The Role of Electric Grid Research in Addressing Climate Change

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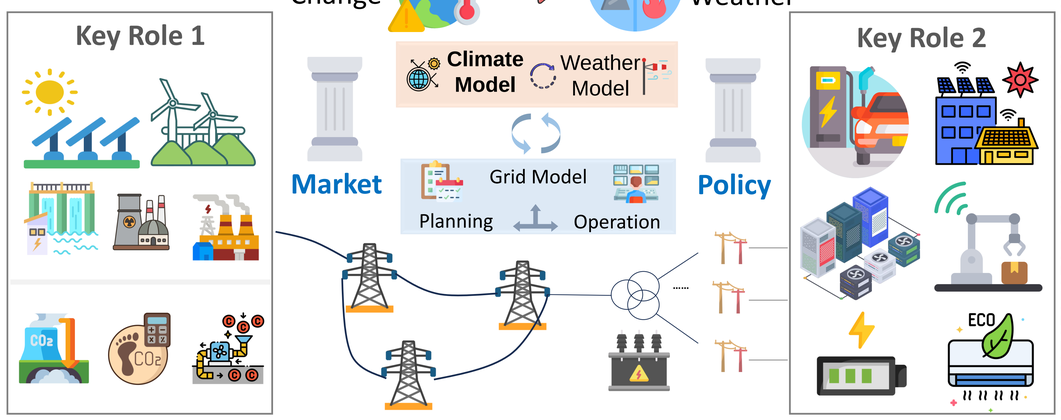
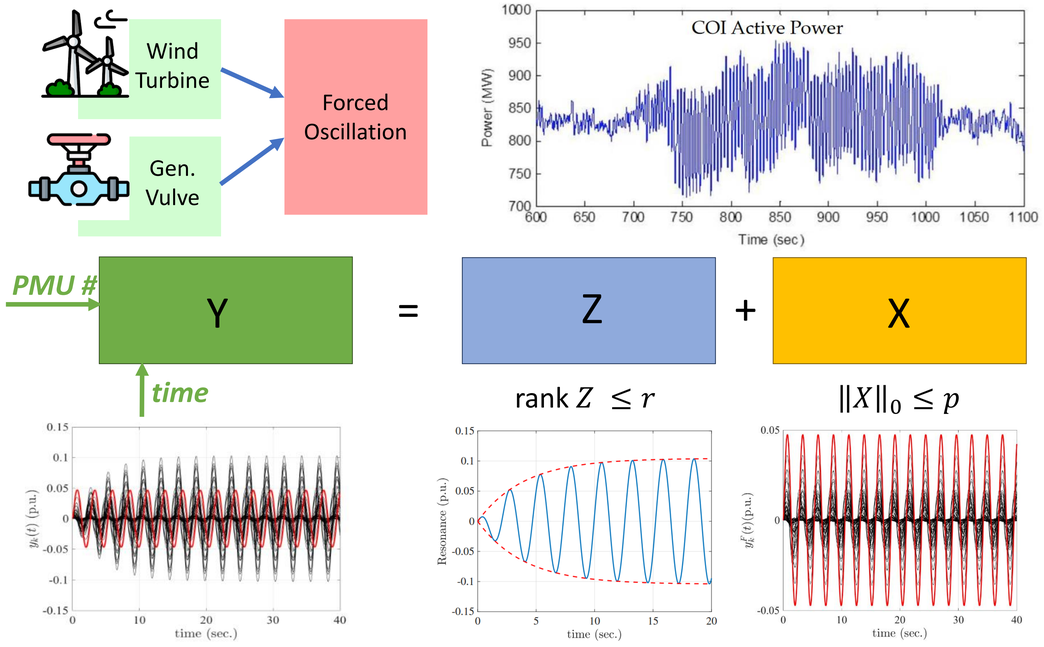
- More renewables
- Carbon capture (and storage)
- Carbon Accounting
- Carbon Transport
- Electrify other sectors
- Growing Existing demands



Key Figure| ***The crucial role of electric grid research in tackling climate change.***

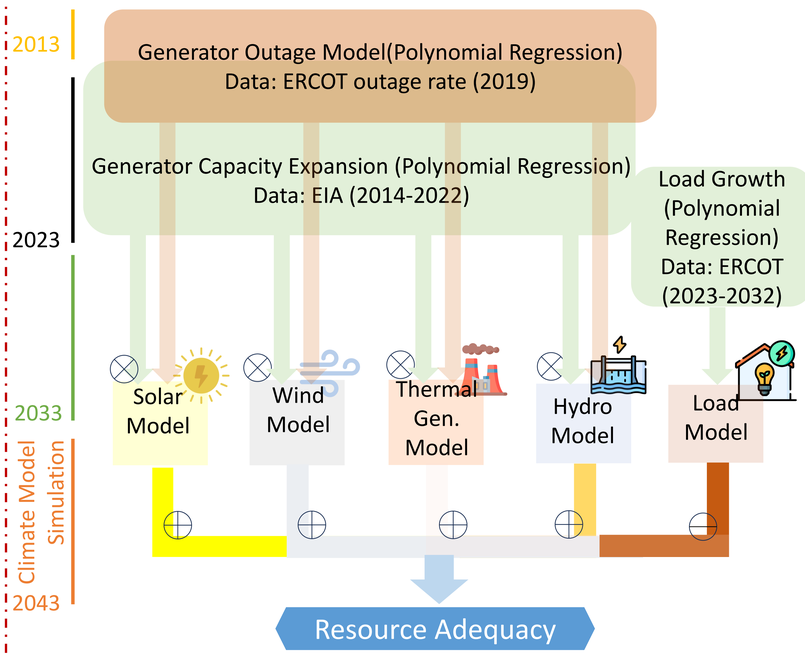
We ask THREE key power grid research challenges in addressing climate change.

Key Challenge 1. How do we have system-aware power grid operations?

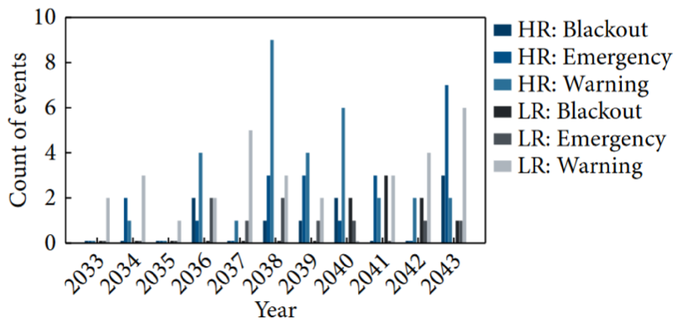


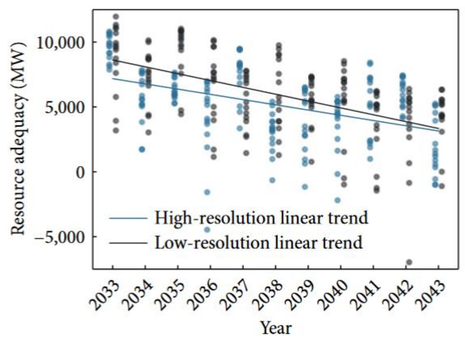
Identifying sources of forced oscillation and developing countermeasures enables maximal utilization of power grid assets.

Key Challenge 2. How do we use tailored climate simulations for long-term planning of power grid?



Results show declining resource adequacy considering simulated low-/high-resolution weather data, and current trend of capacity addition.

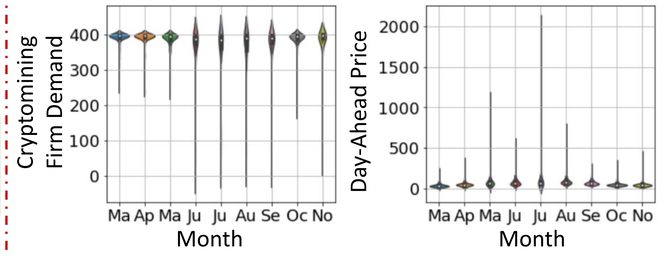




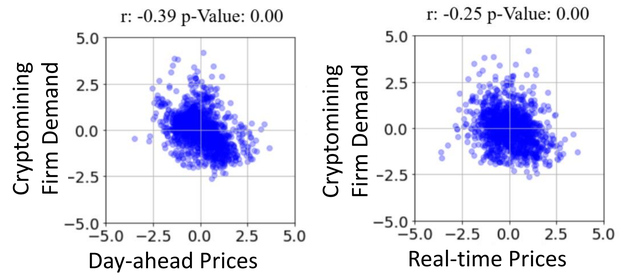
High-resolution climate simulation is more effective in providing informative assessments, especially for emergency events that occur during the night in summer with low wind speeds.

Key Challenge 3. How do we design climate-aware markets and policies for the power grid?

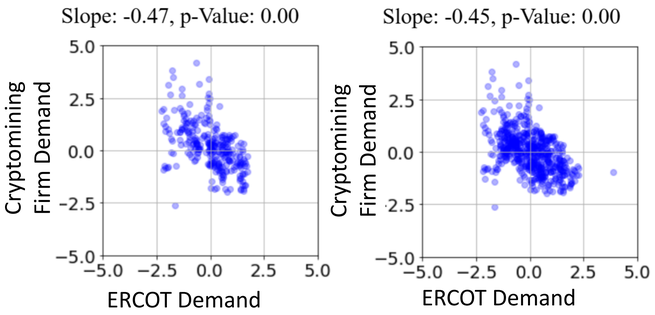
During summer months cryptocurrency miners consistently reduce their energy consumption.



We observe firm demand and prices strongly correlated during summer months.



We also observe firm demand and system-demand correlated – which gets stronger if considered months with low prices.



Can we update 4CP mechanisms to address emerging ERCOT winter peaks?

References:

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