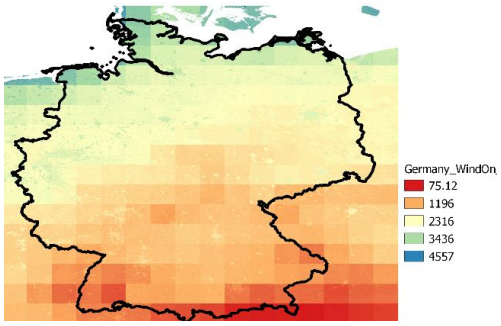
Master's Thesis

Development of correction factors in *pyGreta* for the better representation of small-scale effects

Background

As a part of the research project ETSAP-Deutschland, the further development and use of pyGreta[a] is planned. *pyGreta* is a tool written completely in python to generate **renewable time-series** and **maps** for potential for user-defined regions within the globe.

Since the MERRA-2 weather data has very low resolution and is available on yearly basis, correction factors has to be introduced to better represent the small-scale effects. Currently, the correction factors used in the pygreta have a discrete functionality and therefore is not suitable for all regions. Integrating an optimization module makes the tool better equipped for the all topographies.



Result from pyGRETA - Full Load Hours of Germany

Goals

Within this Master's thesis:

- Different datasets for historical weather data such as MERRA, GWA, and ETA etc. will be studied deeply to understand the variations.
- The study focuses only on **Wind Energy Potential**.
- A better set of correction factors for MERRA-2 data will be suggested that can capture the behaviour of wind for wide scope of regions, either by optimization algorithm or by comparisons with other datasets.

Learning outcomes

By completing this thesis, you will

- obtain knowledge regarding the global wind energy potential
- get an exposure on modelling and geo-referencing in the field of energy systems
- get familiar with the workflow of the research project **ETSAP-Deutschland**

Requirements

- Basic understanding of the renewable energies
- Knowledge of Python and pandas
- Knowledge of GIS/geo-referencing tools is preferred (not mandatory)
- Please attach your CV and grade report to your application

Contact

Thushara Addanki, M.Sc.; Andelka Kerekes, M.Sc.
Chair of Renewable and Sustainable Energy Systems (Prof. Dr. rer. nat. T. Hamacher)
Tel: +49 (0) 89 289-52732, Email: thushara.addanki@tum.de
Tel: +49 (0) 89 289-52747, Email: andelka.kerekes@tum.de

[a] https://github.com/tum-ens/pyGRETA