



# ETIPWind Steering Committee – Minutes 5 February 2025

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# 1. WELCOME & INTRODUCTION

Adrian Timbus, ETIPWind Chair, welcomed the participants online and introduced the main topic of discussion for the meeting, the review of the ETIPWind Roadmap report. Capucine Vannoorenberghe, SETIPWind Secretariat, followed with an introduction outlining the purpose and scope of the report, emphasizing that it is intended to set out long-term Research & Innovation (R&I) technological development timelines towards 2050, with a strong focus on implementation. It was recalled that the document consolidates the work carried out by the ETIPWind Working Groups set for this task between December and January and is designed to present a coherent overview of the milestones necessary to reach the 2050 targets previously set.

The Secretariat presented the specific objectives of the meeting. Firstly, to review the five proposed R&I timelines, each corresponding to an area of action and matching a specific long-term goal, and the associated key performance indicators (KPIs) developed by the Working Groups. Secondly, to validate and gather comments and recommendations from the Steering Committee in order to ensure the final version of the report is comprehensive, technically sound, and aligned with stakeholders expectations.

The Chair encouraged active engagement and open discussion through the meeting to support a constructive exchange. To facilitate the review, the Secretariat provided a brief overview of the structure of the report and the specific objectives of each chapter. Particular attention was drawn to the chapter on R&I needs to achieve the long-term targets, which formed the basis of the discussion. In this context, the Secretariat reiterated the definitions and roles of R&I milestones and KPIs and recalled the five long-term targets set for 2050.

## 2. WG TIMELINES AND KPIS

The SETIPWind Secretariat presented the draft timelines and KPIs developed based on the input of area experts participating in the Working Groups, followed by open discussion among the Steering Committee members to discuss the results. The discussion focused on the proposed R&I milestones and key activities, as well as the policy objectives and capacity targets towards 2050 included on the timelines.

### 2.1 WG1 TIMELINE AND KPIS

Capucine Vannoorenberghe, SETIPWind Secretariat, presented the first timeline on industrialization, scale-up and competitiveness, which addresses the 2050 objective of ensuring a healthy and globally competitive wind energy industry. Following the overview and explanation of the milestones, the floor was opened for discussion to the Steering Committee.

During the exchange, Steering Committee members underlined the need to include a specific milestone for fully automated production lines for wind turbine components by 2030. With regard to the milestone of demonstrating the first fully standardised design, it was stressed that the industry will require the development of modular designs but also designs ready for large-scale volume manufacture. The milestone on standardized designs was adapted accordingly to reflect this insight.

Two milestones were proposed to be removed, namely “ Europe has doubled its manufacturing capacity” and “infrastructure, installation and transport ready for large-scale deployment” as they were overlapping with the existing milestone related to supply chain ramp up.

In addition, a Steering Committee member noted that the expected increase in turbine size would necessitate parallel advancements in testing infrastructure. This includes the standardization of testing protocols, the development of cost-effective testing solutions, and the expansion of facilities to accommodate larger components.

Lastly, the associated KPI was discussed. The Steering Committee endorsed the proposal to retain a single measurable KPI associated to turbine manufacturing capacity (measured in MW per year). It was agreed not to include a KPI on price competitiveness, as pricing is influenced by a variety of external factors and would not provide a sufficiently stable or objective indicator.

## **2.2WG2 TIMELINE AND KPIS**

Capucine Vanoorenberghe, SETIPWind Secretariat, presented the second timeline, which addresses the target of optimisation and digitalisation of Operations & Maintenance (O&M) in the wind energy sector. The timeline presented encompasses a range of developments, including in cybersecurity, digital twin technologies, performance monitoring of wind farms, autonomous O&M, as well as the integration of artificial intelligence and robotics, particularly in offshore wind. The Steering Committee made minor adjustments to the wording of some milestones for clarity and technical accuracy. The proposed milestones were endorsed by the Steering Committee without substantive changes.

The discussion then focused on the selection of appropriate KPIs. A member of the Steering Committee considered the potential inclusion of an indicator to reflect innovation trends, such as the number of patents related to robotics and artificial intelligence in the wind sector, with an emphasis on offshore applications. It was noted that further analysis would be needed to assess its feasibility as performance indicator. It was agreed to retain two quantitative KPIs: one measuring the reduction in O&M costs over time, and another capturing annual generation losses due to wind turbine component downtime.

Few wording adjustments were made to the milestones to ensure greater clarity and precision, but overall, the milestones were endorsed. The discussion then turned to the definition of appropriate KPIs for this area. The Steering Committee members discussed the possibility of including an indicator reflecting advancements in the innovation field, such as the number of patents related to robotics and artificial intelligence, with particular focus on offshore wind. It was noted that further analysis would be required to assess its feasibility and relevance. It was agreed to retain two quantitative indicators: on ton the reduction in O&M costs over time, and the annual generation loss attributed to turbine component downtime, as these indicators were considered effective in monitoring O&M efficiency in the sector.

## **2.3WG3 TIMELINE AND KPIS**

Nina Mavrogeorgou, SETIPWind Secretariat, presented the timeline focusing on the system integration of wind energy. The timeline supports the overarching 2050 target of establishing wind as the backbone of a climate-neutral energy system centered on electrification. It addresses the evolving role of wind power within a flexible, digitalized and interconnected energy system. As with the previous timelines, the discussion focused primarily on the definition and relevance of the proposed KPI. It was noted that the proposed KPI (wind energy penetration in the electricity mix) is sufficiently broad enough to adequately serve as a measurable KPI but might not fully capture the complexities of wind energy integration into the wider energy system. Then, a range of alternative indicators were proposed, including: the ability of wind energy to provide a full suite of energy system ancillary service, interoperability of wind energy systems withing the broader network, optimization of curtailment management, utilization of Power-to-X,

digitalization, and hybrid solutions to support integration, or the implementation and deployment of direct current (DC) grid solutions.

The group acknowledged the relevance of the suggestions but noted the challenge of identifying KPIs that are both meaningful and supported by reliable, country-level data. As a result, it was agreed to maintain a single KPI on wind energy integration to ensure comparability across Member States.

#### **2.4 WG4 TIMELINE AND KPIS**

Nerea Rodríguez (SETIPWind Secretariat) presented the fourth timeline, which focuses on sustainability and circularity, aligned with the 2050 objective of achieving fully circular wind farms that contribute positively to the environment. The input of the dedicated Working Group structured the timeline is around two parallel tracks: one dedicated to circularity milestones, and the other addressing environmental performance and impacts. After the introduction of both tracks, the discussions raised several points. One main aspect broadly agreed, was the need to broaden the scope of circularity beyond end-of-life solutions. In particular, a milestone was added to reflect innovation in materials that reduce the environmental footprint. It was also discussed that, while the inclusion of nature-positive solutions is important, care should be taken not to frame such milestones in a way that could impose additional financial burdens on developers. Additionally, Steering Committee members stressed the importance of addressing waste reduction of the value chain, and a milestone was added accordingly.

The discussion then turned to the definition of KPIs, where a representative from the European Commission (DG RTD) suggested that indicators should be supported by impact assessment and reframed to better reflect the broader sustainability objectives of the sector. After discussing its technical viability, it was agreed to adopt two KPIs. The first focuses on the increase of circularity indicators in the design and deployment of new wind turbines. The second is based on the use of life-cycle assessment (LCA) tools to demonstrate a measurable reduction in the carbon footprint of wind farms.

#### **2.5 WG5 TIMELINE AND KPIS**

Due to time constraints, the timeline and KPIs focusing on skills and coexistence were not fully discussed during the meeting. It was agreed that the milestones timeline and the proposed KPIs aiming to measure progress in skills, social acceptance, and education, were shared with the Steering Committee members for written feedback. The Secretariat then followed up to gather any comments and ensure the proposed elements were validated and reflected in the final version of the report.

### **3. NEXT STEPS AND CLOSING REMARKS**

The Secretariat provided an update on the next steps regarding the finalisation of the Roadmap report. It was noted that a first draft will be circulated to Steering Committee members by the end of February for their review and feedback. The Secretariat also shared the upcoming key dates, including forthcoming events and the next Steering Committee meeting. Adrian Timbus, ETIPWind Chair, then thanked all members for their contributions and active participation and formally closed the meeting.

## PARTICIPANTS LIST

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