NEW 4 MW PLATFORM  ___ ENERCON presents E-126 EP4/4.2 MW

ENERCON RAILWAY ON “RAIL” TO SUCCESS  ___ e.g.o.o. multi-faceted logistics service provider

ENERCON IN TURKEY  ___ market leader installs 1,000 MW
Dear customers, business partners and employees,

At ENERCON we are proud to look back at 30 years of successful business. In today’s global market, we are trailblazers in the industry offering technological solutions to meet tomorrow’s energy challenges. The key to our success in the renewable energies market is our active innovation structure which not only combines commitment and added value but also awareness.

Our aim is to make a major contribution to the success of the energy transition. In line with the principles of “operational excellence”, this requires continuous development of our technological features and constant adjustments to all company sectors.

After 30 years of experience, our focus is on gaining innovative strength and increasing our competitive edge. This forward-looking impetus will be noticeable in external and internal communications such as the all new layout of this Windblatt issue.

Our cover story focuses on our new 4 MW platform – joining innovative technology with smart modular design. The E-126 EP4 (4.2 MW nominal power), designed for IEC IIA wind conditions with a rotor diameter of 127 meters, is the first turbine in the newly developed platform – an outstanding product with maximum efficiency and reduced noise emission.

Systematic sophistication of the tried-and-tested components, increased use of identical parts and standardisation of components are key factors of the new platform concept and turbine design. These factors and the reduction of project realisation time due to process optimisation make this new turbine concept with the highest quality standard an excellent choice.

We hope you enjoy this issue.

Nicole Fritsch-Nehring
ENERCON Managing Director
ENERCON staff jokingly translate the acronym “NOP”, which actually stands for the Noordoostpolder wind farm in the Netherlands, to “No other project”. And indeed, there is no other project like it. ENERCON is currently installing a total of 26 x E-126/7.5 MW turbines directly along the dike at the IJsselmeer in the province of Flevoland making it Europe’s largest wind farm.
GOTHA

Construction of Service training centre in Gotha on schedule

The construction of the new ENERCON Service training centre in Gotha is on schedule. The 1,801 square metre building in which theoretical training for WEA Service employees is to be held is expected to be completed by the end of May/beginning of June. It was designed for a capacity of up to 278 training participants per day and complements the practical training facilities already in place in Gotha. The new structure includes ten training and meeting rooms as well as administrative offices. There will also be a fully-equipped cafeteria large enough to seat approx. 100 people. The cornerstone laying ceremony took place mid-November, in the presence of Gotha’s mayor, Krut Kreuch, ENERCON Service Deutschland GmbH managing director, Volker Kondziarza and other invited guests. The speakers pointed out the positive effect that ENERCON’s training facility has on Gotha’s economy, in particular the hospitality industry. For the year 2015, the training centre is expecting up to 20,000 overnight stays.

MAGDEBURG

Two new ENERCON production facilities inaugurated in Magdeburg

ENERCON inaugurated two new production facilities in Magdeburg. In the presence of Saxony-Anhalt Prime Minister, Reiner Haseloff (CDU), Magdeburg mayor, Lutz Trümper (SPD) and other invitees, ENERCON Managing Director Hans-Dieter Kettwig gave the official starting signal for the operation of Magdeburger Komponentenfertigung GmbH (MKF) and Magdeburger Generatorfertigung GmbH (MGF) at the beginning of January. The two plants at the Industriestrasse site manufacture GRP components and generators for ENERCON.

With a production floor size of 12,989 m², MKF GmbH manufactures rotor blade blanks for the ENERCON E-126, E-101 and E-82 WEC series. These blanks are then transported by rail to ENERCON’s Magdeburg-Rothensee site for further processing including finishing. MKF’s planned volume for 2015 is about 280 blanks. The current headcount in production is 227. Another 16 persons are employed in administration. MGF GmbH, which is located on the same site, manufactures generators for ENERCON’s E-101 and E-115 WEC series. Once full-scale production is underway, the plant will employ up to 100 persons. Their production capacity is expected to be up to 350 generators per year.

ENERCON purchased the facilities at Industriestrasse and re-modelled them for its use. Production employee, explains construction of ENERCON rotor blade by means of cross section at inauguration ceremony of new ENERCON factory, MKF in Magdeburg. Sachsen-Anhalt Prime Minister Reiner Haseloff (3rd front right), Magdeburg mayor, Lutz Trümper (3rd front right) and MKF managing director, Dirk Helmann (4th front right) listen attentively.

ENERCON employee electricity rates now available to all employees in Germany

The ENERCON employee electricity rates are now available to all ENERCON employees Germany-wide. Until now, the 100% green energy electricity was only available to staff in Aurich and Magdeburg. At the same time, the kilowatt-hour rate for new and existing subscribers has been reduced by up to 5%, while other regional power supply companies in Germany have significantly raised their prices. The base rate, however, remains unchanged. Depending on the region, the ENERCON employee rate is between 24.29 and 27.15 cents per kilowatt-hour. Compared to new green energy contracts being offered by local providers, most three-person households can save up to 180 euros per year. Hence, the ENERCON rates are cheaper than the rates being offered by green energy providers such as Lichtblick or Greenpeace Energy.

The provided electricity is made up of 15% energy from ENERCON wind energy converters and 85% hydropower from the High Rhine. ENERCON guarantees that the prices will remain stable in the calendar year in which the contract was subscribed. Furthermore, ENERCON guarantees that the costs for the share of electricity provided by ENERCON wind energy converters will not increase – even after 31 December of the respective year. ENERCON personnel can sign up on the internet under www.enercon-energie.de.
Evolution of time-proven technology:

E-126 EP4/4.2 MW

ENERCON develops new 4 MW turbine type – initial launch of prototype for medium wind speed sites (IEC IIA) by end of 2015 – further versions to follow for low and high wind sites.

ENERCON has developed a new wind turbine platform in the 4 MW category and will soon be launching the E-126 EPA model (4.2 MW nominal power, 127 m rotor diameter) for the medium wind speed sector (IEC IIA). The new ENERCON 4 MW concept combines innovative technology and intelligent modular design for more efficiency and reliability. Systematic sophistication of the tried-and-tested components, increased use of identical parts and standardisation of components are key factors of the new platform concept,” says ENERCON managing director Nicole Fritsch-Nehring. The new turbine design satisfies premium quality standards and, due to maximum efficiency, lower sound emission and reduced project realisation time owing to optimised production, logistics and installation processes, is a very convincing product.

The new E-126 EPA offers the lowest electricity production costs with exceptionally high product quality and is expected to generate an annual energy output of approx. 14.8 million kilowatt hours at sites with an average wind speed of 7.5 metres per second at 135 metres hub height. With regard to quality and cost-effectiveness, ENERCON is providing their customers with a highly sophisticated machine designed to make the fullest use of onshore sites and sites further landwards.

**Nacelle**
- Modular nacelle design to reduce production, transport and assembly time
- Use of premium quality cast components
- Transport in standard containers simplified

**Rotor blade**
- Innovative aerodynamic design boosts efficiency
- 2-part blade design optimised for production and logistics
- Significant reduction of sound emissions by using Trailing Edge Serrations (TES)
- Yield optimised flat-back profile
- Minimal structural loads
- Significant increase in yield at cold climate sites
- Excellent lightning protection system

**Generator**
- Maximum running smoothness, minimised sound emission and maximum efficiency
- 2-part generator design optimised for production and logistics
- Advanced cooling concept with 35% less energy loss in cooling system
- No use of rare earth elements

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New rotor blade profile series

Development work on the E-126 EP4 series already began in 2012 with the introduction of the new aerodynamic profile known as the E-series. Based on ENERCON’s extensive experience and their development engineers’ expertise, the profile of the blades has been specifically optimised to increase power generation and achieve substantial structural load reduction. Other design criteria are the minimisation of sound emission and their resistance to erosion in order to guarantee steady optimum output during the turbine’s service life – even under rough weather conditions. Certainly a first in the wind energy industry is the extent of tests undertaken to validate the required properties of the new profile. To ensure the blade properties, ENERCON carried out extensive wind tunnel tests in addition to complex numerical simulations in their own computer lab and, for the first time, also a full scale blade test on a prototype blade cut similar to the E-126 EP4 blades. As for all other ENERCON wind turbines, the E-126 EP4 rotor blades are supplied with trailing edge serrations [TES] designed to minimize aerodynamic sound emission and can be equipped with a rotor blade de-icing system option. Another optimisation in this turbine type is also ENERCON’s lightning protection system based on a lightning protection class with extremely stringent standards. Only ENERCON rotorbales fulfill these requirements. Similar to the E-115 blades, the E-126 EP4 rotor blades are produced in two parts, i.e. with an inner rotor blade fabricated using the wrapping technique and an outer rotor blade produced using the classic half-shell construction method. This manufacturing principle enables process-optimised production and simplifies transport logistics. Evolutionary step in generator technology Enhancements to the generator technology have significantly improved running smoothness, increased efficiency and reduced sound emission while still using the low maintenance gearless generator system less prone to faults. The overall sound power level of the new E-126 EP4 is only 105 dB(A). Due to the low sound emissions the E-126 EP4 offers considerable advantages for site planning. Validated technology Inaugurated in 2014, ENERCON’s highly modern R&D innovation center equipped with a large number of sophisticated test facilities, is now paying off for the validation of the E-126 EP4 system components. The ENERCON-designed generator test stand is being used to perform full-scale tests to ensure that the innovative technologies of the new ENERCON generator meet the required product standards. Modular machine house concept The E-126 EP4 machine house has also been optimised for transport and assembly purposes. The slimmer, more streamlined design of the nacelle along with the optimised segmentation of the nacelle casing facilitates transporting the components in standard containers. Optimised foundation and tower design In line with “design to manufacture & assembly” design criteria, various new tower concepts underwent a technological and industrial feasibility study. These concepts are expected to be incorporated in the EP4 platform series by 2017, at the latest. A more slender tower design with hub heights ranging between 135 and 144 meter is scheduled to be used in the E-126 EP4 pre-series. All towers will be available as hot or cold climate versions and can be installed on three different foundation types, depending on the local soil conditions. Outstanding grid properties Due to significant advancements in the grid integration properties, the E-126 EP4 will be one of the most modern and most grid-compatible wind turbines on the market worldwide. ENERCON’S grid feed technology offers system solutions for reliable power feed into any distribution and transmission network anywhere. And thanks to the benchmark turbine and inverter control system, the 4 MW platform fulfills the latest grid code standards in the high and medium-voltage range by providing systems services such as, e.g. balancing power for weak grids and the STATCOM feature.

Simplified production process: Inner part of EP4 rotor blade manufactured with same fully-automated wrapping technique as for E-115 series (Figure).
Emerging from the niche

**IN SHORT TIME, E.G.O.O. EVOLVES FROM ENERCON FACTORY SUPPLY TRAIN TO WELL-ESTABLISHED RAIL COMPANY SERVICING MULTITUDE OF EXTERNAL CUSTOMERS.**

**ENERCON e.g.o.o. mbH trains are a well-liked subject for train enthusiasts.** Wherever the green locomotives appear with their eye-catching cargo – rotor blades or tower sections for ENERCON wind energy converters – train buffs are there to capture the moment. Well-frequented “train spotter” forums on the internet show a number of such shots. E.g.o.o. mbH was originally founded in 2007 to transport ENERCON wind turbine components, but this is no longer their sole activity. In just a few years, the ENERCON rail transport company has progressed to a well-established enterprise servicing an extensive rail network as well as a great number of external customers.
In 2009, the e.g.o.o. already started transporting materials from ENERCON suppliers in addition to conveying ENERCON’s own materials and products. The company is certified by the Federal Railway Authority with the Part A and Part III Safety Certificate which allows it to transport goods including hazardous substances on public German rail networks. “We started by asking ENERCON suppliers to move their shipments from truck over to rail transport and the suppliers’ locations formed the basis for our rail network. So the selected hubs are strategically situated near larger industrial centres,” explains e.g.o.o. managing director, Ursula Vogt. The economics was not the only factor taken into consideration. The ecological aspect was another major component as sustainability is an important matter at ENERCON. In line with their founder’s (Aloys Wobben) motto, the company’s aim is not only to be competitive, but also to be ecologically compatible in all company sectors – including logistics and transport. Due to the various ecological advantages rail transport offers, ENERCON prefers rail transport whenever possible. “Slowly but surely, we were able to convince our suppliers of “Green Logistics,” says Ursula Vogt. Today, all production facilities, whether ENERCON rotor blade and concrete tower factories, the stamping plant, the foundry or the electrical cabinets and boxes production facilities, all receive their material by rail. Daily freight runs operate from the e.g.o.o. hubs and suppliers without rail connection deliver their goods to the nearest loading station by truck, where e.g.o.o takes over. In 2012, three years later, e.g.o.o. started doing business with third party customers. Since then, they have been offering their services to companies with no direct connection to ENERCON. “We see substantial market opportunities in combined cargo conveyed in single cars and groups of cars,” explains Ursula Vogt as the reason for expanding their business sectors. “Furthermore, for many companies – especially in the medium-sized business sector – it is becoming evermore important for their image to transfer their freight shipments to rail.” The figures at e.g.o.o. speak for themselves. After just one year, the share of third party shipments made up approx. 15% of the overall transport volume and these figures are growing. Along with this, the rail network has been expanded, new hubs have been added to the schedule and agreements with other regional and trans-regionally operating rail companies have been concluded. On top of the hubs in Aurich/Emden, Magdeburg, Kreuztal, Bösern and Lippstadt, the e.g.o.o. network includes loading stations in Dörpen, Rhine, Ludwigshafen, Berlin, Nürnberg and Munich. Besides connections to the Jade-Weser Port in Wilhelmshaven, international destinations in Austria, Italy, Portugal and Turkey are also being offered. The latest cooperation is the “Ems-Isar Express” (EIX), with daily connections from East Frisia via Dörpen/Emsland to Munich. The payload includes paper, beverages, dairy and frozen food products as well as steel components. “This is the first e.g.o.o. train carrying an entirely external payload,” says Ursula Vogt. Until now, the e.g.o.o. runs were carrying ENERCON shipments, complemented by freight from other companies. Another particularity of the “EIX” is that it is being drawn by electric locomotives powered by 100% green energy. “The advantage of this is the lack of CO₂ emissions,” says Vogt. “This is unique in rail transport sector.” In addition to regionally operating rail companies, haulage companies have also been brought on board. They take over the short distances inaccessible by rail and bring the freight to its final destination. “Our biggest advantages are that we offer the possibility of combined transport in single cars or groups of cars and also serve smaller loading stations in off the beaten track regions,” says Ursula Vogt. “Most rail transport companies concentrate on large hubs and regular circuits and concentrate on processing mass shipments.” Smaller freight villages still have space available and free transhipment capacities with an adequate rail infrastructure to be able to manoeuvre and reconfigure the train cars. Another unique characteristic of the e.g.o.o. is their expertise in handling and loading heavy and special-sized loads. “Due to years of experience working for ENERCON, we have gained extensive expertise,” says Vogt. This is another side of the business which is currently being expanded and external customers are able to benefit from this. “Shifting more heavy goods transport to rail would be a major advantage for the entire heavy goods transport and logistics industry. Allowing road networks and frequent reduced-load restrictions for bridges, are major issues for the industry,” says Vogt. At any rate, the rail transport company intends to expand its business in all logistical sectors with the aim of relieving road traffic, saving resources and improving ENERCON wind energy converters’ environmental balance – all under the motto of ENERCON’s “Green Logistics” concept. And train spotters are delighted to have more spectacular photos to shoot. // Extensive expertise in heavy load transport. e.g.o.o. takes over inter-factory shipment for ENERCON. Image shows WEC hub and main carrier. Rotor blades on track. Wherever possible, ENERCON uses environmentally friendly rail services to transport its components.
Green Energy Market Model

IN BERLIN, PROVISIONS ARE BEING MADE TO PASS A NEW GREEN ENERGY MARKETING ORDINANCE WHICH WOULD ALLOW RENEWABLE ENERGY GENERATED IN GERMANY TO BE SOLD AS GREEN ENERGY.

The last reform of the Erneuerbare Energien Gesetz (EEG – Renewable Energy Sources Act) not only brought about massive restrictions for the expansion of wind, solar, and bio energy, but also did away with marketing renewable energies from German EEG plants. After the German government cancelled the renewable energies privilege and direct marketing of EEG energy became mandatory, all electricity in Germany became “grey”. Since, however, from the point of view of green energy marketers in Germany, there is a demand for a quality product “green energy made in Germany”, a last minute power to issue statutory instruments was incorporated in the EEG 2014. This allows the German government to issue a new marketing model act. Discussions on a green energy model are currently in full swing.

The “Grünstrom-Markt-Modell (GMM)” (green energy marketing model) developed by various green energy marketers is currently the most popular model. It covers all demands imposed on green energy marketing by the Federal Ministry of Economy: Cost neutrality, conformity to European standards, and improvement of all demands imposed on green energy currently the most popular model. It covers all demands imposed on green energy marketing by the Federal Ministry of Economy: Cost neutrality, conformity to European standards, and improvement of all demands imposed on green energy currently the most popular model. It covers all demands imposed on green energy marketing by the Federal Ministry of Economy: Cost neutrality, conformity to European standards, and improvement of all demands imposed on green energy currently the most popular model. It covers all demands imposed on green energy.

The main advantage of the model is that renewable energies will no longer be sold at a loss, but will become the key component of their respective green energy product. The remaining electricity purchase is then planned around this key component. Solutions ranging from wholesale trading of electricity, to load management, on-demand use of renewable energies and the use of storage systems are feasible options that make sense for integrating renewable energies into the system. Green energy marketers have to compile forecasts and road maps and follow these. To compensate for imbalances, green energy marketers would have to purchase balancing energy just like all other electricity sellers and thus bear the same responsibility. Renewables would therefore take on a responsibility for the system.

Green energy marketing will help boost acceptance of wind energy and could promote the decentralised energy transition. The green energy market model enables, for example, community-owned wind farms to consume electricity from their own wind energy converters if desired. Since the green energy is no longer being promoted by the EEG, certificates for electricity from these plants can be issued as there is no longer a conflict with the prohibition of multiple sale. Community-owned wind turbines could be installed with financial participation and the electricity from these consumed later on. This would be a significant step towards a decentralised energy transition. In this respect, it would be wise to pass legislation for the green energy market model as soon as possible and thus create an option for electricity from domestic EEG plants to be supplied directly to the consumers. //

For further information see: www.gruenstrom-markt-modell.de

Rotor blade de-icing system

INNOVATIVE TECHNOLOGY IS THE KEY FEATURE OF ENERCON WIND ENERGY CONVERTERS, IN THE ”TECHNICAL LEXICON” SECTION, WB EXPLAINS OUTSTANDING ENERCON DEVELOPMENTS AND HOW THEY WORK. THIS ISSUE’S TOPIC: ROTOR BLADE DE-ICING SYSTEM.

In winter months, ice may build up on the rotor blades. This is generally caused by high air humidity at outside temperatures around the freezing point (from +2 to -8°C). Ice accretion can lead to loss of revenue or may even cause the turbine to shut down. ENERCON wind energy converters are equipped with a reliable de-icing system that detects and eliminates this ice keeping downtimes and loss of revenue to a minimum.

The ice detection system feature included in ENERCON wind energy converters compares current operating data such as wind, performance and blade angle with the recorded long-term mean values. When changes in the monitored aerodynamic properties occur due to ice accretion, the fan heater installed in the blade root is activated and starts heating the air inside the rotor blade. The heated air flows along the leading edge to the tip of the blade where it is then redirected between the webs back to the blade root and recirculated through the entire blade creating a constant flow of warm air.

The heated air melts the ice and prevents new ice from forming. Meanwhile, the de-icing system is running. After ice has been detected, the wind turbine can be stopped and the blade heating system activated. Safety is the main priority. Once the ice has melted, the machine is automatically restarted or has to be manually restarted once the rotor blades have been visually inspected.

At locations with a low risk of ice accretion, it is also possible to run the rotor blade de-icing system when the turbine is in operation. In automatic mode, if ice build-up is detected, the rotor blade de-icing system is activated and melts the ice while the WEC is running. It is not necessary to shut down the machine and energy yield is maximized.

Although the wind turbine’s energy consumption increases with the de-icing system, revenue at sites with icing was significantly higher. This was successfully proven on ENERCON wind energy converters at research stations in the Czech Republic and Sweden, for example. Yield loss at sites prone to icing was down by seven percent in one winter – from 10% to 3%. //

For more information, visit www.enercon.de
Upgrade kit increases crane availability for E-126 installation

Thanks to new lift enhancing lattice tower, ENERCON can now use crane types from other performance categories to hoist E-126 components.

The Netherlands ENERCON Bemelva BV Pastromstraat 1a · 8013 RP Zeeuwen
Phone +31 38 66 95 010 · Fax +31 38 62 28 010 E-mail: sales.bemelu@enercon.de

Poland ENERCON Poland ul. Polska 30 PL 60-595 Poznan Phone +48 61 65 37 30 · +48 61 65 37 39 E-mail: sales.poland@enercon.de

Portugal ENERCON GmbH Sales Portugal Parque Empresarial de Lanheses · Lugar de Sagadas 4925 624 Lanheses · Viana do Castelo Phone +351 258 803 550 · +351 258 803 509 E-mail: sales.portugal@enercon.de

Spain ENERCON GmbH Sucursal en España Ronda de Augusto de Louis Lumière 23 · Edificio A Parque Tecnológico · 66480 Paterna (Valencia) Phone +34 961 824 556 · +34 961 828 163 E-mail: energy.spain@enercon.de

Sweden ENERCON GmbH · Sweden Arlosvägen 1 · 211 24 Malmö Phone +46 61 163 580 · +46 60 222 420 E-mail: sweden@enercon.de

Turkey ENERCON Rüyzer Enerji · Santari Kurultum Hazinesi Ltd. · Şişli Ahtıhan Caddesi No: 22 Kat: B2 34795 Ataköy · Istanbul Phone +90 216 57 70 757 · +90 216 57 77 192 E-mail: arif.guner@enercon.de

United Kingdom ENERCON GmbH 24 St. John’s Road EH7 2 NE Edinburgh · United Kingdom Phone +44 131 60 150 · Fax +44 131 60 152 E-mail: uk.en@enercon.de

Upgrade kit increases crane availability for E-126 installation

Technical Equipment

Fuming crane type after the CC 9800. According to Terex, the “Boom Booster” is capable of boosting the lifting capacity of the CC 8800-1 by up to 93%, especially when working with large main boom lengths and steep boom configurations.

For the first time, crane service provider Sarens used a Terex CC 8800-1 crawler crane with a “Boom Booster kit” to erect ENERCON E-126 wind turbines at the Noordoostpolder (NOP) wind farm in the Netherlands. ENERCON is currently erecting 26 of these machines there. With a total boom length of 156 metres, including the “Boom Booster”, lifting the components up to 135 metres hub height with the smaller equipment is just like any other routine job. “That’s a big advantage for us,” says Ludger Janßen, Managing Director at ENERCON Energieanlagenmontage GmbH. “Now that we have more cranes available to us for E-126 projects, we can up the pace of machines installed per year.” Another advantage for ENERCON’s project planners is that there is no change in access road and crane platform specifications since the requirements for the CC 9800 and the CC 8800-1 are identical. //

Reinforced lattice tower structure: So-called “Boom Booster” increases lifting capacity of CC 8800-1 crawler crane enabling it to be used for E-126/7.5 MW installation.

Thanks to Terex, the “Boom Booster” is capable of boosting the lifting capacity of the CC 8800-1 crawler crane – to hoist the massive 7.5 MW machine components weighing up to 350 tons. Worldwide only two of these are available so they are always in high demand. Now, in order to increase the versatility of other suitable cranes, Terex is providing an upgrade kit. This upgrade kit reinforces the structure of the lattice tower boom which makes it possible for other crane types to reach the lifting capacity of the lattice tower structure. It was designed to be used for applications with heavy loads requiring a long boom, as is the case for erecting wind energy converters, and can be mounted on the Terex CC 8800-1 and CC 8800-2. According to Terex, the “Boom Booster” is capable of boosting the lifting capacity of the CC 8800-1 by up to 93%, especially when working with large main boom lengths and steep boom configurations.

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Wind energy for remote nickel mine

ENERCON E-82 wind energy converter at Raglan site/Québec.

ENERCON is one of the few manufacturers that offer a technology suitable for extreme sites. Among other locations, ENERCON turbines have been commercially operational for many years in Antarctica, the Swiss Alps, as well as in the Canadian Arctic. This reference list has been extended to another extreme location: ENERCON has installed an E-82/3 MW turbine at the Raglan nickel mine in the Nunavik region of Quebec, Canada, for the natural resource company Glencore.

This robust high wind class turbine will supply the remote mine with renewable energy. The site is located in the Ungava peninsula at the northernmost part of Quebec, above the 55th parallel and approximately 2,600 km north of Montreal. Raglan mine is therefore subject to Arctic temperature conditions and intense winds. The operator Tugliq Energy expects that the yield of the E-82 will replace 5% of the diesel consumption of the diesel generators used for electricity production. This represents approximately 2.6 million liters of diesel.

The mine is not connected to any road system, which made the installation phase particularly challenging. All components had to be delivered via a cargo vessel and the extreme weather conditions allowed for an installation window of only one month during the summer. The E-82 was commissioned at the end of August. The results of this pilot phase will help the mining operator decide on the installation of additional turbines, which could generate up to 12 MW installed capacity, a reduction of 40% of the mine’s diesel consumption.

Furthermore, the operator is installing three innovative storage technologies to allow for a constant supply of renewable energy in the mine’s islanded electric grid: flywheel, battery, as well as an electrolysis system with combined hydrogen and fuel cell storage. These storage technologies are expected to increase the wind energy contribution to the islanded grid from 15%-20% up to 35%-55%.

Photo: Tugliq Energy / Justin Bulota
The development of renewable energies, in particular wind energy, is also progressing in Ireland. After all, energy generation based on renewables is a strategic target of the Irish government and the government of Northern Ireland. However, the growing share of wind power in the transmission and distribution network made it necessary to tighten Grid Code requirements in order to continue ensuring the island’s network security. The conditions of the Irish grid, which is only connected to the GB Grid, are totally different from those on the European continent. During periods of heavy winds, up to 50% of the Irish energy demand is covered by wind energy. On average it is more than 20%. For this reason, the transmission network operator, Eirgrid, recently introduced a new, stricter Grid Code (“DS3”). No problem for ENERCON customers. ENERCON technology meets the higher DS3 standards as demonstrated at the Lettergunnet Wind Farm. Lettergunnet is the first ENERCON wind farm to have been commissioned under the new Grid Code and passed the test right off the bat.

ENERCON installed a total of 17 machines from the E-82 series (2.3 and 3 MW) at the Lettergunnet project which is located in Galway County on the west coast of Ireland, west of the 75,000 resident city of the same name. According to the new Irish Grid Code, wind farms must be able to remain in operation during undervoltage and frequency changes (Fault Ride Through, ROCOF), be able to regulate voltage and active power at the point of connection to the grid (Active power and Voltage Regulation), be able to provide reactive power (Reactive Power Capability), as well as have the ability to control active power depending on the grid frequency (Power Frequency Control).

“ENERCON’s current technological features meet the new Grid Code specifications including Fault Ride Through, Reactive Power Control and ROCOF – no problem,” explains David McMullin in charge of Grid Integration at ENERCON in Ireland. “For the other requirements, new control modes were developed and tested by our Electrical Works Grid Solutions team. For this purpose, the ENERCON FCU hardware was used. New Irish wind farms are now benefitting from this hardware platform’s more rapid reaction time.”

The Lettergunnet WECs have been running at rated power since 2014 and in October the farm passed tests done by grid operator EirGrid certifying that the machines meet the new standards with ease. However, due to the high penetration of wind energy in the Irish grid, operators of older ENERCON wind farms are also affected by these new regulations as they also apply to most existing projects. “It always hurts when wind farms unexpectedly have to be retrofitted, but this also allows wind energy to continue to expand in Ireland,” says Robin Borgert, ENERCON regional sales manager for Northern Europe. “ENERCON operator/owners are fortunate, as all affected projects can be upgraded with the new wind farm controller for a reasonable sum. Due to the reserve capacity and high performance of the ENERCON inverters, older wind turbines themselves do not have to be retrofitted. Wind farms using other technologies generally have to pay a considerably higher amount to comply with the DS3 standard.”

Although Ireland is setting high standards, they are also blazing the trail by rewarding wind farms able to provide system services. The first ENERCON wind farms are already receiving a bonus for the provision of reactive power and a premium for balancing energy and reserves is in preparation.
INTERNATIONAL

ENERCON reaches 1,000 MW mark of installed power capacity

TURKEY ONE OF ENERCON’S KEY MARKETS, COMPANY ACTIVE IN REGION SINCE 1998. FURTHER EXPANSION IN REGION PLANNED.

Recently, ENERCON passed the 1 gigawatt mark of installed power capacity in Turkey. This mark was attained during the development of the Soma Wind Farm in the province of Manisa, roughly 500 kilometres southwest of Istanbul. In the past years, ENERCON has already installed 119 wind turbines there with an aggregate capacity of 140.1 MW. The project is being expanded and currently another 50 machines with a total capacity of 100 MW are being added. “At ENERCON, we are proud of what we have achieved since we entered the Turkish market in 1998,” says Arif Güyar, ENERCON’s regional sales manager for Turkey. “Turkey has become one of our key international markets.”

With a total of 642 wind turbines representing a rated installed capacity of more than 1,011 MW (last survey: 31 December 2014), Turkey is in 8th place on the top ten list of ENERCON export markets - nearly neck in neck with Brazil. Based on a total installed capacity of nearly 4,000 MW, ENERCON’s market share in Turkey is currently 25.18% making ENERCON the market leader.

ENERCON has its own rotor blade and concrete tower production facilities in Izmir. Both plants are producing components for Turkish projects, but also for worldwide export. Izmir is also home of the ENERCON Turkish Service headquarters in charge of repair and maintenance of ENERCON wind turbines in the country’s nine Service regions.

ENERCON’s business activities in Turkey began in 1997 when three E-40/500 kW machines were installed at the Çeşme RES Wind Farm in the province of İzmir for Demirer Enerji. Çeşme was the first wind farm in Turkey and went online in 1998. In 2000, this wind farm was followed by a project with 17 x E-40/600 kW on the island of Bozcaada in the province of Çanakkale. During the course of this cooperation, ENERCON founder Aloys Wobben, and the Demirer family agreed to set up a Service company and a rotor blade factory in Turkey. These were the first companies in the Turkish wind energy sector and the cornerstone for ENERCON’s success in the country. Later on, ENERCON took over Demirer’s shares and is now the sole owner.

“ENERCON has always been a forerunner in Turkey,” says Arif Günyar. “Not only as a supplier but also as a manufacturer and service provider. Our years of experience in many areas of the Turkish market is a big advantage to us today.” In addition to large-scale projects in Soma, Karaburun (50 x E-82, 120 MW) or Fiyozak (70 x E-82, 150 MW), ENERCON has other projects with an aggregate capacity of under 1 MW on the drawing board. “Our E-44 and E-53 turbines are the ideal machines for operator/owners seeking to use their own wind energy,” explains Günyar. These customers include farmers and medium-sized industrial plants.

For the future, ENERCON expects further favourable market development. “Turkey remains a growth market for us,” says Günyar. “The government is planning to install a total of 20,000 MW of wind power by the year 2023 and due to demographic growth, there is an increasing demand for energy. The significance of renewable energies and especially onshore wind energy will continue to increase.” //
The new ENERCON 4 MW platform

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