



DNV – making offshore wind turbines a breeze

DNV HELPS YOU MANAGE RISK FROM SHORE TO SEA

/ FOCUSED
ON DETAILS

/ ALWAYS
APPLICABLE
KNOWLEDGE

/ TAILOR MADE
EXPERTISE



AN INDUSTRY WITH DOUBLE DIGIT GROWTH RATES



There is no longer a question whether investment in wind power will continue but at what double digit growth rate. There is no longer a question where the large wind farms will be built, but how big and complex the offshore wind turbines will be. Offshore wind farms will grow in all ways you can imagine: the height above water, depth below water, distance from shore, geographical spread, power generation per turbine and not at least the amount of investment to make it all possible. As the technological barriers are being pushed constantly and the solutions are more complex, managing risk becomes ever more important.

At DNV we have made it our business to help investors and companies managing risk. We have been assisting companies to manage risk since we came into being in 1864. Although we today apply our knowledge to the full spectre of industries, our core competency has been developed from managing the risk of operating in the marine environment. No one knows the challenges of operating offshore better than DNV.







PRE-PROJECT

Making decisions based on sound analysis of available options at the pre-project phase can make all the difference to your project. You need to design success into your wind farm project, and at DNV we have the knowledge, skills and experience to assist you in finding the best solutions.

THE KYOTO PROTOCOL AND WIND POWER INVESTMENTS

Wind farm projects may qualify for greenhouse gas emission credits under the Kyoto Protocol; emission credits you can use to fulfill your commitments or trade on the greenhouse gas market. As the world-leading provider of validation, verification and certification of projects and being accredited by the United Nations Framework Convention on Climate Change and local emissions trading schemes, DNV can provide you with the expertise you need to get the best possible return on your investment. With more than 100 trained climate change auditors stationed worldwide, we can serve you wherever you plan your onshore or offshore wind farm.



Helping investors and companies
manage risk



We can assist you in finding
the optimal location for your
wind farm

CHOOSING THE RIGHT LOCATION FOR YOUR INSTALLATION

Choosing the right location for your wind farm requires that you can evaluate the expected wind conditions from alternative locations in addition to sea currents, and wave and sea bottom conditions for offshore wind farms. We can assist you in finding the optimal location for your wind farm using a wind resource assessment programme developed by Risø, the world renowned Danish research centre for wind power plants. Knowledge from years of experience with offshore oil installations and numerous wind farm projects will be used in verification of site specific sea currents, wave and soil conditions.

SHIP COLLISION RISK ANALYSIS



An added hazard of placing wind farms offshore is the risk of ships colliding with a wind turbine. A collision may result in production loss with resultant financial consequences stemming from the disruption of production, repair costs and possible environmental impact. Consequently the authorities normally require that the wind farm developers perform an Environmental Impact Assessment, including the ship collision risk analysis, as part of the approval process.

DNV is acknowledged as a world leader in the application of risk assessment and have performed numerous risk assessments of shipping hazards for installations offshore. A ship collision risk analysis performed by DNV will give the developers detailed knowledge about the likelihood of a collision and its possible consequences. If the risk is considered too high, further analysis of possible risk reduction measures can be carried out to bring the risk within acceptable limits.



A world leader in the application
of risk assessment

MANUFACTURING OF WIND FARMS

The manufacturing of wind turbines and building of wind farms are for all practical purposes subject to third party independent assessment and certification. There are a number of reasons for such certification. Regulatory requirements to manufacturing of the wind turbines, associated structures and the construction of wind farms stipulate certification and verification by independent bodies. Stakeholders and environmental organisations demand independent risk analysis on a number of issues. Yet, the most compelling reason for investors and operators to engage DNV in assessment, verification and certification may simply be the recognition that wind farm investment is a risky business in more than one way. You need to partner with the best to manage the many risks you face.

We are accredited under Dutch accreditation to issue certificates for the various stages of the manufacturing.

Our services to the wind energy business are managed from our Global Wind Energy Unit in Denmark. They orchestrate the service offer to the industry, drawing upon specialized knowledge and experience from our auditors, surveyors and specialists around the globe. As world leader in the offshore oil and gas, ship classification and certification field, in addition to our impressive record from the wind energy business and with more than 6000 employees world wide, we are able to cater for all your needs.

We invest in relevant research and development and publish our own technical rules and guidelines. To underpin our leadership position on certification of large wind turbines and to ensure that we are at the forefront of technological development, we are now part-owner of the new Blade Test Centre in Demark.

THE TYPICAL ELEMENTS IN PRE-PROJECT, TYPE APPROVAL AND PROJECT CERTIFICATION

1. Pre-project	2. Wind turbine type certification	3. Project certification of offshore wind farms	4. In service inspection
<ul style="list-style-type: none"> / Emission credits / Evaluation of design basis / Choosing the right location / Ship on turbine collision 	<ul style="list-style-type: none"> / Design verification / Independent calculations / Manufacturing survey instead of evaluation of manufacturing / Type testing 	<ul style="list-style-type: none"> / Site specific approval of integrated structural systems / Verification of external conditions: soil, wind and wave / Manufacturing survey / Marine verification and warranty survey for transport and installation of structures / Installation and commissioning, including power performance verification 	<ul style="list-style-type: none"> / Survey planning and inspection during the operation of the installation

DNV – PROVIDING TRUST AND CONFIDENCE

DNV is an independent and autonomous foundation working to safeguard life, property and the environment. We are a knowledge-based company and our prime assets are the creativity, knowledge and expertise of our people. Helping companies managing risk is our business.

To learn more, visit windenergy.dnv.com
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