SASB STANDARDS

Now part of IFRS Foundation

Wind Technology & Project Developers

Sustainability Accounting Standard

RENEWABLE RESOURCES & ALTERNATIVE ENERGY SECTOR

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

Under Stewardship of the International Sustainability Standards Board

INDUSTRY STANDARD | VERSION 2023-12

IFRS Sustainability

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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.

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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

Wind Technology & Project Developers manufacture wind turbines, blades, towers and other components of wind power systems. Entities that develop, build and manage wind energy projects also are included within this industry scope. Manufacturers also may offer post-sale maintenance and support services. Turbines may be installed onshore or offshore, which can create differences in wind-generating capacity and project development challenges for each type of installation. Most major wind technology entities operate globally.

SUSTAINABILITY DISCLOSURE TOPICS & METRICS

Table 1. Sustainability Disclosure Topics & Metrics

TOPIC	METRIC	CATEGORY	UNIT OF MEASURE	CODE
Workforce Health & Safety	(1) Total recordable incident rate (TRIR) and (2) fatality rate for (a) direct employees and (b) contract employees	Quantitative	Rate	RR-WT-320a.1
Ecological Impacts of Project Development	Average A-weighted sound power level of wind turbines, by wind turbine class	Quantitative	dB(A)	RR-WT-410a.1
	Backlog cancellations associated with community or ecological impacts	Quantitative	Presentation currency	RR-WT-410a.2
	Description of efforts to address ecological and community impacts of wind energy production through turbine design	Discussion and Analysis	n/a	RR-WT-410a.3
Materials Sourcing	Description of the management of risks associated with the use of critical materials	Discussion and Analysis	n/a	RR-WT-440a.1
Materials Efficiency	Top five materials consumed, by weight	Quantitative	Metric tonnes (t)	RR-WT-440b.1
	Average top head mass per turbine capacity, by wind turbine class	Quantitative	Metric tonnes per megawatts (t/MW)	RR-WT-440b.2
	Description of approach to optimise materials efficiency of wind turbine design	Discussion and Analysis	n/a	RR-WT-440b.3

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of delivered wind turbines, by wind turbine class[1]	Quantitative	Number	RR-WT-000.A
Aggregate capacity of delivered wind turbines, by wind turbine class[2]	Quantitative	Megawatts (MW)	RR-WT-000.B
Amount of turbine backlog[3]	Quantitative	Presentation currency	RR-WT-000.C
Aggregate capacity of turbine backlog[4]	Quantitative	Megawatts (MW)	RR-WT-000.D

[1] Note to **RR-WT-000.A** – Wind turbine class is defined by the International Electrotechnical Commission's IEC 61400-1. Wind turbine class shall be determined by the turbine rating.

[2] Note to **RR-WT-000.B** – Wind turbine class is defined by the International Electrotechnical Commission's IEC 61400-1. Wind turbine class shall be determined by the turbine rating.

[3] Note to **RR-WT-000.C** – Turbine backlog is defined by the entity, consistent with its existing public disclosure of order backlog. Turbine backlog excludes any backlog amounts resulting from operating and maintenance agreements or other service agreements.

[4] Note to **RR-WT-000.D** – Turbine backlog is defined by the entity, consistent with its existing public disclosure of order backlog. Turbine backlog excludes any backlog amounts resulting from operating and maintenance agreements or other service agreements.

Workforce Health & Safety

Topic Summary

Many wind turbine manufacturers offer operations and maintenance (O&M) services for wind farm owners or operators together with product sales. These activities may include installation, maintenance, monitoring and repairing turbine installations. The wind farm O&M segment maintains a high safety standard because the work is inherently hazardous. Hazards include physical hazards such as falls from heights and moving mechanical parts, as well as electrical hazards. The quality of O&M services therefore is critical for the safety of wind farm operations, with the potential to affect entity reputations and demand for products and services. Operational downtime and effects on wind farm insurance costs because of accidents may add to wind farm operating costs. Wind farm owners or developers therefore may consider turbine and service provider safety records in requests for tender. Entities that improve turbine and O&M safety may reduce operating costs and extraordinary expenses.

Metrics

RR-WT-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: (statistic count × 200,000) / 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 by each of these employee categories:

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 or type of employment.

Ecological Impacts of Project Development

Topic Summary

Wind farm development involves siting, land acquisition, permitting and engagement with local stakeholders to manage environmental and community impacts. Offshore developments may affect the marine ecosystem, and both on and offshore wind farms may have adverse effects on local animal populations, some of which may be endangered. Obtaining environmental and construction permits for projects may be delayed or prevented if regulators or community members have concerns about the ecological impacts of the development. Wind project approval directly affects equipment manufacturers through demand for turbines. Although manufacturers typically do not control the project approval process, research and development investments may minimise ecological impacts, resulting in long-term benefits. These measures could facilitate project approvals and give wind technology manufacturers a competitive advantage, potentially increasing their market share over time.

Metrics

RR-WT-410a.1. Average A-weighted sound power level of wind turbines, by wind turbine class

1 The entity shall disclose, by wind turbine class, the average A-weighted sound power level of turbines delivered during the reporting period, weighted by the total number of turbine deliveries per wind turbine class.

2 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.

3 The entity shall disclose weighted-average sound power level by wind turbine class as they are defined by the IEC 61400-1, Edition 3.0—Design requirements, such as:

3.1 IEC Wind Turbine Class I;

3.2 IEC Wind Turbine Class II;

3.3 IEC Wind Turbine Class III;

3.4 IEC Wind Turbine Class IV; and

3.5 IEC Wind Turbine Class S.

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

5 The entity may disclose weighted-average sound power level in additional wind turbine classes, including:

5.1 turbulence characteristics;

5.2 mixed class (for example, IEC Wind Turbine Class I/II);

5.3 onshore; and

5.4 offshore.

RR-WT-410a.2. Backlog cancellations associated with community or ecological impacts

1 The entity shall disclose the quantity of orders in its turbine order backlog subject to cancellation during the reporting period for reasons related to or associated with community or ecological impacts.

1.1 Turbine order backlog is defined by the entity, consistent with its existing public disclosure of order backlog.

1.2 Turbine order backlog excludes any backlog amounts resulting from operating and maintenance agreements or other service agreements.

1.3 Order backlog cancellations are defined as the amount of the order backlog cancelled, reduced, terminated, deferred such that it no longer meets the entity's definition of order backlog, or removed from the order backlog for any reason other than conversion to revenue or currency exchange rate fluctuations.

1.4 Order backlog cancellations include those that occur for reasons which may include a customer's failure to obtain necessary project permitting, a customer's voluntary project cancellation, and reduction in project scope because of financial constraints.

1.5 Order backlog cancellations for reasons related to or associated with community or ecological impacts are defined as those cancellations that reasonably can be determined to relate, in whole or in part, to:

1.5.1 community opposition to a customer's wind turbine project development or operations which may include opposition related to noise emissions, land use, visual aesthetics, and safety of human health or property; or

1.5.2 ecological impact or risk of ecological impact of a customer's wind turbine project development or operations which may include risks to wildlife or habitat loss.

2 The entity shall exclude from the calculation any amount of an order backlog cancellation that re-enters order backlog during the same reporting period because of a project developer's successful re-ordering of turbines.

3 The entity additionally may disclose order backlog cancellations as the aggregate amount of turbine capacity subject to cancellation.

4 The entity may discuss specific order backlog cancellations, including root causes and corrective actions to prevent future order backlog cancellations.

RR-WT-410a.3. Description of efforts to address ecological and community impacts of wind energy production through turbine design

1 The entity shall describe how it manages the ecological and community impacts of wind energy production through turbine design, in which:

1.1 ecological impacts may include risk of bird and bat deaths, land-use requirements, and ecological impact of construction; and

1.2 community impacts may include noise emissions, visual aesthetics, land use requirements, and safety of human health and property.

2 If the entity has identified separate ecological or community impacts for onshore and offshore wind energy production, it shall describe separately how it manages such impacts through onshore and offshore turbine design.

3 The scope of the disclosure shall include physical technologies and modifications to wind turbine design as well as operational control software (for example, SCADA systems) that may mitigate ecological and community impacts.

3.1 Physical technologies may include blade heating elements, wildlife detection technologies (for example, radar) and wildlife deterrent technologies (for example, ultrasonic transmitters).

3.2 Modifications to wind turbine design may include 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.

4 The entity may discuss its role in wind project siting, if applicable. The entity may discuss the extent of the entity's role in siting analysis or selection and the incorporation of ecological and community impacts into siting analysis or selection.

Materials Sourcing

Topic Summary

Wind technology entities source materials from global supply chains for use in turbines, including critical materials, such as neodymium and dysprosium, and critical minerals including tantalum and tungsten. Materials sourcing risks result from a low substitution ratio, the concentration of deposits in a few countries, geopolitical considerations, and competition from other industries. Direct drive turbines, which increasingly are being used for reliability, may require significantly more critical materials than more traditional drive trains. Entities may minimise negative externalities and protect themselves from related input cost volatility and supply constraints by creating transparent supply chains, sourcing materials from reliable suppliers or regions that have minimal environmental or social risks associated with them, supporting research into alternative inputs, and reducing reliance on these materials.

Metrics

RR-WT-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 may 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.

Materials Efficiency

Topic Summary

The Wind Technology & Project Developers industry's long-term success depends on producing energy at a comparatively lower cost than other energy sources. Steel and other materials purchases are one of the largest costs of turbines, and inputs such as steel have exhibited price volatility in the past. In recent years, wind turbines have grown in size, in terms of both 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, entities may employ innovative methods to increase turbine output while using materials more efficiently. Increased output and efficiency could influence entities' competitiveness and market share, costs of production, and operational risks related to the supply and price volatility of raw materials, as well as the ability of the entity to scale.

Metrics

RR-WT-440b.1. Top five materials consumed, by weight

1 For each of the following wind turbine classes, the entity shall disclose the weight, in metric tonnes, of the five materials consumed in the greatest amounts, by weight, in delivered wind turbines during the reporting period.

2 The scope of disclosure includes materials weights in the final delivered turbine, including the nacelle, blades and tower, and excludes the weight of materials consumed in production (for example, waste), freight, storage and installation (for example, foundation).

3 Materials may include aluminium, carbon fibre, copper, fibreglass, iron or steel.

4 The entity may disclose the weight of the five materials consumed in the greatest amounts by wind turbine class.

4.1 Wind turbine classes are defined by the International Electrotechnical Commission's (IEC) 61400-1, Edition 3.0—Design requirements:

4.1.1 IEC Wind Turbine Class I

4.1.2 IEC Wind Turbine Class II

4.1.3 IEC Wind Turbine Class III

4.1.4 IEC Wind Turbine Class IV

4.1.5 IEC Wind Turbine Class S

4.1.6 Turbulence characteristics

4.1.7 Mixed class (e.g., IEC Wind Turbine Class I / II)

4.1.8 Onshore

4.1.9 Offshore

5 The entity may disclose additional materials weights that may represent significant materials costs, supply chain risks or exposure to pricing volatility.

RR-WT-440b.2. Average top head mass per turbine capacity, by wind turbine class

1 For each of the following wind turbine classes, the entity shall disclose the average top head mass per turbine capacity of turbines delivered during the reporting period, weighted by turbine deliveries per wind turbine class.

1.1 Wind turbine classes are defined by the International Electrotechnical Commission's (IEC) 61400-1, Edition 3.0—Design requirements:

1.1.1 IEC Wind Turbine Class I

1.1.2 IEC Wind Turbine Class II

1.1.3 IEC Wind Turbine Class III

1.1.4 IEC Wind Turbine Class IV

1.1.5 IEC Wind Turbine Class S

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

3 Average top head mass per turbine capacity shall be calculated as the mass of the top head in metric tonnes divided by turbine capacity in megawatts (MW).

3.1 The top head shall include the turbine nacelle and the turbine rotor.

3.2 The top head shall exclude the blades.

3.3 Turbine capacity is the rated turbine capacity, defined as the maximum output (generation) of a wind turbine, in megawatts (MW), also referred to as 'nameplate capacity'.

4 The entity may disclose performance in additional wind turbine classes, including:

4.1 Turbulence characteristics

4.2 Mixed class (for example, IEC Wind Turbine Class I/II)

4.3 Onshore

4.4 Offshore

RR-WT-440b.3. Description of approach to optimise materials efficiency of wind turbine design

1 The entity shall describe how it improves wind turbine materials efficiency including design considerations and materials selection to optimise:

1.1 Amount of materials consumed

1.2 Capacity and capacity factor by materials consumed

1.3 Lifespan

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

2.1 Materials selection may include priorities in materials selection, emphasis on materials innovation and development, materials risk assessments and objectives around materials consumption.

2.2 Modifications to wind turbine design may include design innovation to reduce materials consumption through reduced turbine weights or tower weights, design innovation to increase turbine capacity or capacity factor relative to materials consumption, strategies to reduce waste created in turbine manufacturing, and design to reduce materials consumed in installation of wind turbines (for example, foundation).

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