SUSTAINABILITY JOINT INDUSTRY PROGRAMME

Offshore wind industry product carbon footprinting guidance

Technical summary

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Introduction

The SUS-JIP consortium has produced the 'Offshore wind industry product carbon footprinting guidance' to harmonise product carbon footprint (PCF) calculations across the offshore wind industry in line with international standards, the Greenhouse Gas Protocol Product Standard and ISO 14067. The PCF of an offshore wind development quantifies the life cycle emissions and removals, helping developers identify their emissions hotspots, plan reduction interventions, and communicate their environmental impact.

Goal and scope

Goal: A PCF assessment aims to measure and report the life cycle emissions of an offshore wind development. This may be done to support a variety of different applications, including meeting regulatory reporting requirements, identifying carbon hotspots and designing decarbonisation interventions.

Scope: A PCF assessment of an offshore wind development that is built for renewable electricity generation. It covers the full life cycle of the infrastructure development.

Assessment steps

The 'Offshore wind industry product carbon footprinting guidance' provides standardised guidance for a PCF assessment in the sector. It thereby enables developers and other assessors to apply a standard and consistent methodology.

Timing of the assessment

PCF assessments can be conducted at various stages of an offshore wind development's life cycle to support different goals. The guidance defines two primary types of assessments:

1. Prospective PCF
2. Operational PCF

A prospective PCF is conducted before the development is fully operational and is typically used during design, planning or early construction phases to inform decisions on technology and materials that can influence the carbon footprint.

In contrast, an operational PCF is performed after the development is fully commissioned and operational, capturing the real-world greenhouse gas emissions across the asset's life cycle.

Defining system boundaries

The guidance defines a standard system boundary that shall include all life cycle activities associated with the infrastructure development, including preconstruction, construction, operation, decommissioning, and end-of-life:

- **A0-A5 (preconstruction and construction):** Activities include land preparation, material extraction and manufacturing, transportation to site and construction.
- **B1-B8 (use stage):** Activities during the operational life of the OSW development, including maintenance and repairs.
- **C1-C5 (end-of-life)**: Activities including decommissioning, waste processing and final disposal.
- **D1-D2 (benefits beyond the system boundary):** Optional inclusion of avoided emissions or benefits arising from beyond the system boundary activities such as recycling or exporting electricity.

More detailed guidance on recommended activities is also provided in Appendix 1 of the guidance.

Reference unit

The functional unit of the assessment shall be 1 kWh of electricity, net, generated at the OSW development delivered at the 'Point of Interconnection' (PoI) with the grid at the onshore substation.

Data quality and uncertainty

Data collection should prioritise high-quality, specific data for accurate reporting. The guidance encourages primary data from suppliers of goods and services but acknowledges the potential need for secondary data in early-stage assessments. Uncertainty in the data is assessed, and higher uncertainty is expected in prospective assessments.

Reporting and verification

Reporting results

Results shall be reported in terms of greenhouse gas emissions per unit of electricity delivered at grid ($kgCO_2/kWh$) and total emissions (tCO_2e), broken down by life cycle stage, asset and component.

Verification

Verification is not mandatory but should be carried out if results are communicated publicly. This is because third-party verification ensures accuracy and credibility. The guidance recommends third-party verification, which validates assessment results against recognised assurance standards.