



Conclusion

Offshore Grid Development Plan 2025, Version 2015, First Draft

This Offshore Grid Development Plan 2025 (O-GDP) already represents the third O-GDP that has been presented for public consultation by the four German transmission system operators 50Hertz, Amprion, TenneT and TransnetBW. The Offshore Grid Development Plan describes the expansion measures required to the offshore grid over the next ten and twenty years. Together with the Grid Development Plan (GDP), the O-GDP shows how power generation in Germany can successfully be restructured and renewable energy be integrated into the grid.

The grid development planning process promotes transparency and an open dialogue with the public. With this first draft of the O-GDP 2025, the transmission system operators have called upon the general public to take part in this process. This ensures that all stakeholders interested in the O-GDP are taken into consideration and that the Offshore Grid Development Plan is the result of a process of mutual recognition and development. The results of the consultation are then presented in summary as part of the second draft of the O-GDP.

Process and methodology

The O-GDP describes measures for the scenario framework that has been made available for public consultation and approved by the Federal Network Agency (*Bundesnetzagentur, BNetzA*) on 19 December 2014. These measures fulfil all the requirements imposed by the German legislative and regulatory authorities. They depict the current route of expansion for offshore wind energy, based on the amendments made last year to the Renewable Energy Act (*EEG*).

The process of grid development planning is made very transparent thanks to the open presentation of these assumptions regarding generation and consumption structure, the objective criteria arranging grid connection systems in sequence and the resultant demand for grid expansion. For the first time, the current scenario framework contains six scenarios (A 2025, B1 2025, B2 2025, B1 2035, B2 2035, C 2025) instead of four. Four scenarios have been projected for the target year 2025 and two scenarios





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refer to 2035, so as to gauge long-term development over a period of twenty years. Due to the scope of six different scenarios, the grid expansion measures investigated cover a wide range of possible future developments. With regards to the O-GDP, three of the scenarios (B1 2025, B2 2025 and C 2025) start from the premise of the same level of installed generation capacity for offshore wind energy (10.5 GW in 2025). Both of the scenarios for 2035 are also generated based on the same level of installed generation capacity for offshore wind energy (18.5 GW in 2035). For this reason, considerations in the O-GDP are restricted to the Scenarios A 2025 and B 2025 as well as the forward projection B 2035. Draft legislation is currently being discussed to integrate a tendering model into the German Renewable Energy Act. If and to what extent this systemic change will have an effect will be considered in the next O-GDP, once the legislative process has been completed.

The O-GDP draws together the development of the onshore transmission network, spatial planning at sea and the basic technical conditions needed to create a basis for sustainable planning, including detailed information on the properties, time scheduling, execution times and costs of the network connection measures necessary for the next ten and twenty years respectively. Here, particular attention is paid to the timing of the offshore grid expansion measures based on objective criteria. This includes the classification of the North Sea and the Baltic Sea into distance zones, the generation potential of wind farm clusters, as individually mentioned in the Federal Offshore Plan (FOP) or in respective regional planning, the planned commissioning of the grid connection points detailed in the GDP as well as progress updates on the realisation of the offshore wind farms that are to be connected. The O-GDP therefore plays a key role as a tool for coordinating the efficient and sustainable development of offshore wind energy.

Supplementary to previous connection concepts based on precise clusters, the plan also investigates the use of collection platforms in the Baltic Sea for the connection of multiple clusters that are geographically close together. Consequently, it can be seen that the economic efficiency of the region north-east of Rügen can be further increased by using a collection platform connection concept instead of precise cluster connections. In addition to cost benefits, this concept also includes the opportunity to further reduce idle capacity and the ability to react with greater flexibility to future developments.





The O-GDP investigates the demand on grid connection systems and selects the start and end points of grid connection systems, taking into account the expected geographic distribution of the offshore wind farms and the network connection capacities available at the grid connection points in the transmission network. Specific line corridors are determined by the Federal Maritime and Hydrographic Agency (*Bundesamt für Seeschifffahrt und Hydrographie*) for the exclusive economic zone (EEZ) and by the respective German states for German coastal regions on land and at sea.

The coordination of the onshore grid expansion, the development of offshore wind farms, the Federal Offshore Plan and the planning of coastal states is an iterative process. The results of the O-GDP will have repercussions for the offshore wind energy industry and the plans that have been used, which will in turn lead to adjustments being made in subsequent Offshore Grid Development Plans. The O-GDP is therefore not conclusive, but, just like the Grid Development Plan, will continue to be regularly revised in order to meet changing conditions.

Results

The offshore starting grid forms the basis for network planning in the O-GDP. This grid indicates all offshore grid connection systems that are assumed to be in place at the time of preparing the O-GDP and whose necessity is not subject to further investigation under the terms of Section 17b of the German Energy Economy Law. The expansion measures of the offshore starting grid have a total length of 1,300 km. The level of investments totals around 5 billion euro.

The length of offshore extension grid required is calculated at 397 km in Scenario A 2025, 902 km in Scenario B 2025 and C 2025 and up to 3,494 km in Scenario B 2035. The total transmission capacity of these extensions to the offshore grid would be sufficient for an additional 1.4 GW in Scenario A 2025, over 3.2 GW in Scenario B 2025 and C 2025 and for up to 10.9 GW in Scenario B 2035. The investment costs for the network measures are calculated in the O-GDP on the basis of specific cost estimations and are of a provisional nature. Depending on the scenario, the total volume of investments over the next ten years amounts to between seven and ten billion euro. This already accounts for investments of approximately five billion euro in the expansion of the starting grid offshore.





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The volume of investments is less than previous Offshore Grid Development Plans as a result of the government's new expansion targets for offshore wind energy and because several projects relating to the offshore starting grid have been completed in the meantime. These are therefore not calculated into the expansion measures of the offshore starting grid and are thus no longer included in the statement concerning investment volumes.

The successful expansion of offshore wind power is dependent upon understanding and widespread acceptance both in politics and in society as well as integrating the development of offshore wind farms, the offshore grid and the onshore transmission network. The frameworks for legal planning and regulation as well as extensive social and political support at all levels are going to play a decisive role in implementing this ambitious investment programme. This requires both extensive information and a cooperative and binding collaboration with all stakeholders. The grid development planning process aims to contribute to this by promoting transparency and an open dialogue.

