Statkraft
Position on Capacity Markets for the German Power Market

Summary

The need to introduce capacity markets (or other mechanisms aimed to stimulate investments in conventional power plants) is currently discussed in Germany.

In this respect, Statkraft is of the opinion that:

- There is currently no need to intervene in the German wholesale power market and to introduce capacity markets or stimulate investments with direct subsidies. Energy only markets have worked very well in Europe and have attracted sufficient investments in new power plants.
- Statkraft understands that the sudden shutdown of 5000 MW nuclear capacity shifts the regional load balance such that it may cause severe and acute challenges for TSOs to maintain a secure system. These challenges need to be addressed on the network side.
- The monitoring of reliability of supply (especially to monitor whether the market will and can deliver a sufficient level of adequacy) is important and must be performed at a European level. Also the discussion on the need, and if needed, on the design of capacity markets must be performed at the European level.
- Efficiency of the system must be given priority. Market mechanisms are best suited to identify the most efficient technologies for production and balancing also in a changing environment. Energy saving in general should be paid more attention.
- Energy only markets are today the most suited to provide the right price signals for both optimal dispatch of power plants as well as to attract investments in the right mix of technologies including demand flexibility.

Introduction

The German energy market faces a period of transition. Renewable energy is subsidized through feed-in tariffs and the target is to achieve a share of 50% renewable electricity in 2030 and 80% in 2050. Conventional power plants will remain important to balance the variable (non controllable) output of renewable sources. Consequently, the number of operating hours of conventional power plants will decrease, forcing them to either earn higher margins in fewer hours or to shut down.

The German government decided to exit nuclear power in 2011 and 5000 MW was directly taken off the grid, calling intuitively for replacement capacity. But power prices and spark-spread levels remained rather low indicating no business case for investments in new gas-fired power plants.

As a consequence one-off subsidies for the construction of gas-fired power plants and/or capacity mechanism were put up for discussion.

In this position paper, Statkraft Markets GmbH expresses its general concerns and opinions on these developments based on a first in depth analysis of the needs of the system.

Statkraft in Germany

Statkraft is Europe's leader in renewable energy and wants to further strengthen that position. It fully supports EU and German targets towards a renewable energy supply and has a unique position to contribute towards solutions to the world's climate change.

Statkraft is one of the few new entrants in the German power market. It has now 2215 MW installed generation capacity (mainly gas fired) in Germany and it performs energy management & wholesale trading activities throughout continental Europe from its office in Düsseldorf. Statkraft does not perform retail supply activities in Germany.

As a non-integrated electricity producer and wholesale trader, Statkraft is strongly dependent on well-functioning wholesale power and gas markets.

Position

Do not intervene in a well-functioning power market

The question whether energy-only markets can provide sufficient investment signals to maintain a sufficient level of reliability of supply is not a new concern. This question has been discussed since the power market was liberalized. In general[1], it is believed that generation adequacy[2] decisions can be left to the market. Inadequate supply will result in high prices which in turn encourage new capacity. Customers should be allowed to decide how much they want to pay for and suppliers should decide how much to invest. These are individual economic and risk management decisions.
However, such conclusions only apply if a liquid market can exist, if the market structure allows for sufficient competition and if the market is not restricted for example by price caps. The German power market is the example of the best functioning power market in continental Europe. It is a liquid wholesale market with many active traders, it is well integrated in Europe with interconnectors with nine other member states, it does not suffer from price control and it has a fully liberalized retail market with industrial consumers being directly active on the energy market. In practice, energy-only markets in Europe have functioned extremely well and generators have invested heavily in new capacity over the last years after an initial response of reducing overcapacity in the first period of liberalized power markets.

Opinion: Be cautious before to intervene in a well-functioning market. Capacity mechanisms might easily distort the market, might lead to over investments or inefficient investments and can for example block a market driven development of demand side participation. Instead of proposing major redesign, it is important to remove the still existing, smaller barriers for well-functioning energy markets and the wholesale gas market in particular. Further improvements in the functioning of the power market in the longer term can be found in a gradual redesign towards a more market based support scheme for renewables (to allow for a more market based dispatch and reduction of generation in case of over-

[1] See for example "Capacity Payments and Supply Adequacy in Competitive Electricity Markets", by S. Oren
[2] Adequacy can be defined as the ability of the system to supply the aggregate electric
power and energy requirements of the consumers at all times. Security can be defined as the ability of the system to withstand sudden disturbances. Security is a public good and TSOs are responsible to maintain an agreed level of security.

supply and security problems) and the implementation of smart meters with real time pricing to further stimulate demand side response.

Do not introduce capacity markets as there currently is overcapacity

Statkraft notes that there is currently overcapacity in the German power market caused by the reduced growth of consumption since the financial crisis and by the large increase of renewable generation (wind and solar). Statkraft's old gas power plant fleet hardly runs and occasionally provides operating reserve or reactive power support to the TSOs. The next winter will show whether it is economically feasible to continue to run these lower-efficient power plants. In case energy prices spike at certain times, old generators will be kept alive and new sources such as demand response will also be developed. Germany alone is suspected to have hidden reserves on the demand side in the magnitude of several Gigawatts, most likely much cheaper to tap than building new peak capacity. These reserves are hidden but will be exploited as soon as prices signals emerge.

Opinion: Be cautious in proposing capacity payments or subsidies for new capacity as there is already overcapacity on the German power market. Allow price signals to emerge and new intelligent reserves such as demand response to be exploited.

Grid and system security concerns are valid but should not be tackled with capacity markets

Reliability of electricity supply is determined by both market forces that should result in a sufficient level of available generation capacity as well as by TSOs and local grid companies that are responsible for both a reliable grid but also for a secure system (like frequency control, voltage control and black-start capabilities). Statkraft understands that the sudden shutdown of 5000 MW nuclear capacity has an impact on the security of the grid. However, system security challenges cannot and should not be addressed by introducing a capacity market if that would result in overcapacity and power plants only used for providing system services to TSOs. System security challenges must be addressed in different ways (e.g. by investing in lines, reactive power compensators or FACTS).

Also BNetzA[3] concludes that there is no major concern for supply shortages in the medium term. The security concerns for next winter seem to be temporary and moreover mainly related to transmission bottlenecks and to some delayed ongoing power plant projects under construction.

Obviously, network investments are needed to avoid structural transmission bottlenecks. Statkraft also supports developments towards a situation in which the TSOs have contracts in place covering all relevant German power plants to allow for re-dispatch to optimally manage network constraints. Shorter term concerns related to possible shortages in the coming winter require targeted and concrete actions.

Opinion: Statkraft understands that the sudden shutdown of 5000 MW nuclear capacity may cause severe and acute challenges for TSOs to maintain a secure system. However, these challenges cannot and should not be addressed by introducing a capacity market if that would result in overcapacity and in power plants only used for providing system services to TSOs.

[3] See Auswirkungen des Kernkrarftwerk-Moratoriums auf die Übertragungsnetze und die Versorgungssicherheit

Regularly monitor whether the market design sufficiently supports reliability requirements

Germany aims to have 80% renewable electricity generation in 2050. This means on the one hand, that conventional power plants still play an important role even in the far future and a well-functioning market will remain of high value for an optimal dispatch of conventional power plants. At the same time, zero marginal cost generation will dominate the scene. Consequently, conventional power plants and demand response in energy only markets will require high prices (spikes) in hours with a tight supply demand balance. It needs to be monitored whether continuous reliance on such price signals is a sufficiently stable and endurable situation with increasing levels of renewable energies. A bi-annual monitoring period seems appropriate, possibly complemented by occasional studies on the need for and the benefit of market design changes such as: capacity markets, capacity payments, capacity obligations (on suppliers/consumers) and enhanced reserve products (procured by TSOs).

Opinion: Market design changes might be needed in the far future. Proper monitoring is therefore important.

Take a European approach

The socio-economic impact of black-outs can be enormous and monitoring of reliability of supply is therefore an important task which is currently performed by national authorities. Several member states perform national monitoring and assume zero import from neighbouring countries. Such an assumption is understandable from a national perspective but is too pessimistic from a European perspective. The European market is an integrated power market. A pure national approach by each member state would result in overestimating the security concerns. Also the problem of intermittency of renewable sources would be overestimated.

Likewise measures to tackle adequacy of supply concerns (assuming that such concerns are real) will have repercussions for the European power market. If such measures are implemented at the national level and if they are not harmonised, they will lead to enormous distortions of trades and investments, and consequently in a welfare loss. The EU security of supply directive prevents that cross-border transactions are treated differently in favour of national objectives. This also means that for example German (possibly subsidised) sources for energy will be dispatched against German market prices that may well be determined by shortages in other member states.

Opinion: Monitoring of adequacy of supply must be done at a European or at least regional scale as otherwise adequacy problems will be overestimated. Possible measures (like capacity markets) need to be coordinated and harmonised with neighbouring countries.

Consider alternatives: Storage and the Norwegian battery provide a low cost option

The current debate about the need of capacity mechanisms and investment stimulations applies in the same way to storage. Storage is generally regarded as necessary to balance intermittency and variability of renewable energy sources. Especially the challenge of long periods with low wind is demanding, at least when approaching 2030 levels. But storage is also important to avoid renewable energy being lost in periods of high wind and low load. Many technologies are discussed today, and the market design should support a competition for the cheapest mix of solutions including storage, peak generation and demand response.

Opinion: The concerns and ideas expressed in this position paper on capacity mechanisms also hold for investments in storage. This means: be cautious, only intervene if really needed and take a European and market-based approach.

In addition, Statkraft wants to underline the importance of flexibility that can be provided by Norwegian hydro reservoirs. The existing Norwegian hydro storage capacity is huge (84.1 TWh compared to 0.04 TWh in Germany). This means that this existing capacity can already be used for the German market if new cables between Norway and Germany/continent would be realized. In addition, the Norwegian generation capacity as well as pumping capacity can be further increased without realizing new reservoirs. If bottlenecks in the Norwegian grid would be critical for such employment of Norwegian reservoirs then some dedicated Norwegian capacity (possibly expanded with pumps) could be operated in a different mode to relieve such bottlenecks. It is apparent that existing Norwegian reservoirs in combination with more DC cables provide a low cost option much more attractive than storage options inside of Germany. One example of such a German solution is the “renewable gas scenario”, which is based on the transformation of electricity into hydrogen (in cases of oversupply of renewable sources) and transformation of hydrogen into methane which will then be transported through the gas system. This solution has the benefit of easy storage however the low conversion efficiencies make this option far less attractive then the Norwegian reservoir option.