



WIND POWER: WHAT NEXT FOR EUROPE?

POLICY BRIEF | JULY 2019
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Europe is the cradle of the wind energy industry and is still rightly perceived as a global leader in the sector. But fresh projects have slowed in recent years, pointing to new challenges for the EU's wind energy sector in the face of growing competition from China. Read this EURACTIV Policy Brief for an in-depth overview.

Wind power: What next for Europe?

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A EUROPEAN SUCCESS STORY...

Modern wind power is considered to have first been developed in Denmark, where a 22.8-metre wind turbine began operation in 1897, according to the International Renewable Energy Agency (IRENA).

Germany, for its part, was one of the first to develop wind energy on a large commercial scale, a process that was initiated in the 1990s and was amplified by its Energiewende laws passed in 2010.

With Denmark's Vestas, Europe still had the world's leading wind turbine manufacturer in 2018.

... CHALLENGED BY THE RISE OF CHINA

Europe's global dominance is eroding, however. While Vestas extended its industrial leadership last year, Chinese turbine manufacturer Goldwind stormed to second place in 2018, driven by surging domestic demand, according to an industry ranking by BloombergNEF.

Meanwhile Germany's Siemens-Gamesa dropped from 2nd to 4th place.

According to WindEurope, a trade association, there are now 7 Chinese companies in the top 15 global wind turbine manufacturers. And although some of them were already there 10 years ago, they are definitely growing stronger.

"Yes, Europe's wind industry is at risk," said Giles Dickson, CEO of WindEurope. "We need continued support for innovation to remain competitive and a robust domestic market," he said.

SUPPLY CHAIN GETTING GLOBAL

China's rise is explained in large part by the commoditisation of gear boxes, one of the key components of wind turbines, according to David Hostert, Head of Wind at BloombergNEF.

"The major innovation over the past three years has been to design gear boxes that are energy-dense enough to be fitted inside shipping containers," Hostert told EURACTIV. "And that has revolutionised the way the supply chain can work," he said.

According to Hostert, the three leading gear box manufacturers worldwide are currently: ZF (Germany), Winergy (Germany) and NGC (China).

China's rapid rise has caught some Europeans unaware. WindEurope reckons that about 50% of all gear boxes in Europe are now imported from China when imports were close to zero three or four years ago. With gear boxes representing about 15% of the price of a new wind turbine, this means a significant part of the market has now gone abroad.

In such a fast-moving environment, Hostert predicted further diversification in the near future, with Indian and South East Asian manufacturers expected to take advantage of the US-China trade dispute to boost their market share.

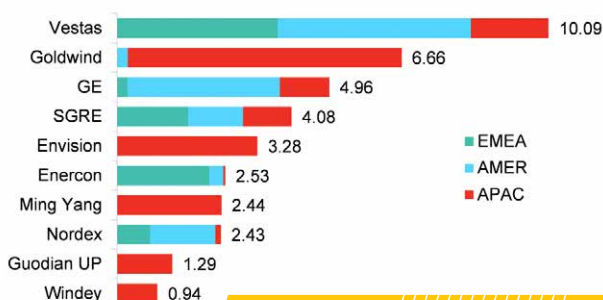
This means European manufacturers are now confronted with a more competitive and sophisticated global environment.

IS CHINA ABOUT TO REPEAT ITS SOLAR PV DASH?

In Europe, some fear China is trying to replicate the success story of its solar PV sector. China emerged as the world's leading solar nation in 2017, thanks to a mix of low labour costs, cheap sourcing of key raw materials and state support schemes.

"China's concerted efforts to research, develop and invest in renewable energy and clean transport offer its industry the opportunity to overtake US and European

Gigawatts



Leading wind turbine manufacturers
[Source: Windpower / BNEF]

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companies,” said a study on the geopolitics of energy transformation launched under the auspices of the International Renewable Energy Agency (IRENA).

But BloombergNEF says parallels with the solar PV sector should not be overstated. “Wind components are still big, bulky and hard to transport,” Hostert explained, saying components such as blades, towers and casting are too large to be shipped in containers.

Such large components usually tend to be manufactured where they’re needed, Hostert pointed out, saying they are unlikely to be commoditised and traded from a single hub like China.

Chinese competition has certainly become fiercer, Hostert said. “But I don’t see a huge risk of Europe being swamped by Chinese competitors or that Chinese-made products will completely overtake the supply chain,” he added.

BIGGER, FASTER, STRONGER

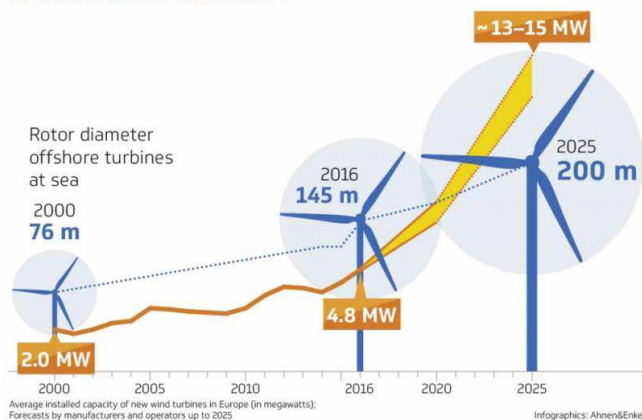
A key development over the years relates to the size of wind turbines, which have now become truly gigantic.

In 1985, a typical turbine had a capacity of 0.05 megawatts (MW) and a rotor diameter of 15 metres, blades included, according to the International Renewable Energy Agency (IRENA).

Today, wind power projects are much larger. Commercially available wind turbines can now reach 2 MW for onshore and 3- 5 MW for offshore, with rotors reaching up to 164 metres in diameter, blades included.

Meanwhile, the average capacity of wind turbines has increased from 1.6 MW in 2009 to 2 MW in 2014.

A GROWTH IN CAPACITY



PLUNGING COSTS

Bigger size, combined with better efficiency, has resulted in massively falling costs.

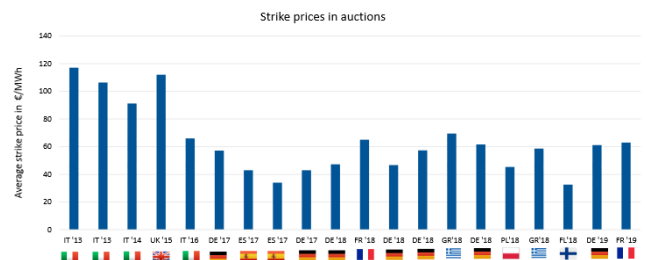
Wind energy today is the cheapest source of electricity, ahead of coal and gas. Wind farms generated the cheapest electricity across large parts of Europe, South America, the US, China and Australia in 2015, according to a study by Finland’s Lappeenranta University.

In 2017, wind energy developers in the UK filed bids to build offshore windfarms for £57.50 per MWh, half the price awarded just two years before. And this trend is expected to continue until 2030, said the Finnish study, commissioned by Greenpeace.

A recent report by the European Court of Auditors confirmed those findings. The cost of onshore wind dropped to \$60/MWh on average in 2017, down from \$80 in 2010, the report found – well below the fossil fuel cost range (\$80-\$200/MWh). Meanwhile, the cost of offshore wind dropped from \$170 to \$140/MWh over the same period.

Falling costs are reflected in bids that national authorities collect when launching auctions for new wind energy capacity.

Cost of onshore wind is decreasing



Wind EUROPE

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In Brussels, EU policymakers were taken by surprise. The European Commission updated its cost projections last year, right in the middle of negotiations over a package of clean energy laws, which included updated renewable energy targets for 2030.

The highly unusual move was triggered by the “impressive fall” in renewable energy prices, the Commission said at the time.

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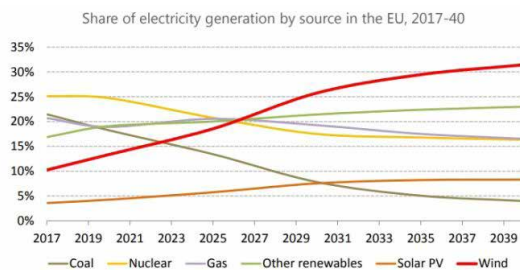
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FAVOURABLE WINDS TO 2050

Around the globe, winds are blowing favourably. In a recent forecast, the International Energy Agency (IEA) predicted that wind power will become Europe's largest source of electricity by 2027.

The estimate, unveiled in September 2018, was a significant improvement on the IEA's 2017 world energy outlook, which predicted that wind power would overtake other energy sources in Europe "soon after 2030".

By 2040, the IEA estimates wind power will account for around 31% of total electricity generation in Europe.



Wind electricity generation in the EU more than triples to 1 100 TWh by 2040; The rapid increase of variable forms of generation calls for new approaches to system integration

Share of electricity by source in the EU, 2017-40 [Source: IEA]

At global level, BloombergNEF estimates that wind power will make up 26% of all electricity generating capacity by 2050, compared with 5% today. In Europe, wind will account for 58% of the European electricity mix in 2050. By comparison, this is about the same share that coal and gas have in Europe today.

"We expect the European onshore wind market to quadruple by 2050, from 158 GW today to 577 GW by 2050. The offshore market will grow even faster, but starting from a lower base at 17 GW today and increase more than tenfold to 211 GW by 2050," says Jef Callens from BloombergNEF.

The largest markets for onshore wind in Europe by 2050 are expected to be Germany (doubling to 111 GW) and France (a seven-fold increase to 107 GW), Callens said, citing figures from BNEF's New Energy Outlook 2019.

"According to our analysis, Europe continues to be the biggest offshore market worldwide, accounting for close to half of global capacity additions, followed by China. On a least-cost basis, we expect Germany to be the largest market in Europe, with 48 GW of installed capacity by 2050, followed by France (34 GW) and the United Kingdom (29 GW)," Callens said.

HEADWINDS 1: PERMITTING

So what could possibly hold back the seemingly irresistible rise of wind power?

At the moment, the single biggest obstacle for wind developers is to obtain new construction permits. And because wind turbines are so much bigger, permits have become harder to get.

"The permitting has gone stricter" owing in part to the size of wind turbines, which are now taller, bigger and more powerful, says David Hostert, Head of Wind at BloombergNEF.

A second factor is that Europe is a space-constrained market, where there are few uninhabited sites. In Germany, designated wind development zones have largely been filled up and are currently saturated, Hostert said, meaning new projects have become harder to complete.

Another factor is the increasing amount of litigation related to new wind turbine projects. Groups opposing development of wind farms are better organised, mobilised and funded than before, says WindEurope. And lawyers have seen an opportunity to exploit all the legal avenues for appeal.

"This is something that has been dogging French wind power for years – at every step of the way, you can have litigation," Hostert said. And that is now starting to hit the German wind power sector as well, he warned.

According to WindEurope, the rate of successful permit application in Germany is 70% lower today than it was 3 years ago. Getting a permit now takes over 2 years, when it was still 10 months just two years ago, it says. In France, it can take up to 7 years.

WindEurope is not alone to highlight this. "From our perspective, permitting is the hardest thing to do. And the fact that highly-sophisticated markets like France and Germany still trip over this tells you just how difficult it is," Hostert said.

"Something needs to be harmonised."

According to WindEurope's CEO Giles Dickson, a first easy step EU member states can take is to implement the renewable energy directive, which was updated last year. This includes:

- Implementing the 3-year limit to finalise a permitting procedure (2 years for repowering)
- Setting up a single authority (one-stop-shop) responsible for permitting processes in each country

Such measures can be easily monitored in the National Energy and Climate Action Plans (NECPs) that member states are required to submit to the European Commission.

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HEADWINDS 2: REPOWERING

Another big challenge is to replace existing turbines when they reach the end of their lifetime, usually after 20 or 25 years.

And here, challenges abound. First, a new permit has to be sought. And legal requirements may have changed, for example regarding the maximum height of turbines or limitations linked to the proximity of dwellings (which may have cropped up in the meantime).

“Repowering is essentially like a new project. The costs are the same, you need to seek a permit again,” says Hostert. “If there is a minimum distance requirement related to a turbine’s height, you may not be able to meet those requirements anymore,” he says.

There are some upsides to repowering, however. In Spain, the Malpica wind farm near La Coruña was replaced entirely in 2018 after 20 years in operation. After the upgrade, electricity generation capacity was doubled and the number of turbines reduced from 69 to 7.

On average, WindEurope estimates that repowering doubles the capacity of a wind farm while slashing the number of installed turbines by a third.

The repowering market in Europe is expected to get much larger as older generations of wind farms reach the end of their lifetime. From 1-2 GW on average in 2017, repowering is expected to reach volumes of 5.5-8.5 GW per year by 2027, WindEurope says. Germany, Spain, Italy, Denmark, Portugal and France will be the biggest markets.

HEADWINDS 3: SOCIAL ACCEPTANCE

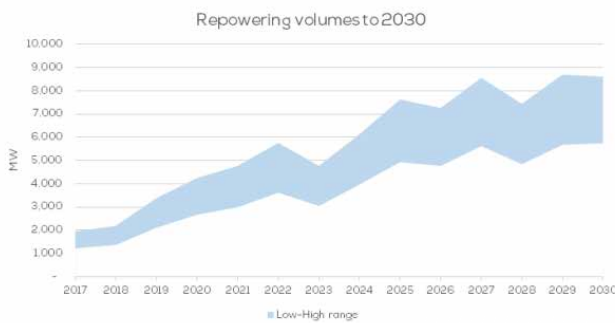
A common challenge to both new and repowering projects is social acceptance by local populations. As existing wind development zones become saturated, new projects are being stalled.

David Hostert says there are “social acceptance limits” to how much wind power can be installed. “How much space is available for renewable energy is a social question,” said the BloombergNEF analyst.

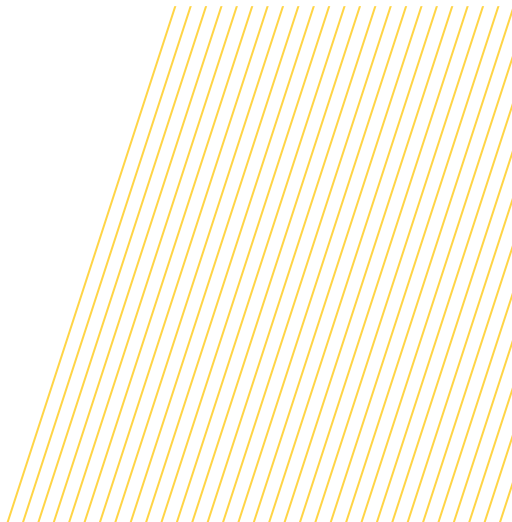
“Much as we want, we can’t put up all the wind turbines that we would like because citizens don’t want them,” said Kristian Ruby, secretary general of EU power industry association Eurelectric.

But there are also good practices. “The German and Danish examples have shown that if you take the local population with you, if you allow them to co-invest and participate in wind development projects, then the chances of success are higher,” Hostert said.

“In Northern Germany and Denmark, people accept wind turbines because they are invested in it, they take part. It very much depends on how you involve the people.”



Repowering volumes to 2030
[Source: WindEurope]





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EURACTIV Policy Brief...

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