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Balancing from Wind power

Technology capabilities and current experiences

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26th September 2018, WindEurope Global Wind Summit, Hamburg, Germany

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Are we there yet?

Technological status of frequency control by wind

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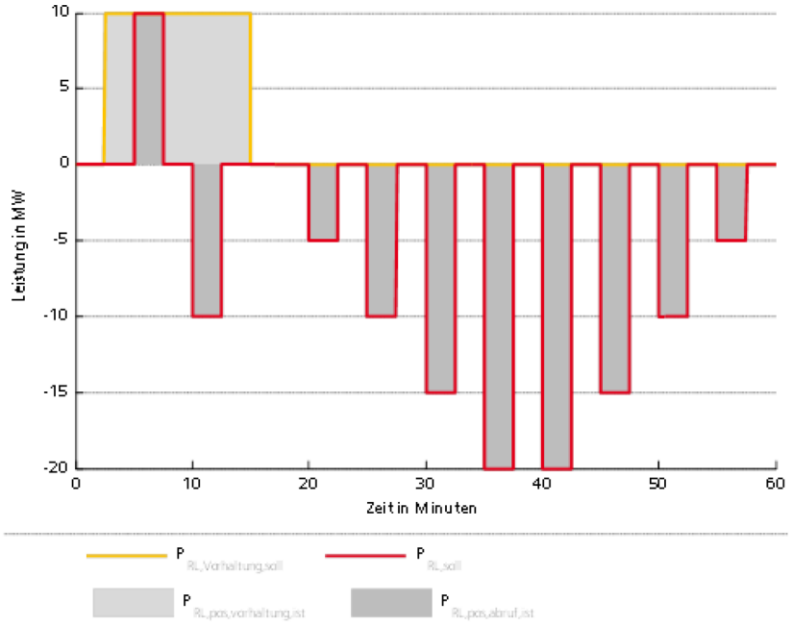
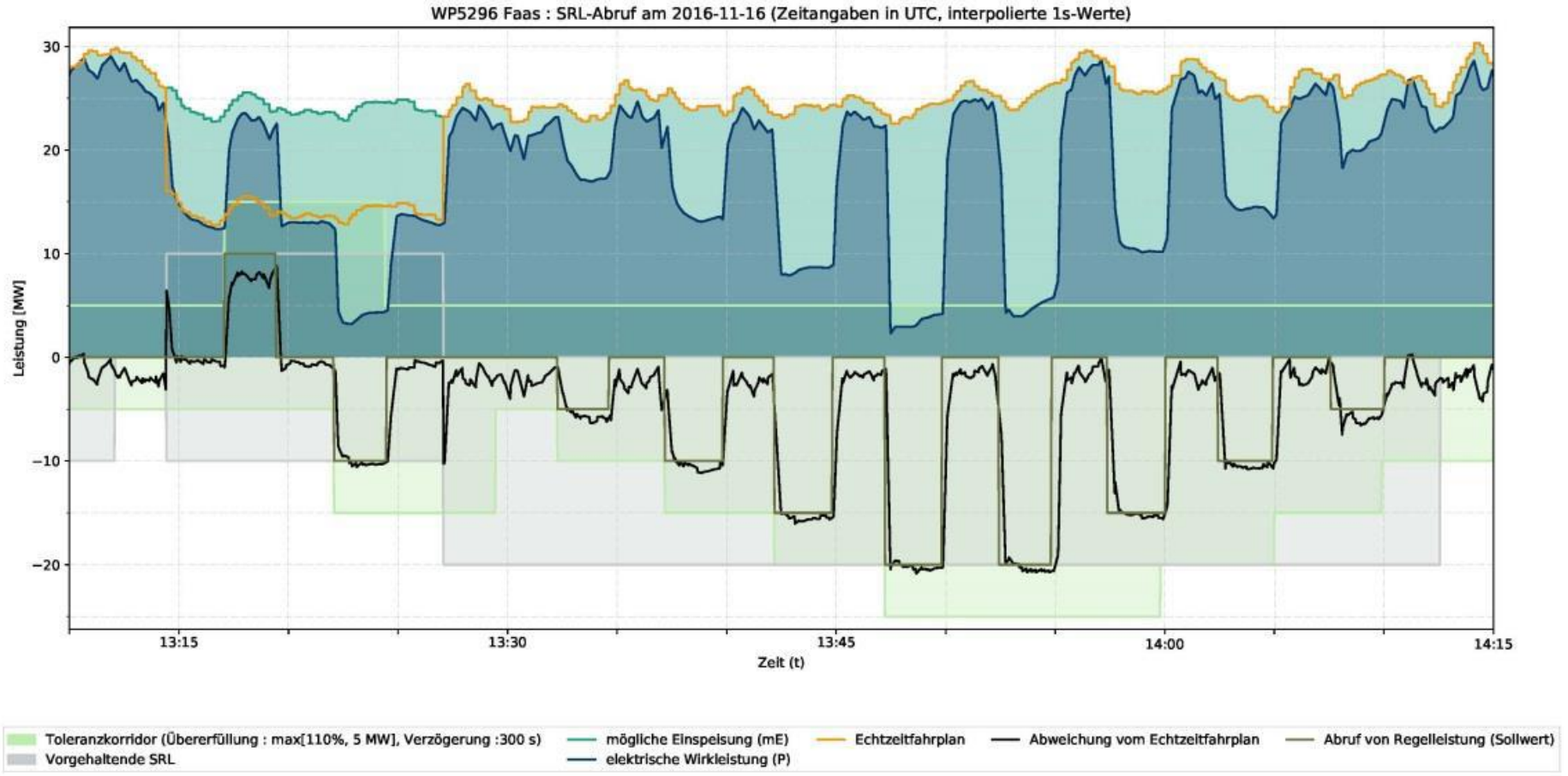
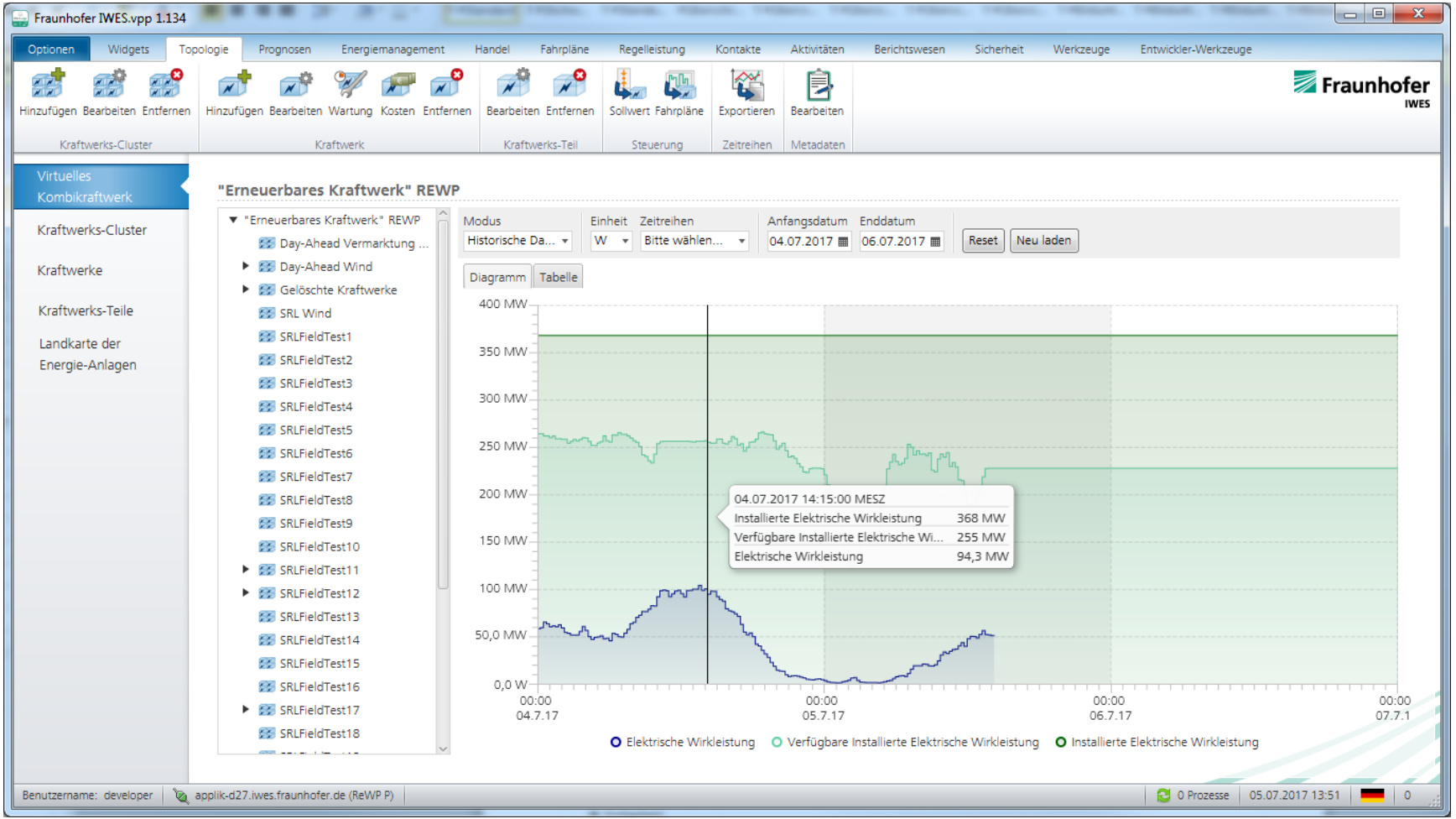
aFRR dispatch from a wind farm in Germany



Fraunhofer IWES (2017): *Regelenergie durch Wind- und Photovoltaikparks – Abschlussbericht*. https://www.iee.fraunhofer.de/content/dam/iwes-neu/energiesystemtechnik/de/Dokumente/Projekte/20170814_ReWP_Abschluss_final.pdf



Fraunhofer IWES (2017): *Regelenergie durch Wind- und Photovoltaikparks – Abschlussbericht*. https://www.iee.fraunhofer.de/content/dam/iwes-neu/energiesystemtechnik/de/Dokumente/Projekte/20170814_ReWP_Abschluss_final.pdf



Fraunhofer IWES (2017): *Regelenergie durch Wind- und Photovoltaikparks – Abschlussbericht*. https://www.iee.fraunhofer.de/content/dam/iwes-neu/energiesystemtechnik/de/Dokumente/Projekte/20170814_ReWP_Abschluss_final.pdf

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Ready for take-off?

Projects across Europe and pilot phase in Germany

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Germany

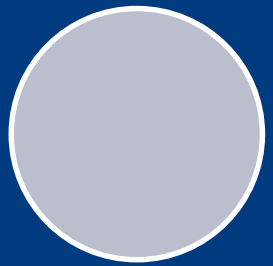
- ReWP: Reserve from Wind and Photovoltaics
- RdW: Reserves from Wind
- KK2: Ancillary services with 100% RES
- Pilot Phase for 2 years

Spain

- Twenties project
- REE activities

Belgium

- R2 down



UK

- Enhanced Frequency Control Capability (EFCC)

Europe

- ReStable

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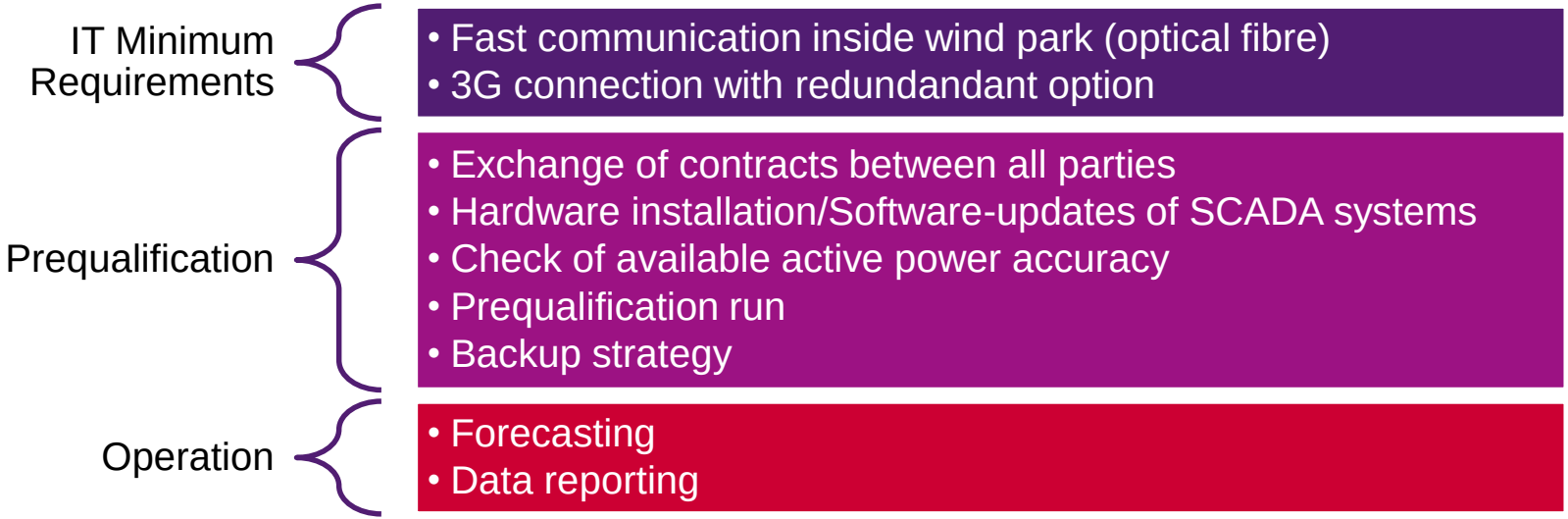
Prequalification Germany (Pilot Phase)



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Ka-ching!

How to design a market for wind, solar and others?

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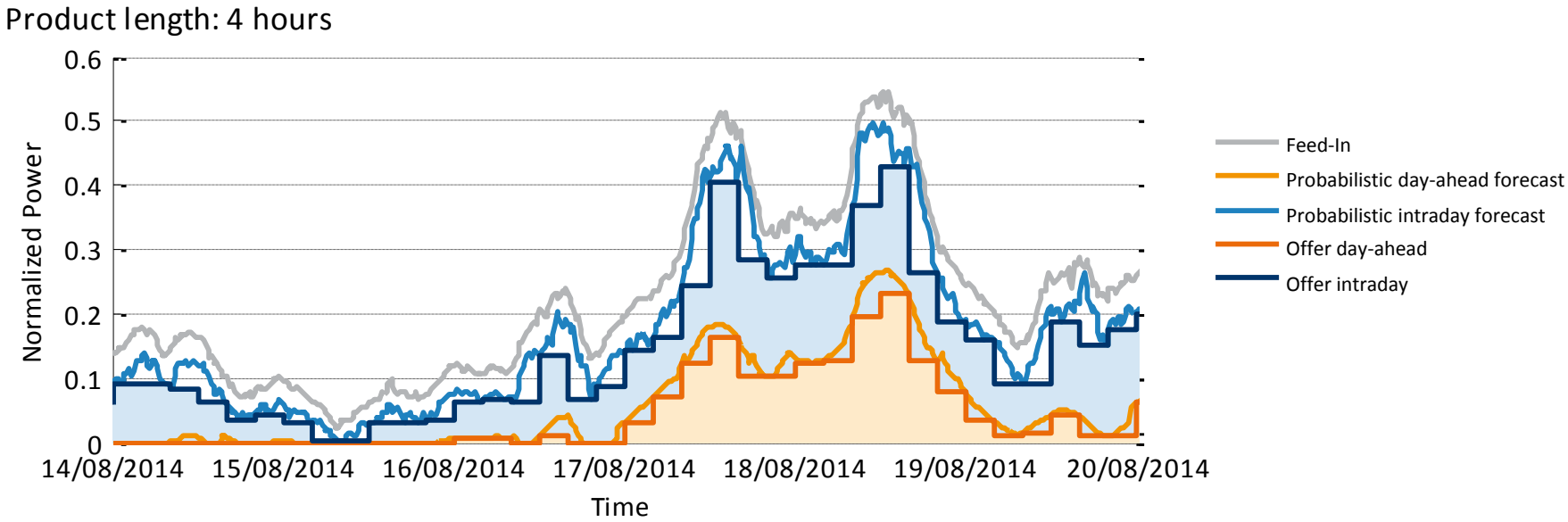
Probabilistic forecasts with a reliability of 99,994%



Jansen, M. (2017): *Economics of control reserve provision by fluctuating renewable energy sources*. https://www.zhb-flensburg.de/dissert/jansen-malte/

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Q&A

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