



INTRODUCTORY NOTE

IEA WIND TASK 11 TOPICAL EXPERT MEETING # 108

ON

TECHNOLOGY TRANSFER AND ADOPTION IN THE WIND ENERGY SECTOR

22-23. March 2023 (online)

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BACKGROUND

[current situation, motivations behind the proposed topic and necessary background information for delimitating the topic of interest: numbers and figures, origin/causes, state of the art if existing, current and expected future issues, needs and potential solutions]

Reaching global climate goals and reducing dependence on fossil fuels will require doubling or tripling the amount of installed wind energy capacity in Europe and North America, and even larger capacity increases elsewhere. This will be met partly by the growth in offshore wind but will also require many more turbines to be built on land. This growth will bring many questions and challenges for wind energy, which have been the topic of a recent series of papers on the “Grand Challenges” for wind energy. Many of these challenges are being investigated by international collaboration through IEA Wind Tasks.

Addressing the challenges of a much larger wind energy industry that provides more energy will require many novel approaches to be used by the global wind energy industry. Innovations will be required throughout the lifecycle of a wind farm, from turbine design and site design to construction, logistics, operations and maintenance, and at the end of a turbine’s operating life. Many of these approaches will be based on technological innovations created by research and development (R&D) organizations and will thus require a process of technology transfer (whereby innovations are spun out of the originating organization) and adoption by the end user (for example, as a new product or service). To meet the needs of the global wind energy industry, technology transfer must happen as quickly and efficiently as possible.

Effective technology transfer and adoption is of national importance. It helps create jobs, enables countries to realize investment in research and development, and supports industry growth. As a result, technology transfer is frequently supported by direct government funding (e.g., through the United States Department of Energy, US DOE) or the German Federal Ministry for Economic Affairs and Climate Action, BMWK) and by fostering collaborations between researchers and industry (e.g., through the UK’s Catapults or the Fraunhofer Society). It can also be enabled by startups, by intermediaries



providing technology scouting or project management, through private investment, and many other mechanisms. In many countries this need for collaboration has led to the development of national ecosystems to support technology transfer and adoption. In some cases, this ecosystem has grown up in an ad-hoc fashion, while elsewhere it has been deliberately guided and collaboration between industry and R&D organisations is an integral part of national funding programs. For example, the announcement of the 7th Energy Research Programme of the Federal Government in Germany states:

“Many of the developments mentioned are not yet technically mature or cannot yet be operated economically. The primary goal of research funding in the energy sector is to accelerate the usability of energy technologies by having the state assume some of the high scientific, technical, and economic risks through financial support. This is achieved by means of a broad funding approach that take into account social processes and creating innovation-friendly framework conditions. The focus of the funding is on technologies and concepts that significantly increase efficiency, integration of renewable energies, guaranteeing security of supply and a rapid transfer of research results to application and the market.”

From *Förderbekanntmachung, Angewandte nichtnukleare Forschungsförderung im 7. Energieforschungsprogramm „Innovationen für die Energiewende“*, published 18. June 2021. Translated from [the original German](#) by A. Clifton.

Technology transfer is an important part of government-funded research and development in the United States. The US DOE established the Office of Technology Transitions (OTT) as the central hub for the technology transfer activities across the DOE’s extensive R&D enterprise. OTT ensures that groundbreaking scientific discoveries achieve their maximum public return and impact, advancing the economic, energy, and national security interests of the US. Getting that done means streamlining access to DOE user facilities at the 17 National Laboratories and sites, DOE world-class scientific researchers, and DOE portfolio of intellectual property – fostering strong internal and external partnerships that guide innovations from the lab toward the marketplace. There are specific ongoing programs designed to support technology transfer, including the [Energy I-Corps](#) which sends teams of researchers and industry mentors through an intensive two-month training where the researchers define technology value propositions, conduct stakeholder discovery interviews, and develop viable market pathways for their technologies. Another program is the [Technology Commercialization Fund \(TCF\)](#). The TCF is a nearly \$30 million funding opportunity that leverages funding in the applied energy programs to mature promising energy technologies with the potential for high impact across DOE’s Research, Development, Demonstration, and Deployment (RDD&D) Continuum. Technology transfer is a complex and dynamic process, and OTT helps connect with DOE-powered innovation to advance discoveries and commercialize transformative, impactful technologies.



Technology transfer can also happen from other industries. While this can happen organically, it can also benefit from support programs designed to encourage cross-pollination. For example, the UK government recently supported the Offshore Wind Energy Innovation Hub. It's Director, Chris Hill, stated:

“The Offshore Wind Innovation Hub is the UK’s primary coordinator of innovation, focusing on offshore wind energy cost reduction and maximising UK economic impact.

Funded by the Department for Business, Energy and Industrial Strategy (BEIS) and delivered jointly by the Offshore Renewable Energy (ORE) Catapult and the Knowledge Transfer Network (KTN), the Hub presents UK offshore wind innovation priorities, supply chain growth opportunities and a comprehensive view of the funding landscape.

The Hub is actively engaging with industry, academia, other research organisations and the public sector to identify the innovation priorities for offshore wind in the UK. These priorities will be developed into a technology innovation roadmap, identifying the natural owners of the technology and know-how to tackle these challenges, and working with them to link up investment, development support and open up routes to market.

The Hub will also facilitate building consortia to meet these challenges. It will undertake brokering and convening activities to foster collaboration and enable partnerships to be formed between companies within the sector, and encourage cross-sector technology transfer through its Offshore Wind Innovation Exchange Programme.”

From [“The Offshore Wind Innovation Hub”](#), published 26th October 2020.

Each of the IEA Wind TCP member countries have an active technology transfer and adoption ecosystem. All have distinct national and even regional characteristics. Similarly, each of the IEA Wind Tasks has taken different approaches to technology transfer that are closely aligned with the needs of their stakeholders. There are many opportunities for each IEA Wind member country, Task, and companies to learn from each other to further improve technology transfer. And, there are opportunities to explore how countries can support IEA Wind Tasks and their stakeholders to boost technology transfer from IEA Wind Tasks.



In this TEM we will explore the state of technology transfer in the wind energy industry and through IEA Wind Tasks and identify how international collaboration through IEA could boost the availability of useful innovations to the wind energy industry. The TEM will hear and discuss presentations from across the technology transfer ecosystem, including:

- Innovators, represented by universities and other research and innovation organisations
- Startups and businesses seeking to commercialize innovations,
- Technology transfer enablers, represented by government agencies, stakeholder organizations
- IEA Wind Tasks
- Technology adopters, represented by wind energy companies.

The TEM will also hear about the opportunities for international collaboration through IEA Wind TCP and discuss how collaboration could enable and accelerate technology transfer and adoption in the wind energy sector.

The overarching goal of this TEM is to identify how a possible new IEA Wind Task could enable and accelerate technology transfer and adoption in the wind energy sector.

OBJECTIVES

The objectives for the TEM are to:

1. Present the current high-level technology needs of the wind energy industry
2. Present technology transfer from the perspective of the end user in the wind energy industry, and the originators in research organisations
3. Present examples of national technology transfer and adoption ecosystems and highlight success
4. Present examples of technology transfer through IEA Wind Tasks
5. Identify gaps in the approach to technology transfer and adoption
6. Identify opportunities for collaboration and exchange between IEA Wind member countries and organizations that could be facilitated through an IEA Wind Task.



TENTATIVE PROGRAM

The event will take place online on Wednesday 22nd and Thursday 23rd March 2023 and run for three hours each day. A preliminary agenda follows.

Day 1: Wednesday 22nd March 2023

The meeting will run from 14:00 – 17:00 Berlin time.

Session	Theme	Start time (Berlin)
1	Welcome and introductions <ul style="list-style-type: none"> • TEM overview & meeting organization (<i>Organizers</i>) • Introduction to IEA & IEA Wind (<i>Ignacio Marti, DTU / IEA Wind TCP</i>) • Introduction to Task 11 (<i>Lionel Perret, Plenair</i>) • Participants introduction 	14:00
2	Innovation challenges in wind energy <i>Presentation by Laura Victoria Mejia, Equinor</i>	14:30
3	Technology transfer in the wind energy industry: pathways and experiences <i>Moderated by ORE Catapult</i> A panel discussion, including representatives of the different stakeholders: <ul style="list-style-type: none"> • A wind turbine OEM and service provider: <i>Christopher Ulrich, Head of Future Renewable Portfolio, SGRE</i> • Academia: <i>Sarah Barber, OST</i> • National research organisations (TBD) • Government funding organization (TBD) • Wind energy startup: <i>Ines Wüirth, enviConnect</i> 	15:00
4	Working groups In groups of 5-6 people: <ul style="list-style-type: none"> • What are your initial thoughts on fruitful areas of cooperation? • What are the opportunities? 	16:00
5	Reporting	16:30
6	Close	16:55



Day 2: Thursday 23rd March

The meeting will run from 14:00 – 17:00 Berlin time.

Session	Theme	Start time (Berlin)
7	Recap and introduction to the day	14:00
8	<p>Examples of supporting mechanisms <i>Moderated by Andy Clifton</i></p> <p>Presentations from:</p> <ol style="list-style-type: none"> 1. An incubator / accelerator program (TBC), 2. Technology transfer organisations (TBC) 3. IEA Wind Task 43, Digitalisation (Jason Fields, NREL) 4. ORE Catapult (TBC) <p>Followed by discussion of opportunities, gaps, etc.</p>	14:10
9	<p>Working group: What are the gaps that an IEA Wind Task could take on?</p> <p>Discussion in stakeholder groups about the opportunities for an IEA Wind Task, e.g.:</p> <ul style="list-style-type: none"> - Country-level collaboration - Identification of transferable experience - Enabling and supporting other IEA Wind Tasks - ... and many others. <p>Each group will identify the priorities, mechanisms, and outcomes that an IEA Wind Task could target</p>	15:00
10	Reporting from the working groups	16:00
11	<p>Summary and close</p> <ul style="list-style-type: none"> • Summary of presentations & discussion • Summary of opportunities for a Task • Next steps • Call for members of a core group to explore the need, scope, and activities of a new Task 	16:30



INTENDED PARTICIPATION

The target audience for the TEM includes:

1. Senior innovation management from companies in the wind energy industry, e.g., GE, Vestas, Siemens Gamesa, RWE, Ørsted
2. Wind energy industry organizations, e.g., Wind Europe, NAWEA, American Clean Power Association
3. Program managers in national and supra-national agencies tasked with supporting and funding technology transfer, e.g., BMWK ZIM, NEDO, European Commission H2020 program, US DOE EERE
4. Senior management in R&D organizations, e.g., EAWC, DTU, Fraunhofer, Catapults, US DoE National Labs, VTT
5. IEA Wind Task Operating Agents
6. Organizations supporting or representing startups.

EXPECTED OUTCOMES

1. A report from the meeting, summarizing each of the sessions, including:
 - a. Perspectives on technology transfer and adoption from industry, R&D groups, and startups
 - b. Technology transfer ecosystems, with examples of how wind energy technology transfer and adoption can be supported
 - c. How collaboration through IEA Wind can support technology transfer
 - d. Ranked priorities, mechanisms, and outcomes for a possible new IEA Wind Task on Technology Transfer
2. Longer term: a proposal for a new IEA Wind Task, “Technology Transfer” to enable and accelerate technology transfer and adoption in the wind energy sector.

CONTACT INFORMATION

The organizing team can be contacted via IEA Wind Task 11. Please email ieawindtask11@planair.ch.