



BALANCING REPORT 2020 - 2021

According to EBGL Article 60 - TSO report on balancing

March 2022

AD MEPSO - Skopje

This report is in accordance with *EBGL Article 60* (TSO report on balancing) which states:

1. *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.*
2. *The report on balancing shall:*
 - (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;*
 - (b) *provide the summary analysis of the dimensioning of reserve capacity including the justification and explanation for the calculated reserve capacity requirements;*
 - (c) *provide the summary analysis of the optimal provision of reserve capacity including the justification of the volume of balancing capacity;*
 - (d) *analyze 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) *analyze the opportunities for the exchange of balancing capacity and sharing of reserves;*
 - (f) *provide an explanation and a justification for the procurement of balancing capacity without the exchange of balancing capacity or sharing of reserves;*
 - (g) *analyze the efficiency of the activation optimization functions for the balancing energy from frequency restoration reserves and, if applicable, for the balancing energy from replacement reserves.*
3. *The report on balancing shall either be in English or at least contain an executive summary in English.*
4. *Based on previously published reports, the relevant regulatory authority in accordance with Article 37 of Directive 2009/72/EC shall be entitled to require changes to the structure and content of the next TSO report on balancing.*

Introduction

Prior to the passing of the new Energy Law from 2018, MEPSO was responsible for all market functions as a transmission system operator and electricity system operator including organizing auctions of transmission capacities, procurement of balancing services, imbalance settlement, invoicing of energy from renewable sources and forecast of the production from the renewable sources, etc.

Among other developments in the energy sector, one of the most important was passing the new Balancing Rules, whose implementation began on the 1st of January 2020. According to the Energy law and the Balancing mechanism, MEPSO is in charge to control and organize the Balancing electricity market by procuring balancing services in the form of FCR, aFRR, mFRR and RR provided by the BSPs.

In accordance with the old Energy Law, up to 1st of January 2020, in the Republic of North Macedonia, the largest state-owned power production company - AD ESM was obliged to provide secondary and tertiary reserves at a price determined by the Energy Regulatory Commission of North Macedonia.

Since the implementation of the balancing mechanism on 1st of January 2020, MEPSO organizes prequalification process for becoming a registered Balance Service Provider (BSP). After the successful fulfilment of the qualification process, the BSP is qualified for supplying of balancing capacity and balancing energy. If the BSP meets the requirements defined in the Procurement Rules of the aFRR balancing capacity and balancing energy and the Procurement Rules of the mFRR balancing capacity and balancing energy, the BSP acquires the right to participate in auctions and submit bids for balancing capacity and balancing energy within the capacity of its balancing units.

In order to ensure operational reliability, maintenance of frequency and voltage stability of the system, considering all planned blackouts and interruptions due to malfunctions, MEPSO procures ancillary services from BSPs, with public bidding for aFRR and mFRR balancing capacity and energy, defining at least the following information:

- Type of auctions,
- Time of execution of the bidding,
- Product characteristics.

MEPSO performs financial settlement only for the activated aFRR and mFRR balancing energy based on the data of the quantities of activated aFRR and mFRR balancing energy and the prices from auctions for aFRR and mFRR balancing energy.

For the financial settlement of the activated aFRR and mFRR balancing energy, the prices provided by the BSPs are used for making the Merit Order List.

Currently in the Republic of North Macedonia, there are two balance service providers qualified for providing aFRR and mFRR balancing services and those are AD ESM Skopje, the largest state-owned production company and the company for production of electricity and heat TE-TO AD.

a) 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.

According to the Balancing Market Rules of North Macedonia, AD MEPSO has the right to define any specific products if needed, however, to this point there has not been a need to define such a product, since the bids of the BSPs satisfy the demand of the TSO.

In September of 2020, MEPSO became an observer of the aFRR and mFRR balancing platforms pursuant to Article 19 of the EBGL, respectively PICASSO and MARI.

MEPSO as an observer actively participates in the regular weekly telcos and scheduled conferences. Regarding the PICASSO platform, MEPSO is a part of the Steering Committee and the Expert Group, while regarding the MARI platform, MEPSO participates as an observer in the Steering Committee, Technical Working Group and the IT Working Group.

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

Regarding the frequency containment reserve, every year ENTSO-E evaluates and publishes the value for the primary reserve for different control subnetwork (System frequency subgroup) according to Policy 1 of the ENTSO-E Operational Handbook. MEPSO has the responsibility to provide primary reserve for relevant calendar year. The technical characteristics of the FCR and the operational requirements that must be met by the producers participating in the FCR, are defined in the Grid Rules. According to the Macedonian Grid Rules, the balancing capacity and balancing energy from FCR units are not the subject of financial settlement between the BSP and the TSO.

As for the aFRR capacity reserves, for now, they are dimensioned in accordance with the P1 – Policy 1: Load-Frequency Control and Performance, as well as the Macedonian Grid Code, using the deterministic approach, as a function of system size:

$$R = \sqrt{a \cdot L_{max} + b^2} - b$$

mFRR reserve is calculated as the difference between planned generated power from the largest production unit and sum of the aFRR reserve and reserve energy within each one hour-interval of the day. mFRR reserve assessment is based on monthly planned value for aFRR reserve.

The calculated aFRR and mFRR balancing capacity reserves are shown in table 1 and table 2.

Table 1 Calculated aFRR balancing capacity for 2020 - 2021

REQUIRED QUANTITIES OF aFRR BALANCING CAPACITY	SUM (MW)	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20	H21	H22	H23	H24
January	(+)	25.358	27	27	27	27	27	27	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37
	(-)	25.358	27	27	27	27	27	27	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37
February	(+)	21.837	25	25	25	25	25	25	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
	(-)	21.837	25	25	25	25	25	25	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
March	(+)	21.111	22	22	22	22	22	22	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
	(-)	21.111	22	22	22	22	22	22	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
April	(+)	17.040	18	18	18	18	18	18	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
	(-)	17.040	18	18	18	18	18	18	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
May	(+)	15.593	16	16	16	16	16	16	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
	(-)	15.593	16	16	16	16	16	16	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
June	(+)	16.110	16	16	16	16	16	16	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
	(-)	16.110	16	16	16	16	16	16	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
July	(+)	16.864	17	17	17	17	17	17	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
	(-)	16.864	17	17	17	17	17	17	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
August	(+)	16.864	17	17	17	17	17	17	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
	(-)	16.864	17	17	17	17	17	17	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
September	(+)	15.810	17	17	17	17	17	17	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
	(-)	15.810	17	17	17	17	17	17	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
October	(+)	18.352	19	19	19	19	19	19	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
	(-)	18.352	19	19	19	19	19	19	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
November	(+)	20.940	22	22	22	22	22	22	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
	(-)	20.940	22	22	22	22	22	22	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
December	(+)	24.614	26	26	26	26	26	26	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
	(-)	24.614	26	26	26	26	26	26	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36

Table 2 Calculated mFRR balancing capacity for 2020 -2021

REQUIRED QUANTITIES OF mFRR BALANCING CAPACITY	SUM (MW)	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19	H20	H21	H22	H23	H24
January	(+)	104.160	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	(-)	37.200	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
February	(+)	97.440	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	(-)	34.800	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
March	(+)	104.160	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	(-)	37.200	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
April	(+)	100.800	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	(-)	36.000	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
May	(+)	104.160	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	(-)	37.200	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
June	(+)	100.800	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	(-)	36.000	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
July	(+)	104.160	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	(-)	37.200	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
August	(+)	104.160	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	(-)	37.200	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
September	(+)	100.800	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	(-)	36.000	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
October	(+)	104.160	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	(-)	37.200	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
November	(+)	100.800	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	(-)	36.000	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
December	(+)	104.160	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140
	(-)	37.200	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50

Table 3 represents the average dimensioned reserves per one imbalance settlement period. Note that the aFRR values are calculated as average since there is a difference per each month and hours (block values for H1-H7 and H8-H24).

Table 3 Summary of the dimensioned average reserve quantities

Reserve capacity requirements	2020		2021	
	Positive	Negative	Positive	Negative
FCR (symmetric)	5 MW		6 MW	
FRR	166 MW	76 MW	166 MW	76 MW
aFRR (symmetric)	26 MW		26 MW	
mFRR	140 MW	50 MW	140 MW	50 MW

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

MEPSO is purchasing the necessary quantities within the dimensioned capacity as previously stated in section b). Table 3 represents the quantities that are subject to procurement.

In both 2020 and 2021, for FCR and aFRR, all procured quantities are a subject to a contractual agreement according to the auctions for procurement of aFRR balancing capacity and Grid Code obligations for FCR.

For mFRR balancing capacity, there is an option for contractual procurement per monthly auctions, however there are day-ahead auctions for procurement of mFRR balancing energy that MEPSO registers them as non-contracted balancing energy bids.

d) analyze 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

In absence of specific products for balancing energy and balancing capacity in 2020 and 2021, as explained in section a), this section is currently not applicable for MEPSO's LFC block.

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

At this point, MEPSO within the SMM block, does not practice block dimensioning of balancing reserves nor practices exchange and sharing of reserves.

However, at the end of 2021 MEPSO and EMS started a process for exchange of Emergency Delivery of mFRR balancing energy which is currently being tested.

Additionally, the SMM block dimensioning is underway, by conducting a study which started in 2021 with the participation of all three areas of the SMM block (EMS, MEPSO and CGES). After finalizing the results of the study, SMM block will start the exchange and sharing of reserves within the newly dimensioned quantities.

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

Since MEPSO does not yet participate in block sharing or exchange of balancing capacity, the following explanation per reserve is provided:

- ▶ FCR dimensioning on regional basis by ENTSO-E, i.e., for Continental Europe, the sharing of FCR reserve capacity for MEPSO'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.
- ▶ Although mFRR cross-border sharing or exchange of reserves would be beneficial to MEPSO, there are challenges that arise from the lack of coordination of the law regulation regarding the VAT Law and the Custom Law.

g) analyze the efficiency of the activation optimization functions for the balancing energy from frequency restoration reserves and, if applicable, for the balancing energy from replacement reserves

The activation of FRR balancing energy is according to the Balancing Rules as standard products with the optimization explained within the Rules and Guidelines for the registration of BSP.

According to the Balancing Rules, until the amendments in December 2021, MEPSO concluded annual contracts with AD TEC Negotino for the supplying/purchase of RR balance energy.

Pursuant to Articles 19, 20 and 21 of ENTSO-E EBGL, all TSOs should develop algorithms to be operated by the activation optimization functions for the activation of balancing energy bids. Since the FRR and RR joint platforms emerge as a consequence of these articles, for MEPSO as an observer this section is not applicable.