

WindCube replaces permanent met mast at BayWa r.e.'s Amadeus Wind Farm

Case Study



The client:

BayWa r.e. Americas

Vaisala solution:

WindCube® vertical profiling lidar

THE CHALLENGE:

A permanent, reliable solution for operational wind measurements

As a leading renewable energy developer and operator, BayWa r.e. Americas manages a large fleet of wind assets throughout North America. At the 250.1 MW Amadeus Wind Farm in Texas—a project featuring 96 turbines across moderately complex terrain—the company sought to modernize its operational meteorological strategy.

Historically, long-term meteorological measurements have depended on tall met masts. However, met masts come with high installation and maintenance costs, safety risks from tower climbs, and permitting complications due to their height and structural footprint.

With the Amadeus Wind Farm fully operational, BayWa r.e. aimed to implement a permanent, low-risk, and cost-effective alternative that could deliver high-quality, bankable wind data over the long term.

THE SOLUTION:

WindCube lidar as a permanent operational measurement station

BayWa r.e. Americas selected the Vaisala WindCube vertical profiling lidar as a full replacement for traditional met mast functionality at Amadeus. Ground-mounted and compact, they deployed WindCube using existing infrastructure in a single day—avoiding permitting delays, safety risks, or extended data downtime.

"After the successful implementation of the permanent lidar station, we see this solution as the future for our operational meteorological campaigns. It's efficient, reliable, and aligns perfectly with our long-term asset management goals."

*Danielle Giesy
Energy Resource Manager, BayWa r.e. Americas*

WindCube provides continuous, high-resolution wind measurements at multiple heights, including turbine hub height and above. Its configuration complies with Electric Reliability Council of Texas (ERCOT) requirements for site-specific meteorological data used in grid forecasting. BayWa r.e. ensured the unit's telemetry, Modbus channels, and data delivery met all ERCOT operational protocols.

In addition to replacing traditional met masts, the lidar also served as an effective substitute for their legacy Triton SODAR system. The transition was straightforward, requiring minimal adaptation—highlighting how easily lidar can integrate into existing measurement strategies for operators looking to modernize.



THE RESULTS:

Lower maintenance, enhanced data, and improved environmental compatibility

With WindCube now in permanent operation, BayWa r.e. is achieving a range of critical benefits over traditional met masts:

- **Lower risk and maintenance cost** — No tower climbs or elevated work are needed, improving safety and reducing O&M expenses
- **High data reliability** — WindCube resists harsh weather conditions, reducing sensor outages and downtime compared to mast-mounted equipment
- **Environmental and permitting advantages** — With no tall structures or guy-wires, WindCube avoids wildlife risks and simplifies siting in sensitive habitats
- **Long-term data quality** — WindCube delivers IEC-compliant data across a wide range of heights, supporting accurate performance modeling and operational decision-making

LOOKING AHEAD:

Lidar as the new standard

The successful deployment of WindCube at Amadeus marks a pivotal shift in how BayWa r.e. approaches permanent wind measurement. The company is now evaluating broader rollout of lidar-based stations across its operational portfolio—replacing the need for tall met masts while unlocking additional applications such as:

- Yaw misalignment detection
- Wake effect characterization
- Maintenance diagnostics
- Forecasting model calibration

WindCube is not just a modern alternative to the met mast— it's also a proven successor to older technologies like SODAR, offering a smarter, safer foundation for long-term wind energy operations.



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 nearly 90 years of experience, deployments in 170+ countries, and unrivaled thought leadership.

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

