



Advanced Atmospheric Measurement Solutions for Improving Site Assessments & Wind Farm Operations

OptoAtmospherics™ will be offering unique products that provide 3D atmospheric mapping, not only of wind speed and direction, but of density and temperature *simultaneously*. These volumetric, yet micro-scale measurements can improve site assessment accuracy, optimize turbine placement, and improve the performance of existing wind farms at a level not seen before. Our long-range product can make measurements at distances greater than 10km, while our short-range product can be mounted directly on turbines for individual control.

OptoAtmospherics™ Site Assessor – for More Accurate & Timely Site Assessments

Superior siting decisions: With 360° scanning covering more volume than competing systems, the *Site Assessor* not only provides wind speed and direction, but density and temperature as well. This leads to accurate characterization of turbulence, inflow angles, shear, and wake effects, providing site assessors with the ability to much more accurately determine the energy potential of a site, especially when complex terrain or structures are present. Turbine placement and hub height can be optimized based on highly accurate measurements.

Less costly off-shore measurements: With its ability to remotely measure winds from long distances, the *Site Assessor* can operate from shore while measuring winds over water at ranges exceeding 10km.

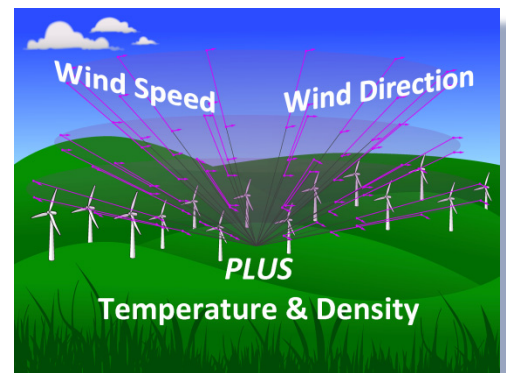


OptoAtmospherics™ Optimizer – for Increased Efficiency, Reduced Maintenance, & Optimized Grid Integration

Reduced turbine fatigue and increased lifetime: The *Optimizer* will come in two configurations: a ground-based unit that can scan a region surrounding many turbines, or a turbine-mounted system for single turbine control. An advanced predictive analytics software package is also available, which will enable maintenance schedule optimization, reduce down time, and ultimately lower maintenance costs. Combined with speed regulation and load reduction based on knowledge of approaching wind anomalies, reduced wear on dynamic components can result in lower maintenance and repair costs.

Reduced hourly grid integration costs: The *Optimizer* provides forecasting times in the *tens of minutes*, providing the potential to significantly lower hourly grid integration costs.

Increased turbine energy output: Wind farms will benefit from real-time measurement and forecasting of winds before those winds reach the turbines, increasing efficiency of wind capture.



The Technology

Our Direct Detection LIDAR technology uses an ultraviolet laser to measure wind speed and direction, density, and temperature, simultaneously. This next-generation, patented capability has been developed and tested with significant funding from NASA, NOAA, and Department of Defense agencies. Volumetric measurements are provided by scanning up to 360 degrees in azimuth and 90 degrees in elevation, providing full three-axis wind and atmospheric characterization. With the ability to make measurements directly on air molecules (i.e., no aerosols/particles required), measurements from 10-20km and in clear air have been demonstrated. Turbine-mounted versions can even be configured with no moving parts, adding to system reliability. These eye-safe systems (ANSI Z136.1-2000) are designed for 24/7 operation under all environmental conditions.



Unprecedented Capability

“OptoAtmospherics’ ability to measure micro-scale wind speed, direction, density, temperature, and pressure over a large volume will result in significant benefits to both site assessments and operational wind farms.”
– ACUSIM, makers of AcuSolve

The availability of temperature and density, in addition to wind speed/direction data, will enable unprecedented measurement of critical parameters, such as turbulence, shear, in-flow angles, and wake effects. This will lead to optimization of turbine placement and hub height selection, and an overall increase in site assessment accuracy. Onshore, the *Site Assessor* will not require permits, as do meteorological (MET) towers, and can be installed faster. With its long-range capability, the *Site Assessor* can remain onshore while making wind, temperature, and density measurements 10km or more over water.

Operational wind farms will benefit from real-time measurement and forecasting of winds up to tens of minutes before those winds reach the turbines, with the prospects of increasing efficiency of wind capture, reducing maintenance costs, improving turbine placement/upkeep/replacement decisions, and reducing grid integration costs. Turbine-mounted versions of the instrument will provide high accuracy, high update rate data that can be used to dynamically reduce loading.

In addition, an advanced predictive analytics capability will be offered that can ingest turbine data and predict many failures before they occur. This will allow site operators to optimize when major repairs are performed, enabling smarter preventive maintenance, reduced down time, and ultimately lower maintenance costs.

Contact Us!

Our products will be available soon. Please contact us to learn how OptoAtmospherics’ LIDAR products can improve your site assessment and operational wind farm needs. Also let us know if you are interested in licensing or partnership opportunities.



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