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

28.2.2022

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# List of Abbreviations

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|---|---|
| ACER | Agency for the Cooperation of Energy Regulators |
| aFRR | Automatic Frequency Restoration reserve |
| BCC | Balancing Capacity Co-operation |
| BSP | Balancing Service Provider |
| BRP | Balance Responsible Party |
| CZC | Cross-Zonal Capacity |
| DSR | Demand Side Response |
| EBGL | Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing |
| ENTSO-E | European Network of Transmission System Operators for Electricity |
| FCR | Frequency Containment Reserves |
| FCR-D Up | Frequency Containment Reserve for Disturbances Upwards |
| FCR-D Down | Frequency Containment Reserve for Disturbances Downwards |
| FCR-N | Frequency Containment Reserve for Normal operation |
| FRR | Frequency Restoration Reserve |
| Fingrid | Fingrid Oyj |
| ISH | Imbalance Settlement Harmonisation |
| ISP | Imbalance Settlement Period |
| LFC | Load-Frequency Control |
| mFRR | Manual Frequency Restoration Reserve |
| NRA | National Regulatory Authority |
| RES | Renewable Energy Sources |
| RR | Replacement Reserves |
| SOGL | Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation |
| TSO | Transmission System Operator |

# 1 Introduction

Regarding the transmission system operator (TSO) report on balancing, Article 60 of Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing (hereinafter referred to as "EBGL") states

*"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 second TSO report on balancing published by the Finnish TSO Fingrid Oyj (hereinafter referred to as "Fingrid") in accordance with Article 60 of the EBGL and it covers the calendar years of 2020 and 2021 (hereinafter referred to as "reporting period"). The first report was published in 2020 and it covered the calendar years of 2018 and 2019.

This report has three chapters including this Chapter 1 on introduction and background. Chapter 2 presents the Executive Summary that will be contained in the European report on integration of balancing markets pursuant to Article 59(6) of the EBGL (the so-called ENTSO-E Balancing Report). The Executive Summary covers the aspects listed in the *Template for the Executive Summary of Each (Article 60) TSO Report on Balancing, in Accordance with Article 59(6) Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing* which provides guidelines to harmonise the executive summaries of the different European TSOs. In addition, this TSO report on balancing also contains the items listed in Article 60(2)(a–g) of the EBGL. These items are collected in Chapter 3 correspondingly.

# 2 Executive Summary

This chapter presents the Executive Summary of Finnish TSO which will be included in the ENTSO-E Balancing Report 2022. This chapter follows the guidelines provided in the *Template for the Executive Summary of Each (Article 60) TSO Report on Balancing, in Accordance with Article 59(6) Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing*. This chapter provides an overview of the Finnish balancing products and markets. This chapter also covers joining the European balancing platforms and balancing capacity cooperation as well as the terms and conditions from the national point of view. Additionally, this chapter summarises the dimensioning and balancing capacity procurement explained more in detail in Chapter 3.

## 2.1 Introduction

Fingrid Oyj (hereinafter referred to as “Fingrid”) is the Finnish TSO. The Finnish power transmission system locates geographically in Northern Europe and is a part of the Nordic synchronous area which consists of the transmission systems of Finland, Sweden, Norway, and Eastern Denmark. This comprises the Nordic load-frequency control (LFC) block. There are only one scheduling area and one bidding zone in Fingrid’s control area.

The market design is based on the self-dispatch model. The types of reserve used in the Nordic synchronous area to balance the system are Frequency Containment Reserves (FCR) and Frequency Restoration Reserves (FRR). The FCRs are reserves used for the containment of frequency. The FCRs are divided into three reserve products: Frequency Containment Reserve for Normal Operation (FCR-N), Frequency Containment Reserve for Disturbances Upwards (FCR-D Up), and Frequency Containment Reserve for Disturbances Downwards (FCR-D Down). The FCR-D Down is the newest reserve product used in the Nordic synchronous area and Fingrid started its procurement on the 1st of January of 2022. FRRs are reserves whose purpose is to restore the frequency to the nominal value of 50.0 Hz and release the activated FCRs. The FRRs are divided into two reserve products: Automatic Frequency Restoration Reserve (aFRR) and Manual Frequency Restoration Reserve (mFRR). Replacement Reserves (RR) are not used in the Nordic synchronous area.

The size of the reserve markets varies between these five reserve products as demonstrated in the table below presenting the number of balancing service providers (BSPs) by reserve product. Technology-neutrality is one of the main principles when designing the reserve markets in Finland. Thus, the resources are treated in equally manner and all types of technologies can participate in the reserve markets as long as the requirements are met. Currently, demand side response (DSR) and batteries participate widely in Finnish FCR markets. The FCR-D Up market has proven to be potential especially for DSR whereas all the FCR markets are well fitted for batteries. For instance, over 40% of the prequalified capacity of FCR-D Up is from DSR. Additionally, almost 19% of the

prequalified capacity of FCR-N, 4% of the prequalified capacity of FCR-D Up, and 21% of the prequalified capacity of FCR-D Down is from batteries. There are not yet many BSPs representing renewable energy sources (RES) in Finland if hydro is excluded. However, there is a growing interest among the wind power producers for mFRR and FCR-D Down, for example.

TABLE 1. THE RESERVE VOLUMES AND NUMBER OF BSPS AT THE BEGINNING OF 2022.

| Reserve product | Nordic volume | National share | National requirement | Number of BSPs |
|---|---|---|---|---|
| **FCR-N** | 600 MW | 19.88% | 119 MW | 21 |
| **FCR-D Up** | Up to 1450 MW | 19.88% | Up to 288 MW | 19 |
| **FCR-D Down**[1] | Up to 1400 MW | 19.88% | Up to 278 MW | 7 |
| **aFRR** | 300–400 MW | 20% | 60–80 MW | 6 |
| **mFRR** | N/A | N/A | N/A | 31 |

## 2.2 Joining the European Balancing Platforms and Balancing Capacity Cooperation

The progress and timeline towards joining the European balancing platforms for the activation of balancing energy are presented below in Table 2. Table 3 lists the balancing capacity cooperations (BCC) and their status and timeline, whereas Table 4 lists the developments regarding balancing.

TABLE 2. PROGRESS AND TIMELINE TOWARDS JOINING THE EUROPEAN BALANCING PLATFORMS.

| European balancing platform for the activation of balancing energy | Accession timeline | Reasoning for derogation and status of the derogation (granted or not) |
|---|---|---|
| **RR Platform** | N/A | N/A |
| **aFRR Platform (PICASSO)** | 24.7.2024 | Derogation (not granted) due to simultaneous joining of the Nordic synchronous area. |
| **mFRR Platform (MARI)** | 24.7.2024 | Derogation (not granted) due to simultaneous joining of the Nordic synchronous area. |
| **IN Platform** | N/A | N/A |

[1] New product. Procured volume gradually increased.

TABLE 3. BALANCING CAPACITY COOPERATIONS.

| Balancing capacity cooperation | Status | Accession timeline |
|---|---|---|
| **Nordic aFRR CM** | Project on-going | 2023 |
| **Nordic mFRR CM** | Project on-going | 2023 |

TABLE 4. DEVELOPMENTS REGARDING BALANCING.

| Question | Answer |
|---|---|
| **Q1: Did you carry out regulatory and IT developments for allowing DSR, RES and batteries to participate at European balancing platforms?** | Yes |
| **1.1. If response in Q1 is "no", why?** | – |
| **1.2. If response in Q1 is "yes", what were the main results"?** | The terms and conditions for the BSPs are technology-neutral and allow full participation from DSR, RES and batteries. |
| **Q2: Did you carry out regulatory and IT developments for adopting standard energy products (aFRR, mFRR, RR balancing energy products) in your system?** | Yes |
| **2.1. If response in Q2 is "no", why?** | – |
| **2.2. If response in Q2 is "yes", what were the main results?** | The market management system has been developed to enable adopting standard energy products. |
| **Q4: Do you procure a standard product for balancing capacity?** | Yes (aFRR) & No (mFRR) |
| **Q5: What are the main characteristics?** | aFRR balancing capacity product fulfils the characteristics of a standard product. mFRR balancing capacity is procured weekly. |
| **Q6: Did you assess the potential for exchange of balancing capacities or sharing of reserve?** | Yes |
| **6.1. If response in Q6 is "no", why?** | – |
| **6.2. If response in Q6 is "yes", what were the main results?** | The exchange of balancing capacities creates socio-economic benefits and common Nordic capacity markets for aFRR and mFRR are to be introduced. |
| **Q7: Are you already involved in a BCC as a member or as an observer?** | No |

## 2.3 The Terms and Conditions for BSPs and BRPs

The terms and conditions of Fingrid for balancing service providers (BSPs) and balance responsible parties (BRPs) in accordance with the EBGL are listed in Table 5 and Table 6. In addition, Table 7 below shows how the terms and conditions for BRPs will evolve in the future.

TABLE 5. THE TERMS AND CONDITIONS FOR BSPS.

| Reserve product | Terms and conditions for BSPs | Status and timeline |
|---|---|---|
| **Frequency Containment Reserve for Normal operation (FCR-N) and Frequency Containment Reserve for Disturbances (FCR-D)** | Terms and conditions for providers of Frequency Containment Reserves (FCR) | Approved, valid as of 1.11.2021 |
| **Automatic Frequency Restoration Reserve (aFRR)** | Terms and conditions for providers of automatic Frequency Restoration Reserves (aFRR) | Approved, valid as of 18.1.2022 |
| **Manual Frequency Restoration Reserve (mFRR)** | Terms and conditions for providers of Manual Frequency Restoration reserves (mFRR) | Approved, valid as of 1.11.2021 |

TABLE 6. THE TERMS AND CONDITIONS FOR BRPS.

| Terms and conditions for BRPs | Status and timeline |
|---|---|
| Balance agreement | Approved, valid as of 1.11.2021 |
| Appendix 1, Part 1: Fingrid Oyj's general terms and conditions concerning balance management | Approved, valid as of 1.11.2021 |
| Appendix 1, Part 2: Fingrid Oyj's general terms and conditions concerning imbalance settlement | Approved, valid as of 1.11.2021 |
| Appendix 2: Fee components and determination of fees | Approved, valid as of 1.11.2021 |

TABLE 7. EVOLUTION OF THE TERMS AND CONDITIONS FOR BRPS.

| Question | Answer |
|---|---|
| **Q1. Was 15-min Imbalance Settlement Period (ISP) implemented by the 1st of January 2022?** | Derogation |
| **1.1. If response in Q1 is "derogation" or "exemption", until when was this derogation/exemption granted?** | 22.5.2023 |
| **Q2. Has your TSO made use of additional components pursuant to Imbalance Settlement Harmonisation (ISH) Methodology Art 9(6) as per the 1st of January 2022?** | Yes |
| **2.1. Scarcity component?** | Not considered |
| **2.2. Incentivizing component?** | Implemented |
| **2.3. Component related to financial neutrality of the TSO?** | Not considered |
| **Q3. Has your TSO made use of dual pricing as per the 1st of January 2022?** | No |
| **3.1. Condition (a)** | Not considered |
| **3.2. Condition (b)** | Not considered |
| **3.3. Condition (c)** | Not considered |
| **3.4. Condition (d)** | Not considered |
| **3.4. Condition (e)** | Not considered |

## 2.4 Summary on dimensioning and procurement of balancing capacity and specific products

**Dimensioning and procurement of balancing capacity**

During the reporting period, the Nordic TSOs maintained two types of FCR products for the Nordic synchronous area: FCR-N and FCR-D. However, at the beginning of 2022 Fingrid started to procure the FCR-D down-regulation product (FCR-D Down) in addition to the earlier FCR-D up-regulation product (FCR-D Up). The Nordic TSOs have agreed that currently the FCR-N volume for the entire synchronous system is 600 MW. The total capacity is distributed among the Nordic TSOs based on the shares which are updated yearly. The share of a TSO is calculated based on the sums of annual electrical energy consumption and generation in the TSO's control area and in the synchronous area. The required Nordic volume of FCR-D is 1450 MW for up-regulation and 1400 MW for down-regulation corresponding to the reference incidents in the Nordic synchronous area. The distribution of the FCR-D Up and FCR-D Down capacities between the Nordic TSOs are calculated similarly to the FCR-N.

The national requirements for mFRR up-regulation and down-regulation volumes are currently determined by the dimensioning incidents of the control area in question. In other

words, the Nordic TSOs dimension the mFRR volumes for their own control area and determine the required distribution within their control area individually. aFRR is seen as an automatic complement to mFRR in the frequency restoration process. Thus, the Nordic TSOs determine the hours for which aFRR shall be procured and dimensioned on a quarterly basis for the next three months. The procurement hours have increased during the reporting period from 7–14 hours to 20 hours a day.

During the reporting period, the dimensioning rules as referred in Articles 127, 157 and 160 of the SOGL were not in use in the Nordic LFC block. Therefore, Fingrid has not performed analyses on optimal provision of reserve capacity following the procedure required by Article 32(1) of the EBGL.

Fingrid utilises the exchange of balancing capacity and the sharing of reserves whenever needed and cost-effective. During the reporting period, Fingrid has purchased FCR-N and FCR-D (for up-regulation) from the domestic yearly and hourly markets as well as from the Estonian and Russian HVDC links and from other Nordic countries by inter-TSO trades. In addition, Fingrid has purchased aFRR from the domestic hourly market and has had the opportunity to purchase aFRR capacity from Sweden, Estonia and Russia when reasonable. Furthermore, Fingrid has purchased mFRR from the domestic markets and has a contract for sharing and exchange of mFRR with the Estonian TSO Elering. However, transmission capacity has not been reserved for the exchange of balancing capacity, and therefore, its utilisation has been avoided during the times when all the transmission capacity is used in day-ahead and intraday markets. Along with the existing alternatives 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 in the future.

**Specific products**

During the reporting period, the implementation frameworks for the European platforms were approved by the Agency for the Cooperation of Energy Regulators (ACER). However, the implementation frameworks have not been implemented yet. Thus, the balancing products used during the reporting period cannot be defined as specific products as denoted in the EBGL.

# 3 TSO Report on Balancing

This chapter is compiled as per Article 60(2)(a–g) of the EBGL. In other words, this chapter contains seven sections and there is a section for each item in Article 60(2)(a–g) of the EBGL.

## 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 the EBGL states

*"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 approved by ACER. However, the implementation frameworks have not been implemented yet. Thus, the balancing products used during the reporting period cannot be defined as specific products as denoted in the EBGL. Hence, the requirement in question is inapplicable and Fingrid cannot provide a more precise response on this item.

## 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 the future to comply with the Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation (hereinafter referred to as "SOGL"). The target model for FRR dimensioning will be based on Article 157 of the SOGL and the associated methodology for the Nordic LFC block. The FCR dimensioning process will be based on Article 153 of the SOGL and the associated methodology for the Nordic synchronous area. These two SOGL compliant dimensioning methodologies are approved by the Nordic national regulatory authorities (NRAs). However, they are not described in this report further but instead the procedures for dimensioning that were used during the reporting period are described below.

### 3.2.1 The current procedure for dimensioning and distribution of FCR

During the reporting period, the Nordic TSOs maintained two types of FCR products for the Nordic synchronous area: FCR-N and FCR-D. However, at the beginning of 2022 Fingrid started to procure the FCR-D down-regulation product (FCR-D Down) in addition to the earlier FCR-D up-regulation product (FCR-D Up). Therefore, the dimensioning principles of all three of them will be explained in this section.

FCR-N is used for continual imbalances during normal operation to maintain the frequency within the ±100 mHz range of the nominal frequency of 50.0 Hz. For this reason, the purpose of FCR-N is not to mitigate the consequences of a disturbance such as the reference incident. Instead, the purpose of FCR-D is to mitigate the impact of single incidental disturbances, including the reference incident. FCR-D Up activates linearly based on frequency deviation between 49.9–49.4 Hz and FCR-D Down activates linearly between 50.1–50.5 Hz.

It is agreed within the Nordic TSOs that currently the agreed FCR-N volume is 600 MW for the entire synchronous system. This total capacity is distributed among the Nordic TSOs based on the shares which are determined every year for the following year using the data of the previous year. The instructions to calculate the distribution of FCR were updated in January 2020. According to the updated methodology, the TSOs' shares are revised each year in October and will enter into force on the 1st of January each year. The share of a TSO is calculated as the ratio of the sum of annual electrical energy consumption (in TWh) and generation (in TWh) in the TSO's control area and the sum of the annual electrical energy consumption and generation in the synchronous area. In other words, the share of a TSO is calculated using the following formula:

$$Share_{TSO} = \frac{Consumption_{TSO} + Generation_{TSO}}{Consumption_{Synchronous\ area} + Generation_{Synchronous\ area}}.$$

The share of each TSO is rounded to the closest integer given in MW.

Currently, the required FCR-D Up capacity is equal to the largest possible active power deficit caused by the reference incident, in other words, the sudden loss of an individual major component (generation unit, transmission line, importing HVDC interconnector, transformer, bus bar etc.). Respectively, the required FCR-D Down capacity is determined based on the largest possible active power surplus caused by the sudden loss of an individual major component (consumption unit, exporting HVDC interconnector etc.). The required total volume of FCR-D is 1450 MW for up-regulation and 1400 MW for down-regulation. The distribution of the FCR-D Up and FCR-D Down capacities between the Nordic TSOs are calculated similarly to the FCR-N.

### 3.2.2 The current procedure for dimensioning of FRR

The Nordic FRR dimensioning has strongly been dominated by mFRR as aFRR has been a process under development and meanwhile aFRR has been procured and dimensioned to a limited volume. However, the role of aFRR has been increasing and will increase further in the future. During the past few years, the number of the procurement hours has been increased significantly, and the procured volume has been increased slightly for certain hours, too.

**Dimensioning of mFRR**

mFRR shall exist to restore the faster reserve products FCR-N, FCR-D Up, FCR-D Down, and aFRR whenever these reserves have been activated. mFRR can also be proactively activated to prevent a frequency deviation, for instance in case of an (expected) deterministic frequency deviation. mFRR shall exist also in normal operation and the mFRR reserves shall be localised to the extent still being capable of balancing the synchronous system at any time. mFRR is dimensioned by the Nordic TSOs individually based on the assessment of local requirements in each control area taking into account the dimensioning incidents and network constraints.

The national requirements for mFRR up-regulation and down-regulation volumes are currently determined by the dimensioning incidents of the control area in question. In other words, the Nordic TSOs dimension the mFRR volumes for their own control area and determine the required distribution within their control area individually. Each control area shall have mFRR volumes available equivalent to or greater than the dimensioning incident in the control area in question. The concept of dimensioning incident is defined as a fault which results from the loss of an individual major component (generation unit, transmission line, HVDC interconnector, transformer, bus bar, consumption unit etc.) and has the greatest impact upon the power system from all the fault events considered. In addition to preparing for the dimensioning incident, the TSOs must also have reserves or other measures available to handle other imbalances which are correlated with dimensioning incidents or two or more simultaneous faults which may occur within the TSO’s control area or on the borders to other control areas.

**Dimensioning of aFRR**

National aFRR capacity markets were introduced in the Nordic synchronous area in January 2013. The background to implementing and developing aFRR was the deteriorating frequency quality and aFRR was identified and agreed within the Nordic TSOs as one of the main measures to stop the weakening of the frequency quality. The aFRR product is seen as an automatic complement to mFRR in the frequency restoration process. The Nordic LFC block centrally activates aFRR from a single LFC controller. Based on the measured frequency, this LFC controller calculates the required activation of aFRR and distributes the activation requests to the Nordic TSOs pro-rata. Consequently, each Nordic TSO distributes the activation requests to the contracted aFRR providers in its control area.

Currently, only the procured aFRR capacity can be activated, and therefore, the complete dimensioned amount shall be procured. Each quarter of a year, the Nordic TSOs determine the hours for which aFRR shall be procured and dimensioned for the next three months. These hours include the hours during which the frequency variations tend to be most challenging. Previously, aFRR was procured only in the morning and evening hours during which the frequency variations have been most challenging whereas during the reporting period, the Nordic TSOs decided to increase the aFRR procurement hours up to 20 hours a day for the first quarter of 2022. This means that the procurement hours have increased significantly during the reporting period, from 7–14 hours a day to 20 hours a day.

The Nordic TSOs expect that balancing the future power systems will require more automated balancing instead of manual balancing. Therefore, the role of aFRR will evolve in the future since the Nordic TSOs have decided to gradually increase the number of aFRR contracting hours to all hours a day in the future.

## 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 the EBGL states

*"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 Regulation (EU) 2017/1485. 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 the SOGL were not in use in the Nordic LFC block. Therefore, Fingrid has not performed analyses on optimal provision of reserve capacity following the procedure required by Article 32(1) of the EBGL. Based on this, it is inapplicable to Fingrid to provide the summary analysis of the optimal provision of reserve capacity including the justification of the volume of balancing capacity as per Article 32(1) of the EBGL.

## 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

Please see Section 3.1 above.

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

Fingrid utilises the exchange of balancing capacity and the sharing of reserves whenever needed and cost-effective. During the reporting period, Fingrid has purchased FCR-N and FCR-D (for up-regulation) from the domestic yearly and hourly markets as well as from the Estonian and Russian HVDC links and from other Nordic countries by inter-TSO trades. In addition, Fingrid has purchased aFRR from the domestic hourly market and has had the opportunity to purchase aFRR capacity from Sweden, Estonia and Russia when reasonable. Furthermore, Fingrid has purchased mFRR from the domestic markets and has a contract for sharing and exchange of mFRR with the Estonian TSO Elering. However, transmission capacity has not been reserved for the exchange of balancing capacity, and therefore, its utilisation has been avoided during the times when all the transmission capacity is used in day-ahead and intraday markets.

Along with the existing alternatives 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 in the future. The purpose of the establishment of common Nordic markets for aFRR and mFRR capacity is to increase the socio-economic efficiency on a Nordic level and to increase operational security in the most efficient way. The current dimensioning process of FRR capacity results in FRR volumes per LFC area which is equal to the bidding zone. When the common Nordic FRR capacity markets are in use, the calculated reserve requirements of a LFC area 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 to Article 33(4) of the EBGL the TSOs can either decide to ensure CZC for the exchange of balancing capacity based on a probabilistic approach or in accordance with one of the three alternative methodologies specified in the EBGL: 1) Article 40 – “Co-optimised allocation process”, 2) Article 41 – “Market based allocation process”, or 3) 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 socio-economically efficient use of the CZC in the Nordic region in overall. Hence, the proposed methodology for a marked-based allocation of CZC for in accordance with Article 41 of the EBGL can be used for both aFRR and mFRR.

The Nordic TSOs aim to introduce the Nordic cross-border aFRR and mFRR capacity markets in 2023. From Fingrid’s perspective, the latest milestone towards the Nordic cross-border aFRR capacity market was achieved on the 18th of January 2022 when Fingrid started to procure aFRR capacity from the common Nordic market platform. Though the aFRR capacity market is still national, the applicable market rules applied, such as the minimum capacity of a single bid and the gate closure time, are already in accordance with the future Nordic cross-border aFRR capacity market that will be introduced later. From the

practical point of view, this will help the shift to the Nordic cross-border aFRR balancing capacity market when the transmission capacity allocation for the exchange of balancing capacity is allowed. However, the go-live date is dependent on the progress of introducing the flow-based capacity calculation method in the Nordic capacity calculation region. 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

This item is inapplicable since Fingrid utilises the exchange of balancing capacity and the sharing of reserves whenever needed and cost-effective and uses also inter-TSO trades for aFRR and mFRR capacity and, additionally, the common Nordic aFRR and mFRR capacity markets will be introduced in the future. Please Section 3.5 for more information on the exchange of balancing capacity and sharing of reserves.

## 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

As explained above in Section 2.1 2 FCRs and FRRs are used in the Nordic synchronous area to balance the system whereas RRs are not used. During the reporting period and at present, mFRR is the only balancing product with an energy activation market in the Nordic synchronous area the rest of the reserve products having solely balancing capacity markets. The marketplace of the mFRR energy activation is maintained by all the Nordic TSOs (Fingrid, Energinet, Statnett and Svenska Kraftnät). The TSOs activate bids on the market whenever necessary during normal operation and disturbances. mFRR balancing within the Nordic synchronous area is based on the system operational situation and available information from all the Nordic TSOs and the optimisation of mFRR activation is carried out based on the decisions of operators. The operational situation affects the required volume of mFRR balancing energy, and the activation is done manually following the merit-order of the balancing energy bids. The activation of aFRR capacity bids is performed pro-rata within the TSOs. Therefore, there are no activation optimisation functions applied to optimise the activation of balancing energy in the Nordic synchronous area.