

OFFSHORE Service & Maintenance

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- **SAFETY TRAINING** What types of courses are necessary and where do they take place?
 - **ACCESSIBILITY OF OFFSHORE WIND FARMS** Service and maintenance concepts compared
 - **DATA SHEETS** At-a-glance overview of wind turbines, vessels and offshore seaports
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Editorial



The year 2009 was a crucial watershed for offshore wind energy in Germany. The first turbines were installed at the Alpha Ventus test site in the North Sea off the island of Borkum; in 2010, all 12 turbines of Germany's first offshore wind farm were eventually connected to the grid; Baltic 1 is due to be commissioned soon. Contrary to earlier expectations, offshore wind farming in Germany has taken off with considerable delay. The challenges to planning and building large-scale facilities far away from the coast and in deep waters are huge. No less than a whole new industry has to be set up along the coasts, and new service and maintenance concepts need to be hammered out. All this was linked to debates on higher remuneration. The industry expects that the future amendment of the Renewable Energy Sources Act (EEG) will need to keep the minimum remuneration for offshore wind energy at € 0.15 per kWh to ensure the economic operation of turbines on the high seas.

Manufacturers of wind power technology have made use of the opportunity to gain offshore experience in international markets. Germany's REpower has successfully launched its 5M turbine in the waters off the British coast. Siemens is the global leader in the 3 MW class, followed by Denmark's Vestas. AREVA/Multibrid and Bard Engineering have launched first projects to test their respective 5 MW turbines. On top of this, new developments are hitting the market, such as the gearless turbines of Siemens or the 4.0 turbine of General Electric. If the development of offshore wind in Germany goes ahead as planned, German engineering companies will be able to transfer their global technological leadership in the onshore wind sector to the high seas. Wind turbine production, ship and helicopter building and equipment, as well as port conversion will maintain and/or create jobs in structurally disadvantaged regions. In the future, the development of offshore wind farming can therefore give fresh impetus to the maritime economy.

BWE, the German Wind Energy Association, supports the German Government's target to install offshore wind capacities of up to 10,000 MW by 2020. In combination with an installed capacity of 45,000 MW on land, this will allow one-quarter of Germany's electricity demand to be met from wind by 2020. At its present rate of € 0.15 per kWh, electricity generated from offshore wind is still considerably more expensive than its onshore counterpart (€ 0.09). Still, if offshore wind can demonstrate a similar learning curve as the tried and tested onshore sector, we will soon be able to rely on it as another pillar for climate protection in Germany and Europe.

H. Albers

Hermann Albers
President, German Wind Energy Association

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The wind industry between vision and reality: Manufacturers present their service and maintenance concepts for wind turbines on the high seas. Which concept will win out in the long term is uncertain. Will we even see new islands built in the North Sea?

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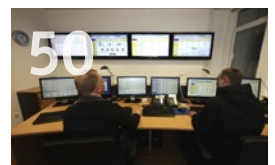
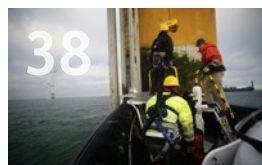
REpower has big plans. The Hamburg-based manufacturer wants to be among the half dozen companies that offer service and maintenance for large offshore wind farms. This requires some upgrading: The first ship is due to be operational by 2013.

42 | A hard commute between farm and port

As the distance from dry land increases, so does the complexity of transporting personnel and materials. Strategies for dealing with this vary considerably within the sector. The choice of transport depends on the weather, on legal working hours and on accommodation facilities at the wind farm.

50 | Automatic systems still need manual support

Well-trained technicians are still much in demand to correctly interpret the data generated by condition monitoring systems. Fully automatic evaluation remains wishful thinking.



54 | Safe passage from ship to tower

How do service engineers get safely on to offshore wind turbines in rough seas? Quite a few operators rely on helicopters. Others prefer special ships. Ship- or turbine-based access systems are also on the market. No solution has won general acceptance as yet. There is no prospect of any standards.

60 | Well schooled in safety

More and more companies on the coast are preparing to offer safety training for future offshore personnel. However, there are still no uniform standards.

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Experts soon expect a dozen competitors to enter the market with their own offshore turbines. The market is set to move towards ten-megawatt turbines, direct drives and floating foundations. So far, however, six manufacturers still divide up the offshore market among themselves.

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In spring 2010 wpd and the Schramm group established the independent service provider All for Offshore. The Bremen-based company Reetec is also developing into an offshore service provider. Although turbine manufacturers have so far done their own servicing and maintenance, the workload is such that they can no longer cope alone.

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Marine Surveyor Jürgen Mackeprang of Kapitän Möller & Partner advises planners and operators of offshore wind farms. He explains what must be taken into consideration when building at sea, what his advice involves and why it makes good sense to include classification societies early on in the process.

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All around the North Sea and Baltic, mayors of port towns are hoping for a slice of the offshore investment cake. For many municipalities in England and Germany, this involves a considerable outlay. We compare the technical facilities already offered by the ports and sketch out their plans for the future.

98 | Accurate forecasts for better operation

Knowing where and when the wind is blowing helps operators to plan their repairs and operate their offshore turbines with greater precision and less wear. Also, greater precision in wind measurement is the only way of establishing whether a turbine delivers what the manufacturer has promised.

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