

*Expertise for offshore projects worldwide*

# Consulting, Engineering and Services



DEUTSCHE  
**WINDGUARD**



## WHERE SCIENCE AND EXPERIENCE UNITE

*Selected international offshore references*

### GUJARAT (INDIA)

- Feasibility study for technical offshore tender support

### YUNLIN (TAIWAN)

- Technical support of wind turbine generator package management
- Technical adviser on integral load assessment and foundation design
- Technical project management support

### GUANYIN (TAIWAN)

- Technical adviser on integral load assessment and foundation design
- Technical project management support

### XIANGSHUI (CHINA)

- Installation surveillance
- Technical due diligence

### GLOBAL TECH I

- Technical project support
- Concept for verification of power curves
- Manufacturing surveillance for rotor blades and castings
- Supervision of commissioning and 500h maintenance
- Concept for inspection and monitoring
- Consulting during due diligence process
- Concept for recurring inspections

### HOHE SEE

- Commissioning concept

### BARD OFFSHORE 1

- Integral load assessment
- Technical project support for offshore sub station design verification
- Technical project support for turbine foundation verification
- Technical support for offshore inspection program

### GALLOPER

- Technical project support for integral load assessment and monopile design

### NORDSEE TWO + NORDSEE THREE

- Wind farm optimisation
- Wind farm layout and energy yield assessment
- Predesign for monopile foundations
- Offshore tender support

### MERKUR

- Consulting during due diligence process
- Technical project support for integral load assessment and monopile design
- Technical Adviser:
  - Support package management
  - Preparation, annotation and amendment of technical documentation and employer requirements
  - Coordination of technical interfaces with other packages

### TRIANEL WINDPARK BORKUM

- Technical project support
- Manufacturing surveillance
- Verification of structural integrity due to influence of neighbouring wind farms

### BALTIC POWER

- Monopile feasibility and concept design
- Technical adviser on integral load assessment and foundation design
- Technical adviser offshore sub station bid evaluation

### WIKINGER

- Technical project support for integral load assessment and jacket design

### BUTENDIEK

- Technical due diligence
- Technical project support for integral load assessment and monopile design

### GENNAKER

- Technical adviser on integral load assessment and foundation design
- Technical adviser design basis and site assessment
- Technical project management support

### MEERWIND SÜD/OST

- LiDAR leasing
- Support for operations and maintenance concept

### NORDERGRÜNDE

- Predesign for monopile foundations
- Technical project support for integral load assessment and monopile design





## WIND & MARINE ENGINEERING

**Offshore construction work is a challenge. As your reliable partner for all demanding technical interfaces, Deutsche WindGuard understands the particular requirements of this special environment. Count on our extensive know-how regarding site-specific characteristics of offshore locations around the globe.**

### INTEGRAL LOAD ASSESSMENT

Among all stakeholders of your offshore wind energy project, OEM and designer play the key roles throughout the planning phase. To ensure a worry-free interface management, we support you regarding organisation, optimisation and monitoring. Benefit from our 20 years of experience with all renowned OEMs in onshore and offshore projects and receive a sophisticated concept for an integral load assessment for turbines, structures and foundations.

### STRUCTURAL DESIGN AND ANALYSIS

Profit from our long-standing and comprehensive know-how in the field of structural design. Leave the design of tower and foundation of your offshore-structure to our experienced hands. Thanks to our constant involvement in renowned projects worldwide, we are always up to date with the latest technology. This gives you the confidence of receiving feasibility studies and cost analysis as well as concept and tender design with maximum certainty.

### WIND FARM LAYOUT

The layout of your wind farm has significant impact on expenditures and revenue. We help you increase the efficiency of your planning process, reduce your costs and maximise your profit. Optimising your layout based on applicable technical and economical conditions always incorporates site-specific parameters such as soil conditions, turbulences from neighbouring wind farms, grid layout as well as the costs of foundations and electrical cable.

### TECHNICAL SPECIFICATION AND REQUIREMENTS

Besides layout and structural design, technology plays the most important role for the operation and performance of your offshore wind farm. To ensure that you get exactly the technical components you need, we contribute our know-how and experience to precisely specify all relevant parts such as turbine, foundation, tower and sub-station. Our service also includes the exact definition of the required scope of delivery for the respective component suppliers.

### ENERGY YIELD ASSESSMENT

For the financing of your wind farm you need to submit reliable data and an accurate forecast of future energy yields. With a long-standing, proven track record in the field of yield assessments, we provide you with independent, scientific calculations that take all site-specific parameters of your planned wind farm into account. As a member of the IEC committee working on new standards for site assessment and yield calculation, we are well acquainted with all applicable guidelines.

### AVAILABILITY AND LOSS CALCULATIONS

In the event that the transmission system operator causes downtimes of your wind turbines exceeding the contractually agreed extent, you need to know exactly how high the lost revenues are. As independent experts, we calculate the achieved technical availability of your turbines based on operational data from your wind farm. On this basis, we provide you with loss calculations for you to assert your claims against your contractual partner.

### LIFETIME EXTENSION

Fully exploit the economic potential of your wind farm and go for a lifetime extension after the design life has expired. We assist you in evaluating the potential of your wind turbines already in operation. With extensive experience in offshore load assessments, tower and foundation design as well as project certification, we support you in safely verifying the life time extension of turbine, balance of plant and infrastructure and resulting operational expenditure implications.

SCIENCE

EXPERIENCE

# INSPECTIONS & QUALITY ASSURANCE

**A good inspector exactly knows where to look. Our experienced experts understand precisely where the potential weak spots are. Deutsche WindGuard's accredited inspection body ensures highest quality standards, so that you receive the service you need – at any time in the life cycle of your wind turbines.**

## MANUFACTURING SUPERVISION

As your offshore wind project involves considerable investment, it needs to start operation quickly, safely and reliably. Through manufacturing supervision, we help to avoid errors and delays of any kind that jeopardise your earnings. Our inspectors monitor the production process of your project. They carefully examine whether all critical components are produced in accordance with contract, technical specifications as well as required technical and quality standards.

## INSTALLATION SUPERVISION

On site at the wind farm, our inspectors not only ensure that all components have been handled correctly and have passed the transport undamaged. Their responsibility also includes the thorough surveillance of all assembly work in accordance with procedural instructions and required quality standards. We also monitor transfer of ownership and commissioning. Thus you can be certain that everything works as it should and no unpleasant surprises occur.

## TECHNICAL INSPECTIONS

Our accredited type A inspection body according to DIN EN ISO/IEC 17020:2012 is your reliable partner for the entire portfolio of technical inspections – from commissioning and end-of-warranty inspection to periodical and condition-based inspection through to the inspection required in the course of a lifetime extension assessment. We stand for maximum independence, exceptional quality standards and have extensive expertise in offshore inspections.





# PROJECT SUPPORT

**Due to their inherent complexity, offshore projects need know-how from diverse fields of expertise. At Deutsche WindGuard, we have access to interdisciplinary knowledge and more than 20 years of experience working closely with certification bodies and authorities – both nationally and internationally.**

## INTERFACE MANAGEMENT

Complex offshore wind projects involve interaction with multiple stakeholders and service providers. Get us by your side as an experienced partner right from the beginning. We not only assist you in all contract negotiations with your suppliers. We also generate a scope-split-matrix by identifying interfaces and assigning the scope of supply and services. This helps us ensure the smooth handover at each interface of the entire project.

## TECHNICAL PROJECT SUPPORT

As your “on-call” expert, we offer you comprehensive support wherever you need it. Benefit from our extensive detail knowledge and wealth of experience that we can contribute to your various working groups – be it for the WTG, OSS or foundation or any other package. Our support may include preparing reports, conducting assessments and identifying optimisation potential, and – if desired – even the entire project management.

## CERTIFICATION, APPROVAL AND PERMIT SUPPORT

With extensive experience in the certification of offshore projects, we know the applicable processes inside out. We are experts in dealing with certification bodies and approval authorities and precisely know how to help you comply with guidelines and requirements. With a focus on minimising potential risks, we support you in obtaining all necessary permits in a timely manner, so that your wind farm can start regular operation swiftly and without any delays.

## OPERATION AND MAINTENANCE CONCEPTS

Start thinking about the operation and maintenance concept for your wind farm at the earliest possible stage. We support you in planning, preparing and implementing, for example, access systems, transfer and repair vessels and equipment. Taking into account all applicable requirements and environmental conditions at your wind farm site, we deliver a sound cost-benefit analysis. This gives you a substantiated decision-making basis for the long-term operation of your wind farm.

## TECHNICAL MANAGEMENT

Once your wind farm has started operation, your wind turbines should run trouble-free at all times and generate the highest possible yield. Reliability is the top priority for the profitability of your investment. As one of the pioneers in the field of technical management, we monitor the technical condition of your wind turbines around the clock. Our 24/7 control centre implements a pro-active maintenance management strategy in compliance with all guidelines and requirements.



# TECHNICAL REVIEW & VERIFICATION

**The implementation of offshore wind projects involves high financial risks. It is a complex interaction of site conditions, technology, and logistics. Benefit from Deutsche WindGuard's extensive expertise and two decades of experience in supporting offshore projects and reduce financial insecurity.**

## TECHNICAL DUE DILIGENCE

We assess the risks tied to the realisation of your offshore portfolio – from the technical risks of each component and the full turbine to those of the entire project. Considering all technical, logistical, certification- and license-related requirements as well as the O&M concept, we perform a detailed review of your project. This also comprises the verification of all site specific forecasts and assessments of all technical aspects regarding the turbines and the entire infrastructure.

## TECHNICAL CONTRACT SPECIFICATION

To receive exactly the supplies and services you need for the realisation of your wind farm, precise enquiries to your potential suppliers and service providers are essential. We provide you with all the relevant details, technical specifications and requirements you need in order to receive adequate quotations. During contract negotiations with your designated business partners, you can count on our sound expertise and specialist advice.

## RISK ASSESSMENT

Not only for the financing of your project is it crucial to be fully aware of all risks. Through technical risk analysis, we identify all possible risks and quantify the potential financial impact. You thus get to know right from the start, for example, the possible consequences of a delayed delivery or of a potential backup for a planned technical implementation method. Gain the overall view of all risks – from the individual component to the entire project.

## POWER CURVE MEASUREMENT

Of course you would like to make sure that your turbines deliver the warranted power. Our accredited test laboratory specialises in various measurement methods using met masts and LiDARs. We recently received the accreditation for measurements with nacelle-mounted LiDARs that are particularly suitable for offshore wind turbines due to their comparatively simple handling. Our power curve tests are accepted by all major OEMs and are tailored to the site conditions.



**DEUTSCHE  
WINDGUARD**

## PROFIT FROM OUR EXPERTISE AND EXPERIENCE



*“The combination of experience and comprehensive know-how is one of the keystones of the WindGuard philosophy. The numbers speak for themselves: 7.500 inspections on more than 100 different turbine types, energy yield assessments for more than 40 GW installed capacity as well as a multitude of successfully realised offshore projects in German and international seas, in cooperation with well-known manufacturers and developers. This is how we earn our customers’ trust.”*

At home in the complex world of offshore engineering, structural design, simulation, and load calculations, with more than two decades experience in offshore wind, Sven continuously helps clients to lead international offshore projects to success during planning, design and certification:

### **Sven Bicker**

Managing Director  
Deutsche WindGuard Offshore



*“We help you to protect your investment. With our experience from technical assessments for offshore projects with a total capacity of 12 GW, we are your reliable partner for all due diligence related tasks.*

*Add our experts to your team, whenever you find you need additional competence. We will support you – as external ‘on-call’ consultants or as project staff working directly at your site.”*

Project management, engineering and construction specialist, analyst and strategist with 25 years of experience in the wind energy market, onshore and offshore. Niels is regularly involved in WTG specifics, technical due diligence and integral interface consideration and specification, as well as O&M topics.

### **Niels Erdmann**

Managing Director  
Deutsche WindGuard Offshore

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