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# On the impact of NWP model resolution and power source disaggregation on photovoltaic power prediction

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Meteorological variables affecting the power production of photovoltaic farms, especially cloudiness, have very high spatial variability and their proper prediction is still a challenge. The effect of high spatial variability of meteorological quantities may be reduced by some sort of averaging. This issue is closely related to the problem of choosing between the top-down and bottom-up approach to power forecasting. Another related question is how the horizontal resolution of the underlying NWP model influences the forecast performance.

On a domain covering a large part of the Czech Republic, a power production model of the same type has been calibrated for every farm with installed power greater than 500kW (cca 600 farms). Input meteorological variables have been obtained from a simulation of the WRF model with high horizontal resolution (bottom-up approach). As an alternative, averaged meteorology, possibly from a model with a coarser resolution, and a single model of power production has been used for larger regions. The forecast for single farms is then obtained as a proportion of regional forecast according to the installed power (top-down approach).

Since the bottom-up approach is substantially more demanding than the top-down approach, it is useful to assess the strengths and weaknesses of both and to attempt at quantification of the potential benefit brought by increased horizontal resolution of the NWP model.