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Forecasting for the Weather Driven Energy System – The New IEA Wind Task 51

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The last 6 years, the International Energy Agency (IEA) Wind Task 36 “Forecasting for Wind Energy” has provided forecasting stakeholders (weather institutes, forecast service providers, end users and academics) a platform to discuss challenges and benefits of forecasting for wind power. These discussions have led to a number of activities and initiatives to overcome challenges and to broadcast the benefits of forecasting. Among the major outputs are an information portal with links to free data, a collection of use cases for probabilistic forecasts, and the IEA Recommended Practice on Forecast Solution Selection, including 4 chapters dealing with the (1) solution selection process, (2) benchmarks and trials, (3) verification process and use of online measurements from wind farms for real-time forecasting applications.

In the future, we will no longer “integrate” wind and solar into existing power systems, but instead are wind and solar going to be the backbone of our power systems.

To address those challenges in an integrated fashion, the IEA Task for Forecasting under the IEA Wind Technology Collaboration Programme (TCP) relaunched with a new Task number (51) and a new work program. The work packages (WPs) are still structured according to stakeholder topics: WP1 deals with weather forecasting, and mainly addresses meteorologists, WP2 deals with the conversion of the weather feeds to the application specific variables such as wind power and addresses forecast vendors, and WP3 deals with the applications and how to get most value out of the forecasts, and therefore addresses the forecast users, including recent advances in data science and digitalisation. However, many of the topics the new Task takes up are cross-cutting, and are therefore now Work Streams (WS):

- Atmospheric physics and modelling (lead by WP1)
- Airborne Wind Energy Systems (WP1)

- Seasonal forecasting (WP1)
- State of the Art for energy system forecasting (WP2)
- Forecasting for underserved areas (WP2)
- Minute scale forecasting (WP2)
- Uncertainty / probabilistic forecasting (WP3)
- Decision making under uncertainty (WP3)
- Extreme power system events (WP3)
- Data science and artificial intelligence (WP3)
- Privacy, data markets and sharing (WP3)
- Value of forecasting (WP3)
- Forecasting in the design phase (WP3)

Most of these work streams require collaboration, and therefore have dedicated partners in other IEA Wind Tasks, or in IEA Tasks outside of the Wind TCP. Task 51 will therefore collaborate with IEA Wind Tasks 32, 44, 48 and 50, IEA PVPS Task 16, IEA Hydro, the IEA Hydrogen TCP, IEA Bioenergy Task 44 and WMO.

A major activity of Task 51 will be four public workshops in the next four summers, starting with a workshop on the State of the Art and Research Gaps in 2022, on seasonal forecasting with a special emphasis on hydro power and storage in 2023, on minute scale forecasting in 2024, and on extreme power system events in 2025. We keep the community updated on events, new publications and other relevant information on our website ieawindforecasting.dk and via LinkedIn and Research gate.