



Report 2023

Task 11

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Wind Strategy, Collaboration & Outreach on Urgent Topics of Wind Energy Research (SCOUT)

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The mission of IEA Wind TCP is to promote high impact wind energy research and communication through international collaboration. Task 11 aims to achieve the mission of the TCP by bringing international experts together to exchange experience and knowledge in Topical Expert Meetings (TEMs).

In addition, Task 11 also supports the formulation of Recommended Practices in areas where there is consensus about a particular new technology or method that can be adopted to support wind energy developers, investors, or decision makers. Task 11 is a key mechanism for the IEA Wind TCP in promoting international collaboration and information exchange. Task 11 has three objectives:

1. Organising four annual TEMs. Task 11 organises four TEMs annually, providing a platform for knowledge exchange on strategically relevant wind energy topics by gathering researchers, industry and government experts.
2. Supporting TCP. Supporting the Leadership Team (LT) by attending meetings, developing

and disseminating recommended practices, and following up on action items from ExCo meetings.

3. **Supporting Tasks.** Creating regular exchange and knowledge sharing among Operating Agents (OAs) through a common platform and facilitating an annual meeting among OAs of Tasks.

Introduction

The selection of topics for TEMs is an active process involving IEA Wind TCP ExCo members and experts who focus on speeding up the de-

velopment and deployment of wind energy. As wind energy constantly evolves in ever-changing energy systems and new policy landscapes, new challenges appear that require unprecedented knowledge and solutions. The TEMs organised in 2023 reflect the latest challenges affecting members and included a broad array of participants from the research community, industry, and public stakeholders.

The broad range of disciplines, organisations and countries involved in TEMs enable bringing in diverse points of view on any of the topics discussed. This approach, which is at the very core of Task 11, results in powerful analyses that include

specific regional particularities and complementary points of view. These perspectives often encompass scientific, technical, economic, and legal expertise. The identification of common obstacles and possible solutions through benchmarking of methods, creation of common databases and revision of existing methods are frequently considered and discussed during TEMs.

Progress and Achievements

In 2023, five TEMs were organised, addressing both high level strategic planning and specific technical topics.

Table 1. Countries Participating in Task 11 (2023).

COUNTRY/SPONSOR	INSTITUTION(S)
Belgium	The Federal Public Service of Belgium (FPS Economy)
Canada	Natural Resources Canada (NRCan)
CWEA	Chinese Wind Energy Association (CWEA)
Denmark	Danish Energy Agency (DEA)
Finland	Business Finland
Germany	Federal Ministry for Economic Affairs and Climate Action (BMWK)
Ireland	Sustainable Energy Authority of Ireland (SEAI)
Italy	Ricerca sul Sistema Energetico (RSE S.p.A.)
Japan	New Energy and Industrial Technology Development Organization (NEDO)
Korea	Korea Institute of Energy Technology Evaluation and Planning (KETEP)
The Netherlands	Rijksdienst voor Ondernemend Nederland (RVO)
Norway	Norwegian Water Resources and Energy Directorate (NVE) and The Research Council of Norway
Spain	Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT)
Sweden	Energimyndigheten (Swedish Energy Agency)
Switzerland	Swiss Federal Office of Energy (SFOE)
United Kingdom	Offshore Renewable Energy Catapult (ORE Catapult)
United States	U.S. Department of Energy (DOE)

TEM#109 Grand Challenges in Wind Energy Follow-on

TEM#109 took place in Boulder, Colorado (US), from the 28th of February to the first of March, 2023, bringing together approximately 120 experts, including leaders from both within and beyond the IEA Wind TCP. The objective was to understand the essential requirements needed for wind energy to succeed in supplying the foundation of a carbon-neutral energy system. The meeting highlighted gaps in scientific knowledge, design, and deployment practices. Specific initiatives were proposed to address these gaps. Insights from the Grand Challenges TEM provided numerous inputs for strategic objectives for the next term of the IEA Wind TCP (2024-2029) and has resulted in several follow-up scientific papers.

TEM#108 Technology Transfer and Adoption in the Wind Energy Sector

TEM108 was hosted online between the 22nd and 23rd of March, 2023, by the IEA Wind Task 11 Operating Agent and convened by the Offshore Renewable Energy Catapult (UK), as well as enviConnect (Germany). Input from more than 30 experts and nine presentations sparked sharing experiences in promoting the adoption of new knowledge and solutions in the sector. The result highlighted strong interest in developing a detailed scope to propose a new IEA Wind Task on technology transfer.

TEM#106 Hydrogen in a 100% Renewable Energy System

TEM#106 was hosted by the National Renewable Energy Laboratory (NREL) and held both at the University of Colorado in Boulder (US), and online on the 6th and 7th of September, 2023. The TEM brought together over 80 participants with the objective to lay the groundwork for a cross-cutting collaboration between the Wind, PVPS and Hydrogen TCPs, managed by the IEA Secretariat on Renewable Energy Sources for hydrogen production. An outcome of the meeting was a discussion on a joint or linked Task

between the Hydrogen, PVPS, and Wind TCPs.

TEM#105 Harmonized LCA for Wind Energy

TEM#105 was hosted by the Zurich University of Applied Sciences (ZHAW) and took place in Wädenswil, Switzerland on the 21st and 22nd of September, 2023. Thirty international experts from the environmental profile of wind energy, initiated discussions on the key considerations for a guiding framework on life-cycle assessment (LCA) of wind energy. The discussion centred around the topic of quantitative life-cycle assessment of wind energy and guidance on inventory modelling and data, impact assessment, interpretation, reporting, and communication of LCA results. The main outcome of the meeting was the finalisation of a wind LCA factsheet, with the majority of participating experts agreeing on the necessity to establish a dedicated IEA Task moving forward.

TEM110 Wind Energy Instrumentation Development

TEM110 was held as an in-person meeting in Broomfield, Colorado (US), on the 2nd of November, 2023, in conjunction with the NAWEA/WindTech 2023 Conference, and convened by Sandia National Laboratory, and the National Renewable Energy Laboratory (NREL). Thirty experts from seven countries gathered to discuss instrumentation gaps, opportunities, challenges and barriers in breakout groups as well as in plenary sessions. As an outcome, the proceedings of the meeting are being finalised, including a roadmap for instrumentation development. A follow up online meeting will be organised in 2024 to facilitate broader participation.

Highlight(s)

Outreach & Dissemination

- The report “Grand Challenges” has been published in Decem-

ber 2023 and shared within the Task 11 community [1]. It summarises the output of TEM#109, and not only explores the five grand challenges; it also examines eight cross-disciplinary issues created at the intersections of the grand challenges. A number of papers are being developed in connection with the Grand Challenges by authors participating in TEM#109.

- The core team lead and participants in TEM#105 jointly developed a fact sheet on the current status of Lifecycle Assessment (LCA) in wind energy, which covered the main challenges in LCA studies of wind power and provided recommendations for practitioners and researchers that were agreed upon during the TEM. This was developed in terms of a proposal for a more harmonised, methodological approach to increase consistency and transparency, a need for international collaboration, and LCA for fact-based decision making. As a final outcome a “Mission Statement” on Harmonised LCA has been published and is available on the IEA Wind website.
- The TEM#106 proceedings have been finalised. As this is a strategic TEM (inter TCP collaboration Wind/PVPS/H2) the documentation will be public and available online.

Supporting new research Task proposals & Dynamics

- After TEM#105, a pre-proposal for a new research Task on LCA Wind Power has been prepared by the core team, co-lead by Switzerland (LCA database/on-shore) and Norway (offshore)
- The TEM#106 core organising team is currently elaborating a proposal for a joint research Task on the integration of wind and solar to produce hydrogen. This aims to begin to address

the research gaps identified by TEM#106.

Outcomes and Significance

The TEMs organised in 2023 have had a significant impact. The outputs of TEM#109 on grand challenges, are used by policy makers that need to allocate funding resources, as well as for the international research community, which now has a common and unified understanding of the key research challenges for wind energy. Several papers published in scientific journals have followed the TEM#109, as the continuation of TEM#89 – Grand Vision for Wind Energy. After TEM#89 and #109, this high-level strategic discussion on challenges in wind energy research will be consolidated into a unique global forum for the academic community, industry, and public authorities to discuss the overall research needs for wind energy.

TEM#108 on technology transfer has inspired the participants with success stories on innovation and reduced time to market for innovations. Furthermore, it has enriched with discussions about how regulation and innovation landscapes can support the market adoption of new solutions. The TEM#106, focusing on hydrogen, sparked broad discussions, including findings from key projects, production of hydrogen, infrastructures and grid integration as well as policy and regulations.

TEM#105 on harmonised LCA is the first step towards a sector-wide consensus on the way to use and calculate LCA for wind energy technologies and projects. TEM#110 on instrumentation helped establish a network of specialists in sensors and data for wind energy applications and will help coordinate further work in this field.

Next Steps

The IEA Wind Task 11 will pursue its role as an interface between the IEA

Wind TCP Executive Committee, member countries, international experts and host institutions, responding with agility to high-priority topics for wind energy development.

The following ambitious new TEM agenda has been prioritised and selected for the successive terms:

- TEM#113 Net Zero Electricity System Studies (April 2024)
- TEM#111 Reanalyses for Wind Energy (April 2024)
- TEM#112 Impact of Extreme Weather on Offshore Wind Energy Systems (November 2024, date to be confirmed)
- TEM#114 Artificial Intelligence for Wind Energy is planned for Q1 2025
- In addition, a virtual follow-up meeting of TEM#110 Wind Energy Instrumentation Development will be held in May 2024
- And an internal Task 11 workshop on communication and internal organisation will take place during Q2 2024 to align the communication efforts for the IEA Wind TCP.

References

- [1] Veers, P., Dykes, K., Basu, S., Bianchini, A., Clifton, A., Green, P., Holttinen, H., Kitzing, L., Kosovic, B., Lundquist, J. K., Meyers, J., O'Malley, M., Shaw, W. J., and Straw, B., 2022, Wind Energy. Sci., 7, 2491–2496.
<https://doi.org/10.5194/wes-7-2491-2022>

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