



# High spatio-temporal wind forecasting with focus on wind energy using a combined statistical – machine learning approach

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## Objectives

Renewable energy production increased in the past years and will continue rising to serve the ambitious goal of (near) zero fossil fuel energy. To achieve this existing, older locations are adapted and equipped with newer wind turbines and new locations are explored and investigated. In Austria, with the rather flat eastern part, hilly northern and southern part, and the mountainous regions, suitable space is sparse. Suitable mountainous regions are located close to existing tourism infrastructure (skiing resorts) or in so far untouched regions and, thus, hard to explore.

When exploring and building wind energy production sites in mountainous regions numerical weather prediction (NWP) models are too coarse, even the convection permitting models.

## How can we improve forecasts?

- Post-processing using statistics and machine learning
- Combine different methods
- Spatial post-processing to include neighbouring effects
- Add additional information such as topography
- Increase spatial resolution (and temporal?)

## Spatio-temporal machine learning (ensemble)

