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MAJOR PROJECT UNDER CONTRACT  ENERCON installs 320 MW in the Dutch wind farm Zeewolde
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**Customer focus remains our key concern**

Dear customers, business partners and employees, dear readers,

At ENERCON one of the fundamental demands we make of ourselves is to do the best possible job of meeting our responsibilities and obligations towards our customers. Our customers – you – are at the focus of everything we do. We are committed to answering your wishes and requirements to your full satisfaction. This maen has governed our work for over 30 years, and will continue to guide how we act in the future.

These are turbulent times for our sector. Things which were taken for granted are now being called into question. The changing framework conditions have also compelled ENERCON to adopt a new business orientation, seen in the stronger focus on international markets, for example. However, this necessary adjustment to our business operations does not change anything about our key concern. This will always remain the customer, particularly in our domestic market, which has come under severe pressures as a result of political reforms.

We will remain at your side in the future and will continue to support you with your projects to the best of our abilities, whether in Germany or further afield. Competent and local contact partners are dedicated to taking care of your concerns. ENERCON provides support with every phase of your project, and offers a one-stop solution where this is desired: for project development, planning and approval procedures, and installation, operation and service of WECs complete with marketing of the energy generated. We are currently expanding our service portfolio in this area so we can offer you attractive options to repower your existing wind farm and ensure economically viable continued operation after the end of the remuneration phase.

One of the great strengths of our teams from Sales, Planning, Site Assessment, Energy Management & Energy Marketing and Service has always been their ability to work together to find suitable and, where necessary, customised solutions, even when the topics in hand present a challenge. We are always willing to discuss any issues frankly and openly – so you can rest assured that you can count on us in the future, too.

In the coming weeks and months, our task is to work together with you to revive the stagnant onshore market. As the initiators of the ‘Made in Germany’ energy transition, politicians need us to create new impulsion. That’s why we are calling on you to let your voice be heard and share your ideas with us. Which issues are important to you? In which sales areas do we need to do even more than we have been doing? The onshore road is tough with many obstacles along the way, but it is now up to us to carry on building together with you as drivers of the energy transition. Our points of contact from Sales and other departments are always happy to discuss this topic with you. We want to assert any influence we possibly can. Give us your input! On that note, have a great summer!

Hans-Dieter Kettwig
Managing Director of ENERCON

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Impressum

Publiziert: ENERCON GmbH, Osnabriger Str. D-26605 Aurich, Phone +49 49 41 927 0, Fax +49 49 41 927 109, www.enercon.de

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E-138 EP3 measurement delivers positive results

At the end of April and following conclusion of the commissioning measures, the E-138 EP3 prototype at the Wieringermeer site in the Netherlands ran at nominal power for the first time. The WEC’s behaviour displayed no abnormalities. The measurement campaign for the new WEC type is also going as expected: the first sound measurement has been carried out, bringing positive results with it. The test phase is still ongoing. “However, these milestones mean we are making significant progress with our prototype program”, says Dr Sebastian Rönsch, Subproject Manager of Control Systems at ENERCON’s research and development company WRD.
ENERCON accomplished a remarkable feat this spring: in the first week of April, the company exhibited at two big international specialist trade fairs at the same time. At the Hanover Trade Fair, ENERCON presented itself as a supplier of system solutions for renewable energies. Meanwhile, the expanded WEC portfolio with the new EP3 and EPS platform WECs were the main focus at the leading trade fair WindEurope, which took place at the same time in Bilbao.

ENERCON’s stand design went down well at both sites and provided a starting point for countless discussions. Customers, interested parties, visitors and politicians from Germany and further afield came to the ENERCON stand in Hanover to learn about ENERCON’s innovative technologies in the integrated energy sector. The series production E-Storage 2300 version of the E-Charger 600 for ultra-rapid charging of e-vehicles proved to be a particularly popular attraction, and the E-storage 2300 for energy storage also captivated the trade fair visitors.

The highlight of ENERCON’s appearance in Hanover was a series of presentations complete with panel discussion, which focussed on the importance of renewable energies and practical integrated energy solutions for further implementation of the energy transition. One thing the speakers all agreed on: these technologies are absolutely essential key factors in successfully switching the energy system over to renewables. ENERCON Managing Directors Hans-Dieter Kettwig and Simon-Hermann Wobben also called on politicians to assume their responsibilities and create suitable framework conditions to lay the foundations for the necessary further expansion of renewables and for marketing options for innovative system solution technologies. In this context, Stefan Kapferer, Managing Director of the German Association of Energy and Water Industries, and Prof. Claudia Kemfert from the German Institute for Economic Research (BDEW) also made reference to the necessity of carbon pricing.

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ENRCON’s stand in the northern Spanish city of Bilbao was also bustling with activity. The latest ENERCON WEC types attracted a great deal of interest. The supporting programme included a visit from the German Institute for Economic Research (BDEW) also made reference to the necessity of carbon pricing.

“The end, all of the effort put in by ENERCON to enable an appearance at both trade fairs paid off”, summarises ENERCON Managing Director Hans-Dieter Kettwig. “Our messages appeal to the public, our technologies generate new demand, and the ENERCON name still has a very good reputation. Customers and politicians alike have faith in us. It is unfortunate that these politicians are missing the important thing is to gain more experience with e-mobility.” ENERCON has declared the aim to gradually switch its fleet over to e-vehicles. Ten next generation will be the first to include this feature. We decided to purchase these vehicles anyway, as, for our purposes, it doesn’t really matter whether they can be charged rapidly or not. For us, the most important thing is to gain more experience with e-mobility.” ENERCON has declared the aim to gradually switch its fleet over to e-vehicles. Ten next generation will be the first to include this feature. 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Official opening of Krammer wind farm

The Krammer wind farm was officially opened in May together with the Dutch King Willem-Alexander and 750 invited guests. ENERCON had installed 34 E-115/3.0 MW WECs on hybrid towers at a hub height of 122 metres for the major project in the province of Zeeland. The Krammer wind farm is owned by two community-owned cooperatives with more than 4,000 local members, making it the largest community-owned wind farm in the Netherlands.

The wind farm is on Philipsdam, which is part of the ‘Delta Works’ flood defence system. The WECs are located directly on the dykes in the lock area. According to the energy yield estimation, the 102 MW wind farm will generate around 390 gigawatt hours of green energy every year. The owners will supply 95 percent of the energy to international commercial enterprises (Akzo Nobel, DSM, Google and Philips) via Power Purchase Agreements (PPAs).

Free upgrades for existing WECs still possible until December

ENERCON Service is offering operators and owners of existing WECs approaching the end of their EEG phase a free upgrade to remote control functionality until the end of December. This offer applies within the framework of the ENERCON Energie Konzept 20+ (EEK20+), on the condition that the operators or owners conclude a cooperation agreement on direct marketing with ENERCON subsidiary Quadra Energy.

The EEK20+ package offers many advantages for operators and owners: risk-free additional revenues can be generated until EEG funding has expired. Once funding has ended, the wind farm is then already equipped with the technical features needed to guarantee flexibility for purposes such as needs-based energy production, participation in the control reserve market or production of guarantees of origin for green energy tariffs. These options come into question as alternative marketing approaches for continued operation after the EEG phase. ENERCON offers operators and owners revenue security within the scope of the EEK20+ concept. However, this is only under the condition that the WEC can be operated flexibly. A tailored Service contract completes the concept. The offer of a free upgrade is only valid until the end of this year. From 2020 onwards, upgrades will be subject to a charge.

Smart Energies Expo
[Paris/France]
17 – 18 June 2019
smart-energies-expo.com/2019

BORGEBY FÄLT DAGAR
[Borgeby/Sweden]
26 – 27 June 2019
borgebyfaltdagar.se

HUSUM Wind
[Husum/Germany]
10 – 13 September 2019
husumwind.com

Nacelle of dismantled E-17.
First EP3 tower assembled from metal construction kit

ENERCON IS BEGINNING SERIES PRODUCTION OF A NEW TYPE OF STEEL TOWER FOR THE E-126 EP3, WHICH WILL MAKE THE EP3 WEC CONCEPT EVEN MORE EFFICIENT. IT IS BASED ON THE MODULAR STEEL TOWER (MST) DEVELOPED BY LAGERWEY. THE PROTOTYPE IS BEING INSTALLED CLOSE TO SCHARNDORF IN AUSTRIA.
It looks as if someone has unpacked an enormous metal construction kit at the wind farm construction site near Scharndorf in Lower Austria. A dozen transport frames are lined up next to the assembly area, containing stacks of 12-metre-long edged steel plates. In front are more containers with boxes full of studs, nuts, washers, steel plates and steel brackets. A steel segment is hanging from the crawler crane hook. The crane slews the load across to the assembly frame, where technicians are hard at work with their tightening tools. They have already assembled seven other identical components. This one will close the gap so that the tower section is preassembled and ready to be placed on the foundation. It will be joined together with eleven other sections to form the steel tower for the E-126 EP3, which ENERCON is installing in Scharndorf. The project in question will be the first EP3 wind turbine to be installed on the modular steel tower (MST). ENERCON developed this tower version on the basis of Lagerwey’s MST concept. Instead of conventional tubular steel segments, the tower is made up of edged steel elements which are bolted together at the construction site to form the individual tower sections. The next assembly step is to place them one on top of the other and bolt them together as well. “The big advantage of this tower design is the improved transportability”, explains Florian Daniel, MST Tower Project Manager for the EP3 platform at ENERCON’s research and development company WRD. “We can also reach higher hub heights using less material, which fits in perfectly with the compact and cost-optimised design of the EP3 WEC.”

**Advantageous transport properties**

MST tower components can be loaded into containers and transported to the installation site by standard trucks at any time. Shipment to overseas sites is no problem for the MST towers, either. In comparison, the logistics process for conventional tubular steel towers is very expensive and time-consuming. Due to their size and weight, their components have to be transported to the construction site at night as an abnormal load with special permit. The logistical challenges associated with complex locations sometimes present an impossible hurdle. “With the MST tower, however, we can serve niche areas and install wind energy converters such as the E-126 EP3 at sites where customary tubular steel tower types would not be possible”, says Florian Daniel.

The maximum permissible width for transport is generally limited to 4.30 metres in Europe, posing another problem for tubular steel towers. “The design engineers therefore come up against limits with this concept”, says Sascha Exner, Project Manager for the E-126 EP3 at WRD. “When hub height increases, so does the tower diameter. The bottom tower sections therefore have to be divided lengthways for transportation, which is both complex and expensive.”
Possibility of higher hub heights

In contrast, the MST concept means higher hub heights can be realised without any problems at all. The prototype tower in Scharndorf has a hub height of 135 metres, and the diameter above the foundation is 8.70 metres. The highest hub height for the E-126 EP3 with a conventional tubular steel tower is 116 metres. ENERCON is currently developing further MST versions for the EP5 platform, with hub heights reaching all the way up to 166 metres.

“The tower diameter and the wall thicknesses of the segments vary between towers but the basic tower concept always remains the same”, explains Florian Daniel. An MST tower therefore always has 24 edges. Friction joints hold the steel plates together. The components are bolted together using brackets and special bolts. The operating loads are transferred via the static friction between the bolted parts. As the bolt connections are therefore only subjected to static loads through the preload, no maintenance is required. The bolts do not have to be re-tightened.

Studs hold the tower together

The 135-metre tower of the EP3 in Scharndorf is made up of steel sections held together by connection plates and studs. These special bolts feature a round head on the exterior tower wall, and threads for a hexagon nut and a multiedge shear attachment on the tower interior end. They are installed using an electric shear screwdriver. It features a hexagon wrench for tightening the nut and a multiedge attachment for holding the bolt and shearing the shear attachment. In a single production step, the nut is tightened and the shear attachment sheared as soon as the predefined tightening torque has been reached. The bolt connection is thus guaranteed to be free of defects and the torque is always correct. This can be checked by means of a simple visual inspection. The pre-assembly does mean that more time is required on the construction site than with the tubular steel tower, concedes Florian Daniel. However, the logistical advantages compensate for this drawback.

The prototype project in Scharndorf has confirmed all of the advantages WRD was hoping to see from the MST concept, says Sascha Exner. “The logistics concept, the handling of the components on the construction site and the installation itself worked out exactly as we expected. The experience we have gained is already being incorporated in the training courses at the EP3 training construction site in Emden, where installation teams are familiarised with the installation of EP3 WECs.” Teams from Sweden and Canada, for example, have already visited the site to receive training for the installation of the first series MST towers in their countries.

“We also used the prototype project to optimise the packing concept for delivering the MST components to the construction site”, says Sascha Exner. In future the containers will be fitted with standardised equipment and the relevant documents will be provided. After all, without a parts list even a metal construction kit becomes challenging to use. //

New lifting device for optimised EP3 installation

The compact design conceived for ENERCON’s new EP3 WECs takes a consistent approach of optimising every single process: all the steps within divisions ranging from Production and Transport & Logistics to Installation and Commissioning have been optimised in order to make them faster, more efficient and more cost-effective. These measures also include new developments in the installation aids used. One such example is the use of a new lifting device to install the hub, which rules out the need for an auxiliary crane to turn the component for lifting.

The hub for the new EP3 types is delivered to the construction site, to be lifted and rotated with the installation crane. The lifting device is suspended on the installation crane hook with the jib unbolted and is connected with the hub. For this, the flange adapter on the jib is bolted to one of the three blade adapters. After this, the jib is bolted in place and the hub is lifted several metres high. The pitch motors are then used to turn the hub suspended on the crane by approximately 83 degrees. This ensures the rotor carrier flange is at the correct angle to the rotor bearing of the generator, to which the hub will later be bolted.

Once the hub has been hoisted and installed on the WEC, the jib is unbolted and the lifting equipment is removed and lowered to the ground again by the crane.

This method has a major advantage: it can be carried out with just the installation crane, without an additional auxiliary crane. If the special lifting equipment was not used, a second crane would be needed to turn the delivered component to the necessary position for installation. This saves time and money on the construction site. There is also another benefit: the lifting equipment is generally suitable for all hubs that are transported in a ‘standing’ position. //
Green light
for transponder solution on the horizon

ALL SAFETY-RELATED OBJECTIONS ARE BEING EXAMINED IN DETAIL. WE ARE THEREFORE A GREAT DEAL CLOSER TO REACHING THE GOAL OF A TRANSPOUNDER SOLUTION FOR NEEDS-BASED NIGHTTIME MARKING.

The number of new approvals for wind farms recently reached an all-time low. The main reason behind the ever more restrictive approval practice supported by politicians is the growing resistance to new wind energy converters in many regions. In the Energiesammelgesetz energy bill, the Federal Government has now finally laid the groundwork to put an end to the flashes of lights on wind energy converters which disturb many residents at night – for existing WECs as well as newly constructed ones. From 1 July 2020, all new and existing wind energy converters higher than 100 meters in total have to be equipped with needs-based nighttime marking (BNK), provided the Federal Network Agency does not extend the deadline.

In the past months, ENERCON has been working hard to convince various groups in order to open up the competition for the best and most cost-effective technology. As yet, only one BNK system using radar technology is approved by law. By contrast, the cost-effective transponder technology has been blocked for years.

At the time of going to press, a risk analysis on the use of transponders for needs-based nighttime marking conducted by order of the Federal Ministry of Transport is on the edge of completion. We expect the expert report to completely eliminate all safety-related concerns, and the objections raised by the Federal Police and the German Air Force to protect their official duties. This would prove an important step towards a real competition for the best and most cost-effective technology.

The responsible Ministry of Transport (BMVI) is now working at full stretch to have the administrative regulation on the marking and approval procedure with the German air navigation services. This also includes extensive testing of the systems offered which will take around five to six months.

Until then, ENERCON will continue to put it all into promoting what is by far the most economical solution – the transponder – to prevent it from being derailed again. If this fails, it would not only be disastrous for the acceptance of wind energy converters, but also for the economic viability of the WECs concerned, explains Andreas Becker, who is in charge of the political enforcement of transponder technology at ENERCON’s Berlin office. “Economically weaker wind farms in inland locations would find it particularly hard to bear the high costs associated with radar systems.” The transponder system is the cheapest option by far and is therefore suitable for existing WECs, too. It can also be used on hilly or mountainous terrain, and can therefore be implemented across the whole country. Planning permission is not required for installation, meaning no additional soil sealing is needed.

As the transponder system does not require the Federal Network Agency to allocate frequencies, it is far superior to the radar system in terms of investment security. Most importantly, the transponders are purely passive systems that do not produce emissions and thus do not spark any new acceptance debates on electromagnetic radiation.

If the validation and approval procedure is successful, the wind farms can start to be fitted with transponder-based beacon systems at the end of the fourth quarter in 2019. Fitting all existing and new wind energy converters nationwide with this technology by 1 July 2020 remains a hugely ambitious project. According to our findings, the site-specific approval procedures carried out by the relevant authorities present the biggest challenge. The Federal Network Agency is currently in the process of establishing policies on this topic, as previously mentioned.

Functional principle behind transponder-controlled needs-based nighttime marking systems.

All safety-related objections are being examined in detail. We are therefore a great deal closer to reaching the goal of a transponder solution for needs-based nighttime marking.
ENERCON has landed another big international contract for its new EP3 platform – this time in the Netherlands. The company was selected to supply WECs for repowering of the Zeeuwolde wind farm. The operator, Windpark Zeeuwland B.V. (WPZ), has concluded a contract with ENERCON detailing the supply of 91 WECs totalling 320 MW.

The repowering plans involve the replacement of 220 legacy WECs that are currently in operation across the whole area. Thanks to the new WEC technology, the wind farm will produce three times as much energy in the future as it does today, despite the number of WECs being cut by more than half. The operating company is owned by over 200 farmers, residents and mill owners from rural areas, and most of them already hold shares. Together they make up the biggest civil and agricultural wind farm operating company in Europe.

“We chose ENERCON because of the yield of their EP3 wind turbines, as well as the excellent availability of the installation teams and the company’s track record with partnerships”, says Sjoerd Sieburgh, Managing Director of WPZ. The operator aims to begin construction of the foundation and access roads in the autumn. Installation of the first wind energy converters is to begin in May of 2020. Completion of the wind farm is set for the end of 2021. //

Plan drawing in Zaragoza, Spain, 2019.
ENERCON expands largest wind farm in Turkey

THE SOMA WIND FARM WILL GAIN 12 E-126 EP3 WECS THIS YEAR. ENERCON HAS ALREADY INSTALLED 89 E-44 WECS AND 80 E-70 WECS IN THREE EARLIER INSTALLATION PHASES OF THE PROJECT.

The Soma wind farm in Turkey is one of the biggest wind energy projects in Europe. A total of 264 MW were installed in several stages in the western Turkish provinces of Manisa and Basker, using ENERCON technology only. The wind energy converters produce over 670 million kilowatt-hours of clean energy every year, corresponding to a CO₂ reduction of 420,000 tonnes. “The Soma wind farm is a showcase project in every respect”, says Arif Günyar, Managing Director for ENERCON Turkey. “All the more reason to be pleased that we have been chosen as WEC supplier once again for the project’s third stage of expansion.” Altogether ENERCON will install 12 of its new E-126 EP3 WECS this year for the Soma IV sub-project.

The addition of 48 MW will increase the wind farm output to a total of 312 MW. The annual energy yield will go up to approximately 873 million kilowatt-hours. This means the large-scale project will be able to save around 525,000 tonnes of CO₂ in the future. The start of installation is planned for the third quarter. The EP3 wind turbines will be installed on tubular steel towers each with a hub height of 116 metres. While the rotor blades, towers and foundation baskets will be produced in Turkey, the rest of the WEC components will be supplied from Germany.

The company Polat Enerji is the customer in the Soma IV project. ENERCON has been working with them in Turkey for many years already. Polat has installed around 600 MW of wind energy capacity across the country using only ENERCON technology.

With 1,400 MW of installed power (as at 02/2019), Turkey is one of the most significant international markets for ENERCON at this time. The company has been active there since 1998 and has made a name for itself as one of the trailblazers of onshore wind energy in Turkey. ENERCON also expects favourable market development in the future. “The opportunities are definitely there for onshore wind energy”, says Arif Günyar. “We are doing our best to ensure that ENERCON will continue to share in this in future.”

First E-126 EP3 installed in Turkey

WIND ENERGY CONVERTER CONSTRUCTED AS PART OF KARABURUN 2 PROJECT.

ENERCON has installed the first E-126 EP3 WEC in Turkey. The installation team successfully completed work at the beginning of May. The machine was installed on a tubular steel tower at a hub height of 116 metres. It is part of a wind farm expansion project for which ENERCON will be providing 11 E-126 EP3/4 MW WECs with tubular steel towers (86 metres) and 22 E-126 EP3/4 MW WECs with tubular steel towers (116 metres). Negotiations on the supply of four more WECs of this type are still underway.

WEC components are being delivered from Germany and Portugal. The towers are produced locally in Turkey.

ENERCON had already delivered 30 E-82 E2/2 MW and 20 E-82 E4/3 MW WECs for the first expansion phase of the wind farm in the western Turkish province of Izmir. With a total power output of 268 MW, the expanded wind farm will be one of the largest in the country.
Caus for celebration for ENERCON in France: the company has installed around 2,000 wind energy converters in what is currently its most important export market, and has thus surpassed the 4 GW mark of installed power. This record was achieved in the course of a repowering project in Guadeloupe. ENERCON installed 8 E-44/900 kW WECs for the “La Montagne II” project.

The repowered wind farm now has a total capacity of 7.2 MW. The E-44 WECs were installed on tubular steel towers at a hub height of 45 metres for the customer Quadran. They will replace 35 legacy WECs in the wind farm. Despite the marked reduction in the number of WECs, the new wind turbines will enable the energy yield to be multiplied.

The project is the first ENERCON has undertaken in the French overseas territory in the Caribbean, making it particularly pleasing for Peter Schuster that this was the one to break the 4 GW mark in France: “We are thrilled with this accomplishment and are proud of each and every member of our team who have been helping us since 2003 on our way to achieving this remarkable milestone”, the Director of ENERCON France comments on the installation result.

ENERCON has been active in France since 2003. With more than 850 employees in the Sales, Project Management and Service divisions, ENERCON is now one of the biggest renewable energy companies in the country. It has a market share of 25 percent (based on the installed power in 2018).

In the future, ENERCON will continue its involvement in France and will make a significant contribution to expanding renewable energies, confirms Peter Schuster: “For us, reaching 4 gigawatts is an important interim step on the way to implementing the energy transition in France. The country still offers considerable potential for onshore wind energy and has ambitious renewable energy targets, so we will not waver in our commitment there.” //

"La Montagne II" wind farm in Guadeloupe with 8 ENERCON E-44/900 kW WECs.