

forecast

Wind energy outlook to 2023 – Energy targets for 2030 will be difficult to meet

JEC looked at how European wind energy markets will develop in the next five years and discussed background circumstances and future scenarios with major associations and industry stakeholders.

By the end of 2020, European countries are due to deliver on their 2020 renewable energy target and will start implementing their 2030 National Energy and Climate Plans (NECPs) towards the 32% renewables target”, says the executive summary of the study “Wind Energy in Europe: Outlook to 2023” recently published by the European non-profit wind power association WindEurope, based in Brussels.[1] The recently elected President of the EU Commission, Ursula van der Leyen, asserted her commitment to push forward a green deal during her first 100 days in office. According to the

study, the EU member states will most likely opt for a “net-zero carbon” economy by 2050.[2]

Both onshore and offshore markets are facing a remarkable trend towards maximizing energy yields. Between 2019 and 2023, larger and more powerful turbines will be installed.

With increased sizes, the average power ratings are growing quickly. By 2023, 10MW offshore turbines are expected to enter the market.[3] In the next five years, an additional 88 GW of net capacity will be added in Europe. According to the Global Wind Energy Council, six offshore wind farms larger than 400 megawatts are currently in operation or under construction.[4]



Fig. 2: Long-term macro and market outlook Source: Energy Perspectives 2019, Equinor, p. 5. ©Equinor

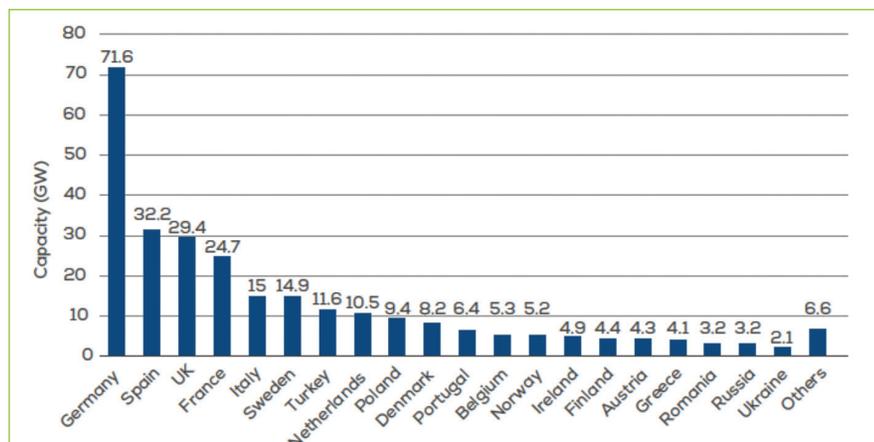


Fig. 1: Cumulative capacity in 2023 per country - WindEurope's central scenario

WindEurope: the voice of the wind industry

WindEurope is a non-profit association based in Brussels that sees itself as “the voice of the wind industry”.

It has over 400 members with headquarters in more than 35 countries, including leading wind turbine manufacturers, component suppliers, research institutes, national wind and renewables associations, developers, contractors, electricity providers and finance and insurance companies – the entire value chain of the wind power industry. WindEurope regularly organises events such as conferences, exhibitions, seminars and workshops.



WindEurope's CEO Giles Dickson comments the recent study as follows:



"Wind energy should be growing rapidly when you consider all the interest in climate change plus the fact that wind is the cheapest in energy production. But there is a real uncertainty about how far it is going to expand in the next five years. It is getting harder to secure permits for new wind farms in many countries. The grids and energy markets are still not functioning as they should. And many governments simply have not decided yet how much new wind they want and when and how they are going to build it. The 2030 National Energy & Climate Plans will be crucial in bringing clarity and improvements in all these areas. If they are not ambitious, we will not meet the 32% renewables target let alone any higher targets. And jobs are at stake here. The wind industry employs over 300,000 people in Europe but has lost 35,000 jobs in Germany alone over the last four years – in large part because of public policy issues. The European Green Deal needs to include a clear industrial policy for Europe's low-carbon industries: supporting the success stories we have established; ensuring we can continue to trade with the rest of the world; and driving continued innovation to stay competitive."

Abo Wind AG: a hidden champion in project development

A recent study on Abo Wind conducted by the Metzler banking house emphasizes the company's continuous profitability as one of the largest project developers for renewables in Europe. Abo Wind is called a hidden champion in project development. The company is currently working on future wind and solar parks with an output of 7,200 megawatts.



ALEXANDER KOFFKA,
GENERAL MANAGER PUBLIC
AND INVESTOR RELATIONS
ABO WIND AG

ALEXANDER KOFFKA: We are currently facing a distorted market, since we do not have reality-based market prices. Wind and solar power are undeniably the cheapest energy sources. If the authorities had opted for a realistic and higher CO₂ tax, wind power would automatically be the champion in sustainable energy supply. Since 2018, we have experienced a dramatic slump with regards to the authorization of new power plants though. These procedures have become very slow and complicated due to multiple citizen co-decision rights and the fact

JEC Composites Magazine: : The recent 2019 outlook from the WindEurope European association foresees a significant decrease in the commissioning of new wind plants. How comes?



Fig. 3: Forst Briesnig is a perfect example showing how to use renewable energy on the ruins of the fossil era. Abo Wind built the windfarm on a former lignite mine in Brandenburg, Germany. In the background, there is still a coal-fired power plant, which is one of the largest CO₂ emitters in Europe

that municipalities often do not have a commercial interest in providing public spaces to enhance the implementation of additional wind power plants. We need new smart concepts to create a win-win situation. This is why stakeholders are currently discussing the adoption of a wind power tax to create economic incentives. With this funding, various municipal projects on hold such as the renovation of schools, hospitals or other urgent needs could be tackled.

Another reason for the slowdown is the introduction of designated preferred wind energy areas, a regulation that did not exist 20 years ago.

What are the most promising geographic areas for Abo Wind in the upcoming years and which outstanding projects did you initiate?

A.K.: Abo Wind is present in 16 countries on four continents. Despite the slowdown, Germany will remain the country with the largest wind fleet in Europe by 2023, followed by Spain and the UK with a strong potential in offshore. Spain has mastered the economic crisis and faces strong growth. France is also a very interesting market for renewable energy and we are strongly present there. Nuclear power plants will most probably be progressively replaced by renewable power plants. We installed seven Vestas V90 facilities with a total of 14 MW in Saint Nicolas-des-Biefs in the French region of Auvergne. Due to the excellent wind conditions in this area (1,000 metres above sea level), occupancy levels are high. The wind park produces 40 million KW hours annually. The Irish Glenough plant is a perfect example for citizen participation in wind power steered by Abo Invest AG. With a total of 35 MW, it is the biggest Abo Wind power plant so far.

A very promising market for us is Argentina. You have strong winds there and a high demand.

By no means, Africa will be an extremely interesting market in the future as well. There is a growing demand for energy supply in large regions, with the challenge to replace environmentally-harmful technologies.

Siemens Gamesa' vision about the future of wind power

Siemens Gamesa is a global leader in the wind power industry, with a strong presence in offshore, onshore and services. With over 99 GW installed worldwide, the company manufactures, installs and maintains wind turbines, both onshore and offshore. Siemens Gamesa is headquartered in Spain and listed on the Spanish stock exchange.

JEC Composites Magazine: By the end of 2020, European countries will have to demonstrate their climate targets for renewable energy. What role will wind energy play in this scenario?

SIEMENS GAMESA: It is undeniable that wind energy is key in achieving the necessary energy transition, so it will play a significant role in the climate targets. In fact, according to a recent study published by KPMG, its role in power supply could provide up to around 34% of the global electric power demand in 2040 (up from 4% today) and it could provide around 23% of the carbon emission reductions needed in 2050, i.e. 5.6 billion tons of CO₂.

By 2040, investments in clean technologies should approximately double with respect to the current levels and wind annual investments will move from USD 110 billion to USD 200 billion.

As it is key for sustainability, wind

power could save up to 16 billion m³ of water in 2030 (around 15% of the Dead Sea water).

In Europe alone, this would save 1,571 million m³. Moreover, the wind industry could employ three times more people than today, from 1.1 to 3 million people, in direct and indirect positions.

What possible scenarios does Siemens Gamesa see for the expansion of wind energy? Which are the decisive parameters for growth?

S.G.: No matter the scenario regarding higher or lower renewable energy deployment, Siemens Gamesa considers that the wind industry (both onshore and offshore) is expected to keep growing.

How does the current climate debate affect the expansion of wind energy? Are you receiving increased pressure from environmentalists?

S.G.: The global climate debate has changed, in part due to the thousands of young people who, inspired by the young Swedish activist Greta Thunberg and its initiative "Fridays for future", protested in more than 1,000 cities around the world to demand urgent measures to fight climate change. The role of young people is fundamental in increasing social awareness of the global warming problem.

They must be part of the solution, something that involves a greater number of students being trained in areas such as science, technology, engineering and mathematics – the so-called STEMs – in order to be able to play an active role in the fight against climate change. If current trends continue, the low level of students opting for this branch could leave the renewable energy sector with a shortage of professionals to drive the necessary change. This raising awareness is related to the need to develop a sustainability model that includes more renewables such as wind energy, as a key part in the solution to global warming.

Moreover, if a sustainable model is adopted, increased renewable energy use could save up to four million lives a year by cutting air pollution, reducing health-related costs by up to 3.2 trillion dollars a year.

What opportunities does Siemens Gamesa see with regards to lithium-ion storage through current research, and when do you believe these findings will be used in wind energy?

S.G.: Siemens Gamesa always studies all the options that involve energy technologies free of fossil fuels, such as lithium-ion storage in this case. Storing energy is essential to have a more constant power source and thus increase the use of renewable energy such as wind power.

In this way, Siemens Gamesa continues to increase its investment in batteries and other types of energy storage systems.



Fig. 4: The Dudgeon offshore wind power plant, located in the North Sea, is equipped with 67 SWT-6.0-154 turbines ©Siemens Gamesa

In fact, our company began the operation of its electric thermal energy storage system (ETES) last June. This innovative storage technology makes it possible to store large quantities of energy cost-effectively and thus

decouple electricity generation and use. The heat storage facility, which opened in Hamburg-Altenwerder, contains around 1,000 tonnes of volcanic rock as an energy storage medium.

In a next step, Siemens Gamesa plans to use its storage technology in commercial projects and scale up storage capacity and power. The goal is to store energy in the range of several gigawatt hours (GWh) in the near future.



ANDREW CANNING,
PRESS & COMMS MANAGER
WIND EUROPE

JEC Composites Magazine: : Do you think Europe can still meet the 2020 renewable energy targets set by the European Commission and what is the role of wind energy in this scenario?

ANDREW CANNING: The efforts of all European countries have still not been ambitious enough. Permitting processes for building new wind farms have become much slower recently. Spain, Sweden and Norway are cur-

rently leading the growth in onshore wind in Europe. However, wind energy development should be much quicker, since it is already the cheapest form of new power generation in Northwest Europe. Europe will reach 277 GW of installed capacity by the end of 2023. 57% of the cumulative wind capacity will be in four countries though: Germany, Spain, the UK and France.

To what extent is Europe a pioneer in floating wind power plants?

A.C.: We are at the very beginning of this new but fast-maturing technology. Close to 80% of the oceans' resource potential is in deep waters. Traditional offshore plants are fixed to the seabed to around a maximum of 50 metres sea-depth; at greater depths they are

anchored to the seabed and float. The advantage of floating plants is that you are further away from the coast and the wind speed is much higher. The plant is mounted on a floating structure, allowing the turbines to generate electricity in water depths where traditional fixed foundations are not feasible. Hywind Scotland, developed by Equinor, is the world's first operational floating wind farm and was brought into operation in 2017. Five floating wind turbines, 253 metres tall, are generating power for 20,000 households in Peterhead. The second floating wind farm is planned in Portugal, a project led by the Wind-plus consortium.

Floating offshore wind has enormous potential and is the next frontier in wind energy. □

Focus



The world's largest floating offshore wind power plant, Hywind Tampen, will be located in Norway, some 140 kilometres from shore in an area with water depths of 260-300 meters between the Snorre and Gullfaks oil and gas platforms. It will have a total capacity of 88 MW and will be equipped with eleven SG 8.0-167 DD turbines.

Fig. 5: The principal of Hywind Tampen is Equinor, a major player in worldwide oil and gas exploration based in Norway ©Equinor

More information:
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ISA HOFMANN,
CONSULTANT, INDUSTRY

