

DeepCLiDAR

Offshore Wind Resource Assessment Buoy

The first floating LiDAR buoy validated in the US providing bankable wind speed data at hub height, metocean data, and ecological monitoring services.

An advanced metocean buoy outfitted with LIDAR that can be used in remote marine environments to provide high-quality, low-cost offshore wind resource data, metocean monitoring, and ecological characterization capabilities.



INNOVATION

High quality, low-cost offshore wind resource data

- 1/10 the cost of a traditional meteorological tower for wind resource assessments
- Deployable in virtually any water depth
- Capable providing bankable wind speed data up to 200m above sea-level
- Fully-integrated metocean sensor package provides wave and current data
- Optional ecological monitoring sensor package for permitting efforts developed with the Biodiversity Research Institute



TECHNOLOGY

LiDAR

- Windcube Offshore®, measures wind speed at 40m - 200m heights
- GLGH Stage 3 acceptance for use in formal wind resource assessment campaigns

Other Sensor Packages

- Metocean: wave, wind, and current
- Ecological: acoustic, bird, bat, and fish

Hull Type and Construction

- Aluminum, 3m discus buoy, fully seal welded with a main central hatch for all data and power control electronics

*Now available for commercial
lease or purchase.*

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TECHNOLOGY CONT.

Telemetry

- GOES, CDMA/GSM, IRIDIUM

Mooring

- Shallow water: chain with gravity anchor
- Deepwater: chain/wire/chain with gravity anchor

Power

- System is autonomous, deployable for 1 year without regular maintenance

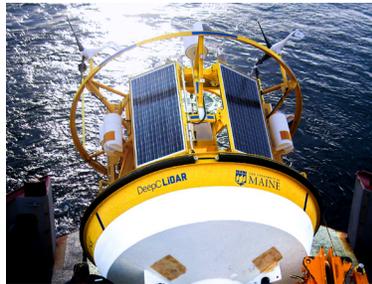
Developed in partnership with Dr. Neal Pettigrew of the UMaine Physical Oceanography Group, AWS Truepower, and NRG Renewable Systems and funding from the U.S. Department of Energy and the Maine Technology Institute



Successful 6-month Validation of DeepCLiDAR in the Northeast United States

Sample DeepCLiDAR Wind Measurement Performance Against Carbon Trust Roadmap Key Performance Indicators

| | | |
|------------|---|--|
| X_{mws} | Mean Wind Speed - Slope Tested for two speed ranges: a) >0.0 m/s b) 4.0 to 16.0 m/s | Best Practice: 0.98 – 1.02 Results: a) 0.998 – 1.008 b) 0.998 – 1.013 <i>Passed for both speed range</i> |
| R_{2mws} | Mean Wind Speed – Coefficient of Determination Tested for two speed ranges: a) >0.0 m/s b) 4.0 to 16.0 m/s | Best Practice: ≥98% Results: a) 0.988 – 0.994 b) 0.988 – 0.994 <i>Passed</i> |
| M_{mwd} | Mean Wind Direction - Slope Tested for two speed ranges: a) >0.0 m/s b) 4.0 to 16.0 m/s | Best Practice: 0.97 – 1.03 Results: a) 0.985 – 0.989 b) 0.985 – 0.987 <i>Passed</i> |



Validation Testing Conclusions

“Based upon the results of this test, and cumulative results of the two previous phases, AWST concludes that the DeepCLiDAR meets the Carbon Trust’s acceptance criteria, and is capable of accurately measuring wind speeds and directions across the range of meteorological and ocean conditions observed during the campaigns.

Having successfully completed these validation exercises, the DeepCLiDAR has demonstrated a “Pre-commercial” level of maturity. Sufficient performance data are now available to assess the system’s uncertainty when operating in similar environmental conditions.

AWST considers this system valid for use in an offshore wind resource and design condition assessment campaign in similar metocean conditions.”

