_ BLADE LIFTING BEAM
New lifting and installation aid for faster construction.

_ JOINT VENTURE ALTERRIC
Aloys Wobben Stiftung and EWE establish joint venture.

_ CORE MARKET ITALY
Framework agreement for 190 MW with ERG energy group.
Dawn of the industrial era of renewables

Dear customers, business partners and employees, dear readers,

We are currently in a phase where everything is changing. Our society, our economy and our energy system are all undergoing a radical transformation, sped up and intensified in some areas by the coronavirus pandemic that continues to rage. The start of the new year was marked with changes for ENERCON, too. One of those is the fact that I am addressing you as ENERCON’s new CEO in this editorial. In the midst of all the changes we are currently dealing with, I would like to carry on with the time-tested procedure established by my predecessor Hans-Dieter Kettwig, and use this opportunity to inform you of news from the company.

In addition to the management changes regarding myself, the changes mainly include measures from our reorientation programme for the company, which we are driving forward with vigour.

As part of the agreement, ENERCON will supply a total of 46 E-138 EP3 E2 and E-115 EP3 E3 wind energy converters for five projects in Italy and Great Britain over the next three years.

ENERCON concludes framework agreement for 170 MW with energy group ERG

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The new lifting and installation aid makes a significant contribution to reducing the costs of installation and can be universally used for many types of ENERCON rotor blade.

First job for Climbing Crane in series project

The Climbing Crane LCC140 lived up to all expectations during installation of an E-136 EPS.

Repowering of the Cham Longe wind farm has been completed. ENERCON replaced 12 wind energy converters with 12 E-82 E4 models for the wind farm owner Boralex, and almost doubled the total installed capacity of the wind farm in doing so.

Repowering at highest wind farm in France

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The first ENERCON E-138 EP3 E2 has been successfully installed at the Jaeun Residents wind farm in South Korea. It’s the first project in Asia to install the E-138 EP3 E2. Despite the winter conditions at site, and facing the coronavirus pandemic, Dongkuk S&C, a trusted partner of ENERCON, has showed once more their strong capability by installing the first turbine within a record time, setting the benchmark for the remaining 100 units which are planned to be installed in Vietnam and Korea within 2021.
As in other years, in 2020 the ecobalance of new wind energy converters was examined in a Life Cycle Assessment (LCA) to determine environmental impact. The LCAs of the E-92, E-147 EP5 and E-138 EP3 E2 were completed by the end of last year.

The objectives for reducing ENERCON’s carbon footprint are pursued on the basis of the LCA of the E-138 EP3 E2. With a carbon footprint of 5.83 g CO₂-e/kWh, the value for the CO₂ emissions (calculated as CO₂ equivalent) for each kilowatt-hour produced is significantly below the target value of 6.1 g CO₂-e/kWh. The energy returned on energy invested is measured to be 36.5, meaning the wind energy converter generates 36.5 times more electrical energy than the energy used for its production. The energy payback time, or the amount of time the wind energy converter needs to be operated for until the energy used for production is generated again, is 8.22 months. In 2021 the aim is to reduce the carbon footprint by another three percent in reference to the E-138 EP3 E3.

The current LCA of the E-147 EP5 has provided the first results showing the extent to which using permanent magnets in the EP5 platform has an impact on the ecobalance of the new ENERCON WEC generation. In addition to this, it was the first time an MST tower has been examined.

The high yield of the E-147 EP5 and the options to recycle the magnets after decommissioning the WEC mean using rare earth elements in the permanent magnets has a smaller effect on the carbon footprint than anticipated. Over its entire lifecycle, the E-147 EP5 thus has CO₂ emissions per produced kilowatt-hour comparable to the EP3 platform values. The carbon footprint was calculated to be 6.44 g CO₂-e/kWh. The energy returned on energy invested is measured at 37.6 with an energy payback time of 6.38 months.

For the E-92, the LCA resulted in a carbon footprint of 5.53 g CO₂-e/kWh and an energy returned on energy invested measurement of 44. The energy payback time is thus 6.91 months.

ENERCON NEWS

ENERCON improves 2020 ecobalance in EP3 programme

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ENERCON can collect valid data on its own IECRE-certified rotor blade test station independently of external test stations.
The E-160 EP5 has been given the ‘turbine of the year award 2020’ by the international specialist journal Windpower Monthly. ENERCON’s new flagship won first place in the ‘large onshore turbine’ category. The key aspects influencing the expert committee’s vote were the rapid development and the substantial advances in the wind energy converter technology that ENERCON has achieved in a relatively short space of time with its new top model. According to the jury, the team has built on the LP4 platform designed by Lagerwey, which forms the basis for all of the EP5 models, to develop the E-160 EP5 into a high-performance wind energy converter with a new PMG generator, one of the biggest rotor diameters on the market and a groundbreaking modular design. The jury added that in doing so, ENERCON has also created the foundations to design other PMG-based direct drive wind energy converters in the future, with higher nominal power and more yield potential.

ENERCON has moved into new office premises in Bangalore in the southwestern Indian state of Karnataka, marking an expansion of its branch there. The move into the new premises meant the existing Bangalore sites could be merged together and capacity for up to 180 employees created. Back at the start of 2020, ENERCON opened another site for its research and development organisation in Bangalore, which it has now adapted to the long-term requirements of this location.

The new branch is an essential component for further organisation and networking of the company divisions in India. At the same time, it means ENERCON’s activities can be coordinated close to the market. As well as the R&D division, the second important focus, Global Procurement, is also located there together with the Supply Quality department. The Indian R&D division is a fully-fledged part of the development unit of Headquarters, and handles product and technology projects independently. The key focus of Indian Global Procurement, together with the Supply Quality division, is on safeguarding the supply chain and reducing the LCOE of the company as a whole.

In addition to this, the support functions, Finance, IT and HR are also represented in the new office complex. Synergy effects have already been generated during training of Indian Production employees, who were taught the specialised knowledge necessary for their work in India at the Magdeburg-Rothensee site.

ENERCON NEWS
Test operation of E2 prototype started

ENERCON is completing the conversion of an E-160 EPS E1 to the more powerful next evolutionary step at the wind energy test site in Wieringermeer.
The new blade lifting beam from the manufacturer Ematec, a hydraulic grabbing and lifting device that allows the crane to hoist the EPS blades at different angles; it can also be used to turn the rotor head of the WEC (see Technical Lexicon, p. 15).

Sascha Exner, EP5 platform manager at WIND, ENERCON’S research and development organisation: “The foundation, tower and machine house of the existing WEC remain untouched; we will only replace the generator and the hub and make some changes to the E-module. This shortens the installation phase and in particular reduces the number of required crane hoists significantly. That means we need fewer wind windows for installation. In the Netherlands, a prototype can be realised more quickly and with less red tape than at our alternative sites in Germany.”

For the developers, the E2 test phase is an important milestone of the EPS programme. “Being able to gain real-life experience with operating the E2 and to start collecting measurement data ahead of the first large-scale projects is very important to us,” says Sascha Exner. In 2021, ENERCON will ship the first E-160 EPS E2 WECs for international large-scale projects, including in Vietnam - a major focus for the company in the current business year. “Another benefit for us is that the wind energy converter at the test site is already equipped with measuring instruments. After the conversion is complete, we can start the trial operation right away.”

**Next evolutionary stage of the E-160 EPS**

The E2 is the next evolutionary stage of the E-160 EPS with a marked performance increase: its nominal power is 5.5 MW, and at sites with annual average wind speeds of 7.5 m/s at hub height, it will produce more than 21,534 megawatt-hours (MWh) of annual energy yield. This is an increase of about 9 percentage points compared to the E1, which yields about 19,615 MWh per year at the same site.

The engineering changes compared to the E1 concern mainly the generator, which has a higher nominal power. Accordingly, modified converters need to be installed in the E-module. This shortens the installation phase and in particular reduces the number of bolt connections required. “Every bolt that does not need to be inserted and tightened by a technician at the construction site saves time, materials, and installation costs,” says Sascha Exner.

A similar effect is achieved by a new installation aid that ENERCON acquired for the installation of the EPS rotor blades. The conversion of the prototype in Wieringermeer was the first time this aid was used on an E-160 EPS. The new blade lifting beam made by Ematec is a hydraulic grabbing and lifting device that allows the crane to hoist the EPS blades at different angles; it can also be used to turn the rotor head of the WEC (see Technical Lexicon, p. 15).

“‘The new blade lifting beam is an enormous help for the installation team,’ says Daniel Weiken, ENERCON project manager for the E2 conversion in Wieringermeer. ‘It really reduces the number of crane hoists, it is easy to operate and ready to use without any lengthy set-up. It has proven its practical worth in our project, and it will greatly simplify and speed up the installation of the series projects, too.’

**Optimisations that reduce the CoE**

The E2 prototype already includes a modified hub that does not require a front hub cover or spoilers between the rotor blades. These guide plates were supposed to help with the air flow towards the exterior cooling fins of the stator. The E1 trials, however, found that they did not significantly impact the cooling effect for the generator. Omitting these components, on the other hand, saves material costs and installation time, which has a positive effect on the Cost of Energy (CoE).

More optimisations will be added in the medium term. Starting with the first major E2 series projects, ENERCON will use the tried-and-tested standard ENERCON lightning protection for the EPS. This means that all ENERCON WECs will follow a single protection concept. Another change shortens the installation time for the MST towers. A new type of coating provides higher friction coefficients on the contact surfaces of the steel plates, and this reduces the number of bolt connections required.

**E-160 EPS E2**

<table>
<thead>
<tr>
<th>Nominal power</th>
<th>5.5 MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual yield</td>
<td>21,534 MWh</td>
</tr>
<tr>
<td>Wind speed at hub height</td>
<td>7.5 m/s</td>
</tr>
<tr>
<td>Hub heights</td>
<td>120 m, 166 m</td>
</tr>
<tr>
<td>Generator</td>
<td>direct-drive permanent magnet generator (PMSG)</td>
</tr>
</tbody>
</table>

**Conversion shortens installation phase**

“This is the fastest way for us to start the real-life testing of the next evolutionary stage of our EPS platform,” explains Sascha Exner, EPS platform manager at WIND, ENERCON’S research and development organisation. The foundation, tower and machine house of the existing WEC remain untouched; we will only replace the generator and the hub and make some changes to the E-module. This makes it possible to shorten the installation phase.
The new lifting and installation aid makes a significant contribution to reducing the costs of installation. It also carries another advantage: it can be universally used for many types of ENERCON rotor blade.

For now, ENERCON will be using a new blade lifting beam to install wind energy converters in the EP5 platform. The lifting and installation aid supplied by the manufacturer Ematec reduces the productive duration of the blade installation process from 4.5 days to 1.5 days. This move has allowed ENERCON to successfully reduce the cost of installing its EP5 platform machines by a mid-five-figure sum, and an effect that has a direct impact on the CoE values of the EP5 models.

The Ematec lifting beam replaces the installation aids used for EP5 blade installation to date: the blade hoisting device for rotor blade installation, where the support device is attached to the crane hook and installation aid on the lifting beam, the rotor blades are installed at the 3 o'clock, bolted and the hub lock has been released, the hub can be turned to 0 o'clock to raise or lower the blade. Separate hoisting operations to the installation position required for the next blade hoisting operation are dispensed with.

The method saves a great deal of time on the construction site. It also has further positive effects on the logistics, since the 25-tonnes lifting equipment can be transported in one standard truck. At least two trucks were needed to transport the two pieces of lifting equipment used for the EP5 blade installation procedure to date. What’s more, the lifting beam is ready for use at the construction site after just 15 minutes. While ENERCON is already utilising these benefits in the current EP5 programme, there will be other advantages to make use of in medium to long-term planning: the new lifting beam can be universally used for many types of ENERCON rotor blade. It is easy to operate and extremely user-friendly, meaning even inexperienced installation teams can be quickly trained in its use without any issues.
Climbing Crane LCC140 installs E-136 EP5 on a first assignment in Eemshaven

In this first assignment in a serial project, the Climbing Crane LCC140 proved that it has a lot of advantages compared to the conventional large cranes usually used for the installation of wind energy converters. These are especially evident in the area of logistics. Up to 100 truckloads are required to deliver a large crane to a construction site. Thanks to its transport-optimised size and relatively low weight of 270 tonnes, the LCC140 requires only 11 truckloads. Within one day, the Climbing Crane is assembled and ready for use. These aspects provide significant cost savings in the installation process.

“The installation of the pre-assembled segments of the modular steel tower was completed after two days,” reports Erwin Maas, ENERCON Construction Manager. The project team had designed a detailed concept of how to position the tower segments close to the tower so that the Climbing Crane could easily pick them up. The Climbing Crane is remote-controlled. Cameras installed on the Climbing Crane also ensure safe guidance. “The operation of the LCC140 worked without any problems. The meticulous testing phase has paid off,” says Erwin Maas.

The crane hardstand necessary for installation works with the Climbing Crane can also be significantly smaller in the future compared to that for a large crane. This is because the Climbing Crane can be used both for installation and for subsequent maintenance and service work. A crane hardstand sized for a large crane is therefore not required in the long term. This not only generates further cost savings, but also preserves surrounding natural and usable areas for industry, forestry or agriculture. In addition, this creates new options for locations where an installation was previously not possible due to space constraints.

ENERCON and Lagerwey have developed a holding concept for the Climbing Crane, in which it encloses the modular steel tower (MST). The LCC140 attaches itself to the MST at six special holding points. “Four stabilisation arms anchor to holding points on the sides of the tower segments. With two movable skids, the LCC140 connects to the front of the tower,” explains Henk Hendrikse, Lead Engineer for the LCC140. With the help of these skids, the LCC140 climbs to the desired height (as reported by wb 04/2019).

The LCC140 was tailor-made for the EP3 and EP5 wind energy converter types in ENERCON’s product portfolio. It easily climbs hub heights of up to 180 metres and can lift weights of up to 140 tonnes. This allows the Climbing Crane to be used throughout the entire installation process – from installing the tower to hoisting the generator and rotor blades.

An ENERCON project has been realised using the new Climbing Crane for the first time. The LCC140 lived up to all expectations during the installation of an E-136 EP5 in Eemshaven in the Netherlands.
E NERCON’s sole shareholder Aloys Wobben Stiftung (AWS) and the EWE AG have successfully launched their joint venture for the project development and operation of onshore wind energy projects. Following the approval of the antitrust authorities, the shareholders’ and investment agreement signed in December came into force on 26 March and the new company Alterric commenced its operations. The AWS and the EWE each hold 50 percent of the shares in Alterric. The aim is to become one of the leading producers of green energy in Germany and France over the next years and to grow in other countries too.

With this step, the former ENERCON areas of project development and operation of its own wind energy projects will merge into Alterric and from now on are no longer part of ENERCON. “ENERCON’s focus on the core business of developing, producing, selling and servicing onshore WECs initiated by the turnaround is made more concrete by these spin-offs,” says ENERCON CEO Momme Janssen. “ENERCON will no longer be active in the areas of project management and operation of its own wind energy projects.” ENERCON Management offers its unreserved support for this fundamental strategic decision made by the trust, emphasises Momme Janssen. “We are following a turnaround programme to lead us out of the crisis in a systematic and coordinated manner, stabilise the company and restore its profitability step by step. This also involves adopting a new strategic focus on core business activities.”

The cooperation with the EWE will result in a new major player in the renewables sector with a significant impact for the expansion of onshore wind energy in Europe. Starting from a basis of one of the largest wind farm portfolios in Europe, Alterric can realise much more of its potential and open up further application possibilities for the energy transition.

Ultimately, the move will also result in new prospects for ENERCON: “We will do our utmost to ensure that Alterric becomes a big ENERCON customer,” Momme Jansson announces. “The company is not committed to a particular manufacturer and we will be up against other competitors to supply Alterric as usual, but we will take on the challenge. We are currently laying the foundations to become Alterric’s WEC supplier of choice in the turnaround, by converting ENERCON to an agile, competitive and future-proof industrial company.”

Former ENERCON divisions will merge into Alterric with this step. ENERCON will focus on its core business.

> AWS and EWE each hold 50 percent of the shares in the Alterric joint venture: Stefan Dohler, Chairman of the Board of EWE AG (left), and Heiko Janssen, Chairman of the Board of the Aloys Wobben Stiftung.
As the species quietly disappear...
Climate protection versus nature conservation?
About an ongoing conflict that should not be one

The fact that nature conservation of all things is becoming a roadblock to the expansion of wind energy comes as a surprise – in view of the destructive effects of fossil energy generation on our ecosystems as well as the established fact that wind energy is a crucial pillar of climate and environmental protection. But, the greatest obstacle to the adequate utilisation of clean onshore wind energy does in fact come from the nature conservation requirements that are applied in the permitting policies for wind energy projects. It is not the application of species conservation law per se that is the problem. Rather, it is the muddled practices, inconsistent between the various authorities, which tie up an enormous amount of resources and that turn the permitting process into a kind of lottery.

Nature is of central importance in our lives. The diversity of nature’s ecosystems and their many species are indispensable as a lasting, stable foundation for human life. It is from nature that we obtain food, medicine, energy and building materials, which in turn form the basis for the global economy and allow human society to prosper. Keeping nature intact serves current and future generations and, in view of worsening climate change, is one of the greatest challenges facing humankind today.

For decades, technologies that support climate protection efforts have been developed and employed in Germany. Manufacturers of renewable energies are not the only ones to have been active. Sales management and leading project developers have also established themselves here. In addition, the great potential of service providers in areas such as technology certification, financing, insurance and environmental expertise has created a solid, highly qualified market structure in Germany which allows for the realisation of the energy transition and for fighting climate change.
However, in recent years, the collective expertise in onshore wind energy has been threatening to erode away, due to muddled rules in permitting procedures and the resulting dearth of projects — and now Germany, the former poster child for climate protection, is facing the risk of falling in the energy transition.

**Society and nature conservation organisations want more wind energy**

There is a contradiction here, because in the fight against climate change, everyone is actually united in supporting an accelerated expansion of renewable energies. This applies explicitly also to onshore wind energy, as evidenced by regular opinion polls and as frequently emphasised in joint statements issued by the major nature conservation organisations. Moreover this relationship makes immediate sense, because the utilisation of onshore wind energy entails comparatively minor effects on ecosystems and does not create irreparable damage to the landscape and nature. There is no accumulation of air pollutants or climate-damaging gasses in the environment.

Species conservation even reaps a double benefit. The first is indirect because the worsening climate change poses the greatest threat to the survival of many species; but the second benefit is very direct: there are very few species, such as some raptors or other large birds, which can be harmed by the spinning rotor of a wind energy converter. Because of habitat destruction, many of these species have been fighting for their survival for decades in Germany. Proposed wind energy projects have actually raised our awareness of the welfare of red kites, black storks, cranes and other birds, and the ecological protection measures tied to most wind energy building permits help those and other bird species by improving their habitats.

Disproportionate to its actual impact, the requirements of species protection in wind energy projects have increased continuously and rapidly over the years. It is no longer enough to meet just the technical requirements; a thorough study of the applicable case law is also required in order to avoid unwelcome surprises during the realisation stage. Delays in the permitting process are frequently caused by statements made by local amateur birdwatchers, whose observations often lack proof and have not been methodically mapped in the way that is needed to consider their supposed discoveries. But still, their complaints must be taken seriously and must be disproved, adding time to the permitting procedures and costs to the project. By now, it is well known that such complaints are by no means raised just by concerned citizens or recognised environmental organisations, but by a well-organised network of wind energy opponents that have an obvious political interest in blocking the energy transition.1

As a society, we need to take quick action and make it clear that we are committed to the goals of energy transition and climate protection — and that in doing so, we are pursuing sustainable, fact-based nature and species conservation. Using wind energy does not put species at risk; on the contrary, it is the solution to their problem. For this reason, in order to support a wind energy expansion on the scale that is needed in Germany, politicians and governments must be courageous and give top priority to energy generation from wind, at least in those areas designated for this purpose. Otherwise, sooner or later nature and species conservation will have outlived its very purpose. And, meanwhile, the species quietly disappear.

**Essential data basis lacking for risk evaluation**

For permitting procedures, the finding of a ‘significantly increased fatality risk’ according to § 44 Section 1 of the German Nature Conservation Act for protected bird species is currently one of the major obstacles for the realisation of wind energy projects. The ‘significantly increased’ category was added to the German Nature Conservation Act only in 2017 — and for years prior to that, it was a hot-button issue argued over by lawyers and the courts, as evidenced by a large number of court decisions. But now, as then, the ‘significantly increased fatality risk’ is impossible to quantify because reference values such as the existing risk at any given site (the ‘basic risk’) for each species have not been defined. This basic risk refers to all risks that a species is exposed to when living in an environment shaped by humans. This includes not just age, disease, predation and territorial fights with members of the same species, which kill animals, but also specific local hazards such as roads, railway lines, pylons and wind energy converters. However, at this point, Germany is still lacking a solid data basis for defining this basic risk.

In this ambiguous situation, the decision made by the German Federal Constitutional Court in 2018 was of utmost importance. The court identified this gap in the knowledge and ordered the federal legislature to eliminate this legal uncertainty. Finally, two years later, the conference of the environmental ministers of the federal states has picked up the issue and defined a ‘significance framework for wind energy and species conservation’ that will be translated into concrete regulations by the individual states. One of the associated action items is to compile the missing data for each species. Without a solid scientific basis, this is quite a challenge! The result can be expected in the autumn of 2022 at the earliest.

**Species conservation putting its very purpose at risk**

Until then, dealing with the ‘significantly increased fatality risk’ in species conservation considerations remains an equation with many unknowns — and the project management of wind energy converters remains a risky investment. In the course of permitting procedures, a multitude of investigations will continue to be conducted and a plethora of expert reports will continue to be submitted in order to achieve evidential sound assessments that provide greater certainty for project realisation. Years pass and costs are incurred while natural disasters increase in number and more and more plant and animal species vanish due to climate change. After all, the effects of global warming have been felt for some time now too in Germany. According to the Global Climate Risk Index published by Germanywatch, the countries most affected by extreme weather events in 2018 were Japan, the Philippines and Germany. If animal and plant species go extinct because their habitats are destroyed by climate change, this will have dramatic effects on the ecosystems and all remaining animals and plants. Because ‘Biodiversity is like a web. Each part that vanishes weakens the stability and strength of the web’ 2

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1 Head of the Greenpeace Research Department, Dr Manfred Redelfs, writes in his recently published article, Die Gegner der Energiewende [The opponents of the energy transition] (Feb. 2021).

2 Alliance 90/The Greens parliamentary group, 2017; response from the Federal Government to minor interpellation from members of the Bundesrat. SteffL Lindem and others, BT printed paper 18/12195.
Climate neutral by 2050: What are the main steps to achieve this goal in Europe?

The construction volumes in the wind industry in recent years – although they have recently risen again slightly – are not reaching the level required to achieve the climate targets of the European Union (EU). In particular, lengthy and complicated approval procedures discourage project developers from engaging in new or repowering projects. A new EU requirement for a 2-year deadline for permit decisions can help to publish new guidance for developers on how to tick in the permit application, the easier it is for a well-paid lawyer to claim you haven’t ticked them all properly. The staffing issue is also a major problem. There is a shortage of qualified personnel at the different levels of administration involved in processing permit applications.

The resulting hassle and delays in the whole permitting process is adding to project development risk and costs, which is deterring developers from pursuing some projects. The Berlin government needs to urgently implement its 18-point plan for the simplification of permitting. Other Governments in Europe need to tackle this issue too. The EU needs to enforce its new two year deadline for permit decisions that comes into force in July. At the same time, onshore wind farm developers need to be exemplary in how they engage local communities on the development of new projects. WindEurope is about to publish new guidance for developers on this. And the whole wind industry, developers and manufacturers alike, need to keep explaining the economic, social and environmental benefits of wind farms.

windblatt spoke to Giles Dickson, CEO of WindEurope, the leading professional association of the wind energy industry in Europe, about policies needed at national and European level to strengthen the position of renewables, especially the wind industry, and the role of National Recovery and Resilience Plans (RRPs) in overcoming national regulatory obstacles.

1. _wb: The updated EU climate target of at least 55 percent is expected to be formally adopted within the coming weeks. In order to deliver this target, the capacity of onshore wind in the EU will need to increase from currently 160 GW to more than 260 GW until 2030. To achieve climate neutrality by 2050, it will need to increase to 1,000 GW. In your opinion, what are the most important factors to make this expansion happen?

Giles Dickson: The most important thing is that Governments simplify their permitting rules and procedures and ensure that they staff the permitting authorities properly. In nearly every country the rules and procedures are too complex. This slows down project development and makes it easier to challenge permits in the courts: the more boxes you have to tick in the permit application, the easier it is for a well-paid lawyer to claim you haven’t ticked them all properly. The staffing issue is also a major problem. There is a shortage of qualified personnel at the different levels of administration involved in processing permit applications.

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2. _wb: A considerable number of installed wind turbines will reach the end of their operational life over the coming years and until 2050, most if not all of today’s installed turbines will have to be replaced by efficient recent WEC models. What role do you see for repowering of existing turbines and how can we make sure that permitting issues in several EU Member States do not hold us back? What are your suggestions for improving the permitting environment for onshore wind in Europe?

Giles Dickson: Over 2021–25 there will be 38 GW of existing wind farms in Europe that are older than 20 years, with the highest number in Germany. As things stand we expect only 2.6 GW of them to be repowered, 7 GW to be fully decommissioned – and the rest to get a lifetime extension. It is at least as challenging to secure a permit for repowering as it is for a new wind farm, if not more so. And very few Governments have a plan for the repowering of their existing wind farms. Many Member States’ laws do not even distinguish formally between new and repowered projects. This is a major problem.

However, the EU’s Renewable Energy Directive (RED II) well makes a difference and reclaims a one-year limit for the permitting of repowering projects – a deadline which seems to be out of reach in most of the Member States.

3. _wb: To weather the economic hardship brought about by the coronavirus pandemic, the European Commission has proposed a large recovery package and is demanding that a minimum of 37 percent of the financial stimulus on investments and reforms contained in each national recovery and resilience plan should support climate objectives. How can these investments support the expansion of onshore wind the EU envisages?

Giles Dickson: The EU’s 27 National Governments are currently preparing their National Recovery and Resilience Plans (RRPs) which will detail how they propose to spend their share of the EU’s €750bn Recovery Plan. No country will get any money until the EU Commission has approved its RRP. The Commission will review each RRP carefully to ensure it supports climate goals and especially the build-out of renewables. This gives us leverage. We need to lean on Governments to include their RRPs those infrastructure investments that will support onshore wind, notably in grids and transport infrastructure.
Despite the Green Deal: Wind energy does not grow fast enough in Europe

The figures recently published by the European wind energy association demonstrate the gap between the professed intentions and the reality of climate protection in Europe. They should be taken as a wake-up call by the EU member states to finally and decisively tackle the obstacles that stand in the way of wind energy expansion. A first step would be the rigorous implementation of the EU’s Renewable Energy Directive according to schedule.

However, the 2020 wind energy figures recently published by the industry association WindEurope are in stark contrast to these new climate goals and the scenarios for the development of demand for green power. The one bright spot is that in spite of the coronavirus pandemic, the vast majority of projects were able to be completed last year without significant delays. But there is a worrying trend: the growth in the wind energy sector is lagging far behind the numbers needed to achieve the climate goals. It is not just Germany where the speed of expansion has slowed down. Other countries, such as Austria and Sweden, are also not making the required progress. In total, 10.5 GW of wind energy were added in the 27 EU member states last year, including 8 GW in onshore installations. According to WindEurope, we need at least twice as much annual growth in order to achieve the more ambitious climate protection goals and to satisfy the growing demand for electricity generated from wind and solar energy. This will increase dramatically in the coming years. For this reason, the large-scale consumers of electricity were also alarmed by the numbers presented by WindEurope. The European steel and chemical industries, for example, immediately responded by calling for a faster expansion of wind energy installations. The availability of renewable power in adequate quantities will become a question of survival for many energy-intensive industries located in the EU.

The reasons for the slow speed of the expansion are well known. In addition to an inadequate supply of designated areas for construction, it is the cumbersome permitting procedures in particular that present the biggest obstacle. They must be urgently simplified and expedited. The EU’s Renewable Energy Directive (RED II) is charting the right course. It defines a 2-year deadline for permit decisions for new projects and a 12-month deadline for repowering projects. These maximum limits apply in all EU member states. The member states have until the end of June 2021 to convert this directive into national planning and permitting law. Another concrete measure stipulated for the implementation of RED II is the creation of a ‘one-stop shop’, a single body that acts as a central clearing house for all planning and permitting procedures. This requirement from EU law must also be satisfied by the summer. More in-depth thoughts on the coexistence of wind energy and species conservation as an ongoing issue in permit procedures are covered elsewhere in this edition of windblatt. Another challenge is presenting itself in many EU countries: the permit authorities are understaffed and without adequate digital means, leaving them unable to process the volume of applications in a timely manner (see also our interview with WindEurope CEO Giles Dickson in this edition of windblatt).

The painstaking implementation of the accelerated permit procedures, as stipulated by EU law, is indispensable for putting the EU back on track towards wind energy growth. If this fails, the European goals are merely academic.

Green Deal, Fridays for Future, climate neutrality by 2050 – it would seem that renewable energies receive nothing but support within the European Union. And it is true, there is no lack of good intentions when it comes to climate protection in Europe, as evidenced most recently by the elevation of the climate goal for 2030 to at least 55 percent. At the beginning of last year, the long-term goal of zero net emissions by 2050 was already enshrined in law at the EU level. Even the coronavirus pandemic was not able to topple the European Union’s climate protection agenda; on the contrary, as if to say ‘now more than ever’, the ‘Green Deal became the Green Recovery’ (as reported by wb 02/2020). The stimulus package, called the Recovery and Resilience Facility in Brussels parlance, includes billions of investments in renewable energies, power grids, the expansion of the electric charging column network and renewable hydrogen.
The Montecalvello wind farm in Apulia was realised by ENERCON in 2020.

business. ENERCON has been present in the country since 1999, when it opened a Service organisation there. This was followed by a Sales office in 2003 and an office for Project Management in 2008. ENERCON currently has around 130 employees in Italy. It has installed around 930 WECs in the country to date, with a total power of 1,211 MW.

ENERCON also considers the market outlook for the future to be positive. "Up to 700 MW of new onshore power are installed in Italy every year on average," says Thomas Barkmann, Regional Sales Manager for Italy & Africa at ENERCON. Approximately 1,600 MW of onshore power were awarded in the most recent tenders and are set to be installed in the coming months. An additional 3,980 MW are expected to be put out to tender in the next three rounds before January 2022. More than 1 GW of approved projects are ready to participate in these calls for tender. On top of this, there are many projects currently under development that are expecting approval soon.

Furthermore, Italy has begun repowering of those wind farms that have now been operating for 20 years. ENERCON estimates that this trend will continue in the years to come and open up fresh opportunities. The fact that many utilities are switching over to generating energy from renewables, in particular onshore wind, will also benefit expansion. "Our Italian team from Sales, Project Management and Logistics is dedicated to ensuring we can participate in this expansion and increase our market share over the next years," says Thomas Barkmann.

ENERCON has signed a framework agreement with the Italian energy group ERG covering 190 MW for five projects in Italy and Great Britain. As part of the agreement, ENERCON will supply a total of 46 E-138 EP3 E2 (4.2 MW) and E-115 EP3 E3 (4.2 MW) wind energy converters to ERG’s subsidiary Power Generation SpA over the next three years. The scope of supply also includes transportation, installation, commissioning and servicing of the wind energy converters during the first phase of operation.

ENERCON won out as a successful supplier in an internal call for tender issued by ERG. The 46 wind energy converters are planned for use in four repowering projects in Italy, and a new construction project in Great Britain. The wind energy converters are set to be commissioned and handed over to the customer in the period between 2022 and 2024. "We are very pleased to be taking this important step forward with our customer ERG SpA, and are glad to have reached a framework agreement with them that will open up further opportunities for us," ENERCON CEO Stefan Lütkemeyer comments on the conclusion of the agreement. "ERG is a market leader in onshore wind in Italy, very active in national repowering business and also has a presence in several European countries. We hope we can expand our cooperation with ERG in the years to come, including in other regions of Europe."

Italy is one of ENERCON’s core markets and therefore also plays a part in the company’s ongoing reorientation towards international
The two E-126 EP3s with 86 meter steel towers on the Magdalen Islands, which are part of the Canadian province of Quebec, were commissioned last December. The Dune du Nord wind farm is a key component of the island community’s plan to diversify their energy supply and switch to renewable energy. The island is not connected to the mainland power grid. The entire electricity demand of the island, which is popular with tourists because of its unspoiled nature, was previously supplied exclusively by a thermal power plant. The power plant generates CO₂ emissions of 125,000 tonnes per year. The two E-126 EP3 supply an average of 1,800 households, are covering around 15 percent of the island’s energy needs from renewable sources. Instead of fossil fuels, and are reducing the island’s CO₂ footprint by 17,000 tonnes per year.

ENERCON realized the challenging project together with the customer, a consortium formed by the Régie intermunicipale de l’énergie Gaspésie Îles-de-la-Madeleine, the community partner, and project developers Valeco Energie Québec and Plan A Infrastructure. “Project logistics proved one of the main challenges since Magdalen Islands are only accessible by sea. High winds in the fall also complicated the assembly of components with cranes. Now that the wind farm is operating, however, it is directly offsetting oil-fired generation thanks to one of the best wind regimes in Canada,” says Hugo Bouchard, Project Manager. The wind farm is located on a sand dune.

The Dune du Nord wind farm shows how wind energy, even at off-grid sites, can fulfill the population’s demand for a nature-friendly, sustainable and efficient alternative to fossil energy sources,” says Hugo Bouchard. Following the positive experiences, the island’s power supply is to be converted step by step to renewable energies.

The location of the E-126 EP3 is very windy with a capacity factor of 52 percent and promises a good output. “As expected, as soon as the first month, the exceptional wind yield of this site has been demonstrated by a production that looks more like an offshore project than an onshore one,” says François Daumard, CEO, Valeco. However, these wind conditions made the assembly of the rotor blades difficult. “A major advantage of the E-126 EP3 is the ENERCON storm control system, which linearly reduces the rated speed so that the WEC can continue to operate at high wind speeds,” explains Hugo Bouchard. The E-126 EP3 were erected on a sand dune. In addition to the climatic challenges, there were also some challenges to overcome with regard to the subsoil and the animal and plant life. The foundation therefore had to be tailored to those complex terrain conditions.

Furthermore, special efforts were made to interfere as little as possible with the surrounding natural environment. The area is a protected habitat for various endangered animal species and for the endangered Conrad hornbeam, which is found only on the North American Atlantic Coast. In order to protect the rare plants, only a very limited area was available for the construction work and a logistics concept was developed to allow components to be stored at the island’s port and delivered ‘just in time’. Access roads from the main road to the wind turbines were also avoided out of consideration for the flora and fauna of the area.

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ENERCON has realised a project at the Cham Longe wind farm in the South of France with long-time customer Boralex that serves as a model example for the potential of repowering projects. The original Cham Longe wind farm was built in 2005 in the communes Saint-Étienne-de-Lugdarès and Astet in the Ardèche department, and was made up of 12 wind energy converters (WECs). The wind farm is owned by Boralex, France’s largest independent producer of onshore wind power. In 2010 2 x E-70 were added to the wind farm. The original 12 WECs with a total installed capacity of about 23 MW were replaced by 12 x E-82 E4 with a capacity of almost 48 MW while repowering the wind farm.

With the more efficient ENERCON E-82 E4, the wind farm now produces almost twice the amount of energy compared with the output of the original WECs. After repowering, the wind farm will be able to provide renewable energy for approximately 20,000 households. Furthermore, the actual energy production is expected to increase by 81 percent thanks to ENERCON’s state-of-the-art technology, which suits the premises of this special site at a height of 1,457 metres. “The customer Boralex wanted to improve the wind farm. ENERCON was able to provide a wind energy converter for strong wind sites with a proven and reliable rotor blade heating system that enables increased availability and power output of the WECs in the challenging weather conditions on site,” explains Aurélie Wloszyn, ENERCON Sales Manager. The complex weather conditions such as strong winds, low temperatures and snowfall in the long winter period posed several challenges for the realisation of the project, along with the mountainous terrain. Due to the bad weather conditions between November and March, the time frame for dismantling the original WECs and installing the new E-82 E4 WECs was short.

“On top of this, we had to take into account the restrictions due to the pandemic when we were just about to start the project,” says Stephane Karim, Project Manager at ENERCON. Travel restrictions delayed the arrival of the dismantling specialists, the reduced handling volume of the port impeded the timely delivery of the components, and the motorway A75, which connects the Sète port and the project site, was often closed for roadworks.

The logistics and installation concepts therefore had to be adjusted several times so the commissioning of the Cham Longe wind farm could be completed in December 2020. “With the great commitment, inventiveness and flexibility of the whole ENERCON team, we were even able to realise the project one month ahead of schedule to the customer’s full satisfaction,” concludes Jean-Paul Buttin, Team Leader Project & Logistics Management.

ENERCON has installs almost 1,000 wind energy converters in Turkey since 1998. As a result, it is one of the biggest renewables companies in Turkey. “We are very proud of the motivation and dedication shown by the whole ENERCON team. Despite the pandemic, the team managed to install more than 100 wind energy converters in 2020. This would not have been possible without the constructive cooperation from all those involved, who were highly motivated and fully committed to helping realise the projects,” explains Arif Günyar, Managing Director ENERCON Turkey.

ENERCON is supplying a total of twelve E-138 EP3 wind energy converters for the Metafor project with a total installed capacity of 49.7 megawatts. All of the wind energy converters are expected to be delivered in 2021 and 2022. ENERCON is realising the project with the customer Göktekin Energy, which is the market leader for solar energy in Turkey and is also pursuing ambitious goals in the wind energy sector. “Metafor is our first wind energy project and we are proud to start our wind energy business with ENERCON. I am confident that this project will be just the beginning of a long, trust-based business relationship for our two companies,” emphasises Abdullah Göktekin, chairman of the board of Göktekin Energy.

ENERCON will continue its involvement in Turkey in future and will make a significant contribution to expanding renewable energies there. “The cumulative power of two gigawatts we have achieved is an important interim step for us and an important contribution to implementing the energy transition in Turkey,” concludes Arif Günyar.