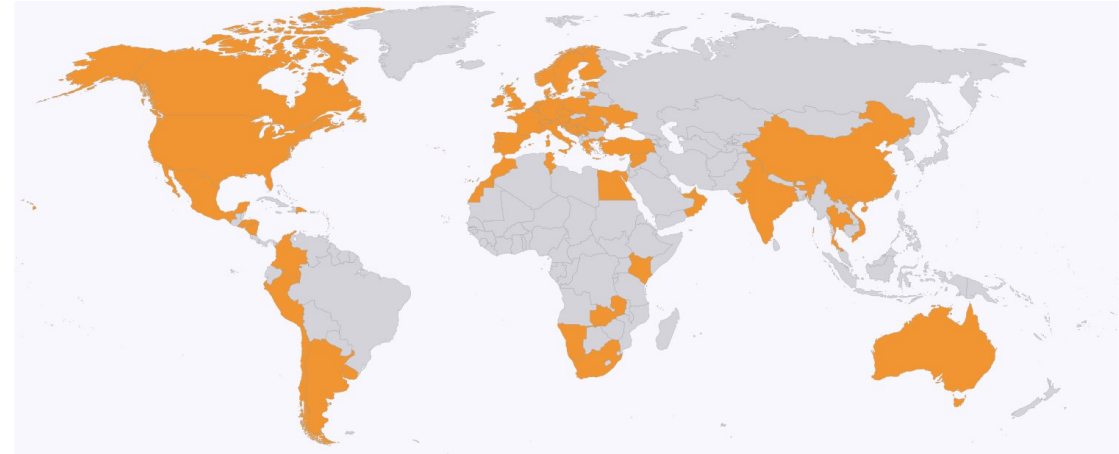


Recent Advancements in Wind, Solar and (Load) Forecasting

Lars Rohwer
06/24/2025

- Headquarters in Oldenburg, Germany
- Approx. 250 employees
- Operations on all continents
- Over 20 years of experience



emsys grid
services

- Grid Operation
- Network Platform

energy & meteo
systems

- Wind & Solar Forecasts
- Consulting

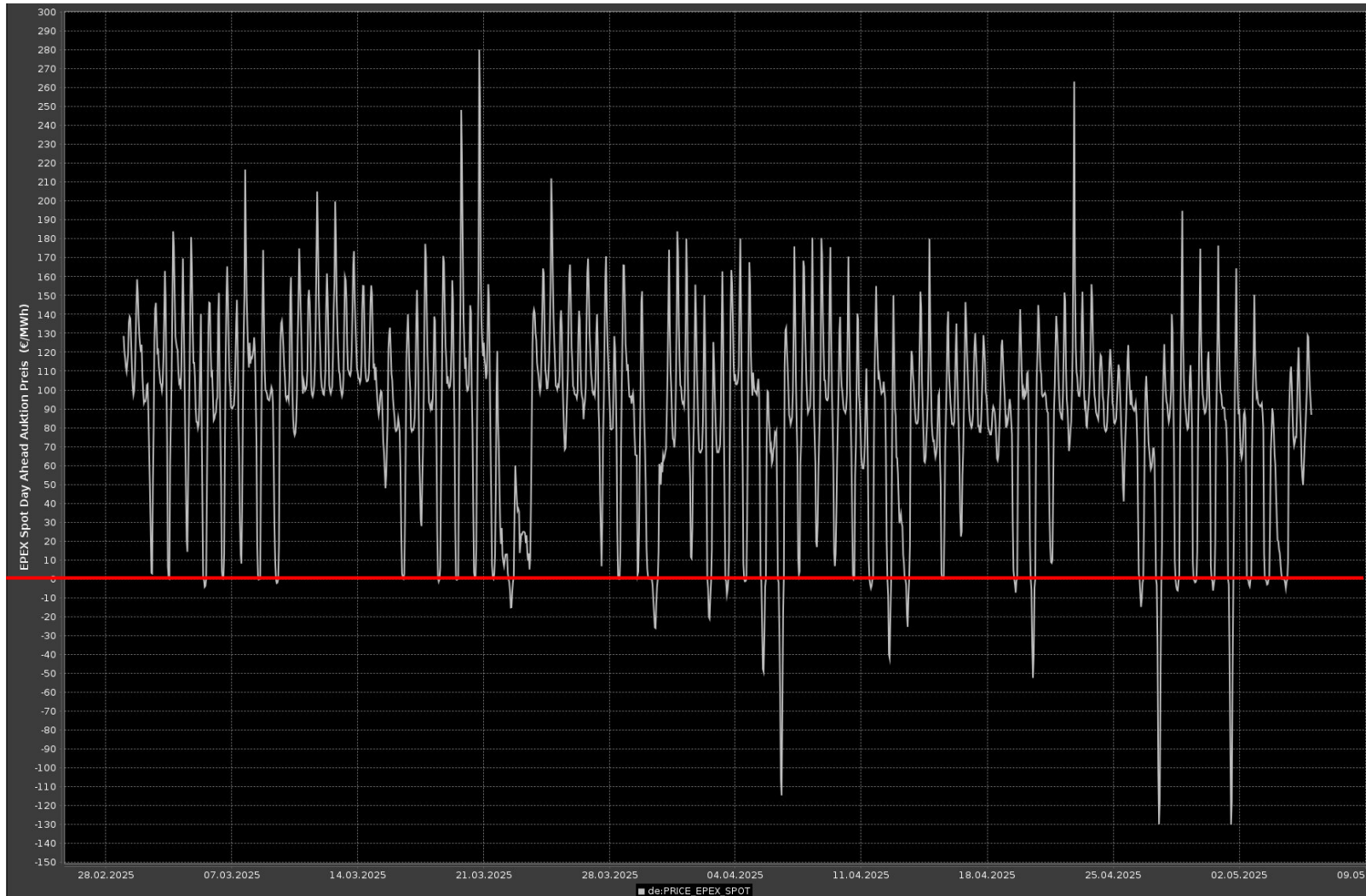
emsys vpp

- Virtual Power Plant
- Balancing Power Services

AI / Machine Learning

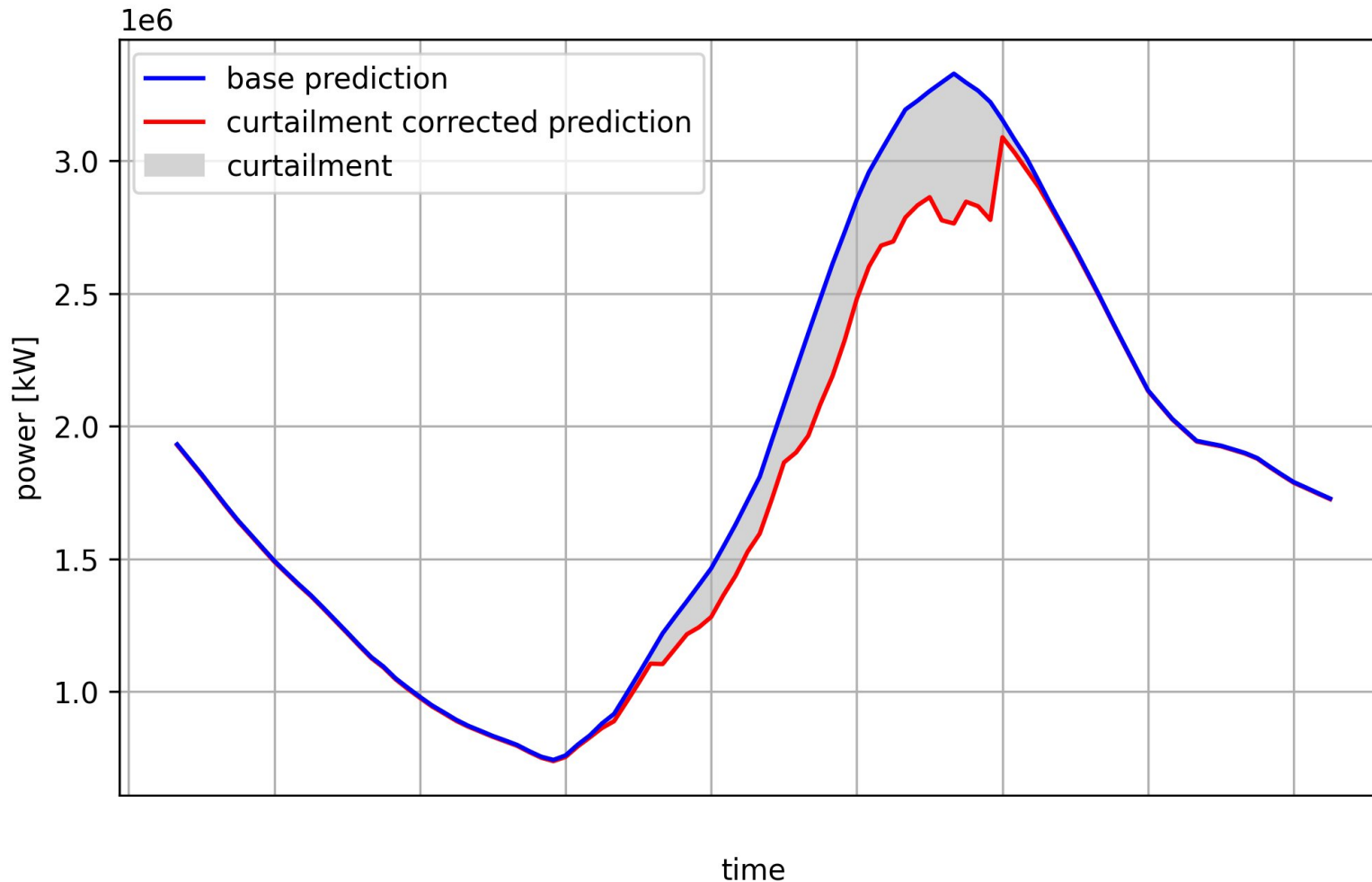
- AI weather models are well on their way, but have disadvantages
 - Parameters for energy forecasts often unavailable
 - Smearing / smoothing effects
- Machine learning can help to improve NWP-based forecasts
 - extensive training opportunities
- A wide range of data and data sources can be used – new forecasting options
 - self-consumption
 - curtailment forecasts

AI / Machine Learning - Example



- DA market prices in Germany have very frequently been in negative territory this spring
- Up to 25 GW curtailments (market-driven)
- -> Grid operators need forecasts for curtailment volumes

AI / Machine Learning - Example



- A wide variety of input data, e.g. on
 - consumption*
 - production*
 - prices*
- enables a more accurate estimation of curtailment quantities

Comparison between Europe and the USA

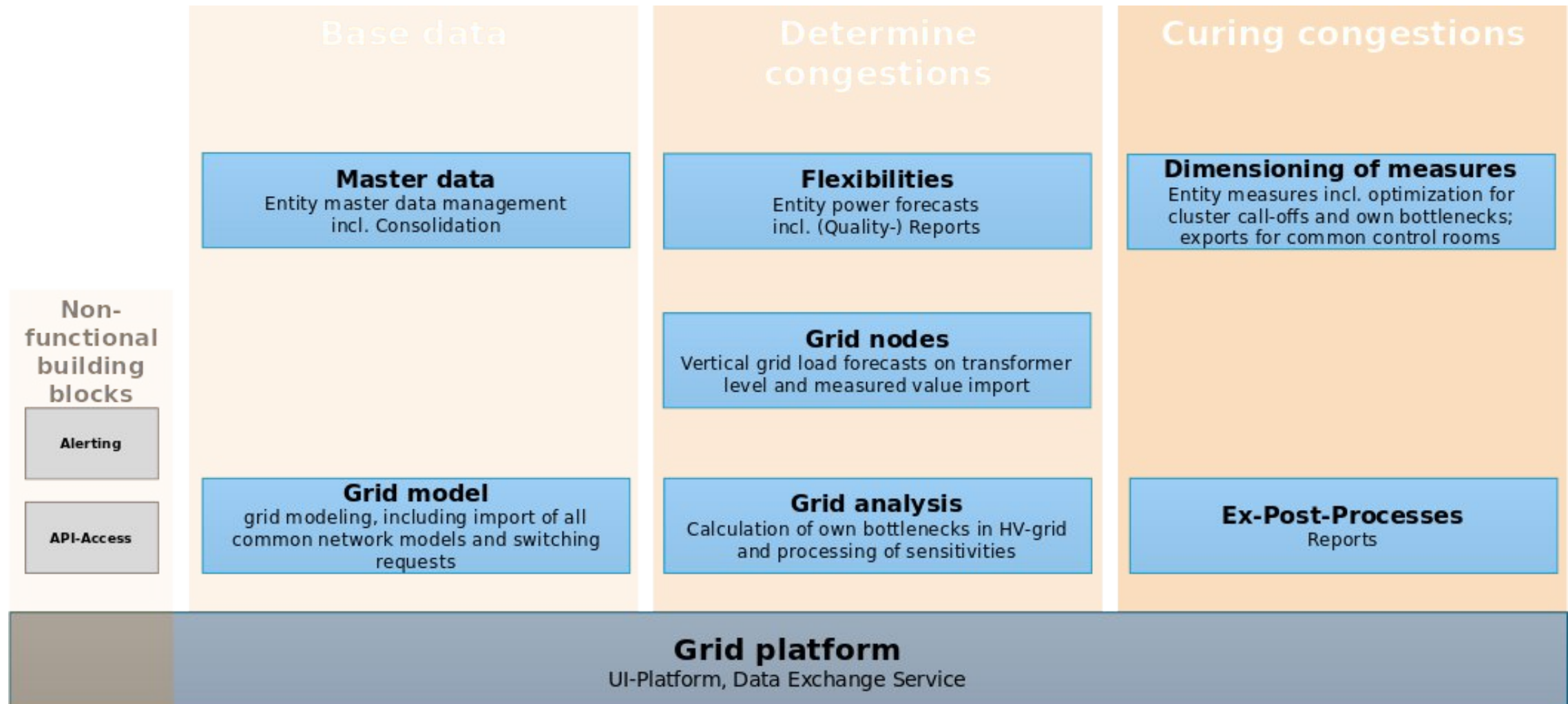
- US-ISOs (grid operators in general) are clearly leading the way in dealing with (extreme) weather and uncertainty forecasts
- European grid operators have promoted smarter use of grids

Dynamic Line Rating
(similar to FERC Order No. 881) is an established process

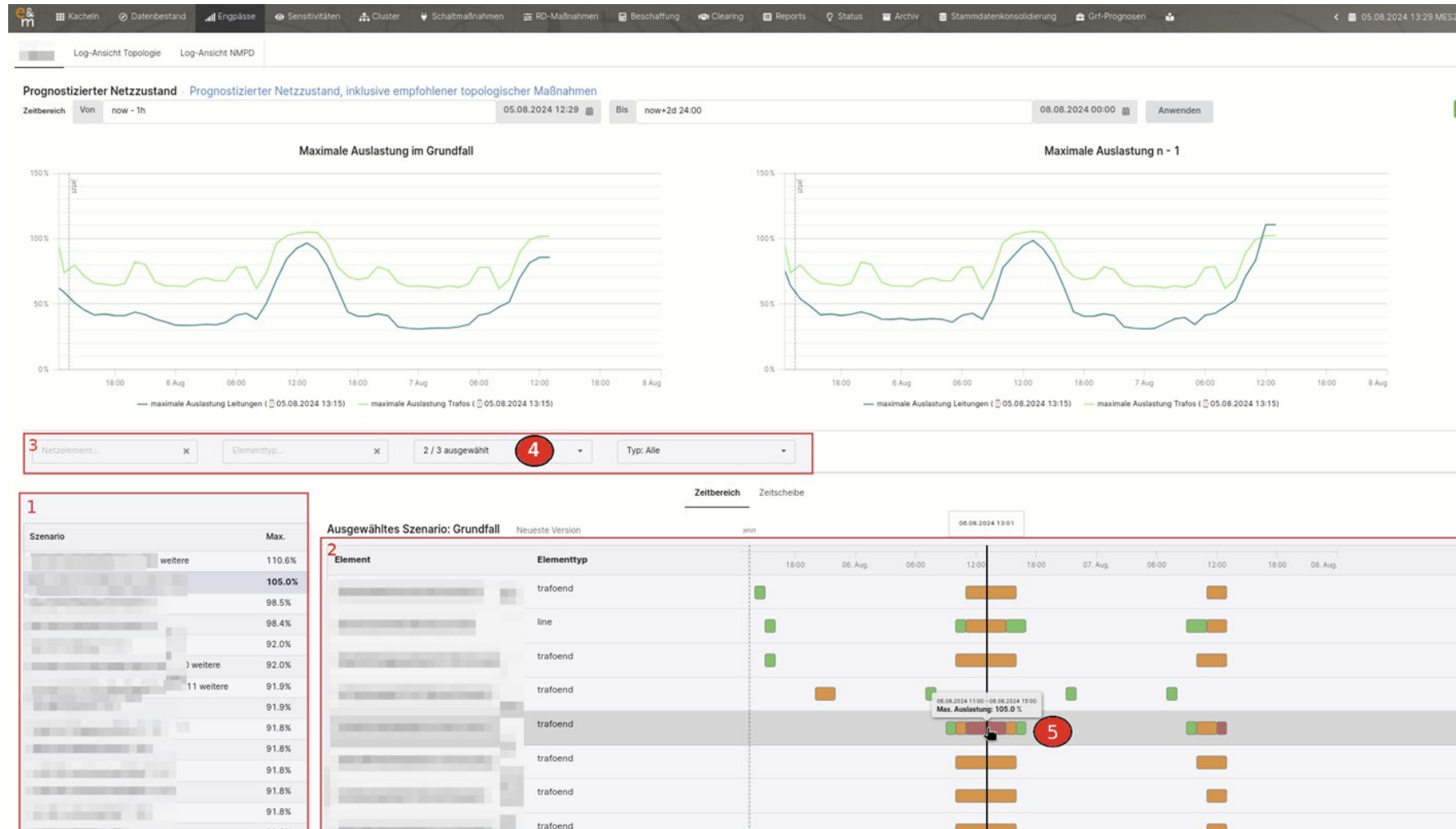
Grid Congestion Management
Including distributed producers from 100 kW into the Redispatch process

Vertical Grid Load
Prediction of the vertical grid load at network nodes of different voltage levels

Grid platform combines all necessary information



Grid platform combines all necessary information



Thanks for your attention!

