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German wind power sector in crisis Energiewende under further threat

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The slowdown in expansion of onshore wind farms poses a serious threat to the German Energiewende. In 2018, wind power accounted for half of the electricity obtained from RES, and is considered the driving force behind the Energiewende. In the first half of 2019, only 81 new turbines of a combined capacity of 271 MW were connected to the grid in Germany, compared to an average annual increase in installed capacity of approximately 4500 MW from 2015 to 2017. There are problems with the system of auctions for new capacities, with the sector complaining among other things of protracted construction permit procedures, court action being taken by environmental organisations and residents, objections being raised by the Bundeswehr and Aviation Safety Agency, and laws restricting the area that can be used for construction. The crisis is having severe repercussions for companies in the German wind power sector. Some have gone bankrupt, with the workforce decreasing by approximately one fifth.

The crisis in the wind power sector began at a time when climate issues were coming under greater public scrutiny, rendering the crisis a political liability due to doubt about whether the German 2030 climate policy target could be achieved. The impasse in growth of wind power could also derail plans to decommission the last nuclear power stations over the coming decade, and especially implementation of the roadmap for the gradual departure from coal.

Onshore wind farms central to the Energiewende

At the start of the decade, Germany undertook the next phase of the Energiewende, principally consisting of a departure from nuclear power, and now from coal as well, in favour of renewable energies[1], greater energy efficiency, and a reduction in greenhouse gas emissions[2]. Over a period of eight years of transition, Germany was able to double the share of renewables in the electricity produced, but this was achieved at a cost of huge funding from a separate nationwide fund, leading to price hikes for consumers. In addition to the high costs, the obstacles to the Energiewende include continued delays in extension of the transmission network from north to south and a standstill in reduction of greenhouse gas

[1] Originally, RES were supposed to make up a minimum of 50% of electricity generation in Germany in 2030, 65% in 2040, and 80% in 2050. Under the coalition agreement of 2018, the ruling CDU/CSU and SPD agreed a more ambitious target of 65% of electricity produced from RES earlier, by 2030, to achieve Germany's climate policy target for 2030 (reduction of greenhouse gas emissions by 55% compared to 1990).

[2] Germany made a commitment to reduce greenhouse gas emissions by 40% by 2020 (compared to 1990). The level of reduction is intended to reach 55% by 2030, 70% by 2040, and 80–95% by 2050. The target for 2050 is to achieve climate neutrality.

emissions, due among other things to the still high percentage of coal in the energy mix[3].

In 2018, renewable energies (RES) accounted for 35% of electricity in Germany in total, of which half (17.3%) was generated by wind power. The rapidly growing share of wind power in the national energy mix was primarily due to rapid growth in installed capacity of onshore wind farms in recent years. In 2015, the total capacity of onshore wind farms went up by 3804 MW, by 4440 MW in 2016, and by a record 5498 MW in 2017[4]. These wind farms were the second largest means of generating electricity in Germany after brown coal (see Appendix: Figure 1).

In 2018, renewable energies (RES) accounted for 35% of electricity in Germany in total, 17.3% was generated by wind power.

To attain the 2030 climate policy target, in an agreement concluded in the spring of 2018, the coalition partners agreed to a target requiring an increase in the share of RES in electricity production to 65% by the end of the next decade. The rapid rate of growth in wind power at that time was intended to play a crucial role in attaining that target. Representatives of the sector say that this target share of RES in production of electricity by 2030 would require an increase in the installed capacity of onshore wind farms of approximately 4500 MW per year, which is similar to the average level for 2015–2017. There was a distinct slowdown in 2018, however, as the increase in installed capacity was 2464 MW. In the first half of 2019, 81 wind farms were connected to the grid, of a total capacity of only 271 MW (see Appendix: Figure 2).

The increasingly severe standstill in measures to expand onshore wind farms is also clearly reflected by the results of auctions for new wind farm capacities in the last two years[5]. In 2018, in four auctions for a total capacity of 2710 MW for new wind farms, bids were accepted for 2342 MW (86% of the envisaged capacity). In four auctions held in 2019, out of a potential 2500 MW, bids for construction of wind turbines of a total capacity of 1130 MW (45% of the intended capacity) were successful. The worst results were obtained for the two most recent auctions, in August and September 2019. At these auctions, bids were accepted for 32% of the intended capacity in August, and for 35% in September[6].

Meanwhile, as at the end of 2020, twenty-year subsidies for operation of wind turbines for approximately six thousand wind farms of a total capacity of 4500 MW will no longer be applicable. In the period until 2026, one thousand six hundred wind turbines will leave the funding system each year, and thus the proprietors will have to decide whether to operate according to market conditions or take down the old installations. One answer might be to replace those turbines with new ones that are much more efficient (repowering), but the permit process could turn out to be a problem, as in the case of new installations. The slowdown in construction of new wind farms means that at the beginning of the next decade Germany could see, for the first time, a decrease in onshore installed capacity.

[3] See R. Bajczuk, *The unfinished reform. An assessment of the energy transformation in Germany* [series: "OSW STUDIES", no 69], Warsaw 2017.

[4] The cumulative installed capacity of German onshore wind farms is currently more than 53 GW.

[5] The system of auctions for new wind power capacities was introduced in 2017 as a market concept for lowering the costs of the Energiewende. Since then, investors have had to compete at auctions for new wind power capacities. The bids offering production of electricity with the lowest rate of subsidy are accepted. The maximum level of subsidies is set on an annual basis by the Federal Network Agency. In 2019, this will be 6.20 cents/kWh.

[6] Results of auctions for new onshore wind farm capacities [2017-2019].

To some extent, the slump in growth of onshore wind farm capacity could be remedied by speeding up construction of offshore wind farms. Offshore wind farms are more efficient and less reliant on weather conditions. Meanwhile, large-scale investment projects of this kind are hampered among other things by continued delays in construction of the transmission network from north to south Germany. None of the key 'energy highways', for which there have been plans for years, have been built.

The slowdown in the expansion of wind farms will delay the implementation of the Energiewende's energy and environmental targets.

The crisis in expansion of German wind farms takes on even greater importance in view of plans to complete the process of departure from nuclear energy by 2022, and the beginning of the process of decommissioning coal power stations. In 2023, RES should replace power currently obtained from 9.5 GW of installed capacity of the last remaining nuclear power stations and from almost 13 GW of capacity provided by coal[7]. Further coal power stations of a combined capacity of 13 GW are to be shut down by 2030. The stalled expansion of onshore wind power calls those plans into question, especially the roadmap for the gradual 'departure from coal'.

The slower rate of RES development might not only present a problem in attaining the Energiewende targets. It could also affect the rate of Germany's reduction of greenhouse gas emissions by the end of the next decade. Problems with the Energiewende and the resultant failure to meet climate obligations would also seriously undermine Berlin's image, as it wishes to be seen as a global leader both in development of renewable energies and measures to combat climate change. There is a firm belief among Germany's political and business elite that successfully conducting the Energiewende would give other countries an incentive to follow suit, opening new markets for German businesses in the RES sector.

Causes of the crisis

Representatives of the wind power sector in Germany say that one of the main reasons for the slowdown in expansion of German wind farms is difficulty in obtaining construction permits for new wind farms. There are protests against plans for turbine installations for which permits are being sought, and court action is taken to stop projects for which permits have been granted. Among the parties taking court action are environmental organisations, which say that operation of wind turbines endangers species of birds. Local residents, associations, and municipal authorities in the areas in which new wind farm installations are to be built also protest. The main reasons given by protesting residents for stopping projects are the noise pollution associated with operation of turbines, health issues (the impact of infrasound and low-frequency noise on health) and the effect on the landscape. The Bundeswehr has also objected to plans to construct new wind farms, due among other things to disruption of strategically important flight corridors and disruption caused by wind turbines to operation of military radar systems. The last major group of investment projects blocked at the permit issuance stage is wind farms located close to radio towers used for aviation traffic navigation (VOR/DVOR).

[7] According to the 'Coal Commission' decisions, by 2022 the installed capacity of coal power stations is to be reduced to 30 GW. This means decommissioning power plants of a capacity of approximately 7.7 GW for hard coal and approximately 5 GW for brown coal. By 2030, more power stations are to be shut down of a total capacity of 13 GW (7 GW from hard coal and 6 GW from brown coal). The last coal power stations are to be shut down by 2038 at the latest. A review of the options of accelerating the 'departure from coal' and decommissioning the last power stations in 2035 is scheduled for 2032.

According to the German Wind Energy Association (BWE), wind power installations of a total capacity of 11 000 MW[8] currently await resumption of construction permit proceedings that have been stopped. The incapacity of courts to process such a high number of filings and objections, and lack of assistance in providing the technical knowledge required to issue a decision due to inconsistency of regulations concerning the objections raised has led to a huge increase in the duration of cases. The average waiting time for a decision has increased from 300 to 800 days in the last three years. Investors waiting for clearance are not permitted to take part in auctions held by the Federal Network Agency for new capacities. Those who have been issued permits but who face court action also do not take part in auctions, because if investment projects approved during an auction are not realised, investors can face severe penalties.

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The final major obstacle reported by the wind power sector is spatial restrictions applicable to construction of new wind farms which have been introduced by the individual federal states. For example, in Bavaria, the '10-H' rule has been introduced, which says that a new installation must be located at a distance no less than ten times its height from the nearest residential area. For wind turbines two hundred metres high, this distance is two kilometres. The Nordrhein Westfalen government intends to introduce a minimum distance of 1500 metres. On the other hand, the government 2030 climate protection programme unveiled on 20 September provides for a distance of 1000 metres applicable throughout Germany. This is intended to help to make new wind turbines more acceptable to residents. Representatives of the sector say that such stringent regulation will reduce the space available for construction of wind farms in Germany by half (population density was 237 people per km in 2017).

Implications for the wind power sector

The growing difficulties involved in planning and realising new investment projects, leading to a sharp decrease in orders in recent years, are already taking their toll on companies in the German wind power sector. The number of jobs in manufacture, installation, and maintenance of wind farms has dropped from a workforce of more than 160 thousand in 2016 to approximately 125 thousand today. A poll conducted this year by IG Metall shows that one in four plants will be announcing further redundancies this year, and one in three expects the number of orders to decline in the next two years. In addition, as many as 43% of companies in the wind power sector are considering relocating to outside Germany[9].

Due to this lack of custom, more and more businesses are becoming insolvent and filing for bankruptcy. Senvion, to date a magnate on the international market, shared the fate of companies in the sector such as Prokon, Windwärts or Windreich in September. This Hamburg-based firm, which employs approximately four thousand people, was among the top ten major global wind turbine manufacturers in 2018, with turnover of around EUR 1.5 bn.

Companies in the sector are warning that German firms that for many years were among the top firms in the world are less and less able to compete with foreign firms. Medium-sized firms are in a particularly difficult situation;

[8] 'Nochmalige deutliche Unterzeichnung der Ausschreibung Wind an Land macht schnelles Handeln für mehr Genehmigungen zwingend', BWE, 9.08.2019.

[9] 'IG Metall sieht deutsche Windindustrie in Gefahr / Betriebsräte erwarten weitere Entlassungen', IG-Metall Küste, 4.09.2019.

they are unable to compete abroad with global giants from China or the US, and have ceased receiving orders in Germany due to the collapse of the domestic market. The German Wind Energy Association has warned that Germany could forfeit its global position as a 'centre of industry and innovation'.

Political consequences – a way out of the crisis

In response to the crisis, Minister for Economic Affairs and Energy Peter Altmaier (CDU) organised a summit for 5 September attended by representatives of the wind power sector and organisations opposed to expanding the wind turbine network, the energy ministers of six federal states, and members of the Bundestag from CDU/CSU and SPD parliamentary groups. This was the first meeting of this kind in history, and while it did not produce any specific decisions, it helped devise a plan of action. Minister Altmaier said at a press briefing that a 'national compromise' was needed regarding expansion of German wind farms. Based on comments and proposals made at the summit[10], the Ministry of Economic Affairs and Energy is to present a working plan for solutions for the sector by the end of September. Specific decisions, including legislative amendments, are to be made even this autumn.

The crisis in the wind power sector began at a particularly difficult time for the government, when public interest in climate change was growing. A series of polls conducted this year reveal that climate change issues are considered by Germans to be the most serious problem that politicians need to confront[11]. Growing interest among voters in the subject of climate change is confirmed by an increase in support for the Green Party, which came second with 20.5% of votes in the May EP elections. The popularity of the Green Party poses a challenge to the two coalition groups, who have lost a large number of supporters, to the Greens. The government attempted to regain the initiative by setting up a 'climate cabinet' in spring 2019[12], to draft a climate preservation bill. The bill is to include a package of measures to ensure that Germany attains the 2030 climate target. Rapid development of RES is essential for the government's plans to achieve the desired effect.

The crisis in the wind power sector coincided with a period when public interest in climate change was growing.

The Christian Democrats are in a particularly difficult political situation. On one hand, the CDU/CSU wish to win back voters lost to the Green Party by showing that they are taking an active approach to combating climate change, while on the other they will try to find a solution that makes new wind turbines more acceptable to residents, to avoid surrendering ground to the right-wing populist party Alternative Für

[10] Among the demands being made by the sector are a reduction of the duration of permit proceedings by providing more resources for government offices and making permit regulations and environment condition regulations consistent; devising a strategy in cooperation with the federal states to designate space for construction of wind farms; abolishing regulations on minimum distances from residential areas; reducing the minimum distance from aviation navigation towers from 15 to 10 km (this is the international standard); making it easier to replace old wind turbines with new ones (repowering) without applying for new permits; guaranteeing municipal authorities revenue from construction and operation of new turbines; organising extra auctions for new offshore wind power capacities.

[11] In a May poll conducted by DeutschlandTrend, 81% of respondents stated that in Germany there is a need or a huge need for action with regard to climate policy. In an August poll conducted by TrendBarometer, this issue was considered the most important challenge by 37% of respondents, followed by the issue of immigration and integration of refugees at 29%, to date considered the most important problem.

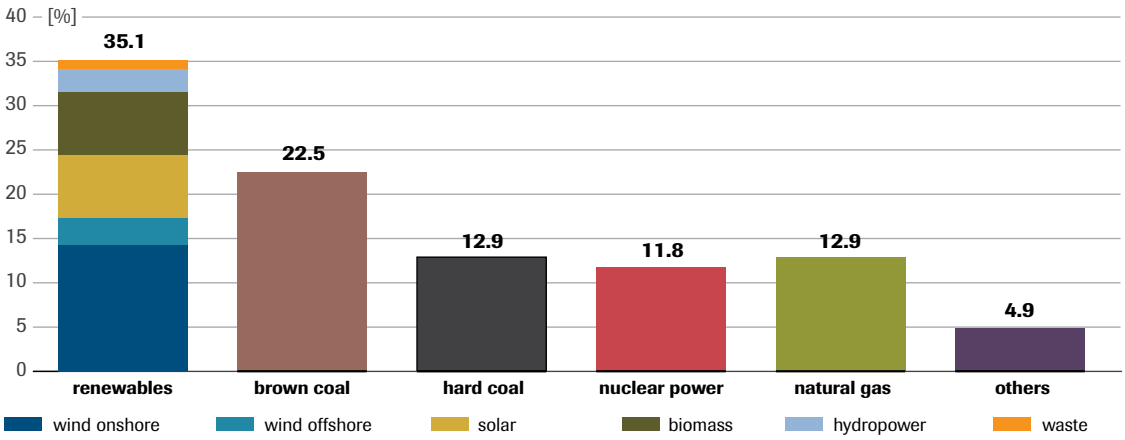
[12] Klimakabinett – a government committee made up of the chancellor and finance, economy and energy, environment, transport, agriculture, internal affairs, and construction ministers.

Deutschland (AFD). The AFD is the only party in the Bundestag to refute that humans are responsible for climate change, contest the basic precepts of the Energiewende, and try to gain political capital from the opposition on the part of some of the public to construction of wind farms, among other things by demanding that construction be halted in residential areas. At the same time, the Christian Democrats are under fire as the political group that has had a decisive influence over the form of the Energiewende since the beginning, for shortcomings in how the Energiewende is structured.

The lack of quick and effective solutions to the wind power sector crisis raises doubts not only regarding the Energiewende power sector and climate policy targets, but also regarding the creditability and effectiveness of the CDU/CSU-SPD coalition. A failure in this respect could place a political burden on Angela Merkel's government during the German presidency of the EU in the latter half of 2020, as well as prior to the Bundestag elections due to be held in autumn 2021.

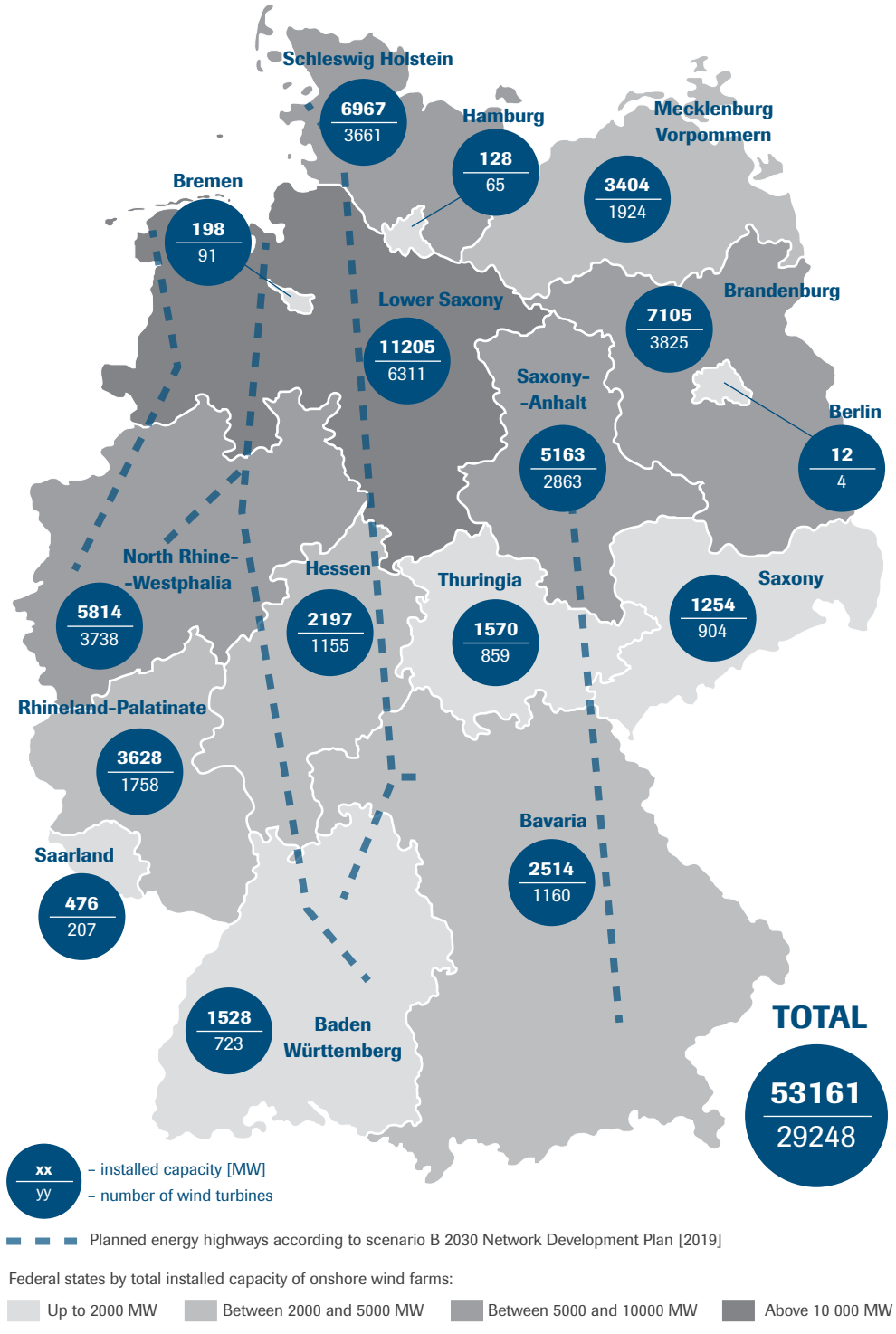
APPENDIX

Figure 1. Electricity production by source in 2018 [%]



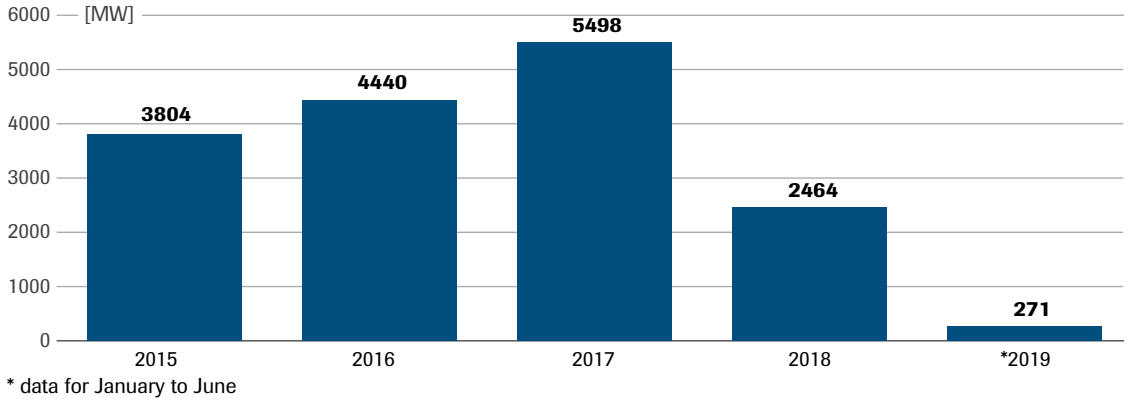
Source: AG Energiebilanzen e.V.

Map. Numbers of wind turbines in each federal state and planned energy highways as at 30.06.2019



Source: Status des Windenergieausbaus an Land in Deutschland. Erstes Halbjahr 2019; Netzentwicklungsplan Strom 2030 (2019)

Figure 2. Growth in installed capacity of onshore wind farms [MW]



* data for January to June

Source: Fachagentur Windenergie an Land

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