NBM
Nordic Balancing Model

SVENSKA KRAFTNÄT ENERGINET FINGRID Statnett

Single price and Single position – implementation in the Nordics

Common Market Design description

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1. Introduction

This document gives an overview of the common imbalance settlement model with associated design, as outlined in Chapter 2, proposed to be implemented in the Nordics on 1 November 2021. The proposed model is in line with the all TSO methodology for harmonisation of imbalance settlement (ISH) decided by ACER in July 2020[1], which foresees a single position and single price as default pricing, and the Electricity Balancing Guideline (EB Regulation)[2].

Even if the EB Regulation and associated methodologies are not yet implemented in Norwegian law, there is a high aim to keep the current harmonisation of imbalance settlement within the Nordics, with a highly linked balancing model and common regulating power (manual frequency restoration reserves - mFRR) market. This document therefore represents a common proposal from all the four Nordic TSOs; Energinet, Fingrid, Svenska kraftnät and Statnett.

The document is not meant to be exhaustive on all details, but to provide a common overview of the key common Nordic elements and be a supportive document in the associated national processes to implement the new imbalance settlement model.[3]

2. Overview of the model

The proposed model is based on the application of a single position (mandatory design element) and a single price (default design element) for imbalances, as provided by the ISH. In addition, to support the current Nordic balancing model, a set of additional measures are included which sets the basis for the expected behaviour of balancing responsible parties (BRPs) in the Nordics. Lastly, the model includes a revised fee structure which represent the so-called "additional mechanism" (EB regulation Article 44(3)) developed to cover additional costs related to balancing, including among other balancing capacity costs, administrative costs, as well as the use of the fee level to create incentives for BRPs.

Need for additional measures

The current Nordic balancing model is based on market participants (BRPs) planning in balance and thereafter following production plans (which are based on the expected physical production), in addition to providing available flexibility to the TSOs as balancing market bids. In the Nordics,

[1] ACER Decision on the imbalance settlement harmonisation methodology: Annex I. Methodology for the harmonisation of the main features of imbalance settlement. 15 July 2020. Follow links to access the Decision document and Annexes:
http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Individual%20decisions/ACER%20Decision%2018-2020%20on%20the%20harmonisation%20of%20the%20main%20features%20of%20imbalance%20settlement%20%28ISHP%29.pdf
http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Pages/Annexes-to-the-DECISION-OF-THE-AGENCY-FOR-THE-COOPERATION-OF-ENERGY-REGULATORS-No-18-2020.aspx

[2] COMMISSION REGULATION (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing.
https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32017R2195

[3] For supportive information, please also see the eSett Commissioning Plan (version 1.0 from May 2020 is available, update expected in October): https://www.esett.com/materials/single-balance/

this is the way for market participants to support the system. This is due to the proactive approach for activation of mFRR for both congestion management purposes and for balancing. Uncoordinated actions by BRPs and TSOs in the same time frame may lead to less efficient activation of mFRR and, more importantly, increase the risk of poorer frequency quality and overloads, and consequently result in operationally strained situations. It may therefore lead to the need to include larger operational margins in the transmission grid, including lower available capacity in the wholesale markets, as one example. Further, production plans are crucial input to the operational processes, and high quality of such plans is therefore very important.

The above-mentioned requirements are already in place and constitute a backbone in the current imbalance model, with explicit requirements on BRP behaviour and through the settlement of the separate imbalance for production based on production plans.[4]

The current balancing model will be changed with the establishment of the new Nordic balancing model (NBM), which includes transition to so-called ACE[5]-based balancing and the application of the imbalance settlement period (ISP) of 15 minutes, which may over time impact the need for additional measures. This will be further addressed at a later stage when the possibilities for changes can be properly assessed.

The Nordic TSOs therefore propose the following additional (mitigation) measures together with the single price model to limit the incentives for self-regulation (taking active imbalances) which may arise in such a price model:

- Requirement on following production plans (Chapter 5)
- Requirement for planning in balance (Chapter 6)
- Increased imbalance volume fee (Chapter 7)

The measures and their effectiveness will be monitored after go-live of the new imbalance settlement model and be subject to changes if seen as necessary.

Timeline

The proposed model is in part a transitory model both due to changes following the implementation of ACE-based balancing and 15 min ISP planned for 22 May 2023, but also due to market changes such as introduction of additional balancing energy products. Further, other aspects such as potential changes to production plans and a possible

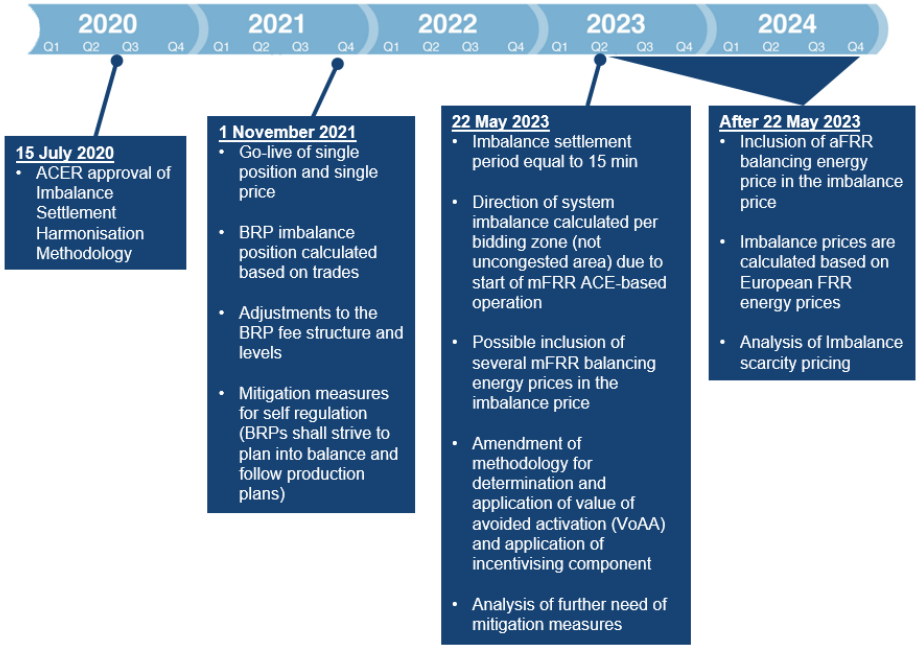
[4] Further information on this may be found here: https://nordicbalancingmodel.net/wp-content/uploads/2020/03/Current-requirements-for-production-plans-and-imbalances_FINAL.pdf

[5] Area Control Error

introduction of consumption plans may impact the proposed requirements or follow-up of these in the future. See figure 1.[6]

In the development of the proposed model the Nordic TSOs have aimed to recognise this fact, and not propose changes with only a short-term viability, but instead keep important features of the current set-up until the longer-term changes can be addressed. The Nordic TSOs find it important to focus on stability in the current phase, as there will be large changes coming up and operational processes will be under large revision.

Figure 1. Overview of up-coming changes to imbalance settlement (not necessarily exhaustive)

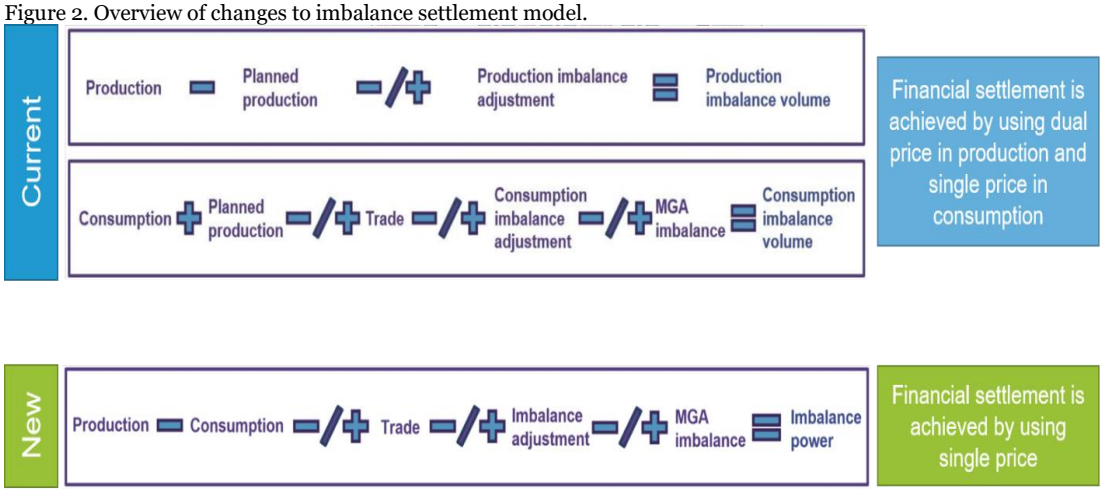


3. Imbalance calculation

In the current Nordic imbalance settlement model, two separate imbalances are calculated for production and consumption. In the new Nordic model, there will only be the calculation of a single position based on trades, as illustrated in figure 2 (taken from eSett's Single Balance Commissioning Plan).

[6] The figure indicates no change between 1 November 2021 and 22 May 2023. It is the target of the Nordic TSOs to avoid any changes to the imbalance settlement between these two dates, but it cannot be guaranteed at the current point in time that it will be possible.

Figure 2. Overview of changes to imbalance settlement model.



4. Imbalance pricing

Determination of the dominating direction

The basis for imbalance pricing in a single price model is the determination of the dominating direction (in existing Nordic terminology) or "direction of the total system imbalance" (in ISH terminology), which is detailed in article 8 of the ISH. This is necessary to select the correct imbalance price in case there is activation in both the upward or downward direction or in no direction. The current methodology of establishing the dominating direction in the Nordics is proposed to be unchanged and thereby set by the net volume of activated balancing energy from mFRR calculated per uncongested area[7].

The legal basis for the proposal is provided in the approved ISH article 8.3 (see also "point" 73 in the decision document from ACER). The target model of the ISH, where the direction of the system imbalance is calculated per bidding zone, is first feasible to implement with the transition to ACE-based balancing.

Determination of the imbalance price in case of activation of balancing energy

In case there is an activation of mFRR in the uncongested area, there will be the establishment of the dominating direction which will be either "Up" or "Down" (in existing Nordic terminology), which corresponds to respectively net positive (upward) activation of mFRR or net negative (downward) activation of mFRR for balancing purposes. In the current imbalance pricing, the mFRR price of the dominating direction is used as the imbalance price for consumption imbalances. The current pricing scheme for consumption, in case of activation of balancing energy, is proposed as the pricing scheme in the new model for the single imbalance position. This is provided for in article 7 and 9 of the ISH.

[7] A uncongested area is an area which gets the same mFRR price. This area may consist of more than one bidding zone.

Determination of the imbalance price in case of no activation of balancing energy

In case there is no activation of mFRR in the uncongested area, there will be no dominating direction. In the current imbalance pricing, the day-ahead price is then used as the imbalance price. The Nordic TSOs propose to continue to use the day-ahead price as the imbalance price in such ISPs.
This is technically achieved by the use of the so-called "incentivising component"[8]. The legal basis for this is provided by article 7, 9 and 10 of the ISH.

The reason for the proposal is to ensure consistency with the current mFRR pricing, where the day-ahead price is used as a reference. The day-ahead price sets the floor and cap for up-regulation and down-regulation, respectively. The mFRR price is defined for an uncongested area, and in hours without activation, it is defined as the day-ahead price (among other for the purposes of settlement of FCR and aFRR).

The current Nordic way of balancing is based on BRPs that plan themselves into balance and to avoid arbitrage possibilities between the day-ahead price and the imbalance price. If the imbalance price scheme ensures that the imbalance price is at least as high as the day-ahead price, market participants are incentivised to close open positions on the wholesale market. This gives an incentive for market participants to balance their portfolio.

Pricing rules for mFRR is expected to change with the implementation of the 15 min ISP together with several other changes (see figure 1). The approach for using the day-ahead price as the price in ISPs without a dominating direction is thereby also motivated by the fact that the Nordic TSOs prefer to avoid short-term changes in the interim phase, which would need revision again in the near future.

5. Requirement on following production plans

The requirement on following production plans in the current model is maintained by the settlement of the production imbalance based on production plans. The Nordic TSOs propose to transform the settlement of the production imbalance into an enforceable requirement to follow production plans, for example a contractual or legal requirement.[9]

The requirements for the quality of production plans towards the BRP will contain the following elements:

[8] The basis for the imbalance price in ISPs without activation is the value of avoided activation, which again is based on the bid price or prices for balancing energy. This value can be adjusted with among other the incentivising component, so that the final imbalance price in such ISPs may deviate.

[9] COMMISSION REGULATION (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation (SO Regulation) introduces new terminology and requirements with regards to schedules and data exchange. The Nordic TSOs have not taken a final stand on the implementation of this. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32017R1485

- The BRP is responsible for following the final production plans delivered to their respective TSO for their portfolio. The final plans are currently delivered at the latest 45 min before the start of the operating hour.

- The TSO should have the right to ask for clarification and corrective actions from BRP, as needed, if there are large and/or systematic deviations from the production plans delivered to the TSO.

- The requirements should be applied as a minimum on a portfolio level (per BRP per bidding zone per ISP), detailed level subject to national choice.[10]

A common monitoring of the quality of production plans on bidding zone level will be managed primarily in the eSett system and complemented by the TSOs' own systems and analysis as needed. eSett currently collects required settlement information and calculates key performance indicators (KPIs) which evaluate market performance of BRPs. After the go-live of the Single price model, the quality of the production plans will be one of the KPIs in the eSett system.

The monitoring and follow-up process consist of the following steps:

- Monitoring of the eSett KPIs.

- Analysis of potential deviations based on BRP-specific data.

- Contact BRP and ask for clarification, and for corrective actions as needed.

- As a last resort and in the case of recurrent systematic deviations, potential breach of contract or similar legal ramifications will apply.

To make transparent which BRPs are delivering good quality production plans, the results of the KPI calculation should be published to all BRPs. Currently, there are thresholds for the KPIs, which are defined per country, to monitor the imbalances of BRPs. Similar thresholds can then be defined for the quality of production plans as well. These thresholds are relative to account for the size of the BRP portfolio.

Any further national monitoring and follow-up on more detailed production plans is subject to national design and decision.

6. Requirement for planning in balance

The requirement for planning in balance is already in place in the BRP agreements in Sweden, Finland and Norway[11]. The Nordic TSOs propose to

[10] The requirement will be on a more detailed level at least in Norway as mandated in "Systemansvarsforskriften".

continue to have this requirement towards the BRPs as an enforceable requirement, for example a contractual or legal requirement. The requirements for planning in balance will contain the following elements:

- The BRP shall strive to plan into balance, i.e. close its expected position in the wholesale market (before the balancing timeframe).
- The TSO should have the right to ask for clarification and corrective actions, as needed, if there are large and/or systematic BRP imbalances.
- The requirements should be applied on a portfolio level (per BRP per bidding zone per ISP).

Monitoring on aggregated level (bidding zone) is based on eSett KPIs of imbalance volumes with a similar follow-up process as for the quality of production plans.

7. BRP fees

Fee structure

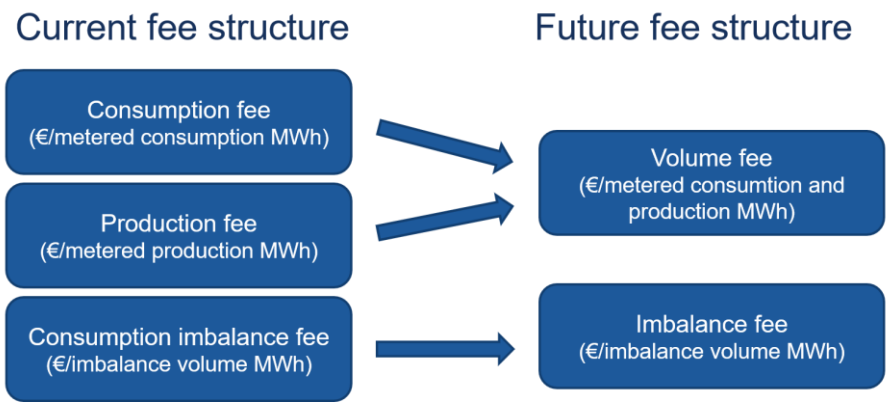
With the change to single imbalance position, the Nordic TSOs propose two changes to the current BRP fee structure[12]:

1) The consumption imbalance fee is proposed to be changed to a general imbalance fee, and

2) The production and consumption fees are proposed to be changed to a single volume fee (based on total consumption and production volumes).

The second point does not apply to Denmark as these fees are collected through the grid tariffs instead.

Figure 3. Overview of the two proposed fee structure changes



[11] In addition regulated in "Systemansvarsforskriften" in Norway.

[12] There will still be a common weekly BRP fee like today (change from monthly to weekly fee for Denmark). The weekly fee contributes to financing the balance settlement performed by eSett and applies to all BRPs, also those without a physically settled position. Further, other only national fees may apply (currently the case in Sweden).

The latter proposal regarding the volume fee is a structural change which differs from what has previously been communicated by the Nordic TSOs. The previous TSO proposal was to keep the consumption fee and the production fee as two separate fees, however the fee level would be changed to be identical. This seemed to create confusion and uncertainty among stakeholders regarding the TSOs intentions, therefore the future fee structure will now consist of one volume fee, including both total production and consumption volumes.

The two allocation keys, imbalance volumes and metered volumes, are both seen as relevant cost allocation keys for the cost base to be covered by these fees. The imbalance fee in general reflects a "polluter pays" perspective, while the volume fee in general reflect that some costs are more appropriate to distribute based on the energy turnover of the portfolio (size). In addition, the imbalance fee may provide incentives to the market participants depending on the fee level.

Fee levels

The Nordic TSOs have started to evaluate the use of the imbalance fee level to improve BRP incentives to avoid self-regulation. The Nordic TSOs also see that there is value in a harmonised imbalance fee level.

Investigation is ongoing on national level and final conclusions are not yet achieved. All the Nordic TSOs see that there is a need to increase the imbalance fee level. The split between the current consumption and production fee will naturally disappear with the change to a single fee. The level of the future volume fee will depend on the level of the imbalance fee and will not be subject to harmonisation due to different national cost bases. The Nordic TSOs will return to the harmonisation of the imbalance fee in a separate note aiming at early Q1 2021.