E-138 EP3 COMPONENT TESTING

Endurance test for new safety system

MOMENTUM FOR TRANSPONDER TECHNOLOGY  Needs-based nighttime marking alternative to be approved

EP4 INSTALLATION IN GRIZZLY COUNTRY  Special protective measures for Moose Lake project / Canada

TWO NEW LANDMARKS OFF HAUGESUND  ENERCON installed 2 x E-115 E2 WECs on the coast of Norway
A glimmer of hope to wrap up the year – but the challenges remain

Dear customers, business partners and employees, dear readers,

As the year draws to an end, the Federal Government has made a decision to take action on the subject of special tendering rounds after all. In view of the difficult months that lie ahead, this is at the very least a ray of hope for us. An additional 4,000 MW are to be put out to tender for onshore wind energy over the next three years. Even though it falls short of the targets stipulated in the coalition agreement, if nothing else this announcement is a sign that the government has not written off the energy transition and the wind energy sector altogether. That is something we can welcome with open arms.

However, the agreed package of measures can only serve as a prelude to further urgently required reforms. If this is not the case, we will continue to run the risk of losing our flagship market and missing our climate protection targets. This will never be in Germany’s interests, whether from the point of view of climate policy or industrial policy. The impact of climate change does not stop at country borders.

In addition to unrestricted extension of the expansion path, we believe there is a particularly urgent need for action where approvals are concerned. Years often go by before initiators can hold their German Federal Immission Control Act notice in their hands. In many regions, opponents calling themselves conservationists are now systematically taking action against wind energy expansion by arbitrarily raising objections. Despite the fact these are often questionable, when in doubt the authorities frequently decide in favour of species conservation for incomprehensible reasons. It is imperative that lawmakers put a stop to this misuse of the practice for approval, which hinders climate protection.

Equally important are measures to facilitate repowering projects. Often, the enormous potential of existing sites in Germany for repowering cannot be utilised due to approval law reservations. We see it as nonsensical to treat existing wind farms as unsold property during the approval process for repowering. This is a view which is detrimental to climate protection. If, in a certain place, nature, animals and human beings have become accustomed to wind energy converters from older generations, approval under the German Federal Immission Control Act surely has to be granted faster than if the site were entirely new. Why is that so difficult for politicians and local offices to grasp?

In this edition of Windblatt we will also go into the latest developments that affect our wind energy converters. Thanks to our R&D department, we have made major innovative progress in the past months. We would like to express our thanks to all those involved! However, there is a fly in the ointment: we get the impression that there is a general mindset when installing WECs that they are expected to have a service life of 20 to 25 years, while margins are kept as low as possible at maximum quality. Unfortunately this does not always work out. As WEC generations are being pushed onto the markets quicker and quicker, we as a manufacturer have to be careful that costs and returns still match up. Costs in various areas are increasing, including raw materials, wages and salaries. Therefore, at the beginning of next year, we will have to take account of the market conditions and adapt our sales prices to meet the new requirements. Investors, operators and owners will still be left with a good result for the future even after this price alignment has taken place.

We will continue to build on the innovative strength of our company. That is something you can count on. We would like to take this opportunity to wish you a happy and healthy 2019, and to thank you for your commitment in these difficult times. Let’s hope for a successful, sustainable future. These are challenging and exciting times.

Hans-Dieter Petzold
Managing Director of ENERCON

For more information please visit https://www.enercon.de/en/privacy-policy.
The next five years will offer favourable prospects for onshore wind energy across the globe – in marked contrast to the continuing decline in development in Germany. Forecasts put forward by the International Energy Agency (IEA) predict renewables will see the highest level of growth in the electricity sector during this period, and will cover around 30 percent of the global demand for energy in 2023. In 2017 the rate was still at 24 percent. According to the IEA report, by 2023 the generating capacity of wind energy will have increased globally by 69 percent. This represents a growth of 324 gigawatts, so that a total of 839 gigawatts will be reached.

Onshore wind energy will account for around 50 gigawatts of new generation capacity every year, the IEA report details. This is the equivalent of the total installed power connected to the grid by ENERCON between the company’s foundation and October 2018 being produced every year until 2023. For ENERCON this is a further incentive to continue intensifying its international business. Photo: Rainbow over the onshore expansion project Raglan/Québec, Canada, with ENERCON E-82 E4 WECs.
ENERCON exceeds installed capacity of 50 gigawatts

ENERCON has surpassed the 50-gigawatt milestone in the installation of wind energy converters. This symbolic global installed capacity number was achieved at the beginning of October during installation of wind energy converters for the Mui Dinh project in Vietnam. ENERCON’s worldwide balance of installations currently amounts to more than 27,075 wind energy converters with an installed total capacity of over 50.027 GW. At this time, the company is installing 16 E-103 EP2 WECs in the Mui Dinh wind farm for its customer eab New Energy GmbH. Together with the Trung Nam wind farm, built at the same time, the project marks ENERCON’s entry into the Vietnamese market.

“We are delighted to have achieved this important milestone, and are proud of the fantastic performance of our whole team,” says ENERCON Sales Director Stefan Lütkemeyer. “Our installed wind energy capacity across the world now replaces the electrical power from more than 50 coal-fired power plant units. This makes a significant contribution to global climate and environmental protection. Nevertheless, the 50 gigawatts are still just an interim result for us. We’ve got a long way to go yet: climate change has not been averted, global energy requirements are rising. Demands are therefore still placed on the onshore wind energy sector to help in switching energy systems over to the necessary 100 percent renewable generation. We will not relax our efforts to push forward with the energy transition across the world, and also take account of areas such as transport and heating with our innovative products and solutions for integrated energy.”

ENERCON is consistently expanding its international activities at this time. The company is already active in more than 45 countries worldwide. As well as in Vietnam, ENERCON is currently entering the market in other countries, including some more in Latin America. Preparations for the first ENERCON projects are also being made in other new regions.
Cause for celebration for ENERCON in France: more than 200 customers, business partners and political guests were invited to Chantilly, Hauts-de-France to mark ENERCON’s 15th anniversary in France at the end of October. As well as taking a look back at its business activities in France up until now, the company also took the opportunity to present its current technological developments. Presentations and discussions on topics such as project development, repowering, service, marketing and operating concepts were also on the agenda.

ENERCON entered France in 2003, and since then it has become one of the company’s key foreign markets. More than 1,800 wind energy converters with a total capacity of more than 3,700 MW have been installed to date. ENERCON has a 25 percent share of the market in France (2018 based on total installed power). With more than 650 employees in Sales, Project Management and Service, ENERCON is one of the biggest renewable energy companies in France.

ENERCON has concluded a contract on the supply of green energy from existing wind farms with the power pool of the Association of German Cold Stores and Logistics Companies (VDKL). In future, ENERCON will be supplying clean energy to leading German logistics companies and food manufacturers for use in their production facilities and cold stores for temperature-controlled goods. The energy will be delivered within the framework of a fixed-price Power Purchase Agreement (PPA), and will come from four existing wind farms with a total capacity of 10.6 MW. The delivery of energy will be organised by QUADRA Energy GmbH. This ENERCON company is responsible for all services and solutions in the field of energy logistics.

“We are pleased that we were able to win over a renowned industry and logistics partner like the VDKL power pool with our PPA model”, says Uwe Behrens, Managing Director of QUADRA Energy. “We will supply the green energy at a fixed price over the entire term of the PPA, providing planning security for both our customer and the wind farm operator. Our PPA allows the wind farm to remain economically viable and is therefore the ideal marketing model for operators and owners of existing wind farms that no longer receive EEG remuneration.”

The VDKL power pool describes itself as the largest energy purchasing collective to be borne by an association in Germany, with an energy requirement of more than 1.2 TWh at over 200 locations across the country. It believes this contract model provides an option to secure prices in the long term, which was something the energy market could not offer up until now.

“We have invested a lot in the development of sustainable marketing solutions in recent years. For us, the project with the VDKL power pool represents the first step into a new business segment that we aim to expand consistently in the future”, explains ENERCON Managing Director Hans-Dieter Kettwig. There is significant market potential here: industry associations estimate that EEG remuneration will end for thousands of older wind energy converters in Germany in coming years. Operators and owners will then have to sell the energy from their wind turbines at market prices via the energy exchange, or find alternative marketing solutions. PPAs would be a possibility.

As a supplier of system solutions for renewable energies, ENERCON sees its PPA model as part of its ‘ENERCON Energiekonzept 20+’ (EEK20+) partnership concept for operators of legacy turbines for the operating phase after EEG funding has expired. It includes consultation and support for repowering projects, and for various scenarios for continued operation of existing WECs where the operator/owner is not planning a repowering project or where such a project is impossible. In both cases, ENERCON can offer an extensive package of support to both customers and operators/owners of competitor WECs. The main priority is always to ensure that the site is retained for wind energy generation in the future.

An anniversary celebration in Chantilly/France: ENERCON had invited numerous customers and guests.

ENCON supplies VDKL cold stores with green energy from existing wind farms

AURICH

ENERCON NEWS
The aim of testing is to rule out errors in the development and verify that the software and hardware function with no problems in the complete WEC system. For the functional tests, WRD is installing the main components of the E-138 EP3 – generator, machine house, rotor head and E-module – in its test centre. These components are connected so as to simulate different operating statuses in test runs. “The same tests will be carried out again on the prototype during actual operation once it has been installed at the Wieringermeer test site”, explains zur Mühlen.

The newly developed E-138 EP3 components are also being subject to the usual tests at the same time. For example, WRD is currently carrying out tests with the E-138 EP3 converters. The E-138 EP3 is the first ENERCON WEC to feature active rectifiers and a higher level of voltage for the electrical system. Generator output can now be flexibly regulated in two different ways: as before via the excitation current in the generator rotor, and via the stator currents which are controlled using the active rectifiers. This results in an optimised operating mode with improved efficiency, and in turn an increase in the annual energy yield. What is more, the new converters lead to a further improvement in the grid properties of the WEC.

“The new rectifiers mean changes had to be made to the generator’s insulating system”, explains Christian zur Mühlen. These manifested themselves, for example, in a new coating for the form-wound coils on the stator. The E-138 EP3 generator is therefore undergoing the same test programme on the generator test station at WRD as the E-126 EP3 generator before it.

It’s a similar story for the rotor blade. A whole blade test has been scheduled for the E-138 EP3 as well. “The blade is based on the same profile family as the E-126 EP3 blade. But it has different dimensions and a structural design that has nothing to do with the E-126 EP3. At 144.8 metres, it is also much longer than the E-126 EP3 blade, which measures roughly 61 metres”, says Florian Rubner, Manager for the E-138 EP3 at WRD. “This is down to the fact that we have developed a new safety system for this wind turbine with new functionalities including new hardware and software. Additional tests to check the integration of the new safety control system in the entire WEC system are therefore required.”

The E-138 EP3 control system is divided into two areas: one focussed on operation and the other on functional safety. While the WEC is in normal mode, it is controlled by the operation-oriented system which ensures the best operating mode at all times according to the prevailing wind and grid conditions. If a fault occurs, the safety-oriented control system takes over automatically and puts the WEC in a safe state. Its protective functions include: protecting from overspeed, protecting from excess generator oscillation, monitoring rotor blade angles and triggering an emergency stop for the entire WEC. “The control system for functional safety has been newly developed and marks a further improvement on existing safety systems, without reducing WEC availability”, says zur Mühlen. “The new safety control system allows us to achieve the highest safety standards that are above the level typical for the industry.”

NERCON’s development engineers have certainly got their hands full at the moment. At almost exactly the same time, they are getting five new types of wind energy converter ready for series production: the E-126 EP3, the E-138 EP3, the E-115 EP3, and the L147 LP4 and L160 LP4 from Lagerwey. A number of intensive test campaigns are therefore running in parallel with the various prototype projects. Test stations are set up in the test centres at ENERCON’s research and development company WRD for this purpose, and external testing organisations are also involved. Following completion of the first series of tests with the E-126 EP3, the developers have now turned their attentions to components from the E-138 EP3. Preparations to install its prototype at the Wieringermeer test site in the Netherlands are currently underway.

There are considerable differences between the testing procedure for this WEC type, which plays a key role in ENERCON’s product strategy, and the conventional test procedure followed for new model ranges. “The test programme for the E-138 EP3 is significantly more extensive”, confirms Christian zur Mühlen, Project Manager for the E-138 EP3 at WRD. “This is due to the fact that the testing is now being carried out over the same test programmes will go back to being shorter.” //
Politicians push transponder solution for needs-based nighttime marking

AFTER YEARS OF BLOCKING THE TRANSPONDER TECHNOLOGY FOR ACTIVATING WIND ENERGY CONVERTER BEACONING, THE FEDERAL GOVERNMENT HAS SUDDENLY GIVEN THE GO-AHEAD FOR ITS APPROVAL. ENERCON HELPED TO DEVELOP THIS CHEAP ALTERNATIVE TO ACTIVE RADAR SYSTEMS. THE TECHNOLOGY HAS PROVEN ITS WORTH IN A PILOT PROJECT AND IS NOW FACING NEW PROSPECTS.

Transponder-controlled needs-based nighttime marking systems like the one developed by ENERCON and its cooperation partner Lanthan are based on the following functional principle: the WEC nighttime marking is switched off as standard. It is only activated in situations where a receiver system installed on the WEC receives transponder signals from approaching aircraft and a possible risk of collision is established based on the evaluated data. Transponders on aircraft send out signals continuously so that other aircraft and receiving equipment on the ground can detect the location of the aircraft. The signals can also contain data for aircraft identification as well as information on the direction of flight, the flying altitude and the airspeed.

One advantage of the transponder technology compared to active radar systems is that it does not cause any emissions whatsoever. This argument should not be underestimated: the aim is to promote acceptance. What is more, it can be installed at a fraction of the cost: the price for equipping each wind farm is calculated at around 30,000 euros. A primary radar system that scans the airspace around a wind farm using radiated radar impulses chalks up costs of up to 750,000 euros.

ENERCON and Lanthan have already proven the long-term effectiveness of their transponder technology in practice. A pilot project undertaken together with the German Federal Police “North flying squadron has been operating in Schleswig-Holstein without any failures since April 2010. For this field test, six ENERCON WECs in the wind farm bordering the Federal Police airfield in Wiemersdorf were fitted with the transponder signal receiver system. The police helicopters are already equipped with transponders. The results of the field test show an average duty cycle of between 0.15 and 2.19 minutes an hour for the WEC beaconing, meaning it remains switched off for 94.35 to 99.75 percent of the time.

“Clearly, the politicians’ sudden change of heart is down to two things: the fact they have realised they need to push ahead with implementation of BNK systems in order to reach the desired goal of improving acceptance of onshore wind energy projects, and the fact that the Transponder technology can be implemented at much lower cost to the operator than the complex primary radar systems,” says Ruth Brand-Schock. “For many years the transponder technology was declared to be politically unacceptable. Now we are finally starting to see some movement in this area. This could mean an end to the permanent flashing of WEC beaconing for many regions in the future. We hope this news will have a positive impact for the approval of planned new wind energy projects.”

PATENT SITUATION FOR TRANSPONDER TECHNOLOGY


To enable fair competition, ENERCON is prepared to license the aforementioned families of property rights at FRaNd (Fair, Reasonable and Non-Discriminatory) terms. This guarantees that all market participants can gain access to the protected technology at reasonable costs in spite of the families of property rights that exist.
The disadvantages of conventional tubular steel towers and hybrid towers for wind energy converters include a relatively complex production process and time-consuming, expensive logistics. Because tower sections are so big and so heavy, each one generally has to be transported to the construction site at night as an abnormal load with special permit. These drawbacks do not exist with the modular steel tower (MSt) developed by Lagerwey. The modular steel towers are made up of pre-fabricated longitudinal elements which are not bolted together to form complete tower sections until they reach the construction site. The second step involves placing these sections one above the other and bolting them together, too. Simplified manufacturing of the standardised individual segments also enables them to be produced locally. This offers a great advantage, just like the straightforward transportation to the installation site. This can be carried out at any time using a standard truck. The components can also be shipped using containers for export projects. In addition, Lagerwey’s ‘Climbing Crane’ can also be used during installation. The self-climbing crane supports itself on the tower interior end. They are installed using an electric shear screwdriver. It features a hexagon wrench for tightening the nut and a multi-edge attachment for holding the bolt and shearing the shear attachment. In one production step, the nut is tightened and the shear attachment automatically 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 special bolt connections forming the basis of the MSt concept enable new types of steel tower boasting higher hub heights and reduced material usage at the same time. To start with, ENERCON and Lagerwey plan to use MSt towers for the E-126 EP3 (hub height of 135 metres), the L147 LP4 (hub height of up to 155 metres) and the L160 LP6 (hub height of up to 166 metres). //

The components are held together using friction joints. Special bolts and brackets are used to bolt them. 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.

The special bolts feature a round head on the exterior tower wall, and threads for a hexagon nut and a multtooth 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 multi-edge attachment for holding the bolt and shearing the shear attachment. In one production step, the nut is tightened and the shear attachment automatically 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.

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ENERCON uses one-piece rotor blades in its new EP3 platform WEC types. These components are up to 66.8 metres long and transporting them to the installation site poses certain challenges. Routes featuring narrow bends in particular could prove to be impassable bottlenecks if conventional equipment was used. Motorway exits and slip roads could also end up being problematic. “In order to ensure we are prepared for the challenges ahead, we are acquiring new special trailers designed for these longer blades for our transport fleet”, says Hendrik Petersburs, Head of Logistics at ENERCON PLM GmbH. “We will then be better equipped to get round these obstacles.”

The new trailers from the company Goldhofer can be extended to a maximum total length of 72 metres with a fivefold telescopic deck. They also feature a ‘gooseneck’ hydraulic lifting mechanism that allows the whole of the front of the semi-trailer to be raised by up to 1.6 metres. This means the blade can swing over obstacles next to the road, such as crash barriers, when taking bends. What is more, the semi-trailer can be telescoped and extended under load, making the overhang bigger or smaller and resulting in a smaller curve radius. “These functions make the process of transportation much easier for us”, explains Hendrik Petersburs. “The new equipment will significantly reduce the need for complex reconstruction measures at many narrow points of the road in the future.”

The new trailers can transport ENERCON rotor blades from the E-30 right up to the new E-138 EP3. Smaller blades up to the E-53 can even be transported in a triple frame. Three special trailers together with tractor units will be delivered to ENERCON by the end of the year. Three more trailers are to be acquired for 2019. The first E-138 EP3 rotor blades to be transported are destined for the installation of the E-138 EP3 prototype at the Wieringermeer test site in the Netherlands. These blades are currently the longest ENERCON blades. //
The key demand made by the wind industry was for special tendering rounds totalling 4,000 MW. The wind energy sector and politicians hope that this volume will go a little way to compensating for some of the losses resulting from the misuse of the special regulation for community-owned energy. One gigawatt of additional wind power will be put out to tender in 2019. This will be followed by 1.4 gigawatts in 2020 and 3.6 gigawatts in 2021. In addition to this, the time period in which unused tendering volumes can be transferred to future rounds will be increased from one year to three. Germany and its federal states will finally have enough time to ensure more project approvals. Increased from one year to three. Germany and its federal states have now a chance to be slower closer to the target of increasing the share of renewable energy in electricity consumption from around 40 to 65 percent by 2030. To reach this goal, however, a yearly expansion of 5,000 MW would be necessary.

In order to push ahead with the synchronisation, specified in the coalition agreement in the agreement at the urging of the Union in particular, the share of renewable energy in the federal government's budget is increasing. This is because the projects require large investments and tendering processes are being tested. If the continued to be bided, they would spill a significant amount of money to the Renewable Energy Sources Act. “To start with, 250, then 480 and finally 500 megawatts of the volume are reserved for pre- innovation tendering. The key issues paper of the Federal Ministry for Economic Affairs sets out: ‘No renunciation in case of negative prices, acquisition of competition by only accepting 80 percent of bids, a technology-neutral fixed market premium and requirements concerning grid-friendly behaviour’.” The new tendering mechanisms are set to be evaluated as soon as 2019, and the positive elements adopted immediately.

Further significant problems lurk in the act of moving the issue of lostfeed-in remuneration – movement of the hardship provision to the Energy industry act does not take effect until 2020. In that case, the operators and owners of wind energy converters that have been shut down would not receive any compensation in 2019.

Together, ENERCON and the German Wind Energy Association (BWE) are taking an active stand against this new regulation.

In the plans for the obligatory needs-based night-time marking (see report on p. 14) is a decisive success and represents huge progress in achieving acceptance for wind energy. The Federal Government has finally acknowledged that the low cost of transponder technology also makes retrofitting of existing wind energy converters economically viable. “Our task now is to help enforcement of the obligation for transponders to be switched on at night, which was the key demand in the last round,” explains Andreas Becker, expert for the political implementation of needs-based night-time marking at ENERCON. “If we get the urgently needed obligation for new and existing wind energy converters to install beaconing that can be switched off, but no approval for the transponder, the worst-case scenario would be expensive retrofitting of the technology, or for older wind farms the threat of being shut down altogether.” The wind energy sector and politicians are united in their view that all wheels need to be set in motion to solve the longstanding problem, and for all – especially considering the impending political implementation of needs-based nighttime marking at ENERCON. “If we get the urgently needed obligation for new and existing wind energy converters...”
NERCON’s installation technicians are used to curious visitors at the installation sites. Wherever in the world wind turbines are being installed, it does not take long for visitors to show up who want to follow the spectacular orchestra of the installation of major components with heavy equipment – an interested public, that usually do not disturb. The installation of the Moose Lake wind farm in the British Columbia, Canada, had to foresee highly unwelcomed visitors, which required special security procedures for the safety of the installation technicians. The site is located in the middle of grizzly country, as it is called in Canada – in untouched nature.

Grizzly bears being huge and strong animals, every year lethal incidents are recorded in North America, when humans and grizzlies encounter each other without warning. “This is why we included special wildlife security procedures into our HSE plan for the project”, indicates Michael Weidemann, Executive Vice-President for ENERCON in Canada. ENERCON was acting as the main contractor, all subcontractors needed to follow ENERCON’s HSE requirements.

“A 45 minute wildlife presentation with indications on how to behave in the event of encountering a bear was mandatory for all workers on site”, mentions Weidemann. “All employees/workers were equipped with pepper spray and signal horns and needed to be reachable by radio communication. All wildlife viewing needed to be reported over radio, to allow a warning to all workers”. The security procedures were not without reason: Several bears showed up during the installation works. Due to the existing security procedures, no incident was reported upon these grizzly visits.

The project Moose Lake consists of 4 x ENERCON E-141 EP4 on steel towers with 99 m hub height. The wind farm has been installed in the municipality of Tumbler Ridge in the Province British Columbia on behalf of the owner, Boralex. Tumbler Ridge is located East of the Rocky Mountains, approximately 1,000 km North of the biggest city in the province, Vancouver.

The project started at the end of 2017, but the installation works had to be suspended due to the typical harsh winter conditions between the beginning of November and end of May. The delivered WEC components were wrapped up for weather protection and the whole installation site was secured for the winter. The installation was continued after the thawing period in May.

“As we look forward to the commercial commissioning of Moose Lake, our first wind farm in British Columbia, we would like to thank ENERCON for their professionalism, thanks to the constant vigilance of their workers, there has been no lost time accident this year,” said Hugues Girardin, Boralex’s Vice President, Development. “Boralex is proud to continue its core mission with this coming commercial commissioning of another reliable, affordable and renewable energy facility that will play a part in addressing global climate change.”

The Moose Lake project increases ENERCON’s fleet in Canada to 947 WECs. The installed capacity amounts to 2,166 MW. //

ENERCON INSTALLED 4 X E-141 EP4 FOR ITS CLIENT BORALEX IN THE CANADIAN PROVINCE OF BRITISH COLUMBIA. THE PROJECT IS LOCATED IN A WILDLIFE AREA WHICH IS INHABITED BY A LOCAL POPULATION OF GRIZZLY BEARS. SITE-SPECIFIC SECURITY PROCEDURES WERE IMPLEMENTED FOR THE SAFETY OF THE INSTALLATION TECHNICIANS.

EP4 installation in grizzly country

Photo: Boralex

Wind farm Moose Lake / Canada with 4 x ENERCON E-141 EP4.
Two new landmarks off Haugesund

ENERCON has installed 2 x E-115 E2 WECS on the Island of Storøy off the west coast of Norway. The complex location meant special solutions were required to tackle the logistics of the project.

New and passengers aboard vessels heading from the north for the Port of Haugesund on the west coast of Norway, or sailing through the Karmøysund strait, can’t miss these new landmarks: for a short time now, two E-115 E2 wind turbines have been generating environmentally-friendly energy on the coast of the island of Storøy. ENERCON installed the wind farm for the project planners Solvind (Prosjekt AS). Once completed, it was handed over to the Swiss renewable energy company Aventron AG as their first wind energy project in Norway.

Jan Thiessen, Managing Director of the project development company, is pleased with the successful realisation of the project: “The location is ideally suited for wind energy production. Encroachment on the environment was not necessary, as all the construction measures were carried out in an industrial estate. The access roads, the port and the grid were largely already in place. On top of this, the excellent prevailing wind conditions are both strong and constant. We are also happy to be able to continue our long-standing cooperation with ENERCON. Multiple delays were encountered along the way as a result of the challenging market conditions in Norway and restrictions imposed by environmental agencies. It was not a straightforward process. Now, the cooperation between partners ENERCON and Aventron offers the potential to implement more projects in the region.”

The wind energy converters with a nominal power of 3.2 MW each were installed on hybrid towers at a hub height of 92 metres. In keeping with their coastal location, the shading on the bottom tower segments is blue rather than the green typical for ENERCON. As well as supplying and installing the wind energy converters, ENERCON also took care of constructing the foundation and will be providing service during the operating phase as laid out in the EPC contract. The customer was responsible for building the roads and installing the wind farm cabling.

The wind farm is located around 50 kilometres away from Stavanger, in the Storøy industrial estate in the north of the municipality of Karmøy. It is built on a former slag landfill site used by the aluminium industry. Comprehensive earthwork therefore had to be undertaken before installation of the wind farm could begin.

The complexity of the location also meant specialist solutions were required for transportation. “We could only deliver the components to the island using ships,” reports Eike Gentsch, Country Manager for Norway at ENERCON Sales International. “The roads leading to the island were too narrow for abnormal load trucks, and impassable for us due to load restrictions on the bridge.” The installation crane therefore also had to be completely dismantled into single components for transportation over the bridge.

The wind energy converters are located just a few metres from the coast. According to Aventron AG, with an average wind speed of 8 m/s, the wind conditions almost match those offshore. “The expected energy yield for the wind farm is 24 gigawatt hours with 3,750 full-load hours”, explains the owner, who also sees an advantage in the fact that the wind farm is so close to ports and industrial plants. “It means there is a limit to the amount of work that has to be done to create a new infrastructure for grid connection.” The energy produced is fed into the local distribution network and used in a region with large industrial consumers and a high level of consumption.

Photo: Solvind

Storey wind farm with 2 ENERCON E-115 E2 wind energy converters.