

# The New European Wind Atlas (NEWA)

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# NEWA – The Project

- ERA-NET PLUS project
- Funded by 9 national funding agencies
- With support from the European Commission under the 7th FP
- Start of project: March 2015
- Anticipated project duration 5 years



# NEWA - Partners



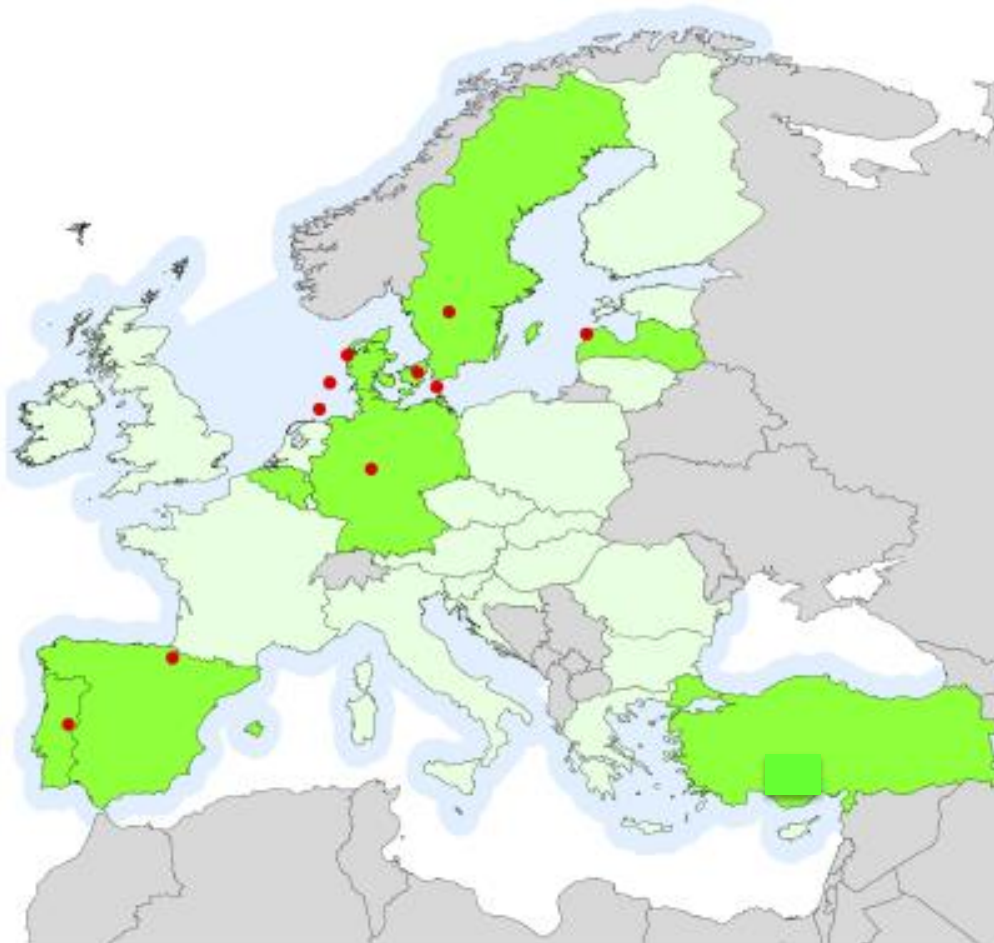
# NEWA - Objectives

- Accurate mapping of wind conditions of Europe
- Determination of uncertainty
- Development and validation of the model chain
- A series of atmospheric field experiments to validate the model and atlas





# NEWA – Experimental sites



- EU countries (in light color)
- NEWA partners
- Offshore coverage
- Experimental sites

# NEWA - Experiments

Conditions for all experiments:

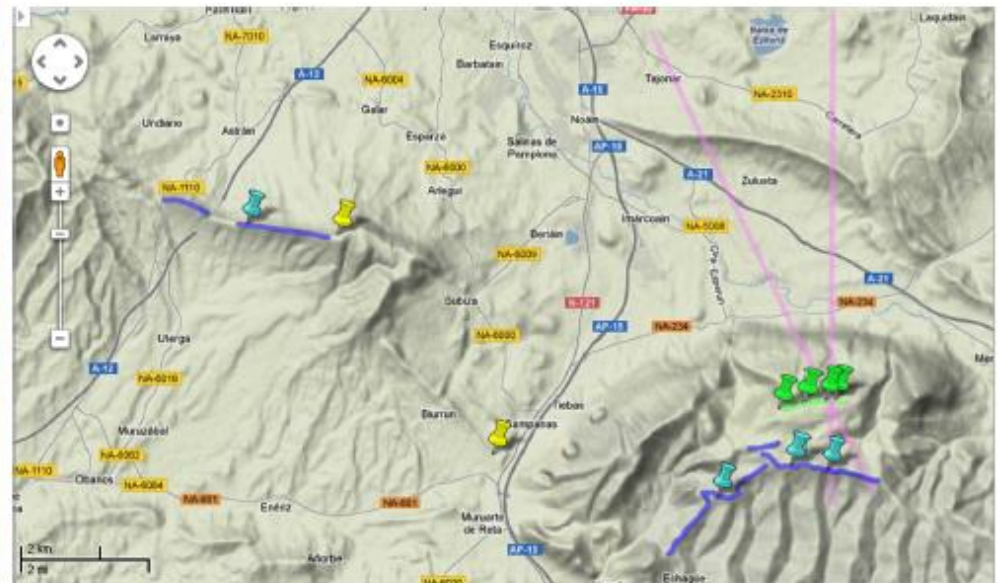
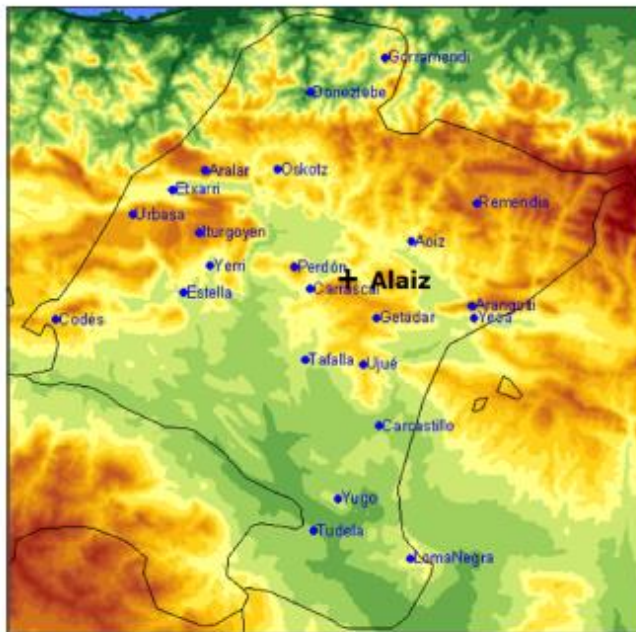
- Used to validate every step of the model chain
- Focus on wind energy relevant sites heights: 50 - 300 m
- Long term measurements + one (or several) intensive campaigns
- Laser scanning to get topography and canopy
- Detailed LES for planning
- Build on existing infrastructure to the highest extent
- Use Doppler wind LiDARS



# Steep, complex terrain with strong mesoscale variability

Alaiz, Spain

The wind turbine test station at Alaiz operated by CENER will be the center of complex terrain experiment with a strong meso-scale component. The nearby Ebro Valley and the Pyrenees make the coupling between large-scale flow and local flow particularly challenging. Existing synoptic network in Navarra.





# Steep double-ridge

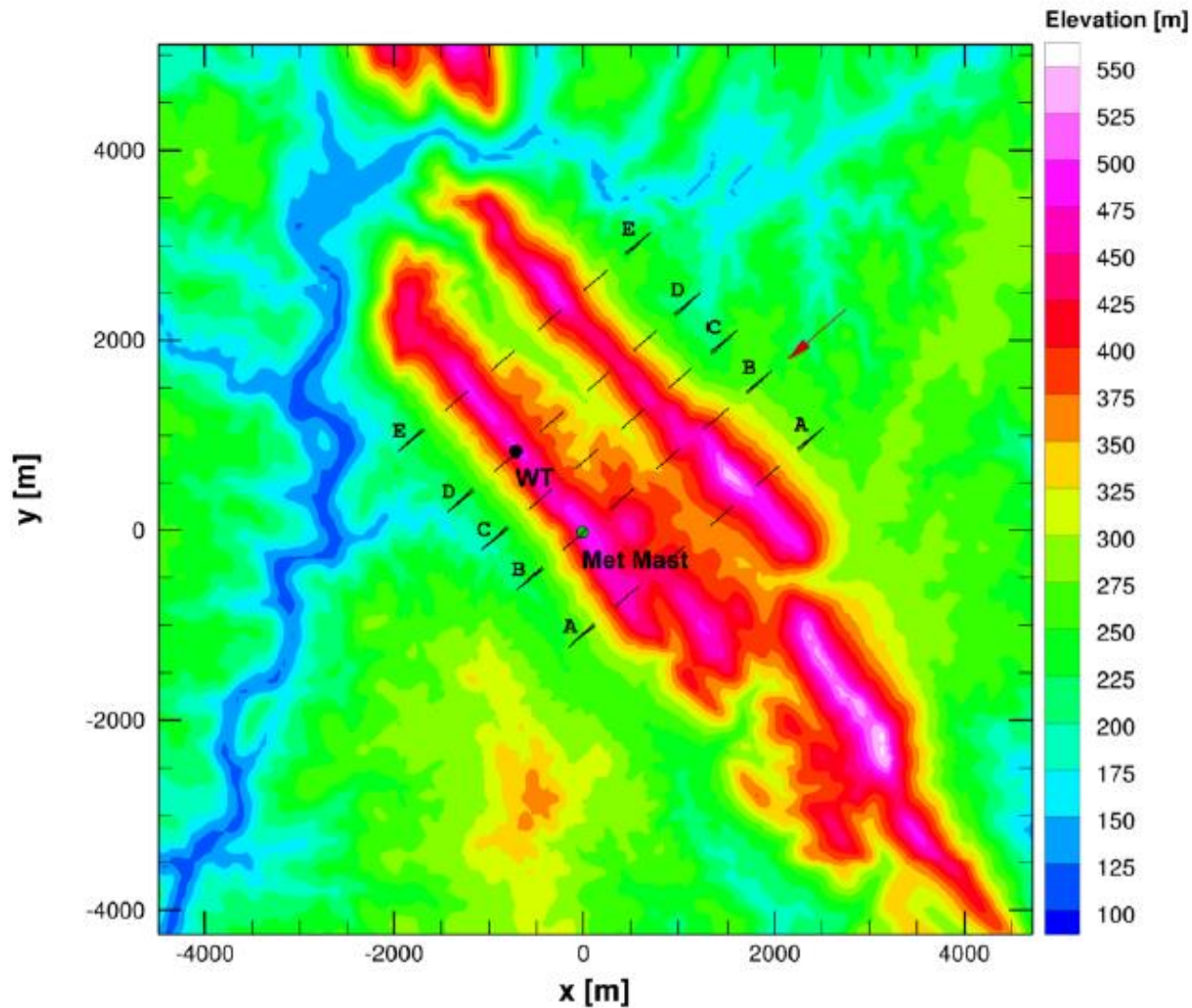
Perdigao, Portugal

Portuguese double-hill experiment. A micro-scale experiment with steep terrain in a windy region. This is the only experiment that does not build on existing infrastructure. A meteorological mast will therefore be erected as soon as possible in order to provide climatological data.



# Perdigao

20 km<sup>2</sup> terrain is scanned with  $> 10\text{pkt/m}^2$



Courtesy:



# Coastal and offshore mesoscale experiment

## in Northern Europe

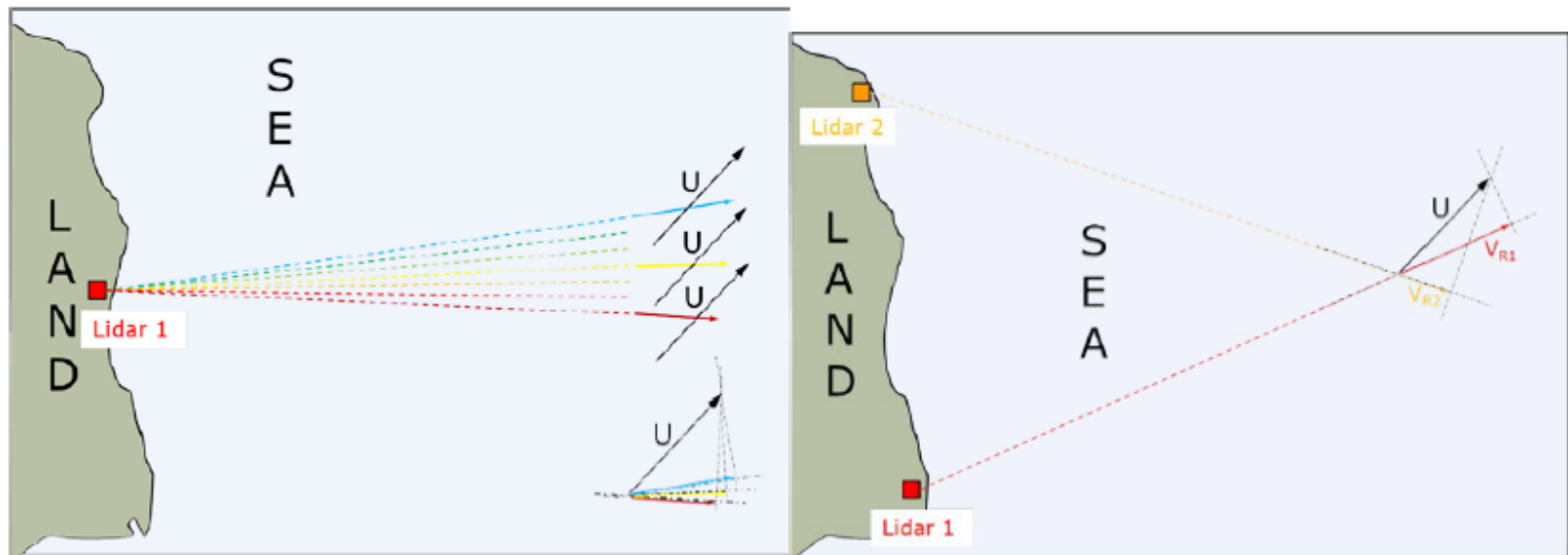
Coastal and meso-scale experiment in northern Europe. A network consisting of existing masts in Northern Germany, the German off-shore FINO platforms, the Danish test sites Høvsøre and Østerild with masts up to 250 m, existing Southern Swedish masts, and masts in Latvia will be the backbone of this experiment.





# Coastal and offshore mesoscale experiment in Northern Europe

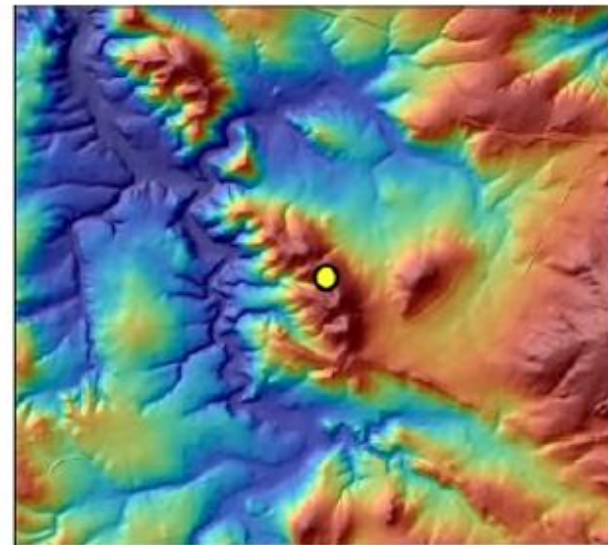
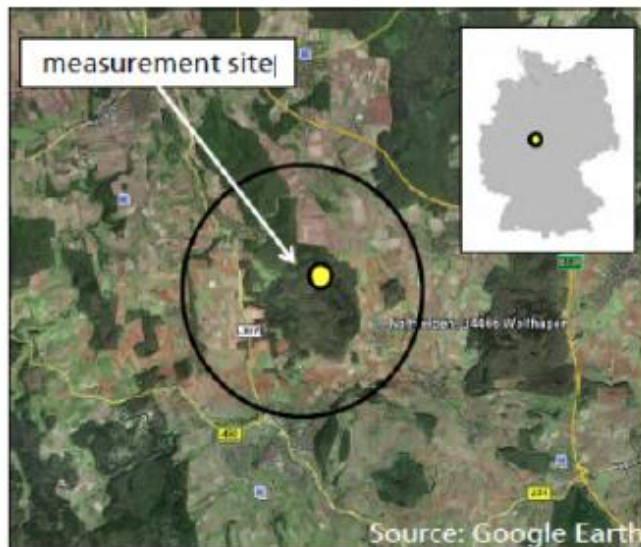
The experiment will be supplemented with studies of the transition between sea and land primarily using scanning lidars, and possibly lidars on ferries.



# Patchy forest in hilly terrain

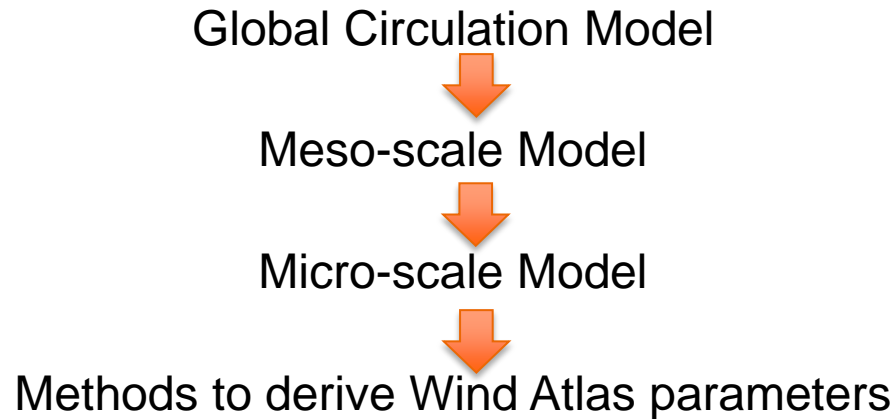
Rödeserberg: centered around 200 m Kassel mast

Centered around the 200 m mast of IWES in Kassel an experiment on patchy forest over hilly terrain will be conducted. The uncertainty of flow characteristics is notoriously high in this kind of terrain and the modeling of the flow is at the forefront of research. Intensive campaigns of this partly deciduous forest will cover both summer and winter.





# NEWA – Model chain



- Improvement of models and downscaling methodologies with data from the experiments
- Development and validation of advanced multi-scale wind assessment
- Development of an open-source model chain platform
- Uncertainty quantification methodologies associated to the model chain

# NEWA - Databases

Database with data from experiments

Database with Wind Atlas data

- Databases will be publicly available - also after the end of the project
- At least one complete model chain will be open-source
- The atlas will not only contain wind resources but also design parameters, variability, etc.

# NEWA – Collaboration welcome

- Wind Atlas: Selection of wind atlas parameters – request of input from stakeholders
- Experiments: Collaboration with external groups in measurement campaigns
- Model chain: Stakeholder workshops
- Validation: Request for existing wind and power measurements



# THANK YOU FOR YOUR ATTENTION

Project web page <http://www.neweuropeanwindatlas.eu>