**Lehrstuhl für Wirtschaftliche Staatswissenschaften,
insbesondere Energiewirtschaftslehre**

Master Thesis

Validation of intermittent energy generation modelling

Energy system models use spatially and temporally resolved capacity factors to model the feed-in of intermittent energies, i.e. solar, wind onshore, or wind offshore. These capacity factors are estimated given assumptions about the corresponding generator, e.g. location, height of the wind turbine, tilt of the PV system, and weather scenarios consisting of parameters like wind speed or solar radiation. Typically, these models use reanalysis weather data to provide a spatially and temporally comprehensive dataset (Staffel and Pfenning, 2016; Pfenninger and Staffel, 2016). There remains a divergence between modelled and real observed intermittent feed-in (Staffel and Pfenning, 2016; Pfenninger and Staffel, 2016). Within energy system models the resulting power feed-in is calibrated to real feed-in, however, this approach lacks a systematic assessment of the underlying accuracy of intermittent feed-in in Germany and the drivers thereof.

The aim of this thesis is to validate the model parameter of intermittent power generation in energy system models. The analysis includes a review of current intermittent energy feed-in models, the implementation of a quantitative model, and the comparison of past real with modelled power feed-in given real weather conditions.

Key tasks and objectives of the thesis

- Conduct a review of feed-in models of intermittent power sources
- Collect and compile relevant power generation data
- Identify differences between real and modelled power feed-in and explore potential sources of these indifferences

Your profile

- Student of economics, best with a background in energy economics
- Interest in quantitative methods
- Analytical thinking and the ability to carry out independent scientific work

Literature

- Pfenninger, S., & Staffell, I. (2016). Long-term patterns of European PV output using 30 years of validated hourly reanalysis and satellite data. Energy, 114, 1251-1265.
- Staffell, I., & Pfenninger, S. (2016). Using bias-corrected reanalysis to simulate current and future wind power output. Energy, 114, 1224-1239.

Contact

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Topics

- Intermittent feed-in
- Energy system analysis

Methods

- Data analysis
- Numerical modeling