
Extreme weather conditions, such as heatwaves, severe storms, floods, cold snaps or Dunkelflaute events, can significantly impact electricity grids and energy supply by disrupting power generation, transmission, and distribution systems. Additionally, extreme weather can spike electricity demand, further stressing the grid and potentially leading to power shortages or blackouts. Therefore, forecasting for extremes and implementing effective mitigation strategies are critical for enabling system operators to prepare for these events in advance. This workshop aims to address these challenges from a weather forecasting perspective, from the power grid perspective, and discuss related cybersecurity aspects.

The workshop is followed by an IEA Wind Task 51 meeting and an IEA-IEC review meeting on the Standard Working Draft for Renewable Energy Forecasting Methods & Data Definitions and Evaluation.

All times are Central European Summer Time (CEST)

| Tuesday, September 30, 2025 \| Deutscher Wetterdienst, Frankfurter Strasse 135, 63067 Offenbach, Germany | |
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| 9:00 – 9:10 | Welcome & Logistics, Overview of IEA Wind Task 51<br>Corinna Möhrlen (WEPROG) and Helmut Frank (DWD) |
| 9:10 – 10:50 | Keynote Session Chair: Corinna Möhrlen<br>• **Welcome Keynote** (Renate Hagedorn, Vice President DWD)<br>• **Weather extremes in a weather-driven energy system** (Vanessa Fundel and Frank Kaspar, DWD)<br>• **Power challenges in grid operation** (Martin Stensdal, Energinet)<br>• **Challenges in the power market** (Detlef Siebert, SETrade)<br>Keynote presentations will be followed by Q&A and slido questions. |
| 10:50 – 11:10 | Networking Break |
| 11:10 – 13:00 | Defining Extremes (1) Chair: Helmut Frank<br>• **Meteorological vs power system extremes: EPRI's insights and overview of EPRI's Risk Screening Tool** (Caroline Draxl, EPRI)<br>• **Weather regimes as a proxy for extremes in the power system** (Christian M Grams, MeteoSwiss)<br>• **Adverse Weather and RES - Event detection from the meteorological perspective: a multi-scale physics-informed approach** (Irene Schicker, Geosphere Austria)<br>• **Estimating and forecasting high-resolution wind gust fields from sparse Mesonet observations** (Maximilian Pierzyna, TU Delft, University of Albany)<br>Presentations will be followed by Q&A and slido questions |

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| 13:00 – 14:00 | Lunch Break |
| 14:00 – 15:00 | Defining Extremes (2) Chair: Caroline Draxl<br>• **Deep Convective Cold Pools: Potential Impacts on Wind Energy from Observations and Numerical Modelling** (Gerard Kilroy, DLR)<br>• **Definition and associated differences of extremes in meteorology and the power system of Ethiopia** (Zerihun Desalegn, Ministry of Water and Energy Ethiopia)<br>• **Warnings of exceptional contingencies of power lines due to weather phenomena** (Gregor Pante, DWD)<br>Presentations will be followed by Q&A and slido questions. |
| 15:00 – 16:00 | Panel Discussion<br>Panel: Irene Schicker (Geosphere Austria), Bekele Kasaye (Ministry of Water and Energy Ethiopia), Mouhamet Diallo (ENGIE), Martin Stensdal (Energinet), Vanessa Fundel (DWD), Hamid Bastani (Energy Consultant for WMO ENANDES+) |
| 16:00 – 16:20 | Networking Break |
| 16.20 – 17.50 | Dunkelflaute Events Chair: Gregor Giebel<br>• **Dunkelflaute and long-term electric energy shortage events in Europe** (Yvonne Scholz, DLR)<br>• **Seasonal forecasting of Dunkelflaute episodes in Western Europe** (Alberto Caldas Alvarez, EDP Renewables)<br>• **Forecasting Flaute Across Sub-Seasonal and Seasonal Timescales** (Abhinav Tyagi, Fraunhofer IEE)<br>• **Wind and solar energy droughts: Potential impacts on energy system dynamics and research needs** (Jim Wilczak, NOAA Emeritus)<br>Presentations will be followed by Q&A and slido questions. |
| 19:00 | Dinner (Apfelwein Wagner, Schweizerstr. 71, Sachsenhausen/Frankfurt a.M) |

## Wednesday, October 1, 2025 | Deutscher Wetterdienst, Frankfurter Strasse 135, 63067 Offenbach, Germany

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| 9:00 – 9:10 | Welcome Back & Summary From Day 1<br>Corinna Möhrlen (WEPROG) and Gregor Giebel (DTU) |
| 9:10 – 10:30 | Security aspects in Extreme Situations - Chair: Irene Schicker<br>• **Extreme event risk mitigation in short-term energy trading by operational meteorological assessment** (Stephan Späth, ANE)<br>• **Impact of extremes on forecast error and market bidding strategies** (Mouhamet Diallo, ENGIE)<br>• **From forecasts to decisions - do we need to care about AI safety?** (Lukas Strauss, Austro Control Digital Services)<br>• **Climate Resilience and Adaptation Initiative (READi) Power Framework** (Caroline Draxl, EPRI)<br>• **How to create a new weather resilience 2.0 for grid operators based on extreme weather events** (Markus Schwab, Meteomatics)<br>Presentations will be followed by Q&A and slido questions. |
| 10:30 – 10:45 | Networking Break |
| 10:45 – 12:15 | Interactive Session / OpenSpace Disucssion Chair: Corinna Möhrlen<br>Inspirational Talks (5min): Martin Stensdal (Energinet), Markus Schwab (meteomatics), Hamid Bastani (Energy Consultant for WMO ENANDES+)<br>OpenSpace Discussion of workshop topics “Extremes Definitions - Mitigation Strategies - Security Aspects” in small groups |
| 12:15 – 13:00 | Wrap Up<br>Summary, Q&A, and presentation of some results from the panel and interactive sessions |
| 13:00 – 14:00 | Lunch Break |

| Wednesday, October 1, 2025 \| IEA Wind Task 51 Meeting | |
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| 14:00 – 15:00 | Specific Topic Reporting & Invited Talks<br>• **Seasonal forecasts of 100m wind and solar radiation for Germany** (Jan Wandel, German Weather Service DWD)<br>• **Seamless climate information for enhancing energy system resilience in Spain (Albert Soret, Barcelona Supercomputing Centre)** |
| 15:00 – 15:40 | **Specific Topic Reporting & Invited Talks**<br>• **Nowcasting Solar Ramp Events for National Power Grids** (Angela Meyer, TU Delft)<br>• **Advances in Wind Power Ramp Forecasting** (Helena Charlotte Hansen, ENFOR) |
| 15:44 – 16:00 | Networking Break |
| 16:00 – 16:45 | Status of IEA Wind Task 51 and its Workpackages<br>Facilitator: Gregor Giebel (DTU)<br>• Workpackage 1: workstreams NWP-AI, Seasonal Forecasting, Airborne Wind<br>• Workpackage 2: workstreams Multi-scale Forecasting, Uncertainty Quantification<br>• Workpackage 3: workstreams Decision-Making, Recommended Practice/Standard, Data Science & Sharing |
| 16:45 – 17:15 | Planning of End-of-Phase 1 |
| 17:15 | Adjourn |
| 19:00 | Dinner (Markshaus amd Wilhelmsplatz, Bieberstr 9. Offenbach) |

| Thursday, Oct. 2, 2025: IEA-IEC Review meeting on Standard Draft for *Renewable Energy Forecast Evaluation* | |
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| 9:00 – 9:30 | Welcome and Introduction of the IEA-IEC Working Group Facilitator: Corinna Möhrlen<br>Welcome Note and contribution possibilities through IEA Wind Liaison, Corinna Möhrlen, (WEPROG)<br>Introduction to the standard and objectives by IEC SC8A WG2 Secretary, Zheng Wang (CEPRI)<br>On the importance of IEC Standards for Meteorological Services and Technologies in Power Systems, Shu Wang (CEPRI) |
| 09:30 – 10:30 | Introduction and Planning<br>Presentation of the development plan and current status, Zheng Wang (CEPRI)<br>Presentation of the Solar Handbook and its role in the standard, Stefan Wilbert (DLR)<br>Presentation of IEA Wind Recommended practice Evaluation Framework and its role in the standard, Corinna Möhrlen<br>Presentation of OpenSource Verification and Evaluation Tools, Jie Yan (NCEPU)<br>Q&A |
| 10:30 – 11:00 | Networking Break |
| 11:00 – 13:00 | Group Work<br>OpenSpace Discussion of specific topics in CDF63531: framework setup, metrics, data preparation, data quality control |
| 13:00 – 14:00 | Lunch Break |
| 14:00 – 15:00 | Group Work Evaluation & Open Discussion<br>Presentation of group work |
| 15:00 – 15:30 | Networking Break |
| 15:30 – 16:00 | Planning of next Period & Wrap up |