Microscale wind simulations and wind resource assessment
Microscale wind simulations using Reynolds Averaged Navier-Stokes (RANS) and Large-Eddy Simulation (LES) turbulence models are essential for understanding the flow characteristics in complex terrains. These simulations are critical for wind resource assessment and operational forecasting of high-resolution winds. Implementing these models allows for accurate predictions in challenging environments, enhancing the reliability of wind energy projects.

Summary
In wind energy, numerical modeling has become a key tool for industry at several stages, from early wind resource assessment to designing efficient wind farms. Coupling mesoscale meteorological models (WRF) with Computational Fluid Dynamics (CFD) techniques provides high-resolution microscale wind forecasts, crucial for optimizing the performance of wind turbines and reducing environmental impacts.

Objectives
- Wind resource assessment
- Wind farm modelling
- Operational forecast of high-resolution winds in complex terrains coupling mesoscale meteorological models (WRF) with CFD

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