

IEA Wind TCP Celebrates 40 Years of Collaborative Research

IEA Wind Newsletter, January 2018

Key Takeaways from IEA Wind ExCo 80 in Mexico – Nov 2017

The Centro Mexicano de Innovación en Energía Eólica (CEMIE Eólico) hosted the IEA Wind Technology Collaboration Programme (TCP) Executive Committee meeting in Huatulco, Mexico. The meeting focused on national R&D efforts and included presentations from 14 member countries and 16 research Tasks. Building on Topical Expert Meeting (TEM) 89: A Grand Vision for Wind Energy, participants identified long-term research needs through 2050 in preparation for updating the organization’s strategic plan (to be published in 2018).

Wind Power Markets Thriving in Mexico

México had 3.5 GW wind power capacity installed at the end of 2016, and an ambitious target of nearly 10 GW is expected by 2020.

México’s R&D focus is on small- and medium-size turbines, such as efforts to develop a 1.2-MW scale wind turbine, as well as exciting innovations in automatized blade manufacturing, virtual reality for O&M staff training, and smart blade concepts for load control.

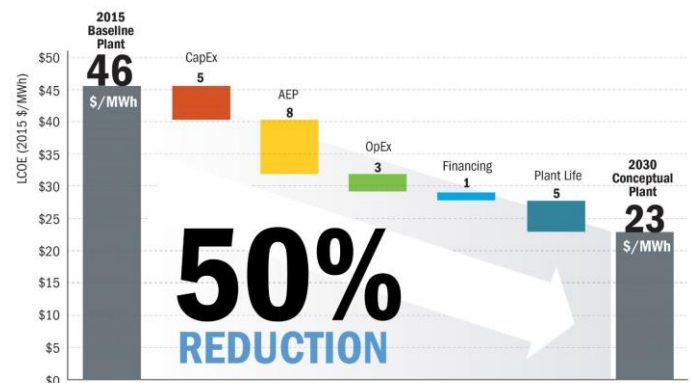


The Instituto Nacional de Electricidad y Energías Limpias’ (INEEL) CERTE wind test facility is situated on 32 hectares near La Ventosa, in Oaxaca, México. La Ventosa hosts nearly 70% of the total installed wind power capacity in México (2,360 MW). (Photo credit: CEMIE-Eólico)

Ambitious Cost Reduction Targets for Wind

R&D efforts in many IEA Wind TCP member countries are focused on sustaining the recent cost reduction trend in the wind energy sector. The United States Department of Energy presented

their latest targets as a waterfall chart, showing where the greatest potential for cost reductions lay. Cost competitiveness is critical for wind power to compete in the market after subsidies are phased out by 2020.



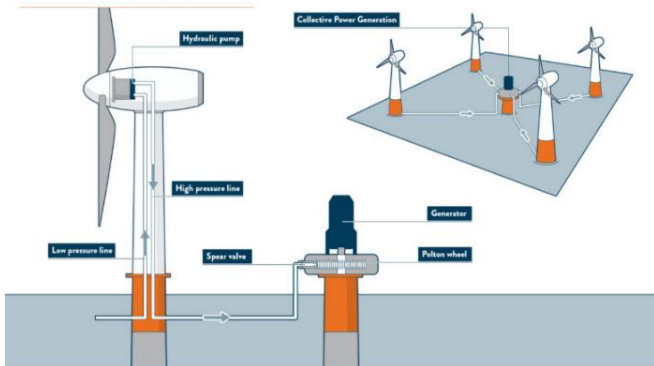
The US Department of Energy’s Wind Energy Technology Office has identified multiple pathways to reduce the cost of wind energy, aiming for a 50% reduction from the current \$46/MWh average cost. (Source: US Dept. of Energy, Wind Energy Technology Office)

Exciting New National R&D Programs

Mitigating icing impacts was high on the agenda for Switzerland, Austria, China, Sweden, and Finland. A new 3D, 2-cm resolution camera for detecting ice throw has been developed and tested in Austria.

Innovative R&D in kite power plants has been seen in the Netherlands and Ireland. National research in the Netherlands also includes two climbing crane concepts for installing big components (tower sections, nacelles, blades).

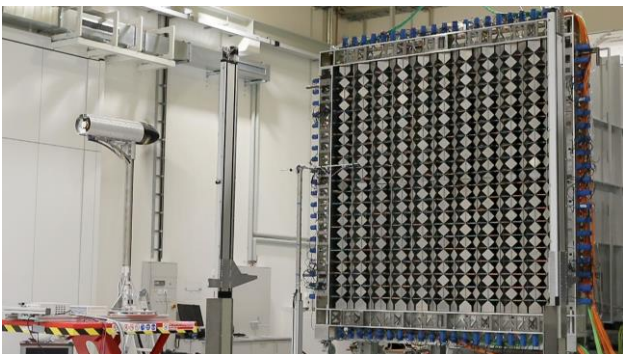
One example of nationally funded R&D is a novel, fully hydraulic drive train under development for offshore wind turbines in the Netherlands. Comprised of no electric drivetrain components (with no generator in the nacelle!), the system uses seawater at high pressure as an internal grid—reducing component and O&M costs.



Innovation from the Netherlands: Delft Offshore Turbine (DOT) is being developed to connect several turbines pumping sea water to a centralized slow rotating pump substation with a large hydraulic motor which is connected to a generator.

New Test Facilities

German representatives presented several new research test facilities: marTech Large Wave Flume with Current, HAPT Highly Accelerated Pitch Bearing Test, and WindLab Turbulence and Wind Energy Systems.



WindLab's new turbulent wind tunnel will be used to study the operational behavior of wind turbines and large off-shore wind farms. (Source: University of Oldenburg)

Grid Integration Challenges Improving

For the small power system of Ireland, wind power generation remained available during a recent hurricane event (at some stages generation was reduced from available wind power). Ireland anticipates more than 25% of its electricity demand in 2017 will be met by wind, and has a list of grid support services of which several can also be provided from wind power.

China continues to face challenges with high curtailment rates of wind power—17% in 2016. However, preliminary figures for 2017 show reduction to 12% curtailment. The targeted build out in that country will focus away from the north provinces. China's 2020 target is 210 GW, of which 5 GW offshore.

Wind Power Deployment Advances

Germany and Spain recently conducted the first rounds of their new auction systems for land-based wind power. A technology neutral auction is also planned in Finland for 2018.

The United Kingdom reported on substantial price reductions in offshore tenders, following similar outcomes in the Netherlands and Denmark.

Norway is enjoying an increase in foreign investment, with more than 4 TWh of wind power capacity under construction. Sweden is on track to have 8 GW by 2020, and is targeting 50% wind in 2050.

Collaborative IEA Wind Task Research Complements National R&D

Distributed wind is gaining more interest in China, Spain, and the United States. Spain has special subsidy scheme for <100 kW turbines, which has attracted activities. **Task 27 Small Wind** presented results from measurements for power curve and turbulence for urban and rural small wind turbines.

Wind energy public acceptance efforts are working in Switzerland, the Netherlands, and Ireland. **Task 28 Social Acceptance** started a new three-year phase in 2017 with seven countries participating. Finland published a [report on infrasound measurements](#): no evidence of higher infrasounds from turbines than surrounding environment was detected.

Task 32 Lidar is researching lidars on nacelles used in power curve measurements, as well as use cases in wake and complex flow measurements. Their next workshop on Certification of Lidar-Assisted Control Applications is in January 2018.

New Tasks and Task Extensions

Several Tasks have been recently approved or extended. Interested experts should contact their IEA Wind TCP member, the Task Operating Agent (visit Task websites at www.ieawind.org), or the IEA Wind Secretariat (Secretariat@ieawind.org) for more information on joining a Task.

- **Task 25 Design and Operation of Power systems with Large Amounts of Wind Power** - extended
- **Task 28 Social Acceptance of Wind Energy Projects** - extended
- **Task 29 Aerodynamics** - extended
- **Task 39 Quiet Wind Turbine Technology** - new
- **Task 40 Downwind Turbine Technology** - new

Upcoming Tasks Activities, Reports, and Tools

- **Task 19 Cold Climates** is working on wind turbine Ice Protection System warranty guidelines (blade anti- and de-icing), to be presented at the WinterWind 2018 conference. Updated international ice throw guidelines are expected in mid-2018.
- **Task 25 Grid Integration** Recommended Practices on wind and PV integration studies will be submitted for ExCo review in February.
- **Task 30 Offshore Code Comparison (OC5)** plans to publish technical reports in 2018.
- **Task 35 Ground Based Testing** is ending in 2017 and working on blade and nacelle testing reports.
- **Task 37 System Engineering/MDAO** plans publish new open source onshore 3-MW and 10-MW offshore FAST simulation models.

Task 29 Aerodynamics was extended for 2018-2020 to analyze the Tjäreborg NM80 2-MW test turbine aerodynamic measurements.

Task 34 WREN on environmental impacts held three webinars in 2017 (downloadable at tethys.pnnl.gov/):

- Research Programs to Understand the Environmental Impacts of Offshore Wind
- Upscaling Wind and Wildlife Interactions to Population-Level Impacts
- BOEM Efforts to Collect and Analyze Offshore Wind Data in a Holistic Manner, as Demonstrated through the RODEO Study

Increasing **generation in complex terrain** is on the Swiss research agenda and a new Complex Terrain task proposal from Germany was discussed at the ExCo meeting.



Recent Publications and Tools from IEA Wind

[Wind Project Statistics Data Viewer](#)

Task 26 Cost of Wind Energy - November 2017

The Task 26 Data Viewer is an interactive tool to explore wind project statistics.

[Wind Turbine Noise Measurements in Controlled Conditions](#)

Task 29 Aerodynamics - November 2017

Research on noise measured from a wind turbine rotor in a wind tunnel, this data was (and can be) used to validate acoustic models. Published in the *International Journal of Aero-Acoustics*.

[Impacts of Wind Turbine Technology on the System Value of Wind in Europe](#)

Task 26 Cost of Wind Energy - October 2017

This IEA Wind TCP Task 26 Technical Report explores the impact of larger rotors and taller towers on the system value of wind energy.

[Recommended Practice 18: Floating Lidar Systems \(FLS\)](#)

Task 32 Lidar - September 2017

New Recommended Practice for obtaining the best quality FLS data for use in the wind energy resource assessment process, developed by expert practitioners and industry stakeholders.

[GABLS3 Benchmark Open Science Benchmarking Data and Results](#)

Task 31 WAKEBENCH: VV&UQ of Wind Farm Flow Models – June 2017

The GABLS3 benchmark was carried out jointly in the NEWA, WAKEBENCH, and MesoWake projects; here you can find the results and open-access data.

[Recommended Practice 17: Wind Farm Reliability Data](#)

Task 33 Reliability Data - May 2017

This IEA Wind Recommended Practice aims to improve the accuracy, consistency, integrity, and value of reliability data for all stakeholders across wind asset investment, development, operation and insurance. Also see the [Factsheet](#).

[Recommended Practice 13 Ed. 2: Wind Energy Projects in Cold Climates](#)

Task 19 Cold Climates - February 2017

An update to the 2012 Recommended Practice from Task 19, this document addresses many special issues that must be considered over the lifetime of a cold climate wind energy project.

[Adaptive Management White Paper](#)

Task 34 WREN - November 2016

Explores the use of adaptive management for wind energy development and suggests the need for a common understanding, definition, and framework for adaptive management and its application to wind energy.

[Wind Power Forecasting: IEA Wind Task 36 and the Future Research Issues](#)

Task 36 Forecasting – October 2016

Open access journal article on current issues for research in short-term forecasting of wind power.

IEA Wind TCP Task Meetings

Task meetings are open to Task participants, please contact the Task Operating Agent if you are interested in participating in one of our collaborative research Tasks.

IEA Wind TCP Upcoming Task Meetings

Task 11 Topical Expert Meetings (TEMs)

- Strategic Dialog for Community and Distributed Wind: hosted by DTU on March 27-28 in collaboration with NREL
- Durability and Damage Tolerant Design of Wind Turbine Blades: hosted by the Montana State University June 5-7 2018, in collaboration with Sandia National Laboratories and VTT

Task 19 Cold Climates Task Meeting

- February 12-13, 2018, Andermatt, Switzerland

Task 27 Small Wind Task Meeting

- April 2018 in Minnesota, United States

Task 28 Social Acceptance Task Meeting

- March 26-28, 2018, in conjunction with the Community and Distributed Wind TEM, DTU, Denmark

Task 29 Aerodynamics Phase 4 Kick-off Meeting

- March 2018, Location TBD in Europe

Task 30 OC5 Task Meeting

- January 19, 2018 in Norway

Task 31 WAKEBENCH Task Meeting

- May 8-10, 2018, Japan

Task 32 Lidar Workshop #8 Certification of Lidar Assisted Control Applications

- January 30-31, 2018 at DNV GL, Hamburg, Germany

Task 34 WREN Task Meeting

- Late May or early June 2018 in the Netherlands

Task 36 Forecasting Task Meeting

- May 2018, Location TBD

Task 37 Systems Engineering

- Interim meeting Jan. 2018, Kissimmee, FL, US
- Annual meeting: June 2018, Milan, Italy

IEA Wind Launches New Website

The IEA Wind TCP is very pleased to announce the official launch of our brand-new website and collaborative platform. This site makes vital information on the TCP and research Tasks available to the public; it also provides Task participants with a centralized space to foster exchanges, share content, and stay informed on what's going on at the TCP level



The screenshot shows the IEA Wind TCP website homepage. At the top is the IEA Wind logo and a navigation menu with links for Home, Research Tasks, Publications, Events, and About IEA Wind. A search bar is also present. Below the navigation is a large banner with the text "Join the IEA Wind TCP Expert Community" and a sub-headline "Connect with a global network of wind energy experts tackling technology, infrastructure, and deployment challenges." Below the banner is a section titled "Explore the IEA Wind TCP Research Tasks" with four featured task cards: "Wind Power Technology Development", "Wind Characteristics", "Wind Power Integration", and "Social, Educational, and Environmental Issues". Further down are sections for "Newest Publications" (listing Task 26, Task 19 Recommended Practice 13 Ed 2, and Task 19 Available Technologies of Wind) and "Membership" (featuring a map of IEA Wind TCP Participants and a text box stating that approximately 84% of the total worldwide wind power capacity (413 GW, 2016) and all of the world's offshore wind capacity currently resides in the 22 countries participating in the IEA Wind TCP). A "More" button is located below the publications list, and an "Upcoming Events" section is partially visible at the bottom.

You are invited to be a member of our online community, through which you can post questions, respond to discussions, and view documents pertinent to your research activities. Check out the website by visiting www.ieawind.org.

IEA Wind TCP 2018 ExCo Leadership

Ignacio Marti of DTU, Denmark, Chair
 Stephan Barth of Forwind, Germany, Vice Chair
 John Mc Cann of SEAI, Ireland, Vice Chair
 Brian Smith of NREL, United States, Vice Chair
 Jose Manuel Franco of INEEL, Mexico, Vice Chair