

INTRODUCTION

Baltic transmission system operators – Elering AS, AS "Augstsprieguma tīkls" and Litgrid AB (Baltic TSOs) are actively working on planned developments for Baltic balancing in accordance with commonly prepared Baltic Balancing Roadmap, which was initially published in October 2021 and updated in October, 2022 and August, 2023. With this update of the roadmap, Baltic TSOs provide information on deliverables, changes and details of the plans for developments.

Since 1st of January 2018, Baltic TSOs operate a common model for balancing of power systems of Estonia, Latvia and Lithuania. To accommodate this, the common Baltic coordinated balancing area was introduced and the common Baltic balancing market for exchange of balancing energy in form of frequency restoration reserves with manual activation (mFRR) was established. In coming years significant changes in Baltic balancing model are foreseen in order for it to be compliant with the requirements of European regulations and ensure Baltic TSOs compliancy with Central European Synchronous Area (CESA) rules and agreements after synchronization with the network of CESA.

¹ https://eepublicdownloads.blob.core.windows.net/public-cdn-container/clean-documents/Network%20codes%20documents/NC%20EB/2023/MARI_Accession_roadmap_Oct_2023.pdf

² https://eepublicdownloads.blob.core.windows.net/public-cdn-container/clean-documents/Network%20codes%20documents/NC%20EB/2024/MARI_Accession_roadmap_Feb_2024.pdf

mFRR balancing energy market

The existing Baltic balancing model and balancing energy market will be changed at the point of time when Baltic TSOs will join the common European platform for exchange of mFRR energy (Manually Activated Reserve Initiative - MARI), which is foreseen in October of 2024. Derogation granted by regulatory authorities in Baltics sets deadline for the Baltic TSOs to join MARI platform no later than 24th of July 2024. The main considerations for granting the derogation were the technical and legal preparation that shall be finished by the time of joining the platform and the operation of neighboring non-Baltic TSOs in MARI platform to avoid isolating the balancing energy market of the Baltic countries.

In the published MARI Accession roadmap on October 25, 2023¹ and subsequently also on February 29, 2024¹, the transmission system operators of the Sweden and Finland and the transmission system operator of Poland indicated later accession than foreseen in the approved Baltic TSO derogation request for connection to the MARI platform. As a result, the Baltic TSOs re-evaluated the plan of the Baltic balancing energy markets integration to the MARI platform and evaluated risks associated with it.

To reduce the risks of very low liquidity balancing market and exhaustion of balancing resources and to avoid limited cooperation with Polish, Swedish and Finnish TSOs that all

together would rise uncertainty for balancing market participants, high price volatility and challenging system operations the Baltic TSOs intend to postpone the connection to the MARI platform until October 2024. This information together with detected risks was communicated to the Baltic national regulatory authorities (hereinafter – Baltic NRAs) in a separate letter on January 29, 2024.

The main change to the Baltic balancing model when joining MARI platform will be introduction of separate balance control for each control area (Estonia, Latvia and Lithuania) and moving to a 15 minute balancing market time unit with respective changes in mFRR energy products as well as processes. Joining MARI platform will ensure that the Estonian, Latvian and Lithuanian balancing market will be an integral part of the European balancing market, allowing local balance service providers to participate in the European mFRR market. Resulting raise in market size will increase the power system security through more liquidity in energy reserves market utilizing available cross-zonal capacities with neighboring areas. Estonian, Latvian and Lithuanian mFRR balancing energy markets will be operated in accordance with European mFRR balancing energy market requirements as defined in national terms and conditions for balancing service providers.

aFRR balancing energy market

In order to accomplish the successful synchronization of Baltics with CESA and ensure power system load and frequency control within 15 minute balance control period, frequency restoration reserve product with automatic activation (aFRR) along with corresponding processes will be introduced by Baltic TSOs. Implementation of aFRR will be aligned with the requirements of common European platform for exchange of aFRR energy (Platform for the International Coordination of Automated Frequency Restoration and Stable System Operation – PICASSO). The same as for mFRR, local aFRR providers will be able to participate in the European aFRR energy market, introduction of it is planned to be done by January 2025, the latest, with Litgrid AB joining PICASSO slightly earlier in December 2024.

Imbalance settlement period

In accordance with the European regulations, imbalance settlement period (ISP) shall be shortened to 15 minutes from existing 60 minutes in Baltics. Introduction of aFRR and change to 15 minute balance control period in Baltics are the key elements to ensure that 15 minute ISP can be properly implemented in compliance and spirit of European guideline on electricity balancing, and as described in implementation concept prepared by Baltic TSOs.

Implementation of 15 minute ISP in Baltic areas is planned until the end of 2024, which is the deadline set in the derogation from respective European requirements and has been granted by regulatory authorities in Baltics. This means balance responsible parties are subject to keeping their balance in 15-minute periods by the 1st of January 2025, the latest.

In order to provide possibility for the market participants to reduce their potential imbalances by allowing them to trade as close as possible to the operation time, Baltic TSOs in line with other European TSOs, will actively support 15 minute market time unit (MTU) introduction in day ahead and intraday energy markets, which is also necessary to ensure 15 minute ISP implementation in Baltic balancing model. The day-ahead market transition to 15 minutes is planned commonly for the entire coupled European electricity market and conducted within a working group under the Single Day-ahead Coupling

(SDAC) cooperation. The planned go-live date for the 15 minute market time unit in the European common day-ahead market is beginning of 2025. In intraday markets, countries have more flexibility and can start offering 15 minute products at their bidding zones at a suitable time. The Baltic countries plan to start offering 15 minute products in the intraday market at the Q4 of 2024.

Baltic Load-Frequency Control block

Synchronization of Baltic power systems with the network of CESA implies complex and fundamental changes in the operations of the power systems and requires completely new model of balancing in Baltics. For this purpose, Baltic TSOs plan to create Baltic load and frequency control (LFC) block consisting of three LFC areas – Estonia, Latvia and Lithuania. Main responsibility for balancing will be on the LFC area level. Along with aFRR and mFRR products, the frequency containment reserve (FCR) products will be introduced. Transmission system operators will use frequency containment and frequency restoration processes for ensuring the applicable load frequency control parameters. Baltic TSOs have commonly prepared LFC block concept document in order to highlight the key concepts, principles and actions as well as to describe the technical requirements and procedures for the future of Baltic load frequency control and market setup to support it. Concept

document describes LFC block structure, principles for reserve providers qualification, approach on capacity dimensioning and distribution, capacity sharing and exchange principles, capacity and energy standard products, capacity procurement process and activation process. To ensure readiness for synchronization with CESA Baltic LFC block is planned to be established by the end of 2024, and shall be implemented when synchronization with CESA takes place.

Baltic TSOs have commonly prepared and organized public consultations for Baltic LFC block FRR dimensioning methodology to be applied after synchronization with CESA. It was provided for public consultation during March 2023 and submitted to the Baltic NRAs for approval in December 2023. Baltic TSOs have applied the submitted FRR methodology and assessed CESA FCR dimensioning methodology to estimate preliminary volume of each type of reserves necessary for Baltic LFC block operation. Based on the CESA FCR dimensioning principle the estimated volume of FCR for Baltic LFC block is 36 MW. Given volumes of FCR shall be reassessed by CESA expert group at least annually, with possibility to make updates during the year. In addition, CESA expert group is assessing the potential use of probabilistic

dimensioning of FCR, which outcomes are unknown for the CESA FCR requirements and will be communicated throughout CESA TSOs.

Baltic LFC block shall require upward regulation FRR in range of 720 to 860 MW and downward regulation FRR in range of 490 to 700 MW. The ranges of FRR shall be dependent on the system power flow scenarios and which elements are operational in the Baltic power systems.

Capacities of aFRR shall vary symmetrically in upward and downward regulation directions in the range of 90 MW to 120 MW depending on the time of the day. Demand for aFRR is higher during the ramping periods of load and generation and lower during periods when load and generation are more stable. Capacities of mFRR shall cover the rest of the FRR after aFRR capacities, in the range of 600 MW to 770 MW for upward regulation mFRR and in the range of 370 MW to 610 MW for downward regulation mFRR.

Dimensioning methodology is applied to ensure sufficient FRR volumes to be procured by Baltic TSOs based on historical imbalances and reference incident of the LFC block. The exact volumes of reserves that shall be procured each day depend on the day-ahead dimensioning

process and can differ from the above-mentioned values considering the Baltic LFC block operational conditions. In addition to daily dimensioning, the methodology foresees a yearly dimensioning process, where results would be published in August prior to the delivery year, to support market participants in their long-term planning.

Balancing capacity markets

To ensure availability of necessary reserves for operation of Baltic LFC block, Baltic TSOs plan to procure following types of reserves (FCR, aFRR, mFRR) in amount of dimensioned volumes determined in Baltic LFC block as capacity products. All Reserve Units providing LFC reserves need to have a successful prequalification testing to participate in the Baltic balancing markets. Baltic TSOs developed harmonised principles for Baltic LFC reserve prequalification to ensure level playing field for Baltic Reserve Units. Following public consultations, Baltic TSOs in April 2022 published harmonized principles for Baltic LFC reserves prequalification.

To increase the readiness of the Baltic power system for synchronization with the network of CESA, Baltic TSOs envisage that the procurement

of FRR capacity in the Baltics, up to levels of preliminary estimated amounts of FRR for Baltic LFC block operation, shall be commenced when the Baltic balancing capacity market is operational. The common market shall be launched before the synchronization with CESA in February, 2025. The final FRR capacity to be procured after the implementation of the Baltic LFC block shall follow the Baltic LFC block FRR dimensioning methodology.

Baltic TSOs have prepared and submitted to the Baltic NRAs have approved the common Baltic balancing capacity market proposal prepared and submitted by Baltic TSOs. It was published in February, 2024. The Baltic balancing capacity market (BBCM) proposal foresees a common procurement of balancing capacity and cross-zonal allocation mechanisms to give the possibility for balance service providers in Baltics to compete in a common Baltic market, ensuring most efficient procurement of balancing capacities within the Baltic countries. The market time unit for all auctions of the Baltic balancing capacity market shall be equal to the market time unit of single day-ahead coupling. According to the prepared methodologies, a significant part of the cross-zonal capacity between the Baltic countries may be allocated for cross-zonal trade of balancing capacity. The allocation of cross-zonal balancing capacity between the Baltic countries shall follow the principle of economic benefit to consumers, thus increasing the allocated cross zonal

balancing capacity in cases, if the calculation shows that allocation of the capacity to day-ahead market is less beneficial.

From the start of common Baltic balancing capacity procurement, cross-zonal capacities will be allocated in accordance with the regional market-based methodology which is prepared by Baltic Capacity Calculation Region TSOs. But later, indicatively from the second half of 2026, the harmonized European methodology for cross-zonal capacity for the exchange of balancing capacity or sharing of reserves shall be implemented, which shall integrate the Baltic countries into the pan-European balancing capacity market.

Baltic TSOs have started to organize a prequalification process for balance service providers from 2023 in accordance to harmonized principles for Baltic LFC reserves prequalification.

Considering the possibility of deficit of balancing reserves as concluded in the Baltic reserve capacity market study conducted by Baltic TSOs in 2021 and uncertainty brought by operation of Baltic power system in new conditions after synchronization with the network of CESA, in order to enhance security of supply and ensure

secure and effective operation of the Baltic power system, as a temporary measure, Baltic TSOs will use TSOs' infrastructure for provision of balancing reserves, subject to the approval from the Baltic NRAs. Namely, Kiisa Power Plant (Kiisa PP) in Estonia, planned AST Battery Energy Storage System (AST BESS) in Latvia and resources of Battery storage operator in Lithuania (BSO) may be used as demand reduction resources to cover part of the necessary balancing reserves as follows:

- Kiisa PP will be used to provide dimensioned share of Estonia for upward mFRR;
- AST BESS will be used to provide dimensioned share of Latvia for FCR and aFRR;
- BSO may be used to provide part of the dimensioned share of Lithuania for both FCR and aFRR.

A considerably larger portion of the total reserve needs (about 70%) will still have to be covered by market participants: at least 50% of FCR, up to 65 % of FRR for upward activation and up to 90% of FRR for downward activation. Additionally, subject to NRAs' decision, Baltic TSOs may use the aforementioned resources as back-up to provide balancing capacity in addition to demand reduction resources in case

the capacity procurement optimisation algorithm is not able to provide satisfactory results, meaning that reserve demands are not met. This can occur if there is an insufficient number of bids provided from the market participants. Back-up resources shall not affect the marginal price of balancing capacity and shall be used only as a last resort in the capacity procurement optimisation algorithm.

Baltic TSOs consider the temporary use of TSO and BSO resources as critical for ensuring secure and effective operation of Baltic power system at the start of operation of the new LFC Block balancing model. Baltic TSOs, by six months after the go-live of the Baltic balancing capacity market and subsequently at least once a year, shall publish and submit information to the relevant regulatory authorities about the volumes and usage of demand reduction resources and back-up resources. If necessary, Baltic TSOs shall change the volume used for demand reduction resources and back-up resources. Such changes shall be publicly communicated without undue delay. As soon as assessment will show that the market is able to securely ensure TSOs reserve requirements and effective operation of Baltic power system balancing is cost efficient without TSO and BSO owned resources, these resources may be phased out gradually. It is

planned that Kiisa PP and BSO will provide reserve capacity starting from the synchronization with CESA, but AST BESS is going to be operational by end of 2025. Latvian TSO, Estonian TSO and BSO owned resources could be used for balancing service provision for up to three years after Estonia, Latvia and Lithuania have joined the continental European synchronous area. When necessary to preserve security of supply an extension of the initial three year period by a maximum of five years may be granted by European Commission.

In the balancing energy markets, the balancing energy activation pricing principles for TSOs'/BSO's resources shall be nationally developed and agreed upon with the respective local NRA in accordance with national legislation. Such principles shall ensure minimal impact to the participants of the balancing energy market and the non-volatility of energy prices. In general, TSOs'/BSO's resources shall be used as a last resort by setting a price that shall aim to be higher than that of market participants.

Implementation timeline

Baltic TSOs are actively working on planning and introducing of necessary changes to the Baltic balancing model. Stakeholders are involved in development of all relevant documents and methodologies through the public consultations and consecutive discussions. More detailed information on planned changes can be found in:

- [Baltic 15 minute imbalance settlement period implementation Concept Document;](#)
- [Baltic Load-Frequency Control block concept document;](#)
- [Harmonised principles for Baltic LFC reserve prequalification;](#)
- [Baltic LFC block FRR dimensioning forecast 2024-2031;](#)
- [Baltic TSOs proposal for Baltic balancing capacity market³](#)
- [Baltic CCR methodology for the market-based allocation process of cross-zonal capacity for the exchange of balancing capacity⁴](#)
- [Exemption to the obligation to allow transfer of aFRR and mFRR balancing capacity for all bidding zones in the Baltic countries⁵](#)
- [Baltic energy market concept for aFRR;](#)
- [Baltic LFC block FRR dimensioning methodology;](#)
- [Baltic LFC block Coordinated actions to reduce FRCE.](#)



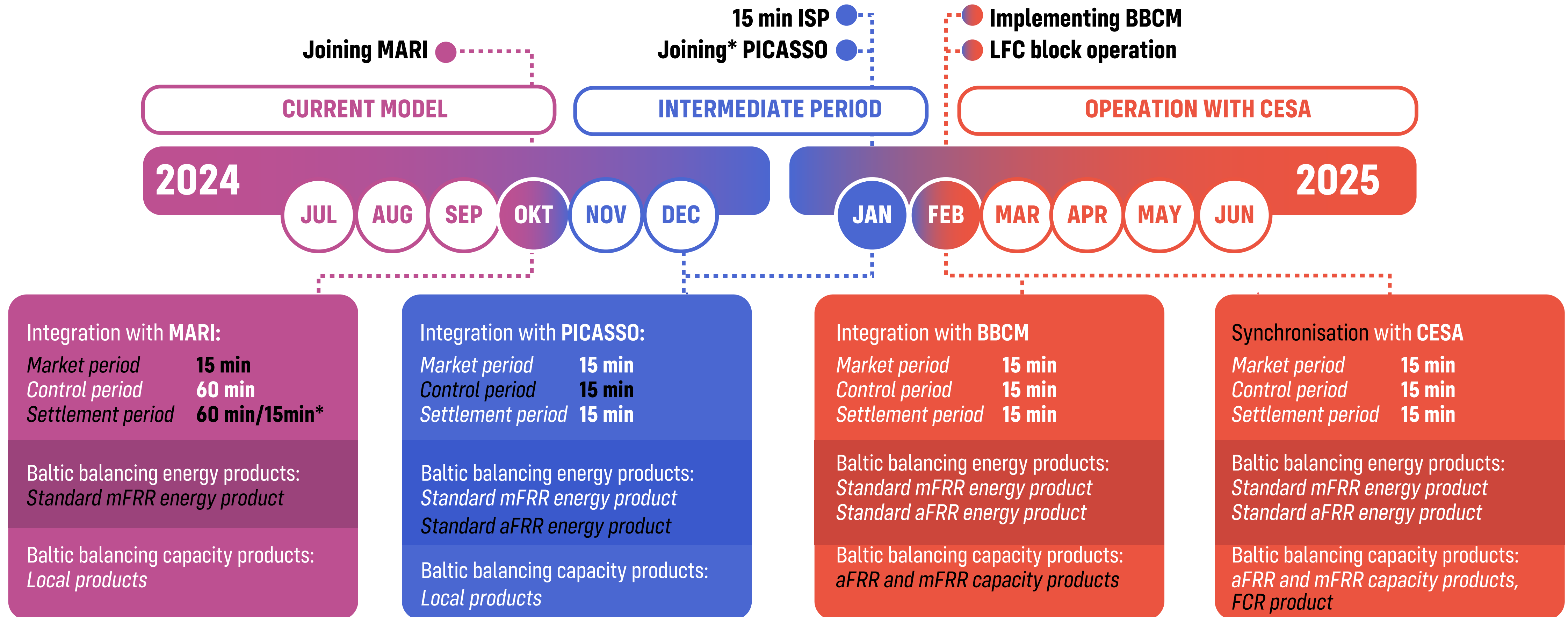
Summary of the implementation timeline for different projects see in the next slide

³ pursuant with Article 33(1) and Article 38(1) of the Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing.

⁴ in accordance with Article 41(1) of the Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing.

⁵ in accordance with Article 34(1) of Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing

Foreseen developments and changes until 2026*



*Settlement period transition in accordance to local implementation plans

* Litgrid will join PICASSO earlier in December 2024

Baltic COBA



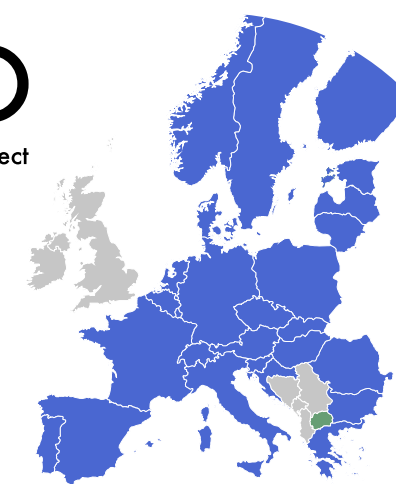
COBA members

MARI Manually Activated Reserves Initiative



● MARI member
● MARI observer

PICASSO
aFRR Platform Implementation Project



● PICASSO member
● PICASSO observer

*The above milestones and deadlines indicate the best estimate of dates and are elaborated in the Baltic balancing roadmap text above.