IEA Wind Task 51
"Forecasting for the Weather-driven Energy System"

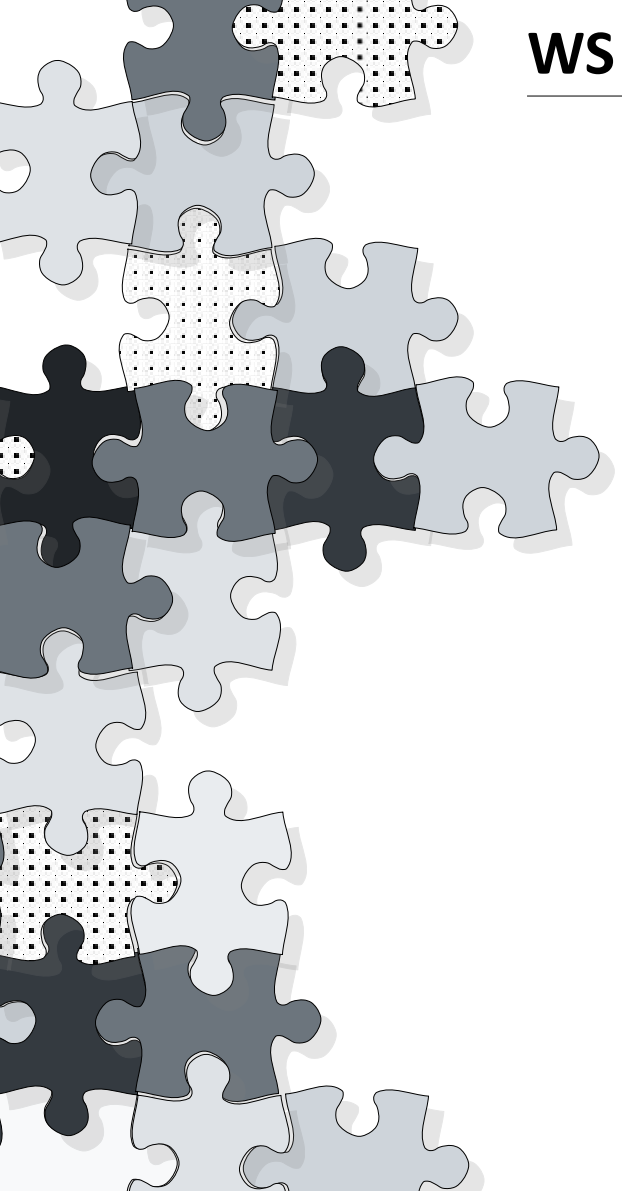
Kick-off Meeting

Workstream Extreme Power System Events

Online

2nd - 3rd February 2022

WS Extreme Power System Events



> “Knowledge is NOT power.
> Knowledge is only POTENTIAL power.
> WISE Action is what is needed in extremes...”

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WS Extreme Power System Events

WS:	WP1 Weather	WP2 Power	WP3 Applications	Deliverable	#, Due	Collaboration
Extreme power system events (WP3)				Workshop	D3.6 / M42	Task 25, ESIG, IEA ISGAN, PVPS T16, G-PST

Weather extremes are a threat to the power system, not only due to destruction of hardware, but also due to inadequate unit commitment, grid planning and available generation units. The challenges are broad and reach into the power markets, where extreme prices can be caused by extreme weather events. Knowledge and exchange of information on how to forecast extremes and mitigate effects from such extremes are topics that need attention in the next phase. While there is a strong weather dependency in this WS, the work will be structured according to the needs of the end users, and therefore administered by WP3.

D 3.6: Convene workshop on extreme power system events (M42)

WS Extreme Power Events

In February 2021, an extreme winter storm event caused a

- **massive electricity generation failure in Texas**
- **loss of power for more than 4.5 million homes**. ...

Outage brought attention to the energy system crisis and its potential causes.
While much press has been dedicated to identifying the entities and individuals potentially at fault, **determining exact causes and accurately assigning responsibility for an event this complex requires expert input and opinion**…..

Texas Outage Sheds Light On 'Unreliability' ...
According to the Austin American-Statesman, the Texas **power supply relies chiefly on natural-gas** plants. Those supplied 40% of the grid to the Lone-Star State while the second-largest source was of power was wind at 23%....

Reliability

Resilience

What does that mean for forecasting in the future with 80% … 100% renewables on the grid ?

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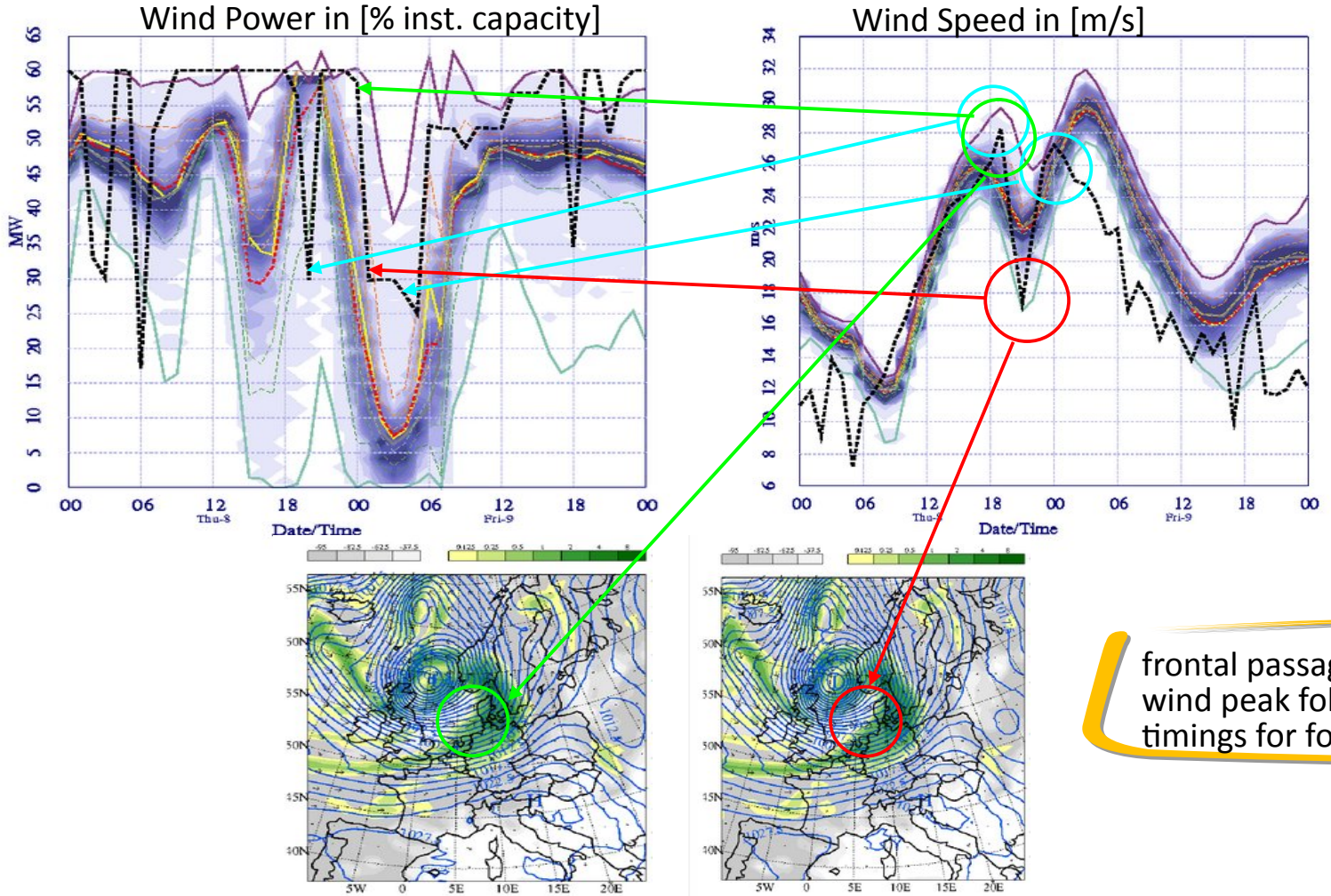
WS Extreme Power System Events



frontal passages mean that after a wind peak follows a drop…. difficult timings for forecasting!

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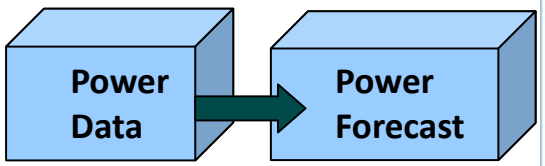
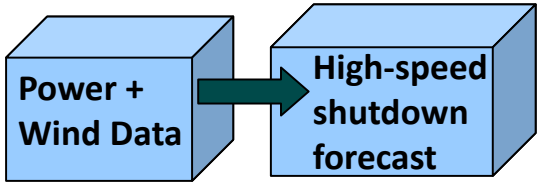
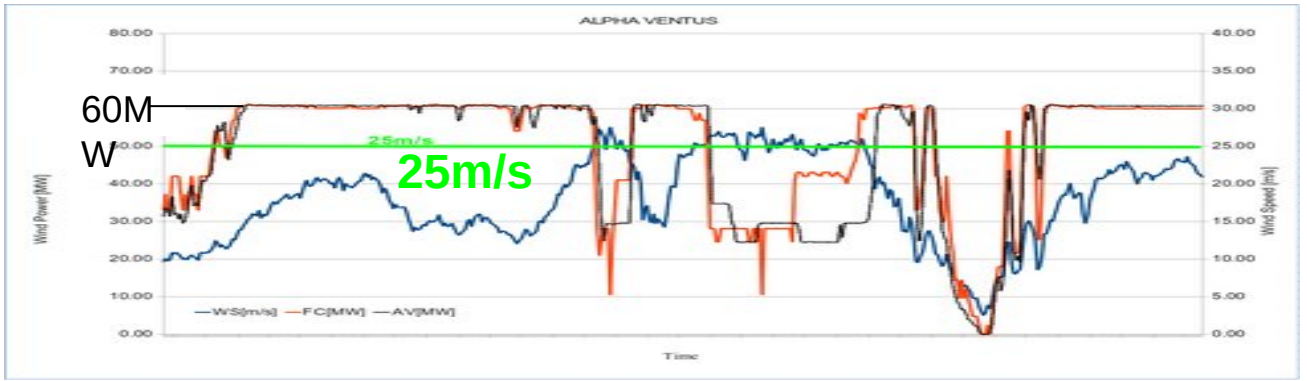
WS Extreme Power Events: new forecast tools need to be developped...



Cut-off Forecast **NOT possible** ==> **it's like playing lotto**





Cut-offs prediction **possible** ==> **no gambling required:**
wind speed measurement clearly indicates risk of cutoff

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WS Extreme Power Events

In February 2021, an extreme winter storm event caused a **massive electricity generation failure in the state of Texas,** which resulted in a **loss of power for more than 4.5 million homes**. ... bringing attention to the energy system crisis and its potential causes. While much press has been dedicated to identifying the entities and individuals potentially at fault, **determining exact causes and accurately assigning responsibility for an event this complex requires expert input and opinion**…..

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Reliability

Resilience

What does that mean for forecasting in the future with 80% … 100% renewables on the grid ?

Do we have to move from *generation* forecasts to *impact* forecasts ?

Do we not have to think wind + solar together with demand ?

Do we not have to collaborate and think all (CO_2-free) generation together ?

Need of broiad collarboration….

IEA Bioenergy Task

IEA HybridTask

IEA PVPS Task

WMO SG-ENE

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WS Extreme Power System Events

Interested in this workstream ?

Contact us … iea-wind.org/task51
Follow us iea-wind.org/task51 → workstreams → Extreme Power System Events

Workshop on the impact of extremes in the power system

Safe the date: April 2025 in Boulder, USA

Workshop topics

- Forecasting of Extremes
- Impact of extremes on
  - Reserves
  - Infrastructure
  - Demand
- … ?

https://iea-wind.org/task51/task51-work-streams/ws-extreme-power-system-events/

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