Balancing Report in Accordance with Article 60(1) of Commission Regulation (EU) 2017/2195 of November 2017 establishing a guideline on electricity balancing

April 3, 2024

Content

Legal framework

Article 60(1) of the Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing, hereafter referred to as “EBGL” requires that 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 report is established by Elia Transmission Belgium SA (legal successor of Elia System Operation SA, both referred hereafter as “ELIA”) to comply with this legal requirement and covers the years 2022 and 2023. Article 60(2) of the EBGL specifies the content of the report, which determines the structure of this report:

a	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;
b	the summary analysis of the dimensioning of reserve capacity including the justification and explanation for the calculated reserve capacity requirements;
c	the summary analysis of the optimal provision of reserve capacity including the justification of the volume of balancing capacity;
d	an analysis of 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;
e	an analysis of the opportunities for the exchange of balancing capacity and sharing of reserves;
f	an explanation and a justification for the procurement of balancing capacity without the exchange of balancing capacity or sharing of reserves;
g	an analysis of 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.

Note that this report is complementary to the report published by ENTSO-E following article 59 of the EBGL, in which ENTSO-E focusses on monitoring, describing, and analysing the implementation of the EBGL, as well as reporting on the progress made concerning the integration of balancing markets in Europe.

Report pursuant to article 60 of the EBGL

a) 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;

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

- The Implementation Frameworks for the European platforms pursuant to Articles 20 (mFRR) and 21 (aFRR) were approved on 24 January 2020 by the Agency for the Cooperation of Energy Regulators, pursuant to Article 6(10)(b) of Regulation (EU) 2019/942 and Article 5(7) of the EBGL. Elia did not develop any proposals for defining and using specific products for balancing energy and balancing capacity.

- The Implementation Framework for the European platform pursuant to Article 19 (RR) is not applicable to ELIA.

b) Summary analysis of the dimensioning of reserve capacity including the justification and explanation for the calculated reserve capacity requirements;

Reserve capacity requirements	**2022**		**2023**	
	positive	negative	positive	negative
FCR (symmetric)	86 MW		88 MW	
FRR	1041 MW	831 MW	1041 MW	983 MW
aFRR (symmetric)	132 MW		117 MW	
mFRR	909MW	699MW	924 MW	866 MW

Until July 21, 2022, the dimensioning methodology for the reserve capacity needs was specified according to Elia's LFC block Operational Agreement, hereafter referred to as LFCBOA, approved by CREG on December 6, 2019 (B)2025[1].

- Annex 1 of the SAFA[2] which is the Policy on Load-Frequency Control and Reserves, determines amongst others the dimensioning rules for FCR.

- Elia dimensions the required reserve capacity on FRR on a daily basis in accordance with the minimum criteria set out in Article 157(2) SOGL on the basis of the maximum value resulting from:

    - a dynamic **probabilistic methodology** in line with Article 157(2)b of the SOGL. It is based on a convolution of two distribution curves, one representing the prediction risk and another representing the forced outage risk. This methodology has been designed to cover 99.0% of the LFC block imbalance risk. After the convolution, the new distribution is decomposed in a distribution of potential positive LFC block imbalances, and a distribution of potential negative LFC block imbalances. This calculation is conducted for each-quarter hour of the next day, and the 99.0% percentile of each probability distribution curve determines the minimum positive and negative required reserve capacity.

        - The probability distribution representing the prediction risk is based on historic LFC block imbalances. The LFC block imbalances are based on consecutive historical records with a resolution of 15 minutes and includes a period of two years, ending not before the last day of the second month before the month of the day for which the reserve capacity is calculated. The time series is filtered to remove periods with a forced outage of Nemo Link or generating units with a loss of power larger than 50 MW (until the end of the forced outage but limited to 8 hours after the start of the forced outage), periods with exceptional events (e.g. market decoupling) and periods with data quality problems (e.g. missing data). The prediction risk is modelled based on machine learning techniques for each quarter-hour of the next day based on the probability distribution of the LFC block imbalances.

        - To calculate the probability distribution representing the forced outages risk, a distribution curve is calculated representing the probability to face a shortage or surplus capacity following forced outages (including HVDC-interconnectors with Great Britain).

    - a dynamic **deterministic methodology** based on the dimensioning incident in line with Article 157(2)e and 157(2)f of the SOGL. For each-quarter hour of the next day Elia determines the required positive and negative reserve capacity on FRR in order that it is never less than the positive and

[1] https://www.creg.be/sites/default/files/assets/Publications/Decisions/B2025FR.pdf
[2] https://transparency.entsoe.eu/system-operations-domain/operational-agreements-of-synchronous-areas/show

negative dimensioning incident of the LFC block, as specified in Article 3 and Article 157(2)d of the SOGL.

- a **minimum threshold** based on the historic LFC block imbalances in line with Articles 157(2)h and 157(2)i of the SOGL. For each-quarter hour of the next day, ELIA determines the required positive and negative reserve capacity on FRR in order that it is sufficient to cover at least the positive and negative historic LFC block imbalances for 99.0% of the time in line with Articles 157(2)h and 157(2)i of the SOGL.

- ELIA uses a 'static' probabilistic method to determine the **aFRR needs symmetrically (positive and negative)**, based on a time series of two years of expected variations between quarter-hours of LFC block imbalances. The aFRR capacity needs are determined as the capacity that can cover 79% of the absolute variations of LFC block imbalances. It is determined as a fixed value at 151 MW. Elia plans to present in a next version of the LFCBOA a new methodology to assess the aFRR needs. While awaiting the implementation of this new methodology, Elia limited the symmetric aFRR needs at the same value as in 2021, i.e. 145 MW.

- Elia determines the required positive and negative reserve capacity on mFRR each day before 7 AM for every period of 4 hours of the next day as the difference between the required positive and negative reserve capacity on FRR (dynamic) and aFRR (static).

As from July 21, 2022, the dimensioning methodology for the reserve capacity needs was specified according to Elia's LFC block Operational Agreement, hereafter referred to as LFCBOA, approved by CREG on July 14, 2022 (B)2435[3], in which the method of determination of the aFRR needs is modified.

- ELIA uses a 'static' probabilistic method to determine the **aFRR needs symmetrically (positive and negative)**, based on a time series of two years of expected variations between quarter-hours of LFC block imbalances. The aFRR capacity needs are determined as the capacity that can cover 79% of the absolute variations of LFC block imbalances after imbalance netting. It is determined at 117 MW.

Note that a new version of the ELIA LFC Block Operational Agreement was approved by CREG on July 19, 2023, with a new methodology for the dynamic dimensioning of aFRR which is foreseen to be implemented on October 1, 2024. The latest version of the ELIA LFC Block Operational Agreement (approved on February 22, 2024, (B)2748[4]) can be found on the website of Elia[5].

[3] https://www.creg.be/sites/default/files/assets/Publications/Decisions/B2435FR.pdf
[4] https://www.creg.be/sites/default/files/assets/Publications/Decisions/B2748FR.pdf
[5] https://www.elia.be/nl/elektriciteitsmarkt-en-systeem/systeemdiensten/het-evenwicht-behouden

c) Summary analysis of the optimal provision of reserve capacity including the justification of the volume of balancing capacity;

Average awarded balancing capacity	**2022**	**2023**
FCR	86 MW	88 MW
aFRR	133 MW (positive) 133 MW (negative)	118 MW (positive) 118 MW (negative)
Positive mFRR	659 MW	674 MW

As from January 7, 2021, the dimensioning methodology for the required balancing capacity was specified in ELIA's LFC Means approved by CREG on December 17, 2020 (B)2159[6] in which the balancing capacity requirements are determined (complementary to the LFCBOA in which the reserve capacity needs are determined).

- For FCR, the balancing capacity equals the required FCR needs.
- For aFRR, taking into account the guaranteed availability of the aFRR balancing capacity products, the balancing capacity is determined to be equal to the required aFRR needs. This capacity is determined in line with Article 32 of the EBGL, taking into account that:
    - Elia did not have sharing agreements on aFRR with other TSOs.
    - As non-contracted balancing energy bids have a limited availability, no capacity can be guaranteed with acceptable availability on an annual basis. For this reason, ELIA cannot cover, even partially, its aFRR needs with non-contracted balancing energy offers.
- For positive mFRR, taking into account the guaranteed availability of the mFRR balancing capacity products in combination with the sharing of reserves with other TSOs, balancing capacity is determined dynamically based on the mFRR reserve capacity needs. This balancing capacity is covered with a minimum of 640 MW of "mFRR standard". The rest of the capacity can be covered with "mFRR flex" and "mFRR standard" products.
    - As shared mFRR reserve capacity with neighbouring TSOs can only be activated in exceptional circumstances, taking into account service availability and remaining cross-border capacity, ELIA can take into account 250 MW of FRR sharing to cover positive mFRR requirements.

[6] https://www.creg.be/sites/default/files/assets/Publications/Decisions/B2159FR.pdf

- As non-contracted balancing energy bids have a limited availability, no capacity can be guaranteed with acceptable availability on an annual basis. For this reason, ELIA cannot cover, even partially, its positive mFRR needs with non-contracted balancing energy offers.

- The negative mFRR requirements are covered with non-contracted balancing energy bids and mFRR reserve sharing. On the basis of an analysis of the availability of non-contracted balancing energy bids and the availability of mFRR sharing (based on the availability of the service and the available cross-border capacity on continental borders) no need to procure balancing capacity could be demonstrated. The coverage of the needs with available means is subject to a yearly analysis.

Following the version of the LFC Means approved on December 22, 2022 (B)2484[7], Elia may from November 1, 2022, until March 31, 2023, temporarily reduce the contribution of the positive shared capacity to 0 MW when receiving from the relevant regional coordination centre a communication on a "Critical Grid Situation" concerning an adequacy issue in one or more countries with which Elia has a sharing agreement.

The table below depicts per month the balancing capacity mFRR standard and mFRR flex procured by Elia in 2022-2023.

Balancing capacity procured by Elia [MW]	2022			2023		
	mFRR standard	mFRR flex	total	mFRR standard	mFRR flex	total
January	650	5	655	679	3	682
February	645	4	649	680	3	682
March	640	2	642	681	2	683
April	647	3	651	678	2	680
May	644	3	647	673	2	675
June	641	2	643	668	2	670
July	647	1	648	665	2	667
August	662	3	665	667	2	669
September	669	3	672	662	2	664
October	669	2	671	671	2	672
November	675	3	678	669	2	671
December	680	3	683	673	2	675

Note that the latest version of the Elia LFC Means (approved on February 22, 2024, can be found on Elia's website[8].

[7] https://www.creg.be/sites/default/files/assets/Publications/Decisions/B2484FR.pdf
[8] https://www.elia.be/nl/elektriciteitsmarkt-en-systeem/systeemdiensten/het-evenwicht-behouden

d) Analysis of 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;

In absence of specific products for balancing energy and balancing capacity in 2022 and 2023 as explained in section a), this section is currently not applicable for ELIA's LFC block.

e) Analysis of the opportunities for the exchange of balancing capacity and sharing of reserves;

As from 2019, after the entry into force of the SOGL and the EBGL, ELIA applied the sharing of reserve concept for mFRR and the exchange of balancing capacity concept of FCR (based on the FCR Cooperation). Opportunities for the sharing of FCR and aFRR, as well as the exchange of aFRR balancing capacity and mFRR balancing capacity is discussed in Section f.

- **Exchange of FCR balancing capacity**

ELIA joined the FCR Cooperation in 2016. FCR Cooperation has developed a common process for the procurement of FCR with other TSOs, thus increasing the competition between BSPs and reducing the overall cost of procurement. ELIA procures since then a significant part of its FCR needs abroad.

The table below represents the volume of FCR provided by Belgian BSPs and the volumes of FCR that Elia contracted abroad, through the FCR Cooperation. Since the 1st of July 2020, the FCR Cooperation introduced a daily auction with 4h granularity product and Elia has procured its total FCR demand in the FCR Cooperation, ending the FCR/aFRR auction. The FCR Cooperation procurement rules ensure nevertheless that the Core Share[9] is satisfied locally. Since the beginning of 2021, the volumes procured locally in excess of the Core Share have been extremely limited. Specific information on the prices and volumes of the FCR cooperation can be found on the website of the FCR Cooperation[10].

[9] Elia ensures that at least 30 % of their total combined initial FCR obligations is physically provided inside their LFC block, in line with Article 163 and Annex VI of the SOGL

[10] https://www.regelleistung.net/apps/datacenter/tenders/?productTypes=PRL&from=2019-07-01&to=2020-04-30&tid=PRL_20200522_D1

	2022		2023	
	Volume of FCR provided by Belgian BSPs [MW]	Imported volumes of FCR [MW]	Volume of FCR provided by Belgian BSPs [MW]	Imported volumes of FCR [MW]
January	27	59	32	56
February	27	59	30	58
March	28	58	32	56
April	28	58	30	58
May	28	58	28	60
June	27	59	30	58
July	27	59	29	59
August	27	59	28	60
September	30	56	29	59
October	30	56	28	60
November	28	58	28	60
December	32	54	28	60

- **Sharing of mFRR**

In line with Article 32(1) of the EBGL, ELIA takes into account the sharing of reserve capacity with neighbouring TSOs in the dimensioning of its balancing capacity.

The maximum shared volume for positive and negative reserve on mFRR that can be taken into account is specified in the LFCBOA, in accordance with Article 157(2)(j) and Article 157(2)(k) of the SOGL. A TSO in the Continental Europe area may reduce the positive (or negative) reserve capacity on FRR if limited to the difference, if positive, between the size of the positive dimensioning incident and the reserve capacity on FRR required to cover the positive (or negative) LFC block imbalances during 99 % of the time. The reduction of the positive reserve capacity shall not exceed 30 % of the size of the positive dimensioning incident.

As explained in LFCBOA, ELIA had at disposal in 2022 and 2023 reserve sharing agreements on mFRR with all neighbouring TSOs. It is however to be stressed that these contracts are voluntary and can be subject to modifications on request of the counterparty. Pursuant to Article 157(2)(g) of the SOGL, and Article 10(3) of the LFCBOA, ELIA takes into account the restrictions defined in the mFRR sharing agreements due to possible violations of operational security and the mFRR availability requirements as specified in Article 157(2)b and Article 4 of the LFC Means:

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- these reserves are subject to service availability and may only be activated under exceptional conditions described in the operational agreements governing the sharing of the mFRR reserve to maintain the balance in the LFC block for a limited number of hours and thus cover part of the mFRR needs. They are generally activated after using all the other available balancing services (the non-contracted balancing energy bids and the contracted balancing capacity).

- these reserves are never guaranteed as the availability of cross-border capacity is not ensured and are therefore subject to the availability of interconnection capacity at borders, as well as internal network operating constraints such as congestions.

Taking into account the above-mentioned constraints, the reliability rate of 99% for covering the expected LFC block imbalances (as specified in Article 8 of the LFCBOA), and the result of an analysis of historic observations on available interconnection capacity at borders after the intra-day time frame, ELIA determined, following the applicable version of the LFC Means approved on December 17, 2020 (B)2159[11]:

- the positive sharing capacity included in the dimensioning to 250 MW.
- the negative sharing capacity included in the dimensioning to 350 MW.

Following the version of the LFC Means approved on December 22, 2022 (B)2484[12]**,** Elia may from November 1, 2022, until March 31, 2023, temporarily reduce the contribution of the positive shared capacity to 0 MW when receiving from the relevant regional coordination centre a communication on a “Critical Grid Situation” concerning an adequacy issue in one or more countries with which Elia has a sharing agreement.

f) Explanation and a justification for the procurement of balancing capacity without the exchange of balancing capacity or sharing of reserves;

Where the previous section already discusses the opportunities of exchange of balancing capacity for FCR, and sharing of mFRR, this section focuses on the exchange of balancing capacity and sharing of reserves which are currently not implemented.

- As FCR is dimensioned on regional basis by ENTSO-E, i.e. for Continental Europe, the sharing of FCR reserve capacity for ELIA’s LFC block is not applicable.

- Considering the automatic, local character of the activation of aFRR, it has been considered very complex to share aFRR reserve capacity or exchange aFRR balancing capacity before the European balancing platform for aFRR is established. In addition, the existing gaps between the local market designs would likely hinder such exchange.

- In ELIA’s view, the exchange of mFRR balancing capacity would have required the reservation of cross-zonal capacity for this purpose. This was not expected to be beneficial to the market, as it would have reduced

[11] https://www.creg.be/sites/default/files/assets/Publications/Decisions/B2159FR.pdf
[12] https://www.creg.be/sites/default/files/assets/Publications/Decisions/B2484FR.pdf

trading opportunities in day-ahead and intraday. It would also have required to establish with neighbouring TSOs complex processes to be able to activate the reserve contracted abroad frequently.

g) Analysis of 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 ELIA was not connected to the balancing energy exchange platforms according to Articles 20 and 21 of the EBGL in 2022 and 2023, this chapter is not yet relevant for ELIA's LFC block.