An overview of geo-data's role in wind farm development process and challenges related to the metocean conditions and commercial fishing activities of the Scotian shelf

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Geo-data is critical information used to design and plan installation of wind farm foundations, mooring systems, and cables. Wind farm development costs range from $4 billion (B) to $7B CAD per gigawatt (GW). Although geodata costs only represent 1% to 4% of the overall development cost, this translates to significant cost for developers at early stages of the development process. The data represent critical means to optimizing development costs, reducing environmental impacts, and mitigating installation risk. This presentation will summarize drivers for collecting geo-data and the role it plays in wind farm development process, pressure to reduce geo-data acquisition costs, and unique challenges and constraints for geo-data acquisition on the Scotian shelf related to metocean conditions and commercial fishing activities.

Geo-data are used to evaluate the metocean, seafloor and subseafloor conditions. Having access to more of those data allows for building a more comprehensives understanding of site conditions. This comprehensive understanding of site conditions provides an improved ability in understanding and mitigating project development risks compared to site condition assessments with more uncertainty due to less geo-data. This leads to a desire to reduce uncertainty related to ground conditions at early stages of the project development process.

The geo-data are acquired through geophysical surveys, geotechnical investigations and benthic surveys that represent significant devex costs during early stages of the wind development process. Additionally, those surveys are conducted using vessels whose productivity are impacted by metocean conditions (e.g. wind, waves and current). The Scotian shelf, where the current Wind Energy Areas are located, are subject to harsh weather conditions and commercial fishing activities that need to be considered for future geo-data acquisition. This presentation will summarize those challenges and present different strategies for reducing costs and acquiring geo-data to support wind farm development needs.