

# Renewable energy priority zones in Germany

Sander L, Jung C, Schindler D

## Introduction

- Competing interests during variable renewable energy (VRE) expansion:
  - Efficient resource exploitation
  - Infrastructure connectivity to reduce costs
  - Protection of environmental and social goods and resources
- Importance of prioritizing VRE expansion for climate protection

## Methods

Multi-criteria decision-making:

1. Meteorological-technical priority score
2. Economic priority score
3. Environmental priority score
4. Geographical restriction scenarios
5. Total priority index (TPI)

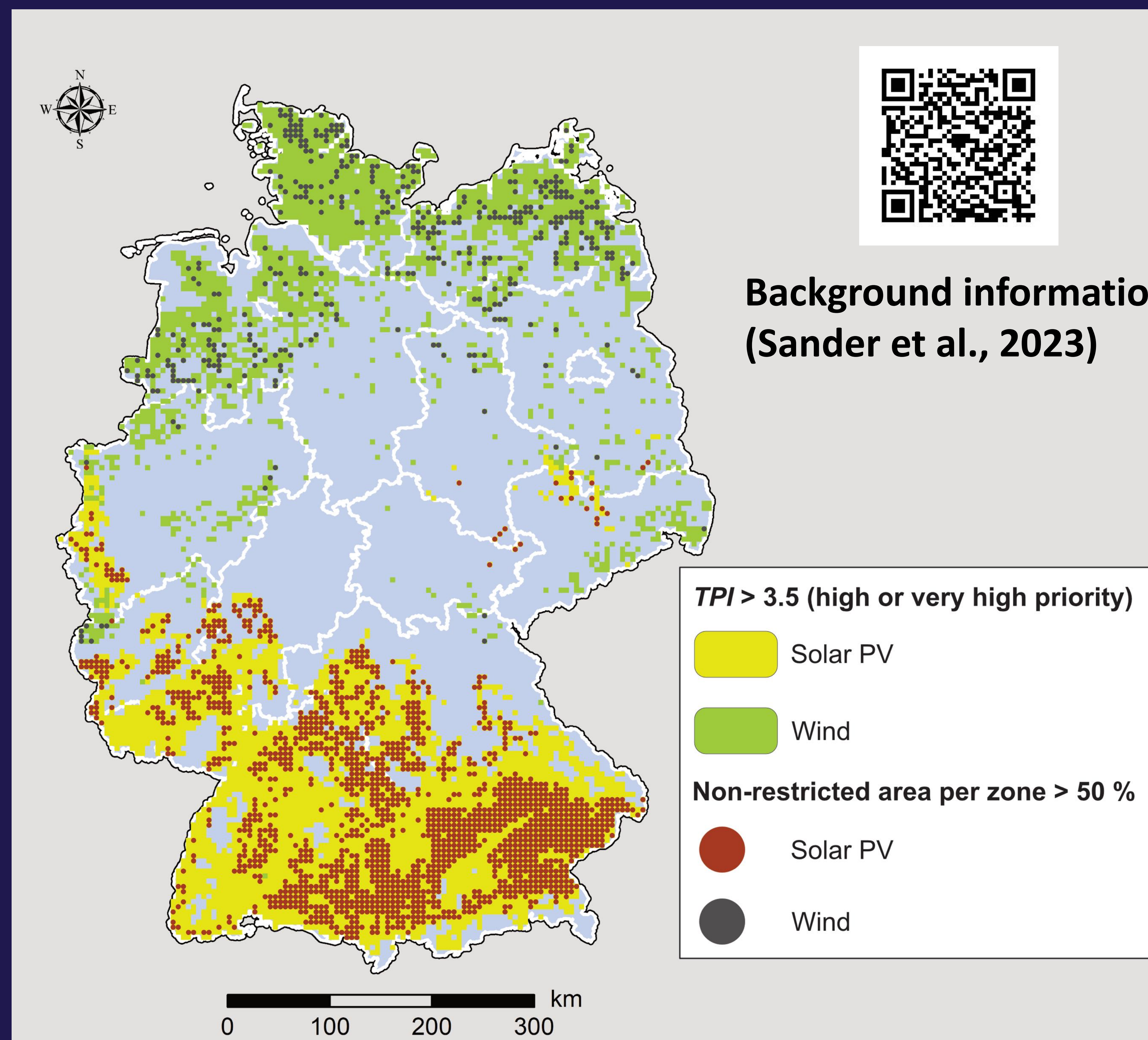
## Results

- Sufficient high-quality (priority) zones for VRE deployment
  - Solar: 5-22 % of Germany
  - Wind: 2-12 % of Germany

## Discussion

- Spatiotemporal variability of wind and solar energy
- VRE capacity expansion together with demand-side management and increasing storage capacities

# Reducing legal restrictions in prioritized areas facilitates an efficient and sustainable expansion and use of wind and solar energy.



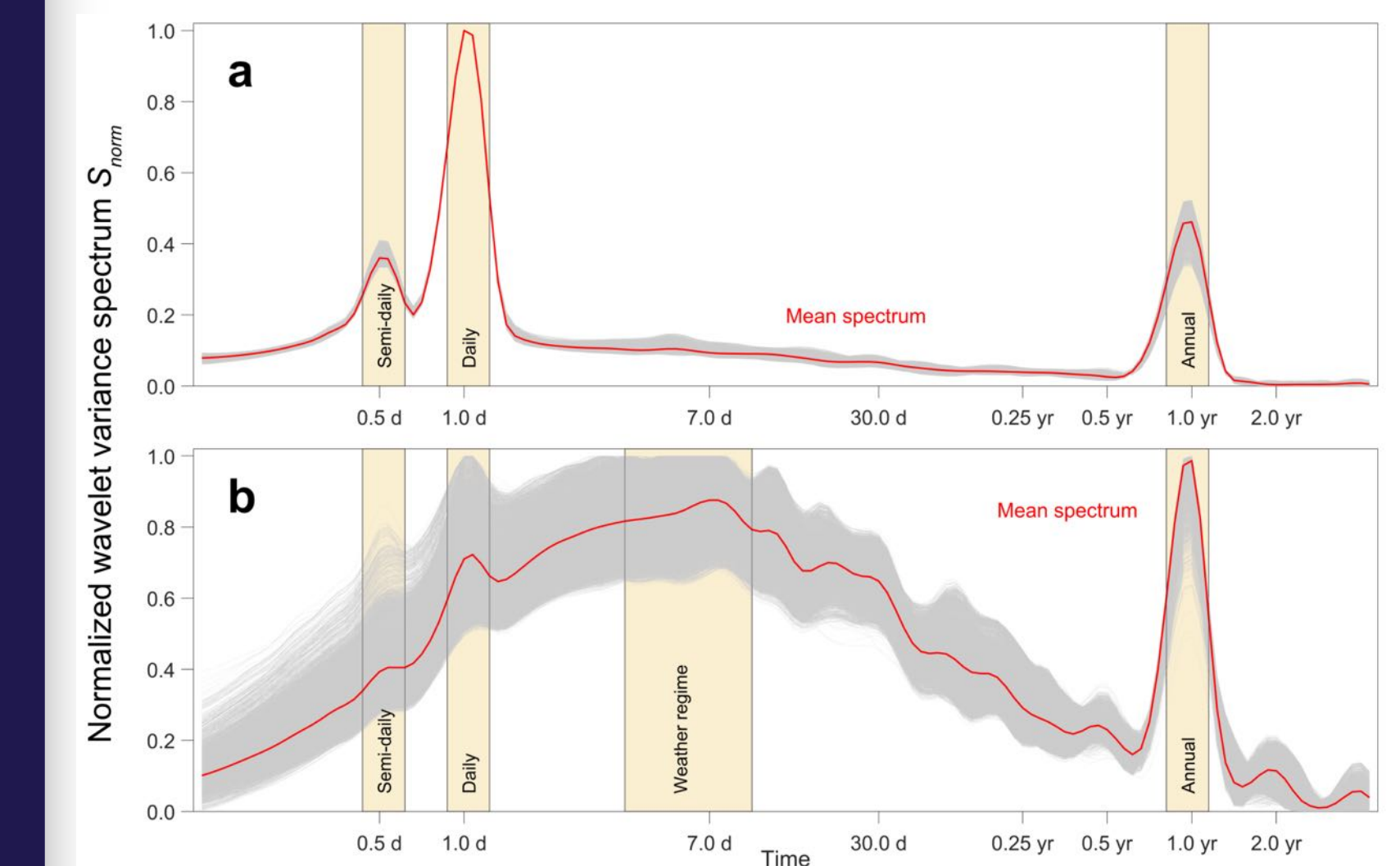
Download the poster



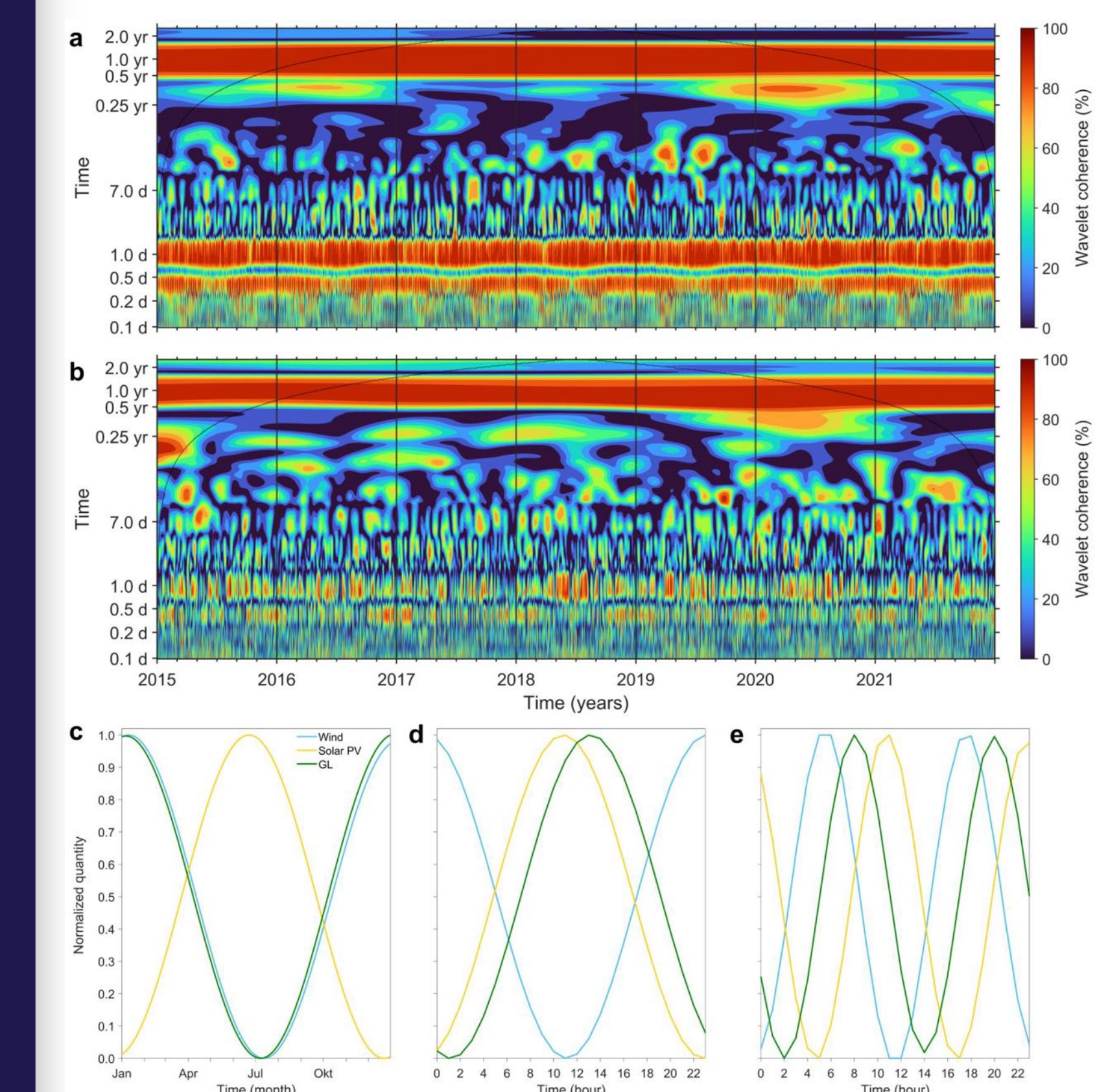
universität freiburg

## Additional info

Normalized wavelet variance spectra for (a) solar PV and (b) onshore wind energy:



Hourly wavelet coherence between German grid load and (a) solar PV, (b) wind energy yield. Real parts associated with the (c) annual, (d) daily and (e) semi-daily cycle:



TPI for (a) solar PV and (b) wind energy with current fleets:

