



DHI MARKET AREA: ENERGY

OFFSHORE WIND

Supporting the growth of one of the world’s leading renewable energy technologies

Climate change is the most serious environmental challenge we face today — a challenge with a direct impact on social, economic and ecological issues. It has become necessary to reduce CO₂ emissions produced by human activities. In this context, green (non -CO₂) technologies are attracting increased interest from industries and governments.

Wind power has emerged as a leading renewable technology — it’s being developed the fastest compared to other renewable energy sources. Currently, there are some 160 offshore farms within European waters either in operation, under construction or being planned. This rapid proliferation in Europe portends a global trend and, to ensure the sustainability of these developments, several challenges are to be overcome. These include coping with harsh environmental conditions when moving further offshore, preserving the fragile ambient ecosystem and ensuring maximum efficiency — at sustainable costs.

- THE CHALLENGES**
- Optimising wind farm development — from site selection to construction
 - Coping with harsh environmental conditions
 - Minimising environmental impact
 - Ensuring efficient and effective maintenance and operation

OUR APPROACH With 50 years of experience solving challenges in water environments, we have a thorough understanding of Metocean conditions and environmental impacts. We use this expertise to help you make informed decisions during the project phases. Our expertise from working on more than 200 offshore renewable projects worldwide helps you ensure a solid foundation for your project.

- OUR SOLUTIONS**
- Field data collection
 - On-line monitoring
 - Numerical and physical modelling
 - Ecological sampling
 - Habitat modelling
 - Noise impact analysis
 - Barrier and collision studies
 - Seabed and coastal impact assessments

THE ULTIMATE GOAL SUSTAINABLE AND EFFICIENT OFFSHORE WIND FARMS



With the number of offshore wind farms set to rise dramatically in the coming years, it is critical that the **implications for wildlife** – such as barrier effects and habitat loss – are fully considered.

BirdLife International

OUR TOOLS AND SERVICES

We can cater to your every water-related requirement to ensure optimal offshore wind farm development, sustainable construction, and cost-efficient operation and maintenance of your offshore wind power facilities. Our tools and services include:

- a wide-range of numerical modelling with MIKE Powered by DHI software suite and in-house modelling software, which includes:
 - wave and hydrodynamics
 - water-structure interactions
 - sediment and seabed morphology
 - ecology and biodiversity
 - habitat and agent-based modelling
 - numerical underwater noise modelling
- physical model testing (in-house facilities)
- Computational Fluid Dynamics (CFD) analysis
- hydrodynamic load and response calculations
- scour analyses and mitigations
- Metocean data and analyses — hindcast, nowcast and forecast
- survey and monitoring (hydrographic, environmental and ecological), including Local Area Weather Radar (LAWR)
- Geographic Information System (GIS) services
- Environmental Impact Assessments (EIAs), including habitat loss, noise disturbance, hydrographic, and seabed and coast alterations
- application for environmental clearance/licences
- due diligence and independent reviews
- capacity building and training by THE ACADEMY by DHI

PIONEER IN OFFSHORE WIND SINCE 1991

The innovative and efficient methodologies and tools we use to support the offshore wind industry are at the forefront of our field. We have 50 years of experience and extensive knowledge solving challenges in water environments worldwide. As such, our scientifically-based specialist services will continue to assist our customers with finding and developing fast, safe, solid and cost-efficient solutions.

CASE STORIES



The Danish government wants wind power to supply 50% of Denmark’s electricity by 2020. In order to achieve this, a number of coastal offshore wind turbines must be constructed. We supported Energinet.dk – the Danish transmission system operator – with data and analysis on Metocean parameters relevant to the planning and development of potential offshore wind farm sites in coastal waters. We also undertook measurement campaigns to further support the development process.



Over the years, we have helped DONG Energy Wind Power A/S – the world’s leading developer of offshore wind power – reach their ambitious target of having 6.5 GW installed capacity by 2020. As part of this, we delivered comprehensive Metocean data and a study to support the design, installation, and operation and maintenance of the first phase of the 4 GW Round 3 Hornsea Zone Offshore Wind Farm off the coast of the United Kingdom in the North Sea.



We are at the forefront of technology when it comes to assessing the impact of underwater noise produced by offshore wind farm development on marine mammals and in assessing impacts on seabirds. Our innovative and cost-efficient methodologies and models provide realistic impact assessments. Using our methods, we are helping the developers of Poland’s first offshore wind farms (located in the Baltic Sea) gain consent.

Contact us: info@dhigroup.com – For more information, visit: www.dhigroup.com