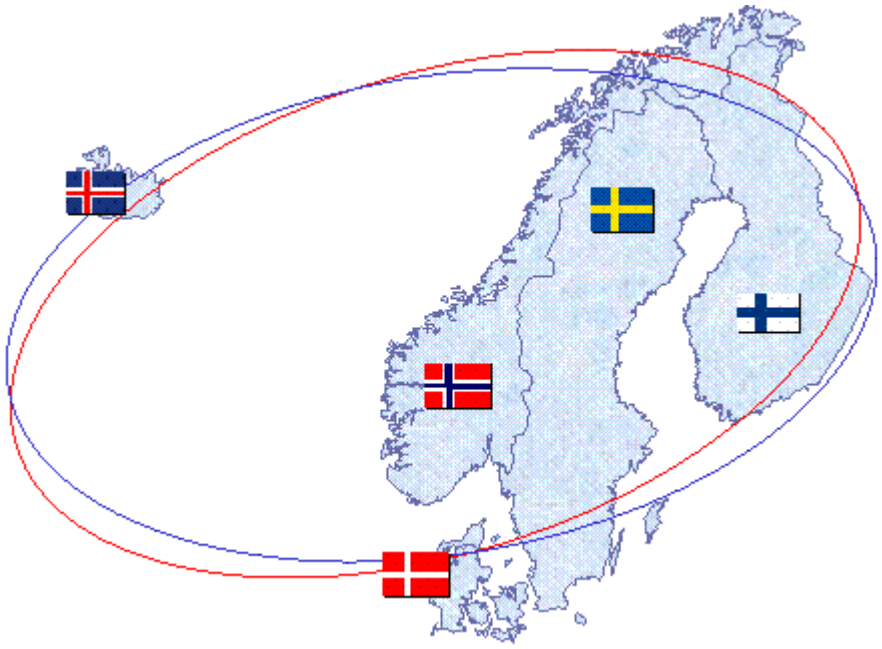
Guidelines for implementation of transitional peak load arrangements

Proposal of Nordel



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Nordel's Guidelines for implementation of transitional peak load arrangements

Executive summary

Nordel has earlier concluded that the Nordic electricity market should be designed to solve peak load problems and interventions in the market should be avoided. However, the EU-Directive 2003/54 empowers the Member States, as a last resort, to introduce a tendering process, or similar safeguarding measures, in order to ensure security of supply. To minimise the negative impacts on the market if a country decides to launch such measures, guidelines for a harmonised transitional peak load arrangement has been made. The guideline includes common methods for assessment of the power system adequacy and relevant market design issues.

Before implementing a tendering procedure the Nordic TSOs should be consulted to evaluate how the peak load arrangement may affect the market with the aim to minimise the negative impact on the market. A peak load arrangement should be an exceptional and temporary solution to overcome a critical period. The time period of the arrangement should be fixed in advance and as short as possible depending on the situation in the country concerned, with a maximum length of 3 years.

Implementing a peak load arrangement would be a national decision. However, any decision to launch a tendering process, or other safeguarding measures, should be based on consistent information and analysis. Nordel makes yearly assessments of the future power balances in the Nordic system and communicates the results to the stakeholders. The adequacy of the Nordic power system is analysed using a well-established method together with a calculation model taking into account both the generation and the transmission system. The Nordic power system is divided into 15 areas and the transmission capacities between these areas are included in the calculation model. Two different risks levels will be analysed based on a probabilistic approach: risk for a "Market failure" and risk for a "System failure". Risk of market failure describes the market's ability to meet the commercial commitments and risk for system failure describes the risk for load shedding. Nordel considers extending the time horizon up to six years ahead. The advanced information on future Nordic power balances will help the market players to react in due time.

Any peak load resources coming from the above mentioned arrangement could be activated in all marketplaces: Elspot, Elbas and the Regulating Power Market. The peak load resources shall be offered first in the Elspot- and Elbas market. All remaining available resources can thereafter be offered in the Regulating Power Market. The resources shall only be used after all the commercial bids have been activated. The bidding price should be equal to or higher than the last commercial bid.

The acquired peak load resources will be paid a compensation for ensuring their availability in critical situations. In principle, those who get the benefit of the peak load arrangement should cover the cost of the arrangement. A flat fee that is separated from other fees should finance the cost of the peak load arrangement.

1. Harmonised rules to promote the Nordic market model

Nordel concluded in the report *Peak Production Capability and Peak Load in the Nordic Electricity Market* /2/ that the market should be designed to solve peak load problems and that intervention in the market, such as special arrangements, should be avoided to provide proper incentives for the decision making of the market players. Harmonised legislation and regulation concerning roles and responsibilities were seen as vital preconditions for the Nordic market model.

The EU-Directive 2003/54 stipulates that member states shall ensure the possibility, in the interests of security of supply, of providing for new capacity or energy efficiency/demand-side measures through a tendering procedure or similar safeguarding measure on the basis of published criteria. The term "tendering process" is used here to cover not only new capacity but also existing resources that otherwise would not be available

If a country decides to implement a transitional peak load arrangement, Nordel recommended /1/ that a harmonised Nordic procedure to initiate a tendering process, or any safeguarding measure, should be developed in order to minimise the negative impact on the market. This procedure should be objective, strict and based on a Nordic approach. Its objective should be to give the market players signals that an interference with the market mechanisms will be initiated only in extreme circumstances, when the risk for an imbalance between supply and demand is foreseen to become high for the society. In addition, the report highlighted need for common Nordic criteria to assess the adequacy of the Nordic power system.

In this paper guidelines for a harmonised procedure are presented. The paper also describes Nordel's methods for assessment of power balances in the Nordic power system.

The Electricity group under the Nordic Council of Ministers has invited Nordel /3/ to study if and how a joint Nordic long-term solution is needed to secure the sufficient peak load capacity investments. Nordel's recommendation implies that a peak load arrangement should be initiated only in exceptionally tight situations and with endorsement of the authorities and TSOs in the Nordic countries. The arrangement should secure that the resources are available to the market. The costs should be borne by the parties who get the benefit, nationally.

The authorities have the responsibility of the overall market design and the security of supply with a duty to react in case of market failure. The market fails when the production does not meet the demand in specific hours. The TSOs are responsible for the operational security of the power system and the adequacy of the operational reserves for that task. If, a permanent peak load arrangement would be introduced, it would have a negative impact on the functioning of the market and it would undermine the roles and responsibilities between the TSOs, authorities and market players.

2. Provisions of EU legislation (Directive 2003/54)

According to EU legislation (Directive 2003/54) a tendering procedure shall be initiated by the member state i.e. Government or competent authority. The directive

states that the tendering procedures only can be launched if on the basis of the authorisation procedure (directive article 6) the generation capacity being built or the energy efficiency /demand side management measures being taken are not sufficient to ensure security of supply. The tendering procedure is therefore in the EU-legislation mentioned as a last possibility if market mechanisms fail.

Member states shall designate an authority or a public body or a private body to be responsible for the organisation, monitoring and control of the tendering procedure. In Denmark the TSO is designated to this task while in other countries no decisions have been made on the matter.

The authority or the designated body will be responsible for publication of the specifications at least six months prior to the closing date. The Directive includes further details to ensure transparency and non-discrimination of all tenders.

3. Methods for assessment of power balances in the Nordic power system

Nordel makes yearly assessments of power balances in the Nordic system. The forecasts for future system adequacy are presented on the Nordel website in order to give market actors, authorities and other stakeholder Nordel's view on the coming power situation in a transparent way. The information comprises forecasts for peak demand, available generation capacity and import capability. The power margin, i.e. difference between generation capacity and peak demand, is calculated for the whole Nordic area and for each country. Based on estimated import and export between Nordic counties and to/from counties outside Nordel an estimate for a market balance is also shown. On a yearly basis, the power balances have been evaluated for the next winter season and for a three-year period ahead.

The adequacy of the Nordic power system is analysed using a well established method together with a calculation model taking into account both the generation and the transmission system /4/. The major generation units are modelled separately. The Nordic power system is divided into 15 areas and the transmission capacities between these areas are included in the calculation model.

In order to improve understanding and facilitate communication of system adequacy, two adequacy levels have been defined:

"Market failure" means a situation where the power balance cannot be maintained without activating the TSOs' fast active disturbance reserves in a normal operation. The adequacy for a *market failure* describes the market's ability to meet the commercial commitments.

"System failure" means a failure in meeting the instantaneous demand in the real time operation after the TSOs' fast active disturbance reserves have been fully activated to the extent allowed in the System Operation Agreement. A *system failure* will lead to a load shedding.

In communication with the stakeholders, an estimate for the remaining capacity[1] to a *market failure* and to *system failure* is presented. A small or negative amount of remaining capacity may be an indication for further actions either by the producers (investments in new generation) or by the TSOs (investments in transmission capacity). Furthermore, the authorities can use this information as an indication of the investment climate on the market and the status of the power balance.

Nordel considers extending the time horizon for the power balance analysis to six years. A six-year period will better match with the decision process and implementation time of new generation investments.

4. Consultation procedure before implementing a peak load arrangement

The tendering procedure will be started by one country and based on the forecasts in that specific country and the Nordel forecast. However, before implementing a peak load arrangement based on a tendering procedure it is essential to invite authorities and TSOs in neighbouring countries to submit comments on the proposed mechanism and its impact on the Nordic market principles. The purpose of this consultation process is to minimise the negative consequences to the common Nordic market.

Recommended consultation procedure

> *Before implementing a tendering procedure the Nordic TSOs should be consulted to evaluate how the peak load arrangement may affect the market with the aim to minimise the negative impact to the market.*

5. Relevant issues for market when implementing a tendering procedure

In case of a tendering process a market or system failure is foreseen. A peak load arrangement will be an earmarked and subsidised resource that will have an impact on normal market functioning. In order to ensure the availability of the resource during a critical period, compensation has to be paid. The negative impact on the competitive market should be minimised (in the short term the market price, and in the long term the investment signals). The most relevant issues for the market, in connection with peak load arrangements, are

- Tendering procedure to acquire peak load resources
  - Type and volume of the resources to be acquired
  - Time period of the arrangement
- Activation and pricing of the resources
- The financing of the arrangement
- Opt-out rules

[1] The calculation tool is a statistical model based on Monte Carlo simulation. The remaining capacity is related to a defined level of risk that corresponds to a loss of load probability (LOLP) of 0.001.

5.1 Tendering procedure to acquire peak load resources

The tendering procedure aims at maintaining a sufficient balance between supply and demand. The objective is to acquire the needed resources at lowest possible cost. To enhance competition both generation and demand response resources should be invited to submit tenders. In addition, demand side resources would facilitate the development of demand flexibility and therefore contribute an added value to the long-term market development and result in lower annual fixed costs compared to generation resources.

To ensure transparency and non-discrimination between potential tenders, market based procurement procedures should be used and EU's rules on public procurement should be taken into account.

The tendering procedure should be open to existing and potential market players in the Nordic market, unless otherwise physically justified.

In order to give a stable framework and proper signals to the market players the maximum volume of the acquired peak load resources must be fixed in advance, decided by the body responsible for the tendering procedure.

A peak load arrangement is an exceptional and temporary action to overcome a critical period only. Therefore, the time period of the arrangement should be fixed in advance and as short as possible depending on the situation in the country concerned, maximum 3 years. In addition, both the time period and the volume must be communicated to the market. The number of years - maximum 3 - should be based on an evaluation of when commercially driven investments will be available to enter the market.

5.2 Activation and pricing of the resources

It is an objective of the Nordic market model, that the market should secure sufficient investments to meet the peak demand. Acquisition of peak load resources (PLR) is a special arrangement. When activating these resources an interference with the market mechanisms and existing market rules cannot be avoided. In case such arrangements are implemented, the following general objectives should be met as far as possible:

- The distortions in the market should be minimized:
    - Neither the commercially set market price nor the incentives for new entrants in the market should be reduced due to the acquisition of PLR.
    - The PLR should be activated preferably in a liquid market where many market players are bidding and there is a good transparency of the available resources.
    - In principle, a peak load arrangement should not have an effect on the roles and responsibilities between the TSOs and market players. However in practice, the TSOs may need to be involved in the practical measures like activation of the PLR having a longer activation time than the time limits in the relevant market where the PLR resource is offered.

- Forced load shedding can be avoided.
- The arrangement is transitional and affects the price in the short-term only.

The PLR may, in principle, be activated in all of the three market places: Elspot, Elbas and the regulating power market (RPM). An interference with the market mechanisms and existing market rules cannot be avoided. However, it is expected that such critical situations do not occur very often and do not last many hours at a time. In order to minimize the distortions on the market mechanisms the following guidelines should be applied:

- In case of the PLR having long start-up times, the preparedness to start-up in accordance with the rules in Elspot and Elbas should be ensured by the terms in the agreement. However, the TSOs may need to be involved and take the initiative to prepare the resources for activation based on the TSOs' forecasts.
- To ensure a harmony with the long-term market model, the PLR shall be offered first in the commercial markets (Elspot, Elbas). All remaining available resources can thereafter be offered in the Regulating Power Market (RPM).
- Due to pay-as-bid pricing Elbas is more problematic in pricing of the PLR than Elspot and RPM.
- The PLR units shall be offered in merit order in each price area.
- In Elspot or RPM, the PLR shall only be activated after all commercial bids have been activated. In Elbas, there is no clear signal, when all commercial bids have been utilised.
- In all cases the price should be equal to or higher than the last commercial bid.

These recommendations are based on the existing rules and market design.

5.3 Financing of the peak load arrangement

Peak load arrangements are intended for ensuring the power balance. The acquired peak load resources will be paid a compensation for ensuring their availability in critical situations. In principle, those who get the benefit of the peak load arrangement should cover the cost of the arrangement. In most cases these are the balance responsible parties in the country where the peak load arrangement is introduced because the arrangement can be seen as a hedging cost for their risks.

A flat fee that is separated from other fees should finance the cost of the peak load arrangement. A fee based on imbalances would in most cases not be enough to cover the cost, but may be used as a supplementary source of income.

During the contract period, the PLR units can be allowed to produce for energy purposes when they are not needed as PLR. In such cases, it is necessary to assure that this generation will not create distortion on the market. A sharing of profit is needed between the designated body for the tendering procedure and the owners of the PLR units. Since the PLR units are subsidised it is reasonable that the designated body should get a bigger share of the profit. Any extra profit to the designated body should be paid back to the parties financing the peak load arrangement.

5.4 Opt out rules

The resource owners may decide to leave the arrangement. For the system security it is not a drawback, if the resources are available in any case. However, for other market players this is a sign of increased resources in the competitive markets and may have an effect on normal market driven investments. When leaving a peak load arrangement the resource owner needs to pay back the received availability fees.

References

/1/ Nordel, February 2005: Enhancing Efficient Functioning of the Nordic Electricity Market

/2/ Nordel, April 2004: Peak Production Capability and Peak Load in the Nordic Electricity Market, Appendix 2

/3/ Nordic Council of Ministers, The Electricity Market Group: Memo dated 22 June 2006

/4/ Nordel Planning Committee, November 2006: Methods for quantitative assessment of power balances in the Nordic power system