

COMMENTS ON THE PROPOSED NORDIC BALANCING CONCEPT AND MACE CONTROL MODEL

A note from Pöyry Management Consulting

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EXECUTIVE SUMMARY

Pöyry has been asked by Fingrid to conduct an independent review of the 'Nordic Balancing Concept'¹, with a focus on the economic and operational issues².

In our view, the proposal for Nordic balancing model reform should place more emphasis on the role of the market participants in resolving balancing issues

- § In proposing such a fundamental review of Nordic balancing arrangements, neither the issue of bidding zone definition, coordinated grid development or enhancing demand side participation is mentioned. These are important omissions in such an important document. Market based solutions can only work to the extent that the pricing system follows the underlying system constraints, if network investment is directed on a Nordic-wide economic basis, and if there is full competition on both supply and demand sides of the market.
- § The proposal remains focused on the control of the grid through national TSOs and the proposed IT arrangements³ and cements the Balancing Principals (Statnett and Svk) in a central position. In the future, decentralised actions by generators, DSOs, retailers, aggregators, and consumers may become a more cost-effective way of balancing, reducing the need for intervention by the system operator. The proposal should be more open to new market participants that can support system operation but may not meet standard product definitions.
- § In the future, allocation of cross-zonal capacity between market time-frames will have to be market based, more dynamic, and fully transparent. The proposal takes a step in this direction but with the TSOs taking a very strong lead and limiting the role for the market.

¹ Version 1, published June 2017. See <https://tinyurl.com/ybhyd9df>. To support our analysis we have also been given access to the "Agreement in Principle for balancing the Nordic synchronous area", 20 June 2017.

² Pöyry has carried out this assessment in collaboration with Dr Graeme Chown, an experienced power systems control and operations specialist at PPA Energy (Pty) Ltd, a wholly owned subsidiary of Ricardo.

³ The MACE control system will be developed by Fifty, the IT company owned by Statnett and Svk. Section 6, "Agreement in Principle for balancing the Nordic synchronous area", 20 June 2017.

- § The caveats on market transparency are concerning – if market transparency is a problem, it is an indication that the market design or the degree of competition is not sound.
- § It is not clear that the proposal will result in appropriate or least cost allocation of balancing resources, due to the proposed ring-fencing of reserve products for different purposes.

There are positive aspects to the proposal but many elements lack of clarity and there could be simpler ways of achieving the same goals

- § Establishing a new mechanism for payment of reserves between countries seems to be a main driver of the proposal. This could be obtained in other ways than the method outlined in the proposal i.e. a new Nordic balancing model.
- § The proposal may provide a higher remuneration to suppliers of flexibility, but does not provide guidance to how markets should be designed to provide optimal valuation and trading of flexibility services.
- § One target of the proposal seems to be the improvement of the automated frequency restoration reserve product (aFRR) and yet changes are proposed to the wider market rules before the product definitions for aFRR and frequency containment reserve (FCR) are decided.

The proposal will result in an over dimensioned system for reserve

- § The procedures described for reserve dimensioning – on a bidding zone by bidding zone basis – are expected to result in an over-dimensioned system and hence increased cost for the Nordic system overall.

From an operational perspective, the proposal is a step back from an integrated Nordic market design; other approaches could provide real benefits

- § The proposal does not explain in sufficient detail how it will solve the real operational issue in the Nordic system (i.e. reduce system frequency deviations, mainly due to ramping of HVDC cables on the borders of the market).
- § The socio-economic value of a tighter control of the imbalance for each country or each day-ahead bidding zone instead of the area frequency is not obvious and should be documented, along with an investigation of alternatives, before a new and more costly system is implemented.

The settlement model has positive elements but is not fully defined

- § There are positive elements for settlement such as 15 minute imbalance settlement period, adequate price signals, scarcity pricing etc., although we note that some of these are not dependent on the MACE model. Importantly, the settlement of exchange of balancing capacity between TSOs is outlined but not fully defined in the document. A clear positive is that the MACE model will enable costs to be allocated more precisely between countries and participants, addressing one of the main motivations for change.

A modern IT system should provide benefits but the ownership model is a concern

- § The project is intended to provide the Nordic market with a common platform that can be harmonised with the European platform and a modern advanced IT tool to support system operation.

- § It is not clear that the ownership of the IT system by *Fifty*, the joint venture between Statnett and Svk, is in line with EU procurement guidelines for TSOs; the proposal appears to block choice and competition for future development.

Evidence of a proper market design process, including stakeholder engagement is lacking and the governance arrangements are a concern given the uncertainty in the proposal

- § Well-balanced collaboration between the stakeholders in all Nordic countries has been important in achieving the stepwise improvement of the market. This collaboration should not be undermined, and we see no evidence of stakeholder engagement in the process (e.g. from utilities, other TSOs or other stakeholders). We strongly advocate the need for a dialogue process that gives Nordic stakeholders the opportunity to participate and influence the debate on an issue that will shape the Nordic market. We see no evidence in the documentation provided that a proper market design process has been followed.
- § The lack of clarity in the proposal raises questions around the governance model. The proposal documentation contains important design details that are left to be decided later, mainly with the Balancing Principals as the responsible parties. This creates issues with the evaluation of the concept as a whole and raises important questions relating to the regional governance model of the Nordic system.

1.1 Structure of this document

The rest of the document is structured as follows:

- § Section 2 presents our introduction, background and perspective;
- § Section 3.1 presents our detailed commentary around the 12 design principles;
- § Section 3.2 presents a summary of the respective detailed sections of the MACE proposal documentation; and
- § Section 4 presents conclusions.

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2. INTRODUCTION

Pöyry has been asked by Fingrid to conduct an independent review of the 'Nordic Balancing Concept' (version 1, published June 2017), with a focus on the economic and operational issues rather than the governance arrangements⁴. We have been given access to the Agreement in Principle for balancing the Nordic synchronous area from Statnett and Svenska kraftnät, a document which provides further information.

2.1 Background

Today the balancing of frequency takes place at the Nordic system level. The existing system uses balancing resources effectively from across the region, but with some challenges that should be addressed. The allocation of balancing costs between countries, price zones and market participants at present is imperfect. In recent years, Nordic TSOs have reported challenges in controlling the Nordic frequency. In addition, the Nordic balancing model and platform needs to evolve to be in line with the European guidelines. The documentation released by Svenska kraftnät (Svk) and Statnett also reveals a further goal – to facilitate trading of balancing products⁵ and thus make the Nordic balancing model and platform compatible with the forthcoming European market arrangements.

The proposed MACE (modernised ACE) control model is the solution Statnett and Svenska kraftnät present to meet the challenges. The heart of the concept is a control system to be developed by *Fifty*, the IT company owned by Statnett and Svk. The MACE control system will calculate and decide on the activation of reserve in each of the eleven bidding zones in the Nordics using a central optimisation function. The dispatch will be subject to constraints imposed (e.g. balancing requirement and resources and transmission availability). As the MACE control model splits the Nordics into bidding zones, ACE can be measured in each zone (and costs allocated) and netting between bidding zones can be applied to reduce unnecessary activations.

In addition to the MACE control model, "The Nordic Balancing Concept" document outlines "a future proof vision" for the Nordic balancing concept (see section 1.3). Although it is stated that the document is not legally binding, the 12 design principles are reproduced in Chapter 4 of the document "Agreement in Principle for balancing in the Nordic synchronous area"⁶, which is intended to be legally binding. So, in proposing the MACE model, the direction and governance arrangements for the development of Nordic balancing markets are also being set.

2.2 Pöyry perspective

Nordic market design has been at the heart of the development of the European electricity market. The Nordic trading arrangements are the original success story for an effective international electricity system, and have formed the blueprint for the European Target

⁴ Pöyry have carried out this assessment in collaboration with Dr Graeme Chown, an experienced power systems control and operations specialist at PPA Energy (Pty) Ltd, a wholly owned subsidiary of Ricardo.

⁵ Section 2, point (b) "Agreement in Principle for balancing the Nordic synchronous area", 20 June 2017.

⁶ This document is a legal document detailing the modified terms, sought by Statnett and Svenska kraftnät from Fingrid and Energinet, to maintain their responsibility for balancing the nordic synchronous area. The document is not public but was made available on request.

Model and other markets around the world. We believe that the core design – encompassing ‘energy only’ trading, balance responsibility, bilateral markets, day-ahead market coupling, intraday trading and a balancing market, complemented by ancillary services – is robust to a system with high penetration of renewables, to a greater degree than most alternative market designs.

Pöyry has advised market participants, TSOs, regulators and ministries in an extensive series of projects in the Nordic and Baltic regions; on a series of measures to enhance the functioning of the electricity markets. A vision for Nordic market design has been developed with Nordic participants in the Pöyry’s Nordic market design forum⁷. The vision is for a Nordic market design that supports system operation, empowers consumers, sends correct and reliable price signals for efficient allocation of Nordic resources and supports innovation and the incorporation of new technologies into the market.

The core principles which Pöyry advocates are market-based arrangements which deliver efficient short term and long term incentives within a competitive paradigm; with minimal reliance on out-of-market measures. The general theme of our advice has been to sharpen incentives for balancing (especially at times of scarcity), to improve price formation, to enhance cross border trading and cooperation (for all products across all trading timescales), and to ensure that the demand side plays an active role in the markets for energy and related services. We consider these are essential features for success in any competitive electricity market. These enhancements to an already-successful market design are all in service of a system which gives better incentives for investment when needed.

At the heart of the success of the Nordic system is the diversity of the generation mix across the region, reflecting the underlying generation mix in each country, and the collaborative approach which has shown to be so effective in capturing common benefits. Evidence of the benefits of collaboration from the Nordic countries has been powerful in breaking down barriers to market coupling and narrow national interests elsewhere in Europe.

We note that the core of the Nordic system is one of a coupled locational market within defined price zones. Market based solutions can only work to the extent that the pricing system follows the underlying system constraints, if network investment is directed on a Nordic-wide economic basis, and if there is full competition on both supply and demand sides of the market.

⁷ Pöyry Nordic Market Design Forum, final report, September 2017.
<https://tinyurl.com/y7kr8nqa>

3. VIEWS ON THE MACE CONTROL MODEL AND BALANCING CONCEPT

This chapter contains Pöyry’s opinion on more detailed aspects of the MACE model. The Chapter is split into two sections:

- § Section 3.1 presents comments views on the main design features, presented in the “The Nordic Balancing Concept” document.
- § Section 3.2 presents more general comments on the documents that have been provided to us (“The Nordic Balancing Concept” and the document “Agreement in Principle for balancing in the Nordic synchronous area”).

3.1 Views on the main design features

This section contains a review of the 12 main design features of the Nordic Balancing Concept (presented in “The Nordic Balancing Concept”, section 1.3). The principles are stated (in italics) and our views written underneath (in bullet points):

1. *The synchronous area is divided into bidding zones corresponding to the main bottlenecks in the grid. Each bidding zone shall also correspond to an LFC area⁸. The bidding zone constitutes the main building block in the Nordic LFC block balancing concept:*
 - In principle, this means that there is greater accountability at the bidding zone level compared with today, while (potentially) retaining the benefits of a common merit order for balancing services.
 - There is a reliance on bidding zones in the document, but how these zones are defined, whether they are suitable, and which rules will govern the change of their boundaries in future is not explained. The present zones are established by national processes, based on very different principles, and more importantly without any form of coordination between countries. Before the introduction of a new balancing model, the Nordic zonal partition should be re-examined in a common top-down process.
 - The MACE proposal gives the impression that bidding zones have fixed borders over time, but every five years CACM GL⁹ requires TSOs to review bidding zone boundaries. It is not mentioned how the MACE concept will adapt to potential changes of bidding zone definitions. This reinforces the need for transparency of the constraints and a process to decide on network investment.
 - According to the SO GL, bidding zones do not have to be LFC areas. The reasons for the creation of LFC areas matched to bidding zones within the proposal is not clear. The new LFC areas add another layer of control which

⁸ ‘Load-frequency control block’ or ‘LFC block’ means a part of a synchronous area or an entire synchronous area, physically demarcated by points of measurement at interconnectors to other LFC blocks, consisting of one or more LFC areas, operated by one or more TSOs fulfilling the obligations of load-frequency control;
 ‘load-frequency control area’ or ‘LFC area’ means a part of a synchronous area or an entire synchronous area, physically demarcated by points of measurement at interconnectors to other LFC areas, operated by one or more TSOs fulfilling the obligations of load-frequency control.

⁹ Capacity Allocation and Congestion Management Network Code (CACM GL).

means less collaboration than already exists in the Nordic synchronous area and is therefore contrary to the SO GL and EB GL goals for more collaboration.

2. *The balancing concept is based on a 15 minute balancing market, Market Time Unit, and a corresponding 15 minute Imbalance Settlement Period is applied for the Imbalance Settlement process:*
 - In principle shorter intervals are a good way of bringing the market closer to the actual needs of the system. The move to a balancing period of 15 minutes is a positive move and will reduce the frequency spikes experienced on the hour.
 - Introduction of 15-minute balancing will require a corresponding reform in the intraday market, allowing BRPs to disaggregate and rearrange their hourly balances to 15-minute ones. The new 15-minute intraday market should have an opening auction, allowing TSOs to cover their ramping and countertrade needs.
3. *Each Balancing Party shall ensure access to sufficient reserve capacity (according to Nordic FRR dimensioning rules to be described in the New SOA in all Market time units and in all bidding zones within its control area. If necessary, market based procurement of reserve capacity and reservation of transmission capacity shall be used to ensure this:*
 - In principle this is fine provided that the maximum and most efficient use is made of resources across the Nordic area (see 4 on over-dimensioning and 7 on capacity reservation).
4. *The FRR dimensioning rules shall be based on historical imbalances and the dimensioning incident in each bidding zone. In addition each Balancing Party shall secure necessary reserves to handle congestions within the bidding zones of its control area. The FRR dimensioning rules shall accommodate proactive balancing of mFRR and reactive balancing done mainly with aFRR:*
 - The key to dimensioning is looking at the history and predicting the future. This is best done with proper modelling. For example looking at existing wind data variations and extrapolating for planned wind farms in the future both looking at capacity and distance from each other.
 - To avoid double-counting of needs, the dimensioning process must be done at a wider regional level, to allow for correlation between needs and capabilities in neighbouring areas. With the proposed approach (so far as it has been defined), which appears to consider each zone independently, there is risk of over-dimensioning and losing the benefits of reserve sharing. This could add to total reserve costs across the system.
5. *FRR dimensioning shall follow the below stepwise process:*
 - i. *dimensioning per bidding zone, based on above principles;*
 - ii. *sharing of reserves within each control area in the LFC block; and*
 - iii. *sharing of reserves between control areas, while respecting the responsibility of each control area for operational security:*
 - This appears to give precedence to reserve within a “control area” [=TSO] over sharing between control areas. If so, this seems to break the basic principles of allocation of resources on a common merit order basis, and may not lead to economically optimal outcomes (and appropriate sharing of costs and revenues). For example, if there is a high need for Norwegian reserve then the price of that reserve should be common whether the buyer is the Norwegian TSO or the Finnish TSO (aside from the potential cost of the network capacity reservation).

- The bottom-up approach is uneconomic and against the principles of EB GL. Dimensioning should be system wide with additional FRR in known congestion areas.
6. *The Balancing Principals shall develop a methodology to exchange balancing capacity. The exchange of balancing capacity shall be used as a tool to ensure sufficient balancing reserves in each bidding zone and to increase economic efficiency. The methodology shall respect capacity exchange limitations that stems from the control area responsibility to maintain operational security:*
- Governance is the key to market efficiency and from the perspective of any market design it is important to have full involvement of all of the relevant parties, not just some of them. If this were the proposed governance of any other aspect of market design, it would quickly be found inappropriate.
7. *Exchange of balancing capacity shall be secured by reservation of transmission capacity. Countertrade is a supplementary tool and shall not be used as an alternative to reservation of transmission capacity:*
- However, the limitation on use of countertrading may not be appropriate: countertrading may provide an effective adjustment mechanism, but its usage should be as limited as possible.
 - In our view, allocation of transmission capacity between market time-frames will have to be integrated into the pricing of the markets from the day-ahead market through the intraday market into balancing. TSOs will thus have to give price dependent capacity bids into the day-ahead and intraday market auctions in order to reserve capacity for balancing. Later, market participants should also be allowed to bid for capacity, however properly regulated to prevent abuse of dominant positions.
8. *The manual FRR product shall under normal operation be used to proactively balance the system and for congestion management purposes. Proactive balancing implies forecasted imbalances and to release expected automatic FRR activation. mFRR control requests from each bidding zone shall be coordinated by a central European or Nordic activation optimization function. The activation process shall be supervised by a Nordic security function:*
- This requirement appears to violate one of the key principles of a generic requirement on TSO licensing present in all European countries, as prescribed in the Directive 2009/72/CE, art 12, letter d, i.e. to be responsible for balancing in its own control area.
 - In principle this sounds as if the dispatch decisions of the TSOs are subject to a central validation process. This could raise concerns (potentially over security of supply) if this leads to increased complexity or potential delays, for example if TSOs lose tools to dispatch their local generation.
 - It is hard to reconcile the statement that “each TSO is responsible for their own ACE by requesting reserve activations from the Nordic and/or European platforms” with the fact that the activation is done by a central optimisation function (see also 9 and 10 below).
 - The separation of use between mFRR and aFRR for different purposes (see 10 below) may not be optimal: merging of mFRR and aFRR into a single merit order where constraints are also considered should result in a more optimal dispatch.
 - The Nordic Balancing Concept document, section 6 proposes “to handle grid related issues first, and use remaining resources for balancing of imbalances”.

Prioritising congestion issues (financially) could compromise economic dispatch and is arguably contrary to the EB GL¹⁰ article 40 which requires a co-optimised allocation process. The principles of marginal balancing prices in the GB BC rely on the principle of not polluting energy balancing pricing with system and local network constraints, and there is a wealth of discussion supporting this principle¹¹.

9. *Each Balancing Party is economically responsible for balancing of the imbalances within its own control area:*

- In principle this is fine, and may even be an improvement over existing arrangements which – we believe – may to some degree socialise the balancing costs between price areas. However it is very dependent on the underlying pricing and settlement model which has not been detailed.
- Ultimately the model for sharing balancing energy (and consequent imbalance prices) should **in economic terms** operate a little like the day-ahead market coupling process, with a single balancing price for each price area (and a sharing of congestion revenue between capacity holders). However, if there are price distortions (e.g. TSOs taking balancing actions out of the stack for local reasons, or operating a dual price system for local/cross zone balancing) then the results could be inefficient and also could significantly distort cash flows.
- From an operational perspective, keeping ACEs to near zero on 11 individual bidding zones basis does not improve security of supply.
- This area needs to be more carefully defined before we can form a clear view.

10. *The automatic FRR product shall be used for reactive balancing and is activated based on aFRR control of each bidding zone, coordinated by a central activation optimization function which ensures a cross bidding zone border optimized aFRR activation in the LFC block. Available transmission capacity, including potentially reserved transmission capacity between the bidding zones is utilized by the central activation optimization function to exchange aFRR balancing energy:*

- The separation of use between mFRR and aFRR for different purposes (see 8 above) is unlikely to be optimal. Ideally, they would both be considered in a common merit order.
- It is hard to evaluate this thoroughly as the document also talks about potentially redefining the balancing products (including possible aFRR product activation and response times in line with EU¹²) and there are no detailed studies presented to determine the amount of aFRR required for future years.

11. *The Balancing Parties in the Nordic LFC block shall establish joint balancing market underpinned by joint platforms for procurement and activation of balancing services. The balancing market design shall provide adequate price signals for balancing services and imbalance settlement for Balancing Parties, BSPs and BRPs, per 15 minute time period and per bidding zone. Scarcity pricing shall be applied. Scarcity situations shall be defined based on the FRR dimensioning rules:*

- In principle, the formation of a joint balancing market and joint platforms, joint activation are positive elements. Ensuring adequate price signals is a positive objective that we fully agree with.

¹⁰ Electricity Balancing Guideline

¹¹ Refining electricity imbalance and balancing prices, <https://tinyurl.com/ybpy5pcw>

¹² See Nordic balancing concept document, 5 “Balancing Products”.

- Scarcity pricing is a significant issue and needs to be defined in detail e.g. does this mean an administered scarcity price? Scarcity quantity calculations are also important: in the event of scarcity and rationing it is important the BRPs are settled on the amount which they would have been short (before rationing) not the outturn (after rationing).
- The settlement of exchange of balancing capacity between TSOs is not defined in the document.

12. *The balancing process shall strive to be non-discriminatory and transparent in all activities established under the balancing process. This implies to publish relevant market information not later than 30 minutes after real-time as long as publication does not create system operational inefficiencies or any competitive advantages or disadvantages to any market participants:*

- This seems good in principle, although the caveat seems too broad and could be used to justify many exceptions.
- If market transparency is a problem it is an indication that the market design is not sound. For example, if the market has clear incentives to act in a way which supports system operation, then transparency should always be beneficial. If there are significant distortions (e.g. poor definition of bidding zones) then this should not be an excuse to reduce market transparency. Instead, transparency should be increased to bring forward demand response and to highlight areas where network investment is needed or zones are inappropriately defined.

3.2 Other views on the MACE documentation

This section contains Pöyry's comments on the material in the documentation concerning related issues outside the main design features ("The Nordic Balancing Concept" and the document "Agreement in Principle for balancing in the Nordic synchronous area"). Our comments reflect what we see as the most important elements and the related issues and are not an exhaustive evaluation of the proposal documentation.

In a market design process, the normal procedure is to start by defining objectives (including difficulties with the status quo), to assess alternative options and then to use evidence to help select the best option, including consideration of the alternative future scenarios. Such a process normally includes an assessment of costs and benefits and their distribution before making recommendations. It is not clear that this process has been followed, and the extent and distribution of benefits of the proposed design compared to alternative designs including the status quo has not been made clear.

A proper stakeholder engagement process is essential if a fundamental market design proposal is to be successful. We would strongly advocate the need for a dialogue process that gives Nordic stakeholders the opportunity to participate and influence the debate on an issue that will shape the Nordic market. This should be done from the very beginning to build engagement and motivation among stakeholders, and would go some way to maintaining the spirit of Nordic collaboration.

The proposal is less likely to lead to a Nordic market environment where there is innovation with new technologies compared to a more market driven alternative. For example, the report mentions that "*real-time publication of the balancing state may create counterproductive signals for self-regulation*".¹³ This limits the possibilities of balancing

¹³ Section 9. The Nordic Balancing Concept.

service providers to offer non-standard balancing, which is not according a specific standard product, but which could still help the system during the operational timeframe.

There is a lack of justification and an evidence base for the proposed model in the documentation. Reasoning and evidence is missing from the proposal. For example:

- § Difference between MACE and frequency control on a basic level – it is difficult to understand where the benefits fundamentally come from based on the information presented in the paper.
- § The proposal only gives a description of proactive and reactive balancing; no explanation for the split and why these are treated as separate balancing processes.
- § The basis for handling grid related issues before balancing of imbalances is not explained in detail.

The proposal for the new balancing model is incomplete, so it is difficult to establish a robust view on the proposed model. Moreover, the proposed governance regime subjugates the Danish and Finnish TSOs under the Norwegian and Swedish TSOs in future decision making.

- § The following areas are incomplete or require further explanation:
 - Algorithm for aFRR is not described but is central to the concept.
 - Settlement of balancing capacity between TSOs is not defined.
 - Products that go into volume weighted imbalance prices are not defined.
 - The treatment of activations that solve congestion and balancing simultaneously is unclear.
- § The proposed governance model is not proper, especially in light of the incompleteness of the proposed model. It is challenging to conceive a situation where the governance model proposed could be accepted by an independent state – or indeed whether the two TSOs proposing the governance model would or could accept the arrangements if the roles were reversed.

4. CONCLUSIONS

In our view, the proposal for Nordic balancing model reform should place more emphasis on the role of the market participants in resolving balancing issues.

Well-functioning markets are a tool to provide cost effective resource allocation and incentives for new and existing market participants while delivering security of supply. The following points highlight our concerns with the proposal from this perspective:

- § In proposing such a fundamental review of Nordic balancing arrangements, neither the issue of bidding zone definition, coordinated grid development or enhancing demand side participation is mentioned. These are important omissions in such an important document. A more market based approach (based on marginal pricing with common merit order) would likely require a redefinition of the Nordic balancing zones and a coordinated Nordic approach to network investment. Our concern is that the MACE model with the emphasis on congestion management¹⁴ will not address this important issue. An IT system alone cannot be the permanent solution to overcome structural and long-term persisting weaknesses of the transmission grid.
- § In the future, allocation of cross-zonal capacity between market time-frames will have to be market based, more dynamic, and fully transparent. This is the only way the abundance of flexibility in some parts of the market can become usable everywhere. It will on the one hand allow for a more decentralised balancing model, and will also require the system operator to have better information and to take fast decisions.
- § The proposal should be more open to let market participants support system operation. For example, the report mentions that “*real-time publication of the balancing state may create counterproductive signals for self-regulation*”.¹⁵ While true in some circumstances (especially if zones fail to reflect congestion), it limits the possibilities to offer non-standard balancing services that do not accord to a specific standard product, but which could still help the system during the operational timeframe.
- § The caveat on market transparency is concerning. In our experience, if market transparency is a problem it is an indication that the market design or the degree of competition is not sound. If demand participates actively and the market has clear incentives to act in a way which supports system operation, then transparency should always be beneficial (see the more detailed comment under our review of point 12 in section 3.1).
- § The implicit assumption seems to be that congestion management is more valuable than energy balancing and it is not clear that the proposal will result in appropriate or least cost allocation of balancing resources. Furthermore, a general rule to treating congestion before energy balancing¹⁶ may be at odds with EB GL¹⁷; article 40 requires a co-optimised allocation process. Splitting balancing resources for different purposes i.e. the separation of mFRR (to be used for “proactive” balancing and

¹⁴ “*The Nordic Balancing Concept suggests to handle grid related issues first, and use remaining resources for balancing of imbalances*”. Section 6. The Nordic Balancing Concept.

¹⁵ Section 9. The Nordic Balancing Concept.

¹⁶ Ibid.

¹⁷ Electricity Balancing Guideline.

congestion management) and aFRR (for “reactive” energy balancing) is likely to result in price distortions and inefficiencies. The issue of internal congestion drives a lot of the argumentation for the proposal and the implicit assumption seems to be that congestion management takes economic precedence over energy balancing. This does not seem economically correct, and there is widespread literature on the need to separate energy imbalance pricing from ‘pollution’ by non-energy actions (i.e. those taken to resolve internal constraints or voltage control¹¹). It is not clear how the mFRR and aFRR products will interact in the market, and in the settlement model. As a result these measures could impact market functioning¹⁸, hamper formation of adequate price signals and result in inefficiencies and ‘pollution’ of the balancing prices.

There are positive aspects to the proposal but many elements lack clarity and there could be simpler ways of achieving the same goals.

While there are positive elements in the proposal¹⁹, there are numerous design elements in the documentation that are unclear or intentionally left to be defined later, which makes it difficult to reach an overall conclusion on the proposal. For example, the method of exchanging balancing capacity, the design of the settlement model, including scarcity pricing, and the aFRR algorithm are not fully elaborated. There is also a lack of important detail; e.g. an exact definition of proactive and reactive balancing.

One target of the proposal seems to be the improvement of the automated frequency restoration reserve product (aFRR) management. Yet changes to the wider market rules are proposed before the product definitions for aFRR and frequency containment reserve (FCR) are set. The role of aFRR and FCR products in the Nordics is to be increased in order to improve frequency control. The product dimensioning (including timeframes for activation and duration of response) is to be aligned with European requirements and for ‘advantageous’ Nordic participation in European markets²⁰. Given the situation, it is unclear why there is such a rush to do something for e.g. the activation of manual frequency restoration reserve (mFRR) whilst changes to aFRR and FCR are undecided

Dimensioning the Nordic system on a bottom up basis will increase costs.

The procedures described for reserve dimensioning – on a bidding zone by bidding zone basis – are expected to result in an over-dimensioned system and hence increased cost for the Nordic system overall (this is explained in the commentary around points 4 and 5 in section 3.1) compared to an integrated counterfactual.

From an operational perspective, the proposal is a step backwards from integrated Nordic market design; other approaches could provide benefits.

From an operational perspective, it is our view that less radical approaches than the MACE proposal could provide real benefits and strategic positioning for the Nordic system. While there are many potentially good elements to the proposal, we see the MACE control model at best as a step sideways from the current practice.

¹⁸ An analogy would be the way in which cable ramping is currently dealt with outside the intraday market and the consequent low volumes in that market.

¹⁹ Such as single price balancing and scarcity pricing, although no detailed design is included in the documentation.

²⁰ See Preface, Nordic Balancing Concept.

- § The current Nordic arrangements are closer to the European guidelines than the proposed MACE approach. The way that SO GL is interpreted in Nordic Balancing Concept section 1.2.1 which calls for separate LFC areas (control areas) is not the same as the goals set by the Regulation (EC) No 714/2009 calling for closer cooperation between TSO's – the stated objective in the introduction to the SO GL. We note that the central European ACE model is based on the German system which initially had the problem of trying to combine control areas with separate tools that already existed. In the Nordics, there is no such problem so we question the need for the bottom-up approach that is proposed.
- § In creating separate balancing zones and driving ACE towards zero in each, the MACE model will, in our view, increase complexity and introduce unnecessary restrictions. For example, it is unclear how TSO dispatch decisions will fit with directions issued from the MACE function.
- § We note that moving to a balancing period of 15 minutes is a positive move and will reduce the frequency deviations currently experienced on the hour boundary, but this does not require the implementation of the MACE model. This will lead to a need for a liquid 15-minute intraday market.
- § In general there are many positive issues in the Nordic Balancing Concept that do not require the implementation of the MACE model.

The settlement model is not fully defined in the documentation.

The MACE model will enable costs to be allocated more precisely, addressing one of the main motivations. Positive elements for settlement such as adequate price signals, scarcity pricing etc., are not dependent on the MACE model. Importantly, the settlement of exchange of balancing capacity between TSOs is outlined but not fully defined in the document. The main issue here is that the evaluation depends on more detailed information and the lack of definition in the proposal keeps the reader guessing. This reemphasises the need for better governance as many of the designs will be finalised later by the Balancing Principals.

Modern IT arrangements should provide benefits but the ownership model is questionable.

From an IT perspective, the ambition of the project is to provide the Nordic market with a common IT platform that can be harmonised with the European platform. The platform will also provide the necessary computational power to deal with the challenges and better allocate Nordic resources and costs. This will come at the cost of increased complexity. As acknowledged in the documentation, new and complex IT solutions are inevitable given the new products and technologies. However, it is not clear that the ownership of the IT system by Fifty, the joint venture between Statnett and Svk, is in line with EU procurement guidelines; and the proposal appears to block choice and competition.

Evidence of a proper market design process, including stakeholder engagement is lacking.

We do not see from the material that normal procedures we would expect to see in a market design process have been followed i.e. defining objectives and scenarios and then using an evidence base to evaluate the competing options. It would be helpful to understand the extent and distribution of benefits of the proposed design compared to alternative designs including the status quo.

A proper stakeholder engagement process is essential if a fundamental market design proposal is to be successful. We strongly advocate the need for a dialogue process that gives Nordic stakeholders the opportunity to participate and influence the debate on an issue that will shape the Nordic market, and could go some way to maintaining the spirit of Nordic collaboration.

In light of the uncertainty around the proposal, proposed governance arrangements are a concern.

The proposed governance arrangements show that Svk and Statnett have a more prominent role (as Balancing Principals) in the model than the two others. Amongst other things, the proposal requires decision making responsibility to be given to the Balancing Principals for design elements that are not clearly described or deliberately left undefined in the proposal. Markets rely on sound decision-making and good governance, and the governance arrangements as proposed are not balanced from the perspective of market participants across the region. In light of the uncertainty around key design elements, the governance model is lacking and there is no evidence that alternatives have been explored - for example, a single, separate organisational entity, governed by regulators and authorities in all four Nordic countries.

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