



Options for the future structure of the German electricity transmission grid

SHORT VERSION OF THE FINAL REPORT FOR BMWI

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The Federal Ministry for Economy and Technology (BMWi) has retained Frontier Economics Ltd. to develop and evaluate possible structural options for the German electricity transmission grid. There are currently four transmission system operators (TSO's) in Germany, which act autonomously and independently of each other (e.g. independent grid planning, grid operations, grid tariff calculations, dispatch of regulating reserve etc.). Imminent challenges for the German electricity transmission grids (such as e.g. extensive network expansions, European network integration, the unbundling provisions of the 3rd energy package of the EU, the announcement of E.ON and Vattenfall Europe to sell their transmission grid activities) may create the option of a fundamental realignment of the German transmission grid company landscape.

Our approach

Based on a catalogue of potential objectives for a potential future structure, we have firstly identified a set of possible structural options, which appear practical ("Long List"). This list of options was analysed in view of

- their compatibility with the current and future unbundling requirements; and
- their likelihood of implementation, given commercial incentives of the current network owners.

For those models which met principal requirements we proved and assessed in how far they contribute to achieving the energy policy objectives of the German government and the EU.

This summary draws together the main results of our analyses. Our analyses and assignments are based on our expertise in the electricity grid sector, publicly available studies and other sources (laws, statements, etc.) as well as conversations with representatives of the BMWi.

Objectives

The structuring of the German grid companies landscape could particularly serve the following objectives:

- Security of investments and supply – The substantial future investment requirements for the German electricity grid must be financeable, and the current or future grid owners must have incentives to undertake these investments;
- Cost efficiency – Operation, planning and expansion of the network should be undertaken in a cost-effective way. This means for example
 - Network services should be procured and priced as efficiently;

- Network expansions should be assessed from an overall energy economic perspective (and not only from transmission operators individual perspectives); and
- Duplication of functions and activities should be avoided – as long as security of supply and security of network standards are met;
- Neutrality in respect of electricity market competition – The future grid structure should satisfy at least the legal requirements as set at the EU-level, in particular the unbundling provisions of the 3rd energy package, and should be neutral with regard to competition in up-/downstream electricity markets.

Options for the grid structure

We have identified a set of fundamental structural options for the German electricity transmission grid as the basis for a more detailed analysis:

- Coordination of selected system services („SO light“ model) – This model is based on the coordination of selected system services across the four current transmission system operators. The model would be in accordance, e.g. with the initiative of the BNetzA to demand of the current transmission system operators to improve the coordination of dispatch of regulating reserve in the German power market. In this respect the model can be regarded as the (prospective) status quo.
- System Control Joint Venture– In this model the coordination of procurement and dispatch of regulating reserve would be expanded to other network services. For this, a Joint Venture could be established which would take over the day-to-day system control across the four current control areas. The grid asset ownership could remain either with today’s owners or be devolved to new owners. Owners of the System Control Joint Venture could be either the transmission system owners (jointly) or other owners.
- System operator with partial grid ownership – As in the previous model, one institution would be responsible for the control of the current control areas. However, in this model one of the current transmission system operators would take over system control for the whole system. This transmission system operator would be grid owner and system operator in his traditional control area and at the same time system operator without grid ownership in the other control areas. This model is similar to a proposal which has been proposed by RWE.
- Partial merger solution („Partial Grid Company for Germany“) – In this model, some of today’s transmission grid companies would merge. The geographical overlap of system operation and grid ownership of the current control areas would be sustained.
- Full merger solution („National Grid Company for Germany“) – In this model, all of today’s grid companies would merge. The owners could be

today's owners (partially or fully) or new owners. System operation and grid ownership would be kept together in one single company.

The coordination and integration models outlined above could be open for international co-operation or mergers. For practical reasons, solutions focussing on the integration of the current German grids appear more practical than solutions that also integrate foreign grids at this stage. However, all integration models should be open for international further development and extensions.

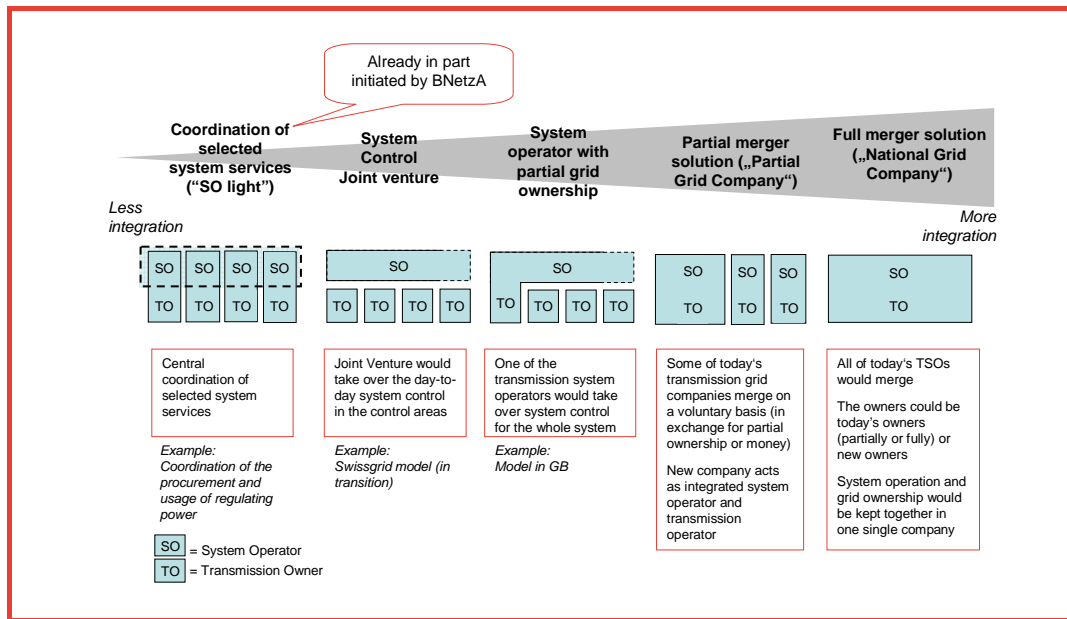


Figure 1: Overview of structure options

Source: Frontier

Preselection

- Minimum solution – The minimum solution is the model with the intensified coordination of selected system services („SO light“). BNetzA already pushes for this model by e.g. demanding for a tighter coordination in the dispatch of regulating reserve. The key question therefore is, whether the other models are superior to this “SO light” model.
- Models with the separation of system operation and grid ownership bear several disadvantages because
 - they create an inherent conflict of interest between system operators and grid owners which may e.g. lead to delayed investments;
 - it is ambiguous if an adequate regulatory incentive regime for the system operator can be implemented which is comparable to an incentive system for an integrated system operator (SO)/ transmission owner (TO). Efficiency losses could occur in the long-term due a lack of efficient incentives; and
 - the model may have negative cost implications compared to an integrated system operator (SO)/ transmission owner (TO). Financing costs for the

grid assets may be higher. However, negative cost implications might be lower for the “System Operating Grid Owner” model (one transmission system operator for all control areas – with ownership/system operation separation for the other areas) since system operator still owns some assets.

- Partial or full merger – Both models are in principle reasonable options even though the assessment of the models differs in detail. Both models have advantages compared to the “SO light” model in which synergies are only partially exploited:
 - The partial merger model can likely be realised more easily in practice, e.g. with a merger of the E.ON and the Vattenfall networks which are up for sale at any rate. However, this solution would not allow capturing all potential efficiency gains and advantages for the wider market. The partial merger model could be an interim step to a full merger.
 - With the full merger solution larger efficiency gains could be exploited. Since two of the four Germany network owners do not appear to be in favour of this option its implementation would be considerably more tedious or politically more difficult to realise.

Further detailed questions

In case that the partial or full merger models are pursued a set of further detailed questions will need to be addressed:

- Private versus public ownership – We principally recommend private ownership (regulated by the BNetzA) as superior to state ownership. Private ownership best ensures that economic incentives drive efficiency and innovation. However, there is a possibility that the state could act as a temporary owner of the transmission grid especially in the case that the envisaged final organisational structure of the grid companies can not be achieved in one step and by the sole co-ordination among private players.
- Number of owners – In principal, there is no reason to strive for a specific number of owners or to limit the number of investors – subject to meeting unbundling requirements from generation, trade and retail sales.
- Strategic versus institutional investors – We principally see no reasons which favour either a model with strategic or institutional investors.¹ In either case it should be ensured that the future organisational entity will have available the required professional, technical and economic resources. It has to be ensured that experts from the network industry as well as experienced management staff are available for the future transmission company. We do

¹ It may be argued that strategic investors may be preferable due to the option of know-how exchange and best practice transfer. However, German grid companies meet the highest technical standards today even when compared to international standards. Therefore, knowledge exchange and know how transfer may not be an essential criterion for selecting an investor from our point of view.

not expect that the availability of adequate resources is an issue given a large pool of experienced employees and experts from today's grid companies.

- Preferred allocation of stakes in the grid company shares for particular stakeholders? The access to grid company shares should be exclusively driven by financial considerations. All potential investors should pay the market value for the company shares (determined e.g. through a bidding process). Particular stakeholder groups would have to compete with other investors for the company shares on an equal basis. If policy makers aim at influencing the operation and development of the transmission networks this can be achieved by appropriate laws, decrees, orders and regulations. In our opinion, it could be detrimental if specific interests of particular stakeholder groups were fostered by a preferential allocation of grid company shares (especially if financial conditions for the procurement of the shares were not market based).
- Governance – We furthermore recommend that the competence to take corporate decisions exclusively rests with investors holding a financial stake in the company. Interest groups without a capital shareholding should not be represented in the decision-making bodies (except as legally stipulated by laws on labour representation). Again, if policy makers aim at influencing the operation and development of the transmission networks this can be done by appropriate laws, decrees, orders and regulation.. Allowing interest groups without any capital commitment to influence major company decisions could lead to uneconomic decisions for which the interest groups would not have to take the commercial responsibility. This, however, does not exclude the option of an intensive exchange of information between interested stakeholder groups and the grid companies e.g. through consultation processes, advisory bodies etc.
- Legal form of the grid company – A suitable legal form for the grid company in Germany would be the publicly listed company (Aktiengesellschaft (AG)). The form of an AG is advantageous as it offers the option to raise capital from the capital market in an easy way – especially in view of the challenge of high future investment requirements for the German electricity grid. Another option would be to combine today's electricity grids in a foundation and to source out the net operation in the form of an AG in which further stakeholders can participate – and later on even further grid operators. The advantage of this solution could be the continuity of ownership (desired by some politicians) at least for the part of the AG that is owned by the foundation. However, a disadvantage would be that it could be more difficult to raise additional capital in the financial market than it would be the case in the “AG” model. Furthermore, efficiency incentives deriving from an incentive-based regulation may not work or may work more weakly in the foundation model. This applies especially if the mission of the foundation would not (only) include commercial profit targets but also other, e.g. environmental or social objectives. Moreover, the incentives for today's grid owners to bring their networks into such a foundation is unclear. A further variant could be to arrange state ownership in the grid company through a foundation. As already indicated the state role may come into play as a

transitional arrangement and it would be very difficult to limit the duration of the state-ownership to a specified time period in the foundation model. Finally, it would also be possible to choose the legal form of a limited company (Gesellschaft mit beschränkter Haftung (GmbH)). However, compared to the legal form of an AG we would regard this option to be disadvantageous especially in terms of the ability to raise funds in the capital market.

International Dimension

The future structural model for the German electricity grid should be open towards and encourage international co-operation. International grid company integration or enhanced cooperation could help to pursue the objectives of the German government and of the EU in terms of energy and competition policy. Like the models of a stronger national cooperation and integration an international cooperation/integration would offer several advantages in terms of

- Efficiency of operating the existing networks – e.g. by optimising the congestion management at the cross-border interconnections or the international coupling of energy markets, respectively;
- Optimising the expansion of networks – due to extensive loop flows within the European network, a best possible optimisation is only achievable if network investments are planned and undertaken across borders;
- Efficiency of energy trading –increased international grid company integration can help improve the international integration of markets for generation/wholesale trading, regulating power and sales.

For practical purposes, however, steps towards national grid company integration should be prioritised over the international company integration. Already on a national scale, there will be numerous challenges in the course of grid company integration. Internationally, there will be further challenges especially in terms of

- Differences and - in parts - even contradictions in national regulatory frameworks especially regarding network investments which have an impact on cross-border electricity trading; and in terms of
- Considerable differences within the ownership structures of neighbouring transmission grid companies – especially due to state ownership in neighbouring countries (Netherlands, France, Austria etc.).

Against this background, implementing international solutions can be expected to require significantly longer than a national solution. If an international solution was prioritised from the very beginning, this could delay the realisation of a solution for Germany as a whole. For the time being, we would therefore recommend the preferred realisation of a partly or complete merger solution for Germany.

Transformation Process

In order to limit time requirements for the realisation of the integration and thus e.g. minimise the possible threat of a potential investment delay, we recommend improving the cooperation on system services (e.g. the current discussion about an improved dispatch of regulating reserve) on one hand and corporately integrating grid companies in parallel.

We consider that it would be less advantageous to proceed sequentially and to aim for a full and comprehensively regulated system service cooperation in a first step and then a merger of the grid companies in a second step. It should rather be left to the owners of a newly integrated entity to decide whether and how they want to develop a new functional organisation structure „from inside“ the company. Additionally, the time requirements of a sequential approach would be much higher than of a parallel approach.

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