Fact Sheet

Berlin, 4 November 2014

GRID DEVELOPMENT PLAN 2014, 2ND DRAFT
CONSULTATION RESULTS, CONTENTS, FACTORS INFLUENCING GRID DEVELOPMENT

The Grid Development Plan 2014 in light of the German Renewable Energy Act reform

The Grid Development Plan 2014 (GDP) is based on the scenario framework approved by the German Federal Network Agency on 30 August 2013. At the same time as the GDP 2014 was being prepared, fundamental framework conditions for the energy industry were redefined by German legislative authorities as part of the amendment of the German Renewable Energy Act (*Erneuerbare-Energien-Gesetz* or *EEG*). The amended Renewable Energy Act came into effect on 1 August 2014. It contains key data that is relevant to the GDP preparation process:

- Expansion corridors of 40 to 45% proportion of the total energy consumption in 2025 from renewable sources, rising to 55 to 60% in 2035
- 6.5 GW of installed offshore wind energy capacity by 2020, 15 GW by 2030
- 2.5 GW net annual increase of onshore wind power
- 2.5 GW gross annual increase of photovoltaic capacity
- 100 MW gross annual increase of biomass energy
- Establish a tendering system for renewable energy projects, to be introduced by 2017 at the latest

The transmission system operators have therefore used this second draft to include several anticipated alterations within the approved scenario framework, for instance a new regionalisation within Scenario B 2024, which better represents the future development of renewable energy input. In the second draft, Scenario B 2024 with an altered regionalisation and updated grid connection points is referred to as Scenario B 2024*. For this reason, a complete market simulation and consequent recalculation of the demand for grid expansion was carried out for Scenario B 2024*. It will first be possible to completely represent the probable development of the generation landscape that fully takes into account the revisions made to the EEG with a suitably adapted scenario framework for the GDP 2015.

Public consultation for the first draft of the Grid Development Plan 2014

Together with the first draft of the Offshore Grid Development Plan (O-GDP), the first draft of the Power Grid Development Plan 2014 (GDP) was made available for public consultation between 16 April and 28 May 2014. During this period, all stakeholders had the opportunity to express their opinion about the plans. In total, 26,064 statements were received, of which 26,041 concerned the GDP and 23 the O-GDP. Of the 26,041 comments received regarding the GDP, 25,569 were sent in by private individuals and 472 by institutions. Of the responses submitted by private individuals, around 98% (this equates to 25,058 statements) of these are form

letters. All responses for which publication consent has been given, were successively published online at www.netzentwicklungsplan.de. The majority of responses refer to specific schemes, in particular the "Corridor D" project (referred to as the "South-East Direct Current Route" in the first draft), and the further consequences of the grid expansion. Numerous statements also address the foreseeable need to make further changes as a result of the amendments made to the EEG. The content of all submitted responses was assessed by the transmission system operators and appropriate revisions were then made to the Grid Development Plan 2014.

Results of the second draft of the Grid Development Plan 2014

The results of the calculations made based on the modified Scenario B 2024* show that the scope of demand to develop the German energy grid is not fundamentally different to that seen in Scenario B 2024 in the first draft of the GDP. Nevertheless, it is very likely that the change in regionalisation will have a noticeable impact on individual measures. The other Scenarios – A 2024, C 2024 and B 2034 – were not completely recalculated for the second draft of the GDP 2014. However, the repercussions of the changes identified in Scenario B 2024* on individual measures were also reassessed for these Scenarios. An analysis performed based on selected sample cases showed that the changes triggered by Scenario B 2024* could also be accounted for in the grids depicted in the other Scenarios.

Recommendations for approval

In light of the changes to the framework conditions of the energy industry caused by the Renewable Energy Act reform, the transmission system operators believe that it would be appropriate to concentrate on the approval of measures from the Federal Requirements Plan 2013 as well as measures that were already confirmed in the GDP 2013 and remain identical in this GDP 2014. Furthermore, the TSOs' projected calculations show that it would also be advisable to give approval for three additional projects, which are directly related to previously approved measures. This covers the projects 112 Pleinting – Pirach – St. Peter, 154 Siegburg Connection and 44 Altenfeld/Schalkau – Grafenrheinfeld area. Further measures, which are investigated in the network analysis, are to be assessed and, where appropriate, then prioritised in terms of their economic and ecological efficiency and their effectiveness in stabilising the network in a later GDP 2015, which will be based on new scenarios.

In Scenario B 2024*, the volume of grid enhancements along existing routes (recabling or circuit requirements, construction of a more efficient power line along existing routes) amounts to 5,300 km. In Scenario B 2024*, the required level of power line route expansion is calculated at 3,800 km, 2,300 km of which are HVDC corridors. This also includes the German share in the three direct current interconnectors between Germany and Belgium, Denmark and Norway with an overland length of approximately 200 km. The transmission capacity of the HVDC corridors in Scenario B 2024* totals 12 GW. Depending on the scenario, the total volume of investments over the next ten years totals between 22 and 26 billion euro.

The GDP does not detail any specific routes for new transmission lines, but rather documents the levels of transmission demand required between grid nodes and contains specific recommendations for the expansion and construction of the over-

land transmission network in Germany. The transmission system operators (TSO) follow the so-called NOVA principle (NOVA is a German acronym for the optimisation, enhancement and expansion of the grid [*Netzoptimierung, -verstärkung und -ausbau*] to determine which measures are necessary.

Effects of Scenario B 2024* on projects and measures

Due to the advanced regionalisation and the resulting changes to transmission requirements, the transmission system operators have re-examined both the previous network concept and the HVDC end points in the second draft of the GDP 2014. As part of this review, particular care was taken to factor in the comments submitted to the transmission system operators during the public consultation process. The result of this investigation further confirms the high transmission demands depicted in Scenario B 2024*, however it also indicates that the relocation of HVDC end points would be able to fulfil the requirements of a new regionalisation to a greater extent. The changes to planning based on this new regionalisation also have a palpable effect on the HVDC corridors C and D as well as other projects and measures in the AC network; detailed descriptions of these projects are documented in the second draft of the GDP 2014 under “Extension Grid Project Profiles”.

Next steps – continuing along the road to grid expansion

The German Federal Network Agency will now check through the revised draft and once again make it available for public consultation together with an environmental report. The Federal Network Agency takes the results of the participation by the public and authorities into consideration when approving the Grid Development Plan.

At least every three years, the approved GDP is used as a foundation for creating the draft of the Federal Requirements Plan. The Federal Requirements Plan Law (*Bundesbedarfsplangesetz* or *BBPlG*) was enacted by the lower house of the German Federal Parliament (*Bundestag*) on 25 April 2013 and was approved by the Parliament’s upper house (*Bundesrat*) on 7 June 2013. The first Federal Requirements Plan contains a total of 36 proposals based on the results of the approved GDP 2012. These include pilot projects for high voltage direct current transmission lines for long-distance transmission as well as a total of 21 transmission lines that cross state or national borders. The Federal Network Agency is responsible for the approval (federal sectoral planning and planning permission) of transnational or cross-border transmission lines[1]. The next Federal Requirements Plan is to be presented based on the GDP 2015 at the very latest.

TSOs’ guideline calculations as the first impact analysis of new legislation

In June 2014, the TSOs presented the first guideline calculations based on the cabinet draft for EEG reform available at the time; they also included the foreseeable changes in parliamentary legislative procedure, which factored in the TSO draft scenario framework for 2015 as well as both changed overall figures for the expansion of energy from renewable sources and a change in regionalisation. However, it was not possible to carry these guideline calculations over to the sec-

[1] Exceptions to this are international projects for the construction of power lines that have been labelled as “Pilot projects for the low-loss transmission of high voltages over long distances” in the BBPlG.

ond draft of the GDP 2014, as they contained overall data that was different than that already bindingly specified in the already approved scenario framework 2014. The guideline calculations suggest that, as a consequence of the new Renewable Energy Act, it is expected that the GDP 2015 will at best contain regionally limited ramifications of Federal Requirements Plan measures, that is, that Germany's grid structure, as already worked out in the Grid Development Plans from 2012, 2013 and 2014, with significant development of the AC network and four controllable DC long-distance transmission corridors will once again prove to be necessary.

Report on factors influencing grid development 2014
The transmission system operators have investigated the impact of three factors influencing the grid development on the measures included in the Grid Development Plan 2014. These factors are as follows:

- offshore capping (Factor 1)
- injection management (Factor 2)
- CO_2 Prices (Factor 3)

They also provide additional findings about the influence of certain defined parameters on the demand for grid development and are to be considered vital contributions to the discussion regarding the configuration of dimensioning factors on grid expansion. Alongside the Grid Development Plan 2014, the transmission system operators also published the report on factors influencing grid development 2014 (Part I and II) on 16 April 2014 and 17 July 2014 respectively, online at www.netzentwicklungsplan.de.

Results of analysing factors which influence grid development
The factor analysis indicates that all HVDC connection lines are still required for the long-distance transport of offshore and onshore wind power from coastal areas directly to the south. Even under changed basic conditions, the measures contained in the Federal Requirements Plan still continue to constitute a robust core for the grid expansion required over the next ten years.

Legal basis
The four transmission system operators 50Hertz, Amprion, TenneT and TransnetBW share the task of drawing up a Power Grid Development Plan, as regulated by the German Energy Management Act, for the expansion of the German transmission network over the next ten years. This is to be prepared every year and submitted to the Federal Network Agency who are the regulatory authority responsible. Prior to the preparation of the GDP, a so-called scenario framework is created, which uses three scenarios to describe the range of possible developments in energy consumption and generation as well as the regional distribution of these; this forms both the foundation for the GDP and the targets of the German government.