

WINDBLATT

ENERCON Magazine *for wind energy*

01/13

ENERCON installs E-92 prototype

The new 2.3-MW-turbine erected near Simonswolde in East Frisia. Measurements already underway.

ENERCON to support Renewable Energy Law

Managing Director Hans-Dieter Kettwig explains ENERCON's proposals for EEG reform in an interview.

Showcase project for multi- megawatt class onshore

ENERCON installs five E-126/7.5 MW at Ellern wind farm in Hunsrück (Rhineland-Palatinate). Farm erected in record time.



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Cover Illustration:
Installation of ENERCON E-92 prototype.

2012 – Best year ever in the history of ENERCON

Last year, ENERCON installed 1,647 wind turbines worldwide with an aggregate capacity of more than 3,500 MW. «That makes the year 2012 the best installation year in the history of the company,» says ENERCON Sales Director Stefan Lütkemeyer. Over 60% of the turbines were produced for export which follows the trend of the previous years. In 2012, Germany also remained one of ENERCON's prime markets with a total of 565 machines installed and a total capacity of more than 1,300 MW.

According to the «Deutsche WindGuard», the total number of new wind turbines installed across Germany came to 1,008 (2,439 MW). This is approximately 20% more capacity than what was installed the year before.

A glance at the installation figures clearly illustrates that wind projects in Southern Germany are becoming more prevalent. In Rhineland-Palatinate, a capacity of 288 MW (100 WECs) was installed, followed by Bavaria with 201 MW (81 WECs). An outstanding example of this development is the Ellern Wind Farm installed last year in the Hunsrück (Rhineland-Palatinate) with five E-126/7.5 MW and three ENERCON E-101/3 MW (see report page 14). Germany-wide, Lower Saxony remains in the lead position with an additional 361 MW added (154 WECs) and Schleswig-Holstein closely behind with 333 MW (135 WECs).

Stefan Lütkemeyer expects the upward trend in Southern Germany to continue again this year. «Step by step we are moving towards achieving the targets of decentralised renewable energy

Picture: Ulrich Merrens, Atelier für Kunst und Fotografie

Installation figures for 2012 showed a significant upward trend for ENERCON – the best year in the company's history.

Picture: ENERCON E-126 in Hamburg.

in Germany with the possibility for the public to buy shares in the projects – a vital factor when it comes to public acceptance,» says Lütkemeyer. «Good framework conditions such as those guaranteed by the Renewable Energy Sources Act (EEG) in Germany play a major role in these positive developments. And these are to be maintained.»

ENERCON achieves top ranking from BWE service survey

Once again, ENERCON attained the highest ranking in the Bundesverband WindEnergie (German Wind Energy Association) service survey. With an overall ranking of 1.96 (the highest being 1), the German market leader came out ahead of all other manufacturers in the 2012 survey. Second and third place was awarded to GE Energy (overall rating 2.64) and Nordex (2.70) and the service quality of Repower was rated at 2.75. Vestas and Siemens only achieved a 3.04 and 3.24 ranking, respectively.

Compared to the previous year's survey, ENERCON's ranking significantly improved last year. In 2011, ENERCON's service performance was given an overall ranking of 2.10 by the participating operators, which was also the highest ranking that year.

ENERCON's first time at wind energy expo in Japan

This spring, ENERCON had its first own stand at the Wind Expo in Tokyo from 27 February to 1 March. Just over two years after the nuclear catastrophe in Fukushima, the Japanese visitors are still as interested as ever in wind energy technology.



The test buildings for ENERCON's Innovation Center already standing. By mid-year ENERCON expects to run first tests at new facilities.

Test buildings for ENERCON's Innovation Centre already standing

ENERCON's new Innovation Centre is slowly taking shape. At Aurich's Industrial Estate North, construction of the buildings containing various test stands and laboratories, including a rotor blade test station, is on schedule. At present, completion of the interior construction is in progress as well as the installation of the test equipment. Both are expected to be completed by mid-year.

Construction of the adjacent office building designed to hold up to 700 employees is also running according to plan. Contractors are now working on the shell and by the end of the year the building should be ready to be moved into.

The innovative research and development complex is unique in the wind energy industry. Such a concentration of state-of-the-art test equipment at one site is currently only available at ENERCON. Not only is the test equipment unique but also the entire building concept. The modern architecture of both the test and office buildings is complemented by an exemplary energy balance, including a combined heat and power plant to heat the facilities.

The e.g.o.o. mbH not only transports ENERCON turbine components but also freight from suppliers and external companies – now also to the new Jade-Weser Port in Wilhelmshaven.

ENERCON railway opens new connection to Jade-Weser Port

The ENERCON railway has just added a connection to Wilhelmshaven's Jade-Weser Port to its rail network. e.g.o.o. mbH is now offering back country transport with single cars or groups of rail cars to and from Lower Saxony's new deep water harbour. «By interconnecting transports to and from the Jade-Weser Port and the existing e.g.o.o. transport system we can set up a daily connection to the harbour in Magdeburg, the Ruhr region, to south Westphalia all the way down to the area around Ludwigshafen,» explains e.g.o.o. signatory, Ursula Vogt. This year e.g.o.o. will be celebrating its fifth anniversary and by adding a new hub the company will be providing yet another option for third party transports as well as ENERCON's own freight transports thus consolidating the system and increasing its efficiency.

Regular combined cargo transport as well as special transport for oversized components can be realised by e.g.o.o. via the Jade-Weser Port. The company is open to any propositions for cooperation between other rail companies and logistics firms. Since the services are an interesting alternative to road transport, e.g.o.o. expects demand to be respectively high. «The first market response since operations were launched at the new deep water harbour is optimistic,» says Ursula Vogt.





Nighttime departure: First E-101 blade transport from KTA in Aurich at end of November.

New plants delivering series produced blade sets for E-101

ENERCON is switching to series production at its new rotor blade factories in Aurich and Haren. Since production of rotor blades for the E-101 series was started at the two plants in the second half of 2012, it has been ramped up and the volume has been continuously increased. Both plants are now each delivering one to two complete E-101 blade sets per week. Output will continue to be increased until they are running at full capacity.

By the beginning of the year the first blade sets had left Kunststofftechnologie Aurich GmbH (KTA)

to be delivered to the construction sites. «We are thus trying to complete our E-101 projects as quickly as possible,» says Jost Backhaus, Managing Director for ENERCON's rotor blade production.

Aero Ems GmbH in Haren had already delivered its first set of blades in October. Because of a special agreement with the police and the approval authorities, the E-101 blade transports can leave Haren without police involvement. Escort vehicles from private security companies or ENERCON, with crews trained by the police in advance, are sufficient to safeguard the loads.

ENERCON is currently in discussions with the

authorities to put in place similar arrangements for E-101 blade transports from KTA in Aurich. This arrangement is already in place for E-70 and E-82 series rotor blades. Since 2002, ENERCON has had a permanent approval to operate transports with a total length of up to 45 metres at certain times without a police escort. They are safeguarded by private escort vehicles. «We have been operating with these arrangements for years with no problems,» reports Silke Tucholski from ENERCON Logistics. «It makes things much easier for us, and for the police, who no longer have to deploy their officers to escort our transports. Our transports are just as safe, as safety is always our top priority.»

Serial production launched at concrete tower plant in Austria

ENERCON has proceeded to serial production at its new concrete tower factory in Zundorf (Burgenland), Austria. Only a few weeks after the production launch in January, ENERCON's first manufacturing facility in Austria has achieved a weekly output of 45 tower segments for the E-101 series. Once full-scale production is underway, 24 segments are expected to be produced per day. This is the equivalent of a complete tower. The factory is dimensioned for an annual production volume of roughly 200 towers. «We hope to show, that the energy change can also provide decentralised added value,» says Norbert Hölscher, Managing Director of WEC Turmbau.



ENERCON's concrete tower factory in Zundorf situated next to a wind power plant with E-101 turbines.

German Federal Environment Minister visits ENERCON in Aurich

Germany's Federal Minister of the Environment, Peter Altmaier and Lower Saxony's former Prime Minister, David McAllister, (both CDU) visited ENERCON in Aurich at the beginning of January. Amongst the discussion topics between ENERCON Management and the politicians was the upcoming reform of the Renewable Energy Sources Act (EEG). During the course of these discussions, ENERCON Managing Director, Hans-Dieter Kettwig, emphasised how important reliable framework conditions are for the entire industry. The revised EEG should ensure that onshore wind energy can continue to be expanded and that targets for the energy transition in Germany can be successfully met. Also discussed were the necessary efforts required to keep the transition costs down to affordable levels for the consumer.

Two weeks before state elections in Lower Saxony, Altmaier and McAllister acknowledged that wind energy is an essential pillar for the future power supply. Altmaier stated that a return to nuclear energy is irrevocably ruled out. He also emphasized the importance of wind energy for the economic development of the state: «It is obvious that there is a lot of economic potential for Lower Saxony in the energy transition,» said the Federal Minister of the Environment. ENERCON, «as the most dynamic and modern company», is a perfect example of this.

During a guided tour of ENERCON's new KTA rotor blade production facility, the politicians and other guests accompanied by camera teams and journalists were able to get a first-hand impression of the site. All were extremely impressed by the modern production concept and the size of the factory building. At the end of the tour, Altmaier and McAllister autographed one of the ENERCON rotor blades on site. Altmaier wrote above his signature: «Energy transition, ahoy!», while McAllister added «We've got the wind!»



Federal Minister of the Environment, Peter Altmaier (f. l.), Lower Saxony's former Prime Minister, David McAllister, and ENERCON Managing Director Hans-Dieter Kettwig before guided tour. Figure right: Altmaier autographs ENERCON rotor blade.



ENERCON opens Sales office on Canary Islands

Since January 2013, customers on the Canary Islands are able to contact ENERCON Sales International directly at their new office on Gran Canaria. The new premises are large enough to accommodate up to 6 employees, but will initially only be manned by one person. Later on this location will also be home base for employees from ENERCON Project Management who will be supervising the islands' wind projects. «The office in Las Palmas will bring us closer to the regional customers and allow us to provide them with even better service,» said Raul Macias, ENERCON's new agent on the island at the office opening in Las Palmas.

For ENERCON, the Canary Islands are one of the more important regions in Spain. The first E-40 wind turbines were already installed on the Canary Islands approximately 15 years ago. And now the first repowering projects have been completed and several other projects are either underway or in the planning stages (see report page 18). The Canary Islands have set

ambitious targets for expanding renewables. By the year 2015, the islands intend to be able to obtain 30% of their electricity from renewable sources of which the major portion is to be wind energy – the cheapest form of energy for the Canary Islands. The projected target of the «Plan Energético de Canarias» for wind energy is 1,025 MW. Roughly 140 MW have already been installed on the islands. «ENERCON welcomes this optimistic target,» says Thomas Barkmann, ENERCON regional representative for Spain, Italy and Portugal. «We are well prepared to provide the Canary Islands with all the support they need for developing wind energy.»

ENERCON moves to new premises in Bremen

ENERCON is moving to new offices in Bremen. Instead of the airport location, from 1 May on the Bremen Sales offices will be situated in downtown Bremen in the former «Beluga» building where the company has leased the third and fourth floors. Other departments will also be moving in with the Sales group soon.

New 2.3-MW-series

ENERCON erects E-92 prototype

New 2.3 MW wind turbine installed shortly before Christmas at site near Simonswolde in East Frisia. Operations launched on schedule. Measurements already underway.

Slowly but surely, the crane inches the rotor hub up towards the main carrier. With an impressive diameter of 92 metres, the rotor hub carefully manoeuvred into its final position by no means appears massive. Due to the new shape of the rotor blades – extremely tapered towards the tip – they almost appear filigree. The new blade profile is the particular characteristic of ENERCON's new E-92 series. However, the elegant silhouette of the blades is not actually their most significant property. Their main purpose is to help boost power generation. The machine being installed near Simonswolde (East Frisia) is the prototype.

In the meantime, the technicians have already bolted the hub to the main carrier at 97 metres above ground. The prototype is in place, brief applause and work continues to complete commissioning and connect the wind turbine to the grid. Despite the ice-cold temperatures, the site is buzzing because the E-92 is supposed to be up and running before Christmas.

The weather nearly threw the plans off schedule. Icy road conditions delayed delivery of the rotor blades. The night before, the police prohibited any heavy transport vehicles from driving in the county of Aurich. Because of the extreme cold the installation crane's hydraulic system failed just before the hub was to be hoisted. And because heavy winds were forecast for that week, the timeframe for hoisting the hub was already extremely tight.

But in spite of all these hurdles the technicians managed to get the hub into place just before the bad weather set in. All other

Hoisting rotor hub of E-92 prototype in Simonswolde/East Frisia.

work went according to plan so the technicians were soon able to report: E-92 prototype up and running!

«In record time,» as ENERCON Head of Sales, Stefan Lütkemeyer, put it. «Not even a year between the time the new machine was announced at the Hanover Fair (end of April 2012) and the time the prototype was installed and commissioned! Quite an accomplishment!» Project manager, Mischa Bräske is also satisfied with the course of the prototype installation: «Everything was just perfect and went exactly as anticipated.»

«Everything was just perfect.»

In the meantime ENERCON has started recording the machine's power curve measurements, loads and sound power levels. Concurrently, the new Wind Class IIA machine is being adapted for serial production and the production lines in Aurich, Magdeburg and Viana do Castelo (Portugal) are preparing for the production launch. Serial production of the E-92 is scheduled to take off in April. As with the E-82 series, the machine houses are to be assembled at Mechanic Anlagenbau GmbH in Aurich as well as in Magdeburg/Rothensee. The first factory to switch to E-92 blade production is the plant in Portugal. Other rotor blade production plants will progressively be making the changeover.

Furthermore, preparations for the first large-scale projects with the new series are already underway. Starting in the second

half of this year, ENERCON will be installing large numbers of E-92 wind turbines in countries including Portugal, Sweden and Canada. «The E-92 is a turbine generation which is particularly well-suited for foreign markets,» declares ENERCON Head of Sales, Stefan Lütkemeyer. Specially designed for sites with light winds, the E-92 complements the product range between the E-82/2.3 MW and the E-101/3 MW. 📄



Loading up rotor blades for E-92 at logistics station in Aurich (left). Final preparations for hoisting rotor hub (centre). Figure right: E-92 prototype completed.

«Electricity price curb» with fatal consequences

Militant cost-cutting slows down energy transition

Measures proposed by the German government are not lowering the price of electricity but are endangering the wind industry and jeopardising billions of euros invested.

Following the catastrophe at the Japanese nuclear power plant in Fukushima, the Federal Government rang in the energy transition for Germany – the same government that only months before had decided to prolong the operating period of the country's nuclear power plants. But even after their about-face, the government is still not 100% committed. Amendments to the Renewable Energy Sources Act (EEG) are being discussed and made nearly every six months. And the constant uneasiness is taking its toll, as planning insecurity is triggering a wave of «pull-forward» effects such as the massive boom in the photovoltaic sector which caused the EEG apportionment to go up. Due to the so-called «electricity price curb» recently proposed by the Minister of the Environment, Peter Altmaier (CDU), insecurity has now been brought to a head. Critics are warning that the government's zeal and unpredictable reform actions are casting a shadow on the entire objective of the energy transition.

Energy transition wise – despite costs

There are a lot of good reasons for the energy transition and it is important to take another look at these, at why the changeover in the power system costs money and why it is still a sensible thing to do.

An especially vital reason is climate change, one of the greatest dangers to the future of mankind. Water shortages, heat waves and flooding are a threat to vast areas on the planet; other regions are strained by huge floods of refugees. We cannot just carry on like this. Firstly, because fossil fuels such as natural gas, coal and petroleum are not unlimited resources and secondly because their combustion is the major contributor to climate change. Alternative energy sources are needed to be able to meet the increasing energy demand. And, because of the ever

increasing rate of climate change, something has to be done soon. Economist Nicholas Stern calculated that a changeover to green energy would not only curb global warming, but would ultimately be cheaper than carrying on as we are now with conventional power supply sources.

This realisation has been incorporated in an act in Germany since the year 2000 – the Renewable Energy Sources Act (EEG). Between 2000 and 2012, the share of renewables rose from roughly 6% of the gross national power supply to more than 20%. Every year the development of renewable energy sources cut CO₂ emissions by 86 million tons in the electricity sector alone. Germany is not only producing clean electricity, the EEG has contributed in part to breaking up the oligopolistic electricity market. The vast participation of private investors in the power supply system has also provided for its democratisation and regionalisation. In 2011, more than 23 billion euros were invested in renewable energy facilities. A good 50% of these investments came from private investors. This development shows that German citizens are no longer satisfied with being mere consumers, but also want to be producers of their own energy. The added value of these facilities remains almost entirely in Germany. For example, nearly 75% of the materials used to produce an ENERCON wind turbine is supplied by German manufacturers.

A complete changeover to a decentralised, clean and permanently cheaper energy supply system costs money. However, measured against expenditures for the fossil fuel and nuclear power plant fleet, these investment costs are comparatively low. In the long term, green electricity is less expensive than the fossil fuel power plant fleet because they do not require any fuel. Currently, the old conventional power stations are benefitting from the fact that the initial investments have long since been amortized. The only costs now are fuel and maintenance costs. However, they forget to mention that external costs are completely passed on to the general public. We are all footing the bill for environmental and health damage, storage of atomic waste, transport of the latter and the consequences of climate change and so will future generations. Green certificates issued through the European Union Emissions Trading Scheme were even paid directly by the



Bleak outlook: Government cost-cutting proposals for renewable energy support creating insecurity in sector.

state through the loss of public revenue. Despite these advantages, power production with fossil fuels is only slightly cheaper than power generated by wind turbines.

Without any substantial changes to the electricity market design, wind energy cannot develop its full potential. In Germany the price of wind energy is currently being calculated to the greatest possible extent according to its stock market trading value, which, due to the growing availability of green energy, is constantly going down. Wind power, at constant costs, appears more expensive – although falling stock market rates for electricity are driving other power plants into the red. A prime example of this is gas power stations that, in view of the declining market value, can no longer supply their power. Energy on the German electricity market is evermore being provided by extremely old power plants producing cheap but extremely dirty electricity. The decisive factor for the composition of the future power station fleet is that the various renewable power sources have to complement each other and that flexible power stations only need to jump in when an insufficient supply of renewable power is available. The task that lies ahead is to set-up a framework which would allow such a «power station fleet» to be created.

Renewable energies create jobs, especially in areas where the traditional strength of the German economy lies, and that is in industry and mechanical engineering. The renewable energies sector has shown that there is potential for more efficiency and ways of curbing costs. Of course, it is fully prepared to work together with politics on further cost-saving schemes. However, any amendments to the EEG must take planning and investment security into account otherwise the reforms will nip the burgeoning industry in the bud.

Unfortunately, the current Federal Government proposals for a reform of the EEG are taking the opposite course putting an economic sector in danger; and the end of the energy change could be initiated with all its negative consequences, should the proposals be systematically implemented. If the renewable energies industry cannot be continued in Germany – the country that advocated the energy transition –, negative effects will emerge in the entire European Union, which cannot be the goal of responsible politics. This is why ENERCON is endorsing reliable politics and modernised framework conditions for the onshore market in Germany, so that the energy change can be continued. The general public is in favour of the energy change and it is a cause worth fighting for. 🇩🇪

ENERCON Managing Director Hans-Dieter Kettwig on Reform of German EEG

Feed-in tariff according to site conditions as solution

Debate on Renewable Energy Sources Act (EEG) in full gear. ENERCON Managing Director Hans-Dieter Kettwig outlines ENERCON's reform suggestions in interview.

WINDBLATT: How significant is the Renewable Energy Sources Act (EEG) for renewable energies and onshore wind energy in particular?

Hans-Dieter Kettwig: Seen internationally, the Renewable Energy Sources Act (EEG) is an exemplary scheme and has been very successful because of its guaranteed feed-in tariff. As an incentive and dissemination instrument, it provides investment security for renewable energies. Not only does it safeguard thousands of jobs in the renewable energies sector but also in small and medium-sized businesses. The remarkable share of renewables connected to the German grid has now reached approximately 25% thanks to the EEG.

The EEG – a well-established scheme – has proven its worth as compared to quota systems and other systems based on restricted numbers of renewable projects seen in foreign markets where the number of new renewable projects is considerably lower. Experience has shown that systems based on a restricted number model are neither more cost-effective, nor are they more efficient.

The major significance of the EEG for the wind energy sector is that it guarantees long-term reliable framework conditions. This is of major importance for wind energy projects that require many months and sometimes even years of planning and lead time. Investors, financiers, owners and manufacturers need investment and planning security. Without this type of security, there will be no more private investor or community-owned wind farms. The participation in and democratisation of our power supply system is unique and provides for wider local acceptance of the energy transition.

WINDBLATT: What do you think about talks stating that the EEG apportionment along with the EEG itself are responsible for rising electricity costs?

Kettwig: The EEG apportionment is not an indicator of renewable energy costs and definitely not for the cost of onshore wind ener-



ENERCON Managing Director
Hans-Dieter Kettwig.

gy – one of the most cost-effective forms of renewable energy. Onshore wind energy is not the cost driver for higher energy bills. It represents merely 0.29 ct/kWh of the EEG apportionment, even though already 8 percent of Germany's electricity is being produced by wind power.

The things responsible for rising costs are above all poor compensation mechanisms, privileges for industry, grid cost exemptions for the industrial sector and the lack of pricing for pollution caused by fossil fuels. As a result, private consumers and small and medium-sized enterprises are the ones currently bearing the burden of the energy transition. In addition, we have to bear in mind the future costs of offshore wind turbines installed in the North Sea far off the coast of Germany. And we should be warned not to make the same errors as the solar industry where the full cost impact was not well thought out and ignored for too long.

EEG apportionment not a cost driver

Furthermore, wind energy is not even benefitting from falling electricity stock exchange prices, although it is supposedly responsible for this. Private customers are also not benefitting from falling electricity costs; instead, it is the power supply companies who are raking in the surplus profit. In Germany, power generation has to become more decentralized and more local action has to be taken. Then electricity prices in an intelligent power grid would be more stable and reliable.

Considering the economic gain such as the number of jobs created, local added value and the reduction of costs for environmen-

tal damage, wind energy has already had a very positive effect on the economy. Not only that, but future electricity prices are then foreseeable as costly gas and oil imports can be avoided along with the subsequent costs of nuclear power. The cost of constantly rising fossil fuels also has to be taken into account. It is insufficient to only look at operating costs. Consequential costs always have to be included in a political discussion.

There is a dire need for a review of the abovementioned issues if the costs for the energy transition are to be more fairly distributed. Instead of turning the EEG into a scapegoat and constantly meddling with it, politics urgently need to come up with a new market design that takes the actual costs of various energy sources into account. And, of course we want to provide our support in this matter.

WINDBLATT: What impact is the EEG debate having on the wind energy sector?

Kettwig: Well, it is creating a lot of uncertainty which should definitely be avoided. Discussions about restricting the development of wind energy or introducing quotas is a reason for concern amongst investors, owners and financiers of wind energy projects. Further development of onshore wind energy, which is necessary for the energy transition, is being hindered because costs for new projects are unpredictable. Besides that, plans for restrictions are triggering a «pull-forward effect» which is not any helpful either.

WINDBLATT: What course of action should be taken?

Kettwig: ENERCON is for maintaining and improving the EEG. It still has a lot of potential for improvement. For example, past errors in the EEG structure – attributed to political compromises – could then be remedied and the regulations modified to meet the current circumstances. Renewables will still be dependent on the EEG for a while as a fundamental means of boosting their marketability and enhancing their competitiveness with conventional power supply systems. With the current energy market design they have not yet reached this level.

In order to promote rapid development of renewables and make the energy transition a success, ENERCON is in favour of amending the EEG, but with sound judgement. We are currently in discussions with politics and associations so that we can make our contribution to further developing the EEG. We hope to have an attentive and constructive dialogue between all market parties – without any hasty decisions or election manoeuvres – so that we can meet the targets set for the energy transition.

During the course of these heated discussions about costs, we

should not lose sight of the main objective i.e. a transition from the current energy system comprising conventional centralised power generators towards the production of energy with decentralised renewable energy sources. Onshore wind energy is a key player in this context. It is readily available at predictable costs. Electricity is generated close to where it is consumed meaning that less «power supply highways» have to be built. And it allows citizens to become locally involved thus promoting acceptance of the energy transition. The EEG can give new momentum to a decentralised reorganisation of the energy system.

WINDBLATT: What do ENERCON's proposals for improvement look like?

Kettwig: ENERCON is in favour of the EEG including a feed-in tariff scheme based on the site condition. This would guarantee investment security at sites anywhere in Germany – at sites in the windy North as well as those in less windy regions in the South. This would allow for region-wide development of decentralised wind energy onshore.

Feed-in tariff according to site conditions

Prime sites in the North should receive a lower feed-in tariff, while the incentives for less windy inland sites would be maintained. This would lower the overall costs of the system.

This model should be implemented by doing away with the feed-in tariff levels (high initial tariff and basic tariff) contained in the current reference yield model. Instead, appropriate feed-in tariffs would be introduced for any type of site qualifying for the support scheme for a duration of 20 years. For inland sites, prices under 10 ct/kWh would be sufficient. For exceptionally productive sites, the feed-in tariff could go down in relation to the particular site. This, however, only applies to the current low-interest rate situation. If this is taken into account, investment security will be maintained for the entire industry. That's our goal.

At the same time, errors in the structure of the EEG have to be eliminated. This includes reviewing some exemptions from the EEG apportionment granted the industrial sector. And we also need a new energy market design which does not discriminate against renewable energies compared to conventional power supply systems, but rather favours them. In the long term, renewable energies will provide for decreasing electricity costs. The sooner the energy system changes over to more renewables, the sooner the customers will benefit from this transition. Hence, onshore wind energy, as the mainstay in the energy transition, has to continue to be dynamically expanded. And for this we need a reliable EEG. 🇩🇪

Multi megawatt class inland

E-126 showcase project installed in record time

ENERCON installs five E-126/7.5 MW at Ellern wind farm in Hunsrück/Rhineland-Palatinate. Construction of major project completed in just six months.

Decentralised power generation using renewable energies onshore offers major advantages for implementing an energy revolution. For example, if wind turbines are installed close to important load centres, less grid expansion is required. Ultimately, the power is generated where it is needed, without having to transmit it across the whole country along new high voltage power lines. This is even more efficient if the technology used delivers maximum yield without taking up a huge amount of space. The Ellern project implemented by ENERCON in the Hunsrück area of Rhineland-Palatinate is an outstanding example of what can be achieved: Five E-126/7.5 MW are now supplying an aggregate output of up to 85 million kilowatt hours per year.

«Generating such a high yield in such a small area is something that has never before been seen in Southern Germany», says Gordon Hoch, the ENERCON sales manager responsible for the Ellern project. «With this wind farm, we have proven that it can be done.» Gordon Hoch believes that this showcase project will point the way for future expansion of wind power in the southern

states of Germany where relatively little space is available for wind farms. «In the south, we have major load centres but not much space. Therefore, the E-126 is the perfect solution. Relative to the required space, it delivers the most kilowatt hours of all wind turbines.»

Project with big impact

The construction time for the wind farm was just six months, a record for a project of this magnitude. «Installing so many turbines in the multi megawatt class in such a short time frame at a low mountain location is a fantastic achievement», says Hoch. One of the reasons why this was possible was the long-standing cooperation with the project developer juwi, who was responsible for planning and road building and had already done great preliminary work. At the same time, ENERCON construction supervisor Burak Bas explains that a new organisational structure for ENERCON's management of major projects had a positive impact on the progress of the construction. This ensured optimum coordination of cooperation between the construction and project managers, along with all other ENERCON departments and external companies involved.

Several ENERCON teams and external companies worked simultaneously on the installation. The result was that the construction time was reduced by around 30 per cent. Setting up temporary storage on the construction site, where components



Installation of ENERCON E-126/7.5 MW at Ellern wind farm. Teams install turbines in record time.

could be delivered ahead of time and stored, was also a key factor. «From there, ENERCON transported them to the installation location in the wind farm using its own vehicles when they were required», says Bas.

For the project developer juwi, who is operating the E-126s in conjunction with the Austrian company Verbund AG, the Ellern wind farm is setting new standards, as the yield from the turbines is comparable with the yield at coastal locations in Northern Germany – a result that is not always guaranteed for inland sites. The project has already made a big external impact. According to Gordon Hoch, investors are already interested in further E-126 projects in southern Germany. 📧



Picture: juwi

Premium low mountain location: Yield from the five ENERCON E-126s at Ellern wind farm comparable with those of turbines on coast.

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Casimcea wind farm in Romania with ENERCON E-82 E2.

ENERCON in Romania

E-82 in Dobrogea reaps high yield

Two construction stages at Casimcea wind power project in Southeast Romania – total of 43 x E-82/2.3 MW. Further subprojects under construction.

Wind energy is playing an increasingly important role in the Dobrogea region. Because of the high average wind speeds, many wind farms are currently being constructed along the Black Sea coast in Southeast Romania – including the Casimcea project which, when completed, will have a total installed capacity of 280 MW making it one of the largest onshore wind farms in Europe. ENERCON supplied a total of 43 x E-82/2.3 MW turbines for two subprojects in Casimcea.

The customers are subsidiaries of the Austrian company Verbund AG and the machines were supplied based on an international framework agreement with the energy supplier. «The forecast annual output of the partial wind farms is estimated at roughly 290 million kilowatt hours», says Florian Rohde, ENERCON sales manager for Romania.

All machines were installed on 108 metre high precast concrete

towers. However, the construction of the foundations was extremely challenging due to the particular soil conditions. Pile foundations with piles up to 43 metres in length were required, but fortunately, the construction sites were easily accessible. The components were initially transported by ship to the nearby port of Constanta where they were then loaded onto trucks for the last few kilometres to the installation site.

Further commitment despite challenges

In 2009, ENERCON was the first manufacturer to connect new wind turbines to the grid in Romania. At that time, the projects in the Dobrogea region already encompassed 12 x E-53/800 kW. Despite the challenges the Romanian market presents – a complicated payment system and a lack of infrastructure in some areas – ENERCON has succeeded in maintaining good activities there.

According to Florian Rohde, the major part of Romania's wind power activity is still concentrated in the Dobrogea area. ENERCON has a continuing presence there, with two further stages of the Casimcea project currently under construction – a total of 34 x E-101/3 MW and other clusters are on the drawing board. 🇷🇴

ENERCON on the Faroe Islands

First wind farm on Faroe Islands connected to grid

Five ENERCON E-44/900 kW installed on 44 metre steel towers. Special electro-technical configuration due to island's stand-alone grid.

Craggy steep cliffs towering nearly 300 metres above the sea, outline the islands' coasts. The North Atlantic waves unremittingly beat against the rocky shoreline while brisk southwesterly winds whistle across the plateau. Neshagi on the Faroe Islands, is an impressive location. Five ENERCON E-44/900 kW machines – the first ENERCON wind turbines on the remote archipelago – have now been up and running since December 2012.

Eike Gentsch, ENERCON's sales manager for the Faroe Islands is totally impressed by the conditions there. «The resources here are outstanding. There's really a lot of wind. It's exceptional.» The site, northeast of the islands' capital, Tóshavn, is comparable to an offshore site but with the advantage of being onshore. This was one of the main reasons for choosing to install the robust ENERCON E-44 turbines on 44 metre towers for the pilot project, says Terji Nielsen, project manager for ENERCON customer Eflagid SEV, the Faroe Islands' power supply company.

Despite the excellent wind conditions, a number of challenges still had to be mastered. To start with, the E-44 machines had to be equipped with specially configured electronic equipment,

which includes FACTS and STATCOM properties to stabilize the grid as well as a wider reactive power range. This is essentially due to the particular structure of the stand-alone system which cannot be compared with the grids on the European mainland.

Installation and logistics were also tricky. All installation equipment including cranes had to be brought to the wind farm site from the mainland as nothing was available on the islands. In addition, the installation timeframe, already extremely tight, kept getting thrown off by high winds. Then, two further turbines were ordered at short notice to replace three wrecked wind turbines from another company. But in the end, all hurdles were overcome and the turbines were handed over to the customer on schedule.

Highly satisfied customer

«The customer is highly satisfied with our work,» reports Eike Gentsch. They were obviously so impressed by the project that further projects are already on the drawing board. On top of that, the Faroe Islands also offer ENERCON interesting prospects: «In the long-term, the Faroese want to be independent of fossil fuels,» says Gentsch. Currently the islands' electricity is primarily derived from diesel generators, which is both expensive and environmentally unfriendly. «In the next few years, the Faroese intend to continue to increase their share of renewable energies sources,» says Gentsch. 🇫🇴

Impressive site: Neshagi on Faroe Islands with five ENERCON E-44/900 kW.



Picture: Terji Nielsen/SEV



Installation of ENERCON E-70 near Arinaga/Gran Canaria (left).
Picture above: Hoisting rotor hub of ENERCON E-48 near Garafia/La Palma.

ENERCON on Canary Islands

ENERCON technology top choice for repowering

ENERCON successfully completes first renewal projects on Canary Islands.

Further repowering projects already in planning stages.

Connecting wind turbines to weak stand-alone systems is a big challenge for some manufacturers. However, the state-of-the-art power electronics used in ENERCON wind turbines can make a major contribution to stabilising a grid and is ideally suited for these conditions. Excellent reliability and availability of the turbines, plus their tried and tested service, were major decisive factors which made ENERCON the number one choice for the project developers of renewal projects on the Canary Islands. The first repowering project has now been handed over to the customers.

ENERCON installed two repowering wind farms on La Palma, one at Garafia in the northwest of the island with two E-48/800 kW and one at Fuencaliente in the south with three E-44/900 kW turbines. The ENERCON turbines are replacing five previous installations from another manufacturer at each of the high wind locations.

Raul Macias, ENERCON sales manager for the Canary Islands, explains that logistics were a particular challenge at the remote Garafia location. «It was certainly the most difficult transpor-

tation that we have ever organised in Spain.» The components had to be negotiated along 30 kilometres of switchback roads and because the rotor blades did not fit around the bends, they had to be transferred from one truck to another each time – an extremely laborious and time-consuming process. Meanwhile, the Fuencaliente location is in a conservation area in the middle of a barren volcanic landscape, which also had to be taken into account during installation.

Logistics a major challenge

A few weeks ago, ENERCON also launched operations of an E-70/2.3 MW at Arinaga on the East coast of Gran Canaria. This is the largest wind turbine on the island so far. The location is in an industrial area and is adjacent to an existing wind farm made up of a group of older turbines. «Similar to La Palma, the grid is relatively weak in the Southeast of Gran Canaria», says Raul Macias. «In addition, the E-70 had to be connected to the grid in a circuit with several older turbines from other manufacturers.» Because of the grid stabilising features of its feed-in system, the E-70 can regulate the entire wind farm as well as stabilise the grid for the older turbines.

The advantages of the ENERCON concept were crucial in the developers' decision to work with ENERCON on their renewal projects, Raul Macias concluded. They have certainly made a lasting impression. ENERCON is planning more renewal projects on the Canary Islands, with an aggregate capacity of 160 MW. 

E-82 for high wind locations Initial projects with new E-82 E4

ENERCON installs Wind Class IA turbines at locations in Ireland and Spain. Total of seven new 3 MW machines installed to date.

ENERCON has just completed installing the first new Wind Class IA turbines from their E-82 series. The type E-82 E4 turbines designed for high wind locations were installed in Ireland and Spain. The new 3 MW machine is primarily intended for export.

By the end of January, the ENERCON installation teams had assembled five E-82 E4s at the Ballycadden wind farm in County Wexford in Southeast Ireland. The customer is the Belgian project developer Electrawinds. The wind farm is situated on hilly ground just a few kilometres from the Irish Sea where the wind is consistently strong. The turbines were installed on precast concrete towers with a hub height of 84 metres.

In Spain, the E-82 E4 type turbines were installed in Porto do Son and Pobra do Caraminhal in Galicia in the Northwest of the country. Like Ballycadden, both are Wind Class I locations and are close to the Atlantic coast. One E-82 E4 (84 m hub height) was installed at each of the locations and both projects are operated by the local authority. 



ENERCON E-82 E4 near Porto do Son in Galicia.

ENERCON Fairs

Hannover Messe 2013

(Hanover/Germany)
Leading Trade Fair for Wind Generation Technology
8 - 12 April 2013
www.hannovermesse.de

All Energy 2013

(Aberdeen/UK)
Exhibition & Conference for Renewables
22 - 23 May 2013
www.all-energy.co.uk/

Eolica 2013

(Rome/Italy)
Exhibition & conference for wind power generation in the Mediterranean area
18 - 20 September 2013
www.eolicaexpo.com

Powerexpo 2013

(Zaragoza/Spain)
International wind energy fair
24 - 26 September 2013
www.feriazaragoza.es

Renexpo 2013

(Augsburg/Germany)
International energy exhibition and congress
26 - 29 September 2013
www.renexpo.de

CanWEA 2013

(Toronto/Canada)
Annual wind energy fair
7 - 10 October 2013
www.canwea.ca

Renewable UK 2013

(Birmingham/UK)
Annual conference and exhibition for renewables
5 - 7 November 2013
www.renewableuk.com

Agritechnica 2013

(Hanover/Germany)
International fair for agricultural machinery and equipment
10 - 16 November 2013
www.agritechnica.com

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