FINGRID

TSO report on balancing in accordance with Article 60 of Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing

28.2.2020

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1 Introduction

According to Article 60 of Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing (hereinafter EBGL), at least once every two years, each TSO shall publish a report on balancing covering the previous two calendar years, respecting the confidentiality of information in accordance with Article 11.

This document is the first TSO report on balancing published by Fingrid in accordance with Article 60 of EBGL. The report covers whole calendar years 2018 and 2019 (hereinafter reporting period).

The Executive Summary covers all the aspects required by the Amended ENTSO-E Monitoring Plan in accordance with Article 63(2) of EBGL. The Executive Summary will be contained in the European report on integration of balancing markets pursuant to Article 59(6) of EBGL.

2 Executive Summary

2.1 Terms and conditions for BSPs, in accordance with Article 18(5) of the EB Regulation

Reserve product	Terms and conditions for BSPs
Frequency Containment Reserve for Normal Operation (FCR-N)	Terms and conditions for providers of Frequency Containment Reserves (FCR)
Frequency Containment Reserve for Disturbances (FCR-D)	Terms and conditions for providers of Frequency Containment Reserves (FCR)
Automatic Frequency Restoration Reserve (aFRR)	Terms and conditions for providers of automatic Frequency Restoration Reserves (aFRR)
Manual Frequency Restoration Reserve (mFRR)	Terms and conditions for providers of Manual Frequency Restoration reserves (mFRR)

2.2 Terms and conditions for BRPs, in accordance with Articles 18(6) and 18(7) of the EB Regulation

Terms and conditions for BRPs
Balance agreement
Appendix 1, Part 1: Fingrid Oyj's general terms and conditions concerning balance management
Appendix 1, Part 2: Fingrid Oyj's general terms and conditions concerning imbalance settlement
Appendix 2: Fee components and determination of fees

2.3 Terms and conditions for the establishment of European platforms for the exchange of balancing energy and for the imbalance netting process (only for Central-dispatch TSOs), in accordance with Article 18(8) of the EB Regulation

Fingrid is not a central-dispatch TSO making the requirement in question irrelevant.

2.4 Definition of specific products and of the time period they were used, in accordance with Article 26(1)(a) of the EB Regulation

Article 26(1) of EBGL requires that following the approval of the implementation frameworks for the European platforms pursuant to Articles 19, 20 and 21, each TSO may develop a proposal for defining and using specific products for balancing energy and balancing capacity.

During the reporting period, the implementation frameworks for the European platforms were not approved. Thus, the balancing products, which were used during the reporting period, cannot be defined as specific products making the requirement in question irrelevant.

2.5 The volumes of available procured and used specific products, as well as justification of specific products, in accordance with Article 60(2)(a) of the EB Regulation

See section 2.4 above.

2.6 Demonstration that standard products are not sufficient to ensure operational security and to maintain the system balance efficiently, in accordance with Article 26(1)(b) of the EB Regulation

See section 2.4 above.

2.7 The description of measures proposed to minimise the use of specific products subject to economic efficiency, in accordance with Article 26(1)(c) of the EB Regulation

See section 2.4 above.

2.8 The process for the conversion of balancing energy bids from specific products into balancing energy bids from standard products, in accordance with Articles 26(1)(d) and 26(1)(e) of the EB Regulation

See section 2.4 above.

2.9 Demonstration that the specific products do not create significant inefficiencies and distortions in the balancing market within and outside the scheduling area, in accordance with Article 26(1)(f) of the EB Regulation

See section 2.4 above.

2.10 Ensure that Articles 44(1)(a) to 44(1)(i) of the EB Regulation are meet

Article 44(1)	Fingrid's Status
(a) establish adequate economic signals which reflect the imbalance situation	Accomplished
(b) ensure that imbalances are settled at a price that reflects the real time value of energy	Accomplished
(c) provide incentives to balance responsible parties to be in balance or help the system to restore its balance	Accomplished
(d) facilitate harmonisation of imbalance settlement mechanisms	Accomplished
(e) provide incentives to TSOs to fulfil their obligations pursuant to Article 127, Article 153, Article 157 and Article 160 of Regulation (EU) 2017/1485	Accomplished
(f) avoid distorting incentives to balance responsible parties, balancing service providers and TSOs	Accomplished
(g) support competition among market participants	Accomplished
(h) provide incentives to balancing service providers to offer and deliver balancing services to the connecting TSO	Accomplished
(i) ensure the financial neutrality of all TSOs	Accomplished

2.11 Explain the additional settlement mechanism, separate from the imbalance settlement, is in place to settle the procurement costs of balancing capacity (e.g., administrative costs and other costs related to balancing), in accordance with Article 44(3) of the EB Regulation

Fingrid uses balance and grid service fees to cover the procurement costs of balancing capacity. More information concerning the fee components used in the national Imbalance settlement and Balance management can be found from the following link: Fee components and determination of fees.

Balance service fees cover:

- 10 % of the procurement costs of mFRR balancing capacity
- 100 % of the procurement costs of aFRR balancing capacity
- 100 % of the procurement costs of FCR-N balancing capacity
- 10 % of the procurement costs of FCR-D balancing capacity

Grid Service fees cover:

- 90 % of the procurement costs of mFRR balancing capacity
- 90 % of the procurement costs of FCR-D balancing capacity

3 TSO Report on Balancing

3.1 (a) include information concerning the volumes of available, procured and used specific products, as well as justification of specific products subject to conditions pursuant to Article 26

Article 26(1) of EBGL requires that following the approval of the implementation frameworks for the European platforms pursuant to Articles 19, 20 and 21, each TSO may develop a proposal for defining and using specific products for balancing energy and balancing capacity.

During the reporting period, the implementation frameworks for the European platforms were not approved. Thus, the balancing products, which were used during the reporting period, cannot be defined as specific products making the requirement in question irrelevant.

3.2 (b) provide the summary analysis of the dimensioning of reserve capacity including the justification and explanation for the calculated reserve capacity requirements

This section comprises a summary description of the dimensioning of FCR and FRR in the Nordic synchronous area during the reporting period. It is worth noticing, that the dimensioning rules for FCR and FRR will be changed in order to comply with the Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation (hereinafter SOGL). The target model for FRR dimensioning will be based on Article 157 of SOGL and the associated methodology for the Nordic LFC block. The FCR dimensioning process will be based on Article 153 of SOGL and the associated methodology for the Nordic synchronous area. Both of the SOGL compliant dimensioning methodologies are approved by the Nordic NRAs. However, they are not described in this report any further, but instead the procedures for dimensioning that were used during the reporting period are presented below.

3.2.1 The existing situation for the dimensioning of FCR

The Nordic TSOs define two types of FCR for the Nordic synchronous area: FCR-N (Normal operation) and FCR-D (Disturbance situations). FCR-N is used for continuous imbalances to keep the frequency within the 100mHz range. For this reason, the purpose of FCR-N is not to mitigate the consequences of a disturbance such as a reference incident. The purpose of FCR-D is to mitigate the impact of incidental disturbances, including the reference incident.

At the moment the volume for FCR-N is at least 600 MW for the synchronous system. The distribution between subsystems is revised each year before 1st March on the basis of annual consumption in the previous year (annual consumption is given in TWh at an accuracy of one decimal). The share of each subsystem is rounded to closest integer given in MW and this will enter into force on 1st April.

At the moment the required FCR-D capacity is equal to the largest possible imbalance caused by the loss of individual major components (production units, lines, transformers, bus bars etc.) from all fault events that have been taken into account, deducted by 200 MW due to the estimated load frequency dependency. It should also be noticed that, at the moment, FCR-D is required only for low frequencies (49.5…49.9 Hz), which are caused by a loss of generation or import via an HVDC interconnector to another synchronous area.

The current dimensioning rules do not explicitly consider the additional network losses that may result from changing flows after a disturbance. E.g. if a nuclear plant in Sweden trips, the flows from both northern Sweden and Norway may increase which may increase the network losses which would result in a larger imbalance on a synchronous area level.

The current method for distribution of the requirements for FCR-D between the subsystems in Nordic power system is carried out in proportion to the largest possible imbalance caused by the loss of individual major components within the respective subsystem. Distribution of the requirement is updated once per week or more often if needed. Control centers of each Nordic TSO are responsible of defining the largest possible imbalance caused by the loss of individual major components on Thursday or Friday on previous week, separately for each hour. The TSO’s Nordic Operational Information System NOIS automatically calculates the amount of needed FCR-D for each TSO.

3.2.2 The existing situation for the dimensioning of FRR

As aFRR is a process under development in the Nordics and the current total Nordic determined volume of aFRR is a fixed and limited volume (300 MW) in about 1/5 of the hours of the week. The current Nordic FRR dimensioning is strongly dominated by mFRR (at least 15 times the aFRR capacity).

Dimensioning of mFRR

mFRR shall exist in order to restore the faster reserves FCR-N, FCR-D and aFRR when these reserves have been activated and to control flows in the grid within applicable limits. mFRR can also be proactively activated to prevent for frequency deviations, e.g. in case of (expected) deterministic frequency deviations. The mFRR shall in normal operation exist and be localized to the extent that the synchronous system can be balanced at any time. mFRR is dimensioned by the individual TSOs based on their control area assessment of local requirements. Bottlenecks on the network, dimensioning faults and similar are included when assessing this.

The requirements for mFRR volumes in upward direction are currently defined by large national N-1 incidents: Each control area shall have mFRR volumes available equivalent to or greater than the dimensioning fault in the subsystem. The ‘dimensioning fault’ is defined as 'faults which entail the loss of individual major components (production units, lines, transformers, bus bars, consumption etc.) and entail the greatest impact upon the power system from all fault events that have been taken into account.'

In addition, the TSOs must also have reserves or other measures available to handle other imbalances which are correlated with N-1 incidents or two or more simultaneous faults which may occur within the TSOs control area and on the borders to other control areas.

In practice, all four TSOs dimension the mFRR volumes for their control area and determine the required distribution within the control area. The mFRR volumes are based on the dimensioning fault in the control area, as described above. However, some mFRR capacity is shared between Sweden and Denmark. mFRR that shall be available for handling of 'normal' BRP imbalances are not explicitly dimensioned for in Denmark East, Finland and Sweden. For this, these TSOs rely on voluntary mFRR energy bids that are available in the Nordic Regulating Power market. In addition, Statnett relies on voluntary mFRR energy bids for most of the time. However, if the probability for availability of sufficient mFRR is too low, Statnett contracts upward mFRR. This is normally an issue in winter.

There are currently no explicit Nordic arrangements for dimensioning nor contracting of downwards mFRR since historically availability of downward mFRR bids have been sufficient. However, the TSOs see a trend that the amounts of downward mFRR bids are reducing and the need for capacity is increasing. Due to this, the Nordic TSOs will now establish arrangements to secure downward mFRR capacity.

Dimensioning of aFRR

aFRR was introduced in the Nordic synchronous area in January 2013. The background for implementing and developing aFRR in the Nordics was the deteriorating frequency quality and aFRR was identified and agreed as one of the main measures to stop the weakening of the frequency quality.

The aFRR product shall be seen as an automatic "complement" to mFRR in the Frequency Restoration process.

The Nordic LFC block centrally activates aFRR from a single Load Frequency Controller (LFC). Based on the measured frequency, this LFC calculates the required activation of aFRR and distributes the activation requests to the Nordic TSOs pro-rata. Consequently, each Nordic TSO distributes the requests to the contracted aFRR providers in its control area.

Currently, only procured aFRR capacity can be activated and therefore the complete dimensioned amount shall be procured. The TSOs procure aFRR in the morning and evening hours where the frequency variations are most challenging.

Each quarter of a year, all Nordic TSOs determine the hours for which aFRR shall be dimensioned. These hours include the hours where the frequency variations are most challenging.

The TSOs expect that future challenges will require more automated balancing. The Nordic TSOs will increase the number of aFRR contracting hours to all hours. After that, the aFRR volume will gradually be increased from today's level of 300 MW to a tentative target volume of 600MW. Larger aFRR volumes than 600 MW require another activation process in order to appropriately take structural bottlenecks in the grid into account. The Nordic TSOs therefore aim to base the future activation process on area imbalances where the LFC area equals the bidding zone. The dimensioning process will then use short-term LFC area and control area imbalances (ACEOL) to determine the needed volume and maximize internal LFC block sharing possibilities.

3.3 (c) provide the summary analysis of the optimal provision of reserve capacity including the justification of the volume of balancing capacity

Article 32(1) of EBGL states that all TSOs of the LFC block shall regularly and at least once a year review and define the reserve capacity requirements for the LFC block or scheduling areas of the LFC block pursuant to dimensioning rules as referred in Articles 127, 157 and 160 of SOGL. Each TSO shall perform an analysis on optimal provision of reserve capacity aiming at minimisation of costs associated with the provision of reserve capacity.

During the reporting period, the dimensioning rules as referred in Articles 127, 157 and 160 of SOGL were not in use in the Nordic LFC block. Therefore, Fingrid has not performed analyses on optimal provision of reserve capacity in a way that is required by Article 32(1) of EBGL. Based on this, it is irrelevant to Fingrid to provide the summary analysis of the optimal provision of reserve capacity including the justification of the volume of balancing capacity.

3.4 (d) analyse the costs and benefits, and the possible inefficiencies and distortions of having specific products in terms of competition and market fragmentation, participation of demand response and renewable energy sources, integration of balancing markets and side-effects on other electricity markets

See section 3.1 above.

3.5 (e) analyse the opportunities for the exchange of balancing capacity and sharing of reserves

During the reporting period, Fingrid has purchased Frequency Containment Reserves (FCR-N and FCR-D) from the domestic yearly and hourly markets, from the Russian and Estonian HVDC links and from other Nordic countries. In addition, Fingrid has purchased aFRR from the domestic hourly market and had the opportunity to purchase 35 MW of aFRR capacity from Sweden when reasonable. Furthermore, Fingrid has purchased mFRR from the domestic markets and had an existing contract for the utilization of Kiisa power plant, which is located in Estonia and which can provide capacity of 140 MW. However, transmission capacity has not been reserved for the utilization of the Kiisa power plant and therefore, its utilization has been avoided during times when large imports from Estonia to Finland have been foreseeable.

Along with the existing opportunities for the exchange of balancing capacity and sharing of reserves, Fingrid and other Nordic TSOs are preparing to establish Nordic cross-border aFRR and mFRR capacity markets. The purpose of the establishment of a common Nordic market for aFRR and mFRR capacity is to increase the socioeconomic welfare on a Nordic level and to increase operational security in the most efficient way. The FRR dimensioning process results in FRR volumes per LFC area (equal to bidding zone). When the common Nordic capacity markets are in use, the calculated LFC area reserve requirements can be procured from other LFC areas within the Nordic synchronous area if there is available cross-zonal capacity (CZC) that can accommodate the exchange.

According Article 33(4) of EBGL, the TSOs can either decide to ensure CZC for exchange of balancing capacity based on a probabilistic approach or in accordance with one of the three alternative methodologies specified in EBGL: Article 40 – “Co-optimised allocation process”, Article 41 – “Market based allocation process” or article 42 – “Allocation process based on economic efficiency analysis”. Based on both the theoretical assessments and the practical experience, the Nordic TSOs consider that the application of a market based CZC allocation methodology will lead to the most socioeconomic use of the CZC in the Nordic region in overall. The proposed methodology for a marked-based allocation of CZC for in accordance with Article 41 of EBGL can be used for both aFRR and mFRR.

The Nordic TSOs plan to start the operation of the aFRR capacity market during 2020, but the go-live date is dependent on the ongoing regulatory process. Regarding the mFRR capacity market, the stakeholder feedback has pointed in the direction not to prioritize the Nordic mFRR capacity market before 15 minutes time resolution, which is going to be implemented by Q2/2023 according to the current plans of the Nordic TSOs. The details of the market design for the mFRR capacity market are not yet decided.

3.6 (f) provide an explanation and a justification for the procurement of balancing capacity without the exchange of balancing capacity or sharing of reserves

The Nordic TSOs have an intention to introduce Nordic cross-border aFRR and mFRR capacity markets as described above. A prerequisite for the implementation of the Nordic aFRR and mFRR capacity markets is the NRA approval of the legal documents submitted by the Nordic TSOs.

On 12 April 2019, the Nordic TSOs (Svenska kraftnät, Statnett, Fingrid and Energinet) submitted the legal proposals regarding the Nordic aFRR capacity market to their National Regulatory Authorities (NRA) for approval. Since the relevant NRAs have not been able to reach agreement within the period referred to in Article 5 of EBGL, the Agency for the Cooperation of Energy Regulators (ACER) shall adopt the submitted proposals concerning the Nordic aFRR capacity market by 17.8.2020. Proposals regarding the the Nordic mFRR capacity market are not submitted to the NRAs as the details of the market design for the mFRR capacity market are not yet decided.

3.7 (g) analyse the efficiency of the activation optimisation functions for the balancing energy from frequency restoration reserves and, if applicable, for the balancing energy from replacement reserves

During the reporting period and at present, mFRR is the only balancing product with an energy activation market in the Nordic power system. The marketplace is maintained by all the Nordic TSOs, which activate bids on the market whenever necessary during normal operation or disturbances. The planning of mFRR balancing within the Nordic power system is founded on all the available information from all the Nordic TSOs and the optimisation of mFRR activation is carried out based on the decisions of operators. The activation of aFRR is performed pro-rata and replacement reserves are not used in the Nordic power system. Thus, there are no activation optimisation functions applied to optimise the activation of balancing energy in the Nordic power system and therefore, it is not relevant to Fingrid to provide any further analyses related to this requirement in question.