

METICE™

**Cup-Equivalent Turbulence Intensity
from ZX Lidars.**

Delivering trusted turbulence
measurements for consultants,
developers and wind turbine OEMs.





ZX300e ZX300M

Turbulence Intensity (TI) defines how variable the wind is - a key driver of turbine loads, site suitability, and energy yield. Historically, TI has been measured by cup anemometers - these measurements are embedded in decades of design standards and tools. METICE translates ZX Lidar data into accurate, cup-equivalent TI.

METICE™ - Multi-Site Ensemble Turbulence Intensity Cup Equivalent - is a machine-learning model developed by ZX Lidars to make Lidar-measured turbulence directly comparable with cup anemometer turbulence.

It works as an ensemble of experts: multiple site-specific neural networks, each trained on co-located Lidar and met-mast data from diverse environments. When new data is received, a Bayesian weighting system identifies which "expert" best represents those atmospheric conditions - such as stable, unstable, or high-shear regimes - and adapts the output accordingly.

The result is a proven, physics-based approach that delivers cup-equivalent turbulence behaviour transforming how developers, consultants and OEMs trust and apply Lidar data in the real-world.

Validated Accuracy

- Benchmarked across 16 validation sites and 64 height levels (20–200m)
- 99% of wind-speed bins met CFARS Best Practice bias criteria ($\pm 1\%$ TI) and 100% met Minimum Practice thresholds
- Consistently within DNV-RP-0661 acceptance limits for mean bias and scatter ($\pm 5\%$ / 15%)
- Proven to maintain accuracy across varying atmospheric stability regimes and measurement heights
- No height-dependent drift — maintains accuracy from 20m to 200m.

Use cases

• Turbine OEMs — Design and certification

Use METICE data to assess site turbulence for load and fatigue models without installing met masts. Multiple measurement heights and built-in uncertainty outputs provide the confidence needed for turbine design validation and site certification.

• Developers — Site Classification & Energy Yield

Classify site turbulence, optimise turbine placement, and refine energy yield models using standalone ZX Lidars. METICE enables faster, mast-free campaigns that still deliver bankable, cup-equivalent turbulence data.

• Consultants — Bankable wind campaigns

Replace conservative turbulence assumptions with validated METICE data that meets DNV and CFARS benchmarks. Improve confidence in stand-alone Lidar campaigns and reduce project uncertainty.

• Non-wind industry applications

METICE supports the use of Lidar TI in other industries such as civil engineering design (e.g. bridges and buildings), vertical take-off and landing, and Helideck Monitoring Systems

Implementation

- Available in firmware or post-processing via ZPH2CSV
- Requires only 10-min Lidar statistics — no mast inputs

METICE delivers turbine-ready turbulence data from every ZX Lidar.

Visit us at zxlidars.com

