risks associated with integration of solar energy into existing energy infrastructure and discussion of efforts to manage those risks*

- 1 The entity shall describe risks, challenges, and barriers surrounding the integration of solar energy into the existing energy infrastructure in terms of its products and services.
  - 1.1 Relevant information to provide may include, but is not limited to:
    - 1.1.1 Technological barriers to increased integration of solar energy, such as limited transmission network connectivity, lack of access to high-capacity transmission networks, variability in interconnection standards, and inverter interconnection requirements;
    - 1.1.2 Operational barriers to increased integration of solar energy, such as curtailment and challenges associated with the variable nature of solar energy; and
    - 1.1.3 Customer motivations for seeking increased integration of solar energy, such as economic advantages, regulatory compliance, risk mitigation, and public perception or reputational risk.
- 2 The entity shall discuss its strategy and approach to design, development, and sales in order to integrate solar energy into the existing energy infrastructure.
  - 2.1 Relevant strategies and approaches may include, but are not limited to:
    - 2.1.1 Technical product design;
    - 2.1.2 Development of new products or product components (e.g., smart inverters);

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- 2.1.3 Technical innovation designed to reduce the cost of solar energy modules and/or systems;
  - 2.1.4 Third-party partnerships and product integrations;
  - 2.1.5 Project design (e.g., project siting in regions with reduced curtailment risk);
  - 2.1.6 Project risk transfer (e.g., power purchase agreements (PPAs) with curtailment caps);
  - 2.1.7 Marketing and sales (e.g., focus on regions or customer segments with less grid integration risk);
  - 2.1.8 The incorporation of energy storage technology, or “smart grid” technology, into solar energy systems, whether through proprietary technological development or collaboration with third parties;
  - 2.1.9 Products designed to operate “off-grid” or as part of “micro-grids;”
  - 2.1.10 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
  - 2.1.11 Innovation designed to increase the total addressable solar energy market.
- 2.2 Relevant information to provide includes, but is not limited to:
- 2.2.1 Whether the entity pursues multiple approaches;
  - 2.2.2 Whether the entity’s approach differs by market;
  - 2.2.3 The intensity of R&D requirements for the entity’s approach and strategy;
  - 2.2.4 The level of competition relative to the entity’s approach and strategy; and
  - 2.2.5 How the entity evaluates the success of its approach.
- 3 The scope of disclosure shall include all of the entity’s solar energy-related products, product components, projects, project development efforts, and services, as well as the associated marketing and sales strategies, in the markets in which the entity operates.
- 4 The entity may describe how energy infrastructure influences the establishment of sales targets, strategies for specific product categories, technologies or marketing practices in specific regions, research and development (R&D) objectives, and partnerships.

*RR-ST-410a.2. Description of risks and opportunities associated with energy policy and its impact on the integration of solar energy into existing energy infrastructure*

- 1 The entity shall discuss its risks and opportunities associated with energy policy and the impact energy policy has on the integration of solar energy into existing energy infrastructure, where:
  - 1.1 Relevant risks and opportunities may include, but are not limited to:
    - 1.1.1 Direct or indirect government subsidization of solar energy;
    - 1.1.2 International trade policy disputes and agreements;
    - 1.1.3 Public policies that establish minimum requirements for renewable energy generation (e.g., renewable portfolio standards);
    - 1.1.4 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;
    - 1.1.5 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;
    - 1.1.6 Public policies pertaining to any external social costs created by distributed solar energy generation;
    - 1.1.7 Policies pertaining to electricity transmission, including, but not limited to, regional transmission planning, interconnected transmission networks, interconnection standards, and high-capacity transmission networks; and
    - 1.1.8 Replacements to aging energy-generation and transmission infrastructure.
- 2 The entity shall identify risks and opportunities it faces related to legislation, regulation, rule-making, and the overall political environment (hereafter referred to collectively as “regulatory and political environment”) related to energy policy and the integration of solar energy into energy infrastructure.
  - 2.1 The scope shall include existing, emerging, and known future risks and opportunities.
  - 2.2 The scope shall include risks and opportunities that may exist at the local, state, and national levels, international governmental organizations, and regulatory organizations.
    - 2.2.1 The scope shall include the relevant policies of utilities, rule-makers, and regulators.

- 3 Relevant information to provide includes, but is not limited to, the impact on demand for the entity's solar energy products and services and the impact on business viability related to risks and opportunities associated with energy policy and the impact energy policy has on the integration of solar energy into the existing energy infrastructure.