

From Wind Resource to Ground Risk: Building Confidence in Offshore Wind Projects

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Offshore wind development projects demand stakeholder confidence building across resource assessment, foundation design, cable routing, installation planning, operations, and financing. Inadequate understanding of site-specific wind resources, metocean conditions, and subsurface characteristics often increase technical and financial risks and uncertainties, impacting investment decision making for project development.

In this presentation, we will bring our unique experiences of supporting wind development projects across the world. Our site characterization approach in developing optimal data solutions through acquisition, processing and interpretation of both wind-metocean and geophysical data is critical for reducing technical, commercial, and operational execution risk across the project lifecycle and building investors' confidence.

Wind resource assessment from the floating LiDAR measurements form the primary basis of site-specific bankable annual energy production (AEP) estimates, wake modeling, turbine selection, and extreme-load assessment. We will share significance of safe and efficient project design and execution of floating LiDAR Buoys for generating quality measurements, drawing our expertise from prior floating LiDAR buoy campaigns from multiple geographic regions.

Geophysical and geotechnical data enable characterization of the seabed & shallow subsurface structure and properties of key soil units and allow identification of hazards to ensure reliable and safe foundation or anchoring systems. We will share how our site characterization survey strategy could decrease the number of geophysical surveys undertaken, whilst honoring site complexity and subsurface heterogeneity at spatial scales, ranging from meters to hundreds of square kilometers e.g. the extent of a typical windfarm. A single-pass integrated geophysical and hydrographic survey incorporating Ultra High Resolution (UHR) 3D seismic data, along with advanced processing and imaging technologies, enable Quantitative Ground Model (QGM) building during the early part of the

project cycle, resulting in targeted and optimized geotechnical sampling and testing for site-specific foundation design, and installation planning with concomitant reduction of both time and cost.