

Ensuring the Long-Term Adequacy of Balancing Capacity in Estonia

Consultation document

The Problem

Baltic States joining Continental European synchronous area from 2025

Estonia, Latvia and Lithuania are currently connected to and rely upon the Russian synchronous area for frequency management. From 2025 onwards, the Baltic States will separate from the Russian synchronous area and will, instead, join the continental European synchronous area.

From this point, the Baltic transmission system operators (TSOs) will need different frequency management processes that are in line with the European regulatory framework, specifically the provisions of Regulation (EU) 2019/943¹ of the European Parliament and of the Council on the internal market for electricity (the Regulation) and Commission Regulation (EU) 2017/2195² establishing a guideline on electricity balancing (EBGL).

Adopting the European default arrangements without a transition poses challenges

In anticipation of the switch in synchronous area, the Baltic TSOs have conducted analysis³, in line with European methodologies⁴, to assess reserve requirements. For Estonia, this identified the following requirements in terms of standard Balancing Capacity products, assuming extensive reserve sharing with Latvia and Lithuania:

- FRR upward: 393 MW; and
- FRR downward: 334 MW.

These requirements are based on normal operational conditions and presume no limitations on cross zonal sharing of capacity. Nevertheless, it is crucial to acknowledge that restrictions on sharing may exist, necessitating a consideration of requirements under more extreme operational conditions. The Baltic system needs to be capable of island mode operation in the event of temporary desynchronisation from the continental European synchronous area. The above means that actual reserve requirements in Estonia (when considered separately) may be higher than determined by assessment under the European methodologies.

The latest calculations, factoring in the Estonian renewables objective of generating sufficient renewable electricity to meet 100% of Estonian electricity consumption by 2030⁵, indicate reserve needs for 2025 and 2030, as outlined in the table below. Reserve requirements are dynamic and subject to change based on installed renewable capacity and other significant production or consumption factors. These values will undergo consultation and review with other Baltic TSOs.

¹ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32019R0943&qid=1699523636645>

² <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32017R2195&qid=1699523673675>

³ https://elering.ee/sites/default/files/2022-10/FRR_dimensioning_forecast_2024-2031_0.pdf

⁴ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32017R1485>

⁵ <https://kliimaministeerium.ee/media/9407/download>

In addition, there are indications that the existing thermal power plants in the Estonian system which are able to provide some reserves will have difficulty competing in the market. Given the carbon-intensive nature of much of the current generation capacity, increases in carbon prices bring their ongoing operational viability, and, hence, their ability to contribute to meeting Estonia's reserve requirements, into question. The existing thermal fleet is ramping relatively slow, and the units will already need to be generating for them to offer reserves. With time this problem only exacerbates as thermal fleet ages and forecasting errors from the increasing amount of renewable production grows. The largest element in the Baltics remains an HVDC interconnector, which means that there must be enough reserves to compensate for the outage of 700 MW.

This context highlights that **new investments are needed** in the form of fast-ramping production units which are able to support reserve procurement, as supported by recent market test analysis. Possible restrictions on capacity sharing and the need to ensure stable operation in island mode increase this need further⁶. With the rapid development of renewable energy, it is further anticipated that the importance of interconnectors shall greatly increase in value in the context of accommodating energy flows (for example in the context of the day-ahead market). Therefore, it shall be more and more critical to ensure a certain amount of ancillary-service providing assets in the Estonian electrical system.

However, there is considerable **investment uncertainty**. The current absence of markets for FCR capacity, aFRR energy and capacity and mFRR capacity standard products in the Baltics means that investors do not have a view of potential revenues and returns from the provision of reserve services and practical experience on bidding strategy. Even in case these markets would be available, according to EU legislation they are short-term in their temporal scope and, therefore, won't give long-term investment certainty. Elering has received feedback from potential investors, regarding the need for long-term financial stability in order for projects to be bankable and proceed.

Solution Proposal – High-Level Design of the Mechanism

TSO goal is to ensure sufficient balancing reserve capabilities to enable system reliability of electricity system. The main obstacle identified with the current rules for acquiring balancing reserves is the lack of investment certainty. The move towards day-ahead procurement and pricing is aimed at short-term dispatching efficiency and offering a competitive market price. However, the conventional procurement mechanisms (including the existing exemption possibilities) prevent the conclusion of long-term contracts, which would be a typical way of supporting investment certainty.

The proposed solution is a long-term contract for balancing reserve products, structured around the conventional European balancing reserve markets, in the form of a contract for difference (CfD). The Balancing Service Providers who enter the contract are paid the difference between the price stipulated in the contract and the day-ahead balancing capacity market price. As such, they have an incentive to participate in the day-ahead balancing capacity market to receive market payments and bid at short-term variable costs. Figure 1 illustrates the obligations and financial flows from Reserve provider perspective and Box 1 shows an example of how to settle a CfD contract.

⁶ These points are identified within recent market test analysis conducted by the Baltic TSOs, which is available at: <https://elering.ee/en/closed-consultations-april-2021#tab1>

Box 1

Let us assume that a Balancing Capacity provider has secured a CfD contract with a Strike Price of €5/MW/h for the provision of mFRR. Let us then suppose that the short run cost of provision for mFRR of this specific provider is €2/MW/h. The provider would be incentivised to participate in the spot balancing markets and bid its short run cost of provision (€2/MW/h).

In a period where the provider is 'cheaper' than the marginal unit of provision (let us assume this is €4/MW/h), the provider would capture:

- €4/MW/h from the participation in the spot market, assuming it is selected for mFRR provision; and
- an additional $(€5/MW/h - €4/MW/h) = €1/MW/h$ from the settlement under the CfD.

In a period where the provider is more expensive than the marginal unit of provision (let us assume this is €1/MW/h), then the provider would be 'out of merit', and would only capture the difference payment $(€5/MW/h - €1/MW/h) = €4/MW/h$.

In a period where market price is above the strike price, say €7/MW/h, the provider will return the difference between market price and the Strike Price $(€5/MW/h - €7/MW/h) = -€2/MW/h$.

Ultimately a 2-way CfD would ensure some degree of price certainty without distorting bidding incentives. At the same time, it would also offer some protection for consumers given that the back payments under the CfD would ensure that any income above the Strike Price would be paid back.

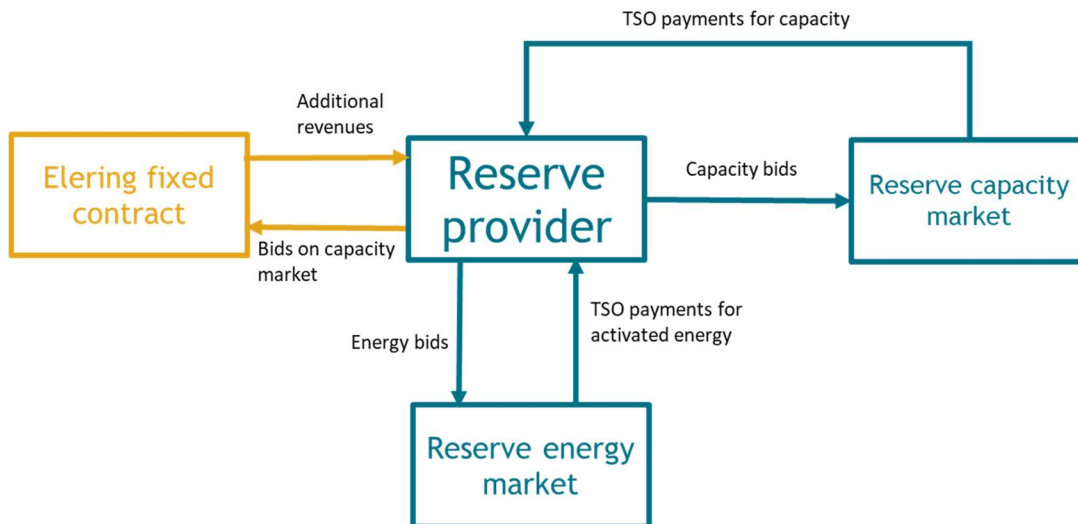


Figure 1 Obligations and financial flows from Reserve provider perspective.

In order to enable the long-term CfD contract, a temporary derogation is needed from the EU legislation. Such derogation is now under discussion in the Electricity Market Design Reform trilogues. Based on information available for Elering, the wording of derogation under discussion is as follows:

“By way of derogation from Article 6(9), (10) and (11), Estonia, Latvia and Lithuania, may conclude financial contracts for balancing capacity up to five years before the start of the provision of the balancing capacity. The duration of such contracts shall not extend beyond eight years after Estonia, Latvia and Lithuania have joined the continental European synchronous area.”

Proposed Procurement Parameters

- **Contract duration:** In the absence of an existing market and associated price signals, a longer contract duration is necessary to support investment certainty.
 - Proposal is delivery period until 2033.
- **Procurement deadline:** The award of the contract must take place long enough before the delivery dates to allow for the necessary construction works.
 - Delivery must start up to five years after conclusion of the contract (before 2030). Contract duration is limited by EU legislation to 8 years starting from Baltic states synchronisation with continental European synchronous area. The sooner the commissioning, the longer the delivery period under the contract.
- **Procurement process:** sealed bid procurement process and lowest bid(s) to win to find the most economically advantageous solution. Procurement may be conducted in separate parts with different deadline for start of delivery.
- **Requirements specification:** The quantity and technical characteristics of the resource required to provide the services must be clearly defined.
 - Proposal to procure ca 300 MW capability to provide mFRR bids towards up-regulation in the day-ahead balancing capacity market. One bid unit is 50 MW.
 - Resource must have capability to provide also aFRR bids at least in amount of 10% of total capability.
 - The technical characteristics of the resource shall follow the Baltic balancing capacity market rules according to methodology pursuant Article 33(1) and Article 38(1) of the Commission Regulation establishing a guideline on electricity balancing⁷ and must be able to complete the prequalification process⁸.
 - The resource must meet all environmental standards for ensuring higher compliance to more stringent emissions regulations in the future.
 - The resource must be able to provide Black Start capability. Black Start capability means at least the following requirements:
 - Ability to restore power to the electricity grid, including high voltage transformers and AC lines, coping with the resulting reactive power.
 - Ability of smooth frequency control in wide dispatch area.
 - The resource should comply with other requirements for generators set in EU and Estonian legislation.
 - The resource shall be available for launching at any time in accordance with the conditions set out in following sections of this document. As an exception, the resource does not have to be available for launching during annual maintenance. Annual maintenance schedules are submitted to Elering for approval in November of the previous year. Elering has the right to make changes to the maintenance schedules in order to avoid excessive overlapping of maintenance schedules and their falling into critical time periods for the electricity system. The maximum maintenance period per year is 45 calendar days.
- **Eligibility:** The process is open to investment in new generation asset across all possible resource types (production, storage and consumption). Eligibility is limited to resource connected to Estonian electricity system to ensure the preservation of the security of the system in event of islanding from a wider synchronous area.

⁷ https://elering.ee/sites/default/files/2022-10/Baltic%20Proposal%20to%20Baltic%20Balancing%20capacity%20market%20rules%20in%20accordance%20with%20EBGL%20Article%2033%281%29%20and%2038%281%29_CLN.docx

⁸ Prequalification process descriptions for aFRR and mFRR <https://elering.ee/en/load-frequency-reserves>

- Any generator unit with specific CO₂ emissions 550 kg/MWh or lower may apply.
- Location: the participating assets must be located in Estonia and connected to the Estonian power system to be eligible.
- In order to participate in the procurement a bidder must present detailed description of planned unit with location, planned connection point in Estonian electricity grid, construction timeline and proof of the unit being able to meet EU- and national environmental goals.
- In order to participate in the procurement a bidder must deposit a security in sum of 5000 € per offered MW of mFRR in Elering's bank account or present a bank warranty in same amount. The deposit will be released for unsuccessful bidders after announcing of the winning bidder and for successful bidders after signing the contract.
- In case of successful contracted bidder(s) fail to fulfil the agreed construction schedule a fine in sum of 100 000 € per contracted MW will be imposed.
- Procurement may also include financial capability criteria for the bidders.
- **Payment:** Successful bidders are paid based on the bid price €/MW/h capacity fee on monthly basis during the delivery period. Payments are only made to the bidder that has participated in the balancing capacity market.
- **Operation of the day-ahead balancing capacity reserve market:** Elering, with neighbouring TSOs, would organize day-ahead balancing capacity markets for procurement and payment of balancing capacity products (FCR, aFRR and mFRR)⁹. It is not mandatory for the holder of long-term contract to participate (submit bid) in the day-ahead capacity market, but the CfD payments are only made in case of participation.
- **Participation in the day-ahead balancing capacity market:** a resource that has entered a long-term contract participates in the normal processes of the day-ahead balancing capacity market.
- **A resource that has entered a long-term contract must be able to provide balancing energy:** at least for 24 consecutive hours and if more than 6 hours have elapsed since the previous activation, the reserve capacity must be ready to provide balancing energy again for at least 24 consecutive hours.

Balancing capacity reserves long-term procurement is used as a transitional measure to create a bridge for the period of synchronisation with Central-European area and closing of several Estonian generation resources. This means that after conclusion of long-term contracts only short-term (day-ahead) balancing capacity markets will remain.

⁹ <https://elering.ee/sagedusreservide-turg>