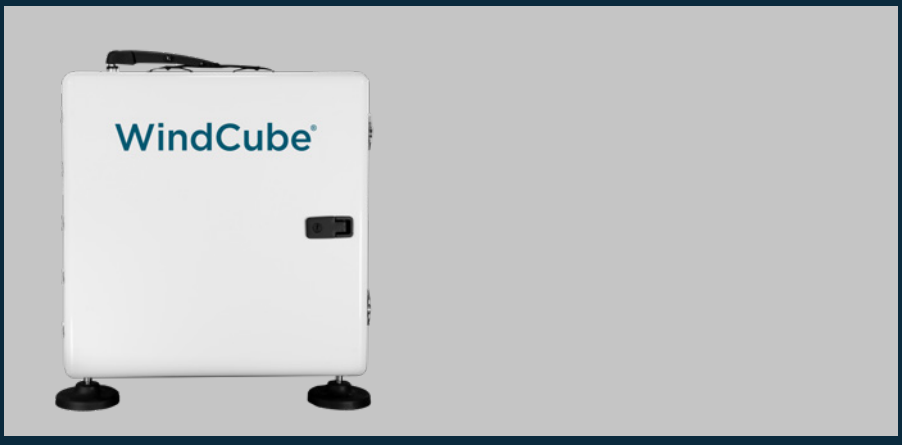
Celsia uses WindCube to reduce uncertainties

VAISALA

Case Study



The client:

Celsia

Vaisala solution:

WindCube

THE CHALLENGE:

Measuring wind shear and wind speed at increasingly taller wind turbine heights

With multiple wind farm projects planned in Colombia, mainly on the Atlantic Coast, Celsia sought the optimal wind measurement technology to provide not only the bankable data needed to secure funding but also the precise measurements for energy yield assessments.

Accurate knowledge of the wind's behavior is necessary to know how much energy will be produced and whether on-site turbines will survive at a specific location. In past projects, Celsia performed wind measurements using an 80m met mast, but with turbines growing larger and reaching higher into the atmosphere, it had become increasingly difficult for the company to measure wind shear and wind speed over 120m using just a met mast.

THE APPROACH:

The industry standard lidar for accurate, bankable wind data

The global positioning and expertise of Vaisala were important factors in Celsia's decision. WindCube® is the most flexible and accurate wind measurement technology available, and, in order to reduce uncertainties, the technology's data has been proven by experts and international standards and guidelines. WindCube has also been deployed by thousands of customers across the globe.

For Celsia, building, permitting, and installing met masts and instrumentation at the great heights required for these projects would have been increasingly cumbersome, time intensive, and expensive. Consequently, the best solution for

"We saw that WindCube is a technology that meets our expectations in terms of equipment performance, reliability, track record, and industry expertise. Thanks to the references of different companies worldwide, we found WindCube very well positioned, so we have trusted and chosen it to be used for the first time in our country."

Ilba Cuadrado
Development Engineer, Celsia

Celsia to collect the most accurate wind data at great heights was to use WindCube lidar, which measures the full wind profile from wind speed and direction — above 200m in height. (The newest version of WindCube now reaches up to 300m.)

In 2018, Celsia installed WindCube next to a traditional met mast for a one-year measurement campaign to extrapolate wind speed. WindCube lidar was then moved to precisely where the turbines would be installed to measure and assess where the wind would be most representative for the future wind farm.

THE RESULTS:

More flexibility and more accurate, detailed, and bankable data

With WindCube, Celsia was able to collect accurate, detailed, and bankable wind data at much higher heights compared to a met mast, easily relocate the device to other locations as needed, and truly understand the wind's behavior at project locations.

By using a met mast, Celsia would have needed to do the interpolations, whereas with WindCube it was not necessary; the company only needed to configure the height at which it wanted to conduct measurements, which can be easily configured to measure at 12 user-defined distanced simultaneously in order to meet wind resource assessment needs at various turbine heights. (The latest version of WindCube now measures at 20 heights.)

In terms of performance, a widely recognized consultant has validated the measurements made at different heights, revealing the uncertainty due to shear was lower since Celsia was able to make a very complete measurement campaign with WindCube.

Even better, the installation, setup, and connection were so fast and simple that WindCube was installed early in the day, and Celsia was already receiving data by the afternoon. Another benefit Celsia enjoyed was WindCube Insights — Fleet, the easy-to-use, secure, cloud-based software tool that provides real-time insights, allowing Celsia to access and manage the lidars and data.

Why Vaisala?

We are innovators, scientists, and discoverers who are helping fundamentally change how the world is powered. Vaisala elevates wind and solar customers around the globe so they can meet the greatest energy challenges of our time. Our pioneering approach reflects our priorities of thoughtful evolution in a time of change and extending our legacy of leadership.

Vaisala is the only company to offer 360° of weather intelligence for smarter renewable energy, nearly anywhere on the planet. Every solution benefits from our 85+ years of experience, deployments in 170+ countries, and unrivaled thought leadership.

Our innovation story, like the renewable energy story, continues.

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