Technology Collaboration Programme
by iea

ExCo 89
Newsletter
June 2022

Photo: Troels Friis Pedersen, DTU Wind
Østerild Test Centre

Online Meeting 16-19 May 2022

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Editorial

IEA Wind ExCo meetings provide a compact yet detailed insight into the state and progress of international wind energy research. The current developments in the international energy markets make it even more evident how important it is to roll out wind energy technology quickly. With the goals IEA Wind had set for itself, we are working in the Tasks to do just that.

Accelerated expansion also requires accelerated interaction with the energy system, other energy technologies, and new energy carriers such as hydrogen. At the same time, we must not neglect the challenges of wind energy technology. We therefore intend to repeat the highly successful Topical Experts Meeting on the Grand Challenges of Wind Energy on a regular basis, to provide the global community with a recognized forum for the orientation of international wind energy research.

The accelerated expansion in almost all nations increases the need to share existing knowledge and experience and to address new issues. Together with the World Bank, we therefore intend to target developing countries to expand collaborations in the IEA Wind TCP.

We were very pleased that two guests from Central and South America, Costa Rica and Colombia, also participated in ExCo 89. The exchange with new markets facing new challenges is extremely important for a holistic development.

The entire ExCo expresses its sincere thanks to José Manuel Franco-Nava for his active time as an inspiring Vice-Chair and Chair of the Advanced Technologies Committee. We congratulate Katja Maus on her election as the new Vice-Chair, who will continue the field in a committed and enriching way.

While ExCo 89 was a pure online meeting and ExCo 90 will still be, we are already looking forward to a personal reunion in Japan in spring 2023. Until then, we will work hard to make our tools and services fully operational again, including hybrid meetings.

Best regards,

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Austria
Country Presentation

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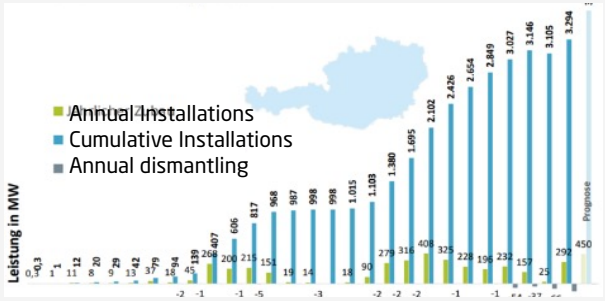
Key highlights

- Renewable Energy Expansion Act 2021: Starting from 2022 onwards, a minimum of 390 MW of wind power shall be tendered per year
- Today, around 0.2% of the entire territory are used for wind power plants in Austria. With a share of 2%, an energy yield of 80 TWh can be achieved. This figure corresponds to the current energy imports in form of Russian gas
- High social acceptance for wind power in Austria: According to recent opinion polls, 78 % accept wind power; from those living near a wind farm, even an acceptance of 88 % was observed.



Wind Power Deployment - Current Status

China
Country Presentation

Key highlights

- Installed capacity in 2021 reached 346.67GW (25.35GW offshore) with 55.92GW new installed (14.48GW offshore)
- Wind power production was 655.6 TWh, accounted for 7.9% of China electricity demand supplied in 2021
- Floating offshore wind turbine, and desert, gobi, and wilderness wind energy are being developed.

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103m long blade passed the static test

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India
Country Presentation

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Key highlights

- Being 4th Largest Wind Installed Capacity in Globe, India aims for 500 GW installed capacity clean energy sources by 2030
- With identified Offshore Wind Potential of 70 GW in Tamil Nadu and Gujarat Coasts, India Plans to establish Test Cum Research Centre at Dhanuskodi which can cater to the needs of Asia pacific region
- With state-of-the-art wind turbine manufacturing capabilities, India has become an export hub for WT components.

- **Proposed Offshore Test cum Research Centre at Dhanuskodi**

Italy
Country Presentation

Key highlights

- 64 EOI for offshore wind projects (40 floating ones!) received by the Ministry of Ecologic Transition
- Deployment of MaRELab, a laboratory at sea by CNR and University of Campania for testing novel marine energy harvesting systems
- New Italian Wind Atlas developed by RSE.

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Installation of the first offshore wind turbine in December 2021 in Taranto Harbor (Beleolico park)

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Japan
Country Presentation

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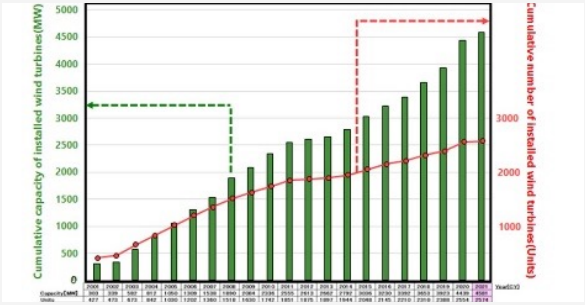
Key highlights

- Total installed wind capacity is 4,581MW at the end of 2021 in Japan. Wind power accounted for 1.0% of the total electricity
- The government has set up a Green Innovation Fund to implement the "Green Growth Strategy ". NEDO has started the development and social implementation of elemental technologies
- There are five promotion zones for "the new Act "as of September 2021. Operators were elected during 2021 for four of these five zones.

Installed capacity of wind power in Japan



Spain
Country Presentation

Key highlights

- Wind energy has generated more electricity in 2021 than any other technology in Spain
- Spain approved its first Offshore Wind Roadmap in 2021: 3GW Floating Offshore Wind by 2030
- The first hybrid wind farm (32 MW) with batteries (5 MW, 1 hour) has been carried out

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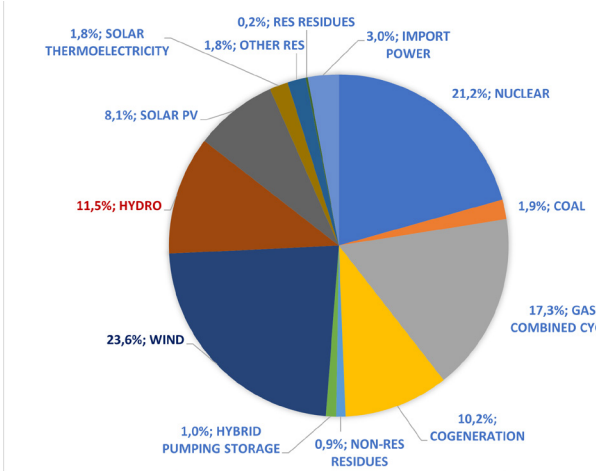

Deployment of wind power in Spain is setting new records again: 23.9% yearly power demand coverage.

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Task 25

Design and Operation of Energy systems with Large amounts of Variable generation

Key highlights

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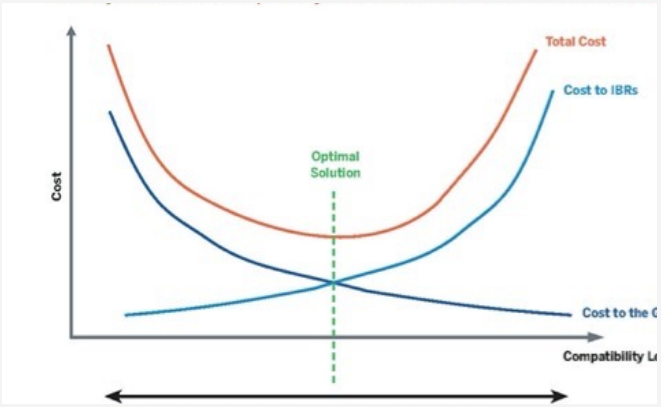
- Task summary report was published Oct 2021. Several webinar presentations to disseminate, recording and slides available in our web page https://iea-wind.org/task25/
- Updated curtailment paper published at RSER (Open access: https://doi.org/10.1016/j.rser.2022.112212
- Ongoing work in several countries on enhanced capabilities for wind power plants to support the grid: Grid forming converters – Figure for system perspective from https://www.esig.energy/wp-content/uploads/2022/03/ESIG-GFM-report-2022.pdf

Total System Cost as Compatibility Burden is Moved Between IBRs and the Grid



Task 34

WREN

Key highlights

- An assessment of the environmental effects of wind energy showed cumulative effects and turbine collisions remain the top priorities
- A review of cumulative effects analyses indicates increasing data acquisition for species of interest and improving standardization of monitoring practices can expedite the permitting process
- Finalizing a database summarizing the research status of monitoring and mitigation technologies

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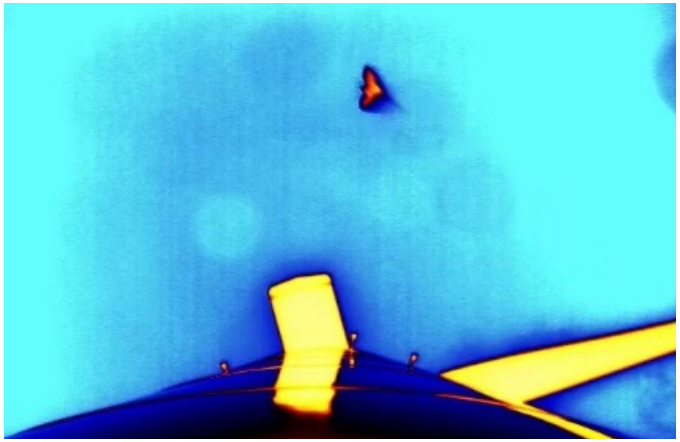
Thermal image of a bat flying near a wind turbine



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Task 39
Quiet wind turbine technology

Key highlights

- Phase 2 of Task39 includes 2 new work packages focused on noise assessment, human perception and psychology of noise
- Wind Turbine Noise Code benchmark testing will continue with actual noise measurements from a wind turbine, which is rarely available together with turbine information
- A number of benchmark test-cases for wind turbine noise propagation have been initiated. This are supported by 3 different measurement datasets (from DLR/KTH/LUH)

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Serrated airfoils are measured in different wind tunnels (DTU/DLR-DNW/TUDelft) - Results are being compared.

Task 49
Integrated Design of floating wind Arrays (IDEA)

Key highlights

- IEA Wind Task 49 kicked off in December 2021 and has held meetings for Work Packages 1 and 2 along with an in-person meeting in May 2022. 7 countries have committed to participating in the Task
- The primary goal of the Task is to develop reference designs and models that establish baseline design parameters, costs, and best practices for commercial scale floating wind arrays
- Task participants have developed a list of reference site data required for floating array design, including environmental, infrastructure, social, and regulatory parameters. These results will be aggregated into reference sites for the floating array designs.

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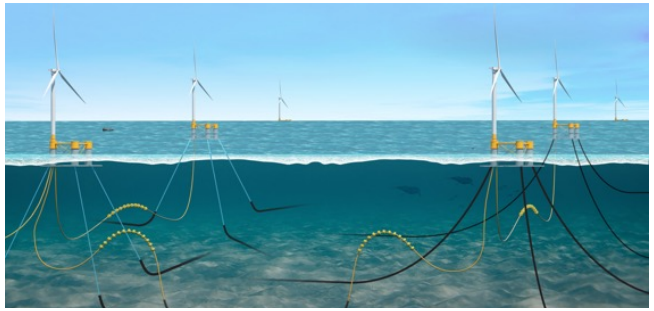
Conceptual design of a floating wind array



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Task 50
Hybrid Power Plants

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Key highlights

- IEA Wind Task 50 was kicked off in March 2022 which witnessed huge number of participation from industry and academia from 16 countries
- The primary goal of the task is to accelerate the development and deployment of wind based hybrid power plants
- The task will "design reference hybrid plants to perform specific objectives on design and operation", "characterize different building blocks which define the majority of hybrid power plant control algorithms", and "determine capabilities of hybrid power plants to provide both traditional and futuristic grid services" in close collaboration with other TCPs and IEA wind tasks.

Task 37
Wind Energy systems Engineering

Key highlights

- Two reference wind farm papers for offshore applications (energy production and monopile sizing) were presented at Torque 2022
- A new 20+ MW reference turbine preliminary design has been completed by DTU and will be further refined in collaboration with NREL and other task 37 colleagues
- Technical report on the ontology/schema for wind turbines and plants is now available along with the updated release of the software: Technical report: https://www.nrel.gov/docs/fy22osti/82621.pdf Ontology software: https://github.com/ieawindtask37

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Task 28
Social Science of Wind Energy Acceptance

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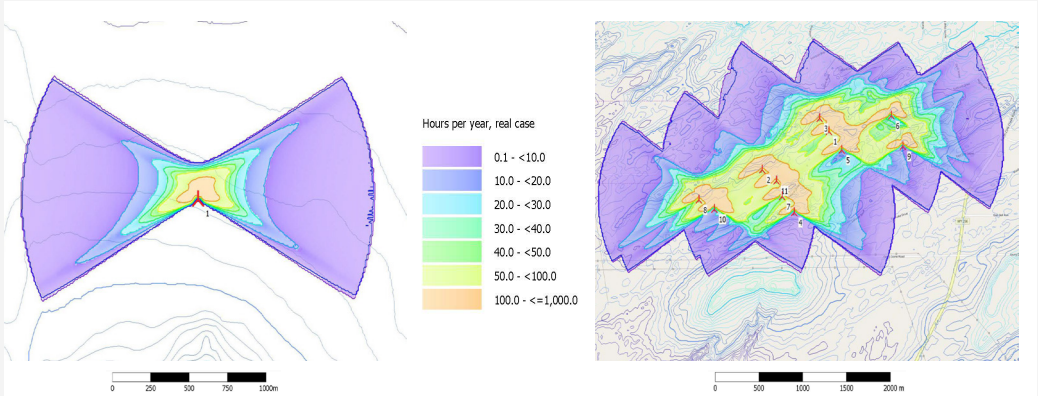
Key highlights

- Publication of best practice guidelines on 'Offshore Wind Farm Project Community Acceptance and Stakeholder Engagement' by Garry Keegan with input from participating member countries. Disseminated widely by ENTSO (E) and EU Commission and Parliament. Link
- Article co-authored by two task members published in Energy Research and Social Science: "In the shadow of wind energy: Predicting community exposure and annoyance to wind turbine shadow flicker in the United States'. Link
- Task summary report was published Oct 2021. Several webinar presentations to disseminate, recording and slides available in the web page. Link

Example of annual shadow flicker hours around (A) a single wind turbine and (B) a string of wind turbines



Grand Challenges of Wind Energy Science
ExCo update

Key highlights

- The Grand Challenges of Wind Energy Science will include 'the physics of atmospheric flow', 'the system dynamics and materials', and 'optimization and control of fleets of wind plants'. The papers will also expand with 'environmental', 'social', and 'small wind' issues.
- Authors of the Science paper have volunteered to lead a series of review and recommendation articles, sponsored by the EAWE Publications Committee to foster thought-leading communication.
- Four articles have been submitted in 2022 and six more will be submitted by the end of 2022. More than 100 authors have contributed.

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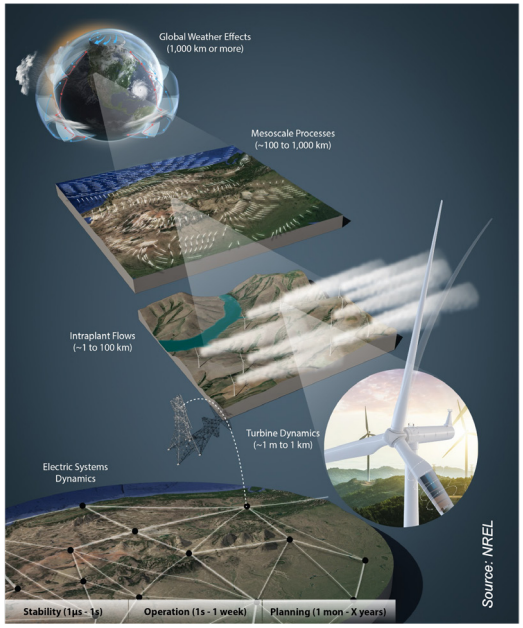
The Grand Challenges of Wind Energy articles extend from the global weather system to the minutiae of materials science to sub-second power system stability



Misc.

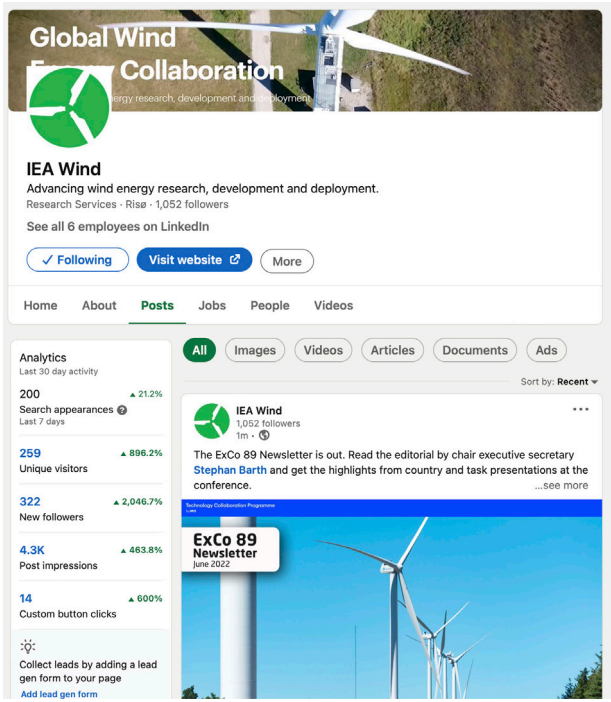
The ExCo 89 took place online 16-19 May 2022
84 participants were present, close to 40 presentations were given.

Next ExCo Meeting
ExCo 90 was approved in the dates 7 - 10 November 2022. Detailed agenda and invitations will be sent by the secretariat in due course. ExCo 90 will also be an online meeting due to the COVID situation.

Subscribe and get updated on the latest news
We are increasing our presense on LinkedIn and use it as a primary platform for broad communication and public engagement:

LinkedIn
https://www.linkedin.com/company/iea-wind/

All country and task highlights have been separately posted on our channel for the last ten days.



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