



INVESTING IN GREEN ENERGY SPOTLIGHT ON... GERMANY

Following our Investing in Green Energy: Spotlight on Germany event on Wednesday 24 January 2024, please find below an overview of what was covered. For reference, here are the [speaker details](#) if you would like to discuss the topic further.

With thanks to London Energy & Infrastructure Senior Associate [Gavin Jackson](#) for preparing this overview.

Market introduction - Germany

The German renewables market has a long history. The first onshore wind turbine in Germany was developed in 1984 with strong governmental support for green energy since then.

Germany is targeting Net Zero by 2045, with renewable energy production currently comprising over 50% of the energy mix in the power sector (although the transport, infrastructure and housing sectors continue to present challenges). There are also plans to build out the German grid network to help transport renewable power more effectively to other areas within Germany.

On the more "conventional" side, Germany's historic dependency on Russian gas has led to it building its own floating LNG capacity in recent years – demonstrating the government's ability to react quickly in "worst case" scenarios. The first German onshore LNG-terminals are currently under construction and, hopefully, more will be developed in the near future. Separately, Germany has accomplished the denuclearisation of its power sector, with coal fired power projects due to be phased out soon. This presents a need for "bridging technologies" as Germany transitions to a full-renewables mix. See recent work from WFW in relation to this [here](#).

Asset classes

Onshore wind

There is still a way to go in Germany's onshore wind journey; there is currently 61 GW of installed onshore wind capacity, a further 8 GW targeted this year and a 2030 goal of 120 GW.

Whilst greenfield projects present investment opportunities, repowering existing wind farms, which benefit from the "old" subsidy regime will also be integral to this goal, with a number of existing wind farms having come up for sale in the past few years:

- repowering should be a more straightforward proposal in comparison to greenfield development. However, securing land presents a challenge as it is only possible to do so for 30 years under German law;

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- from a procedural perspective, repowering also requires new permitting to be obtained for a project. From a practical perspective, if repowering doubles or triples (for example) the generation capacity of an existing wind farm, this will likely result in grid capacity challenges *vis a vis* the project's connection; and
- WFW has a strong understanding of the requirements associated with repowering onshore wind projects. By way of example, we advised a German municipality on the purchase of the 165 MW Horizon portfolio of 60 wind farms ([see more here](#)).

There are still substantial challenges associated with onshore wind projects, including the permitting regime. However, the German government has acknowledged this challenge and is instigating changes in the law to speed up the permitting process. These measures include:

- under the Onshore Wind Act, that federal states will be obliged to make 2% of land sites available for onshore wind projects; and
- the Renewable Energy Act considers renewable energy projects as a "priority concern" for the purposes of weighing various interests when making a permitting decision.

New/repowered onshore wind farms will follow the current subsidy scheme, as the "old" fixed feed in tariff subsidy is no longer available. Under the current system a "direct marketing agreement" is concluded between the renewable plant operator and the direct marketing company, usually with reference to spot prices. The operator may receive an additional so-called market premium from the grid operator if the average market price as published by the grid operators is lower than the "applicable value" the onshore wind facility operator tendered for. The German scheme differs from the "contracts for difference (CfD)" arrangements found in the UK. Under the German system, if the market price is higher than the tender price, the beneficiary of the subsidy can retain the upside. With respect to other revenue sources, there are also PPAs, often for generation facilities which have run out of the subsidy scheme and are not yet repowered. Corporate PPAs used to be uncommon for onshore wind but are increasingly seen in the market.

Offshore wind

Germany currently has circa 8.5 GW of installed offshore wind generation capacity. The targets under the Offshore Wind Act are 30 GW by 2030, 40 GW by 2035 and 70 GW by 2045.

There is a tender system for offshore wind, with two auctions scheduled in 2024 for five sites with a total capacity of 8 GW.

There are two different auction systems depending on the category of site. Previously, a site would be pre-investigated by the authorities to determine its appropriateness for an offshore wind project. This still takes place for part of the sites. In order to expedite growth, the German government has now introduced a new category of sites which are not subject to pre-investigation. The different types of sites have different tender processes.

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Where there is no pre-investigation for a site, the tender is a "price only system". In principle, bidders bid for an "applicable value" and the winner can obtain a market premium in the direct marketing regime as described above for onshore wind. However, in the latest auction rounds, there have been some bids for €0, meaning that the operator offers to construct the offshore wind farm subsidy-free without a "market premium". If several bidders offer €0, negative bidding rounds take place in which the operators offer payments for the site. This led to a record amount of approx. €13bn to be paid as a result of last year's German offshore wind auctions, mostly from two oil majors who are keen to participate more actively in the renewables sector.

For pre-investigated sites, it is not possible to obtain a market premium. Rather, the bidders offer a price and can obtain points for other criteria in a "beauty contest". These criteria relate to decarbonisation, volume of energy subject to letters of intent for PPAs, number of apprentices compared to the overall workforce, and foundation technology. It is to be noted that the "beauty contest" is limited to these specified criteria and not to other aspects such as the capacity of the wind farm. The generating capacity expected from a project on each site is pre-determined by the relevant site development plan, so is the basis for the tender.

According to the statutory targets a growth in capacity is expected and there are various incentives in the German market to encourage this. For example:

- developers do not need to pay for grid connection in Germany as this is covered by the grid operator;
- there are potential efficiencies in respect of size and proximity of sites, which can be exploited by developers considering multiple sites, especially as there is no limit to the number of sites a bidder can win; and
- payment obligations by relevant bidders are staggered - 10% of a bid amount must be paid in the first 12 months after winning the auction, with the remainder due in even instalments over a period of 20 years after commissioning.

Furthermore, there is an experienced permitting authority in Germany dedicated to promoting the development of offshore wind projects. Certain wind farms can follow a simplified procedure, where the intention is for permits to be granted within 12 months.

There has been a lot of discussion regarding the bidding system, and offshore wind associations have lobbied for changes. However, for the 2024 auctions, the rules for both types of auctions remain the same. It remains to be seen if changes will be made for future auctions, which may depend on the outcome of the 2024 auctions.

Solar

Solar installations in Germany are currently split roughly 50/50 between rooftop and "open space" projects. The government has plans to grow solar capacity in Germany to 215 GW (currently at 74 GW) by 2030, effectively tripling the number of operational solar projects. There are also plans to speed up grid connection and land access to develop solar projects.

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The legal framework for solar projects is similar to that for onshore and offshore wind projects, although there are more solar projects with PPAs. Construction costs are naturally lower for solar projects than for offshore wind projects.

The permitting process for solar projects is also relatively simple in comparison to onshore wind and offshore wind projects. However, it is important to remember that there are different permitting regimes within Germany given its federal system.

At present, we are seeing a lot of early stage and smaller solar project developments, with small developers putting together portfolios, leading to significant demand for development financing. By way of example, WFW recently [advised](#) on a large mezzanine financing of circa 100 solar projects in different development stages.

What next?

As in other jurisdictions, the energy transition presents opportunities and challenges.

Hydrogen

The first hydrogen projects in Germany are currently being developed, though there are issues across the “green” hydrogen value chain. One key consideration is the origin of the electricity used for producing green hydrogen. There is an EU framework setting out numerous requirements for the production of “green hydrogen”, at least in the transport sector. One of these requirements is that, as of 2028, renewable energy used for hydrogen production comes from a new renewable energy facility. Therefore, whenever clients are looking to invest in hydrogen projects, it is necessary to keep this in mind.

There are concrete plans for building a hydrogen network in Germany under which gas transmission operators will be obliged to build this network using quasi-redundant gas pipelines, where technically possible, as well as new hydrogen pipelines. However, the cost for transporting such hydrogen still needs to be addressed.

For hydrogen offtake, it’s important to note that the industry is only now developing green hydrogen solutions. This makes it difficult to agree long-term offtake arrangements, and in particular long-term prices. However, the German government has made clear that it sees Germany as a “pioneer market” for green hydrogen and has – for example – made it possible to conclude so-called climate protection agreements to promote inter alia green hydrogen solutions for energy intensive industrial companies.

Baseload challenges

With the phasing out of nuclear and coal, how is Germany going to secure baseload capacity in the upcoming years?

The German government is currently evaluating what more can be done to improve storage capacity. Originally, it was more focussed on grid expansion but has since already introduced statutory improvements to allow for the development of economically viable battery storage projects. For example, depending on a battery’s purpose, developers can obtain exemptions from grid fees and a reduction/exemption on surcharges.

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A friendlier regulatory environment for storage projects is a positive development but will not be sufficient to solve Germany's baseload challenges as "conventional" power projects are phased out. In the future, we expect to see the development of more energy-from-waste projects to secure baseload and gas-fired power plants as a "bridge technology".

The clear takeaway is that Germany does not want to rely on Russian gas. It is receiving gas from Norway and the Netherlands and is rapidly improving its LNG infrastructure - onshore terminals are under development and there are presently four locations for FSRUs.

Heat

Heating is a local issue across Germany, with an increasing number of community/industry projects being developed.

Households are supposed to implement heat pumps domestically, but more electricity and grid capacity is required to support this transition. The government estimate for the investment required is €4bn, though alternative sources suggest the figure is closer to €30bn.

Given the scale of investment needed, local communities/municipalities will need to consider new sources of financing for funding, on which WFW is well placed to advise both municipalities and investors.

Grid development

Government plans for grid development suggest there will be circa €250bn of investment. However, the question remains as to whether utilities will be able to fund such investments themselves, and it is likely that investment opportunities will present themselves for other parties.

Bankability

Bankability issues present more of a challenge for newer technologies (for example hydrogen), although some are starting to materialise in the project finance market.