WindCube Nacelle
Feedforward turbine control for reducing costs and improving efficiency

WindCube® Nacelle makes Lidar-Assisted Control (LAC) a reality, reducing Levelized Cost of Energy (LCOE) and creating numerous other benefits for wind energy.

By fully characterizing the incoming wind field, the system enables anticipatory control optimizations for changing conditions. This can result in significantly extended wind turbine design limits, reduced loads and costs, improved safety and resilience to extreme events, and increased energy capture.

Key Benefits

Proactive control for improved efficiency and lower LCOE
WindCube Nacelle accurately anticipates (several seconds in advance) the wind data hundreds of meters in front of the rotor plane, allowing developers and operators to quickly respond — thereby reducing turbine loads, reducing costs, and improving energy production.

Innovation in an increasingly challenging turbine market
Reduced fatigue and extreme loads allow the use of longer blades and/ or higher towers for a given class, or upgrading the wind class of a given turbine platform. This enables significant energy production increases while maintaining a streamlined portfolio of turbine products.

Seamless integration using proven designs and practices
Turbine control is an extension of existing WindCube Nacelle lidar technology, and it has been shown to integrate seamlessly with turbine manufacturers' projects. This simplicity of integration extends to wind developers and operators as well, further enhancing the manufacturer's value proposition.

The simplicity and reliability of the industry leader
WindCube Nacelle is already the industry standard for LAC, operating in large fleets in China and increasing locations around the globe.

WindCube Nacelle at a glance

Applications

- Fatigue and extreme load reduction
- Production increase
- Reliability and turbine availability increase
- Continuous wind monitoring and turbine performance testing
- Building a base of historic data for failures diagnosis or performance improvements

Key features

Comprehensive measurement of all essential incoming wind conditions, including rotor averaged wind speed, wind direction, shear, and turbulence, at multiple distances before it reaches the turbine rotor

Sophisticated, high-frequency information processing allowing for quick, confident turbine control decisions

Constant accuracy from 50 to 200 meters with 10 configurable measurement distances

Straightforward adoption with lightweight, efficiently designed system components and proven engineering

Vaisala: Support and services you can count on

Wind energy isn't just about technology. It's about having the backing of a global partner that can directly support your business end-to-end, with complementary services, robust customer service, and consultation.

Today, WindCube lidar technology — trusted by the world's largest wind energy clients, as well as plenty of smaller, emerging ones — is also backed by Vaisala's 80 years of experience and worldwide services.

Testimonial

Goldwind, one of the world's leading turbine technology providers, chose WindCube Nacelle for its turbine control initiative, validating the suitability and reliability of Leosphere technology to this promising application.

Since 2015, Leosphere has delivered more than 180 systems to Goldwind for this purpose.

"Since deployment, we have been successfully operating our Leosphere technology with great benefit to our project. Leosphere has enabled us to innovate, create new value for our customers, and help push the wind industry forward."

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