Investigating the potential of technically optimising the interregional spatial allocation of wind and solar PV capacity in EU

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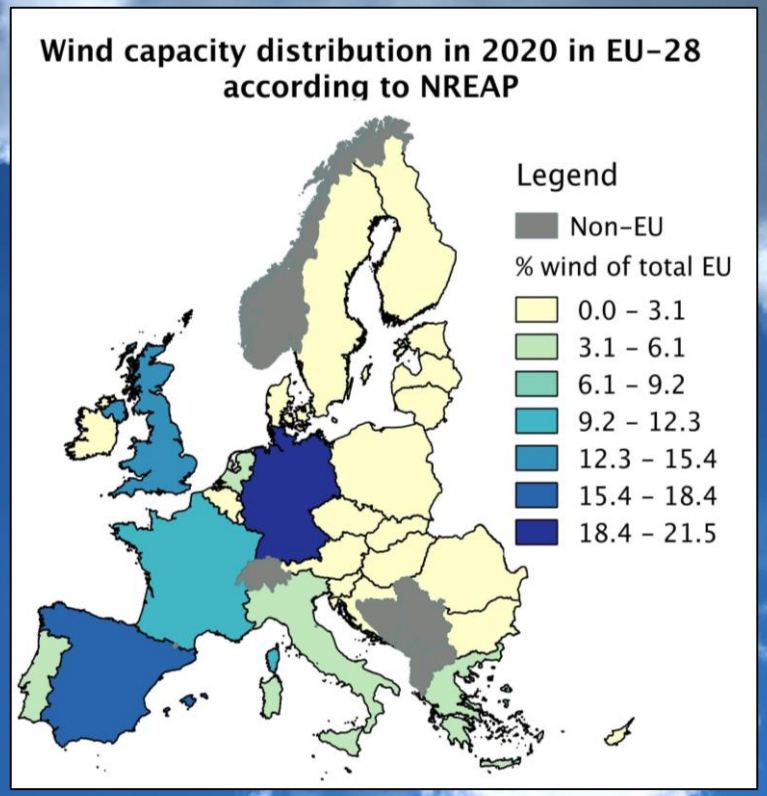
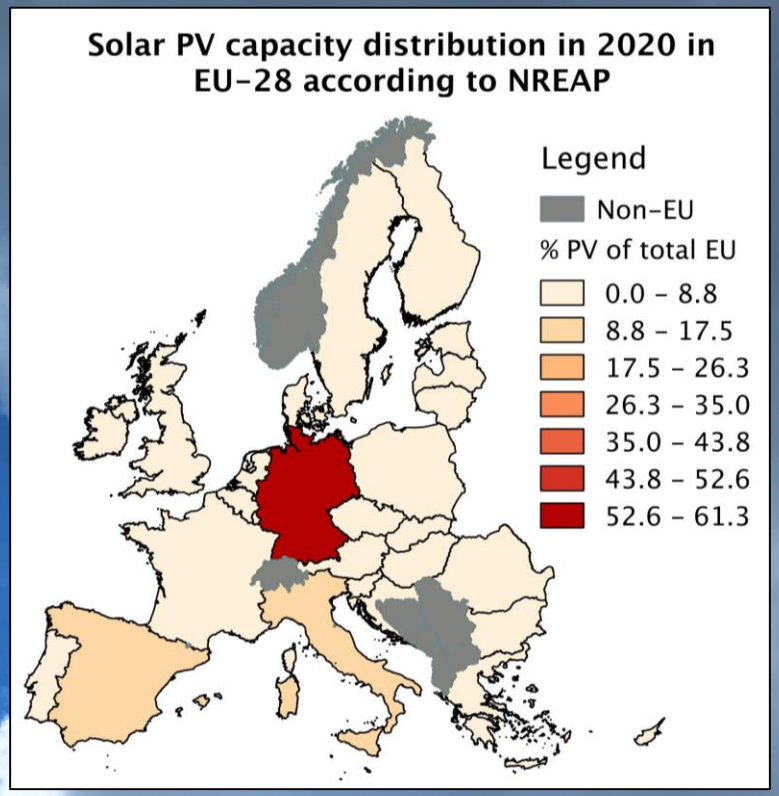
Expected wind and solar PV capacity distributions in EU in 2020

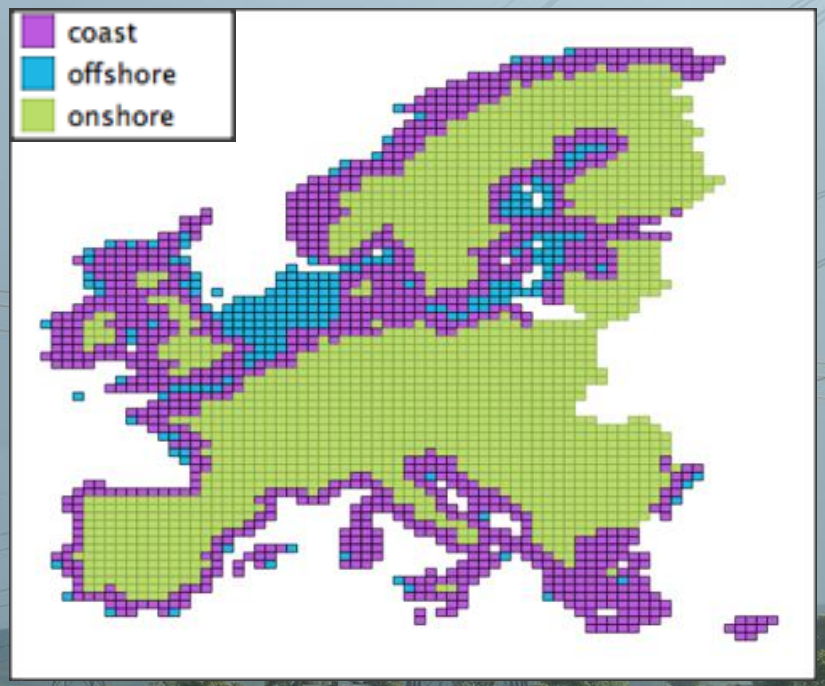




Data: EC (2014)

Method

1. Create time series of wind and solar power output in each grid cell using reanalysis data
2. Aggregate to regional power output
3. Create different spatial capacity layouts:
   - Optimizations based on different time scales
   - Reference scenarios
4. Compare values of variability indicators for different spatial layouts and time scales



	Variability indicators		
Power system impact / Time series	Flexibility requirement	Needed back-up capacity	Energy spilling/curtailment
Negative residual load	Spread	Lower percentiles	Balancing energy
Power output	Spread	Lower percentiles	
Time-step change in residual load	Upper/lower percentiles Spread		
Time-step change in power output	Upper/lower percentiles Spread		