

Gridded Hourly wind power data for Switzerland

This dataset consist of simulated hourly power production from an Enercon E82 Turbine at 100 m hub-height. It describes the hourly power output a 1MW turbine would produce in each 0.01° grid cell for the years 2016 and 2017.

100 m wind speed data was taken from the COSMO-1 model (Consortium for Small-scale Modeling 2017), which has a 0.01° horizontal resolution. The domain covered is the whole of Switzerland, with the exclusion of lakes. As such, the number of 0.01° pixels within Switzerland amounts to 48657.

Conversion to power output was done based on the power curve of the Enercon E82 Turbine. As power output is lower at altitude due to lower air density, we corrected for this effect as described in (Kruyt et al. 2017).

The format of the data is an R data frame, with dimensions [48657 17544], where the first dimension is the number of pixels or grid cells, and the second is the hours (2 years with one leap year). An additional RDS file (gridCH.RDS) contains the latitude and longitude coordinates of each pixel, as well as a cosmo pixel ID.

This data was used for the following publication:

Improvement of wind power assessment in complex terrain: The case of COSMO-1 in the Swiss Alps – Bert Kruyt, Jérôme Dujardin, and Michael Lehning. *Front. Energy Res.* | doi: 10.3389/fenrg.2018.00102

Keywords: Wind Power, Wind Energy, Switzerland, COSMO-1, Alps, renewable energy, alpine renewable energy, ES2050

References:

- Consortium for Small-scale Modeling, 2017. COSMO model. Available at: <http://www.cosmo-model.org> [Accessed February 1, 2018].
- Kruyt, B., Lehning, M. & Kahl, A., 2017. Potential contributions of wind power to a stable and highly renewable Swiss power supply. *Applied Energy*, 192, pp.1–11.
- Kruyt, B. Dujardin, J., Lehning, M. 2018 Improvement of wind power assessment in complex terrain: The case of COSMO-1 in the Swiss Alps *Front. Energy Res.* doi: 10.3389/fenrg.2018.00102