

PRODUCTS

FRAUNHOFER-CENTER FOR MARITIME LOGISTICS AND SERVICES CML



DEVELOPING AND EVALUATING LOGISTICS CONCEPTS FOR OFFSHORE WIND FARMS

Offshore wind energy

The German government's offshore strategy aims to generate 25,000 MW of energy (equivalent to roughly 5,000 to 7,000 plants) in 2030 through the use of offshore wind farms. This will entail the construction of many new wind farms on the North and Baltic Sea in the near future.

Challenges

The logistics involved in installing and operating the offshore wind farms are a particular challenge and a major cost in this strategy. The logistics costs are estimated to account for 15 to 20% of the total installation costs for an offshore wind farm. The main challenges in the installation are rough weather, heavy swells and distance from the ports which allow just short windows of opportunity for installing the wind farms at sea. In some cases, the installation periods are just a few days long and in total come to approximately 100 to 120 days a year. In order to ensure that the available time is used efficiently, ships, materials and staff must be 'ready for action' as soon as weather conditions permit the installation of the wind farms.

In addition to the installation of offshore wind farms, the operation of the plants themselves is a major challenge for maritime logistics. A wide variety of logistics concepts currently exist relating to the maintenance of offshore wind farms located far from shore. Apart from weather conditions, other challenges include the safe transfer and crossing of staff to the plants, an ability to troubleshoot rapidly and the availability of ships for the transportation of large components.

www.cml.fraunhofer.de

Fraunhofer-Center for Maritime Logistics and Services CML Schwarzenbergstraße 95 D 21073 Hamburg

Contact :

Prof. Dr.-Ing. Carlos Jahn Telefon +49 40 42878-4451 carlos.jahn@cml.fraunhofer.de





Procedure

1. Analyze the actual situation:

We work with you to establish the framework conditions for your project, such as the location of the wind farm and the number of plants, and help you to define your requirements and objectives.

2. Develop and model the logistics concepts:

We then develop several potential logistics concepts in line with your requirements and model these in a simulated environment. Alternatively, we can also model the concepts that you yourself have designed.

3. Simulate the concepts:

In a following step, the planned areas can be verified using a simulation process. The simulation process makes it possible to link the previously planned layouts with the associated target processes and check them for weaknesses. As part of the simulations, we create a sensitivity analysis to identify the crucial factors in the processes.

4. Analyze the simulation results:

The simulation results are then evaluated and compared in terms of your objectives and preferences. The output of the simulation process includes costs and process duration but also details about the availability of the plants.

5. Select a concept:

Based on the simulation results, we support you in identifying the logistics concept that is best suited to your project and corresponds most effectively to your requirements.

Our services

We support operators, manufacturers, project developers and suppliers in the offshore wind industry in dealing with the logistical challenges. This includes the development and evaluation of efficient logistics concepts for the installation and operation of offshore wind farms using established methods such as simulation.

The benefits for you

Selecting a suitable logistics concept for the installation or operational phase of an offshore wind farm is a major and, in some cases, costly decision. A large number of potential concepts must be identified and validated in order to select the most suitable concept for a specific wind farm. We can support you in this task with our methodological expertise. With a tailored concept design and the simulation of concepts in the most realistic conditions, the relevant concepts can be comprehensively evaluated before the first foundation is built. This provides you with a solid basis on which you can make decisions. And of course we can support you during this decision-making process.



ANALYZE THE ACTUAL

Your requirements and objectives

SITUATION

