NVE

HOW WEATHER AND CLIMATE AFFECT RENEWABLE ELECTRICITY SOURCES IN NORWAY

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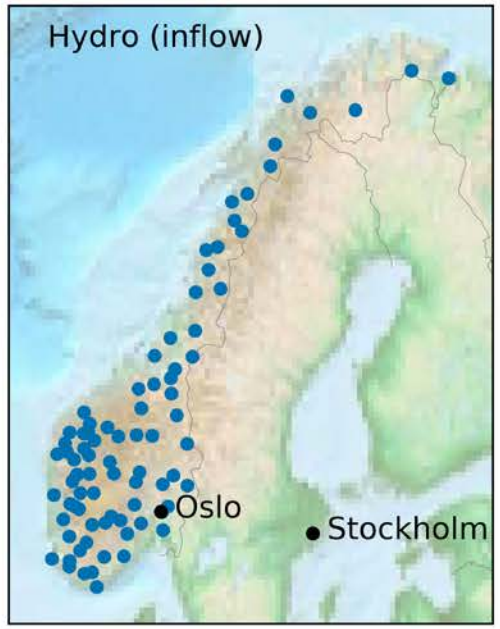
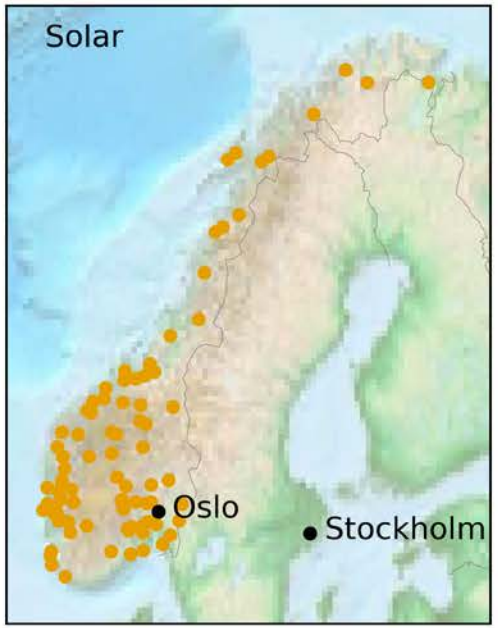
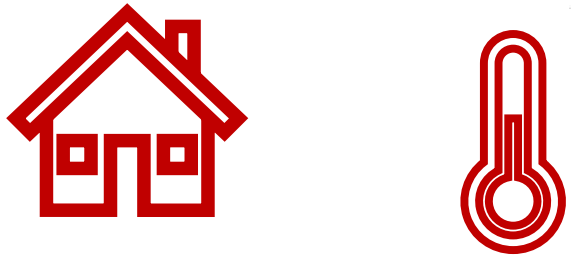
Photo: Ingjerd Haddeland

Why and how

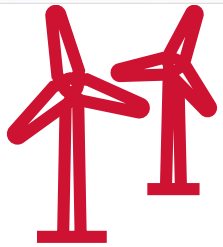




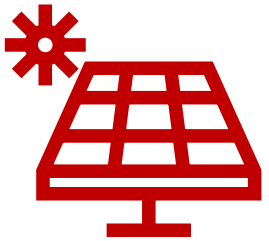


Consumption (hourly)

Inflow energy (daily)



Wind power (hourly)

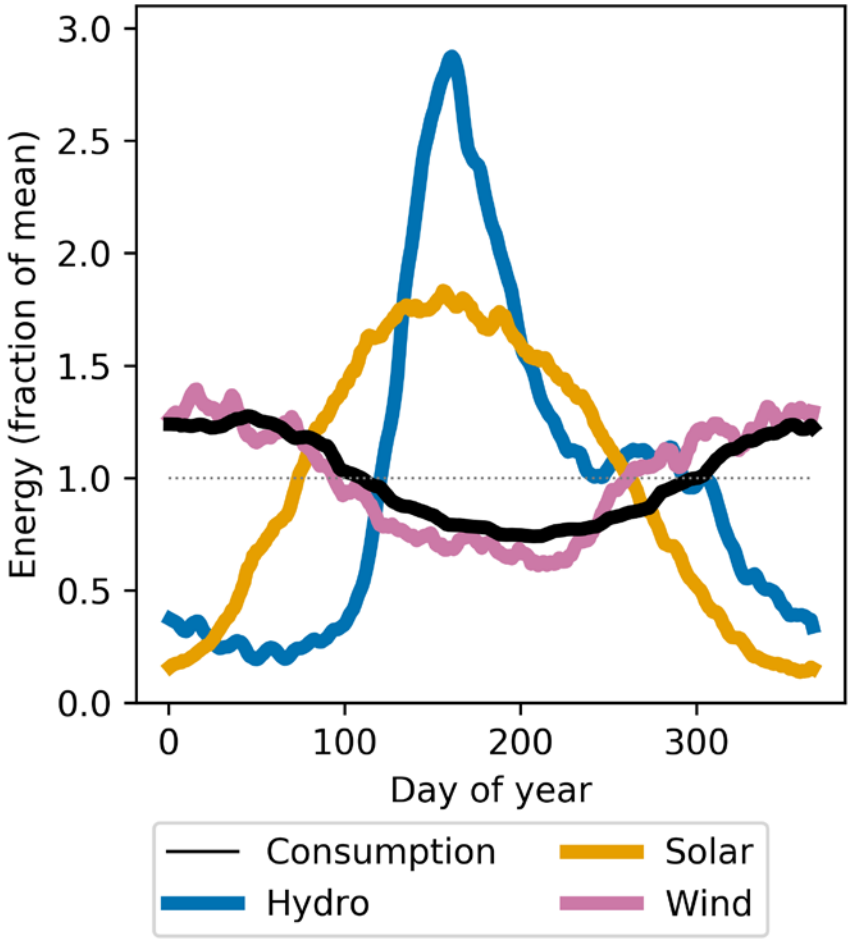


Solar power (hourly)

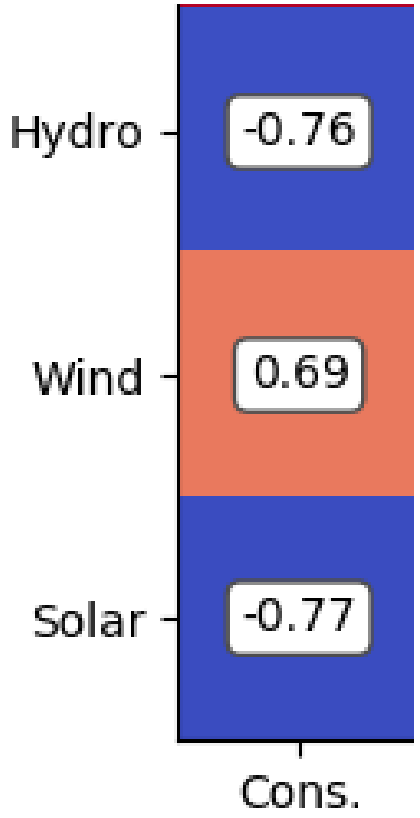
- Meteorological data:1961-2020 (ERA5 and local), infrastructure = 2020
- Complementarity
- Security of supply

Subannual profiles and correlations

7-day rolling means (1961-2020)



Monthly correlations



Windy days are wet and cloudy

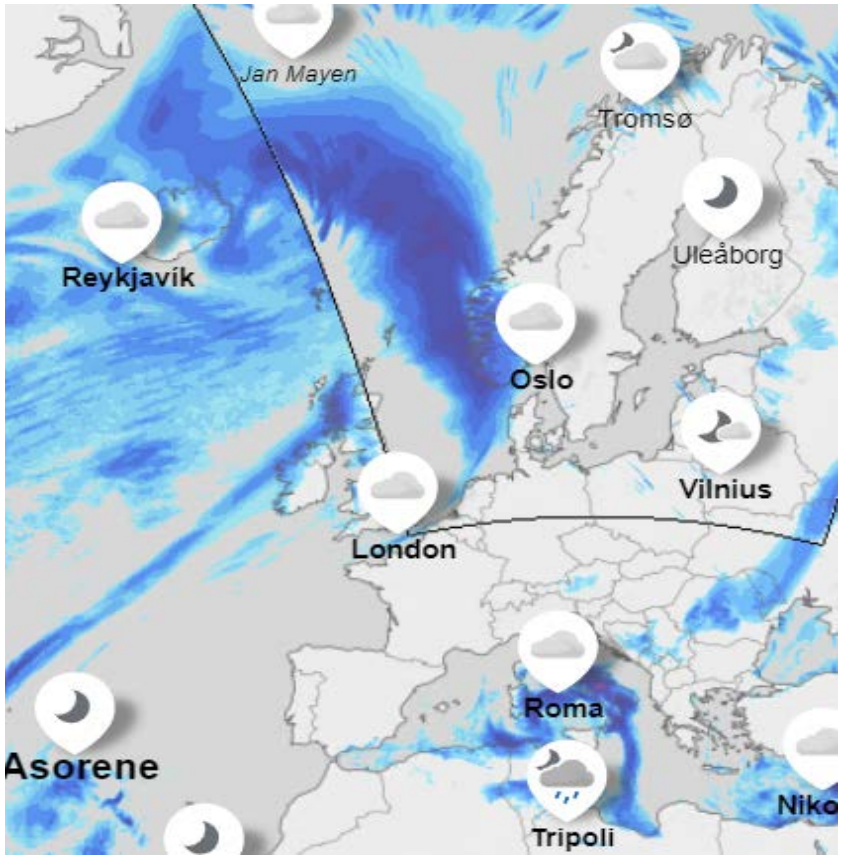
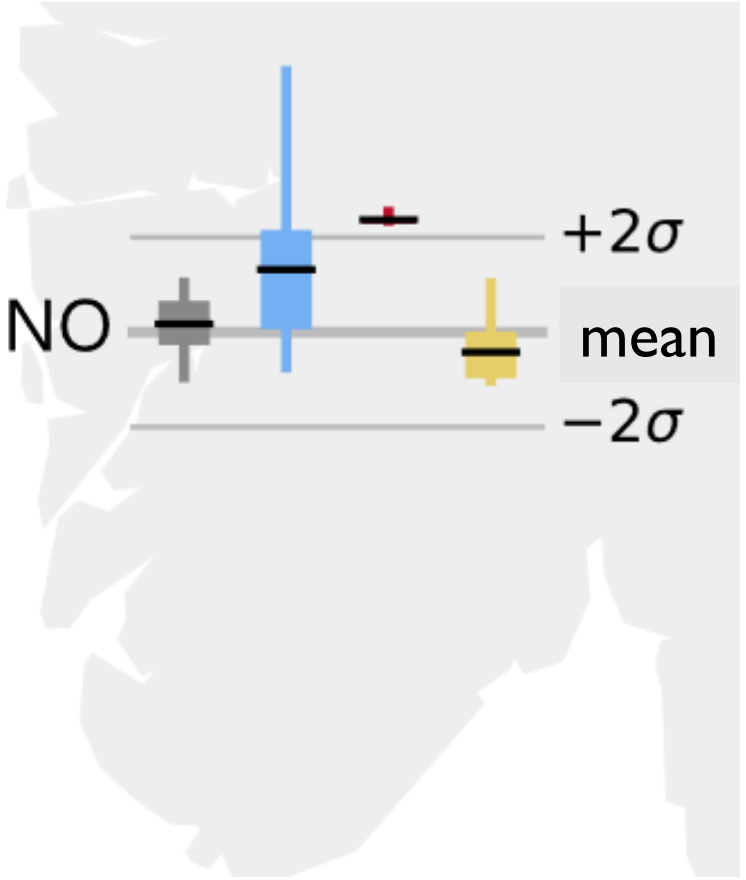


Illustration: ECWMF



Temperature

Hydro inflow

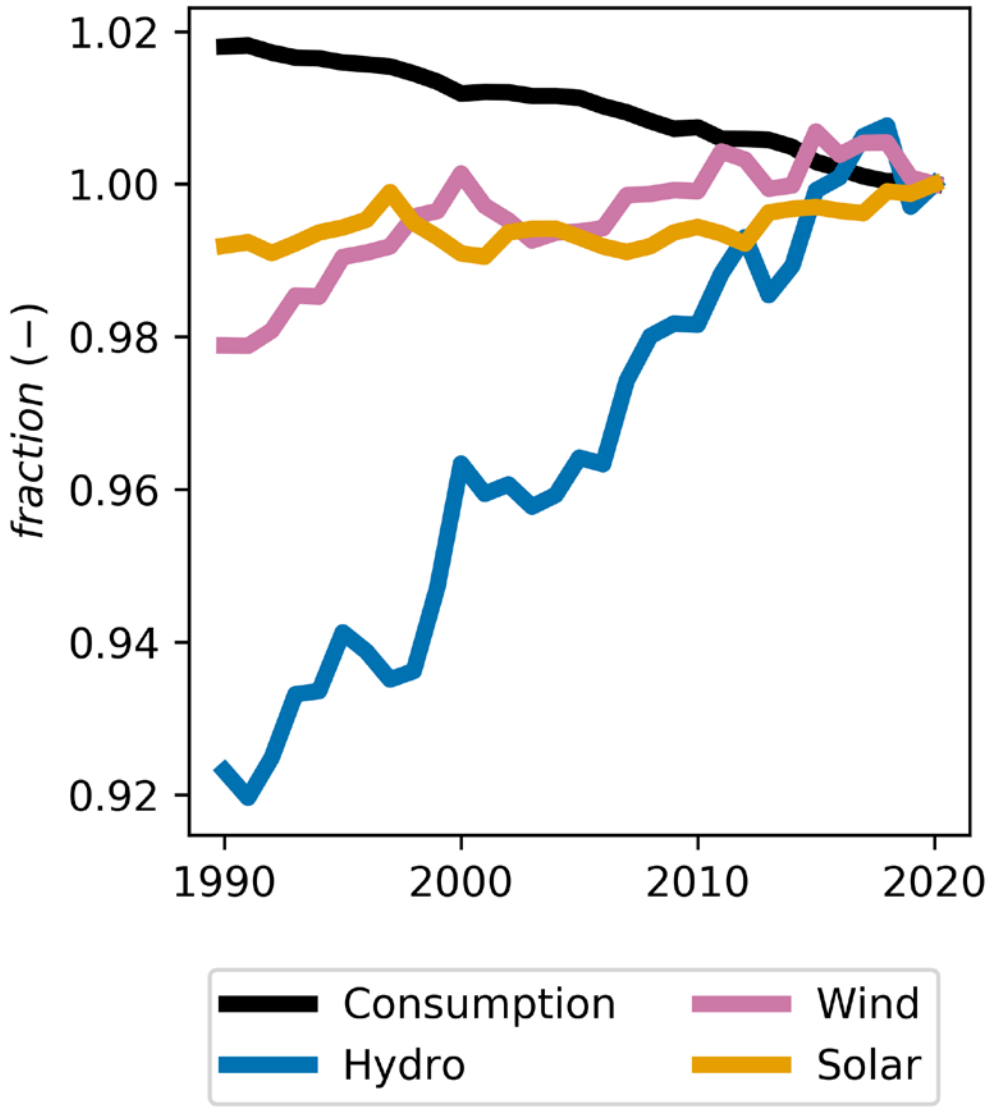
Wind power

Solar power

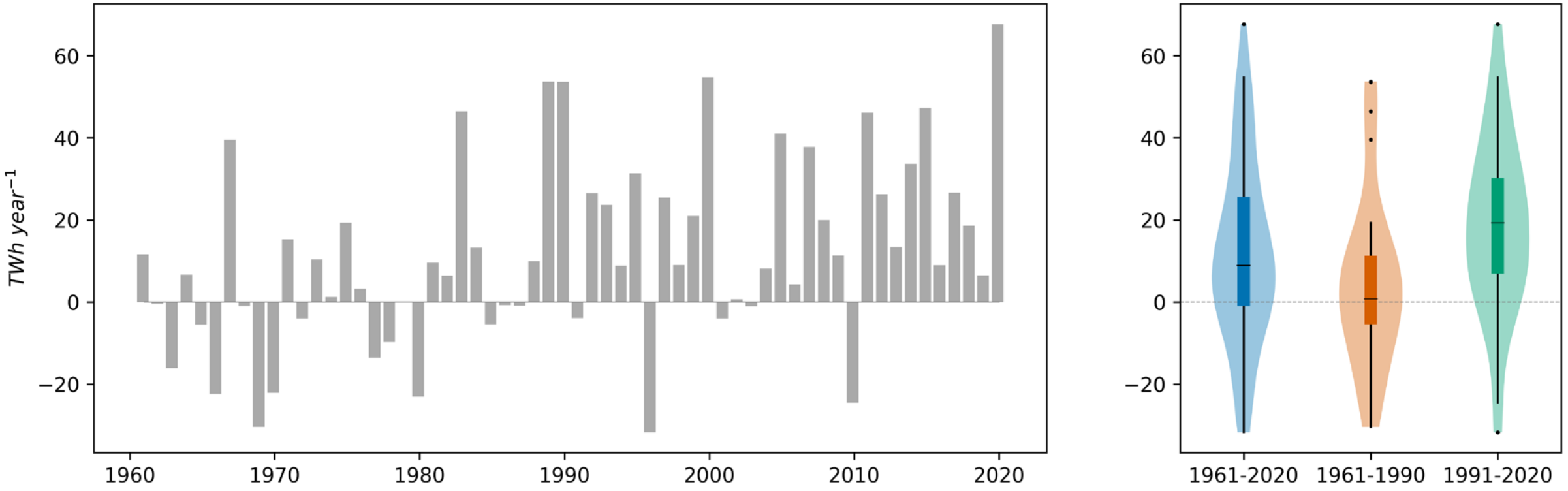
Inflow increases, temperatures decreases

- 30-year running mean power production and consumption, relative to 1991-2020

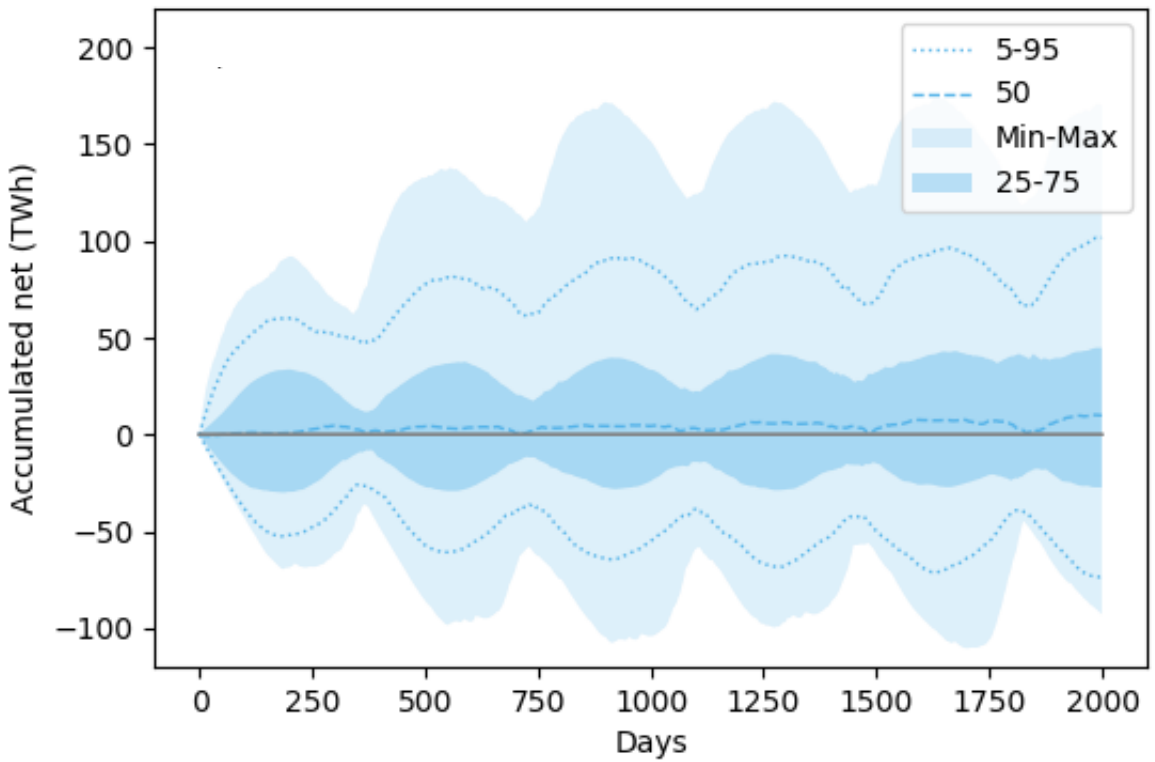
- Statistically significant trend: Inflow and consumption



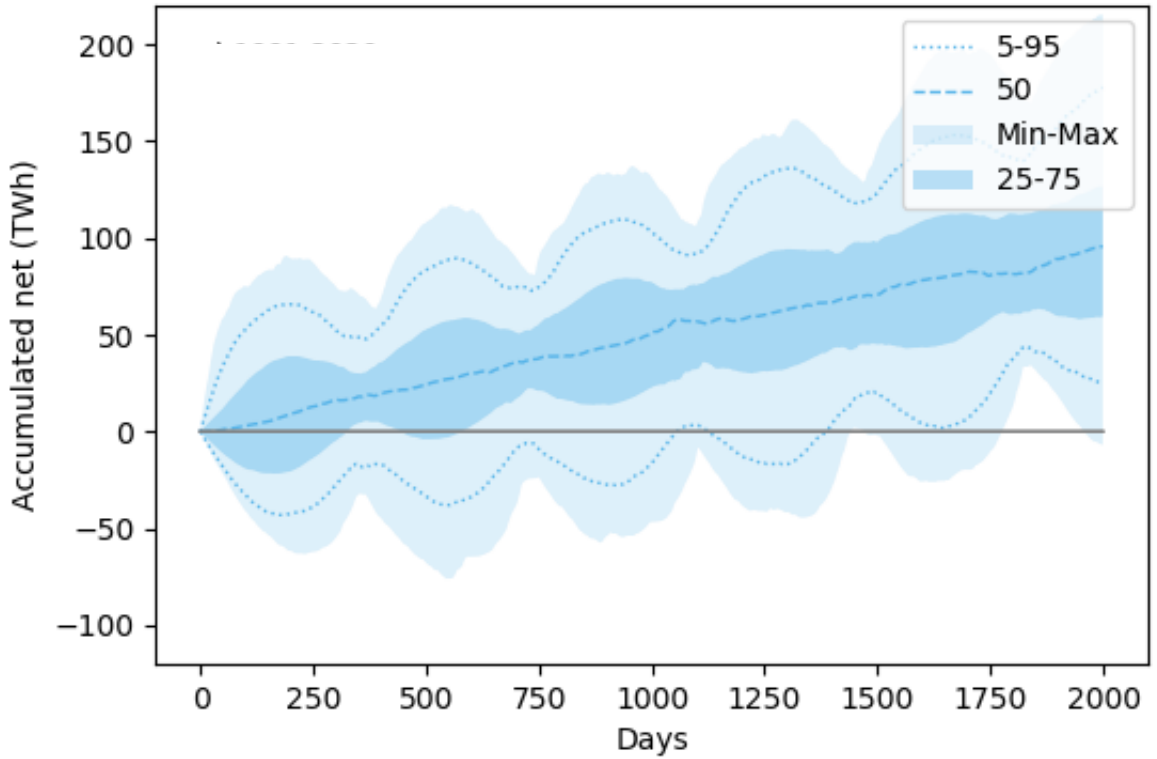
Annual net numbers (production – consumption)



Accumulated n-day results



1961-1990



1991-2020

Thank you!

Sources and more results:

Sidelnikova et al., 2020,
NVE report 44-2020

Haddeland et al., 2022,
paper in revision,
http://dx.doi.org/10.2139/ssrn.3940150