

ESIG

DOWN UNDER



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Impediments and Enablers to Higher Renewable Penetration

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ESIG Down Under

Physics – Markets Interface

Impediments and Enablers to Higher Renewable Penetration

Sept 1st 2020

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Q&A

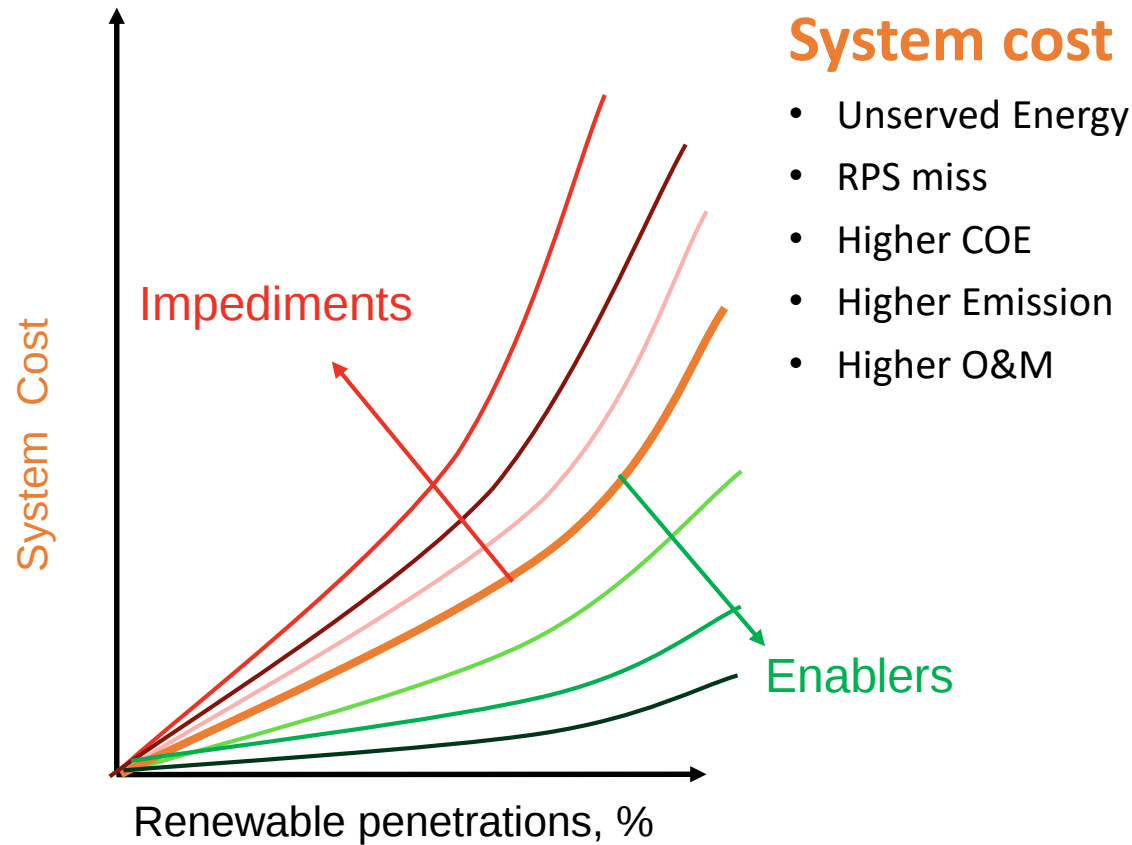
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Physics... Variability, Regulation, Flexibility

We have been talking about these for a while



Impediments

- Lack of transmission
- Lack of control area cooperation
- Inflexibility due to market rules and contracts
- Unobservable DGs
- Inflexible operation strategies during light load & high risk periods

Enablers

- Forecasting
- Thermal fleet
 - Higher quick starts
 - Deeper turn-down
 - Faster ramps
- More spatial diversity
- Renewable + DG + Demand A/S
- Grid-friendly renewables

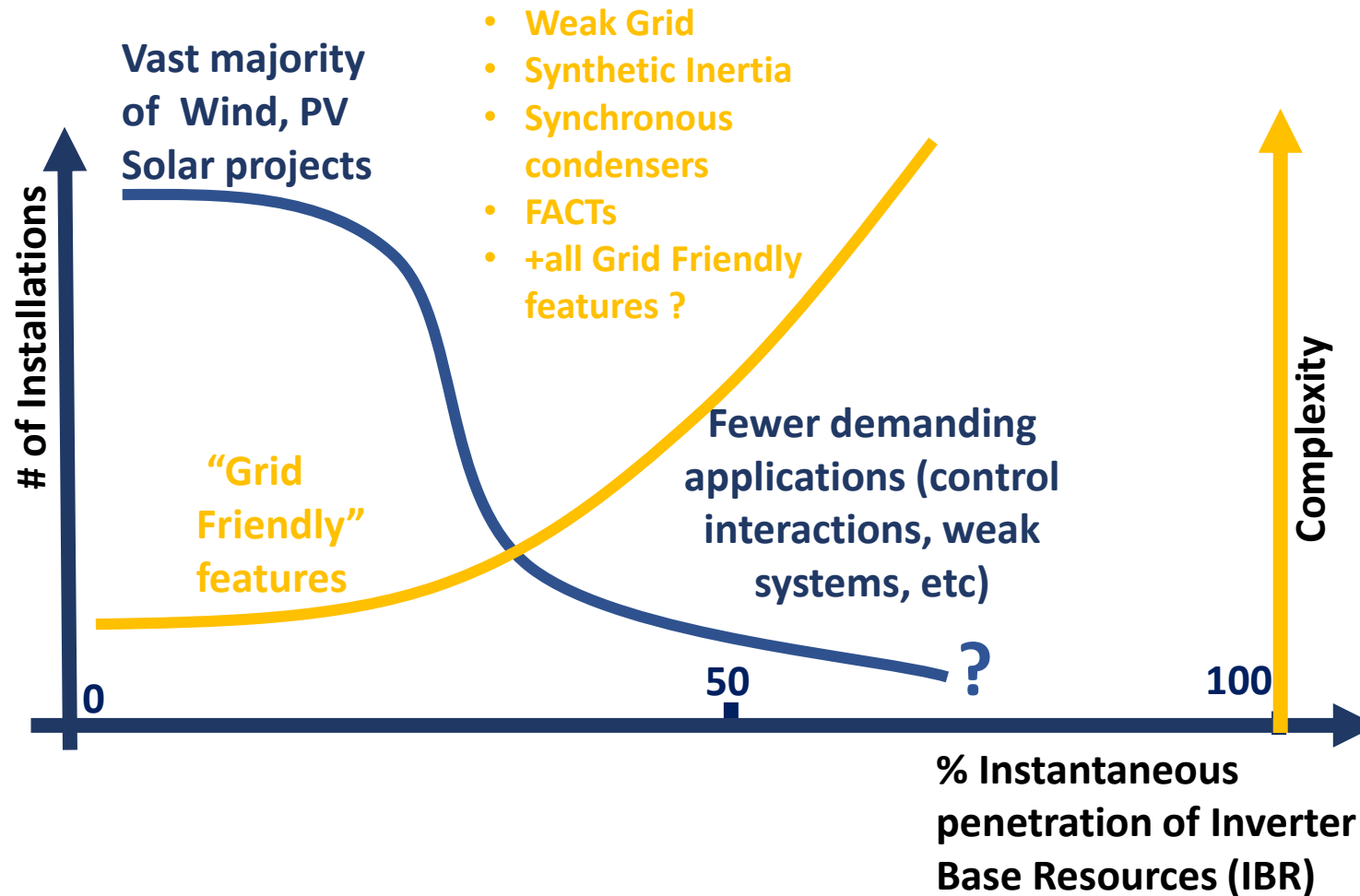
Q&A

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Physics...what else is going on



- What are the manifestations of these challenges:
 - Curtailments based on reliability
 - Delays/cancellation of projects
 - Increased cost of equipment
- Complexity and schedule are correlated
- How can the pace of installations be maintained with same processes and higher penetration
- Owning the risk of increased complexity
- Grid Code:
 - Simpler for low % penetration
 - Practicalities of connection processes
- Is demanding “cumulative” new features to vendors the solution
- Old projects operation limitations with higher % penetration than planned could prevent new installations

September 1, 2020

Q&A
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