Issue 2015

# WINDFORCE Guide

**MAIN FOCUS:**

Tendering System

Conference programme

North Sea Wind Farm Tour

**WINDFORCE 2015 Bremerhaven**

11th WAB Offshore Conference 9–11 June

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# Message of Greeting by Sigmar Gabriel

Federal Minister for Economic Affairs and Energy
Patron of WINDFORCE 2015

Bundesministerium für Wirtschaft und Energie

2015 is the breakthrough year for offshore wind power. By the end of this year, more than 3,000 MW of offshore capacity will have been installed in the German parts of the North and Baltic Seas. Offshore wind power has entered its industrial phase in Germany and the construction and operation of offshore wind farms is now creating added value.

Last year, we set the course for this by making important adjustments to the legal environment: we have ensured the necessary degree of investment security, which has helped us achieve a true breakthrough. In future, the amount of funding provided for electricity generated offshore will be determined by way of auction. This will spur competition in the industry. As more experience is gained and new technical solutions discovered, the cost of generating electricity offshore will gradually fall.

To be able to use offshore wind power, you first need to build large-scale power plants at sea. Investors, manufacturers, construction and logistics companies, the supply industry, and not least policy-makers have learned some important lessons as far as the technical, commercial, and legal sides of these projects are concerned. The experience that is being gained by the energy sector, plant manufacturers, suppliers, and also by the port industry and the grid operators is unique: this is the first time that offshore power plants of this size have been installed and operated at such depths, so far from the shore, and with wave heights that are this extreme. We are currently building a showcase that will allow German industry and their European partners to display their prowess. Their performance deserves our deepest respect and forms a solid basis for ongoing improvements in the field of applied technology.

It is now apparent that we did the right thing when we overhauled the Renewable Energy Sources Act last year. There is excellent progress being made on the construction of wind farms and, since the entry into force of the revised law, we have seen additional investments in new offshore wind farms.

Offshore wind power has become a very important segment for many businesses. It is creating attractive jobs in coastal areas, many of them related to the operation of these wind farms throughout the next 20 years. Industry is sending positive signals as well, with companies investing in technical innovation, in areas like in the field of wind turbines, or in tackling the logistical challenges involved in the construction and operation of plants. And we should not forget the grids – an area where we are seeing innovative approaches being followed that hold a great deal of promise in terms of efficiency gains. For all these reasons, I am extremely confident that we will soon be able to bring down the costs in line with what industry has planned.

We can offer investors and everyone involved along the entire value chain a clear and reliable environment to work in. The legal framework up to 2020 has been set, which means that new projects can rely on a stable economic outlook. For industry, this means both opportunities and responsibility: the opportunity to scale up offshore wind energy to industrial levels, and the responsibility to act in the interest of electricity users and considerably bring down the cost. The Federal Ministry for Economic Affairs and Energy is a reliable partner when it comes to offering support with research and development into lowering the cost and improving the efficiency of the technology, and also when it comes to cutting red tape.

All the relevant aspects within an energy supply system must be fine-tuned so that they work in concert. This is the only way to ensure that the German Energiewende becomes a success story that is emulated by others internationally. For this reason, we will be continuing to work at both national and European level to further develop the market design for the electricity market, enhance energy efficiency, and expand the power grids, and to make sure all these measures complement each other.

As of 2017, the system used to promote the use of renewable energy will change. We are currently consulting with industry on possible designs for the auctions that are to be held for individual technologies. The aim here is to make offshore wind farms more efficient and more cost-effective. The bidding process will spur competition and attract the greatest possible number of different stakeholders, all of which will ensure that the Energiewende becomes a success and that we will continue to see technical progress. Now is the time for the energy industry and for plant manufacturers to pick up speed and keep to what is an ambitious timetable.

It is my hope that everyone participating in WINDFORCE 2015 will be able to engage in informative and fruitful discussions. You can help us overcome the major technical challenges around offshore wind power and, ultimately, contribute to the success of the Energiewende.

Sincerely yours

Sigmar Gabriel
Federal Minister for Economic Affairs and Energy

# Words of welcome from the Organisers

Ronny Meyer, WAB e.V. and Jens Eckhoff, Offshore Wind Messe- und Veranstaltungs GmbH

## Dear Participants at WINDFORCE 2015!

Welcome to Bremerhaven! We are pleased to see you here, in the eleventh year of the conference, to enjoy three exciting days with us. With more than sixty speakers from Germany and abroad, a relaxed get-together to launch the event, and the exclusive WINDFORCE Dinner, the conference is the place where we can offer you the opportunity again to find out the latest on offshore wind developments, get up to date on the current status of projects, and renew old contacts and make new ones.

After more than ten years of intense work, discussion, and visionary plans for the future, the offshore wind industry has arrived in everyday life as an established industry; indeed, it has now grown out of its infancy. While preparations for a tendering process for the next wind farm projects are currently being made, we can already rely on first experience with installing and operating wind farms. And at the same time, ongoing research has continued to optimise foundations and rotor blades as well as improve turbine performance. However, changes in the underlying political conditions repeatedly pose new challenges. But we will never tire of making it clear that the enormous dimensions and associated complexity of the offshore wind industry require lead times that should not be underestimated at any point. We regularly point this out during all the talks we have, especially at the political level. Even the potential changeover to a tendering model, now scheduled for 2017, which would replace the feed-in tariff system, must go smoothly. Renewed uncertainty in the industry, especially for investors, must be avoided in any case after the experiences of last year and the year before.

The German government's envisaged energy turnaround cannot be implemented without the generation of electricity at sea. The expertise that has emerged in Germany has a global reputation. Both factors should motivate us and make us look optimistically to the future. German companies have long since had more than just the development of domestic offshore wind energy in mind and have become important international business partners. We wish for all of you that WINDFORCE will make a strong contribution to the next steps in utilising offshore wind energy.

At this time we also cordially invite you to next year's WINDFORCE 2016. From 7 to 9 June 2016, the industry will meet again in Bremen in an expanded format to include the only trade show dedicated solely to the offshore wind industry. Take advantage of this opportunity and book your exhibition space on time to present your business to international conference delegates and exhibition visitors as a competent partner for renewable power generation at sea. You will find all the information you need at www.windforce.info. Our team is here in Bremerhaven and happy to answer any questions you may have about next year's event.

You are also cordially invited to join us in January 2016 on the wonderful Danish island of Bornholm for the two-day WINDFORCE Baltic Sea conference, focusing on the development of the offshore wind energy industry in the Baltic region.

Wishing you every success, an interesting event and many good talks!

Ronny Meyer
WAB e.V.

Jens Eckhoff
Offshore Wind Messe und
Veranstaltungs GmbH

# Words of welcome from Hans Gatzemeier

ela[container]

## Managing Director of ELA Container Offshore GmbH

ELA Container Offshore GmbH is pleased to be one of the main sponsors of the WINDFORCE 2015 – the 11th WAB Offshore Conference in Bremerhaven. Recently founded in August of 2014, the ELA Container Offshore GmbH focuses on the need for offshore accommodation in Germany, Europe and the whole world. We decided to support this unique event as main sponsor since we see a huge potential within the wind industry and foresee an interesting and bright future for us, especially within the offshore market. To our opinion, the topic of 'Offshore Accommodation' has not been very prominent in past and current discussions, however, it is an very important and challenging topic that should be given more attention. Not only onshore accommodation is needed but also the demand for offshore accommodation is huge and will always exist. Some large installation vessels specifically designed for the wind industry already have integrated the accommodation space needed for the crew in the vessel design. Nevertheless, platforms and vessels, such as jack-up vessels and barges, will have to constantly adjust their deck layout for each project, depending on the actual number of people needed. This is where Temporary Living Quarters are an efficient and flexible solution to create temporary accommodation and work space. Accommodation is needed especially in the construction and commissioning phase when there is a large concentration of activity taking place in the wind farm. But also for upcoming maintenance within the next years we see an increasing demand to temporarily accommodate people offshore.

In the past years and months a lot of discussions regarding learning curve, cost savings, product improvements and the political environment took place. In addition to all these aspects of offshore wind we would like to take a different approach by focusing on the people working and living offshore. If a wind farm is located more than 15 km from the shore, it is necessary to keep people at sea to save time and reduce costs. From the point of view of the crew they require a high quality of life, which can be established by a high standard of the accommodation units, good food and the possibility of leisure activities. From the operators point of view also the costs for additional accommodation are important.

Through the experience gained from our projects, we realized that the concept for accommodation should be more tailor made to the specific clients' needs, save space and costs by just adding a few containers or removing them again. Hence, we started to work towards flexible 20 ft. units that can quickly and easily be refitted into the desired shape and function. Hereby our new concept "Flexibility on Demand-One Type, Various Accommodation Solutions" was born. Therefore, with our containers "Made in Germany" and our concept of "flexibility on demand" we offer a solution for both parties: buyers and users.

Within this concept, one of our key ideas is the saving of costs for offshore wind farm operators by providing them with the flexibility they need: even during the rental period, the accommodation facility can be extended or changed to the client's specification. Our standard 20 ft container units can be added, removed or switched and quickly connected into an existing ELA accommodation unit. All containers are ready for immediate use after being connected to the electrical circuit board system as well as the fresh and waste water systems. Due to the 20 ft ISO Norm, CSC measurements our containers can be delivered at low costs and within a minimum of time. The low tare weight of 7.7 t also features an easy handling of the units. However, still, the container provides enough space for two separate living rooms to increase users' comfort factor and to offer them some privacy.

Another very important aspect that we took care of is safety. All our containers are manufactured at our premises in Haren, Germany and are strictly monitored during production. Every container is A60 insulated and certified according to DNV 2.7-1 / EN 12079-1. Hence, highest safety standards are achieved to guarantee a safe environment for people working and living offshore.

Taking all these aspects and developments into account, we can proudly say that we are more than ready for direction offshore and we hope to further assist in questions, plannings and projects concerning 'Offshore Accommodation'! ELA is fully committed to support the WINDFORCE 2015 conference in Bremerhaven and also the WINDFORCE 2016 in Bremen. Let's all enjoy this pleasant event and may we all have interesting and fruitful discussions, enlightening presentations and promising new contacts.

Hans Gatzemeier

# Words of welcome from Markus Rieck

## Managing Director of ALSTOM Renewable Germany GmbH

Germany's offshore wind energy industry is presently very dynamic: offshore converter stations are being rolled out, wind farms are going online, new wind turbines are being installed every day – mostly in the North Sea, but in the Baltic too. The BWE expects capacity to quadruple over the next year. In Germany, more than 2,000 MW will be transmitted to the grid in 2015, while the estimated figure for the United Kingdom is 800 MW. That means that by the end of the year, Germany will have taken the lead, ranking first in installed offshore wind power followed by China and the United Kingdom.

Alstom has developed the Haliade™ 150-6MW, a high-yield electricity generator. It is currently one of the largest offshore wind turbines and also the first of a new generation of offshore turbines. With 6 MW of output and a 150-metre diameter rotor, each of these wind turbines can meet the electricity demands of 5,000 households. In March 2012, the first prototype of the 6 MW turbine was installed onshore at St. Nazaire, France; in November 2013, the first offshore deepwater (35m) installation was completed in the North Sea at the Belwind wind farm 46 km off the Belgian coast. Since then, the Haliade has received final certification from the classification society DNV GL. This certification officially approves the engineering, design, production, operation and efficiency of the turbine and is a prerequisite for commercial operation.

In March 2015, Alstom began serial production of nacelles and generators at its new production facilities in St. Nazaire, where 238 wind turbines are also being assembled for three French offshore projects to be installed by EDF. Moreover, five Haliade wind turbines have been ordered for the Block Island project in the USA. The commission is France's first export contract in the offshore wind energy sector, and the first offshore wind project to be undertaken in the USA. The two projects are expected to generate a total of 1.5 GW of wind power.

The continual expansion of offshore wind farms 80 km or more away from the shore brings up the issue of low-loss connections to the mainland's electricity grid. Alstom also has a solution for this. The transmission system operator TenneT selected Alstom in February 2013 to serve as general contractor and build the DolWin gamma offshore converter platform as well as the land-based converter station in Dörpen. With its low-loss, high-voltage direct current (HVDC) transmission technology, the converter platform will ensure that power generated at the offshore wind farms is transmitted to the mainland grid at very low loss.

Located in the south western part of the North Sea, DolWin gamma will transform 900 MW of power generated by the wind turbines from alternating current to direct current. It will then be transmitted to the Dörpen West land-based converter station at a voltage level of 320 kV via subsea and land cables (total cable length is about 160 km). Once the power reaches the Dörpen station, it will be converted back to alternating current, fed into TenneT's onshore electricity grid and delivered to consumers.

The DolWin gamma converter platform will be the centrepiece of one of a total of twelve connections for offshore wind farms in the North Sea. Together, they will help TenneT to develop approximately 7.1 GW of connection capacity by 2019.

The topside will house Alstom's HVDC technology, workshops, living quarters and engine rooms. It is as tall as an eleven-storey residential building, 55 metres wide and longer than an Airbus A380. The platform's support structure, referred to as the jacket, will be anchored in Dollart Bay in waters nearly 30 metres deep. Once it is attached to the substructure, the self-erecting topside will be raised to approximately 20 metres above the surface of the water by means of a hydraulic jack-up system.

DolWin3 is Alstom's first HVDC offshore project, but our engineers draw on over 50 years of experience in HVDC technology. At the same time they profit from the numerous AC offshore projects that Alstom has successfully completed in recent years.

Alstom and its teams support the implementation of the energy transition – our team at ALSTOM Renewable Germany GmbH in Hamburg accompanies client projects in the areas of on and offshore wind power, and our highly efficient teams at ALSTOM Grid GmbH in Berlin and Dresden are in charge of the realisation of offshore transmission projects.

Let's take advantage of this dynamic market situation!
In this spirit, I wish you all a successful conference, productive exchanges and beneficial contacts!

Yours sincerely, Markus Rieck

ela[container]

# Offshore Accommodation

for Rent and Sale


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ela[container]

# ELA Container Offshore GmbH

## Flexibility on Demand – One Type, Various Accommodation Solutions

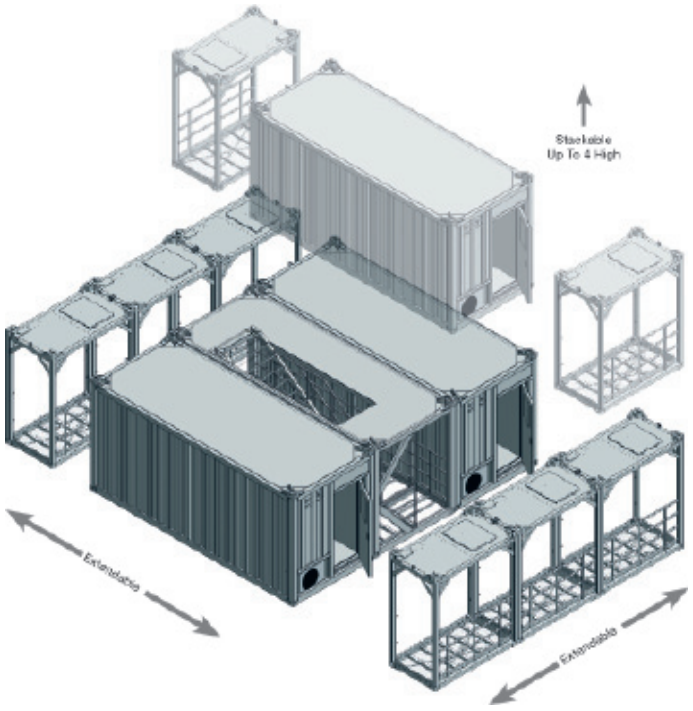
ELA Container Offshore GmbH produces stand-alone offshore containers for rigs, converter platforms and all types of seagoing vessels, pontoons and barges. These offshore containers are provided as living quarters, offices, messrooms, galleys, laundry facilities, recreation or locker rooms for your individual demand.
Object of ELA is to provide accommodation in flexible and convenient 20 ft. Offshore Containers. The company was shaped by experience from several offshore projects. Mr Gatzemeier, the Managing Director at ELA Container Offshore GmbH, says: "Through the experience gained from our projects we realised that the concept should be more tailor made to the specific flexible offshore requirements. We experienced that clients want to react more flexible to specific needs, save space and costs by just adding a few containers or removing them again." Thus the company started to work towards flexible 20 ft. units that could quickly and easily be refitted into the desired shape and function. Hereby the new concept "Flexibility on Demand – One Type, Various Accommodation Solutions" was born. The concept is based on two main points: flexibility on demand and high safety standards and certification.

### Flexibility on Demand:

Due to the 20 ft ISO Norm, CSC measurements and the tare weight of only 7.7 tones the handling of containers is easy and the containers are delivered at low costs and within a minimum of time. To save even more space all units can be stacked up to 4 high. Even during the rental period, your accommodation facility can be extended or changed to your specifications. All ELA Offshore units can be added, removed or switched and quickly connected into an existing ELA accommodation unit. The containers can be connected with stairway and gangway containers. Therefore, a complete accommodation facility can be configured, planned and assembled on site. All containers are ready for immediate use after being connected to the electrical circuit board system as well as the fresh water and waste water systems (if necessary).

### High safety standards and certification:

All containers are DNV2.7-1 /EN 12079-1, CSC certified. In terms of fire resistance an A60 insulation provides high safety standards. Mr. Hans Gatzemeier says, "We offer turnkey solutions that are 'Made in Germany'".




# HALIADE™ 150-6MW

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Simple: direct-drive permanent magnet generator (PMG)
Efficient: 150m diameter rotor for high energy yield

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ALSTOM
*Shaping the future*

# ALSTOM

## Almost 6,500 MW and 3,000 wind turbines installed and under construction!

Alstom is a leader in the construction of plants and products for power generation, energy transmission and rail infrastructure, and sets benchmarks for innovative, environmentally friendly technologies.

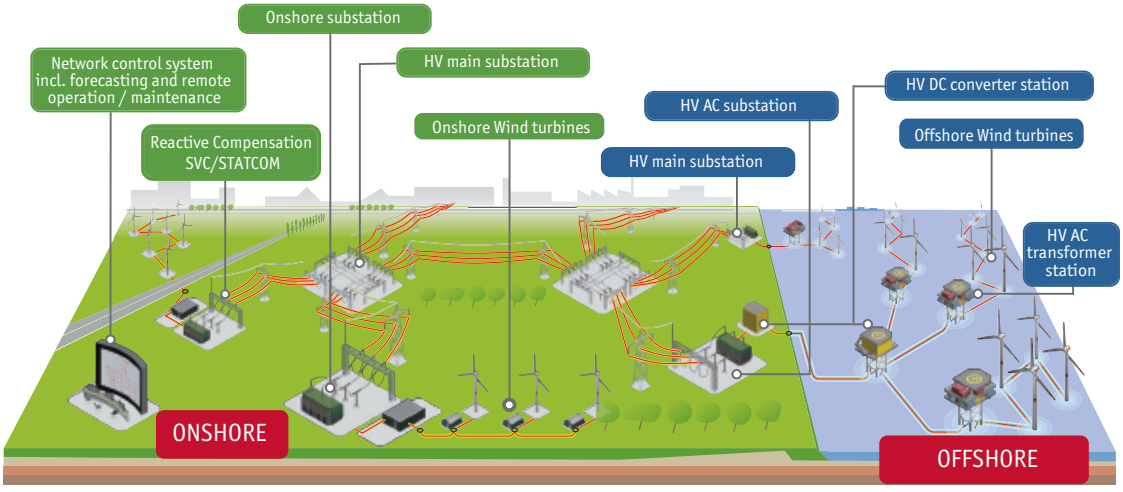
Alstom is shaping the future of energy systems. As the market leader in integrated solutions for clean electricity generation, Alstom provides technologies for all energy sources including wind power. With the Haliade 150-6MW, the first new-generation offshore turbine, Alstom has developed an extremely powerful electricity provider. One plant alone can cover the consumption of 5,000 households. In addition, Alstom is designing, building and installing several onshore turbines known as the ECO platform, with outputs of 1.67 MW to 3 MW and rotor diameters of 80 to 122 meters. More than 3,000 wind turbines have already been installed by Alstom at over 300 wind farms worldwide, with a total capacity of almost 6,500 MW.

Alstom covers the complete spectrum necessary for the energy transition in Germany, from generation through to smart grid integration of renewable energies.

With over 130 years of experience, Alstom is one of the market leaders in electrical energy transmission. The company stands for quality and turnkey solutions in combination with grid integration of renewable energies in the onshore and offshore sectors. For instance, Alstom supplied the electrical equipment for the first operational German offshore wind farm, alpha ventus. In the onshore sector, Alstom delivers turnkey system solutions for integrating energy into the high-voltage grids. Furthermore, Alstom already has 50 years of experience in high-voltage direct current (HVDC) transmission. This expertise will also be applied to German electricity highways of the future. Alstom brings power to the projects of its customers, who range from grid operators, municipal utilities, and electricity-intensive industrial companies to electricity traders.

Alstom is a global leader in the world of power generation, power transmission and rail infrastructure and sets the benchmark for innovative and environmentally friendly technologies. Alstom builds the fastest train and the highest capacity automated metro in the world, provides turnkey integrated power plant solutions and associated services for a wide variety of energy sources, including hydro, nuclear, gas, coal and wind, and it offers a wide range of solutions for power transmission, with a focus on smart grids.

The Group employs 88,000 people in about 100 countries. In Germany, Alstom employs 7,600 people at 23 locations in the sectors Power, Transport and Grid.



# System Change Brings Opportunities and Risks

Future subsidy rates for renewable energies are no longer to be determined by fixed remunerations but by tendering – this is the aim of Germany's present government. But the industry is sceptical because this kind of model cannot function without having adequate competition, and competition is a rare thing indeed in the offshore wind industry because there are so few players.



The tendering models expected to start in 2017 have made it apparent that there is a paradigm shift going on in Germany. So far, Germany's definitely successful and often copied law to promote renewable energies, the Renewable Energies Act (EEG), has provided for strong development and rapid growth in green power technologies. However, because of rising costs and levies, but also because of competition law requirements on the part of the European Union, the German government intends to determine future subsidies by using tendering processes. This policy is supposed to reduce costs as well as preserve the present diversity of players in fair competition and ensure the achievement of scheduled expansion targets. Contracts for the services put out to tender should be awarded to the actors making the best offers.

The price quoted is then guaranteed for every kilowatt-hour of electricity produced over a long period of 20 years. Basically, the debate in Germany revolves around how much regulatory effort would be involved in this process, which securities and guarantees the bidder may get, and whether the whole procedure in the end allows fair competition with many players and thereby leads to cost reductions. In the offshore wind industry in particular, the key question is how tendering can thereby be combined with the regulatory framework, because until now the installation of the grid infrastructure needed in the North and Baltic seas has been systematically piloted by a federal schedule and an offshore grid development plan.

It all starts with photovoltaics. In 2014, when the newly amended EEG was adopted, the decision was taken to launch pilot projects to tender on solar power in order to gain experience with this instrument. To this end, Germany's Federal Network Agency, as the responsible regulatory body, is issuing invitations to tender on 500, 400 and 300 megawatts respectively by 2017, for which there will be three rounds of bidding each year. Additionally, the Federal Ministry for Economic Affairs and Energy (BMWi), as the ministry responsible, has commissioned market analyses of all green energy technologies; these analyses are expected to serve as the basis for further invitations to tender. "Looking ahead, this principle should be applied to all other technologies. But that means the EEG would have to be amended again in 2017 because the model is presently designed only for photovoltaics. So right now we are talking this over with industry representatives", said Beate Braams, a press officer at the BMWi.

And these industry representatives have been groping in the dark up to now because it is not clear what these models might look like in practice. So far, both the political side and industry associations have been making suggestions on what the invitations to tender could look like. These are firstly that the options should allow an adequate number of interested parties to participate. To this end, more performance should be tendered on than is ultimately needed. The desired competitive effect would emerge only by using this lever of supply and demand. Furthermore, it is still open whether tendering would be on power, capacity or area. Secondly, it is the smaller players who would struggle to cross the entry threshold. Like their larger competitors, they would also have to pay the costs of preliminary project planning as well as secure the guarantees per megawatt that must be lodged as collateral. If projects were delayed or if these bidders experienced negative auction results, they would quite simply lose their investments.

On land, those privately owned wind farm projects and cooperative models would be affected that could hardly place a bid or get a loan without the probability of realising the project. "That's why we have made a simple proposal together with other players. EUR 50,000 per megawatt should be deposited as security and the period of time for realisation should be fixed at 18 to 24 months. This model would be open to all players and focus on well-advanced projects or projects ready for construction. On one hand, this eliminates risks in the approval process and leads to the implementation of the wind farm project that was actually bid on. And on the other hand, it keeps the current market structure in place", explained Klaus Meier, chair of WAB's Executive Board and managing director of wpd.

For a number of reasons, the question of competition is very central to the offshore wind industry. Topping the agenda are the facts that there are only a limited number of actors and investors, and that the pricing of tenders is complicated due to the long period of project planning involved and because pre-ordering from suppliers is difficult. Added to that, the German government has capped its targets. Instead of the 10 gigawatts of capacity originally foreseen, the target now is to issue invitations to tender on a maximum of 6.5 gigawatts of installed capacity by 2020, and after that, only 800 megawatts annually. This is equivalent to the capacity of two typical wind farms in the North Sea, and indeed falls short of what is desired. To enable the industry to achieve at least the cap level, Germany's Federal Network Agency placed a grid connection capacity of 7.7 gigawatts on the market at the end of 2014. While distances from Germany's coasts and the potential for electricity production play an essential role in awarding contracts for cost reasons, once the tendering procedure is concluded and there is a final figure for how much capacity will actually be built, the difference (in capacity) between what the Federal Network Agency placed on the market and what is actually installed is then returned to the agency as it serves as the regulator of Germany's physically installed capacity.

Moreover, there is a fixed procedure for the grid connection made available by transmission system operators. This results out of the grid plans for a total of thirteen clusters in the North Sea and the criteria laid down by law for connection. Both of these factors are expected to make the scheduling for connecting offshore wind farms to the grid more manageable after the earlier timetable ran into serious delays. "For a tendering process to work as desired, we need, first of all, compatibility with grid expansion at sea, and secondly, more capacity to be tendered on in the competition than can actually be installed", said Meier.

Even so, there is no guarantee of having enough competition. Although there are already many licenced offshore wind projects in the North Sea, they are spread across a total of thirteen clusters. In a circular to the industry, Germany's Maritime and Hydrographic Agency (BSH), the federal authority responsible for licencing, announced that enough projects were ready for construction, and planning would focus on only two zones. "This applies to Clusters 1 to 8. For the remaining areas, the Federal Network Agency is not planning any more grid development or grid connection", explained Nico Nolte, who is responsible at the BSH for regulation at sea. This is basically the result of the capping. Theoretically, 31 approved projects with more than 2,000 turbines would compete annually for 800 megawatts, but the reality is that not all projects have been promised grid connection capacity. The planners of projects in the other zones would go empty-handed, even though they have already invested money into development or have been awarded licencing. "Rights similar to ownership were awarded to sites, and many millions of euros were invested for their development or purchase. This raises the question of what would happen to these investments", said Meier.

This problem is also worrisome for governing politicians in Bremen and Lower Saxony because it would mean that the businesses affected had built on sand if licences were withdrawn. Both German states benefit directly from the value creation chain in the offshore wind energy industry. Politicians have warned that system change dare not lead to a renewed disruption in expansion like that which brought the offshore wind industry to a halt when there were

**That's why we have made a simple proposal together with other players. EUR 50,000 per megawatt should be deposited as security and the period of time for realisation should be fixed at 18 to 24 months. This model would be open to all players and focus on well-advanced projects or projects ready for construction. On one hand, this eliminates risks in the approval process and leads to the implementation of the wind farm project that was actually bid on. And on the other hand, it keeps the current market structure in place.**

Klaus Meier, chair of WAB's Executive Board and managing director of wpd.

delays in grid connection and a public debate raged over the role of offshore wind power in Germany's energy turnaround. This slump did not end until the Renewable Energies Act was amended in August 2014 and provided for sound legal protection and associated market recovery. The industry is now expecting 3,000 megawatts to be installed at sea by the end of this year. To ensure that this happens, Bremen's senator for economic affairs, Martin Günthner, and Lower Saxony's premier are proposing a model that has stable and sustainable development in mind. This model should, in a transitional phase, also take projects into account that have already received binding approval. This would take into consideration the high costs of extensive preliminary studies. These high-level politicians advocate using Denmark's model for tendering in a second phase in which the state provides all of the essential prerequisites for planning and itself commissions the grid connection.

This proposal is also widely supported by the offshore wind industry. Although it rejects tendering as an instrument for reducing costs, the industry has taken up a position in the ongoing discussion. Accordingly, the Offshore Wind Industry Alliance, an association of the industry's major players with the participation of WAB, is, after weighing in all factors, likewise proposing a model. This model is based on issuing invitations to tender on already approved projects and available grid connection capacity in individual clusters, and on finding solutions that apply comprehensively to all clusters. Bidders could then participate in the tendering process in the defined zones. This proposal would keep the licenced projects in the North and Baltic seas on legally secure ground and allow them to be managed on predictable schedules, avoiding a wave of lawsuits from the operators concerned. But even that is just one position so far. "Many workshops have been held but neither politicians nor the industry have a final opinion. This problem has to be tackled on all sides", said Dr Ursula Prall, partner at the Becker Büttner Held law firm and executive chairman of the Offshore Forum Windenergie. Her law firm supports the industry on the requirements for tendering. And here it is not only about competition but about having a stable framework for investment. As things now stand, projects would be affected by tendering that have received no promise for grid connection capacity by the end of 2017 or where construction will not have started by the beginning of 2021. This is a very narrow window of time for the complex planning of offshore wind farms.

# Conference Programme Overview

## TUESDAY, 9 JUNE 2015

**from 2 p.m.** Registration of conference participants

**7.30 p.m.** **CONFERENCE KEYNOTES**

**8.30 p.m.** **WINDFORCE RECEPTION AND GET TOGETHER**

## WEDNESDAY, 10 JUNE 2015

**7.30 a.m.** Registration of conference participants

**8 – 9.45 a.m.**

**BREAKFAST SESSION A**
**ROOM A**
**New international markets**

**BREAKFAST SESSION B**
**ROOM B**
**DC Grid connection –**
learnung from experiance

**10 a.m. – 1 p.m.**

**SESSION C**
**ROOM A**
**Germany's Renewable Energies Act –**
the starting point for a tendering system?

**SESSION D**
**ROOM B**
**National projects –**
planning, installation and operation

Lunch
1 p.m. – 3 p.m.

**3 – 5 p.m.**

**SESSION E**
**ROOM A**
**Financing**

**SESSION F**
**ROOM B**
**Grid connection –**

WINDFORCE Dinner
Abeking & Rasmussen, Lemwerder
7.30 p.m.– midnight

# WINDFORCE 2015 Bremerhaven

## THURSDAY, 11 JUNE 2015

**7.30 a.m.** Registration of conference participants

**8 – 9.45 a.m.**

**BREAKFAST SESSION G**
**ROOM A**
**Offshore turbines**

**BREAKFAST SESSION H**
**ROOM B**
**Offshore vessels**

**10 a.m. – 1 p.m.**

**SESSION I**
**ROOM A**
**European projects**

**SESSION J**
**ROOM B**
**Service and maintenance**

Lunch
1 p.m. – 3 p.m.

**3 – 5 p.m.**

**SESSION K**
**ROOM A**
**Foundations**

**SESSION L**
**ROOM B**
**Cost reduction**

We reserve the right to change the programme without prior notice.

**Simultaneous German / English as well as English / German translation is available throughout the entire conference.**

# WINDFORCE 2015 Conference Programme

## TUESDAY, 9 JUNE 2015

7.30 p.m. **OPENING OF THE CONFERENCE / KEYNOTE SPEECHES**

**ROOM A AND B**

**Words of welcome:**

- Ronny Meyer, Managing Director, Windenergie Agentur WAB
- Olaf Lies, Minister for Economy, Labour and Transport of Lower Saxony
- Günter Albers, Managing Director, ELA Container Offshore
- Markus Rieck, Managing Director, ALSTOM Renewable Germany

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8.30 p.m. **WINDFORCE RECEPTION** sponsored by UWIND UNTERWESER INDUSTRIES

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## WEDNESDAY, 10 JUNE 2015

A

8 a.m. – 9.45 a.m.

## BREAKFAST – SESSION A – New international markets

**Chair: SET Analysis, CEO, Jos Beurskens, The Netherlands**

Jos Beurskens currently works as an independent consultant on SET Analysis. From 1989 to 2004 he was head of the renewable energy and wind energy divisions at the Energy Research Centre (ECN) in the Netherlands. Between 1986 and 1989 he was a programme manager and researcher at ECN. Jos is a founding member of the Netherlands Wind Energy Association (NEWIN), EWEA, EUREC Agency, European Academy of Wind Energy and International Meeting of Test Stations. In 2008 he was awarded the Poul la Cour prize. In November 2009 he gained an honorary doctorate from the University of Oldenburg, Germany.

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### 1 New international offshore markets

Focus on Asia (China, Japan) and USA

**DNV GL - Energy, Business Development Director, Dr Helmut Klug**
Helmut Klug is regional manager of Central Europe, Middle East and Africa for DNV GL – Energy, Renewables Advisory. He previously served as general manager of GL Garrad Hassan Deutschland with 24 years of experience in wind energy. Dr Klug joined Garrad Hassan in 2006 after serving as vice managing director at DEWI (German Wind Energy Institute). Dr Klug is also a WAB board member.

### 2 Business development – emerging markets

How long until new markets really bite?

**MHI Vestas Offshore Wind, Head of Strategy and Business Development, Sr. Director, Joerg Kubitza, Denmark**
Mr Kubitza´s career includes extensive experience in senior operational and strategic management functions in the energy industry, especially wind turbine manufacturing and wind farm construction business. He is currently head of strategy and business development at MHI Vestas Offshore Wind, based in Aarhus. Previous to his current position he was acting general manager for Mitsubishi Heavy Industries Europe, based in Hamburg and London.

### 3 Offshore wind farms in Chinese waters

The Hong Kong Electric Lamma Island offshore wind monitoring project

**SgurrEnergy, Director of German Operations, Matthias Henke**
Matthias Henke is in charge of SgurrEnergy's Hamburg office and works with his team on offshore and onshore wind projects worldwide. After he began his career in the wind energy industry in 1999 developing wind energy projects, he worked as technical advisor to onshore and offshore projects. His experience includes independent engineering services for wind energy projects around the world including Europe, Asia and America. Mr Henke holds degrees in electrical engineering, economics and an MBA.

MHI VESTAS OFFSHORE WIND

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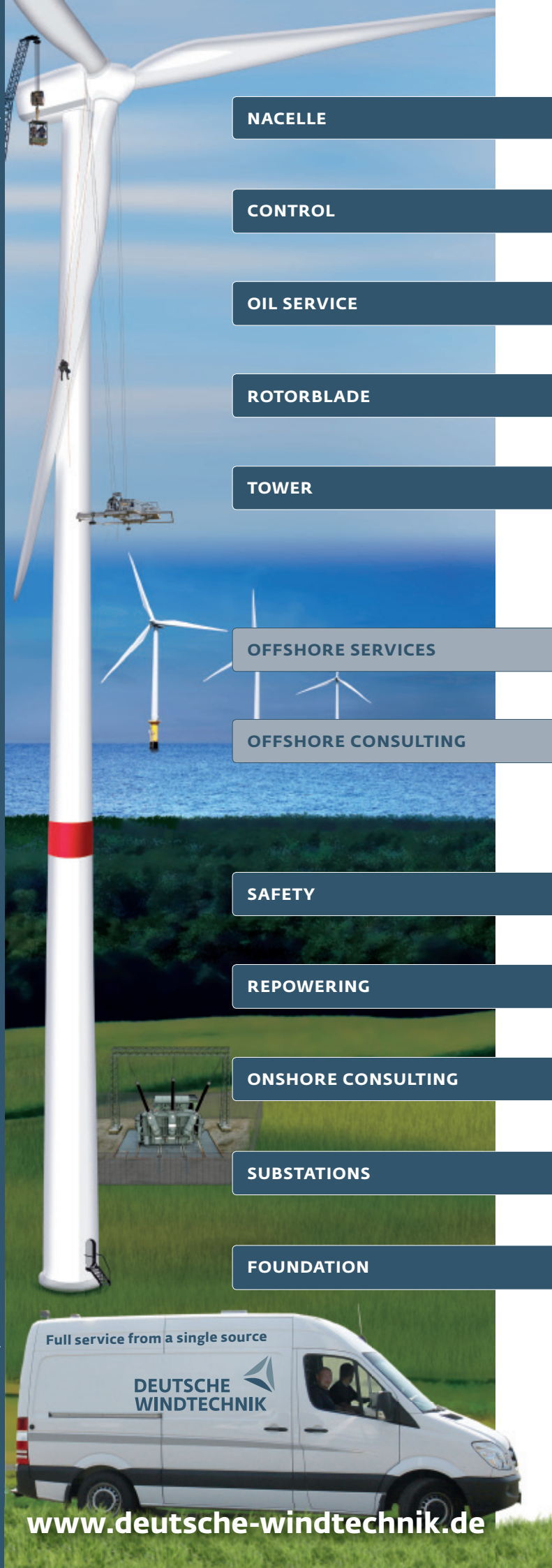
SUBSTATIONS

FOUNDATION



## WEDNESDAY, 10 JUNE 2015

B

8 a.m. – 9.45 a.m.

## BREAKFAST – SESSION B – DC Grid connection – learning from experience

**Chair: Stiftung Offshore Windenergie, CEO, Andreas Wagner**
Andreas Wagner has been the CEO of Stiftung OFFSHORE-WINDENERGIE since 2008. He has also been the head of the Berlin office of the German Offshore Wind Energy Foundation since 2013. Before joining the Stiftung, Andreas held positions in European marketing and communications, public affairs and business development with GE Wind Energy in Germany. In the 1990s, he worked for the German wind energy association BWE as a consultant on European Affairs, and was also managing director of FGW. Andreas began his professional career as scientific assistant to Dr Hermann Scheer, MP in the German Bundestag. He holds a degree in political science from the University of Innsbruck, Austria.

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### 5 Maintaining the stability of offshore grid connection systems

Assessment of the stability margin based on frequency-dependent impedances

**TenneT Offshore, Team Leader Grid Planning Offshore, Andreas Menze**
Andreas Menze studied Electrical Engineering at Leibniz Universität Hannover and received his diploma in 1996. He started at PreussenElektra, a former German TSO. Since then he worked as a project manager in the field of grid planning and power plant connection studies at TSOs and for power plant operators. He gained vast experience in grid operation and the connection of HVDC systems and large power plants to the system. Since 2012 he is working for TenneT Offshore GmbH. Here he is responsible for the system technology and planning of the offshore grid connection system.

### 6 High-voltage cables for offshore and onshore applications

Technology and installation

**ABB, Head of Cable Projects, Sebastian Ebert**
Sebastian Ebert, studied Elektrotechnik / Elektrische Energietechnik at the FH Zittau / Görlitz, Dipl. Ing.(FH),

Working with Südkabel GmbH between 03/2005-10/2011
- Regional Manager Middle East, based in Qatar between 2005-2007
- Project Manager UK 2007-2009 based in Liverpool for a 275kV cable project
- Project Management of various Cable Projects up to 500kV HVAC such as in UK, Columbia, Greece, Bhutan
- Jicable 2011 Publication and Presentation about EHV 275kV XLPE Underground Cable Project Challenges UK / National Grid

Working with ABB / Germany (Grid Systems) since 11/2011
- Project Manager DolWin1 Land Cable Installation 320kV HVDC
- Sales and Project Management Nordergründe Onshore Cable 155kV AC
- Head of Cable Projects incl. DolWin2 Operation, Contract Management, Sales & Marketing, Service, Innovations
- VDE Member, partly ZVEI FB Kabel, DKE UK 411.1 planned
- Publication planned @ Jicable 2015 DolWin2

Breakfast – Session B — Room B

**7** Status and lessons learned from the 900 MW HVDC offshore grid connection project DolWin3

**ALSTOM Power, Technical Project Director, Dr Cederick Allwardt**

**8** Lessons learned from HVDC offshore connections in Germany

**Siemens Grid, Sales Manager Grid Access, Roland Walz**

## WEDNESDAY, 10 JUNE 2015

10 a.m. – 1 p.m.

# SESSION C – Germany's Renewable Energies Act – the starting point for a tendering system? Interviews and discussion

C

**Chair: Stiftung Offshore Windenergie, Chairman, Jörg Kuhbier**

Mr Kuhbier has worked for various offices of the Free and Hanseatic City of Hamburg since 1969. In 1981 he became Director of the Senate and senior official of the environmental protection agency.

- From 1983 to1991 he was member of the Hamburg Senat, responsible for environmental and energy policies as well as for supply and waste management issues.
- He has been a lawyer in Hamburg since 1991 and a senior partner at the law firm KUHBIER Rechtsanwälte since 2000.
- In addition to his regular work, Mr Kuhbier's activities and honorary positions include being Chairman of the German Offshore Wind Energy Foundation, and Managing Director of Offshore Forum Windenergie.

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## 9 Offshore Auctions – post 2020

Update and outlook

**Wind Energy Agency WAB, Managing Director, Ronny Meyer**

Ronny Meyer is currently Managing Director of the Wind Energy Agency WAB. WAB is the German offshore and onshore wind energy network with 350 member companies and institutes. It is also a liaising agency to politically responsible bodies and local public authorities. Prior to this, Ronny Meyer worked as an analyst for renewable energies and utilities at the Boston Consulting Group (BCG). He studied physics at the University of Oldenburg, Germany.

## 10 Interview

**BMWi Bundesministerium für Wirtschaft und Energie, Thorsten Falk**

## 11 Interview

**Fraunhofer ISI, Mario Ragwitz**

Prof Dr Mario Ragwitz is deputy head of the department Energy Policy and Energy Markets at the Fraunhofer-Institute for Systems and Innovation Research (ISI). He is also head of the business unit of renewable energies at Fraunhofer ISI and coordinator of the Fraunhofer network wind energy. He is responsible for developing and evaluating policies for renewable energy and modelling energy systems with renewable sources focusing on the European Union. He has coordinated more than 25 research projects on renewable energy policy development at global, EU and national level and authored more that 40 peer reviewed scientific articles. Ragwitz also acted as an expert to the German Bundestag concerning the revision of the German Renewable Energy Sources Act and to the European Parliament on the Directive for renewable energies. Ragwitz is honorary professor at the University of Freiburg in the field of energy and climate policy. Ragwitz is physicist with professional experience in the fields of modelling complex dynamical systems, data analysis, wind energy conversion and solid state physics. He studied physics at the universities of Düsseldorf, Waterloo (Canada) and Heidelberg, and earned his doctorate degree in physics from the University of Wuppertal. He worked as a scientist at the Max Planck Institute for the Physics of Complex Systems and as a guest scientist at the University of Texas at Austin and at the Lawrence Berkeley National Laboratory.

## Coffee break

11.10 a.m. – 11.40 a.m.

## 12 Interview

**DONG Energy, Managing Director, Trine Borum Bojsen**

Trine Borum Bojsen has been managing director of the German wind division of DONG Energy since November 2013. A qualified engineer, she gained her initial experience of working in the offshore sector with Grontmij in the Ports and Marine division from 1995 to 2008. In 2008 she joined DONG Energy and became active in offshore project development. From 2009 to 2012 she was in charge of the cross-market area of environment and licensing, and in 2013 took on responsibility for project certification and compliance at DONG Energy for all markets.

## 13 A call for tenders system for EEG remuneration

Implications for offshore wind

**Watson Farley & Williams, Lawyer and Partner, Dr Christine Bader**

Dr Christine Bader has worked as a lawyer since 2001 and is a partner in WFW's Hamburg office. As a member of WFW's international Regulatory, Public Law & Competition Group she advises project developers, investors and financing banks on energy law and permit issues. Her experience in the offshore wind sector includes a number of wind farm projects and investments in offshore grid connection. Christine's second field of expertise is on EU and German competition law where she advises clients on the full range of competition issues as well as public procurement and state aid.

## WEDNESDAY, 10 JUNE 2015

10 a.m. – 1 p.m. **SESSION D** – National Projects – planning, installation and operation

**D**

**Chair: Nordwest Assekuranzmakler, CEO, Thomas Haukje**
Internationally renowned expert in the renewable energy industry
- "Early Bird" for insurance solutions for offshore wind farms
- 10 years of experience with an industrial insurer in Germany
- Has held various leading positions in insurance brokerage firms
- Seven years of experience as branch manager of an international insurance broker group
- Since 2008 Managing Partner of Nordwest Assekuranzmakler GmbH & Co. KG KG
- Group Company of Lampe & Schwartze
- Since 2010 Managing Partner of Lampe & Schwartze Group.

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### 14 Offshore wind energy development in Germany – Status quo & current trends

New installations, projects under construction, outlook

**Deutsche WindGuard, Head of Markets & Politics, Anna-Kathrin Wallasch**
Anna-Kathrin Wallasch born in1983, MA in German Literature and Economic Sciences, University of Oldenburg. Participated in an advanced study course in wind energy technology and management from 2008 to 2009, and has been working at Deutsche WindGuard GmbH since 2006. Appointed as division head of Markets & Politics in 2013. Specialist for market analysis and wind energy statistics, economic analysis of wind energy projects, analysis of wind energy technology development, due diligence projects and monitoring of political framework conditions (e.g. regular amendments of the German renewable energy law EEG).

### 15 Nordergründe – Tiny: Challenge

**wpd offshore solutions, Project Director, Alexander Klemt**
Alexander Klemt has been working in the offshore wind industry since 1999, mainly in project management, as managing director at an offshore engineering company and for offshore contractors. He holds degrees in marine (and warranty) surveying and in marine science.
His has gained extensive interdisciplinary experience in planning, contracting, conceptual and detailed design and engineering, in a wide range of offshore projects. His expertise also includes installation and site execution tasks. Alexander Klemt was hired by wpd in 2010 for the development of Butendiek and is project director for Nordergründe.

### 16 Nordsee Ost offshore wind farm

From fictitious readiness to fully operational wind farm

**RWE Innogy, Project Director, Marcel Sunier**
Marcel Sunier has been project director for the Nordsee Ost offshore wind farm of RWE Innogy since October 2011. He holds a degree in electrical engineering as well as an MBA from Kaderschule St Gallen, Switzerland. He has over 16 years of experience in the wind industry. He is running his own consulting company, EPC Consulting, since 2008 which provides project management services for off- and onshore wind projects worldwide. He successfully delivered the first commercial offshore wind farm Baltic 1 for EnBW in 2010. He also is also a co-founder of A2SEA back in the year 2000.

## Coffee break

11.15 a.m. – 11.45 a.m.

## 17 Offshore windfarm Amrumbank West

Status report and challenges

**E.ON Climate & Renewables, General Project Manager Amrumbank West, Dominik Schwegmann**

Dominik Schwegmann is a graduate in structural engineering and has a Master of Business Administration. After gaining experinece in the development of offshore projects in 2002, such as on Arkona Becken, he switched to construction in 2007. Dominik then worked on Robbin Rigg as project engineer and alpha ventus as package lead for the wind turbine generator before taking on the position of general project manager on Amrumbank West in 2009. Amrumbank received FID at the end of 2011 and construction started in 2013.

## 18 Sandbank Offshore Wind Farm

Maximizing value through lessons learned

**Vattenfall Europe Windkraft, Certified Project Director, Niels Bjaert**

Niels Bjaert joined Vattenfall in 2014 as project director of the Sandbank offshore wind farm. He was in charge of Horns Rev 2 (2010) and the London Array project (630 MW – still the world's largest offshore wind farm). At Siemens, he led the first turnkey project Westermeerwind in Holland. Niels has a bachelor's degree in electrical engineering and studied engineering business administration. He has five years of experience in general management, 10 years in international sales and 15 years in project management, of which eight were in offshore wind energy. Appointed as Certified Project Director in 2013, Niels leads a team of people from 15 nationalities.

## 19 EnBW Baltic 2

Experience from implementation of Baltic 2

**EnBW Energie Baden-Württemberg, Project Manager Baltic 2, Stefan Wallenmaier**

Mr Wallenmaier studied aeronautics in Stuttgart and Toulouse and started his career within RWE Power in the field of maintenance for steam and gas turbines. In 2010 he joined EnBW and among other things managed a gas storage project in Etzel. He then he switched over to the wind sector of EnBW in late 2011, working in the project management of Baltic 2. Mr Wallenmaier has been project manager of Baltic 2 since August 2014.

## WEDNESDAY, 10 JUNE 2015

E

3 – 5 p.m. **SESSION E** – Financing

**Chair: PricewaterhouseCoopers, Senior Manager, Oliver Moß**
Oliver is Senior Manager and deputy team head of the renewable energy team within PwC Germany's Infrastructure Advisory practice based in Hamburg. His core expertise comprises Project Finance and Transaction Advice in the renewable energy sector, including, but not limited to, financial modelling, financial advice, sell-/buy-side advice, commercial due diligences and economic evaluations. From November 2008 until November 2009 Oliver worked at PwC UK in London. Recently, Oliver has been involved in advising a project developer in the sale of an offshore wind farm in the German North Sea and in advising an institutional investor in buying an onshore wind energy portfolio.

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### 20 The financing of the Nordsee 1 project

**Green Giraffe Energy Bankers, Managing Director, Dr Jérôme Guillet, France**
Jérôme Guillet is a founder of GGEB, which was created in early 2010 and focuses on financial advisory services for the renewable energy sector. He has 15 years' experience in the energy project finance industry, with a specific focus on offshore wind. Under his leadership, GGEB helped close large non-recourse financings for the C-Power, Meerwind, Northwind and Walney projects in the past three years. He is a graduate of the Ecole Polytechnique in Paris and holds a PhD in economics from the EHESS in Paris.

### 21 Challenge to the offshore sector

Sumitomo's experiences in Belgium

**Sumitomo Deutschland, General Manager, Koji Wakabayashi**
Koji Wakabayashi has been General Manager of Pan-EU Renewable Energy Business Dept. of Sumitomo Corporation Europe Group since 2014. After joining Sumitomo Corporation (Tokyo) in 1997, he became involved in the infrastructure-related business, especially focusing on the trading of industrial machinery between Europe and Japan. He was also a member of the team deeply involved in Sumitomo's participation in the Belgian offshore wind projects, namely Belwind, Northwind and Nobelwind. He is currently in charge of investment in the offshore wind sector within the European market.

### 22 Guarantee and Insurance cover

Guarantees of turbine, cable, and foundation manufacturers and subcontractors and it's insurability

**Nordwest Assekuranzmakler, Managing Partner, Dr Patrick Wendisch**
Patrick Wendisch has degrees in mechanical engineering and business administration. He has pursued his career in engineering and industrial insurance at Munich Re, Allianz Albingia, Hartford Steam Boiler in the United States, and in the London market. He is managing partner of Lampe & Schwartze Group and its subsidiary Nordwest Assekuranzmakler (Germany's leading renewable insurance broker). Dr Wendisch often holds lectures on onshore and offshore wind insurance.

## 23 Disputes? Avoid them or win them!

**CORVEL, Lawyer and Partner, Dr Nicoletta Kröger**
Nicoletta Kröger is a lawyer and partner of CORVEL LLP with special focus on renewable energies and the maritime industry. She has been advising clients from the wind energy industry since 2003. One of the core areas of her work is the advice and representation of clients in dispute resolution, which includes state court litigation, arbitration as well as alternative dispute resolution. She also regularly acts as arbitrator. Before joining CORVEL LLP in 2013 she was a partner at Dabelstein & Passehl and worked with Freshfields Bruckhaus Deringer.

## 24 Managing weather risk

Weather delay insurance in offshore construction and maintenance

**Endurance Global Weather, Head of European Origination, Ralph Renner, UK**
Ralph Renner is director of European Origination for Endurance Global Weather and responsible for developing and implementing structured solutions with EGW'S European and Asian clients. He was formerly head of power trading at Macquarie Bank, Dresdner Kleinwort Investment Bank and Centrica Energy. With over a decade of energy trading and risk management experience in the European power, gas, coal and $CO_2$ markets, Mr Renner has an excellent understanding of the evolving requirements of utilities, traders, renewable energy companies and financiers.

## WEDNESDAY, 10 JUNE 2015

3 – 5 p.m. **SESSION F** – Grid connection

F

**Chair: Renewable Energy Hamburg Cluster Agency, Managing Director, Jan Rispens**
Jan Rispens studied electrical engineering at the TU of Enschede. From 1993 to 2000 he was campaign coordinator for Greenpeace in Germany, working on climate change, energy efficiency policy and renewable energy. After that he was engaged as project manager for offshore wind at the Deutsche Energie Agentur (dena), in which position he was responsible for project cooperation between Germany's federal government and individual states. From 2002 until 2010 he was managing director of the Wind Energy Agency Bremerhaven/Bremen (now WAB). Since 2011 he has been managing director of the Renewable Energy Hamburg Cluster.

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### 25 Electrifying the German North Sea

Planning, building and operating grid connections and interconnectors

**TenneT Offshore, Head of Project Management Office Offshore, Dr Benjamin Hühnerbein**
Dr Benjamin Hühnerbein is an expert in power transmission and project management with over seven years of experience in this sector. After graduating in 2008 from the Leibniz University of Hanover with a doctorate in engineering, he joined E.ON Netz, predecessor of TenneT TSO GmbH. Dr Hühnerbein worked as project lead for cabling in the grid connection project BorWin1 and as overall project lead for BorWin2. Since January 2015, Benjamin Hühnerbein has been team leader of the project management office at TenneT TSO GmbH.

### 26 Ensuring access to compensation funds for loss of revenue from grid connection delays

**CARNEADES Project Services, Managing Director, Alexander Kruse**
Alexander is an experienced senior contracts and claims manager with more than 10 years experience in offshore and onshore wind industry. In the past he has acted as contract manager for the construction of the 288 MW DanTysk offshore wind farm and the development of the 288 MW Sandbank offshore wind farm, with focus on grid access and contract negotiations (FIDIC, Logic, Bimco). Before working for DanTysk and Sandbank, Alexander worked as legal counsel for a WTG manufacturer, as commercial project manager for onshore wind farms and attorney for wind farm and real estate transactions.

### 27

**ALSTOM Grid**

## 28 Offshore substations

Experience and prospects

**Siemens Energy Management Division, Head of Mechanical Development, Jörg Findeisen**
Joerg Findeisen is head of the mechanical development group in the Research and Development department in Siemens' business segment of medium power transformers and responsible for innovation and product development of transformers for offshore and special applications. Findeisen completed his studies in electrical engineering and graduated with a degree in engineering in 1984. He then started his career in the mechanical design department at the Siemens transformer factory in Dresden. In 2000 he became team leader of the mechanical design group for special transformers.

## 29 Security of supply and system operation

Interaction between electrical grid and power plants

**Tennet TSO, Head of Control Centre Lehrte, Volker Weinreich**
1989: Dipl.-Ing. Electrical Engineering (University of Dortmund)
1989: 8 years Project Engineer automation technology "Stahlwerke Bochum"
1997: 17 years PreussenElektra/E.ON Netz/transpower/TenneT:
1997: Project Engineer Control Center Lehrte
2003: Head of team Grid and Data Management
2008: Deputy Head of Control Center Dachau and Lehrte
2011: Head of Control Center Lehrte

## WINDFORCE Dinner

Abeking & Rasmussen, Lemwerder
7.30 p.m. – midnight

# WINDFORCE Dinner

## WEDNESDAY, 10 JUNE 2015

7.30 p.m. – midnight
**at ABEKING & RASMUSSEN**
An der Fähre 2
27809 Lemwerder

in cooperation with

## OPENING WORDS

**Jens Eckhoff**, Managing Director,
Offshore Wind Messe und Veranstaltungs GmbH
**Nils P. Olschner**, Managing Director,
Abeking & Rasmussen Special Vessels GmbH
**Martin Günthner**, Senator of Economy,
Labour and Ports of Bremen

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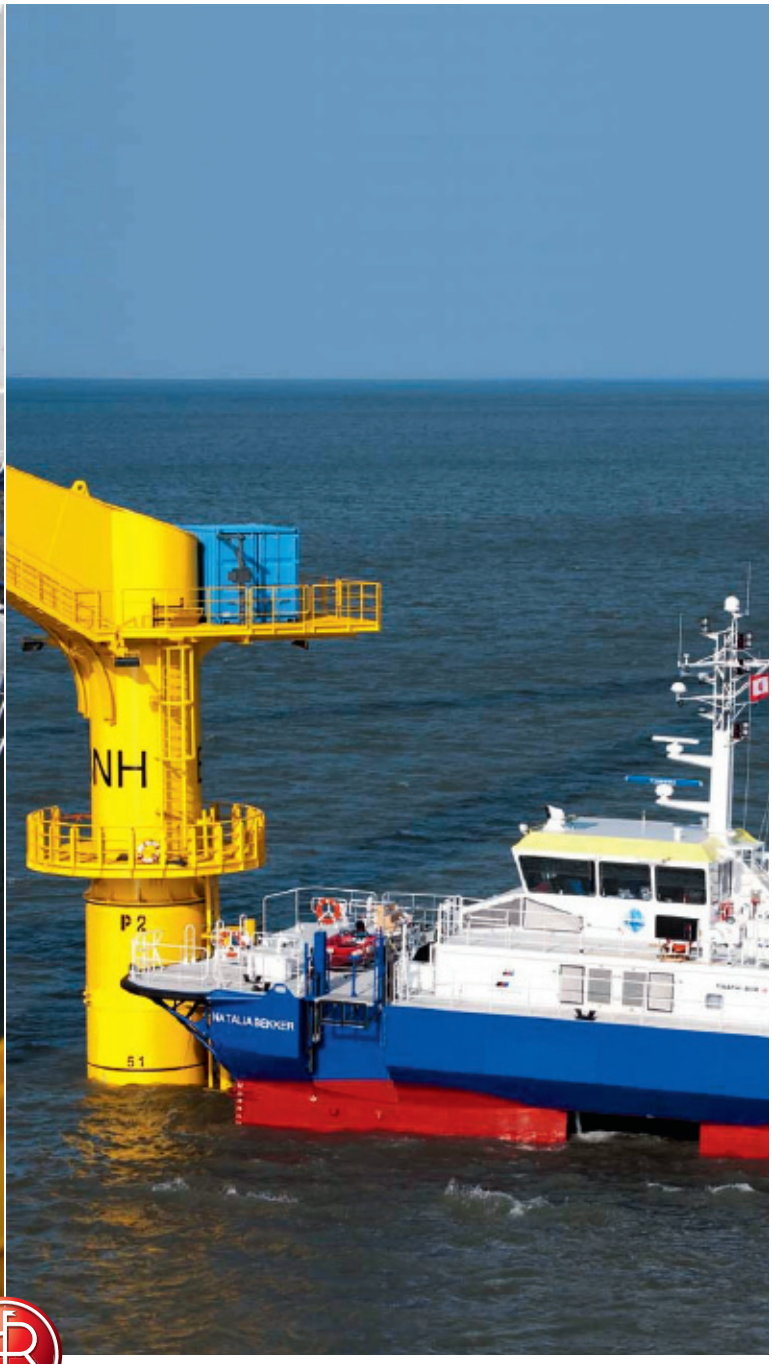


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## THURSDAY, 11 JUNE 2015

8 a.m. – 9.45 a.m.

## BREAKFAST – SESSION G – Offshore turbines

G

**Chair: Fraunhofer Institute for Wind Energy and Energy System Technology (IWES), Director of the institute, Prof Dr Andreas Reuter**
Andreas Reuter is professor for wind energy at the Leibniz University of Hanover and director of the Fraunhofer IWES which has 300 persons employed in research and a well established testing infrastructure. His education is in aviation and space technology. After completing his doctoral thesis on fatigue in wind turbines at the TU Berlin, he worked in the wind industry for 15 years for companies such as aerodyn, GE Energy and Bharat Forge as project engineer, director of engineering and managing director before returning to the research community in 2010.

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### 30 Haliade 150-6MW from demo to series production

**ALSTOM Renewable Germany, Managing Director, Markus Rieck**
Since January 2010, Markus Rieck has been country sales director of Alstom Germany. In this position, he is responsible for the sales activities of the thermal and renewable power sectors with and their respective business areas – ranging from conventional turnkey plants to renewable energy solutions. Furthermore, Markus Rieck has been managing director of ALSTOM Renewable Germany GmbH since February 2014. In this role, he is responsible the development of the renewable power sector in Germany, with a special focus on the growing on and offshore wind business.

### 31 How the V164-8.0 MW turbine will help reduce cost of energy for offshore wind

**MHI Vestas Offshore Wind, Senior Product Manager, Anders Bach Andersen, Denmark**
Mr Andersen holds a position as senior product manager at MHI Vestas Offshore Wind. He works with strategic profitability analyses for offshore wind. He was part of the core team behind the V164-8.0 MW turbine, and was involved in the key design choices for the product. Mr Andersen was transferred to the joint venture company MHI Vestas Offshore Wind after seven years at Vestas Wind Systems.

### 32 Experiences from the Chinese offshore wind market--and how there could be a fruitful cooperation between European and Chinese companies in the future

**Ming Yang Wind Power, Per Bull Haugsøen, China**

## 33 Turbine drivetrains for offshore wind

Trade-offs, key success factors and return of experience

**Ocean Breeze Energy, Chief Engineer, Joachim Arndt**
Joachim Arndt has been chief engineer at Ocean Breeze Energy since November 2014. Prior to that, he was CTO of AREVA Wind – now Adwen. Joachim Arndt has over 15 years of experience in R&D management positions in the wind turbine industry and in the engineering of complex manufacturing processes. He led the development of the Multibrid offshore turbine design, from the first prototype back in 2004 to its serial production and installation on the alpha ventus, Global Tech 1 and Borkum West 2 sites. At Ocean Breeze Energy, his engineering team focuses on the BARD V design, which is used in the 80 turbines of this first commercial wind farm in the German North Sea.

## 34 The Senvion 6.2M152

A 20% increase in yield for the 6.xM platform

**Senvion, Program Manager 6.XM, Harry Pim**
Harry Pim joined Senvion as a project manager in 2007 and became UK Head of Projects in 2010. In this role he was responsible for the successful and safe delivery of all Senvion wind turbine projects within the UK. In 2012 he moved to Hamburg to take up the role of program manager for the MM platform (2MW) before moving to the 6.XM platform in April 2014. Harry graduated with an MEng from Cambridge University in 2001 and started his career working in the marine industry focussing on carbon composite manufacture.

## 35 HVAC booster turbines

How to eliminate the need for an HVAC offshore substation

**Siemens Wind Power, Head of Offshore Concepts and Solutions, Jesper Møller, Denmark**
Jesper is head of offshore concepts and solutions at Siemens Wind Power. He is responsible for future-oriented technologies for tomorrow's offshore wind farms within electrical as well as civil balance of plant areas and offshore logistics solutions. Before that he was head of offshore technologies in the areas of technology and innovation. He graduated as an electrical engineer from Aarhus Technical College in 1991. He joined Siemens as project manager in 2001 and was appointed senior proposal manager in 2005. As offshore sales manager he has been responsible for negotiating contracts for large offshore wind farms, including Greater Gabbard. In 2008 he was appointed head of offshore technology and in 2009 director for offshore engineering.

## THURSDAY, 11 JUNE 2015

8 a.m. – 9.45 a.m.

## BREAKFAST – SESSION H – Offshore vessels

H

**Chair: EMS Maritime Offshore, Managing Director, Knut Gerdes**
Knut Gerdes has sailed on many vessels since 1980 and has 15 years of experience as commanding officer and master. He has spent seven years working in positions such as quality and safety manager, maritime security (ISPS) manager, HSE and ISM manager at Aktiengesellschaft "EMS" and currently holds the position of managing director at EMS Maritime Offshore GmbH. Knut Gerdes is a member on technical committees in many industry associations including the Ship Owners Association, Accident Prevention & Insurance Association and Stiftung Offshore Windenergie.

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### 36 New construction and safety standards for offshore wind service craft

**German Shipowners' Association (VDR), Marine Director, Capt Wolfgang Hintzsche**
Wolfgang Hintzsche is a captain and master mariner, holds a BSc degree in economics and engineering, and has had 34 years of experience in shipping and shipbuilding. He has done service on minehunters and minesweepers, bulk carriers, and on ro-ro, heavy lift and semi-container vessels for Frigga, CF Ahrenkiel and Sloman Neptun. His work experience includes positions as sales and project engineer at ELNA, area sales manager at MacGregor, managing director at Jastram, technical director at Shipyard (SET), and general manager at the Peter D.hle crewing agency. Since 2006, he has been marine director at VDR.

### 37 Offshore vessels: A flexible approach

Lessons learned from German offshore wind installation

**Fred. Olsen Windcarrier, Commercial Manager, Martin Degen, Norway**
Martin Degen held several positions in the energy division of Siemens AG starting in 1996. He has also worked for various other companies in the offshore wind industry since 2006. After playing a vital role in the establishment and growth of the offshore project management organisation at Siemens Wind Power (2006-2010) and leading GE's offshore wind activities in Norway (2010-2012), Martin joined Fred. Olsen in 2013 and currently holds the position of commercial manager. Martin lives in Oslo, Norway with his wife and two children.

### 38 Offshore logistics shuttle (OLS)

Feeder concept for the installation of offshore wind farms

**BLG Logistics Solutions, Manager strategic projects, Annette Schimmel**
Economist Annette Schimmel is responsible for the strategic development of BLG WindEnergy Logistics. Her main focus is on the provision of new services and the establishment of new geographical markets. Ms Schimmel also works in marketing and public relations in the logistics services division of BLG WindEnergy.

## 39 Offshore wind farm emergency rescue and response vessel (OWF-ERRV)

**Bugsier-, Reederei- und Bergungs-Gesellschaft, Project Head, Carsten-S. Wibel**
Carsten Wibel was active as technical officer on container, bulk and special ships for 15 seagoing years, most recently on the Oceanic, an ocean-going tug belonging to the Bugsier-, Reederei- und Bergungs-Gesellschaft. During this period he also completed his studies toward a graduate degree in ship operation engineering. After two years of R&D in ship safety and environmental protection he moved in 2000 into organising operations from land. As project manager he has worked on developing specialised ships such as the Nordic, an emergency tug. In an honorary capacity he also heads the offshore wind energy standards committee.

## 40 The new SWATH@A&R crew base and transfer vessel

Accommodation and transfer for service technicians

**Abeking & Rasmussen Schiffs- und Yachtwerft, Sales Director Special Vessels, Nils P. Olschner**
Nils P. Olschner studied at the University of Applied Sciences in Kiel and finished his studies, graduating as naval architect. He worked in the project departments of different shipyards in Germany where he proved himself in the design of specialised ships and project management, mainly for cruise ships and large ferries. Since 2003 he has been sales director of Special Vessels at Abeking & Rasmussen AG and is responsible for the offshore wind sector, especially for the extraordinary SWATH@A&R vessels.

## THURSDAY, 11 JUNE 2015

10 a.m. – 1 p.m.

# SESSION I – European projects

**Chair: Energy Correspondent, Freelance, Sara Knight, UK**
Based in Cologne, Sara Knight has worked for over 20 years as energy correspondent, providing regular reports and analysis on the German energy sector for specialist publications ranging from Financial Times Energy to Power In Europe, McCloskey's Coal Report to Windpower Monthly and Windpower Offshore. She has authored specialist business reports and provided consultancy on a range of aspects of the German energy sector.

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## 41 The North Sea and the Energy Union

Challenges and Rewards

**European Commission Directorate, DG Energy, The European Commission, Team Leader for North Sea Energy Projects, Brendan Devlin, Belgium**
Brendan Devlin is leading the team to deliver an integrated energy system in the North Sea. In the first phase, the emphasis is put on electricity interconnections and off-shore wind cost reduction. Further phases may take in carbon capture and storage, the legacy use of gas pipelines and the decommissioning of offshore structures. The aim is to promote synergies across sectors and to maintain the North Seas as the pre-eminent regions for energy market development at global level.

## 42 Development of Borssele Wind Farm Zone, The Netherlands

Status of development of Borssele Wind Farm Zone will be presented

**Ministry of Economic Affairs Netherland, Project manager Offshore Wind, Ruud de Bruijne, Netherlands**
Some of my previous activities: Coordinator of the EU ERA-NET SmartGrids; Manager of e-Decentraal (association for decentralized energy supplies); Secretary National Platform for Transition to a Sustainable Electricity Supply. Co-ordinator of Agency NL's on- and offshore wind activities; member of the Irish Energy Investment Advisory Committee, vice chair of the EU Platform electricity grids (SmartGrids) and ExCo member IEA Implementing Agreement Renewable Energy Technology Deployment. Experienced in the development of wind energy, both on and offshore. Expert in smart grids and decentralized - distributed generation. Started my career at a utility, worked as energy consultant, and joined one of RVO's predecessors in 1987. The mix of electricity supplies, distributed generation and renewable energy has been in my portfolio since the 80s.

## 43 Offshore wind in France

Situation and perspectives

**France Energie Eolienne, Industry and Offshore Wind Advisor, Matthieu Monnier, France**
After a year spent at the French Ministry of Energy as liaison officer for the World Bank and Americas-Balkans-CIS, Matthieu Monnier joined the French Trade Commission in Düsseldorf in 2011 where he was in charge of the energy sector, for three years. Matthieu is currently responsible for the monitoring of the offshore developments in France at the French Wind Energy Association, in Paris. He elaborates the positions of the association in liaison with the members (involved in the rounds 1 & 2) and coordinates initiatives to structure the supply chain of wind energy in France.

## Coffee break

11.15 a.m. – 11.45 a.m.

## 44 The SEASTAR Alliance

A European Offshore Wind Industry Alliance fostering cross-border collaboration on cost reduction, knowledge management and offshore grid development

**Stiftung Offshore Windenergie, CEO, Andreas Wagner**
Andreas Wagner has been the CEO of Stiftung OFFSHORE-WINDENERGIE since 2008. He has also been the head of the Berlin office of the German Offshore Wind Energy Foundation since 2013. Before joining the Stiftung, Andreas held positions in European marketing and communications, public affairs and business development with GE Wind Energy in Germany. In the 1990s, he worked for the German wind energy association BWE as a consultant on European Affairs, and was also managing director of FGW. Andreas began his professional career as scientific assistant to Dr Hermann Scheer, MP in the German Bundestag. He holds a degree in political science from the University of Innsbruck, Austria.

## 45 Offshore wind projects in Scotland and the UK

The challenge of delivery

**EDPR, Managing Director EDPR UK and Director of Offshore Business EDPR, Dan Finch, UK**
After 14 years in hydro and onshore wind with SSE, in 2005 Dan Finch took a leading role in delivering the Beatrice Prototype Offshore Wind Project; two 5MW turbines forming the first deep-water demonstrator. Commercialisation followed, and as a Director of Sea Energy Renewables, he was part of the team which not only won two development sites in the UK's Offshore wind licencing programme, but also attracted leading global energy companies, including EDPR (the world's fourth largest wind energy company) to invest in the UK offshore wind market. Dan led Moray Offshore Renewables Ltd (responsible for a 1,116MW offshore wind project in the Outer Moray Firth) as Director of EDPR UK and secured consent for the project in 2014. EDPR developed its offshore expertise and specialism from its UK office, winning 1000MW of development rights in the French offshore wind market as a partner in a joint venture. Dan now also holds the post of Director of Offshore Business for EDPR.

## 46 Lessons learned in German offshore wind industry

A good foundation to further develop European offshore projects

**Adwen, Chief Commercial Officer, Rémi Coulon, France**
Rémi Coulon is the Chief Commercial Officer of Adwen. He holds a degree from AgroParisTech, Rémi began his career in 1990 at Ecobilan, a management and environmental consulting start-up. In 2001, he joined ASP-One, a company specialized in remote reporting and internet services, as Director of Business Development. In 2004, he joined the AREVA Group as AREVA NC Inc.'s Director of Strategy in Bethesda, Maryland (USA), before becoming Director of Strategy and Business Development of AREVA Back-End Segment. Three years later, he was appointed Director of the International Projects Department AREVA Back-End Business Group. Until joining Adwen and from 2012, Rémi was Chief Commercial Officer at AREVA Renewables.

## THURSDAY, 11 JUNE 2015

10 a.m. – 1 p.m. **SESSION J** – Service and maintenance

**J**

**Chair: Ocean Breeze Energy, CEO, Jean Huby**
Jean Huby managed MAKE Consulting's Hamburg office from January 2014 to October 2014. MAKE is a leading market research and strategy advising firm for the wind energy industry. Prior to that, from 2011 to 2013 he was CEO of AREVA Wind, deputy CEO of AREVA Wind GmbH, Bremen, and managing director of AREVA Blades GmbH, Stade. From 2008 to 2011, he held the post of Senior Vice President of Strategy and M&A at AREVA, Paris, France.
Mr Huby acted as member of the cabinet of the EU Commissioner for Transport in Brussels, Belgium from 2007 to 2008.
From 2005 to 2007, he was assistant to the General Director for Competition, European Commission in Brussels, Belgium
Jean Huby holds a degree in engineering from the Ecole Polytechnique and the Ecole des Mines, both in Paris, and an MSc in economics from the University of Paris 1, Panthéon-Sorbonne

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### 47 VGB S-831 – the new guideline for the provision of technical documentation (Technical Plant Data, Documents) for plants in the energy industry

**RWE Technology International, Head of Documentation Management, Jörg Richnow**
Jörg Richnow Studied electrical engineering at University of Aachen and economics at the University of Hagen. He worked at RWE in various positions (development of electric vehicles, management of diverse biomass power plant projects) and has been head of the documentation department at RWE Technology International since 2010.

### 48 Survey of welding seams of offshore foundations

**Fraunhofer-Institut für Keramische Technologien und Systeme, Institutsteil Materialdiagnostik IKTS-MD, Project coordinator, Dr Bianca Weihnacht**
Dr Bianca Weihnacht studied physics and geophysics in Dresden, Freiberg and St. Petersburg. She earned her PhD in soil physics at the Dresden Groundwater Research Center DGFZ in 2008.
She has been with the Fraunhofer Institute for Ceramic Technologies and Systems (formerly the Fraunhofer Institute for Non-Destructive Testing) in Dresden since 2008. Research interests: non-destructive testing by guided waves.

**Baltic Taucherei- und Bergungsbetrieb Rostock GmbH, Project manager, Jens Eppler**

## 49 Fast, safe and easy access

Maintenance and modification of offshore substations

**AAK, CEO, Torgeir Nærø, Norway**
Torgeir Naero has experience in general management, sales and marketing and project management in the telecommunications, oil and gas and renewables industries in Europe, Asia and Latin America. Prior to joining the energy services company AAK AS as CEO, Torgeir held management positions with ABB, Nera, Nokia Networks Oy, Chr. Michelsen Research and the advisory firm Idevekst Energi. Torgeir's main experience lies in general tech company management, international sales and marketing of high tech products and services, as well as infrastructure project management. With an engineering background and a master's degree in business administration, Torgeir also holds various board positions in several tech companies that deal with energy markets.

Coffee break
11.15 a.m. – 11.45 a.m.

## 50 Required HSE documentation for an OWF in Germany

**DNV GL, Andreas Beeken and Vivien Taillebois**

## 51 Introduction of O&M manual transition piece

The challenge to reduce service frequency in respect to logistic cost reduction

**Deutsche Windtechnik, Managing Director, Carl Rasmus Richardsen**
After his apprenticeship as a mechanical craftsman, Carl Rasmus Richardsen worked from 2001 to 2005 at AN Bonus as a service technician and worked towards the commissioning, construction and fault clearing of various bonus types. From 2007 to 2012, he was managing director of Windstrom Service SH GmbH and was responsible for sales, service and site management. In 2012 he began working as aftersales manager at Deutsche Windtechnik Service GmbH. He has held the post of managing director and head of sales at Deutsche Windtechnik Offshore & Consulting GmbH since 2013.

**Deutsche Windtechnik, Project Management Service, Alexander Huth**
After his apprenticeship as a seafarer on container vessels, Alexander Huth attended the University of Applied Sciences in Bremerhaven. Upon completing his technical studies, he joined the service department of an offshore turbine manufacturer where he was responsible for the exchange of main components in the field and for preparing service strategies.

## 52 Leading offshore experience through strategic partnerships – development of one common offshore service hub in Emden

REETEC and Wind Multiplikator & OWS increase BO1 efficiency

**Wind Multiplikator / REETEC, Managing Director, Michael Munder-Oschimek**
Michael Munder-Oschimek graduated from ISF Management College. Michael was head of service CEE at Siemens Wind Power, and head of order processing at MAN Brennwert-Heiztechnik. He became managing director of AREVA Wind GmbH in 2009 and was COO of AREVA Wind BU until 2014. In August 2014 Michael Munder-Oschimek founded Wind Multiplikator, a new offshore service project management provider which works as a strategic partner with REETEC.

## THURSDAY, 11 JUNE 2015

3 – 5 p.m. **SESSION K** – Foundations

K

**Chair: Support Structure Test Center of Leibniz University of Hannover, Prof Dr Peter Schaumann**

Prof Dr Peter Schaumann received his doctorate in civil engineering after his studies at the Ruhr University in Bochum in 1984. After working in the steel industry and as consultant he was appointed full professor for steel construction at Leibniz University Hannover in 1996. In 2003 he became cofounder of ForWind research center for wind energy. In addition to being a professor, he has been a partner at SKI Consult since 2009 and has worked for Fraunhofer IWES since 2010. At present he is involved in numerous offshore wind farm projects as technical expert.

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### 53 Experience with suction bucket jacket Borkum Riffgrund 1

**DONG Energy, Jacket Product Line Manager & Senior Lead Structual Specialist, Henrik Carsten**

### 54 Revolutionising productivity and safety in offshore grouting

A new material, the result of a joint initiative between BASF and FoundOcean, is set to deliver significant and quantifiable improvements in productivity when grouting offshore wind turbine structures

**FoundOcean, Business Development Manager, Carsten Michels and BASF**

Carsten joined FoundOcean as business development manager (renewables) in 2012. Responsible for the running of FoundOcean's German office, he has in-depth knowledge of the German renewables market. Carsten, who holds a degree in environmental engineering, began his career in the renewables sector as R&D project supervisor of the Hydrogen Challenger GmbH research project. Since then he has been involved in project management and business development for wind, aerospace and logistics organisations. Carsten has a degree in Environmental Technologies from the University of Applied Science, Bremen. His previous experience includes business development for Freightplus in the fields of energy, mining and infrastructure. Prior to this, he utilised his experience in aviation, working as head of the Shroud project for ETN Aviation.

**Business Development Manager Offshore Wind Power, Erik Thorlak**

Erik Thorlak has been with BASF since March 2013, working as Business Development Manager within Offshore Wind in Europe.

## 55 50 x 8 > 80 x 5?

Tripod supports MHI Vestas V164-8.0

**OWT Offshore Wind Technologie, Dr Sigurd Weise**

Sigurd Weise has been active in the offshore wind industry since 2010, leading the R&D and sales department of a foundation fabricator. He has worked in the field of lattice foundation structures focusing on the interaction between design and fabrication. Before that he worked for several years in the steel industry for automotive supply. His wrote his PhD thesis on welding technology. He studied mechanical engineering.

## 56 GBS - the "new normal"

Why bigger turbines and deeper waters will fundamentally change foundation choice

**Seatower, CEO, Petter J. Karal, Norway**

Petter J. Karal is co-founder and CEO of Seatower AS, a European company specializing in foundations for offshore wind. He holds an MSc in Economics from NHH in Bergen, an EU masters in business (CEMS), and an MBA from the MIT Sloan School of Management. Before Seatower, Karal co-founded and built several technology-based businesses, including offshore oil and gas company Anchor Contracting. Karal has previously served as EVP of Findexa, Business Unit Manager at Eniro, and as top management consultant at McKinsey & Company.

## 57 Supply chain concept for the industrial assembly of offshore wind jackets

**Salzgitter, Director, Centre Wind Energy Foundations, Georg Michels**

Since 2013, Georg Michels has been Director, Renewable Steel applications at Salzgitter AG, being responsible for the supply chain of industrial products for renewable Energy structures Prior to assuming the position he held several senior executive positions within the Salzgitter Group; CSO of KHS AG, CSO at Mannesmannröhren-Werke GmbH, Member of the Board of Directors of Salzgitter Stahl, responsible for structural steel plants. Before joining the Salzgitter Group in 2002, he held several senior executive positions in the multi-utility service companies and in the steel industry.

**Salzgitter Mannesmann Forschung, Research Engineer Department Joining and Heat Technology, Dr Stephan Brauser**

Dr Stephan Brauser studied mechanical engineering at the Technical University of Berlin; the focus of his studies was on welding and material science. After completing his PhD theses at the Federal Institute for Materials Research and Testing he worked as a research engineer for the Salzgitter research department. Since joining the Salzgitter renewables division in 2013 he has been responsible for all aspects related to the technical progress within the Salzgitter offshore wind unit.

## THURSDAY, 11 JUNE 2015

3 – 5 p.m. **SESSION L** – Cost reduction

L

**Chair: OWIA Offshore Wind Industry Alliance, Project Manager for Political Communication, OWIA Berlin Office, Urs Wahl**

Urs Wahl joined WAB in 2011 as project manager for cluster development and energy policy. He moved to the OWIA Office in Berlin to take up his current position in October 2012. Previously he worked as project manager for Thales Instruments and as assistant to a member of the European Parliament. Mr Wahl studied political science at the Universities of Bremen (Germany) and Tampere (Finland).

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### 58 The impact of innovation in the LCOE of offshore wind energy

The role of KIC InnoEnergy

**KIC InnoEnergy, CTO Renewable Energies, Antoni Martínez, Spain**

Antoni Martínez works at KIC InnoEnergy as CTO of Renewable Energies. He was the first director of the Catalonia Institute for Energy Research (IREC), focused on advanced materials (PV, fuel cells, and storage), power electronics and energy efficiency in buildings. For 16 years, he was the CEO of Ecotècnia, a Spanish wind turbine manufacturer that was sold to ALSTOM in 2007. During that time, he was vice president of the EWEA and awarded the Poul la Cour Prize for "his outstanding contribution to the development of wind energy".

### 59 Siemens' new offshore wind turbine concept: leveraging reliability

**Siemens Wind Power, Sales strategy manager, Lars Hedemann**

Lars Hedemann is sales strategy manager in the offshore market unit at Siemens Wind Power. Lars has been with Siemens since 2011 working in product marketing and sales strategy, mainly focusing on the Siemens D7 Platform. Before joining Siemens, Lars was a researcher at Aarhus University (DK), Delft University of Technology (NL) and the University of Michigan (USA). In addition to his work in renewable energies, Lars is active in carbon conservation via the Grow For It network.

### 60 Cost reduction begins with the right decisions

**CPNL Engineering, Director, Ton Tuk**

Ton is co-founder and director of CPNL Engineering. With more than 6 years of hands-on experience in the field of cable protection systems Ton has differentiated himself from current suppliers with an open mind in seeking simple and adequate cable protection solutions to serve the offshore wind market. Years of consistent product development, offshore experience, independently performed tests, calculations and Orkaflex simulations has lifted the CPNL systems for monopile entry, I- and J-tubes to a higher level with DNV-GL certification based on 4 different standards and codes. This independent indication of product reliability is what Ton considers to be the next step in the field of cost reduction. He will introduce the audience in clear terms what mistakes this industry makes, the additional expenses to solve these mistakes, in terms of perceptions and assumptions related to cable protection and what the impact is on the overall offshore wind project.

## 61 Offshore substations– selected aspects of increasing of cost efficiency from fabrication inspection to maintenance

**Jörss Blunck Ordemann, CEO, Dr Falk Lüddecke**
Falk Lüddecke studied civil engineering, with a focus on constructional civil engineering, at the TU Dresden from 1997 to 2002. From 2002 to 2005, he did his doctorate at the BAM Federal Institute for Materials Research and Testing. In 2005, he worked on a research project on the optimisation of cast joints for offshore wind energy facilities. From 2006 to 2007, he worked at KLW Ingenieure where he was responsible for reviewing static calculations. In 2009 he became head of the static and construction department and authorised signatory at Technologiekontor in Bremerhaven. Since July 2014 Falk Lüddecke has been managing director of the Jörss-Blunck-Ordemann engineering offices, located in Hamburg and founded in 1963.

**Nordic Yards Wismar, Head of Offshore Substations Systems Design, Sven Höpfner**
Sven Höpfner is a member of VDE (German Association for Electrical, Electronic & Information Technologies). He studied electrical engineering at the University of Applied Sciences for Technology, Industry and Culture (HTWK) in Leipzig. From 2002 to 2007, he worked as research assistant at the Institute of Electrical Power Systems and High Voltage Engineering, TU Dresden. In 2007, he took up the position of design engineer at Areva T&D / ALSTOM Grid for Offshore AC Substations. In 2015 he joined NordicYards as head of offshore substation systems Design. His primary area of work involves AC substations for offshore wind farms.

## 62 The cheaper the better?

Evaluation of logistics concepts for the installation of offshore wind farms

**ISL: Institut für Seeverkehrswirtschaft und Logistik; HIWL: Hochschule für Internationale Wirtschaft und Logistik, Prof Dr Kerstin Lange**
Prof Dr Kerstin Lange studied industrial engineering and economic sciences at the Technical University of Hannover and the University of Seville (Spain). She has worked at the Institute of Shipping Economics and Logistics (ISL) since 2005. In 2014 she was appointed professor of logistics and production at the School of International Business and Supply Chain Management (HIWL) in Bremen. She is engaged in developing intermodal logistics systems for the energy sector such as maritime power plant supply and maritime logistics systems for offshore wind energy farms.

# These businesses will showcase their products at the Outdoor Exhibition:

ela[container]

## ELA Container Offshore GmbH
## Offshore Accommodation: Flexibility on Demand

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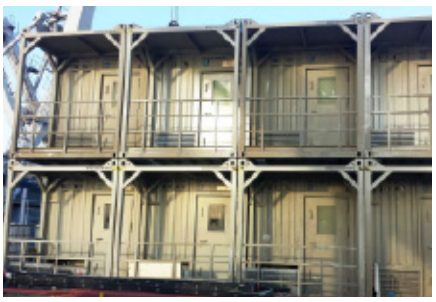
The ELA Container Offshore Living Quarter is designed for the use on rigs, converter platforms and all types of seagoing vessels, pontoons and barges. Due to the 20 ft ISO Norm, measurements and the tare weight of only 7.7 tones the handling is easy and the containers are delivered at low costs within a minimum of time. However, the unit provides enough space for a shared sanitary unit and two separate living rooms to increase users' comfort factor and ensure their privacy.



Next to the ELA Offshore Living Quarter we provide Multipurpose Offshore Containers such as offices, mess rooms, galleys, laundry facilities, recreation or locker rooms for your individual demand. All ELA Offshore Containers are DNV2.7-1 /EN 12079-1, CSC certified and are A60 insulated. To save even more space on deck all units can be stacked up to 4 high.

You are kindly invited to take a look inside and convince yourself of the high quality of ELA Offshore Containers!

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## MOBILE RESCUE CONTAINER: "MEDICbox" by WINDEAcare

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E-Mail: info@windea.de
Web: www.windea.de
www.windea-care.de

Injuries and diseases in offshore windfarms always mean big challenges. The WINDEAcare concept offers a holistic acute and emergency medical care service which normally uses a fully equipped rescue helicopter being suitable for offshore operations to cope with such situations. However, in various cases, e.g. during bad weather conditions the helicopter is not able to reach the emergency site.

The **MEDICbox** by **WINDEAcare** is a **10 ft. ELA Offshore Container** solution with DNV 2.7-1/ EN 12079-1 certification and provides an adequate alternative to flight solutions whenever medical care cannot be provided by helicopter. Using the mobile MEDICbox persons can be treated on site and transported immediately by vessel. The mobile MEDICbox is equipped with telemedicine facilities, direct media connection to a hospital and can be used on various vessel types.

It provides medicine & medical equipment to ensure EMS treatments in case of medical emergencies. All equipment fulfills the latest valid offshore- and medical treatment area guidelines.

Due to the included stable satellite connection with guaranteed bandwidth the MEDICbox staff can interact autonomously with an appropriate doctor per video and voice over IP-connection and can transmit vital signs which are monitored and forwarded to hospital via satellite. The compact design ensures effective treatment in the container and only needs a small part of vessel capacity.

You are kindly invited to visit our sample container at the outdoor area of the WINDFORCE.

Please feel free to contact us directly.

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International Trade Fair & 12th Offshore Conference

**7–9 June**




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**www.windforce.info**

# SWATH CREW TRANSFER VESSEL NATALIA BEKKER

EMS Maritime Offshore GMBH

The SWATH will be present at the conference, with open ship and trials at the river Weser.

## TUESDAY, 09 JUNE

11.00 a.m. – 5.30 p.m. Open Ship
Ship trials at the river Weser for participants of the WINDFORCE Conference (max. 15 passenger)
Departure times @ 11.00 a.m. / 1.00 p.m. / 3.00 p.m.

## WEDNESDAY, 10 JUNE

11.00 a.m. – 3.00 p.m. Open Ship
Ship trials at the river Weser for participants of the WINDFORCE Conference (max. 15 passenger)
Departure times @ 11.00 a.m. / 3.00 p.m.

## THURSDAY, 11 JUNE

12.00 a.m. – 5.30 p.m. Open Ship
Ship trials at the river Weser for participants of the WINDFORCE Conference (max. 15 passenger)
Departure times @ 1.00 p.m. / 3.30 p.m.

| | |
|---|---|
| **Class:** | DNV GL |
| **Length:** | 26.40 m |
| **Beam:** | 13.00 m |
| **Draft:** | 2.70 m |
| **Max Speed:** | 18 knots |
| **Service Speed:** | 15 knots |
| **Crew:** | 3 |
| **Passengers:** | 12 |
| **Fuel:** | 11.200 ltr |
| **Fresh Water:** | 1.000 ltr |
| **Fender:** | Shock Absorbing A&R Design |
| **Owner:** | OWS Natalia Bekker GmbH & Co. |

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26723 Emden, Germany
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Fax: +49 4921 8907 – 1285
E-Mail: info@offshoreservice.de
www.offshoreservice.de

# North Sea-Windfarm-Tour on 12 June 2015

On Friday, 12 June 2015, the conference organisers are hosting an all-day boat excursion to see two German wind farms currently being installed in the North Sea.
Offshore wind businesses will present the activities they are engaged in at each of the different project areas.

The Tour will visit the windfarms Meerwind Süd/Ost and Nordsee Ost.

The programme and the schedule of the tour may change due to weather conditions (wind, waves, rough seas) and permission to approach a wind farm.

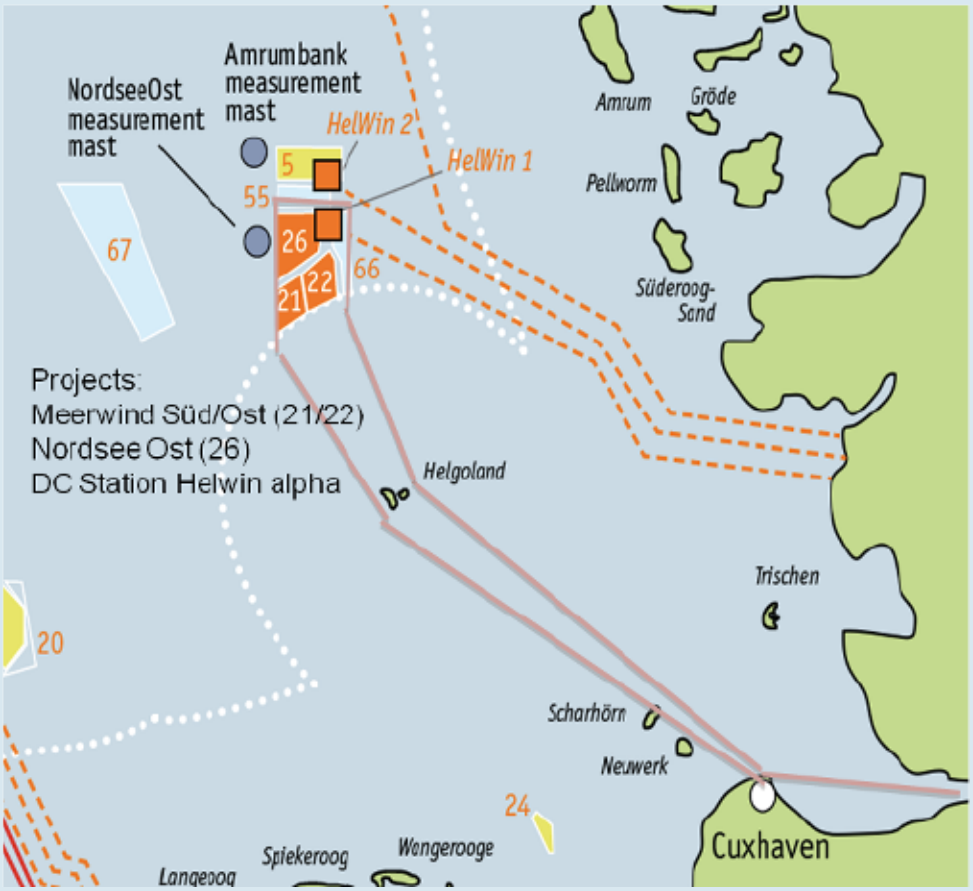
**WINDFARMS:**

## Meerwind Süd/Ost

| | |
|---|---|
| **Operator:** | WindMW GmbH |
| **Number of turbines:** | 80 |
| **Turbine type:** | Siemens 3.6 - 120 |
| **Waterdepth:** | 22 to 26 Meter |
| **Foundation:** | Monopile |
| **Web:** | www.windmw.de |

## Nordsee Ost

| | |
|---|---|
| **Operator:** | RWE Innogy GmbH |
| **Number of turbines:** | 48 |
| **Turbine type:** | REpower 6M |
| **Water depth:** | 19 to 24 Meter |
| **Foundation:** | Jacket |
| **Web:** | www.rwe.com/web/cms/de/961656/offshore-windkraftwerk-nordsee-ost/ |




## Time tables:

- The ship will depart as normal ferry to Helgoland from Hamburg at 9 a.m. and from Cuxhaven at 11.30 a.m.
- A shuttle bus will leave at 10.15 a.m. from the Atlantic Hotel Sail City in Bremerhaven for Cuxhaven.
- The ship will arrive Helgoland approximately 12.45 p.m.
- The ship will depart as exclusiv offshore wind tour from Helgoland to Meerwind Süd / Ost and Nordsee Ost at 1.30 p.m.
- The ship will arrive back Helgoland approximately 3.30 p.m.
- The ship will depart Helgoland 4.30 p.m.
- The ship will arrive back in Cuxhaven approximately at 5.45 p.m. and in Hamburg roughly at 8.15 p.m.
- A shuttle bus from Cuxhaven will return participants to the Atlantic Hotel Sail City in Bremerhaven, the main rail station Bremerhaven and Bremen, and Bremen Airport.

## Getting there & parking

### at Hamburg:

Paid parking is available close to the harbour.
Payment is made via a coin.

**For navigation:** St. Pauli Landungsbrücke, 20359 Hamburg

### at Cuxhaven:

Paid parking is available near the pier directly behind the dike.
Payment is made via coins.

**For navigation:** Bei der Alten Liebe, 27472 Cuxhaven

**Catering is available on board.**


Overleaping project areas
14/15
9 Global Tech 1
87
80
88
24
Norway
Norway
NorLink
NorNed
Denmark
Esbjerg
Fanø
Rømø
Sylt
Föhr
Amrum
Gröde
Pellworm
Süderoog-Sand
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Neuwerk
Cuxhaven
Nordholz
KS Büttel
Heligoland
10/11 Meerwind Süd/Ost
35 Sandbank
8 Dan Tysk
FINO 3
Accomodation platform
SylWin alpha
SylWin beta
19 Butendiek
5
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C
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37b
37a
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6 Amrumbank West
Amrumbank measurement mast
HelWin beta
HelWin alpha
12 Nordsee Ost
NordseeOst measurement mast
75
74
73
2 Bard Offshore 1
BorWin alpha
AC
BorWin epsilon
BorWin beta
BorWin delta
BorWin gamma
1 alpha ventus
FINO 1
DolWin gamma
DolWin alpha
DolWin epsilon
DolWin delta
DolWin beta
25 Godewind 1
13 Trianel Windpark Borkum
7 Borkum Riffgrund 1
32 Nordsee One
30 Nordergründe
30
3 Riffgat
Scharhörn
Neuwerk
Cuxhaven
Nordholz
KS Büttel
Spiekeroog
Wangerooge
Langeoog
Baltrum
Norderney
Juist
Borkum
Mellum
AC
UW Hagermarsch
Norddeich
UW Inhausen
Wilhelmshaven
Bremerhaven
Sande
Bremen
Eemshaven
Schiermonnikoog
Ameland
Terschelling
Vlieland
Texel
Emden
KS Emden/Ost
KS Dörpen West
KS Diele
Netherlands
North Sea
Dutch Exclusive Economic Zone
EEZ
UK
Viking Link
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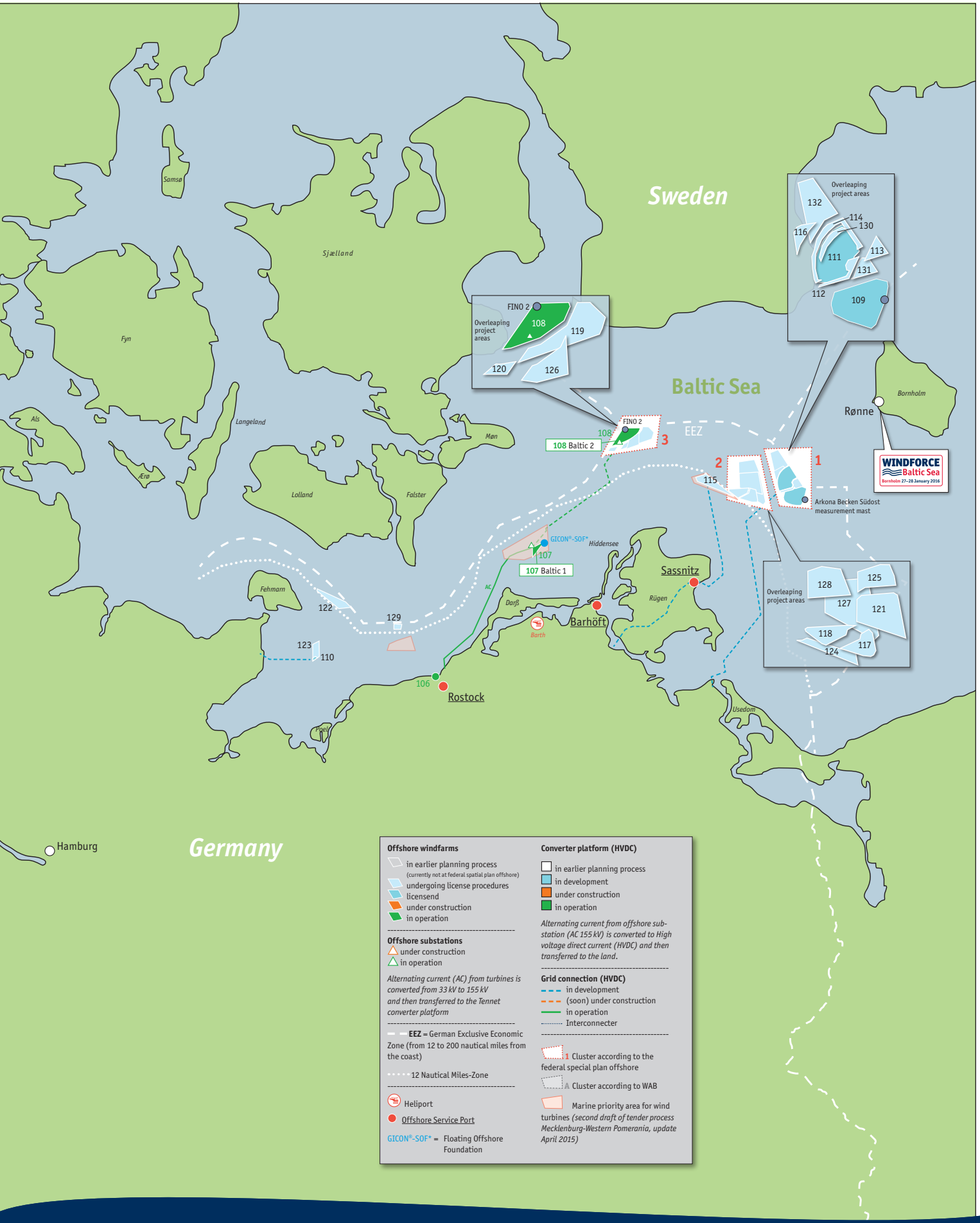
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GICON®-SOF*
107
107 Baltic 1
AC
122
129
123
110
106
Offshore windfarms
in earlier planning process
(currently not at federal spatial plan offshore)
undergoing license procedures
licensend
under construction
in operation
Offshore substations
under construction
in operation
Alternating current (AC) from turbines is converted from 33 kV to 155 kV and then transferred to the Tennet converter platform
EEZ = German Exclusive Economic Zone (from 12 to 200 nautical miles from the coast)
12 Nautical Miles-Zone
Heliport
Offshore Service Port
GICON®-SOF* = Floating Offshore Foundation
Converter platform (HVDC)
in earlier planning process
in development
under construction
in operation
Alternating current from offshore sub-station (AC 155 kV) is converted to High voltage direct current (HVDC) and then transferred to the land.
Grid connection (HVDC)
in development
(soon) under construction
in operation
Interconnecter
1 Cluster according to the federal special plan offshore
A Cluster according to WAB
Marine priority area for wind turbines (second draft of tender process Mecklenburg-Western Pomerania, update April 2015)

| No. | Project name | Developer/Operator | WTG | Total [MW] |
|---|---|---|---|---|
| **Operational** (12) | | | | |
| 1 | alpha ventus | DOTI | 12 | 60 |
| 6 | Amrumbank West | E.ON climate renewables | 80 | 302 |
| 2 | BARD Offshore 1 | Ocean Breeze Energy | 80 | 400 |
| 3 | Borkum Riffgat | EWE ERNEUERBARE ENERGIEN | 30 | 108 |
| 7 | Borkum Riffgrund 1 | DONG Energy | 77 | 277 |
| 8 | Dan Tysk | Vattenfall Europe Windkraft, Stadtwerke München | 80 | 288 |
| 4 | Ems Dollart | EWE ERNEUERBARE ENERGIEN | 1 | 4.5 |
| 9 | Global Tech I | Global Tech I Offshore Wind | 80 | 400 |
| 10 | Meerwind Ost | WindMW | 40 | 144 |
| 11 | Meerwind Süd | WindMW | 40 | 144 |
| 12 | Nordsee Ost | RWE Innogy | 48 | 288 |
| 13 | Trianel Windpark Borkum | Trianel Windkraftwerk Borkum | 40 | 200 |
| **Summary** | | | **608** | **2,611** |
| **Under Construction** (5) | | | | |
| 19 | Butendiek | wpd offshore | 80 | 288 |
| 25 | Gode Wind 1 | DONG Energy | 54 | 324 |
| 30 | Nordergründe | wpd offshore | 18 | 111 |
| 32 | Nordsee One | RWE Innogy | 54 | 332 |
| 35 | Sandbank | Vattenfall Europe Windkraft | 72 | 288 |
| **Summary** | | | **206** | **1,055** |
| **Licensed Wind Farms** (19) | | | | |
| 14 | Albatros | EnBW Energie Baden-Württemberg | 69 | 345 |
| 15 | Albatros 1 | EnBW Energie Baden-Württemberg | 10 | 50 |
| 16 | Borkum Riffgrund 2 | DONG Energy | 73 | 262 |
| 17 | Borkum Riffgrund West 1 | DONG Energy | 80 | 400 |
| 20 | Delta Nordsee 1 | E.ON Energy Projects | 48 | 240 |
| 21 | Delta Nordsee 2 | E.ON Energy Projects | 32 | 160 |
| 22 | Deutsche Bucht | Laidlaw Capital | 42 | 273 |
| 23 | EnBW He Dreiht | EnBW Erneuerbare und Konventionelle Erzeugung AG | 119 | 595 |
| 24 | EnBW Hohe See | EnBW Erneuerbare und Konventionelle Erzeugung AG | 80 | 492 |
| 26 | Gode Wind 2 and 4 | DONG Energy | 84 | 504 |
| 27 | Gode Wind III | PNE Wind | 15 | 90 |
| 28 | Kaikas | wpd offshore | 83 | 581 |
| 29 | MEG 1 | DEME Concession Wind | 80 | 400 |
| 33 | Nördlicher Grund | WindMW | 64 | 320 |
| 37 | Nordsee three | RWE Innogy | 60 | 369 |
| 36 | Nordsee two | RWE Innogy | 48 | 295 |
| 81 | OWP West | Northern Energy OWP West / STRABAG OW.EVS | 42 | 400 |
| 18 | Trianel Windpark Borkum | | 40 | 200 |
| 31 | Veja Mate | Laidlaw Capital | 72 | 400 |
| **Summary** | | | **1,141** | **6,376** |
| **Wind Farms undergoing licensing procedures** (56) | | | | |
| 37a | Aiolos | wpd Offshore | 80 | 400 |
| 37b | Apollon | wpd offshore | 80 | 640 |
| 38 | Area C I | Windreich | 80 | 400 |
| 39 | Area C II | Windreich | 80 | 400 |
| 40 | Area C III | Windreich | 80 | 400 |
| 41 | Atlantis I | PNE Wind AG | 80 | 400 |
| 42 | Atlantis II | PNE Wind AG | 80 | 400 |
| 43 | Atlantis III | PNE Wind AG | 80 | 400 |
| 44 | Austerngrund | Windreich | 80 | 400 |
| 45 | Bight Power I | Windreich | 80 | 400 |
| 46 | Bight Power II | Windreich | 80 | 400 |
| 47 | Borkum Riffgrund West II | Energiekontor AG | 43 | 215 |
| 48 | Concordia I | KNK Concordia | 80 | 400 |
| 49 | Concordia II | KNK Concordia | 80 | 400 |
| 50 | Diamant | BARD Schiffsbetrieb GmbH & Co. Nathalie KG | 80 | 400 |
| 51 | Euklas | BARD Foundation | 160 | 480 |
| 52 | GAIA I | Northern Energy GAIA I | 80 | 400 |
| 53 | GAIA II | Northern Energy GAIA II | 40 | 200 |
| 54 | GAIA III | Northern Energy GAIA III | 80 | 400 |
| 55 | GAIA IV | Northern Energy GAIA IV | 68 | 340 |
| 56 | GAIA V | Northern Energy GAIA V | 80 | 400 |
| 57 | Gannet | Northern Energy Projekt (NEP) | 80 | 400 |
| 58 | Global Tech II | NEP / STRABAG OW.EVS | 76 | 380 |
| 59 | Global Tech III | NEP / STRABAG OW.EVS | 21 | 105 |
| 60 | He Dreiht II | EnBW Nordsee Offshore | 28 | 140 |
| 61 | Heron | NEP | 80 | 400 |
| 62 | Horizont I | Mainstream Renewable Power | 65 | 390 |
| 63 | Horizont II | Mainstream Renewable Power | 76 | 456 |
| 64 | Horizont III | Mainstream Renewable Power | 71 | 426 |
| 65 | Horizont IV | Mainstream Renewable Power | 51 | 306 |
| 66 | HTOD 1 | HOCHTIEF Offshore Development Eins | 81 | 486 |
| 67 | HTOD 2 | HOCHTIEF Offshore Development Zwei | 85 | 510 |
| 68 | HTOD 3 | HOCHTIEF Offshore Development Drei | 84 | 504 |
| 69 | HTOD 4 | HOCHTIEF Offshore Development Vier | 95 | 570 |
| 70 | HTOD 5 | HOCHTIEF Offshore Development Fünf | 80 | 400 |
| 71 | HTOD 6 | HOCHTIEF Offshore Development Sechs | 64 | 384 |
| 72 | Jules Verne | PNE Wind | 80 | 480 |
| 73 | Kaskasi I | RWE Innogy | 40 | 320 |
| 74 | Kaskasi II | RWE Innogy | 34 | 170 |
| 75 | Meerwind West | Windland Energieerzeugungs GmbH | 161 | 800 |
| 76 | Nautilus I | PNE Wind AG | 80 | 480 |
| 77 | Nautilus II | SSP Technology Holding ApS / PNE Wind AG | 80 | 560 |
| 78 | Nemo | PNE Wind Nemo AG | 80 | 480 |
| 79 | Nordpassage | Vattenfall | 80 | 400 |
| 80 | Notos | wpd offshore | 53 | 265 |
| 82 | Petrel | NEP | 80 | 400 |
| 83 | Sandbank Extension | Vattenfall Europe Windkraft | 80 | 400 |
| 84 | Seagull | NEP | 80 | 400 |
| 85 | SeaStorm I (OWP) | Northern Energy SeaStorm I (NEP) | 80 | 400 |
| 86 | SeaStorm II (OWP) | Northern Energy SeaStorm II (NEP) | 56 | 280 |
| 87 | SeaWind I (OWP) | NEP / STRABAG OW.EVS | 80 | 400 |
| 88 | SeaWind II (OWP) | NEP / STRABAG OW.EVS | 80 | 400 |
| 89 | SeaWind III (OWP) | Northern Energy SeaWind III (NEP) | 57 | 285 |

| No. | Project name | Developer/Operator | WTG | Total [MW] |
|---|---|---|---|---|
| 90 | **SeaWind IV (OWP)** | Northern Energy SeaWind IV (NEP) | 78 | 390 |
| 91 | **Skua (OWP)** | NEP | 80 | 400 |
| 92 | **Witte Bank** | Projekt Ökovest | 118 | 590 |
| Wind Farms undergoing licensing procedures | | Summary | 4,265 | 22,432 |
| **Total projects in the North Sea** | | Summary | **6,220** | **32,474** |

## Windfarms in earlier planning process (13)

| | | | | |
|---|---|---|---|---|
| 93 | **Enova Offshore NSWP 8 - 15** | Enova Energieanlagen | | |
| 94 | **Neptun 1** | Neptun Energy Projekt-gesellschaft | | |
| 95 | **Neptun 2** | Neptun Energy Projekt-gesellschaft | | |
| 96 | **Neptun 3** | Neptun Energy Projekt-gesellschaft | | |
| 97 | **Nord-Ost Passat I** | Tiefbau Unterweser (TAGU) | | 360 |
| 98 | **Nord-Ost Passat II** | Tiefbau Unterweser (TAGU) | | 360 |
| 99 | **Nord-Ost Passat III** | Tiefbau Unterweser (TAGU) | | 360 |
| 100 | **Norderland** | Norderland Projekt | | |
| 101 | **Prowind 1** | Wind PROffshore International | 63 | 389 |
| 102 | **Prowind 2** | Wind PROffshore International | | 389 |
| 103 | **Prowind 3** | Wind PROffshore International | | 389 |
| 104 | **Stribog I** | Neptun Energy Projekt-gesellschaft | 80 | 560 |
| 105 | **Stribog II** | Neptun Energy Projekt-gesellschaft | | 560 |
| **Summary** | | | **143** | **3,367** |

**MW** = megawatts, **WTG** = wind turbine generator, **12 NM zone** = 12 nautical mile zone (coastal seas) in Germany licensed by German states, **EEZ** = German Exclusive Economic Zone (from 12 to 200 nautical miles from the coast); in Germany licensed by: German Maritime and Hydrographic Agency (Bundesamt für Seeschifffahrt und Hydrografie, BSH)

| No. | Project name | Developer/Operator | WTG | Total [MW] |
|---|---|---|---|---|
| **Operational (3)** | | | | |
| 106 | **Breitling / Rostock** | WIND-projekt | 1 | 2.5 |
| 107 | **Baltic 1** | EnBW Erneuerbare und Konventionelle Erzeugung AG | 21 | 48.3 |
| 108 | **Baltic 2** | EnBW Erneuerbare und Konventionelle Erzeugung AG | 80 | 288 |
| **Under Construction (1)** | | | | |
| 111 | **Wikinger** | Iberdrola Renovables Offshore D. | 70 | 400 |
| **Licensed Wind Farms (2)** | | | | |
| 109 | **Arkona Becken Südost** | E.ON | 80 | 288 |
| 110 | **Geofree** | GEO Ges. Energie & Ökologie | 5 | 18 |
| Summary | | | 85 | 306 |
| **Wind Farms undergoing licensing procedures (21)** | | | | |
| 112 | **Adlergrund 500** | Adlergrund 500 | 20 | |
| 113 | **Adlergrund GAP** | BEC-Energie Consult | 39 | |
| 114 | **Adlergrund Nordkap** | BEC-Energie Consult | 31 | |
| 115 | **Arcadis Ost 1** | KNK Wind | 58 | 348 |
| 116 | **ArkonaSee Ost** | ArkonaSee Ost | | 320 |
| 117 | **ArkonaSee Süd** | ArkonaSee Süd | 80 | 400 |
| 118 | **ArkonaSee West** | ArkonaSee West | 80 | 400 |
| 119 | **Baltic Power East** | Windreich | 40 | |
| 120 | **Baltic Power West** | Windreich | 40 | |
| 121 | **BalticEagle** | Windreich | 80 | |
| 122 | **Beltsee** | Plambeck Neue Energien | 76 | 274 |
| 123 | **Beta Baltic** | E.ON Energy Projects | 50 | 100 |
| 124 | **Ostseeperle** | Financial Insurance | 35 | 245 |
| 125 | **Ostseeschatz** | Financial Insurance | 45 | 225 |
| 126 | **Seewind** | Iberdrola Renovables Offshore D. | 25 | 150 |
| 127 | **Strom Süd** | Iberdrola Renovables Offshore D. | 111 | 666 |
| 128 | **Strom-Nord** | Iberdrola Renovables Offshore D. | 39 | 270 |
| 129 | **Vineta** | KNK Vineta | 50 | 400 |
| 130 | **Wikinger Nord** | Iberdrola Renovables Offshore D. | 8 | |
| 131 | **Wikinger Süd** | Iberdrola Renovables Offshore D. | 18 | |
| 132 | **Windanker** | Iberdrola Renovables Offshore D. | 57 | 342 |
| Summary | | | 134 | 2,537 |

## TenneT Cluster (North Sea)

| Converter platform | [MW] | Connecting Offshore Wind Farms | Substation supplier | Planned | Commissioning |
|---|---|---|---|---|---|
| **BorWin alpha** | 400 | (2) Bard Offshore 1 | ABB | | 2010 |
| **BorWin beta** | 800 | (36) Veja Mate, (9) GlobalTech 1 | Siemens/Prysmian | | 2015 |
| **BorWin gamma** | 900 | (14) Albatros I, (24) Hohe See | Siemens/Prysmian | 2019 | |
| **BorWin delta** | 900 | (22) Deutsche Bucht | not decided | 2018 | |
| **BorWin epsilon** | 900 | (23) HeDreight | not decided | after 2020 | |
| **DolWin alpha** | 800 | (29) MEG 1, (13) Trianel Windpark Borkum Phase 1, (7) Borkum Riffgrund 1 (interim grid) | ABB | | 2014 |
| **DolWin beta** | 900 | (25,26) Godewind 1,2, (32) Nordsee One | ABB/Aibel | | 2015 |
| **DolWin gamma** | 900 | (7) Borkum Riffgrund 1, (16) Borkum Riffgrund 2 | Alstom | 2017 | |
| **DolWin delta** | | (20, 21) Delta Nordsee 1, 2 | not decided | after 2020 | |
| **DolWin epsilon** | 900 | (17) Borkum Riffgrund West 1, (81) OWP West | not decided | after 2020 | |
| **DolWin zeta** | 900 | (36,37) Nordsee two, three | not decided | after 2020 | |
| **HelWin alpha** | 576 | (12) Nordsee Ost, (10,11) Meerwind Süd/Ost | Siemens/Prysmian | | 2014 |
| **HelWin beta** | 690 | (6) Amrumbank West | Siemens/Prysmian | | 2015 |
| **SylWin alpha** | 864 | (8) DanTysk, (19) Butendiek, (35) Sandbank | Siemens/Prysmian | | 2015 |
| **SylWin beta** | 720 | (31) Nördlicher Grund, (83) Sandbank Extension | not decided | after 2020 | |
| Summary | 11,150 | | | | |

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# NOTES

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