Technology Collaboration Programme
by iea

ExCo 91 Newsletter

June 2023

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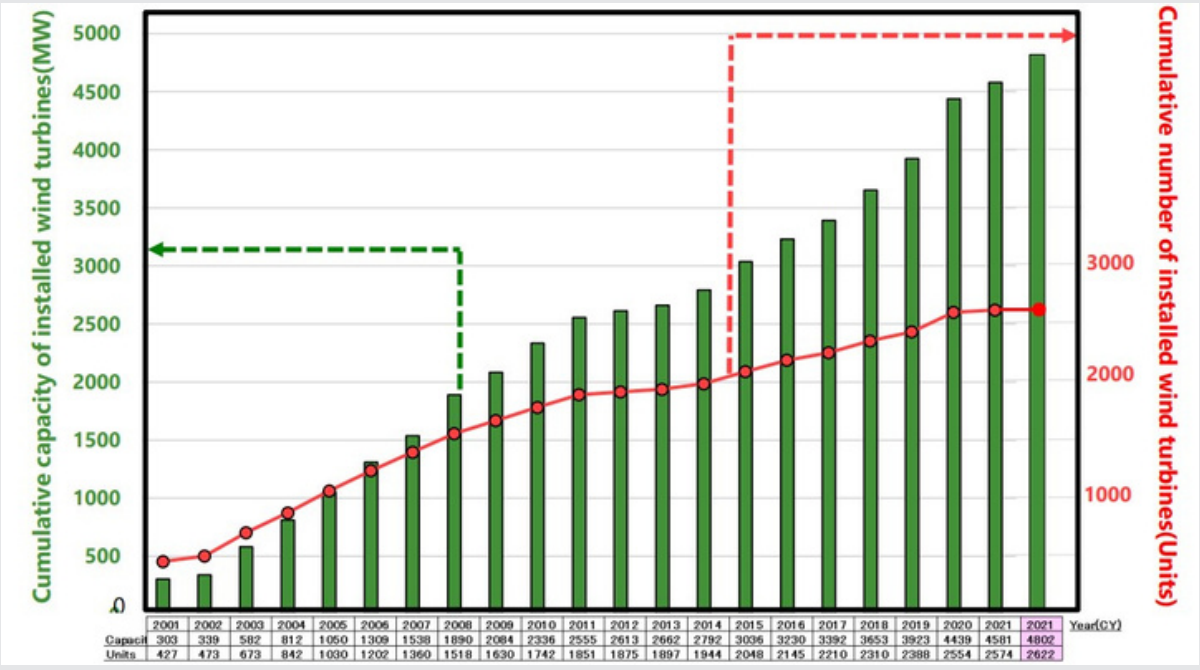
Japan
Country Presentation

For more information please contact:
Yoshitomo Watanabe
NEDO
watanabeyst@nedo.go.jp

Key highlights

- The total installed wind capacity is 4,802MW at the end of 2022CY in Japan. Wind power accounted for 1.0% of the total electricity.
- Japan's first large-scale commercial offshore wind farm has started operation in Akita Prefecture. There is a fixed-bottom offshore wind farm with a total capacity of about 140 MW.
- Regarding the GI Fund project, as Phase 1 in the wind power field, we are working on elemental technology development targeting four fields.

Installed capacity of wind power in Japan



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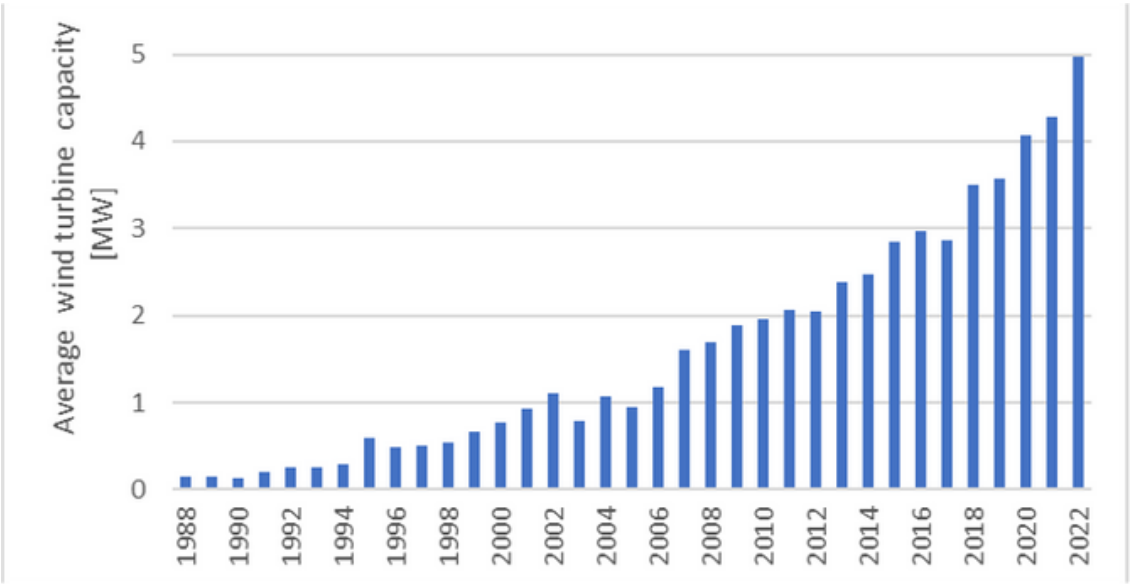
Sweden
Country Presentation

For more information please contact:
Andreas Gustafsson
Swedish Energy Agency
andreas.gustafsson@energimyndigheten.se

Key highlights

- Wind power in 2022 installed capacity reached 14,2 GW. Wind power accounted for 19% of electricity production (33 TWh).
- During 2022 new wind power was installed corresponding to approximately 7 TWh of annual production.
- Intensive development of offshore wind power projects is underway, and the Swedish marine plans are being updated.

Average nominal wind turbine capacity trend [MW] in Sweden



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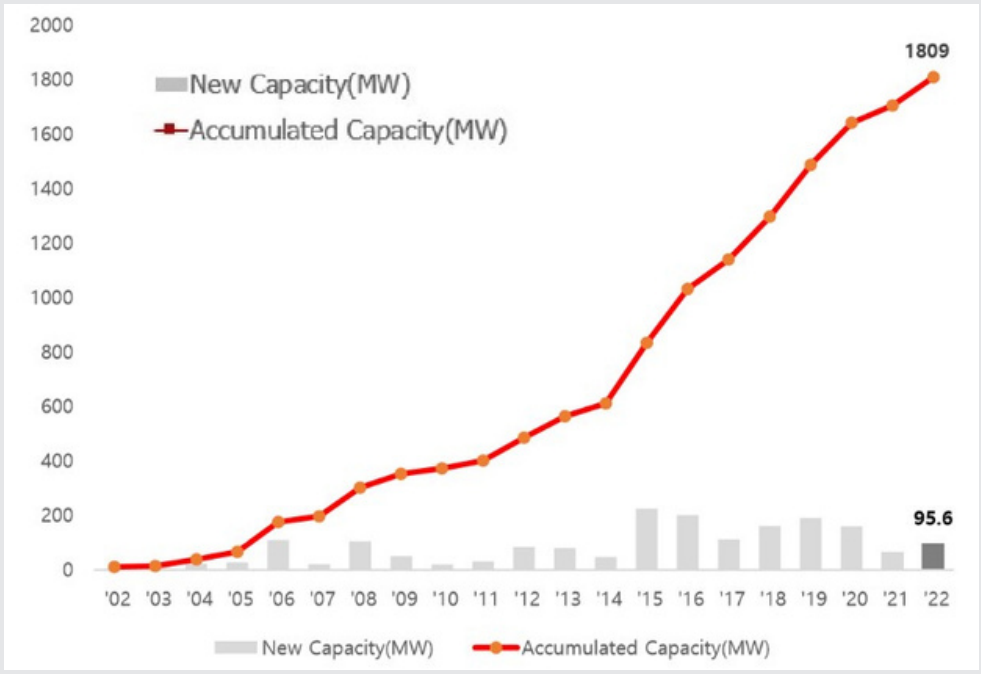
Republic of Korea
Country Presentation

For more information please contact:
Seung-Ho Song
Kwangwoon University
ssh@kw.ac.kr

Key highlights

- The slow deployment of wind energy during the last years shows big barriers such as complicated permitting processes and lack of social acceptance.
- According to the 10th Basic Plan on Electricity Supply and Demand, the renewable energy target is 21.6%(134.1TWh) of generation until 2030 and 30.6% by 2036 in Korea.
- The capacity of renewable energy in 2030 is expected to be 72.7 GW. This requires an additional 39.9GW to the current capacity with a major contribution of offshore wind power.

Wind energy deployment in Korea



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China
Country Presentation

For more information please contact:
Du Guangping
Chinese Wind Energy Association
dugp@cwea.org.cn

Key highlights

- The installed capacity in 2022 reached 395.57GW (30.51GW offshore) with 49.83GW newly installed (5.16GW offshore).
- Wind power production was 759.9 TWh, accounted for 8.8% of China's electricity demand supplied in 2022
- Deep-sea floating wind turbines were put into operation, and the turbines with 10MW inland and 18MW offshore arose.

6.2MW-152 floating wind turbine

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Task 25

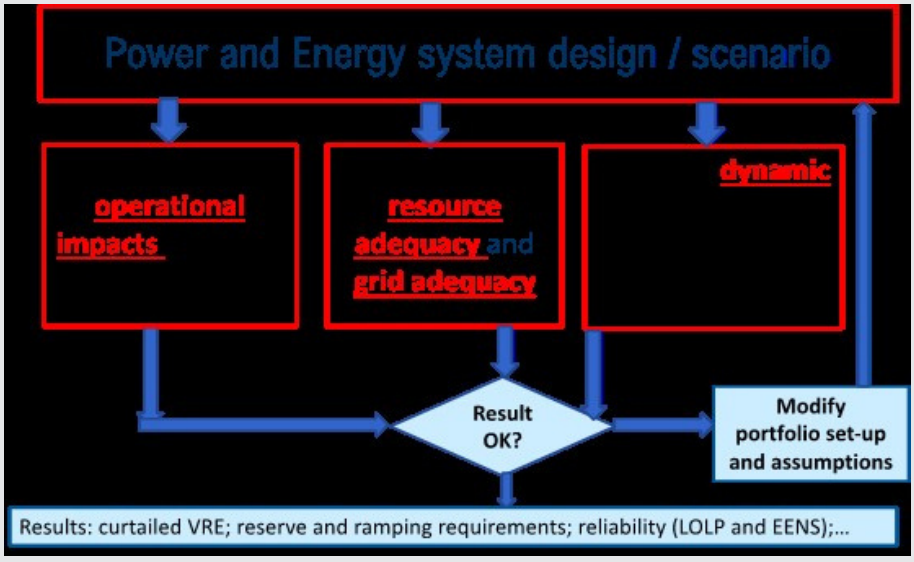
Design and operation of Energy Systems with Large amounts of Variable Generation

For more information please contact:
Hannele Holttinen
Recognis Oy
hannele.holttinen@recognis.fi

Key highlights

- Public workshop disseminating renewable integration best practices in Kyoto Japan in conjunction with Task 25 meeting May 2023.
- New publication: "Flexibility From the Electrification of Energy: How Heating, Transport, and Industries Can Support a 100% Sustainable Energy System", IEEE PES Magazine, July-Aug. 2022.
- New publication updating data on wind Curtailments https://doi.org/10.1016/j.rser.2022.112212

Task 25 is working to update Recommended Practice for Wind/PV Integration studies, adding recommendations for wind and solar dominated power systems.



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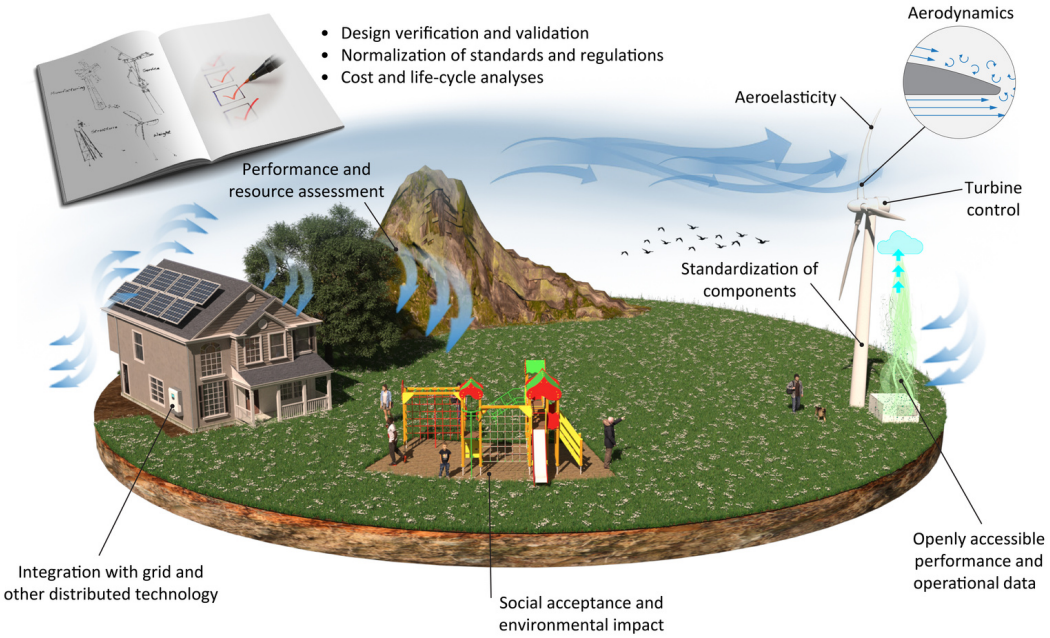
Task 41
Distributed Wind Energy

For more information please contact:
Ian Baring-Gould
NREL, USA
Ian.Baring-Gould@NREL.gov

Key highlights

- Kicked off the next four-year project phase, expanding work to include a new work package on the Human Dimension of Distributed Wind
- Planned revision of the International small wind turbine standard (MT-2) initiated based on work completed in phase I of this IEA effort, work efforts continue to support revision of the standard.
- Task members contributed to a journal article on the Grand Challenges for Small Wind Technology, building on the Grand Challenges in the Science of Wind Energy Technical Experts Meeting and publication.

Expanding on the Grand Challenge of Wind Energy: Need for small wind energy to contribute to a clean, distributed energy future.



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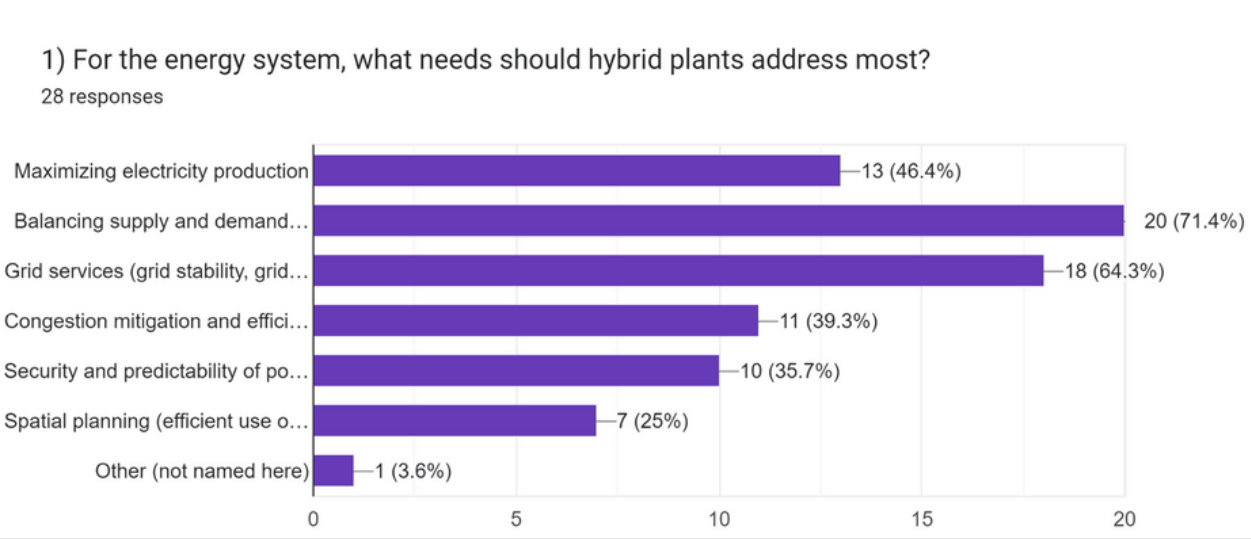
Task 50
Hybrid Power Plants

For more information please contact:
Christopher Bay
National Renewable Energy Laboratory
Christopher.Bay@nrel.gov

Key highlights

- Task 50 is officially kicked off with all work packages having identified working groups and is making progress.
- A draft report is in progress for WP1 on global consensus on the definition of a "hybrid power plant", which gathers input across academia and industry.
- Expert solicitations are being conducted for WP2, receiving insightful feedback for creating reference hybrid power plants.

An example of the expert solicitation results for WP2 helping to inform the creation of reference hybrid power plants



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Video Series:
Grand Challenges of Wind Energy Science
TEM 109 in Boulder, Colorado

For more information please contact:
Katherine Dykes
DTU Wind & Energy Systems
kady@dtu.dk

Key highlights

- Paul Veers and Katherine Dykes (main facilitators of the Topical Expert Meeting) recap the event that gathered around a hundred of the greatest minds in wind energy technology from across the globe.
- The focus was on interdisciplinary collaboration for a holistic approach to wind farm design and deployment.
- Breakout sessions paired different experts, like social scientists and wind turbine designers, atmospheric scientists and environmental scientists, and more.

Katherines Dykes and Paul Veers recap the IEA Wind conference on the Grand Challenges

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Grand Challenges of Wind Energy Science

The Perspective Piece

For more information please contact:
Paul Veers
NREL
Paul.Veers@nrel.gov

Key highlights

- In the past three years, the global wind energy research community identified urgent challenges in the design, development, and deployment of wind energy.
- These challenges must be swiftly addressed for wind power to fulfil its role as a significant carbon-free energy source.
- In a consensus-driven effort, 100 global wind energy experts have authored 10 articles for publication in Wind Energy Science (WES), synthesizing and clarifying the most crucial science needs in the field.

The Perspective Piece:
The Grand Challenges of Wind Energy Science

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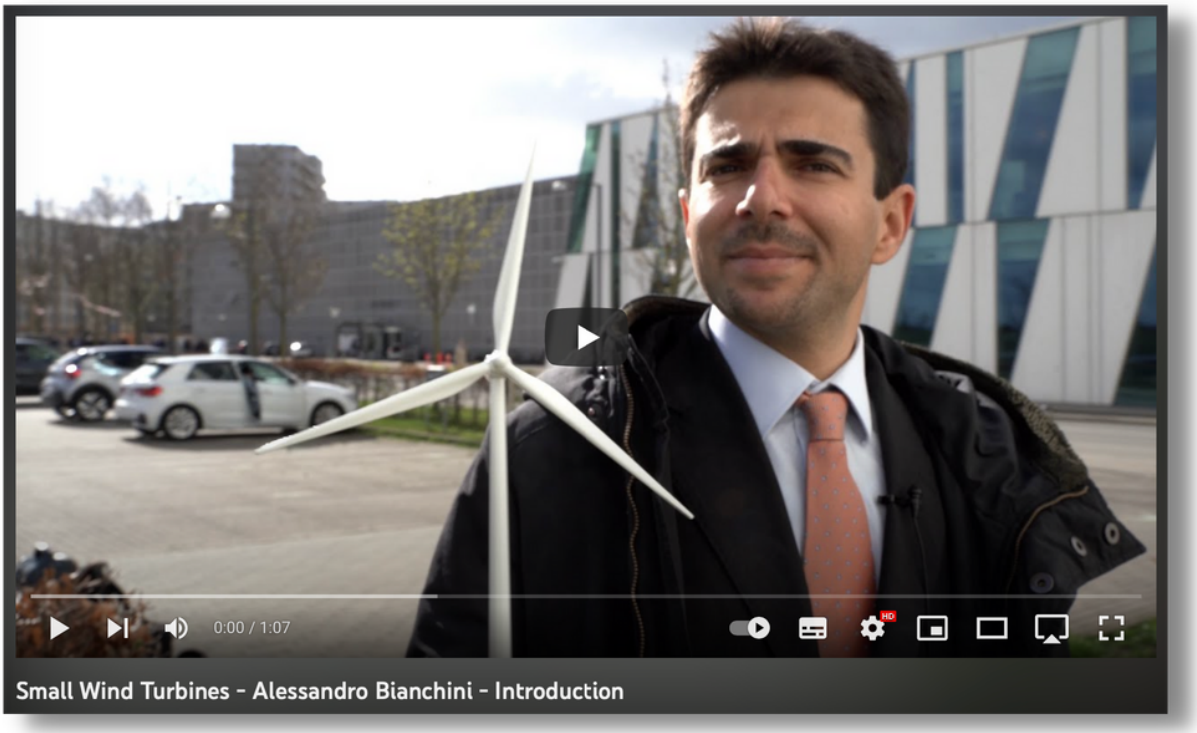
Grand Challenges of Wind Energy Science
Small Wind Turbines

For more information please contact:
Alessandro Bianchini
Università degli Studi di Firenze
alessandro.bianchini@unifi.it

Key highlights

- As the largest rotating machines on earth, wind turbines are set for future upscaling. However, there is a renewed interest in small wind turbines, driving energy transition and smart grid development.
- 1 million small wind turbines are installed around the world producing a total of 1.5 GW of power.
- This paper assesses the present state of small wind turbine technology, including its technical maturity, diffusion, and cost.

Introduction: Grand Challenges of Small Wind Turbines



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Grand Challenges of Wind Energy Science

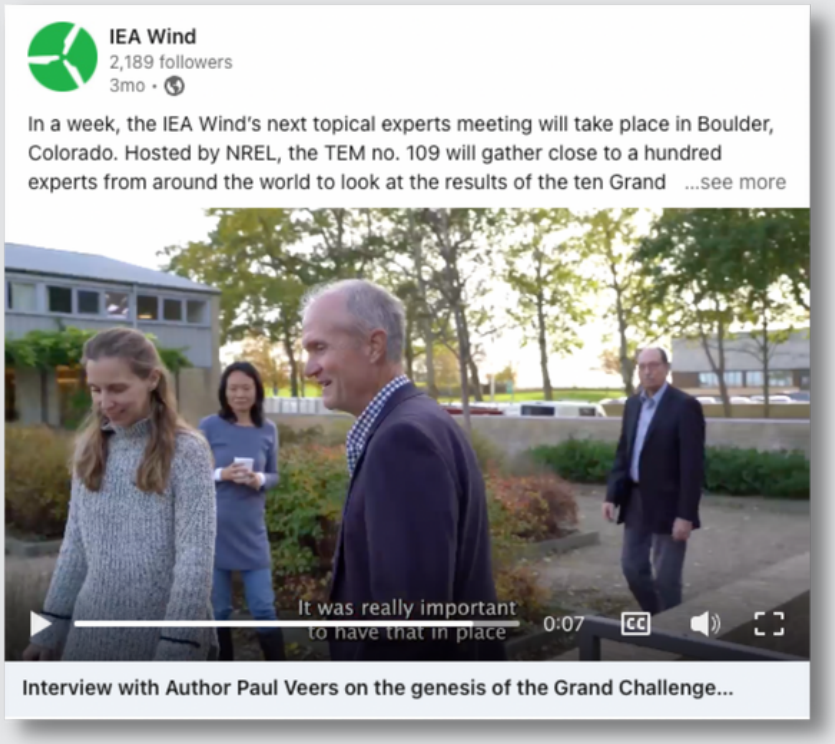
The Origin

For more information please contact:
Paul Veers
NREL
Paul.Veers@nrel.gov

Key highlights

- The origin of the Grand Challenges work came out of an IEA Wind topical experts meeting back in 2017.
- This collaborative effort focuses g on grand challenges like atmospheric flow physics, wind turbine system dynamics and materials, and control of wind power plant fleets with hundreds of generators supporting the electric grid.
- Later an article was published, outlining the progress, potential, and high-level scientific gaps while also noting opportunities in digitalization and integrated education.

The Origin of the Grand Challenges Papers



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ExCo 91 & 92 Meetings

Next ExCo meeting in Germany, 17-20 October 2023

ExCo 92 will be held as a physical meeting at Koeniglicher Pferdestall in Hannover, Germany. Detailed agenda and invitations will be sent by the secretariat in due course.

Koenigl. Pferdestall, Exterior view

ExCo 91 took place at Kitakyushu International Conference Center in Fukuoka, Japan, 10-13 May 2023

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Misc.

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

Coming up: Annual Report sneak previews on LinkedIn IEA

The IEA Wind Annual Report 2022 is in the final stage of preparation. Like last year, there will be chapter previews dropping on our LinkedIn.

YouTube

https://www.youtube.com/@IEAWIND

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