WHAT IS THE OPTIMAL ELECTRICITY SHARE FOR VERY INEXPENSIVE SOLAR PV?

Adam Dvorak[1], Marta Victoria[1,2]

1, 2. Department of Mechanical and Production Engineering, Aarhus University, Aarhus, Denmark; iCLIMATE Interdisciplinary Centre for Climate Change, Aarhus, Denmark

Research Question

- What factors affect the amount of Solar PV in highly renewable Energy Systems?

Hypotheses:

- Average Solar availability (capacity factor)
- Cost of Solar
- Cost of related resources (battery, wind)
- Latitude of region
- Including sectors besides electricity (ex: transport, industry, agriculture)
- Heating or cooling demand
- Correlation between electricity, heating, or cooling time series
- Transmission between nodes

ethods

nvestigate simple factors with single node odal for four different regions

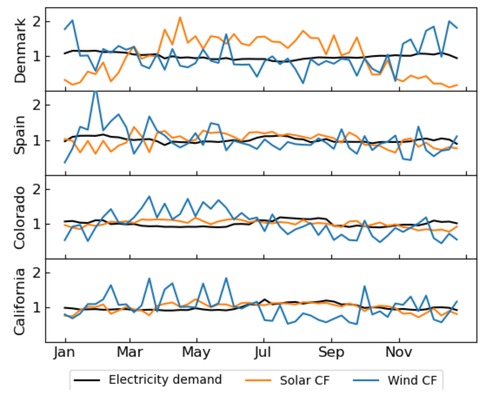
Then, use PyPSA-Eur-Sec, an open, networked, ector-coupled energy system model for uropean countries

Conclusions

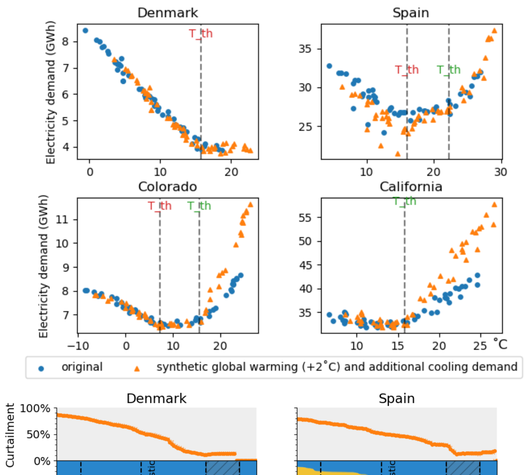
- Transmission negatively affects solar share
- The

Optimal solar penetration depends on the system's global **connectivity** and **complexity**

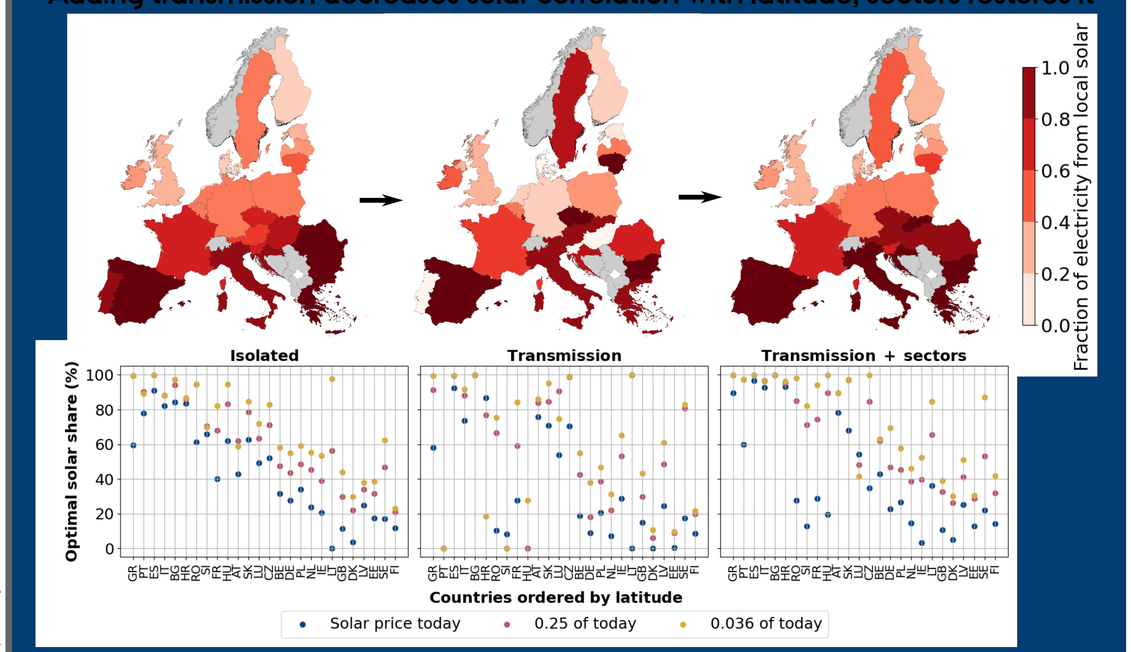
Seasonal Variation of Wind, Solar, and Electricity Demand



Electicity Demand Sensitivity to Temperature



Adding transmission decreases solar correlation with latitude; sectors restores it



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