



Suggested solutions for connecting offshore wind farms to the grid.

Developed by the working group 'Acceleration of Offshore Grid Connections'

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Preliminary remarks

Thanks to the initiative of German Federal Minister of Economic Affairs Dr. Rösler and in joint cooperation with the Federal Ministry for the Environment, the working group "Acceleration of Offshore Grid Connections" (hereinafter referred to as WG Acceleration) was launched on January 13, 2012.

The working group's task is to draw up solutions concerning delayed offshore grid connections, the resulting effects on wind farm operators, and the financing difficulties of TenneT, the transmission system operator (TSO) for the North Sea.

An appointed working commission, including the TSO (TenneT, 50 Hertz), grid connection providers (ABB, Alstom, Siemens), wind turbine manufacturers (VDMA), offshore wind farm operators (WG Operators 1), insurance businesses (Marsh), associations (BDEW, BWE, OFW), and representatives of federal authorities (BMW, BMU, BSH, BNetzA), developed various solutions on March 5, 2012, with the OFFSHORE WINDENERGIE Foundation acting as moderator and communicated provisional results to the working group.¹

The solutions and recommendations suggested – except for some minor variations – have found the backing of all business representatives in WG Acceleration.

There is general agreement in believing that existing procedures need to be reviewed and that a new course, including a legislative initiative, is required to overcome existing difficulties related to the grid connection of Offshore wind farms. Only in so doing, this part of the energy policy change can be smoothly implemented. The federal government has an actively role in this.

The German Federal Grid Agency (BNetzA) has made it clear to WG Acceleration that, according to section 17 paragraph 2b p. 2 EnWG, BNetzA is the sole organization responsible for defining criteria to identify practical feasibility and enable discrimination-free contracting of grid access capacities. Taking account of this notion and not seeing it as an obstacle, WG Acceleration has developed the following suggestions and recommendations, as Minister of Economic Affairs Dr. Rösler made clear that political initiatives and legislative amendments will be essential in solving the issues discussed on January 13, 2012.

¹ WG Operators (of OWF) is a working group inside the German Offshore Wind Energy Foundation. The WG comprises those companies that are willing to own and operate offshore wind farms in Germany on a permanent basis and who have already made appropriate investment decisions. The companies represented have detailed insight into current developments in the offshore wind industry. They operate the majority of the globally installed offshore wind capacity.

The members of WG Operators include BARD Engineering GmbH, DONG Energy Renewables Germany GmbH, EnBW Erneuerbare Energien GmbH, E.ON Climate & Renewables Central Europe GmbH, EWE ENERGIE AG, RWE Innogy GmbH, SWM Stadtwerke München GmbH, Trianel Windkraftwerk Borkum GmbH & Co. KG, Vattenfall Europe Windkraft GmbH, IBERDROLA Renovables Deutschland GmbH and WindMW GmbH.

To make it easier to read the results of the discussions on March 22, 2012, the extensively discussed analyses and descriptions of the issues identified by the working group are not included here. However, it will be necessary for the ongoing political decision-making process to add appropriate and detailed reasoning to the suggested recommendations.

Executive Summary and possible solutions

In 2008/9, grid connection suppliers stated that a 30-month period was needed to accomplish grid connections, a time period that was then incorporated into the BNetzA's 2009 position paper. Especially considering an offshore wind farm's implementation period (usually some 30 months from investment decision), this 30-month term was a generally accepted period by all those involved and represented acceptable synchronization between an offshore wind farm's construction phase and its grid connection phase.

However, it currently takes approximately 50 months to connect a wind farm to the grid. One reason for the delays is the first ever use of the direct-current (DC) transmission technology offshore on such a grand scale. Along the entire investment and value chain, the parties involved (manufacturers of cables and converter stations, grid and wind farm operators, certification institutes, authorities, the maritime industry, banks and insurance companies) undergo a steep learning process. This learning process must provide answers to questions that at present can only be answered with a considerable degree of uncertainty, which prompts investors and insurance companies in particular to act with some hesitation.

WG Acceleration was able to identify several areas of optimization with a time saving potential (***planning and permitting procedures (cf. point 2.1), commissioning and contracting grid connections (cf. points 2.2, 2.5), manpower capacity (cf. point 2.6)***). Moreover, the group saw particularly high potential for acceleration in ***standardizing grid connection systems (cf. point 2.3)***. At the same time, costs for the national economy would be optimized and the transmission system's quality and reliability would be enhanced. Furthermore, ***grid connection management (cf. point 2.4)*** is vital to achieve cost minimization when grid connections are delayed and to achieve an ideal use of transmission capacity, which is a scarce resource.

WG Acceleration considers ***implementation roadmaps*** to be a key approach to tapping these potentials (***cf. point 3.3***). An implementation roadmap set up in a joint effort should achieve the greatest possible level of commitment and complete transparency between all stakeholders involved, in particular the TSOs and wind farm operators.

On top of that, WG Acceleration members agree that structural changes to build a sustainable grid infrastructure are urgently needed to comply with the **offshore grid plan according to section 17 paragraph 2a, p.3f, EnWG (cf. point 5.1)**.

Many of the existing difficulties could be solved with this plan in the short term. It would make it significantly easier to plan the use of scarce resources when it comes to grid connection, investors, insurance and manpower and ensure a significantly higher degree of investment security. The coordinated transition required for this change of system is to be discussed with all stakeholders. The WG members offer to be actively involved in this discussion.

From the WG members' perspective, the TSOs' and wind farm operators' **liability and financing issues** need to be resolved as soon as possible in order to overcome the uncertainties that have emerged during the implementation phase of the first construction stage of offshore wind farms in Germany (some 3,000 MW) in 2012 and 2013. In so doing, the way can be paved for the investment decisions due in 2012 for the second implementation stage (some 3,500 MW, see Annex 2). Grid operators **need the liability issue (see point 1.1) and the profitability of grid investments (see point 4) clarified** in order to **set up an organizational structure (see point 5.2) that is sustainable and capable**.

The offshore wind farm operators, in turn, need a greater commitment from TSOs as far as the exact dates for grid connection are concerned (implementation schedules). Apart from that a **cost shifting for delayed grid connections (see point 3.1)** and for possible transmission curtailments during **trial operations (see point 3.2)** is required.

The overriding objective of the suggested solutions is building a grid infrastructure that ensures electricity transmission to the centers of consumption by using appropriate technical and organizational measures.

In the process, system safety, systematic identification and minimization of possible damage risk as well as its insurability, exchange with neighboring countries and timely provision of grid capacities for offshore wind farms need to be achieved. A necessary pre-condition to achieving energy-efficient and economically viable objectives is the tight connection of the offshore grid plan with on-shore grid planning, as a key component of the German transmission grid when preparing grid development plans. The solutions submitted can make important short and medium-term contributions to achieving this objective.