



Memo to Elmarkedsgruppen regarding demand-side flexibility

1. Introduction

Elmarkedsgruppen (EMG) has requested¹ NordREG to make an evaluation of the report “Demand response in the Nordic electricity market” by THEMA Consulting Group (THEMA report). EMG asks NordREG to consider the content of the report in relation to the work within the mandate of the regulators and present a memo recommending whether there is need for Nordic initiatives regarding demand-side flexibility that require coordinated actions on ministry level.

In this memo, we respond to EMG’s request regarding the need for coordinated Nordic initiatives regarding demand-side flexibility. Apart from commenting on the recommendations made by THEMA we also describe relevant ongoing EU-processes, with a focus on areas where coordinated initiatives on ministry level may be useful. In the evaluation of the THEMA report, we do not go into details on every recommendation but address the issues we find relevant in the context of answering EMG’s question regarding need for coordinated actions. We present a summary of our recommendations regarding the need for coordinated actions, which are presented in chapter 4.

In an additional request, EMG has also asked that NordREG address how storage is handled within the current regulations in the Nordic countries. NordREG points out that there is currently no NordREG position regarding storage, but this memo provides a brief description regarding storage per country in Annex I.

2. Previous and ongoing NordREG work relevant for demand response

Before considering the need for future actions, it is important to keep in mind the initiatives already carried out and initiated. In the following paragraphs, we go through NordREG’s or Nordic regulators’ independent work over the past few years, which we consider relevant also for demand-side flexibility.

NordREG recommends a supplier centric model which will make it easier to be an active electricity customer, increase the competition and facilitate market entry for new suppliers. Access to the relevant information is increasingly important for well-functioning markets and also a prerequisite for demand-side flexibility to develop. NordREG refers to the recommendations on Common Nordic Metering Methods², developed to harmonize rules on smart metering. NordREG believes that these rules will enhance the possibilities to offer contracts and services to customers based on actual consumption with prices reflecting the day ahead prices on Nord Pool Spot. We further refer to the report *High-level suggestions for common Nordic processes for information exchange - obstacles and possibilities*³. This work has contributed to the development of national hubs in Denmark and Norway⁴. Finland and Sweden has also taken the decision to create a hub run by the national Transmission System Operators (TSO’s); Fingrid and Affärsverket svenska Kraftnät.

NordREG considers a common Nordic balance settlement as an important contribution for a well-functioning common Nordic end-user market, as this will lower the entry barriers for suppliers and the balance responsible market participants with an ambition of operating in all Nordic countries. This measure thus

¹ Letter dated 3.12.2014

² In Sweden SWEDAC for example

³ Report 1/2012

⁴ The Norwegian hub to be operational from 1 October 2016

facilitates increased competition across the borders of the involved countries between balance responsible parties on the one hand, and suppliers on the other. The TSOs in Sweden, Finland and Norway initiated a common project in 2010 and the project will go live during 2016.⁵

NordREG has also looked into the roles and responsibilities of the TSOs and DSOs regarding information exchange, energy services, micro production and demand response. A brief summary of the content of these reports⁶ is presented in Annex II to this memo.

The Nordic regulators are currently cooperating in the preparation of statements on the Commission's Market Design Communication released on the 15 of July 2015. In the communication, the Commission present several initiatives related to the electricity market design. Actions related to demand-side flexibility are a central part of the communication. NordREG will revert to EMG if we find that there is need for coordinated actions on Ministry level regarding this communication.

The Nordic regulators are also actively involved in various tasks carried out by the Commission, CEER and ACER. Many of these tasks have the purpose of exploring the potential for demand-side flexibility or to propose changes in the electricity market design. The Nordic regulators will also follow the development of the capacity markets, as these markets are also relevant for demand-side flexibility. In CEER and ACER, regulators develop recommendations concerning the role of the DSO and the development of incentive regulation and tariff structures and one of CEER's and ACER's common task forces is currently exploring future market models for flexibility.

NordREG is also considering further work to go more thoroughly into issues related to demand-side flexibility. If NordREG concludes that such work is beneficial, we will present this work in a memo/report during first half 2016.

3. Evaluation of recommendations in «Demand response in the Nordic electricity market»

In the following sections, we address recommendations presented in chapters 7.2 and 7.3 in the THEMA report. As mentioned in the introduction to this memo, we do not address every recommendation in detail. The evaluation focus on areas where common Nordic initiatives may be useful, with the purpose to identify whether initiatives is needed on ministry level.

3.1 Brief comments on general perspectives⁷

The THEMA report points out that regulations and markets should ensure utilization of the most cost efficient resources at all times, be it on the demand or the supply side. Demand-side flexibility may increase cost efficiency in the Nordic electricity market by provision of system services at lower costs, reduced investments in the distribution grid and by improved price information in the market. The report points out that there are uncertainties regarding the future value and cost efficiency of demand-side flexibility. Any specific measures to promote demand-side flexibility should focus on correcting market failures. The report concludes that there is need for further research to understand the sum of future challenges in the Nordic power system, including how the fundamental need for, and value of, different kinds of flexibility may develop.

NordREG agrees that regulations and market rules should ensure utilization of the most cost efficient flexibility resources to cover the system's flexibility needs. From a regulators perspective, it is useful to ensure a sound understanding of whether existing regulations and market designs actually allow for all forms

⁵ Report 5/2010

⁶ *Mapping of TSO and DSO roles and responsibilities related to information exchange and Rules and regulation for demand response and micro-production* (both by THEMA Consulting group)

⁷ The following sections address the recommendations presented in the THEMA report chapter 7.2.2

of flexibility to participate on equal terms. In this context, the role of the regulators is to facilitate well-functioning markets and allow cost efficient solutions to develop, including removing barriers and correcting for any market failures as well as empowering consumers. Moreover, as described in chapter two flexibility is considered as a very important issue at European level. In the Nordic countries several changes to the existing regulations and market rules are ongoing. NordREG regards the ongoing implementation of smart meters and data hubs in all Nordic countries to be essential tools to enable demand-side flexibility, since access to better data will provide the market actors valuable information for their market operations, and enable customers to respond to price signals. At the same time, NordREG recognizes that there is not full knowledge regarding flexibility, and further research can be useful. The Commission's Market Design Communication also points to the need for analyses regarding barriers in regulations and/or market rules that may influence the possibility for demand-side flexibility to develop. Further work could e.g be arranged as joint studies in cooperation between NordREG, the Nordic TSOs and stakeholders. Before further work is initiated, there is need to evaluate on which areas further studies is expected to provide useful insight.

The question of how to develop the regulations and market rules to enhance flexibility is considered as very important by NordREG and is also an issue of great importance in the European context. NordREG therefore suggests to consider further studies to enhance the knowledge regarding demand-side flexibility. Due to limited resources, NordREG suggests that such studies are financed by NMR. If financing is provided, NordREG can come back to specific proposals for studies at a suitable point in time.

3.2 Efficient market solutions⁸

3.2.1 Spot markets

The THEMA report states that the Nordic spot price formation is already efficient, but development is still desirable and should be assessed. THEMA also point out that consumer flexibility should preferably be clarified before the operational hour and that consumer flexibility should be utilized in the spot market rather than in balancing markets when possible. The report recommends an assessment of costs and benefits of changes to the day ahead market design by shortening the time resolution to 15 minutes; moving gate closure closer to real time; apply methodologies for more accurate capacity allocation; define bidding zones by physical constraints; and consider new products that promote flexibility. The report also proposes to develop a roadmap for implementation of changes in the Nordic spot market design.

NordREG agrees with THEMA that it is desirable to develop the spot market (as well as other market timeframes). But since the Nordic Spot market is price-coupled with other regions in Europe, the future spot market design is no longer a Nordic issue. All changes need to be analyzed in this broader context. Further, the design of the spot market is highly dependent on the rules and governance structure set by the CACM guideline⁹. As an example, the price coupling algorithm used in the single day ahead market coupling is a common EU-wide algorithm. Changes to the day-ahead market rules, e.g. on changing the market time unit from 1 hour to 15 minutes or moving the market gate closure time closer to real time would be ruled by the process set out in the CACM guideline and depend on EU-wide agreements. Another example is the design of products used in the day-ahead market in order to promote flexibility. According to CACM, proposals for new products shall be developed by the nominated electricity market operators (NEMOs), be consulted at EU-level with market participants and TSOs, and be approved by all relevant regulatory authorities in the EU.

The CACM guideline also gives a possibility to decide and implement some changes to the market design at a regional level in relation to the Capacity Calculation Regions (e.g. on the capacity calculation methodology). At present those Capacity Calculation Regions are under development.

⁸ The following sections address the recommendations presented in the THEMA report chapter 7.3.1 and 7.3.2

⁹ The guideline enters into force August 14 2015.

Within this framework there might be opportunities for the Nordic countries to take the lead in relation to flexibility and suggest changes to the spot market design EU-wide or at regional level. To be successful, the regulators as well as the Nordic TSOs need to establish proposals based on cost benefit analysis.

Concerning the two first recommendations, CACM leaves no room to shortening the time resolution or moving the gate closure closer to real time in the Nordic region, without this also being implemented in the other European member states as well. In order to shorten the time resolution in the spot market, it would also be necessary to shorten the time resolution in the intraday market, the balancing markets and the imbalance settlement as well. The first step to reach a shorter time resolution in the spot market would therefore be to shorten the time resolution of the imbalance settlement period (ISP) to e.g. 15 minutes. We discuss this further in the section on balancing markets.

Concerning the recommendation to apply a more accurate capacity allocation methodology, the Nordic TSOs and regulators are according to CACM currently investigating whether a flow based capacity allocation methodology is more efficient in the Nordic system than a coordinated net transmission capacity methodology, assuming the same level of operational security. The outcome of this investigation will give direction to which methodology for capacity allocation to be applied in the future. CACM also defines a process for assessing and reviewing the bidding zone configuration. As also recommended by the THEMA report, this process will account for physical constraints.

The CACM sets procedures regarding introduction of new products to promote flexibility. A procedure for product review and product accommodation is defined, and every second year all NEMOs shall consult market participants, TSOs and regulatory authorities to ensure that the available products reflect their needs and that operational security is taken into account as regards to the available products. Pursuant to this consultation, the NEMOs shall amend the products if needed. The Nordic regulators will closely monitor proposals for new products from the NEMOs according to the approval process defined in the CACM.

The THEMA report recommends development of a road map for implementation of changes in the spot market design. NordREG points out that since most changes need to be developed and coordinated at a European level, a roadmap for implementation of changes is likely to be more meaningful and efficient if developed through ACER, and agreed among all European regulators.

That said, it may be useful if the Nordic regulators take lead when it comes to explore how to enhance demand-side flexibility in the spot market, as the spot-market in the Nordic area is already efficient to a high degree. Many other regions tend to focus on enhancing demand-side flexibility in the intraday and balancing markets.

NordREG takes note of THEMA's recommendations related to the development of the spot market. NordREG finds that the CACM guideline will cover the issues highlighted by THEMA in relation to development of the spot market design. NordREG will continue its work to influence the implementation of the guideline in dialog with the Nordic TSOs and concerned NEMOs. Since the implementation of CACM should be carried out by national regulators, NordREG sees no immediate need for further coordination of actions between the ministries.

3.2.2 Balancing markets

The THEMA-report recommends that the regulators should consider various measures specifically aimed at improving the balancing markets.

NordREG points out that harmonized European rules for the balancing markets are currently under development and the Network Code on Electricity Balancing (NCEB) is expected to enter into force late 2016. The entry into force of the NCEB will provide a legal framework for developing the balancing markets but also gradually limit the room for separate Nordic initiatives, since the rules and methodologies to an increasing extent need to be developed and approved at EU-level.

According to the ongoing early implementation initiatives of the future NCEB, ENTSO-E is planning a pan-European cost-benefit analysis of harmonizing the imbalance settlement period (ISP) for Europe. The results for this study is expected early 2016. As several European members states have already implemented a 15 minutes ISP, a possible result of the cost-benefit analysis could be a recommendation to move to 15 minutes. Further, a shorter ISP is a prerequisite to shorten the time resolution in both the balancing markets, intraday market and the spot market. As a shorter ISP and market time resolution will provide the market actors with more accurate price signals, this could provide a positive contribution to the development of demand-side flexibility. At the same time, such a change may imply cost both to the market actors and to the network operators. In order to gain more knowledge of the consequences of a change in ISP and market time resolution, a more detailed cost-benefit analysis seems necessary. ENTSO-E's pan-European study should provide sufficient information regarding this.¹⁰

According to ACER's Qualified Recommendation on the NCEB¹¹, all regulatory authorities shall, based on ENTSO-E's pan-European cost-benefit analysis (CBA), decide on a harmonized European ISP. Thus, the Nordic regulators and ministries should closely evaluate the result of the CBA, and investigate whether one could form a common Nordic position on the preferred ISP as input when the NCEB enters into comitology, and further when the regulatory authorities (after entry into force of the NCEB) shall decide on the harmonized ISP.

In order to aid implementation of the NCEB, ENTSO-E has established several regional pilot projects¹². The objective of the pilot projects is to gain bottom up experience for the implementation of different steps towards a common European balancing market. The Nordic pilot project is chaired by Energinet.dk, and the focus is to enhance the functioning of the existing regulation power market in the Nordic region.

According to the latest draft of the NCEB, all European TSOs shall also propose a list of harmonized standard products for the balancing markets, which again will be approved by all NRAs. The TSOs proposal for standard products will contain requirement for minimum bid size, preparation period, ramping period, duration, etc. These requirements are expected to influence the possibilities for flexible demand to participate in the balancing market. The Nordic regulators will, together with the other European regulators, closely evaluate the proposals for standard products in order to ensure that the product definitions allows participation of demand-side response at equal terms with other types of resources.

From NordREG's point of view, a structural barrier for demand-side participation in the balancing markets may be the requirement for minimum bid size, currently at 10 MW in the common Nordic regulating power market. When the European standard products for the balancing market are developed according to the NCEB, a likely outcome of this process is that the minimum bid size will be reduced to either 5 MW or 1 MW. In parallel to this EU-wide process of defining standard products, the Nordic TSOs are already investigating possibilities to reduce the minimum bid size, and a reduction will likely require further development of current IT-systems¹³ - by the TSOs and the market participants.

NordREG takes note of the THEMA's recommendations on improvements of the Nordic balancing market. NordREG finds that the priority during 2015 and 2016 should be to follow the NCEB Nordic pilot project and other relevant initiatives by the TSOs, and to develop and influence the configuration of the NCEB. NordREG finds it important that when the NCEB enters into comitology, the ministries should seek to coordinate their input. If wanted by the ministries, NordREG can provide input in this process.

¹⁰ Expected spring 2016.

¹¹ ACERs Qualified Recommendation on NCEB from 22.07.15

¹² For more information on the NCEB pilot projects see ENTSO-E: <https://www.entsoe.eu/major-projects/network-code-implementation/cross-border-electricity-balancing-pilot-projects/Pages/default.aspx>

¹³ ICT, Information and Communication Technology

3.2.3 Use of aggregated demand-side resources and need for balance responsibility

The THEMA report addresses that TSOs and DSOs may aggregate and activate consumer flexibility, and points out that entities who are aggregating demand response should be balance responsible parties. The THEMA report recommends that regulation on this issue will be most effective if implemented in a coordinated manner.

There are currently ongoing European initiatives regarding the role of third party aggregation of demand-side response. In the Nordic countries, implicit demand response (also sometimes called “price-based”) plays an important role. This refers to consumers choosing to be exposed to time-varying electricity prices or time-varying network grid tariffs that reflect the value and cost of electricity and/or transportation in different time periods. Armed with this information, consumers can decide – or automate the decision – to use less electricity at times of high prices and thereby reduce their energy bill. Where customers choose implicit demand response services embedded in their supply contracts the balance responsibility is not impacted.

Explicit demand response schemes (sometimes called “incentive-based”) is also used. This means that the “freed-up/ shifted” electricity is traded in electricity markets or used for other purposes. Consumers receive specific remuneration to change their consumption upon request, e.g. triggered by activation of balancing energy bids. The consumers can sell its flexibility in electricity consumption individually or by contracting with an aggregator. The latter can in principle be a third party aggregator or the consumer’s supplier. When the supplier acts as the demand response aggregator or in cooperation with the aggregator as one balance responsible party, the chain of balancing responsibility remains unchanged. In cases where the demand response aggregator is acting as an independent third party aggregator with no link to the supplier or the balance responsible party, a correct track of the balances may be challenging.

How to change market design to enhance demand-side response and aggregation of demand is also discussed in various forum at EU level. These issues are also covered by Commission’s market design communication. The EG3 group initiative – Expert Group 3 for Smart Grids, an expert group established by the Commission – has also presented material regarding removal of barriers and need for incentives to promote demand-side flexibility related to among other things aggregators. The EU regulators are also exploring implicit and explicit demand response issues within CEER and ACER and a report will be published later this year. A reflection is that at EU level there is an increased focus on explicit demand response.

Due to all these ongoing initiatives concerning the role of aggregators and aggregation of demand at EU level, we find that there is vital need for coordinated action from the Nordic regulators. In order to better understand possibilities and challenges regarding aggregation, further evaluation may be useful. Such evaluations could contribute to clarify how aggregators may act in the Nordic market, and to consider whether the regulators could agree on a common Nordic position in order to ensure efficient solutions and preserve well-functioning retail and wholesale markets.

NordREG takes note of THEMA’s suggestions related to aggregation of demand. NordREG will continue to closely monitor the European processes concerning the aggregator’s role and models for aggregation of demand in the electricity market in various forums. NordREG believes there can be need for coordinated actions on ministry level if rules for aggregators or aggregation of demand would be included in the development of the NCEB or other network codes or guidelines. The role of aggregators is discussed in the Commission’s Market Design Communication. NordREG is investigating a common position on the role and responsibilities for the aggregator. Coordination at ministry level should be considered when responding to the Market Design Communication later in October.

3.3 Peak load in local grids¹⁴

The THEMA report states as DSOs are subject to incentive regulation through revenue caps, the DSOs have incentives to stimulate demand-side flexibility when this is the most cost efficient solution. The report also states that grid tariffs according to marginal losses, interruptible contracts and capacity pricing may incentivize increased end-user flexibility. Such grid tariffs should however not be implemented in order to increase flexibility, but in order to reflect underlying grid costs more efficiently. Further that, improved grid tariff structures could stimulate increased consumer flexibility.

The role of the DSO is on the EU agenda, and the regulators have also pointed out the role of DSO as an important issue when it comes to electricity market design in the ACER-CEER Conclusion Paper *A Bridge to 2025*. The regulators within CEER has also presented recommendations related to the role of the DSO during this year¹⁵. The role of the DSO related to demand-side flexibility is also an issue within the Commission's Market Design Communication.

From a network perspective, NordREG's view is that demand-side flexibility may be used for network system operation purposes, e.g as an alternative to grid reinforcements. Such measures may be cost efficient and help lowering or postponing capital costs. Demand-side-flexibility measures might also imply a cost for the network company. Such costs may be related to possible need for adequate ICT investments, and also resulting from payment of compensation to the end-user activating the flexibility resources. A general purpose for network regulation should be to provide the network companies with overall incentives to choose cost efficient solutions for operation and development of the grid.

Through revenue cap regulation, the NordREG regulators aim to provide the network companies with incentives to utilize and develop their network in a cost efficient manner. NordREG points out that revenue cap regulation alone is not sufficient to ensure that cost efficient use of flexibility will be a reality. For flexibility to be correctly stimulated by incentive regulation through revenue caps, the cost related to use of flexibility (e.g compensation to customers) as part of network operations must be treated as any other network cost. Today the revenue cap regulations differs between the Nordic countries. All countries continuously develop their methods.

All Nordic countries have national rules on tariff design. It is an overall objective that tariffs are cost-reflective. However, NordREG acknowledge that to design tariffs that really are cost reflective in practice is difficult. Tariffs should be designed for both short and long term perspectives, and ensure revenue for network companies to cover costs. The tariffs should provide network users with short and long term price signals which contribute to efficient network utilization and network investments, which should (ideally) also include stimulating to participation of demand-side flexibility.

NordREG agrees with THEMA that there is need for further analysis regarding how to handle peak loads in local grids in a cost efficient way and the need of exploring further how the revenue cap regulation can provide correct incentives. Since these issues are also explored within CEER working groups, NordREG believes that it is suitable that the Nordic regulators carry out the necessary analyses in relation to the work in the relevant CEER groups. NordREG will also continue to closely monitor the European processes concerning incentive regulation and tariff design in various forums. The role of the DSO related to demand-side flexibility is also an issue in the Commission's Market Design Communication, and coordination at ministry level should be considered when responding to the Market Design Communication later in October.

¹⁴ This section address the recommendations the recommendations presented in the THEMA report chapter 7.3.3

¹⁵ http://www.ceer.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Cross-Sectoral/Tab1/C15-DSO-16-03_DSO%20Conclusions_13%20July%202015.pdf or CEER Ref: C15-DSO-16-03

3.4 Availability of data¹⁶

The THEMA report states that the cost of demand flexibility in buildings could be reduced if there are standards for data/information, required for small end-users who respond to spot prices and grid tariffs. Further, third parties enabling demand response should have access to data collected from smart meters.

Smart metering and information exchange issues are issues on the EU agenda. Various initiatives are ongoing, and these issues are also part of the Commission's Market Design Communication.

NordREG agrees that a prerequisite for a well-functioning market is easy access to relevant user data for market actors, if the customers has agreed to allow data access from their meters. In all countries there are regulations regarding the handling of personal data. These regulations are not necessarily energy sector specific, and consequently handled by the data protection authorities in each country. As the DSOs are in charge of the meters, there is need for regulation to ensure equal a non-discriminatory access for all market actors. At present there are rules for metering and information exchange in place in all countries.

NordREG considers that the relevant role for the regulator is to regulate standards for accessing data, rather than establishing data formats.¹⁷ Standards for accessing data should be open. This applies for accessing meter data directly from the meter, as well as access to historical usage data. The use of open standards and interoperability are key to ensure fair competition between integrated and independent parties. Furthermore the MID¹⁸ is the main tool for development of all measurement devices, including meters in the energy area. The implementation of this directive is in legislation under the responsibility of other authorities than the NRA.

When regulating the right to non-discriminatory access to data, regulations should ensure that authorized parties can access data from metering systems and data hubs, and that all parties are able to get access to all relevant data necessary to provide a good service. Third parties and integrated companies should all be able to access data under the same conditions through the metering systems or hub solutions. Integrated companies should not have any competitive advantage by having access to more or better data directly from the integrated network company.

NordREG considers that smart metering and efficient information exchange is a prerequisite for demand-side flexibility. At present, actions are ongoing in all Nordic countries related to smart metering and data exchange. Availability of data is handled through establishment of hubs, by regulations regarding customer protection and regulations regarding rights to access and standards for access. NordREG has initiatives ongoing regarding these issues, and we do not see the need for further initiatives at the moment. Smart metering and efficient information exchange are issues covered by the Commission's Market Design Communication, and coordination at ministry level should be considered when responding to the Market Design Communication later in October.

4. Summary – need for coordinated actions

In this memo, we have investigated whether there is need for coordinated actions on ministry level regarding demand-side flexibility. We find that there may be need for such coordinated actions in some areas, while coordination between the regulators in NordREG or at European level may be useful in others.

¹⁶ This section address the recommendations presented in the THEMA report chapter 7.2.3

¹⁷ When it comes to availability of data, it is important to keep in mind the role of the regulator vs. the role of the market players. The Nordic regulators do not participate in establishing data formats and standards in their national markets. On the Nordic level, this role must be carried out in cooperation between the TSOs and the industry. The customers have the right to their own data, and the right to decide whether third parties should be allowed access to them.

¹⁸ Measuring Instrument Directive Directive 2004/22/EC

For the time being, NordREG considers that the need for coordinated actions on ministry level, will most likely be related to the various ongoing EU processes. Such coordinated actions can be related to promoting that the Nordic energy markets are to a high degree already well-functioning, to avoid implementation of measures that may be in conflict with already well-functioning solutions, and to promote that the Nordic region takes the next step to ensure that flexibility is efficiently included in the markets. As these EU processes are currently running, it is too early to state specific coordinated actions. In the list below, we summarize on which areas we expect that coordination can be relevant.

- The question of how to develop the regulations and market rules to enhance flexibility is considered as very important by NordREG and is also an issue of great importance in the European context. NordREG therefore suggests to consider further studies to **enhance the knowledge of demand-side flexibility**. Due to limited resources, NordREG suggests that such studies are financed by NMR. If financing is provided, NordREG can come back to specific proposals for studies at a suitable point in time.
- NordREG takes note of THEMA's recommendations related to the **development of the spot market**. NordREG finds that the CACM guideline will cover the issues highlighted by THEMA in relation to development of the spot market design. NordREG will continue its work to influence the implementation of the guideline in dialog with the Nordic TSOs and concerned NEMOs. Since the implementation of CACM should be carried out by national regulators, NordREG sees no immediate need for further coordination of actions between the ministries.
- NordREG takes note of the THEMA's recommendations on **improvements of the Nordic balancing market**. NordREG finds that the priority during 2015 and 2016 should be to follow the NCEB Nordic pilot project and other relevant initiatives from the TSOs, and to develop and influence the configuration of the NCEB. NordREG finds it important that when the NCEB enters into comitology, the ministries should seek to coordinate their input. If wanted by the ministries, NordREG can provide input to the ministries in this process.
- NordREG takes note of THEMA's suggestions related to **aggregation of demand**. NordREG will continue to closely monitor the European processes concerning the aggregator's role and models for aggregation of demand in the electricity market in various forum. NordREG believes there is need for coordinated actions on ministry level if rules for aggregators or aggregation of demand would be included in the development of the NC EB or other network codes or guidelines. The role of aggregators is discussed in the Commission's Market Design Communication. NordREG is investigating a common position on the role and responsibilities for the aggregator. Coordination at ministry level should also be considered when responding to the Market Design Communication later in October.
- NordREG agrees with THEMA that there is need for further analysis regarding how to handle **peak loads in local grids** in a cost efficient way and the need of exploring further how the income cap regulation can provide correct incentives. Since these issues are also explored within CEER working groups, NordREG believes that it is suitable that the Nordic regulators carry out the necessary analyses in relation to the work in the relevant CEER groups. NordREG will also continue to closely monitor the European processes concerning incentive regulation and tariff design in various forums. The role of the DSO related to demand-side flexibility is also covered by the Commission's Market Design Communication, and coordination at ministry level should be considered when responding to the Market Design Communication later in October.
- NordREG considers that **smart metering and efficient information exchange** is a prerequisite for demand-side flexibility. At present, actions are ongoing in all Nordic countries related to smart metering and data exchange. Availability of data is handled through establishment of hubs, by

regulations regarding customer protection and regulations regarding rights to access and standards for access. NordREG has initiatives ongoing regarding these issues, and we do not see the need for further initiatives at the moment. Smart metering and efficient information exchange are issues covered by the Commission's Market Design Communication, and coordination at ministry level should be considered when it comes to responding to the Market Design Communication later in October.

Annex I - Storage

EMG has asked that NordREG addresses storage in one of its reports this year. We point out that there is no common NordREG position regarding storage at this point. In the following, we address the treatment of storage in each Nordic country.

Sweden

Ei believes that energy storage is likely to be part of the future solution for how the electricity network, production and consumption will be adapted to more renewable and especially intermittent electricity generation. Energy storage can provide benefits to all parties, such as producers, suppliers, customers and utility companies, through more efficient use of electricity networks and production resources.

Energy storage, i.e. feeding energy to or from a storage facility, is comparable to trade or production of electricity. A distribution system operator (DSO) may not produce, buy or sell electricity other than to cover its network losses or to ensure operations during short power outages. Energy storage represents a potential for a new opportunity, a new function, in the competitive market. Therefore, energy storage should be undertaken by actors in the competitive market - producers, suppliers - or by the customers themselves. This would be more effective than allowing a DSO, acting as a regulated monopoly, to trade or produce electricity and having Ei regulate this activity. A mixture of monopoly and competitive activities also go against the basic underlying idea of EU legislation for electricity markets and the increasingly stringent requirements for the separation of such activities - unbundling.

Owning a storage facility or renting out storage space on a commercial basis does not equal trade or production of electricity. A DSO is thus not prevented to construct an energy storage and then lease storage space to other actors. However, any such activity must be reported on separately from network operations as this activity is not covered by the definition of network operations in Chapter 1, 4 § Electricity Act (1997: 857).

In summary, Ei does not see any reason for allowing DSOs engage in energy storage in such a way that it involves production or trade of electricity, as this would contradict primary EU law. In addition, Ei does not see a need to further regulate the ownership of energy storage or the rental of storage space to other actors. Such activities are permitted under applicable law but must be disclosed separately from network operations.

Denmark

Like Ei, DERA believes that energy storage is likely to be part of the future solution for how the electricity network, production and consumption will be adapted to more renewable and especially intermittent electricity generation. Energy storage can provide benefits to all parties, such as producers, suppliers, customers and utility companies, through more efficient use of electricity networks and production resources.

However, in Denmark a distribution system operator (DSO) may only perform the activities within the license (according to § 47 in the Danish electricity Act), which is to operate the distribution grid within the definition of network operations. Other activities such as production or trade with electricity as which storage also must be considered, lies outside the license and must be undertaken by companies independent of the DSO (also § 47 in the Danish Electricity Act) with limited liability.

In Denmark storage activities are permitted for the DSO under applicable law but must be disclosed separately from network operations.

Finland

Like Ei, EV believes that energy storage is likely to be part of the future solution for how the electricity network, production and consumption will be adapted to more renewable and especially intermittent electricity generation. Energy storage can provide benefits to all parties, such as producers, suppliers, customers and utility companies, through more efficient use of electricity networks and production resources.

In Finland a distribution system operator (DSO) may not produce, buy or sell electricity other than to cover its network losses or to ensure operations during short power outages. Other activities such as production or trade with electricity including storage must be undertaken by companies independent of the DSO.

Norway

Like Ei, NVE believes that energy storage is likely to be part of the future solution for how the electricity network, production and consumption will be adapted to renewable and especially intermittent electricity generation.

NVE considers that storage is primarily an activity related to production and/or trade of electricity. In Norway, a DSO should not engage in such activities. This implies that any costs and revenues related to owning and operating such facilities must be kept separate from network operations. Energy storage is an area in development, and future solutions might include use of storage facilities as part of network operations. If so, it may be relevant for the DSO to own and operate storage facilities for such purposes, and possible exemptions to this principle may need to be considered further in the future.

Annex II – summary of recent reports

From report “Mapping of TSO and DSO roles and responsibilities related to information exchange” (By THEMA Consulting Group)

Background

The report presents a mapping of differences and similarities of the roles and responsibilities of DSOs and TSOs when it comes to information exchange in the Nordic countries. It does not aim to map the exact rights and obligations of the markets actors, but rather to provide a model on an overview level.

Conclusions

The report concludes that the Nordic countries have generally similar electricity market regulations, which also applies on rights and obligations of market players in information exchange. Most Nordic countries are currently in a transition period toward national data hubs ranging from early development to operational use.

DSOs are currently responsible for most of the functions regarding information exchange. This includes meter operation, data collection, data storage, meter data validation and distribution of data to other market participants. With a hub a number of responsibilities that originally were allocated to DSOs have been, or will be according to the outstanding proposals, transferred to the hub.

TSOs are responsible for imbalance settlements in all Nordic countries. In addition, they have varying responsibilities with regards to the development of the national data hubs.

There is also a transition toward a supplier centric model. The hubs have, will have or are proposed to have other functions. There is currently no regulation for cross-border information exchange and interaction between data hubs, but initial contact has been made in the development process to facilitate interaction.

From report “Rules and regulation for demand response and micro-production” (By THEMA Consulting Group)

Background

The report presents a mapping of differences and similarities of rules and regulation for demand response and micro-production in the Nordic countries. The report aims to provide an understanding of current national regulations. It does not describe the role of demand response or micro-production and does not review barriers for increased empowerment of the consumers.

Conclusions

The roll-out of smart meters is completed in Sweden and Finland, and is scheduled for completion in Norway 2019 and in Denmark 2020. The functional requirements for smart meters are similar¹⁹, where they include at least hourly measurement and daily reporting to the DSO as well as a standard communication output to provide access to measured data. Ei in Sweden are currently considering new functional requirements for smart meters.

The report observes that grid tariffs are not regulated specifically to promote demand response in the Nordic national markets. In all countries, national law states that tariffs must be transparent, fair and non-discriminatory. The tariff structure however is not regulated²⁰. The lack of regulation on tariff structure means that they are unable to directly promote demand response.

¹⁹ In Denmark, Finland and Norway.

²⁰ Apart from in Norway where they are regulated in some detail.

The report observes a lack of direct regulation governing third party access in the Nordic area. Third parties may however be given access to meter data in all countries by power of attorney by the consumer.