

Science and Pretzels

Integration of Renewable Electricity Generation



**Australian-German
College of
Climate and Energy
Transitions**



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Melbourne, February 25th 2014

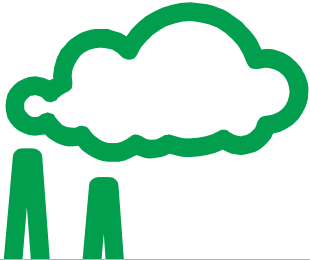


Climate Change Negotiations

Climate Modeling



T  $f(GHG)$



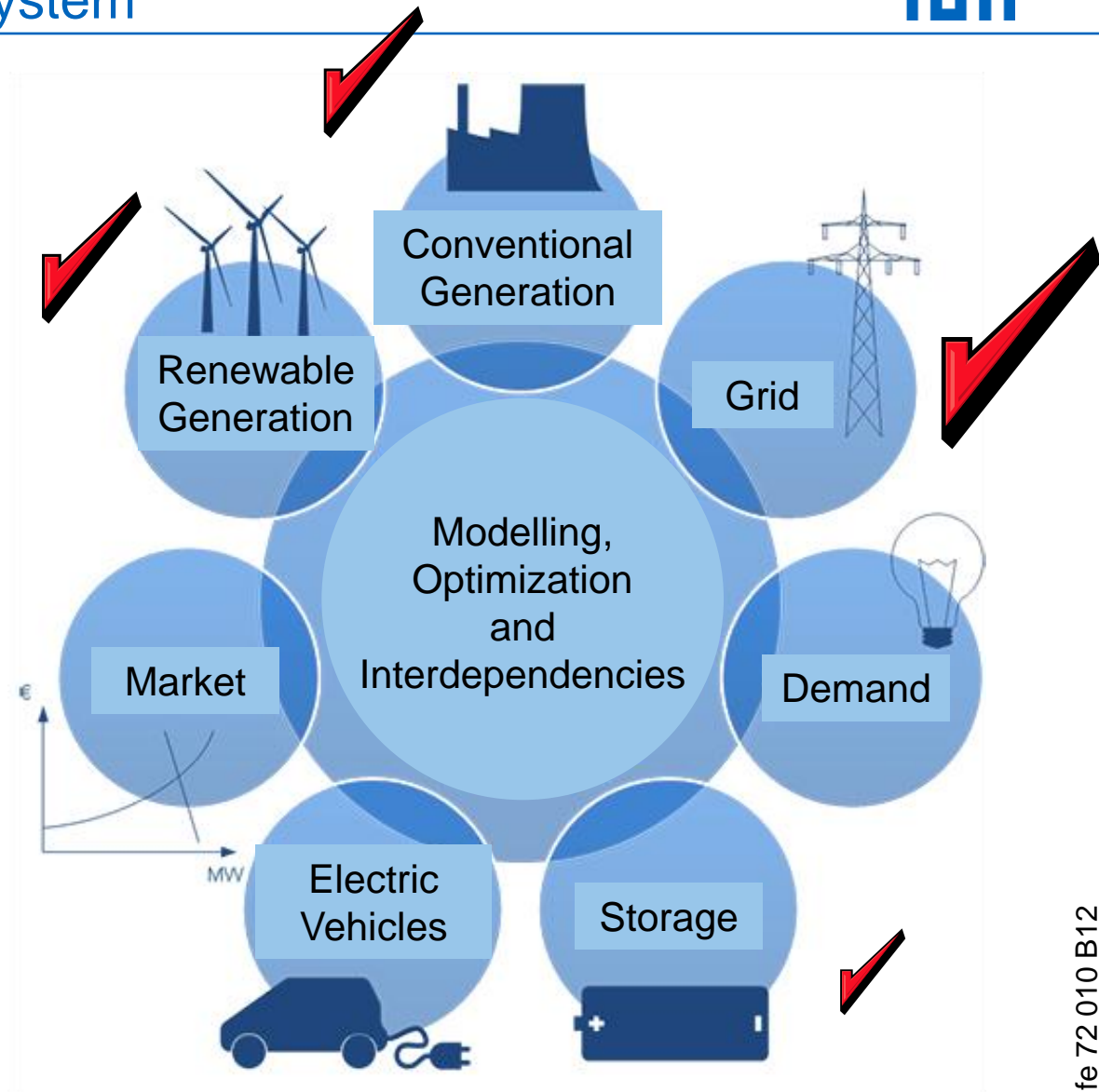
LIMIT CO₂ ELECTRICITY GENERATION LIMIT COST

What's the most efficient way to reach emission targets?

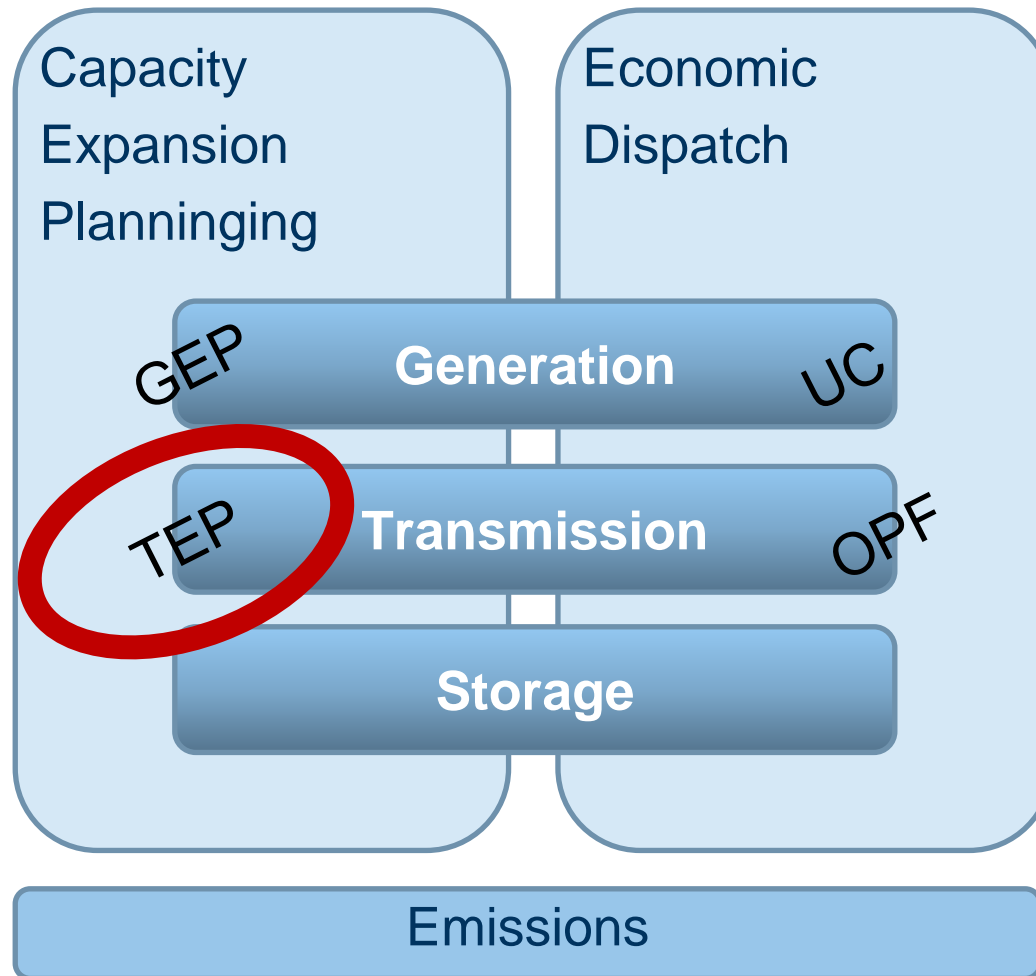
How much does it cost?

Requirements

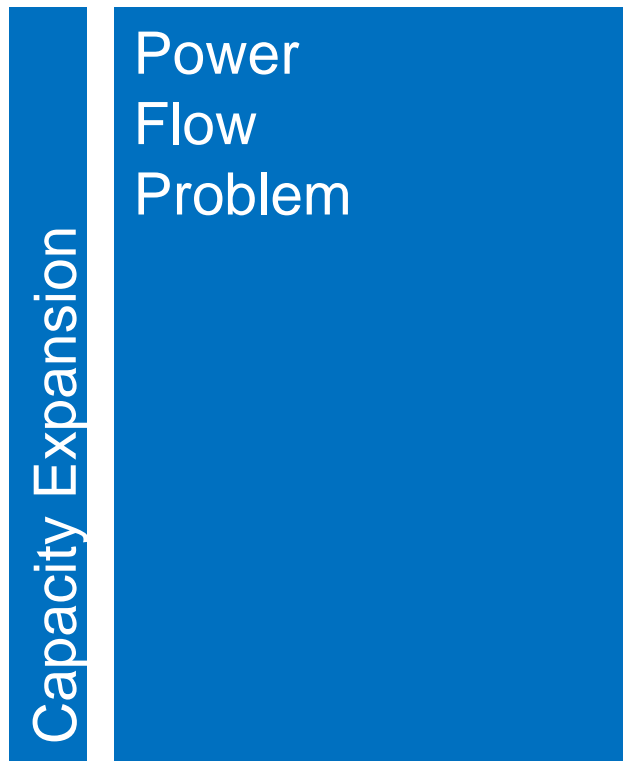
- Energy Security
- Emission Limit
- Cost Efficient



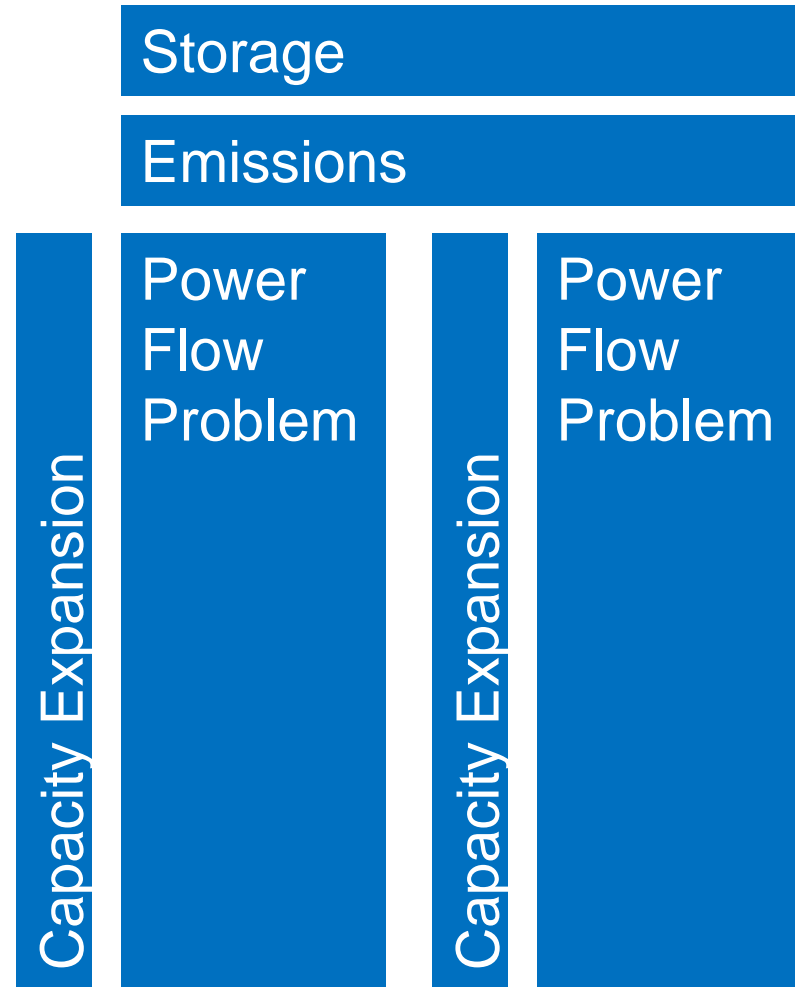
Interdependency of Capacity Expansion and Dispatch Infrastructure



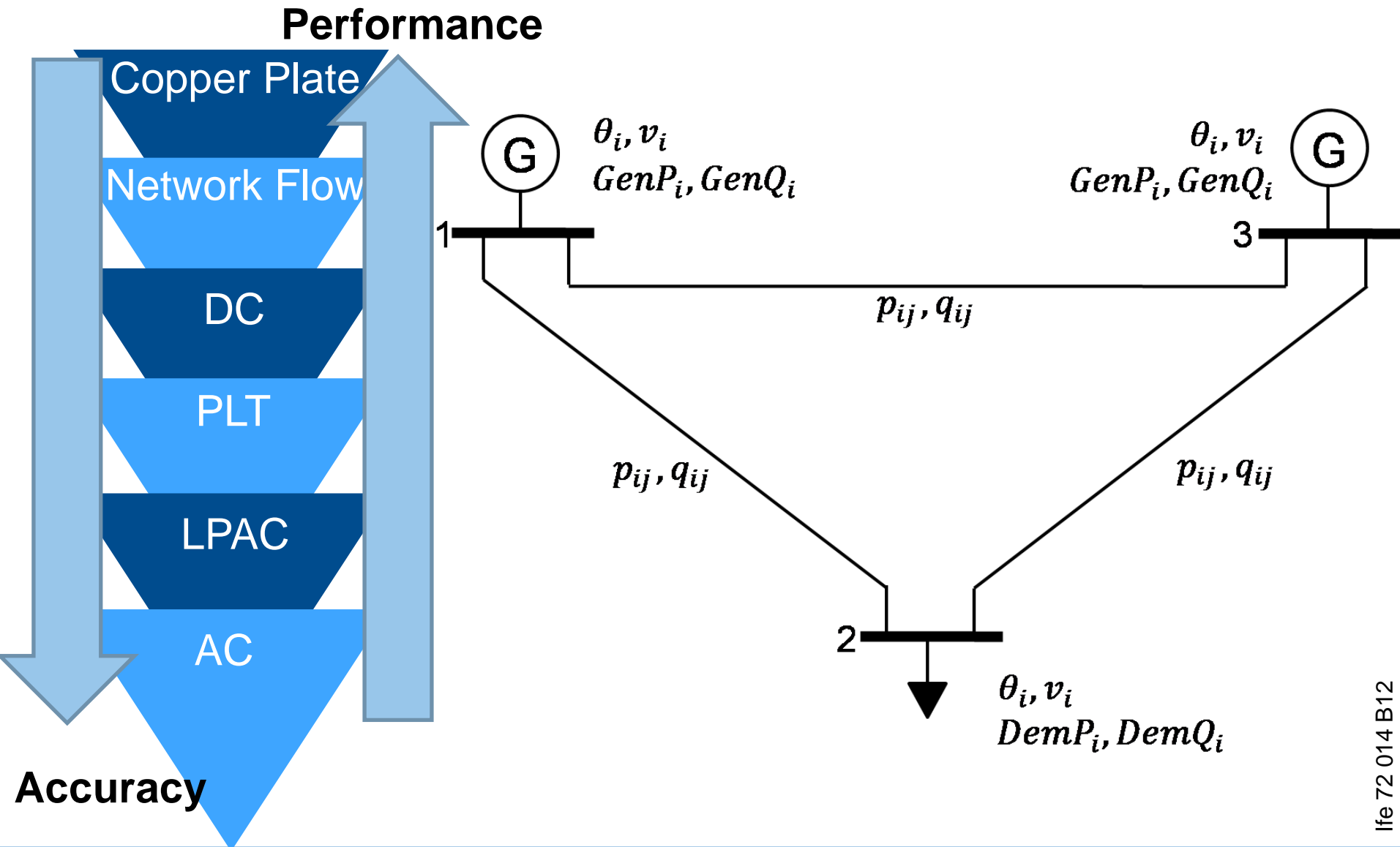
- very large scale MI(N)LP
- complicating constraints
- complicating variables

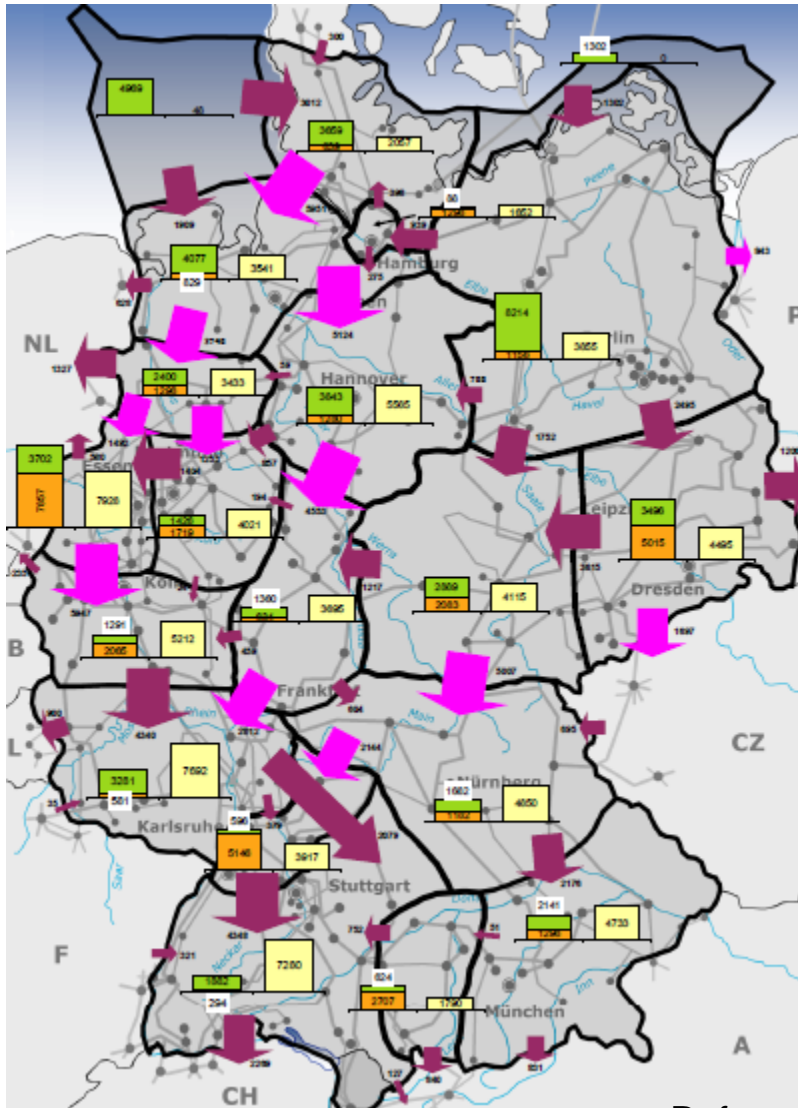


One year optimization



intertemporal Problem





Technical Constraints

- Thermal Capacity
- Phase Angle
- Voltage Bounds
- N-1 Security

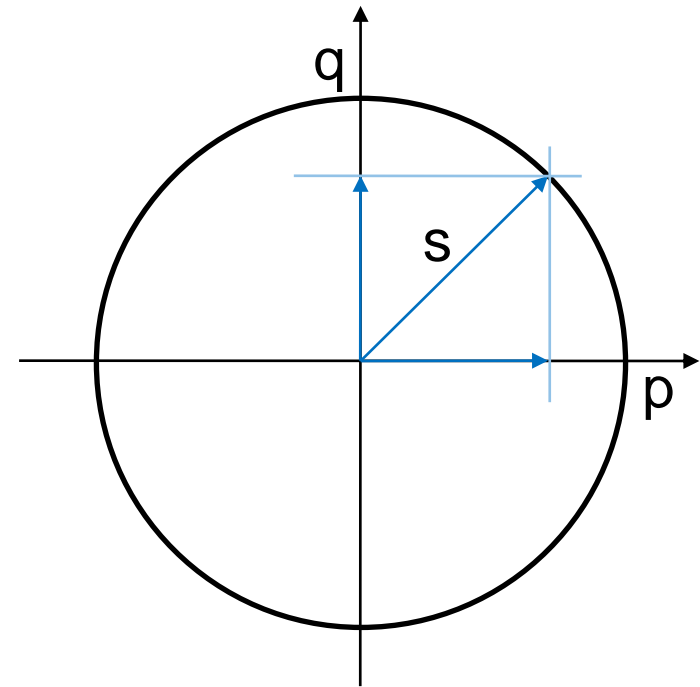
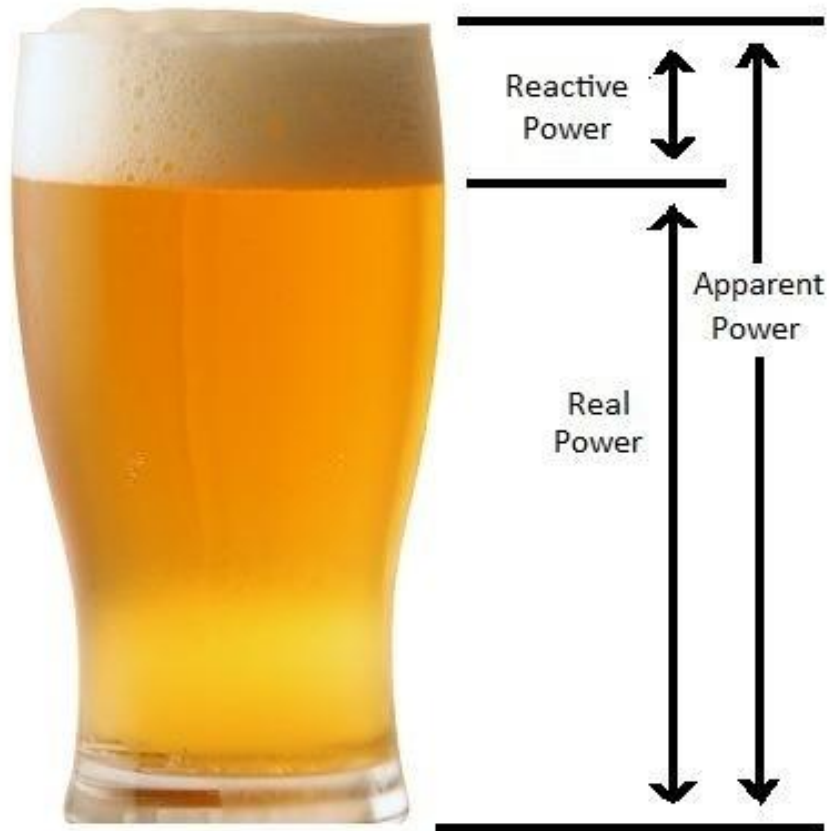
Economic Feasibility

- Cost(Offshore Wind+Grid) < PV ?
- Reduce Curtailment

Legal Issues

- Obligation to supply connection for Transmission System Operators

Reference: Amprion et al 2009 Regionenmodell Stromtransport 2013



Reference: <http://www.google.com.au/ur...www.quora.com%2FElectrical-Engineering%2FWhat-is-the-use-of-the-reactive-power...>

Let's stay in touch!

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