



CONTEXT

- The rise of a low-carbon society, compatible with economic growth and environmental sustainability, is pending technological evolutions and breakthroughs.
- Wind energy is deemed to increase further in the next decades.
- Nowadays, the performance prediction of wind turbines is conducted using standard profiles of mean incoming velocity, turbulence intensities and scales, which are not representative in complex terrains and urban environments.
- The implementation of wind turbines in urban environments constitutes an important component of future environmentally-friendly Smart Cities thanks to the conditions offered by an urban canopy.
- The ambition of this multi-disciplinary training platform is the development and application of advanced meso/microscale atmospheric models and the assessment of the impact of real terrain and local atmospheric effects on the predicted aerodynamic performance, structural dynamics and noise emissions.

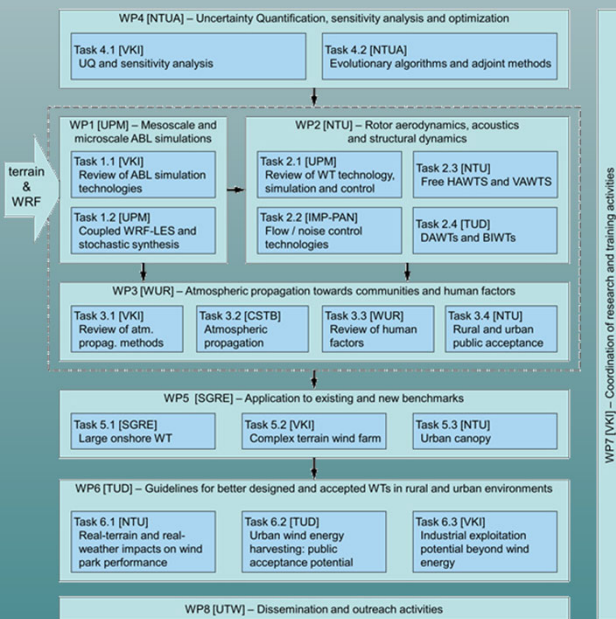
OBJECTIVES

- Foster a training-through-research network of young researchers, who will investigate and develop promising emerging technologies enabling a more efficient harvesting of wind energy resources in 'conventional' on-shore as well as urban environments.
- Bring in a coordinated research environment top-rank academia, research centers and industrial stakeholders, involved in fluid dynamics, aeroacoustics, structural dynamics and fatigue life prediction, Uncertainty Quantification, optimization methods, system dynamics and control, and human factors.
- Offer an unprecedented training infrastructure where the ESR will be confronted with the intricacies of an innovation process including integration, manufacturing, economical constraints.

Three benchmark cases:

- Large onshore Horizontal axis wind turbines (HAWTs),
- Flow over complex terrain including the interaction with a single WT,
- Urban wind turbines: vertical axis wind turbines (VAWTs), diffuser-augmented wind turbines (DAWTs) and building-integrated wind turbines (BIWTs).

METHODOLOGY



BENEFICIARIES



PARTNERS



Kick-Off Meeting of the zEPHYR project @ VKI



GENERAL ORGANIZATION

- Coordinator: Dr. Sophia Buckingham (VKI)
- Network Administrator: Bram Goeman (VKI)
- 15 Early Stage Researchers
- 6 technical courses (12 EC); 6 courses transversal skills (5 EC); 8 workshops; 3 VKI lecture series.
- Deputy coordinator: Prof. Leandro Dantas de Santana (UTW)
- Ombudsperson: Cansev Kucukosman (VKI)