

WHAT TOOL CAN BE DEVELOPED TO OPTIMIZE THE LOGISTICS OF THE ASSEMBLY AND THE OFFSHORE INSTALLATION OF FLOATING WIND TURBINES?

10 Feb
08 april
2021



L'éolienne flottante Floatgen développée par Ideol - tests sur le site d'essais Sem-Rev de Centrale Nantes au large des Pays de la Loire © Arnaud Dréan

THE COMPANY

For more than 20 years, WPD is a strong partner for the development, financing, construction and operation of wind farms on land and at sea, and of solar parks as well. Founded in Bremen (Germany), WPD AG has installed more than 4,800 MW so far in 25 countries.

With approximately 20 GW in its pipeline and more than 3,100 members of staff, WPD Group holds a leadership position in the development of wind farm projects, built on a financial long-term strength.

WPD's track record in offshore wind dates back to 2000 starting off with the active development of an European project pipeline. Since the turn of the century, WPD has been engaged in the implementation of 20+ offshore wind projects over the World and has acquired unequalled know-how in Offshore Wind Project Development through multiple stakeholder engagement and numerous technical and environmental studies - ensuring best in class practices and standards.

WPD offshore, responsible for offshore activities within WPD AG, is actively engaged in all sectors of offshore wind power - from classic project development and consenting, technical and environmental studies, through design engineering, procurement, project finance and construction all the way to operation of the multi megawatt power plants.

THE CHALLENGE :

The challenge we are suggesting for the contest “Résolutions MRE Pays de la Loire – Asturias” is related to floating wind energy. It reflects the need to assess the dependence of floating wind concepts on weather and on the supply chain, during their installation at sea.

As an offshore wind project developer, we are examining several solutions for floating substructures. In this process, it is necessary to consider the entire life cycle of the floating wind turbine, including, particularly, the Transport and Installation phase.

On the one hand, the operations at sea depend on the weather (sea states, wind, tides). The effect of the weather on the transport and installation differs according to the concepts (shape of the substructure, stability) and the installation strategy.

On the other hand, the installation rate depends on the supply chain on land and at sea. This includes the storage of the floating wind turbines (prior to installation), the assembly process of the substructures and the wind turbines (delivery rate), the Transport and Installation fleet, the distance between the assembly hub and the final installation area, the sequencing of the offshore operations (installation of mooring lines, installation of inter-array cables, hook-up of the floating wind turbines).

This scope is complex. Thus, we consider that the sensitivity of the floating substructures, as well as their logistic organization, according to weather and project specificities, must be assessed.

THE EXPECTED BENEFITS

We expect from this project the development of a decision-support tool. Based on site-specific inputs (distance between the assembly hub and the final installation area, weather window forecasts, storage capacities on land and at sea) and floating substructure data (towing speed, installation lead time, mobilization of specific vessels), the tool will define the most appropriate logistics solutions (installation fleet, storage of pre-assembled components and fully assembled floating wind turbines). This solution will be reinforced by an installation schedule and a cost overview.

Depending on our needs and the capabilities of the solution provider, an additional module can be integrated into the tool. This module will cover the onshore logistics. For example, it will consider as input data : the sequencing strategy, the assembly methods (number of assemblies, time to complete one assembly), the transport and installation schedule (from the initial tool), the component supply chain (delivery rate). It will then provide a delivery schedule and a cost overview (for the assembly of the floating substructure).



TERMS OF COLLABORATION

We will mobilize a member of the engineering team to provide technical and methodological support and to ensure a role of advice and follow-up with the solver throughout the project.