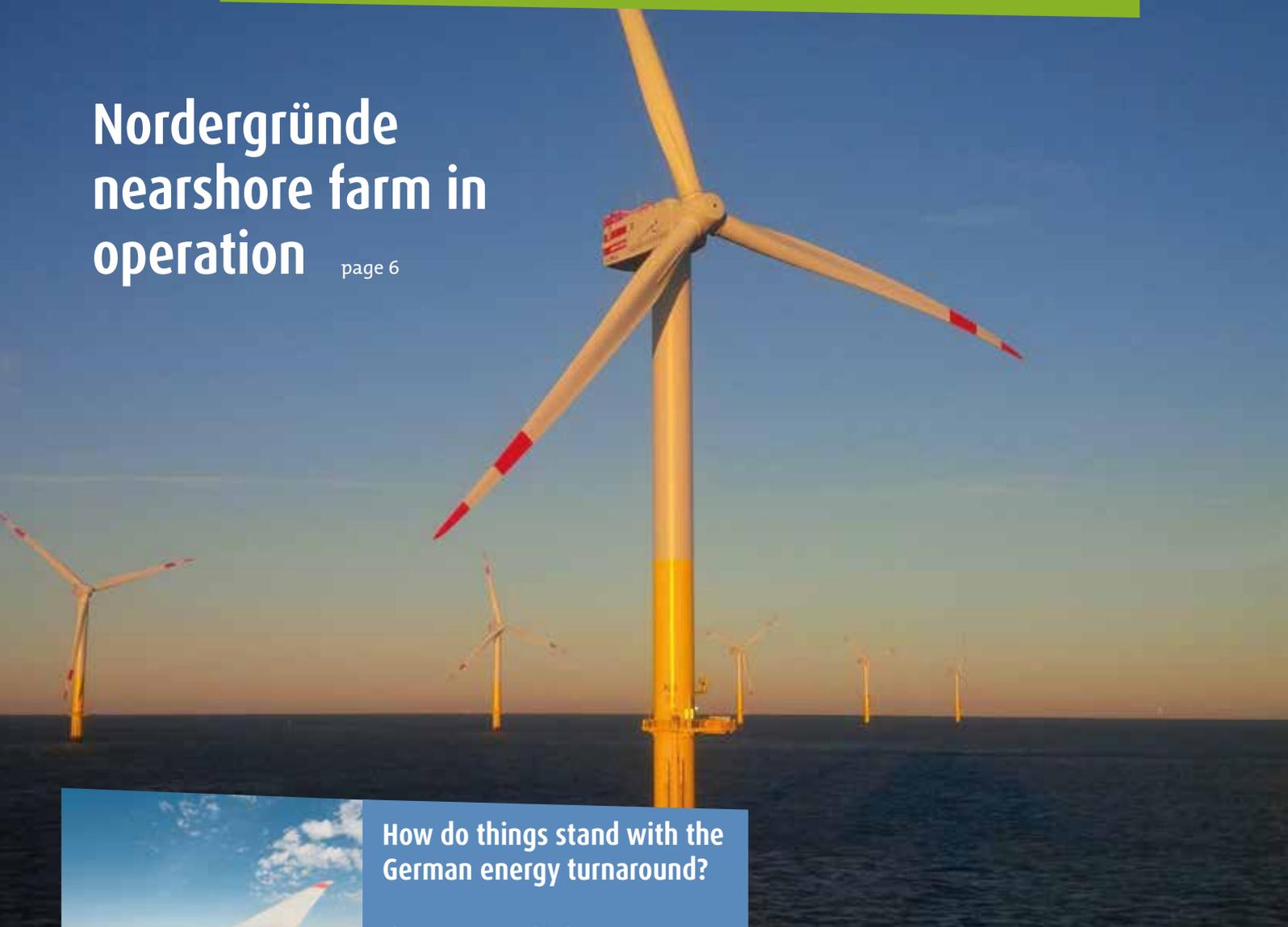


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nearshore farm in
operation** page 6



How do things stand with the German energy turnaround?

The German wind industry is experiencing turbulent times at the moment. The situation has calmed down a little with the first call-for-applications for wind power on land in 2018. Nevertheless, the sector needs more stability. page 2

New impetus for the German wind sector



You might think the gold medal for the energy turnaround which Germany has to date draped around its neck with swelling pride, has never sparkled more. After all, new records have been set. The sector has never seen faster growth than in 2017 – over 36 percent of electricity now stems from regenerative energies. And at the beginning of the year, 28,200 wind turbines in Germany were producing 925 GWh per day, more than ever before. Superlatives come thick and fast in many reports. But still: under the golden glaze, there is only bronze or maybe silver to be seen as many aspects were out of kilter last year.

The changeover from fixed remuneration to tenders and above all the poorly designed privileges given to citizens' energy companies have led to an extreme fall in prices, market distortions in favour of a mere few and finally also to a foreseeable collapse of wind power and loss of thousands of jobs.

Luckily, the politicians recognised the errors in the tendering system and adjusted it for the first tender in 2018. The introduction of approval under Federal Immission Control legislation has created a uniform basis for all participants – enabling fair competition. And the agreements enshrined in the coalition agreement have set the stage for the further ordered ex-

pansion of wind power in Germany. wpd succeeded in winning a total of six projects in the first round of tenders in 2018. Hartmut Brösamle, Chairman of wpd AG, is delighted: "At last we have established fair conditions for competition under which we were able to demonstrate that we can still operate very successfully in the German market. It was right not to exploit the loophole in the law in the 2017 tenders as other competitors did, and to set up so-called citizens' companies, but to call instead for fair market conditions."

Politicians have clearly understood that the 2030 climate protection goal can only be achieved if electricity production from renewables rises significantly. And there is no way around wind power in the process. The road to achieving the targeted reduction of greenhouse gases is steep and we will need a tailwind. At least the handbrake has come off with the additional tenders planned for 2019 and 2020. Still missing, however, according to Brösamle, is an overall concept for the energy turnaround. "We need the introduction of comprehensive charges for CO₂ in order to achieve a sustainable energy turnaround across all sectors. There's a need for politicians to take action in this regard."

Spain's energy turnaround picking up pace – wpd on board

wpd has been represented in Spain with its own team since 2000 and has so far contributed 64.5 MW to the country's energy turnaround. The colleagues in Valladolid had to spend some time on standby – renewables were put on ice in Spain for a number of years. But now, these wpd employees have their hands full. Because in the summer of 2017, wpd won the contract to build 170 MW. By the end of 2019, the company will therefore construct six wind farms with over 50 wind turbines.

The conditions are good. The farms are being constructed on the Torozos high plain around the largest transformer substation in the North-East of the country. Here, wpd has a secure connection to the grid – not to be taken for granted in Spain as expanding the grid is one of the major assignments which the country has to face up to. At the same time, the location directly beside the mega transformer substation “La Mudarra” also represents a challenge. “The countless power lines criss-cross the project area like a spider's web”, says Ralf Ketteler, wpd's man responsible for the Spanish market. “That is why we have to plan the spaces very carefully.”

The first steps for the six farms ran very differently. “While the applications for some projects were submitted as early as 2001, the two latest developments were only added in 2016”, Ketteler reports. These projects are now receiving their environmental

approvals practically at the same time. The changed framework conditions are having a marked effect.”

The Spanish wind power market

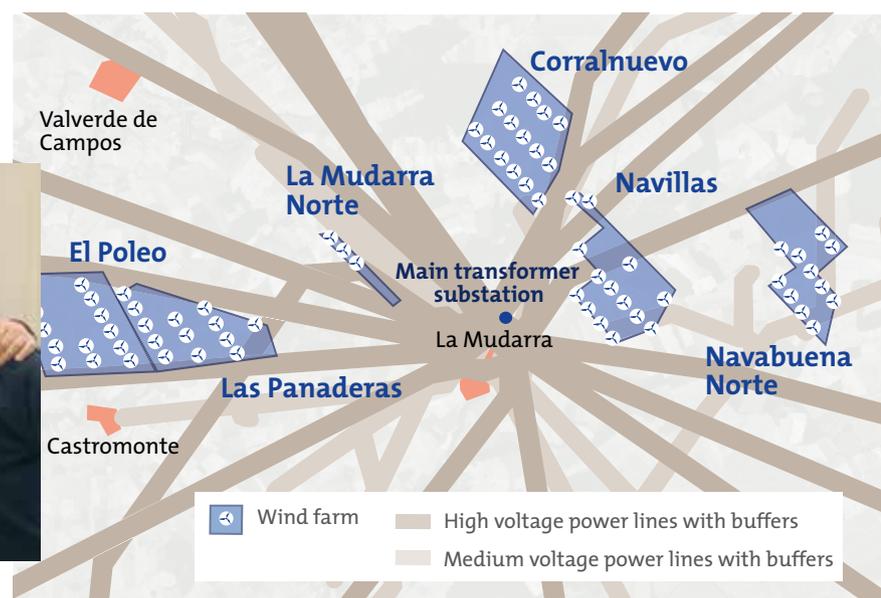
By 2012, Spain had worked its way up to one of world's leading countries for wind power with 23 GW of onshore farms. But this was followed by a collapse. The poor coordination of the “Régimen Especial de energía”, Spain's equivalent of Germany's EEG (Renewable Energy Act), led to the law being overloaded. As a result, remuneration was not paid for farms – the expansion came to a standstill.

The call-for-applications in 2016 and 2017 in which the government offered more than eight GW of photovoltaic and wind energy, came as a surprise. The prices for the winning bids were minimal. “The industry is ready to explore new roads in the marketing of electricity with the Spanish government's backing”, Ketteler explains. Higher market shares were increasingly secured by long-term electricity supply contracts or corresponding financial market products, he continues. “To some extent, this makes Spain a pioneer again in the expansion of Renewable Energies.”

The wpd team in Spain



Project area in Spain



New managing directors for Croatia and Italy



*Zoran Obradovic,
new Managing Director
for Croatia*

Zeljko Samardzic has terminated his work as Managing Director of WPD ENERSYS d.o.o. after 15 years as he has reached retirement age. In this time, he readied four wind farms for construction with the result that wpd today operates 92 MW of the total 527 MW installed throughout Croatia. Zoran Obradovic (33) will now build on this work as the new Managing Director. Since the beginning of the year, he has been developing new project ideas together with Project Manager Milan Antonijevic.

In Italy, too, there has been a change of Managing Director. Lorenzo Longo (44) took over management of local wpd project development in September 2017. Together with his three-man team, he faces the challenge of readying projects with a total capacity of 200 MW for construction.



*Lorenzo Longo,
new Managing Director
for Italy*

wpd in Canada: Sumac Ridge on the grid and green light for White Pines

At the beginning of November 2017, commercial operation of the Sumac Ridge wind farm began in the Canadian Province of Ontario (5x Senvion MM92). This is already the fourth wind project successfully implemented by wpd in Canada. Wide-ranging challenges were mastered in the process, particularly strict water pollution specifications and species protection requirements as well as a negative stance from the local community.

wpd also laid the foundations for the Canadian White Pines project in September 2017. Due to restrictions in environmental legislation, the project had to be reduced to nine turbines (Senvion MM92) in the shortest space of time which was accomplished within only six months thanks to the outstanding work of all employees. The beginning of commercial operation is scheduled for the end of 2018.



*wpd Sumac Ridge wind farm
during completion of turbine
installation at the end of 2017.*

Crowdfunding as a finance model in France

In France, wpd has selected the Tiper wind farm in Thouarsais (Deux-Sèvres) – a region known as a driving force in the energy turnaround – to carry out its first project with citizens' participation. In collaboration with the Lumo platform, this crowdfunding programme offers four percent returns within five years. Crowdfunding, also known as swarm crowdfunding, is a kind of funding in which those interested can contribute any arbitrary amount towards the implementation of a certain project. In return, they receive a benefit such as a financial interest in this case. In order to involve the local population, wpd has decided to reserve this crowdfunding project for residents of the Nouvelle Aquitaine, Pays de la Loire and Centre-Val de Loire regions. In addition, communication campaigns were organised as well as eight tours of the building site. The three-month registration campaign ran parallel to the construction of the wind farm. A total of 84 local savers invested a sum of 157,075 euros in the construction of the new wind farm with four turbines.

In the conviction that crowdfunding campaigns make an important contribution to the development of Renewable Energies, wpd intends to rely again on citizens' participation projects in France.



During construction of the Tiper wind farm in October 2017.



It has been in operation since November 2017.

wpd at WindEnergy Hamburg



WindEnergy Hamburg is being held this year for the third time: from 25 to 28 September. When this fair was staged for the first time in 2014, over 30,000 trade visitors streamed in to see the world's leading trade fair in the wind power sector. A similar number of visitors are expected this year. You will find wpd at Stand A1.221 in Hall A1. We look forward to talking to you!

Nordergründe nearshore wind farm: new roads and innovation

Interview with Achim Berge Olsen,
Managing Director of wpd offshore GmbH



Lefts:
Achim Berge Olsen,
Managing Director of
wpd offshore GmbH



Right:
One of the most
exciting moments in
the project: the massive
transformer substation
leaves dry land for the
first time while being
loaded onto the float-
ing platform.

All's well that ends well: The nearshore farm Nordergründe has been on the grid since December 2017. The starting gun for the 18 turbines totalling 111 MW was fired in May 2016. Initially, everything went to plan. However, the wpd project was to be severely put to the test.

Mr. Berge Olsen, what does the Nordergründe project mean for wpd, and what were the challenges?

Nordergründe is wpd's third offshore project. Before that, we built Butendiek – 80 turbines where nearly everything ran smoothly, an exemplary project. Things went a little differently on the Nordergründe project. Because in September 2016, the manufacturer of the offshore substation (OSS) went bankrupt. What a shock! For a while, all the life was sucked out of the OSS, only a monstrous steel skeleton at this stage – and the building site ground to a standstill. The entire wpd team was on its mettle to bring the project to a profitable end. We developed several strategies to solve the situation, and in the end, we decided to build it ourselves. This was the only way to ensure that the project would be finished in 2017.

How was the OSS specifically realised?

We managed to build the OSS ourselves as we were able to fall back on a broad level of manufacturing expertise in our team. That's what gave us the confidence to take over the roughly 60 sub-contracts. In addition, 1,200 workers had to be coordinated on the building site, trained in safety measures and supervised. Consultations with the banks and investors were also very close and time-consuming.

In spite of all this or specifically because of it, seeing the purpose and innovative attitude with which everyone went about their work, was something special to watch. During this time, we developed a lot of new features, for example our own reporting system on progress at the building site or a proprietary positioning system for the flange connection of the OSS.

What was your experience of completion?

There were some very tense moments. I can remember how the 2,000-ton OSS was moved for the first time and pushed with millimetre precision onto the floating platform using an elaborate air pad system. A lot of factors had to be exactly right to ensure nothing went wrong. The same went for the offshore installation of the OSS on its foundations using the floating crane.

What did wpd learn from the experience and what's next?

All these experiences have made us more self-confident. We were able to demonstrate that we can be relied upon and we can deal with the trickiest situations. Another takeaway is that the size of the companies we work with is crucial. You also have to be able to stand firm when costs rise. Although we succeeded magnificently in delivering the project within the new deadline to the very day, we will not build any transformer substations ourselves in the future – unless we have to. We are now devoting ourselves to very different challenges: our projects in Taiwan are making great strides. The difficulties there will tend to be ones of long transportation routes or cultural aspects. We are curious to see how things go.

*Film on the origination
of the nearshore farm*



How safe are wind farms?

IT security is constantly gaining in significance

There is scarcely an area which has grown as strongly as IT in the last few years. We have only been using mobile internet for a good decade. We now manage our entire daily process via mobile apps – from our purchases, transfers all the way to the heating or freshly brewed coffee from the coffee machine.

Neither does digitization stop short of wind power. Nowadays, every turbine can be connected to the internet. “However, with a planned operating life of around 20 years, many turbines – especially the older ones – are still in the Stone Age when it comes to IT”, says Michael Tenten, Managing Director of wpd IT GmbH which among other things looks after the portfolio of around 2,000 turbines, acting as IT service provider to wpd windmanager GmbH & Co. KG.

Turbines as a target for hackers

“Most operators neglect the subject of IT. Many farms have a need for retrofits”, Tenten explains. Wind farms are being targeted by hackers ever more frequently. In the hackers’ sights: weak links resulting from obsolete systems or missing updates. For the operator, this can bring the turbine or the entire farm to a standstill. This leads to loss of revenues. But even companies’ own operating IT infrastructure is at risk from hacker attacks.

The focus is usually on financial interests. Hackers employ different methods in the process. Here is one version. The wind farm’s system is encrypted via malware and only released again in return for a payment. “We are increasingly confronted with attacks from the sphere of white collar crime”, Tenten says. A further alternative is the so-called CEO fraud. “Here, employees are deliberately deceived by orders instructing them, e.g. through forged emails or calls from superiors, to make a transfer to a criminal organisation”, Tenten explains.



Technical, physical and organisational security

The rule in all cases is that the best protection comes from being careful. Hackers normally look for the path of least resistance. Purely technical protection is therefore not sufficient. The physical security of a turbine is also important. “What use is the best firewall if an attacker can easily gain access to the turbine?”, says Tenten with a word of warning.

“It is also essential that operators pay attention to organisational security.” For example, this includes identifying potential risks or planning specific processes in the event of an attack.

Due to the complexity of the subject, it is definitely advisable to look for professional partners for all IT and security questions. The Federal Office for Information Security (BSI) in IT now lists 1,500 measures for reducing security risks in its basic IT protection catalogue. Operators quickly reach the limit of their abilities without professional support. Here they should definitely seek options for solutions from their operations manager.

You can find further information on the IT security of wind farms here:

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wpd follows hacking attempts in realtime through a monitoring process

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