

win[d]

Vestas Central Europe Customer Magazine
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Interview with
Jos Beurskens



offshore.

Vestas Germany

Brandenburg: Area doubled
H. Albers: Grid expansion needed

Vestas Benelux

New business unit in Arnhem
Wind farm in Belgium

Vestas Austria/Eastern Europe

100% green electricity is realistic
Focussing on south-eastern Europe

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Contents



Editorial	p. 3
Interview Jos Beurskens	p. 4
Report offshore	S. 6
Products The first V112-3.0 MW is now standing!	p. 10
Vestas tower crane can replace a heavy-duty crane	p. 11
Partners The developer juwi is expanding rapidly	p. 12
Education and training Vestas supports new endowed professorship	p. 13
Events HANNOVER TRADE FAIR EWEC Warsaw	p. 13
Vestas Germany Area available for wind energy in Brandenburg almost doubled	p. 14
President of German Wind Energy Association: Germany needs a new grid strategy ..	p. 16
Vestas Benelux Ambitious targets in the Netherlands	p. 18
Belgium: First Vestas wind turbines for SPE-Luminus	p. 19
Differentiation between various wind areas is necessary	p. 20
Wind farm makes Aruba more self-sufficient	p. 21
Vestas Austria/Eastern Europe Austria: 100 percent green electricity is realistic	p. 22
Karl-Heinz Fatrdla: Focussing on Austria and south-eastern Europe	p. 24
Tailwind The target is the fastest sailing boat ever	p. 26
Imprint	p. 27
Quiz Where in Europe do the strongest winds blow?	p. 29

Editorial



Hans Jørn Rieks
Managing Director of Vestas Central Europe

Increasing numbers of Vestas wind turbines will soon be in operation on the African continent too. Vestas Central Europe is starting to develop the wind market in south-eastern Africa. This spring, we will be opening offices in Nairobi, Kenya, and in Johannesburg in South Africa. Particularly crucial for the success of this venture is our project experience in Kenya. In win[d]8, we already reported on the Ngong Hills project in detail.

Experience is also the basis for the current offshore development taking place at Vestas in Europe. Vestas has been active in the offshore wind market right from its beginnings, and probably has more expertise than any other player in the sector. Our offshore report describes the opportunities that Vestas is pursuing at sea (p. 6) and the projects that are currently being built and planned.

Offshore is just one of the pressing energy topics that the European Union has to deal with – indeed, this topic has become even more urgent because the climate summit is generally perceived to have been a failure. The scientist Jos Beurskens is regarded as one of the top experts in offshore research in Europe, and he puts a strong case for certain policies in the current interview with the win[d] editorial team (p. 4).

Things are also moving on the coasts of Germany: Hermann Albers, President of the German Wind Energy Association, predicts 10,000 MW of capacity off Germany's North Sea and Baltic Sea coasts by 2010 (p. 16), and gives his opinion on current issues in the wind sector.

Proof that there is still a lot of onshore potential to be exploited in Germany is provided by the successful renewable energy strategy – focussing mainly on wind energy – that is being followed by Brandenburg (p. 14), the largest of the new federal states formed after the reunification of Germany.

Our colleagues in the Benelux region are also experiencing growth: the Dutch Minister of Economic Affairs Maria van der Hoeven wished them all the best during the opening of the new branch office in Arnhem (p. 18).

The future for wind energy promotion looks very good in Austria thanks to new legislation on green electricity. More about this and our prospects in south-eastern Europe in the Austria/Eastern Europe section (p. 22-25).

Many new opportunities will thus be opening up for VCEU in 2010. Come and talk to us about them at the HANNOVER TRADE FAIR in Germany. You will find us at stand J 16 in hall 27.

Hans Jørn Rieks
Managing Director of Vestas Central Europe

Jos Beurskens

Jos Beurskens (born in 1947) is director of the Dutch WE@SEA offshore programme and a senior researcher at the Energy Research Centre of the Netherlands (ECN). He is a co-founder of the European Academy of Wind Energy (EAWE) and an advisor to the European Commission. Jos Beurskens was awarded the "Poul la Cour Prize" by the European Commissioner for Science and Research in 2008, and received an honorary doctorate from the University of Oldenburg in 2009.

win[d]: Mr Beurskens, in his address during the awarding of your honorary doctorate, Professor Kühn spoke of your major successes and of the significant influence you have had and continue to have on European and international wind energy research. What do you regard as your personal highlight?

Beurskens: Yes, it is not easy for me to make a choice from my 35-year career. The first thing that occurs to me is the beginning in 1972, just before the energy crisis. The Club of Rome provided the spark that led us, as students, to think for the first time about wind energy. My own personal conclusion at the time was that wind energy was not suitable for industrialised countries because the yields were too low. For this reason, we became active in developing countries, which we wanted to help with water purification.

win[d]: And the second highlight?

Beurskens: Here I would choose the foundation of the "Informal Meetings of Test Stations, IMTS". One of the results of this was MEASNET, which today still guarantees the quality of measurements worldwide and sets standards for wind turbines with regard to safety, design, sound level measurements and the quality of the electricity, for example. And, of course, the foundation of the "European Academy of Wind Energy" (1).

win[d]: What are you working on at the moment?

Beurskens: Together with the European Wind Energy Association, the Academy has

provided important impetus for the European UpWind project that will run until 2011. As part of this project, we are carrying out urgently required fundamental research in 15 working groups – on topics ranging from foundations, rotor structures and air flow in large wind farms, right through to measurements. I can already say that our work is a success and has resulted in a number of surprises – for example, the implications of the discovery that the flow angle on a rotor blade on a large turbine does not remain constant, due to the turbulence structure.

"There are no fundamental environmental problems caused by offshore wind energy!"

win[d]: .. and what does this mean in practice?

Beurskens: For very large rotors, there is no point in implementing a full blade pitch any more. The blade profile must be controlled locally, and this is technically feasible. Another result is that our UpWind partners have developed the LIDAR – an optical radar unit – to the point that a wind field can be characterised even before it reaches the turbines. Turbine control can then be adjusted accordingly in advance. This is very attractive for very large offshore wind turbines with diameters of over 150 m and capacities of over 10 MW.

win[d]: You are currently the director of the Dutch WE@SEA offshore research programme – what are you working on here at the moment?

Beurskens: There are many research areas: wind turbine technology, environmental research, grid integration, and operational and maintenance concepts. One of the most important questions is: How can we work on the wind turbine at high wind speeds and with high waves? This is important if wind turbine availability of over 95 percent is to be reached, as this is the value that can be achieved on land. Due to the weather conditions, things are more difficult at sea because one can't always react quickly. As part of the WE@SEA programme, Delft University of Technology has developed a stable platform that is mounted on a rock-

ing ship. Thanks to hydraulic technology, it remains steady even during high waves. Environmental research is another field. Based on my experience, I can already come to the following conclusion today: The more research we carry out, the clearer it becomes that there are no fundamental environmental problems caused by offshore wind energy. The problems that exist are either temporary, or else can be dealt with by implementing suitable preventative measures.

win[d]: The Copenhagen Summit was a failure in most people's opinion. Addressing you as a member and advisor for various European bodies, and as an advisor to the European Commission: What needs to happen next from the European side?

Beurskens: The summit was certainly not a success. But is that dramatic? It is strategically important that Europe keeps to its targets – regardless of whether there is an international treaty. There will probably be an energy or environmental crisis. We simply consume too much energy in industrialised countries. However, if Europe implements all its targets soon, we will then have a major competitive advantage in the future over all those who are more hesitant now. Regional and local initiatives are crucial for the economy and for jobs. Renewable technologies bring about economic advantages, amongst which decentralised development is prime. The European Commission must ensure that national targets are actually implemented – and this means strict regulation of climate goals, together with sanctions.

"I simply forgot about my early retirement...!"

win[d]: You have been a wind pioneer right from the beginning. Do you not get a little discouraged when you see how little political movement sometimes takes place?

Beurskens: No! The trick is to focus on the ultimate goal, which we have not yet attained. The great adventure that is wind energy is only half complete. We currently have 75 GW in Europe. The target is to have 300 GW installed by 2030. What does that



“The great advantages of wind energy make it an absolute must in the energy mix.”

mean when converted into concrete measures? Which challenges are still ahead of us? I haven't experienced a single dull moment in the last 35 years, and this will probably continue to be the case in the coming 35 years. Last year I could have taken early retirement... but I simply forgot to do so! (laughs)

“The lack of fresh talent is the most critical issue in the development of wind energy.”

win[d]: What role can your Dutch compatriots play in wind energy research in the future, and what will be the Germans' part?

Beurskens: It is easier to organise research structures in smaller countries such as the Netherlands and Denmark. There have always been a lot of results achieved in Germany, but one had to look out for them in the individual federal states. We are currently experiencing a wave of concentration in research: Lower Saxony is active with ForWind (2) in cooperation with the Fraunhofer Society, and Schleswig-Holstein has CEwind (3). European projects offer an excellent basis for the exchange of experience. The research landscape no longer considers nationality, but instead looks for specialisation.

win[d]: You work at a number of universities. Is there young talent waiting in the starting blocks for the next generation of wind energy technology?

Beurskens: There are not enough people coming through! The experts that we urgently require today should already have been studying at university five years ago.

In my opinion, this is the most critical issue in the development of wind energy: the lack of young professionals – this is even more crucial than any materials engineering challenges involved in attaining 300 GW. There are some modest attempts in place – master's courses, the European Academy for Wind Energy – but there should be ten times as much activity. We weren't taken seriously for a long time, and many people, including politicians, are still ill-informed.

win[d]: Is offshore technology advanced enough to be able to handle gigantic projects?

Beurskens: Up to now, we have simply made onshore turbines seaworthy. We now need to take a completely fresh approach to offshore. One example: If you consider erecting offshore wind turbines far off the coast in Germany, the cabling costs are very high. How can we use technology to reduce costs? The approaches required are fundamentally and completely different to those taken for onshore projects. There is hardly any standardisation of operational and maintenance activities, the whole area of interfaces, of docking performances. At the moment, concepts for wind turbines without mechanical gears are being discussed. There are still many phases we will need to pass through with offshore. This is a learning process.

win[d]: Despite your optimism, you also indicate that wind energy cannot be expanded infinitely. Where and when will development reach its limits?

Beurskens: There will come a time when the growth rates created by the installation of

new turbines will be replaced by repowering activities and measures to preserve operation, etc. The emphasis will change, possibly in 2030, 2040 or 2050...

win[d]: You have published a booklet: The most frequently asked questions about wind energy. Please answer the most frequently asked question of all.

Beurskens: The most frequent and the silliest question: “The supply from wind energy is not constant. If we are being supplied with wind power, will we be able to watch a football match on television without temporary interruptions to transmission?” My answer to this is yes. There will be many options for balancing wind power fluctuations, such as gas, oil, biomass, storage plants and photovoltaics. The great advantages of wind energy make it an absolute must in the energy mix. And... the wind is always blowing somewhere!

win[d]: We wish you all the best and we thank you for this interview, Mr Beurskens.

- 1. European Academy of Wind Energy, (EAWE),** a co-operation between research institutes from Germany, the Netherlands, Denmark, Greece, Norway, Great Britain and Spain.
- 2. ForWind,** Centre for Wind Energy Research of the Universities of Oldenburg, Hanover and Bremen.
- 3. CEwind** is the wind energy research network founded by universities in Schleswig-Holstein. Its goal is the long-term transfer of expertise between science and industry.

offshore.

Vestas – an experienced player in an immature market



◀ The 'MPI Resolution' transport vessel with Vestas turbines on her way to the offshore installation at the Thanet wind farm

"Vestas Offshore is here!" Anders Sørensen, President of Vestas Offshore A/S, leaves no room for doubt: "With our V112-3.0 MW, we have an excellent new turbine on offer, and we are currently developing a 6 MW platform, for which we will be announcing initial data in 2010." In addition, there is also the successful installation of the V90-3.0 MW. It is currently being erected on the Bligh Bank project on the Belgian coast and on the Thanet project off Great Britain, at present the world's largest offshore wind farm under construction, in all 300 MW, a true offshore wind power plant. Including the V80-2.0 MW, Vestas is now offering three offshore wind turbines – more than any other competitor. With over 900 MW in total, Vestas has now installed half of the world's offshore capacity.

Thanet offshore wind farm

Thanet is record-breaking in a number of regards. The transport vessel 'Resolution' left the port of Dunkirk in January to set out on an unusual voyage: the ship transported nine Vestas wind turbines, thus breaking the world record for this type of transport.

Construction of the offshore wind power plant off the east coast of Great Britain – twelve kilometres off Foreness Point, the most easterly part of the county of Kent – is making good progress. All 100 monopiles have been installed, and over a quarter of the 100 V90-3.0 MW turbines have been erected (as of February). Vattenfall Wind Power plans to complete this project in 2010. The wind farm will then have a capacity of 300 MW, and will be able to provide clean energy to 240,000 households. Anders Dahl, head of Vattenfall Wind Power, emphasises the significance of this project as one of the first "round 2" projects in Great Britain. "Round 1" of the approved offshore projects comprises a maximum of 30 turbines per project, while the second round covers larger areas with between 100 and 200 turbines close to the coast. Thanet is one of the first projects here. The third round will include future wind farms to be located far off the coasts of Britain.

End of the experimental phase

Even though the sector is expanding rapidly, "we must not forget that offshore is a

very young industry," says Sørensen. "We all still have a lot to learn – both the suppliers and the customers. Onshore has been there for 30 years already, but offshore has only developed in the last five to eight years. This is still an immature market to a certain extent, although Vestas is the most experienced player worldwide. Vestas Offshore is currently in a phase in which the focus has shifted from experiments to large-scale commercial installations. And this is an area where we are significantly ahead of all other manufacturers because of our long and sometimes hard-won experience."

Vestas has been accumulating practical experience since 2002 from a current total of eleven offshore wind farms in the North and Baltic Sea (see figure). According to Sørensen, Great Britain has long been the forerunner here and will remain head of the pack in Europe for some time to come. "In the next 20 to 30 years, Germany, with the North and Baltic Sea areas, will develop to become the number two, but Mediterranean countries such as France, along with Denmark, the Netherlands and Belgium in the North, will also continue to be significant players." The first phase of the Bligh Bank Offshore Wind Farm with 165 MW is currently being constructed in Belgium.

Bligh Bank offshore wind farm

A sandbank, 46 kilometres off the coast at the Belgian port of Zeebrugge: no other wind farm under construction anywhere in the world is located at such a distance from the coast. Here, the largest offshore wind

Robin Rigg / UK

Owner: E.ON UK
Installation year: 2009
Number of turbines: 60
Turbine type: V90-3.0 MW
Total capacity: 180 MW

North Hoyle / UK

Owner: Npower Renewables
Installation year: 2004
Number of turbines: 30
Turbine type: V80-2.0 MW
Total capacity: 60 MW

Kentish Flats / UK

Owner: Vattenfall
Installation year: 2005
Number of turbines: 30
Turbine type: V90-3.0 MW
Total capacity: 90 MW

Thanet / UK

Owner: Vattenfall
Installation year: 2010
Number of turbines: 100
Turbine type: V90-3.0 MW
Total capacity: 300 MW

Barrow / UK

Owner: DONG Energy
Installation year: 2006
Number of turbines: 30
Turbine type: V90-3.0 MW
Total capacity: 90 MW

Scroby Sands / UK

Owner: E.ON UK
Installation year: 2004
Number of turbines: 30
Turbine type: V80-2.0 MW
Total capacity: 60 MW

Horns Rev / Denmark

Owner: Vattenfall & DONG
Installation year: 2002
Number of turbines: 80
Turbine type: V80-2.0 MW
Total capacity: 160 MW

Sprogø / Denmark

Owner: Sund & Bælt
Installation year: 2009
Number of turbines: 7
Turbine type: V90-3.0 MW
Total capacity: 21 MW

Egmond aan Zee Netherlands

Owner: Shell & NUON
Installation year: 2006
Number of turbines: 36
Turbine type: V90-3.0 MW
Total capacity: 108 MW

Princess Amalia (Q7) Netherlands



Owner: WP Q7 Holding B.V.
Installation year: 2007
Number of turbines: 60
Turbine type: V80-2.0 MW
Total capacity: 120 MW

Bligh Bank / Belgium

Owner: Belwind N.V.
Installation year: 2010
Number of turbines: 55
Turbine type: V90-3.0 MW
Total capacity: 165 MW

Vestas offshore-projects in the North and Baltic Sea

April 2010

 under Vestas service
 under construction

energy project so far is being installed in two construction phases. Installation of the first phase with 165 MW capacity is making speedy progress: the foundations for 55 V90-3.0 MW wind turbines have been anchored, and the first V90 turbines have already arrived. This is the third biggest offshore contract that Vestas has been awarded so far. Frank Coenen, from the developer Belwind N.V., says: "This is the first phase of the 330 MW Belwind project. A major step towards implementing Belgium's targets for renewable energies!"

Belwind is a consortium consisting of Belgian and Dutch investors. The total planned capacity of 330 MW is to generate 1.1 TWh of electricity per annum and will avoid emissions of 540,000 tonnes of CO₂.

Bligh Bank can boast further superlatives: the construction phase began within three-and-a-half years – at record pace, according to Belwind. Bligh Bank is one of the largest investment projects in Belgium, and maintenance alone will create 70 jobs over 20 years.



Offshore-Wind Farm Scroby Sands / United Kingdom

offshore.

Power control from the coast

The fact that Vestas Offshore was able to win over major developers is not simply due to the wind turbines themselves; the turbines are important, but are not the sole success factor. Just as significant is a high degree of flexibility during installation: "What you can see above the water line," says Vestas' Offshore President Søren-Jensen, "is just the tip of the iceberg. The largest challenge for the offshore industry lies below the surface of the water: foundation construction, cable technology and the line network. Logistics also need to be approached in a new way. Very frequently, machines and equipment that were originally designed for different purposes, such as transport vessels, are still being used." In the area of foundation construction, Vestas is involved in a Norwegian research project that is developing floating foundations for water depths greater than 30 metres.



High voltage station for the Prinses Amalia offshore wind farm / Netherlands

Operation and maintenance also take on an additional dimension at sea as compared to land. "In the future, we will no longer be searching for faults on the turbine itself; instead, when we travel out to the turbine, we will already know what is to be done, which replacement parts are required, and what labour steps are necessary. The turbines are located far off the coast, meaning that forecasts and diagnostics play a critical role. You can't simply allow yourself to travel back and forth a number of times to get spare parts and tools, too much production would be lost – also taking into consideration that at times bad weather and high

waves can prevent access to the offshore turbine for weeks. Basically we have to get it right the first time when the weather and wave conditions permit us access to the wind turbine." The Vestas Performance and Diagnostic Centre is one of the most important tools here. "We can now predict the service lifetime of individual components based on the data available – this is incredibly important when working at sea, as far as operation and maintenance is concerned." In the initial project phase lots of information is needed to execute a project successfully. The more detailed this information, such as data about the seabed or wind and wave strengths, the better the offshore wind farm will be. For example, the construction of the tower also depends on the project data – towers are subject to an individual design phase for every offshore project.

However, technological issues are not the only important criteria. Vestas can also provide the second important component: experienced people. Some employees have been involved since the construction of the first offshore project, Horns Rev I, back in 2002. Vestas' head of offshore, Søren-Jensen, says: "We employ some of the very few really experienced experts around, and that is priceless. At the moment, there are only a handful of people who have solid knowledge in this area. Further personnel will be necessary for the future development of the offshore sector – particularly in project management and multi-contracting."

Gode Wind I and II

Our cooperation with the wind power plant project planner PNE WIND AG from Cuxhaven is another example of our fruitful business relationships. The company's "Gode Wind I" and "Gode Wind II" offshore wind farm projects have already been approved by the German Maritime and Hydrographic Agency (BSH). PNE WIND AG and Vestas Offshore have been announced as preferred suppliers for these two projects and are currently cooperating on the engineering development of these projects. Thorsten Fastenau, head of the offshore at PNE WIND AG, says: "The project areas are on the North Sea, around 38 kilome-

tres north of the island of Juist, so they are quite close to the coast." Up to 80 offshore wind turbines with a rated power of up to 400 MW can be installed in each of these projects. PNE WIND AG will now be working on the engineering development of "Gode Wind I", alongside the "Gode Wind II" offshore wind farm project, which has also already been approved. The target date for the start of construction is 2011/2012.

European offshore boom on the horizon

Just about half of all the offshore wind farms under construction in Europe are being built off the coasts of Great Britain. At present, 52 offshore wind farms for European waters with over 16,000 MW of capacity have been approved. The impetus here came from the European Economic Recovery Plan. Europe continues to be the world leader in the offshore wind industry. The potential both in the North Sea and in the Baltic Sea is huge, and it looks like the harnessing of this potential will be tackled relatively quickly in the coming years. For example, wind farms with a capacity of 25,000 MW are to be installed off Germany's coastlines by 2030 alone, according to the German government.

A spectacular billion-euro project also suggests that a boom is coming: nine countries along the North Sea coastlines, including Great Britain, Germany and the Benelux countries, intend to bundle their green power activities with a joint high-voltage grid underneath the North Sea. Within a few years, thousands of kilometres of high-tech cables are planned to deliver wind power to large parts of the continent. But these plans are still at an early stage.

So the prospects are good in Europe. The approval procedures still take a very long time, however. According to Søren-Jensen, a developer in Germany who already has all the approvals and financing necessary must still wait another 30 months before construction can begin. "These 30 months cost money, also in terms of interest, until a return on the investment starts to materialise." Nonetheless, the European Investment Bank is quite active in financing this type of major project.

Flexibility and standardisation: with its three offshore wind turbines, Vestas is able to react to widely varying wind and wave conditions in the North and Baltic Sea. While the V90 is recommended for the strong winds of the North Sea, there is major interest in the V112 for regions with more moderate wind conditions up to 9,5 m/s. The new V112-3.0 MW Offshore, which is based on the tried-and-tested technology used in previous generations of Vestas turbines, is currently hard to beat in terms of reliability, ease of maintenance and high availability during moderate weather and wind conditions, and it also generates more energy than any other turbine in its class. The unusual combination of generator and rotor blades used here provides optimal efficiency at average wind speeds of 9.5 m/s.

Equipped for the North Sea and Baltic Sea alike

The development process goes on. According to Anders S oe-Jensen: "In the future, offshore wind turbines will be bigger than they are today. The 6-MW platform will be the next milestone for Vestas in the offshore sector." However, one should also be aware that size – or MW capacity – is not automatically the best solution, adds S oe-Jensen. "It all comes down to the lowest energy costs and the best possible business case certainty, and these criteria are not necessarily achieved by the largest turbines. Business case certainty depends less on the size and the technical capacity of an individual turbine, but is instead more dependent on whether the supplier can provide the customer with the right service package – a package that takes into account the overall quality of the turbine, its yield, MTBI (Mean Time Between Inspection), and its performance in terms of operation and maintenance. We will be pointing the way for the rest of the sector here!"



Construction of the Horns Rev I offshore wind power plant in Denmark

The first V112-3.0 MW is now standing!

The first prototype of the V112-3.0 MW went into operation for the first time on an open site close to Lem, Denmark, in January 2010. Many parts on the new Vestas wind turbine had already completed hundreds of operating hours in testing facilities before now being used in test runs in the field. A second prototype will be installed in Spain in April.

"It is a really great feeling to be present at this first commissioning," enthuses Claus Ahler from Vestas Transport, Installation & Service. Ahler is an experienced specialist and was already involved in the installation of the first offshore wind turbine in Horns Rev I. He and his colleagues can look back on an exciting construction period. The last rotor blade was installed at the end of January, and the wind turbine has already been feeding wind power into the grid since February. Every step has been accompanied, investigated and evaluated by Vestas experts, and this work is ongoing. The task during this phase is to investigate and document every single computer-planned step and every installed part under realistic conditions.

Logistics and installation

The new dimensions of the V112 demand new approaches to logistics and installation. The prototype has a tower height of 94 m, resulting in a turbine height of 150 m. The nacelle is now either fully pre-installed or else mounted in two parts high up on the tower. The method used depends on the crane capacity that is available. The ro-

tor blades, which are almost 55 m long, are mounted on the hub one-by-one, which is in contrast with the star mounting method used right up to the V90. The new features for installation technicians include the positioning of the electrical operation room inside the tower and nacelle, and the electrical cabling.

Tests and documentation

Function tests began in Lem immediately after construction and commissioning. Rotor blade adjustment, drive train, hydraulic systems, electrical systems – everything remains under observation.

Only an open site can deliver the real conditions that are necessary for final evaluation of the design and for verification of design simulations. For example, being used for the first time is an electronic full-scaled converter, which is the intermediary between the electricity grid and the mechanical drive train, including the generator. The wind turbine is also fitted with various additional measurement devices in order to provide continuous, detailed information about the operation of the turbine. Everything comes together here: the various engineering disciplines are at work with their measurement systems on all tower platforms inside the prototype. The recorded measurement data is immediately processed in the Vestas Performance & Diagnostic Centre (VPDC), for example, in order to create an overall picture. Vestas uses the SixSigma standard.

Pilot phase and series production

The first V112 turbine will now be observed over a three-year test phase, and is already in service for one operator. Up-to-date, newly identified findings will be implemented immediately in operation of the turbine. Everything that cannot be implemented on the prototypes now will serve as input for the turbine type's pilot phase, which will begin in autumn with eight further turbines. Once this phase is completed in the first quarter of 2011, the V112 will go into series production. Vestas will then be able to provide its clients with guaranteed power curves. Graduate engineer Jens Dieter Clausen, Director of Product Management at Vestas, says: "Based on our experience, mathematical simulation models and verifications, we are certain already today that we will actually be able to deliver the power specified at the moment of purchase."

Wind turbine for all locations

The demand among clients is strong already now, as many operators see the V112 as a very attractive turbine in the low-wind and medium-wind sectors. Thanks to the optimised relationship between the generator power (3 MW) and the size of the rotor area, the new V112 can quickly deliver high power levels – which is particularly important in the low-wind and medium-wind ranges. This broad turbine specification based on a turbine platform for standardised series production for the entire world – in other words: this is a turbine for all locations!

Vestas tower crane can replace a heavy-duty crane



The patented tower crane from Vestas is a unique service tool for changing replacement parts. The technical demonstration version of this unique innovation in the sector is currently undergoing its final test phase. Further versions for other turbine types, including the V112-3.0 MW, are currently being worked upon.

It will thus no longer be necessary to provide an external heavy-duty crane for maintenance work. The advantages are obvious: faster availability of components thanks to uncomplicated crane use, even in challenging environments, as the new Vestas tower crane can be deployed more flexibly than large heavy-duty cranes.

The tower crane uses the existing static structure of the tower. It consists of three main elements: electricity supply, crane platform and the anchoring of the crane to the nacelle. The entire tower crane system can be transported by two standard trucks, meaning that no special access routes are required. One of the trucks carries the generator (electricity supply), while the other truck transports the crane platform, the anchoring system and the lifting gear to the site.

The V90-3.0 MW has an internal crane, which is used to lift up a part of the anchor-

ing system and attach it laterally to the nacelle. The other part can then pull itself up with the help of the lifting gear mounted on the side of the nacelle. Another lifting gear is located on the truck, stabilising the entire process from the ground. The tower crane platform then pulls itself up using this anchoring system and clamps around the tower underneath the nacelle, where it is automatically fastened and secured.

When replacing and installing components, the roof of the nacelle is first opened upwards by means of a number of flaps; the components to be replaced can then be pulled out from above using the crane. The tower crane can lift up to 30 tonnes.

For the reverse procedure, the main components can be moved into place through the nacelle opening and then be mounted inside. The roof is then closed again.



“You can always find a way with Vestas.”

The developer juwi is expanding rapidly

Juwi keeps on growing and growing... This specialist company for renewable energy is based in Wörrstadt, in the German state of Rhineland-Palatinate, and has been a Vestas partner for many years. The company tripled its turnover between 2007 and 2009, achieving sales of 600 million euros in 2009. juwi expects to break the 800-million mark for turnover this year – and 250 new employees will be taken on, even though the group already created 350 new jobs in 2009! In addition, extension work has now started on the headquarters that the company only moved into in 2008.

Versatility is key

“The secret of our success is the diversification that we started pursuing at an early stage,” explains Dr. Marie-Luise Pörtner, Managing Director of the juwi Wind Energy Department. “We are active in all areas of renewable energy sources – and in various regions worldwide. In this way, we spread the commercial risk. Despite the crisis on the financial markets, we have still been able to continue all our projects as planned.”

Rooted in wind energy

The company's roots are in wind energy: in 1996, the two founders Fred Jung and Matthias Willenbacher started out with a single wind turbine. Since then, around 400 wind turbines have been engineered for over 65 locations worldwide. The total installed capacity amounts to around 600 MW. Vestas is one of the company's leading suppliers – for example, 40 percent of all the wind turbines that juwi installed in Europe in 2009 were supplied by Vestas. Vestas has supplied 86 wind turbines since the two companies started co-operating back in 2000. The biggest sites with Vestas turbines are located in Rhineland-Palatinate (Morbach with 14 turbines, Flomborn

with 13 NEG MICON turbines) and in France (Raucourt with 6 turbines, with an extension planned). “We have had a long-standing and very fruitful partnership with Vestas,” says Marie-Luise Pörtner. “We are able to discuss things openly, and we are taken seriously. These are the criteria we consider when choosing partners. Most importantly, we can negotiate solutions ‘without an armada of lawyers’. You can always find a way with Vestas,” according to Marie-Luise Pörtner, who has a doctorate in political science.

V112 and V100 turbines planned

A new framework agreement is on the cards in the future. “We are very interested in the new V112 from Vestas with its large rotors, and also in the V100 turbine for weaker winds,” says Pörtner.

Intensive discussions are underway regarding possible major projects in the USA, where juwi intends to construct the biggest wind farms in the company's history in the coming years. The plans include projects in the Midwest (Kansas, Nebraska) and in the Great Lakes region (Ohio, Michigan). Pörtner adds that Vestas could also prove to be “a very attractive partner” for planned juwi projects in Latin America – in Chile and Uruguay, for example.

100 percent supply vision

Matthias Willenbacher, founder and owner of juwi, repeatedly emphasises that the company does not simply want to make a quick profit, but instead always keeps its philosophy in mind: an owner-managed enterprise pursuing sustainable business activities on a basis of trust and honesty. Willenbacher's vision of 100 percent supply is part of this philosophy: in a few years, it will be possible to provide 100 percent of power and heat generation from renewable energy sources. The company estimates that this will become a reality in just

seven years' time for the municipality of Wörrstadt, where juwi's headquarters are located.

Setting a good example

With its headquarters (photo, upper left), juwi demonstrates just what an intelligent energy mix looks like. The parking spaces are covered with photovoltaic modules, and thus serve as “solar service stations”. Electric cars parked here can be recharged with electricity. The company building has been awarded the title of “most energy-efficient office building in the world”. It produces more energy than it consumes. The building features a wood construction and special insulation, and also takes advantage of synergy effects. For example, a biogas plant converts food leftovers into energy, which is then reused in the building.



Morbach energy landscape with Vestas 2.0 MW turbines

Award-winning concept

The company has been awarded numerous prizes for its company philosophy: in 2009, juwi received the “Clean Tech Media Award” for the best environmental technology and the State Environmental Prize in Rhineland-Palatinate – to mention just two of them. The two juwi “inventors” Fred Jung and Matthias Willenbacher can also boast the titles “Entrepreneurs of the Year” and “Greentech Managers of the Year”.

Vestas supports new endowed professorship

Wind energy is booming, which is why there is an increasing demand for innovative research and for engineers with first-class training. Vestas is doing its part here by participating in the funding of a new endowed professorship for wind energy technology, to be created at Flensburg University of Applied Sciences on the basis of a public-private partnership.

A second professorship and the establishment of an institute for wind energy are being financed by the Schleswig-Holstein Innovation Foundation, which also provided the initial impetus for setting up the institute.

More money and more time for research

"These are very special professorships," explains Professor Hans-Jürgen Block, the director of the Innovation Foundation. These

positions, which each come with 750,000 euros for personnel and equipment costs over a total period of five years, are better equipped financially than is usual at Universities of Applied Science in Germany; in addition, the professors will have significantly more time for research, as they will only have half of the normal teaching duties. "With these funding measures, the industry is sending out a signal that professional training for engineers also requires stronger research activity," praises Professor Block.

Research topics suggested by industry

Vestas is contributing to the tune of 125,000 euros. "As one of the sponsors, we place particular emphasis on applied research, continued education and transfer of expertise," says Peter Hartwig,

Vice President of Marketing & Customer Insight at Vestas Central Europe.

The sponsors will have an input into the way research will be conducted: they are involved in the appointment of the professor, and will be represented on an advisory council that will make recommendations regarding research issues and the awarding of project funds.

As Flensburg University of Applied Sciences already has multi-disciplinary links with other third-level institutions within the CEwind research network, it is very likely that a lot of synergy effects will result – both for the industry and for academic research.

www.fh-flensburg.de



Unique 3D perspectives



Vestas invites you to take a virtual tour right into the very heart of the V112-3.0 MW at this year's HANNOVER TRADE FAIR in Germany. An original nacelle from the new wind turbine offers unique 3D perspectives that will impress not just engineers and designers. Visitors to the trade fair will also gain an insight into the Vestas Performance and Diagnostic Centre – a one-off tool in the wind sector for the development and maintenance of wind turbines with 60 terabytes of data storage capacity.

As part of MobilTec, the new flagship trade fair in HANNOVER, Vestas will also be co-operating with Solarworld on a presenta-

tion on electromobility initiated by the German Wind Energy Association. Vestas will be exhibiting its wind turbine models and its TESLA-E-Mobil together with a Vestas wind power recharging station for electric vehicles. German Chancellor Angela Merkel and Italian Prime Minister Silvio Berlusconi have been invited to this event.

Vestas trade fair stand: Hall 27, Stand J16

Vestas at the German Wind Energy Association stand (electromobility): Hall 27, Stand D46.

www.hannovermesse.de



The EWEC 2010 European Wind Energy Conference will take place from 20 to 23 April 2010 in Warsaw, Poland. More than 200 wind energy companies will be presenting themselves at this conference over a total exhibition area of 5,800 m². Vestas will be represented with a presentation at stand 1144 in the Expo XXI hall.

With over 500 presentations organised into over 50 conference sessions, the event boasts a varied and informative conference programme covering future issues such as "Wind power in Europe: 50 percent by 2050?" Experts from the wind power sector, including Vestas representatives, will be giving presentations on current energy topics such as research, technology, finance and political framework conditions.

www.ewec2010.info



Area available for wind energy in Brandenburg almost doubled

The German state of Brandenburg offers enormous potential for the expansion of wind energy. The largest of the new federal states that used to make up East Germany was in first place for all of Germany in 2009 as regards newly installed wind energy capacity. According to Brandenburg's Environment Minister Anita Tack (from Germany's Left party), this trend is to be continued. She explicitly supports the further development of renewable energy sources. The framework conditions are now being put in place for 2010 and subsequent years.

Brandenburg plans to expand its position as an energy exporter within Germany in the future. "Wind energy is capable of making a massive contribution here, all in keeping with the goals of climate protection, resource conservation and security of supply," says Hermann Albers, President of the German Wind Energy Association. In total, around 3,000 people are employed

by wind turbine manufacturers, component suppliers, operators, design offices and service companies. Over 500 jobs have been created in recent years at the Vestas rotor blade plant in Lauchhammer alone.

Increase from 1.3 to 2 percent

Vestas Deutschland has already installed 909 wind turbines with 1,583 MW of capacity in Brandenburg. This represents more than a third of the overall volume. Brandenburg boasted a total of 402.70 MW of newly installed capacity in 2009.

At the moment, around 2,750 wind turbines are in operation in Brandenburg, with a total installed rated power of around 4,000 MW. They generate more than 36 percent of Brandenburg's net electricity consumption and thus avoid almost 7 million tonnes of CO₂ emissions. With its 'Energy Strategy 2020', the state government has committed itself to supporting wind energy. According to regional planning, the fraction

of the state's land area set aside for wind farms is to be increased from the current figure of 1.3 percent to 2 percent. This represents an area of 555 square kilometres. 7,000 MW by 2020 is thought to be a realistic target. This would cover 90 percent of Brandenburg's power requirements.

Berlin needs renewable energy

Right in the middle of Brandenburg lies the metropolis of Berlin, with its population of 3.5 million. A lot of energy is consumed here, and up to now only a negligibly small fraction of this energy has been generated from renewable sources. Wind turbines inside Berlin's city limits do not make any contribution here. On the other hand, those who live in the capital city are the biggest advocates of renewable energy sources in Germany, according to a survey. In contrast, Brandenburg has a low population density with its 2.55 million inhabitants (87 inhabitants per square kilometre) and possesses a crucial asset for wind energy that Berlin



◀ Cottbus-Halde wind farm on a former mining site in the Lausitz lignite mining area. The project is located on the covered and partially recultivated inner tip of the mine. Before the wind turbines could be erected, labour-intensive improvement measures for the foundations and building ground in the form of a 'hidden dam' had to be carried out.

easy to reconcile nature preservation, wind capacity, grid compatibility and the needs of the population.

Lignite no longer economically viable from 2013

Frank Weise, President of the Vestas Blades Deutschland GmbH rotor blade plant, emphasises that interest in the expansion of renewable energy systems in Brandenburg is enormous among private and institutional investors. Weise encourages the politicians responsible to "campaign even more strongly for the political interests of the industry in Brandenburg", and he draws attention to another reason why Brandenburg should get behind wind energy: currently, the majority of electricity still comes from the combustion of lignite. "But the economic viability of electricity generation from lignite will come under significant pressure from 2013 at the latest, when emissions allowances will have to be fully acquired by auction with the start of the next stage of carbon certificate trading at an EU level." To summarise, he says: "Even better framework conditions for wind energy have to be created, as electricity from lignite will soon be more expensive!"

Wind farms on coal stockpiles

A number of investors already demonstrated in 2009 together with Vestas that land for wind energy use is currently still available. For example, PNE AG (Plambeck) constructed the Leddin wind farm with five V90-2.0 MW wind turbines in 2009. Ventotec GmbH planned seven V90-2.0 MW tur-

bines for Christinendorf and a further four in Ketzin; Notus Energy planned three V90-2.0 MW turbines for Crussow. "Brandenburg will be able to maintain its leading position in newly installed capacity, assuming that the expansion targets are implemented in regional plans as quickly as possible", says Alexander Siepelmeyer, Sales Manager for East Germany and contact person at Vestas for projects in Brandenburg. Disused lignite mines are a unique feature in Brandenburg. For example, the Ostwind group has begun operation of the Cottbus-Halde wind farm on old coal stockpiles in the Lausitz region in eastern Germany, with 14 V90-2.0 MW wind turbines. For a number of years now, this medium-sized family company has been specialising in developing former industrial sites that could not be put to other commercial uses up to now because of their chemical, biological and physical conditions. Former mining areas with extreme ground conditions are one example of this type of site.

Vestas sales office in Berlin

Vestas Germany will be opening a new sales office in Berlin in mid-2010 for the coordination of its activities in Brandenburg, Berlin and the other federal states in East Germany. Andreas Eichler, Director Sales for Vestas Germany, says: "Here we are implementing something that we have already started doing all over Germany: local presence and personal contact with our clients – and, at the same time, close proximity to important political decision-makers in the capital."

doesn't have, namely land area (29,480 square kilometres) and, of course, favourable wind conditions.

In order to meet the ambitious targets, wind power in the Berlin-Brandenburg region must be increased to around 35 to 40 percent by 2020. Brandenburg also plans to be a leader in the grid integration of wind power.

Regional planning is getting its turn

It is now down to regional planners to play their part: in 2010, they have the task of distributing the dedicated area over approximately two per cent of the state's surface area in a beneficial manner and in good time, in order to pave the way for the expansion of wind energy. Consideration is also being given here to the stronger inclusion of so-called wind forestry in planning. According to the state government, there is enough space available for the expansion of wind energy without giving rise to conflicts. Nonetheless, it will not necessarily be

Hermann Albers, President of the German Wind Energy Association,
on current wind issues

Germany needs a coherent strategy for grid expansion

Hermann Albers was born in 1960 and grew up in Simonsberg, close to Husum on the German North Sea coast. He has been a successful entrepreneur in the agribusinesses of cereal and bio-oil production since the 1980s, and has also been active in the area of wind energy since 1989 – as a project planner and operator of wind turbines, and in other capacities, too: first as a joint initiator of the Windenergie Westküste industry association, then as a member of the board of the German Society for Wind Energy. From 1996 he has been a member of the German Wind Energy Association (BWE), becoming its president in 2007.

win[d]: Mr. Albers, what needs to happen and what can your association do so that electricity will be generated from wind power in a steady manner in the future? How can this power be made available precisely when it is needed?

Albers: We need incentives to improve the steadiness of supply as quickly as possible. When the operators of wind, photovoltaic, biogas, hydroelectric and geothermal systems co-operate on storage plants and undertake to meet electricity requirements in a more reliable and constant manner, it

then has to be possible for market investors to finance these measures.

The legal and economic foundations for this have to be put in place. What is necessary here is a remuneration rate that takes into account the costs of combining various different renewable generation types and the costs of investments in storage technologies. A legal framework is provided by the power to enact legislation set out in the 2009 German Renewable Energy Sources Act.

win[d]: Which measures must be implemented in order to further expand the grid?

Albers: Network operators and politicians in the area of energy have known for more than ten years that the transmission grids urgently need to be improved. But almost nothing has happened up to now.

Germany quickly needs a coherent, forward-looking strategy for the expansion of domestic grids, storage facilities and cross-border connection points. Otherwise the growth rate of wind, solar and friends will hit a bottleneck.

win[d]: Many people think that the current decade will see a breakthrough for offshore in Europe. What role will Germany play here?

“Repowering is gradually taking off.”

Albers: Almost 600 MW of new offshore capacity was installed in Europe in 2009 – 60 MW of which was in Germany. I expect to see 10,000 MW installed off the German North and Baltic Sea coasts by 2020. This will position us among the leaders in Europe.

win[d]: Repowering was supposed to be the focus for the German wind market in 2009. Will there be progress in 2010?

Albers: Repowering is gradually taking off in Germany. In 2009, almost 37 MW worth of old turbines were replaced by 136 MW of new turbines. The recipe for success for the German onshore wind energy industry for the coming years will be to halve the number of turbines while doubling the capacity and tripling the yield.

Of the turbines currently installed with their total capacity of around 25,800 MW, around 18,000 MW could be replaced by new turbines by 2020. We can significantly



“We are within reaching distance of an energy transition that will finally bring us into the renewable energy era.”

improve the efficiency of wind turbines by using higher towers and larger rotor diameters in order to produce more CO₂-free electricity. Unfortunately, the height restrictions in numerous German federal states are preventing the efficient harnessing of this potential. We must campaign for more understanding for our position among political decision-makers at state, regional and local level. These things take time, however. We will be able to do much more for climate protection if we take full advantage of the current state of the art in wind technology.

“Electric cars are only environmentally friendly if they run on renewable power.”

win[d]: Studies have shown that electric vehicles will make a breakthrough much quicker than was previously assumed, particularly in large cities. What needs to be done so that development in Germany heads in the right direction?

Albers: The German federal government wants to see over a million electric cars on Germany's roads by 2020. However, these vehicles are only environmentally friendly if they run on power from renewable sources. Numerous project proposals from the renewable energy sector already provide evidence today of the huge potential for innovation and of the sector's willingness to invest in this promising area. We need fair, transparent, and, above all, unbureaucratic framework conditions if electric vehicles are to be successfully introduced to the market in Germany.

It must be as simple as possible for people to purchase an electric car and use it every day. With a sufficiently large fleet of these vehicles that can be connected to the grid at home and at the workplace, a great number of decentralized electricity buffer storage units (V2G) could be combined to create a single large virtual power storage system.

“I cannot imagine life without wind...”

win[d]: Mr Albers, when you travel home to Simonsberg, you pass by the North Frisian citizen-owned wind farm. You are the managing director of this wind farm, you were a founding member of the Butendiek citizen-owned offshore wind farm, and you are also active in the sector in many other ways. What would your life be like without wind?

Albers: Actually, I can't imagine my life without wind. Wind energy has had me firmly in its grips since the start of the 1980s. We are within reaching distance of an energy transition that will finally bring us into the renewable energy era. But the last few metres are the most difficult. Let's all work hard to achieve this goal!

win[d]: Thank you very much for this interview.



Ambitious targets in the Netherlands

New business unit in Arnhem

▲ The Dutch Minister of Economic Affairs Maria van der Hoeven speaking to Ditlev Engel (CEO of Vestas, right) and Hans Vestergaard (General Manager of Vestas Benelux, middle).

There is no way the world can do without wind energy if the ecological targets that have been set are to be achieved – this point was emphasised by the Dutch Minister of Economic Affairs Maria van der Hoeven in her address at the opening of the new Vestas Benelux business unit: “I am very pleased to support further developments in the area of wind energy, both onshore and offshore.”

Growth opportunities

The new Vestas business unit in the Dutch city of Arnhem is easier to reach than the old location in Rheden, and also offers another advantage: the new building gives Vestas Benelux room for expansion again, as there are enough meeting rooms, and ample office space for the over eighty in-house employees.

The most innovative country

During the opening ceremony, Ditlev Engel, the CEO of Vestas Wind Systems A/S in Denmark, praised the successful co-operation between Vestas and the Dutch government. “The Netherlands is far from being the biggest country in the European Union in terms of surface area, but it makes up for this by being the most innovative country in the field of wind energy,” he remarked. He

pointed out that the Netherlands is pursuing ambitious targets as regards wind energy. “Vestas is fully committed to reaching these targets, and this new branch office will contribute to our effort.”

Tireless dedication

The Economic Affairs Minister van der Hoeven congratulated Vestas on its tireless dedication to technological development aimed at increasing the efficiency of wind turbines. She proposed a toast to the Vestas team in Arnhem: “I hope that this business unit will be the source of many new undertakings.”

The new business unit in Arnhem.



Belgium: First Vestas wind turbines for SPE-Luminus

The biggest supplier of green power in Belgium has installed a wind farm consisting of three V90-2.0 MW wind turbines in co-operation with Vestas. Including this wind farm in Berloz, the energy generator and supplier SPE-Luminus now has a total of more than 50 wind turbines, spread over eleven sites. This is the first time that Vestas and SPE-Luminus have worked together: "Vestas put together an attractive overall package, and was also able to deliver quickly," reports François Desmaré from SPE-Luminus.

Three wind turbines have been erected along the E40 motorway close to the village of Berloz, Belgium, in the middle of an area that is mainly used for agriculture. Large information panels explain the general operation principle of a wind turbine. Photos showing the construction of the Vestas wind turbines are also included on these panels. Passers-by can thus find out more about ecological power generation provided by the energy generator and supplier SPE-Luminus. The company delivers electricity and gas to more than 1.5 million private and commercial customers. François Desmaré, Product Manager for Green Electricity at SPE-Luminus, believes that open communication with the local residents is important. For this reason, the company has erected information panels at each of its eleven wind farms in Belgium.

Largest generator of green electricity

SPE-Luminus is the second largest power supplier on the Belgian energy market and Belgium's biggest generator of green electricity. SPE-Luminus first became active in energy generation all of fifty years ago with its hydroelectric power plants on the Meuse river. The company also holds a share in nuclear and biomass power plants. At the moment, a grand total of 12 percent of the company's production capacity comes from renewable energy sources. Desmaré hopes to erect a further 100 MW of wind turbines in the coming five years. "Whether we manage this or not depends mainly on the permits."

According to Desmaré, wind energy is currently the most efficient form of energy generation. The newest SPE-Luminus wind farm consists of three Vestas V90-2.0 MW

wind turbines. In total, the lead time for this wind farm was around five years, but this meant that construction itself then proceeded quite quickly. SPE-Luminus and Vestas came to an agreement in February 2009 regarding delivery, construction and maintenance of the three wind turbines. Once SPE-Luminus had installed the cabling and the foundations, Vestas was able to deliver the components for the 105-metre-high turbines as early as August.

Desmaré: "That is a short delivery time, and this was one of the decisive factors in our choice of Vestas."

a local road. While this turbine was being installed, the team had to partially close off this road using traffic lights so that trucks carrying construction materials could stop safely there for unloading. The installation work also attracted a lot of attention in the surrounding area. "Mainly in the case of the first turbine," reports van der Roest. A lot of spectators gathered regularly at the roadside to observe the work in progress.

After intensive checking, van der Roest was able to deliver the first kilowatt-hour in November. "That is always a milestone," he



The Berloz wind farm in Belgium

Smooth project progress

During the initial project phase, Desmaré carefully considered a number of wind turbine suppliers before finally deciding in favour of Vestas. "Vestas prepared an attractive overall package for us in terms of delivery, construction and maintenance – particularly as regards overall costs for us as owners and operators."

Construction site manager Johan van der Roest from Vestas can look back on the project in Berloz as a job well done. In his role he is responsible for all aspects related to construction. The wind turbine in the middle of a group of three is positioned beside

enthus. Once the acceptance procedure had been carried out by an independent body, van der Roest was able to hand over the keys for the wind turbines to François Desmaré.

Efficient turbine

The wind conditions in the area are favourable, "considering this is an inland location," says Desmaré. The V90-2.0 MW is well suited here. "This model has been proving itself for many years now as an extremely efficient turbine for weak winds." It is expected that the turbines will have a yield of 15 million kWh per annum.

Differentiation between various wind areas is necessary

Vestas campaigns for extended support mechanisms in the Netherlands



Ronald Boerkamp (left) and Anton van Wijk (right), Account managers

Which wind turbine has the best yield? Account managers Anton van Wijk and Ronald Boerkamp from Vestas Benelux advise their customers on a case-by-case basis for every Dutch project. For example, they check the wind conditions at the site in question. However, they must also take into account the incentives for renewable energy sources stipulated by law, which are complex and rather difficult to understand.

How does the legal framework work?

The regulations currently in place came into force at the start of 2008. They replaced the Netherlands' Environmental Quality of Electricity Programme (the so-called MEP). The new rules now guarantee wind turbine operators financial support based on the electricity delivered. The state tops up the current power price by as much as €96.00 per MWh. This only applies to the first 2,200 full-load hours, however. The full-load hours are determined by dividing the annual production by the turbine's rated power.

A slightly different rule applies to offshore turbines: because of the more favourable wind conditions here, the maximum number of full-load hours is 3,975 hours. In addition, the state only provides support to parties that have been successful in a tendering process.

Same region, different recommendation

But the limiting of full-load hours leads to problems, particularly in areas with weaker winds. In these cases, it is more advantageous to use wind turbines with lower power ratings.

In order to ensure project viability within the unfavourable context of the support mechanism, the wind turbine operators often have to opt for more expensive turbines with higher power ratings." It is thus possible that account managers will recommend a V90-3.0 MW turbine, for example, for a project in the Netherlands, while they would recommend a V90-2.0 MW turbine for a site with the same wind conditions a few kilometres away over the border in Belgium. "And this is entirely due to the legal regulations regarding full-load hours."

A double loss

According to van Wijk and Boerkamp, the Dutch state is harming itself in two ways here: wind turbine operators are opting for turbines with lower yields in borderline cases, which means that the state is paying more in subsidies per megawatt-hour generated.

On top of this, many prospective projects never get off the ground in parts of the Netherlands with weak winds – although these make up more than half of the country's land area. Van Wijk says: "In contrast with neighbouring countries, we cannot harness wind energy in a financially viable manner in these areas." The consequence of this is that energy companies and other developers are increasingly opting for projects in other locations in Europe.

Focusing on generation

According to Van Wijk, the problem is mainly caused by the current regulations on support mechanisms for renewable energy sources, as they concentrate too much on high turbine power ratings when generation should actually be the focus. Through the Dutch NWEA association, Boerkamp and van Wijk are raising awareness of this problem among politicians. In addition, the Governmental Relations department at Vestas Denmark is supporting the two account managers. "They are helping us to communicate this issue to Dutch members of parliament and to parliamentary committees in a transparent manner," says Boerkamp. Support mechanisms are not the only matter for which he is taking advantage of this help: he also regularly draws attention to spatial planning issues. Boerkamp emphasises that the Netherlands is a wind-rich country. "Our windmill tradition is the best proof of this. It is our responsibility to make the best possible use of this resource." In his opinion, it is essential that the various wind regions be treated differently. "Only then will we be able to fully exploit the enormous potential of wind energy in the Netherlands."



Princess Amalia offshore wind farm Netherlands

Wind farm makes Aruba more self-sufficient

The ceremonial opening of the Vader Piet wind farm marks a big step towards independence from fossil fuels for Aruba. The ten newly installed V90-3.0 MW wind turbines will together supply no less than 18 percent of the Caribbean island's overall energy requirements. The island used to be completely dependent on fossil fuels for electricity generation (as reported in win[d] 9).



Many high-ranking personalities in Aruba took part in the entertaining opening ceremony for the wind farm. Mike Eman, Aruba's Prime Minister, and Jossy Lacle, Director General of W.E.B. Aruba N.V., the local water and energy company, started up the wind farm with the help of a video game console: by moving a Nintendo Wii, they created a virtual wind on a large screen, which then caused one wind turbine after another to gradually start turning in real life.

For Vestas Benelux, the Vader Piet wind farm is a unique project, not least because of the company's co-operation with the developer Henk Hutting and the investor Bright Capital Partners. Sales, delivery and maintenance were fully organised by Vestas Benelux. Many Dutch partners were

involved in the construction of the wind farm.

The Arubans were more than willing to help out during the installation work in any way possible. There were no delays at all, and the project was carried along by a wave of enthusiasm. People stood at the side of the road and applauded when the wind turbines were being transported across to the other side.

Vestas Benelux will be responsible for the maintenance of the wind turbines on the island for the next ten years. Four experienced Vestas employees are on site at the moment, and two local employees are currently being trained so that they will be able to carry out maintenance on the wind turbines to a high standard.



Austria could become the first EU country to switch its electricity supply entirely to renewable energy sources. According to the result of the power summit held by trade associations for renewable electricity, it is an entirely realistic prospect that Austria will be supplied with 100 percent clean power by 2020. This fraction is currently around 60 percent, and is thus already significantly above the EU average of 14 percent.

New Austrian Green Electricity Act

The Green Electricity Act that came into force in October 2009 represents an important step towards incrementing Austria's power supply from renewable energy sources. The act provides for an increase in the maximum subsidy amount for green power from 17 to 21 mn euros, and also increases the subsidy period from 11.25 to 13 years. Subsidised green electricity represented 9.8 percent of power consumption in 2009, and the new act shall contribute to raising this figure to 15 percent by 2015.

Austria's government has identified a strong economic aspect to its support for renewable energy generation, next to the environmental element. The volume of Austria's wind energy exports has already reached 350 mn euros per annum, with an annual growth rate of around 30 percent. According to IG Windkraft, the Austrian Wind Energy Association, the wind energy economy in Austria benefits from every wind turbine to the tune of around 3 mn euros.

Ideal power mix

Austria is rich in water, wind, sun and biomass. If the untapped energy potential

is harnessed in a targeted manner and an optimal electricity mix is established, 100 percent renewable power supply is entirely realistic by 2020, according to expert opinion. A further significant boost to the continued expansion of wind energy in Austria was provided by the agreement on the feed-in tariff, which was achieved at the start of February after long negotiations. At 9.7 cents per kWh, the tariff is admittedly below the European average, but still means that construction can go ahead at efficient locations.

Tripling wind energy

"A positive aspect of the tariff negotiations was that Economics Minister Mitterlehner, Environment Minister Berlakovich and Consumer Protection Minister Hundstorfer examined the actual production costs of wind energy in a considered, detailed manner. The Austrian Trade Union Association and the Chamber of Commerce have also recognised the important role of wind energy for the labour market and the domestic economy, and they provided active assistance in the search for a compromise solution," explains Stefan Hantsch, Managing Director of IG Windkraft, (Austrian Wind Energy Association). This way, electricity generation



Austria: 100 percent green electricity is realistic

Vestas has a market share of 38.5 percent in Austria

◀ The Tauern wind farm in the Austrian state of Styria.

from wind energy could be more than tripled in Austria in the next ten years. At the moment, 617 wind turbines with 995 MW of capacity are delivering over 2 bn kWh per annum. This represents 3 percent of the total power consumption, and is equivalent to the electricity needs of 600,000 Austrian households. By 2020, 1,100 turbines could be generating 7.3 bn kWh and thus be providing around 10 percent of Austria's overall power requirements, while at the same time saving 4 mn tonnes of CO₂ emissions.

Just like on the North Sea

From a geographical point of view, the most favourable federal states for the harnessing of wind energy are Lower Austria and Burgenland. The confluence of two major wind systems leads to wind conditions in the east of Austria – mainly in Lower Austria and Northern Burgenland – that are comparable with those on the North Sea.

Lower Austria, which is Austria's largest federal state, currently has 345 wind turbines with a total capacity of 541 MW and is the leading state in the use of wind energy with a share of over 50 percent. By 2020, the number of turbines could be increased to 500, with a capacity of 1,500 MW.

From 23 to 140 employees

The Vestas headquarters for Austria and Eastern Europe are also based in Lower Austria. Sales, project planning and services for Vestas turbines in this region are carried out from the offices in Schwechat, close to Vienna airport. The number of employees at Vestas Austria has risen from 23 to over 140 since 2007. "We are well-equipped for the expansion of wind energy in Austria: with our excellent employees on the ground, we can make use of the strong Vestas international network, and the V90 turbine means we can supply a model that is ideal for the prevailing wind conditions in Austria," says Andreas Thomas, General Manager of Vestas Österreich GmbH, regarding developments in Austria.

Over 220 Vestas wind turbines with a total capacity of 384 MW are currently in operation in Austria. This gives Vestas a share of 38.5 percent in the Austrian market.



Facts and figures

The Republic of Austria, which has a land area of around 84,000 km² and is divided into nine federal states, has a population of over 8 million, with around two million living in the Vienna metropolitan area alone. In 2009, Vienna was rated the city with the best quality of life worldwide, thus pushing Zurich, which had previously held this title on a number of occasions, down into second place.

According to the Mercer study, Vienna's excellent ranking is due in part to its high level of security and its political stability, along with the improvements in recent years in housing, leisure, recreation and the arts.

Around 60 percent of Austria's territory is mountainous, which is why the country is also referred to as the Alp Republic by German-speakers.

www.oesterreich.gv.at

Karl-Heinz Fatrdla:

Focussing on Austria and south-eastern Europe

“The most important thing for me is to be present with the client on site, to get to know the people involved personally, to listen carefully to what they have to say, and to always consider their point of view. On this basis, we can then work together as a team to find the best possible solution.” Since August 2009, Karl-Heinz Fatrdla has been responsible for the areas of Sales and Customer Relationship Management (CRM) in his capacity as Director at Vestas Austria. He is a 41-year-old from Vienna, and his job involves servicing Austria and the countries of south-eastern Europe from the company base in Schwechat.

21 staff at the moment

He places deliberate emphasis on providing individual advice and service to customers with his team in Austria, which currently consists of 21 employees, and works in close co-operation with Vestas staff in the various countries. As an enthusiastic sailor, he knows that good results depend on many factors – on the wind, of course, and on equipment and team performance. “Our biggest competitive advantage is definitely the fact that we work and provide our services with project teams that not only have a good range of technical expertise, but also boast an intercultural mix,” says Fatrdla.

Current investor network

The spectrum of consultation services offered by Vestas ranges from expert advice regarding the most suitable wind turbine right through to support in financial matters. The latter is particularly popular with clients at the moment, as efficient project implementation also demands reliable financial backing.

Because of the poor financial and economic climate at the moment, it is often difficult to secure the necessary liquidity. For this reason, Vestas is currently establishing an investor network so that a comprehensive service package covering all aspects and stages of wind projects will be available to Vestas clients.

Strong demand expected

“Even though the global economy is only gradually recovering again, I expect a strong increase in demand for wind farms in 2010. One reason for this is the various legal frameworks that are being put in place this year in many countries to promote and subsidise wind energy.” According to Fatrdla, highly qualified and motivated staff along with internal processes that operate as smoothly as possible are all necessary in order to meet this demand.



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For this reason, developing the company's human resources and continuously improving the processes are particularly important activities of this engineering graduate. Fatrdla says: "Of course, the opportunity to work in a prospering sector provides great motivation for the entire Vestas team. There is an incredibly positive spirit around. We believe in what we are doing. We believe in the benefits of wind energy and we want to move wind energy forward. Our employees are all very dedicated and they are not afraid to put in long hours when they are working on a project."

Energy from Qigong

For this father of two, the day would ideally have much more than just 24 hours in it. Every working day is different. The flexibility to respond quickly to a varying range of clients, employees and subject areas is required. Project and CRM meetings, client inquiries by email and face-to-face discussions with clients are just as much a part of the daily routine as economic planning and calculations are.

A versatile sportsman in his spare time, he manages to top up his energy and positive attitude towards the challenges of the working day by carrying out Qigong exercises

every morning without fail. The experienced sales director also views his background in project management as an advantage for successfully mastering his many tasks. His career path has been linear and focussed from the beginning of his working life in the mid-1990s right up to today. The various career stages and challenges that this keen reader has experienced so far now help him to identify potential problems at an early stage, to analyse them from a number of perspectives, and to solve them efficiently.



The word rap

Karl-Heinz Fatrdla, what is the first thing that comes to your mind when you hear...

... wind power?

That's clear: the energy of the future.

... clients?

Important: partnership put into practice.

... sales?

Sustainable success only comes by searching for and finding solutions together

... the future?

The future is green.



The target is the fastest sailing boat ever

The successor to the legendary Vestas SailRocket is in construction

The Vestas SailRocket during the record attempt



SailRocket pilot Paul Larsen

What could potentially be the fastest sailing boat of all time is currently being created at the heart of the Vestas Research and Development Centre on the Isle of Wight, off the coast of England. This description is no exaggeration, as we are dealing here with the optimisation of the famous Vestas SailRocket, which itself came within a hair of breaking the world record. The new 'baby' doesn't have a name yet, but one thing is certain: it will be able to use the force of the wind in a much more clever way than its predecessor.

Unique design

The new high-performance boat will again be developed by the Vestas engineer Malcolm Barnsley, who designed the original back in 1999 at the very same location. The new model with its unusual lightweight construction will harness the wind's energy with maximum efficiency, just like the SailRocket – and just like Vestas wind turbines too! The SailRocket was able to achieve 2.2 times the speed of the wind – only 23 knots of wind were necessary in order to achieve a speed of 50 knots. The new version will probably beat this value by some margin.

(R)evolution in the workshop

"We prepared a feasibility study for various designs," says the Australian Paul Larsen, who was a pilot on the SailRocket for many years and thus knows the practical requirements better than anybody else. "At the end, one design was left." Using this design, a remote-controlled, 1:5 scale model was built and tested off the coast of Namibia. The results were promising. "This is definitely an evolution", says Larsen with pride. And perhaps even a revolution, too.

Breaking records and crossing oceans

In the long term, the versatile new high-speed craft is to be able to cross entire oceans. It will be unveiled to the world audience this summer. And the SailRocket? After ten years in service, it has now been retired. It only just failed to achieve its goal of being the first sailing boat in the world to break the 50-knot mark: due to a spectacular capsizing accident the world record was not recognised.

www.sailrocket.com

win[d] is the customer magazine of Vestas Central Europe.

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Answer to the last quiz and the winners from win[d] 9

Passat: A predominant north-easterly trade wind blows on the Caribbean island of Aruba.

The Vestas wind turbine LEGO kit was won by:

Markus S. Wetter, ABO Wind AG

The stunt kites went to:

- Adriaan Filius, Windservice Zeeland
- Daniel Gahleitner, Energiewerkstatt GmbH
- Th. Nögler, Ökostrom Saar GmbH
- André Schuster, Deutsche Bank AG
- Bart Thiele, Raedthuys Groep



En route to the Kentish Flats offshore wind farm in Great Britain

win[d] Get in touch with win[d]! Tell us what you think:

Four vertical dotted lines representing a contact form or survey area.



No. 1 in Modern Energy

Quiz: Where in Europe do the strongest winds blow?

- In low mountain ranges
- On the northern and western coasts facing the Atlantic Ocean and the North Sea
- In dry areas

Please tick your answer on the card and send it to Vestas Central Europe by 15 May 2010, fax it to +49 (0)4841/971 360, or email your answer to wind@vestas.com.

Correct answers will be entered for a draw to win a Vestas wind turbine LEGO kit and five stunt kites. Don't forget to tell us what you think of win[d] on the back of the card or in your email. See page 27 for the answer to the last competition question and the winners from win[d] 9.

Please tick the right answer:

Low mountain ranges

On the northern and western coasts facing the Atlantic Ocean and the North Sea

In dry areas

Company

Name

Street

Postcode, City

E-mail

Please send me win[d], Vestas Central Europe's customer magazine, from now on free of charge.

Vestas Central Europe
win[d] Editorial team
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Vestas

vestas.com

Vestas Central Europe (VCEU)

VCEU has overall responsibility for the sales, marketing, construction and servicing of wind turbines in Germany, the Benelux countries, Austria/Eastern Europe, and the south-eastern regions of Africa. The headquarters of the parent business unit, Vestas Central Europe, are in Husum in northern Germany. Management: Hans Jørn Rieks, President

Vestas Germany

Vestas Deutschland GmbH was founded in 1986 and currently employs around 1,100 staff. 5,750 wind turbines have been erected so far, which generate a total of approx. 7,200 MW. The company headquarters, which house the Sales, Projects and Service departments, are in Husum in northern Germany. At the same time, this is also the headquarters of the parent business unit (VCEU). Vestas has regional offices in the German cities of Hamburg and Osnabrück.

Vestas Austria/Eastern Europe

Vestas Österreich GmbH has its headquarters in Schwechat, near Vienna. The company operates in Austria and in all relevant Eastern European countries such as Hungary, the Czech Republic, Romania, Croatia, Bulgaria, Slovakia, Ukraine and Russia. The 140 employees work at locations in Sofia and Varna in Bulgaria, in Hamburg for Russian-speaking areas, and at the headquarters in Schwechat.

Vestas Benelux

Vestas Benelux B.V. operates on the Dutch, Belgian and Luxembourg markets. Over 200 employees work here, primarily in the areas of Sales, Projects and Service. To date, Vestas Benelux has installed over 1,600 MW. The headquarters are in Arnhem in the Netherlands.

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