Wind Energy Research Farm in Krummendeich (WiValdi)

DLR

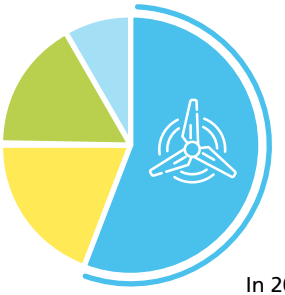
Researching future energy supplies

DLR research for the energy transition

65% The plan is for 65% of Germany's electricity mix is to come from renewable sources by 2030.

<2°C Germany has pledged its commitment to the Paris Agreement, whereby global temperatures should not increase by more than two degrees, and ideally have a maximum of 1.5 degrees.

H_2 Irrespective of any agreements, renewable energy demand is set to increase over the coming years, for example due to sector coupling and hydrogen production.



In 2022, the use of energy derived from renewable sources avoided the emission of 232 million tonnes of CO_2 equivalents, 95 million tonnes of which were attributable to wind power.

Source: AGEE-Stat, 3/2023

Objective

To make wind turbines quieter and more efficient, and electricity from wind more cost-effective.

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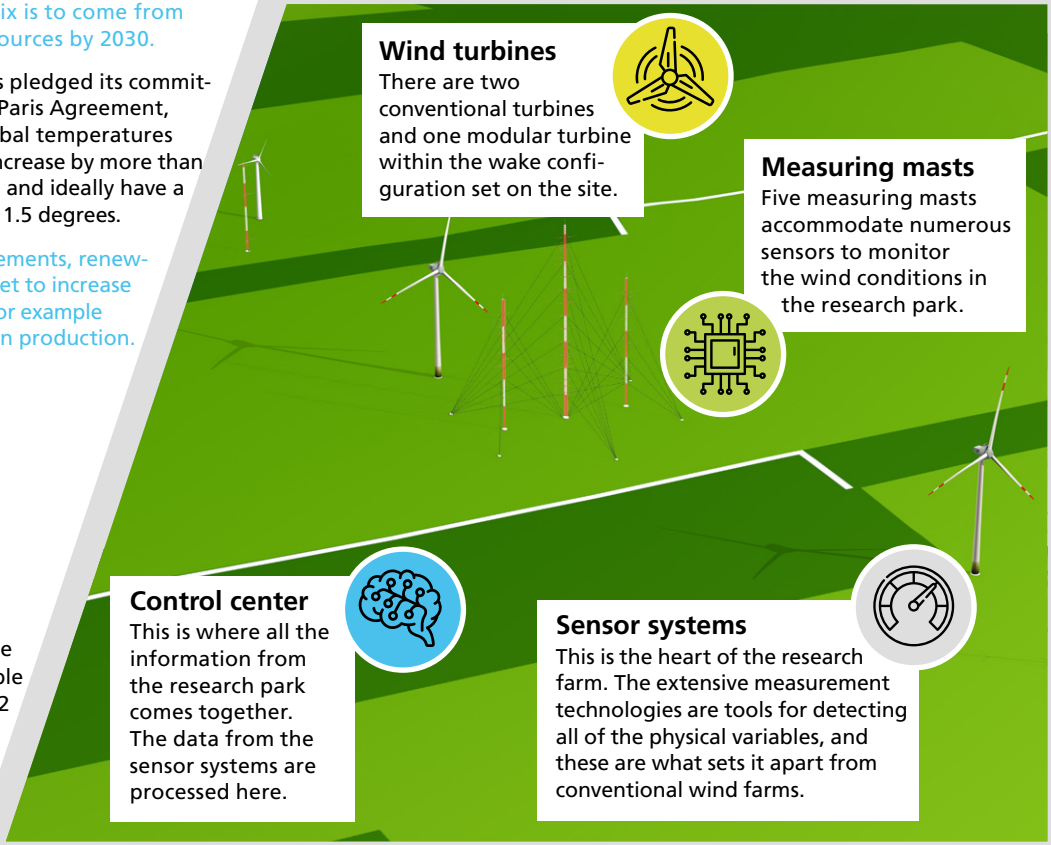

Wind turbines

There are two conventional turbines and one modular turbine within the wake configuration set on the site.

Measuring masts

Five measuring masts accommodate numerous sensors to monitor the wind conditions in the research park.

Control center

This is where all the information from the research park comes together. The data from the sensor systems are processed here.

Sensor systems

This is the heart of the research farm. The extensive measurement technologies are tools for detecting all of the physical variables, and these are what sets it apart from conventional wind farms.

www.windenergy-researchfarm.com

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How we conduct our research

The WiValdi research wind farm enables full-scale research, in order to develop technologies to increase the acceptance, efficiency and cost-effectiveness of wind turbines. WiValdi is short for ‘wind validation’.

WiValdi is being created by several DLR institutes and facilities and their partners from the Research Alliance Wind Energy (Forschungsverbund Windenergie). Scientists from a range of disciplines will conduct research here.

1 Identification

WiValdi is not a conventional wind farm, as is clear from its meteorological masts, which are up to 150 metres tall. In addition, the wind turbine themselves are fitted with an extensive suite of sensors, while a number of measuring devices are installed on the ground. These sensor systems are the heart of the research farm.

This also sets it apart from wind farms designed solely for the generation of electricity. The measurement technologies are tools for capturing all of the physical variables.

2 Testing

The extensive instrumentation provides an excellent infrastructure for testing new technologies, such as rotor blades with new structures, shapes, materials and designs, developed by the Wind Energy Research Alliance.

Technologies from the aeronautics sector for use in wind turbines can also be tested here. Examples include the use of new blade geometries for noise reduction.

3 Validation

The research infrastructure enables a wide range of calculation models to be validated. Simulations are now an indispensable part of scientific practice, but such models must first be verified and validated in various test cases under real environmental conditions.

DLR's Krummendeich site

WiValdi is being built on agricultural land in the joint municipality of Nordkehdingen, in the rural district of Stade, Lower Saxony, between the communities of Krummendeich, Oederquart and Freiburg (Elbe).

How we will be keeping you up to date:

www.windenergy-researchfarm.com

On our website you can find all important information, announcements and our construction site diary.

Who we are and how to contact us

The Wind Energy Research Farm in Krummendeich (WiValdi) is run by the Wind Energy Experiments facility of the German Aerospace Center (DLR) at its Krummendeich and Braunschweig sites.

DLR is the Federal Republic of Germany's research centre for aeronautics and space. We conduct research and development activities in the fields of aeronautics, space, energy, transport, security and digitalisation.

Do you have any questions about WiValdi?

Do you want to conduct your research project with us? Please feel free to get in touch:

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