**Balancing regulations**



## 1. Terms

- **Aggregator** – legal entity that manages the making of a balancing bid to the system operator through either aggregation in consumption or production capacity.
- **Down-regulation** – selling additional amounts of electrical energy by the system operator, due to either lower energy consumption or greater energy production in the system than predicted, need to countertrade or if the security of the electricity system's supply is endangered;
- **Emergency reserve capacity** – capacity reserve held or pre-ordered by the system operator to manage emergencies that may occur in the electricity system;
- **Balance provider** – legal entity, that in order to ensure balance, has a balance contract with its system operator based on regulations established by the Electricity Market Act and the legislations imposed on it;
- **Imbalance** – unbalanced electrical energy that the system operator buys and sells based on a balanced contract made with a balance provider in order to ensure balance;
- **Balancing** – all activities or processes through which the system operator ensures that the electricity system frequency stays within stable fixed limits during different time horizons at all times;
- **Balancing Energy** – balancing reserve or emergency reserve bidding energy activated by the system operator to ensure balance. The system operator uses it to increase or decrease production and consumption, according to the law and legislations established, based on the law and contracts made by the system operator;
- **Balancing Bid** – balancing the energy bid that is made to the system operator by the balancing service provider and which meets the requirements established by the system operator;
- **Imbalance adjustment** – amount of balancing energy that the system operator has activated in the balancing area of the balance provider, and which is reverberated in the balance report of the balance provider taking into consideration trading windows and balancing energy course.

- **Balancing Service Provider** – producer, consumer, balance provider or aggregator, who offers balancing service to the system operator;
- **Common Merit Order List (CMOL)** – list of balancing energy bids sorted in order of their bid prices, used for the activation of balancing energy bids within a coordinated balancing area.
- **Countertrading** – exchange of electrical energy between different market areas, which is initiated by one or more system operators in order to take physical parameters of the electricity system (for example cross-border power flows) within eligible limits and ensure electrical energy trading transactions that have already happened;
- **Up-regulation** – buying an additional amount of energy by the system operator, due to either greater energy consumption or lower energy production in the system than predicted, unexpected discontinuance of production capacity, need for countertrading or when the security of the power system's supply is endangered.

## 2. Main principles of balancing

The Estonian power system belongs to the same synchronous area as the Belarusian, Russian, Latvian and Lithuanian power systems (united system). The Russian system operator guarantees automatic frequency regulation for the Estonian power system (except when it works in isolation from the other power systems). The Belarusian, Russian, Estonian, Latvian and Lithuanian system operators' cooperation organisation BRELL was created to manage synchronous work in the united system, including ensuring that the frequency remains within the required limits.

Ensuring the Estonian power system's balance is coordinated with other system operators' control centres that belong to the BRELL cooperation organisation, and also with the Finnish system operator's control centre due to operation of direct current connections between Estonia and Finland. According to the agreement between BRELL's system operators, the Estonian power system's alternating current balance has to stay within the range of ± 30MWh in an hourly sum in comparison with what was planned (the Latvian power system's alternating current balance must stay within the range of ± 30MWh and the Lithuanian power system's alternating current balance must stay within the range of ± 50MWh.

Elering activates balancing reserves and emergency reserves in real time to balance the Estonian power system balance. The respective activated reserves are manually activated frequency restoration reserves. To ensure normal function of electricity system, Elering does not buy or activate any other types of reserves, for example either automatically activated frequency containment reserve, automatically activated frequency restoration reserve or replacement reserve. In the event the Estonian power system's forecasted alternating current balance is not within the allowed range (± 30MWh), then before deciding on balancing actions dispatcher is recommended to check the total Baltic netted imbalance. If total Baltic netted imbalance is not within allowed range (± 50 MWh), the dispatcher may activate balancing energy bids from the CMOL to balance the Estonian power system. If total Baltic netted imbalance is in allowed range (± 50 MWh), the balancing actions are not needed.

## 3. Balancing reserves and their use in securing balance

Balancing reserves are used to balance inaccuracy in the balance provider's consumption or production predictions, in case of unexpected tripping of production capacity or electrical equipment that influence cross-border transmission capacity or when the security of the power system's supply is endangered.

Balancing reserve bids are drawn up into a Baltic common merit order list (CMOL). Each market participant can submit balancing reserve bid(s) to its connecting TSO, which in turn then submits the bids to the Baltic CMOL. Balancing bids can be made for up-regulations as well as for down-regulations. In addition, Elering mediates the balancing bids in the Baltic CMOL to the Finnish TSO, and the Finnish TSO mediates the balancing bids in its control area to the Baltic CMOL through Elering.

Bidding on balancing reserves is voluntary for market participants. As a premise for making bids, is a bilateral contract with Elering, where the procedure and requirements for bidding are fixed.

Market participants can submit balancing bids or change biddings that have already been submitted up to 45 minutes before the operational hour begins. Balancing reserve has to be fully activated within 15 minutes from when the order to activate has been granted and its full capacity realisation needs to be guaranteed until the operational hour ends.

## 4. Requirements for balancing bids

Balancing bids made by Estonian market participants to Elering need to correspond to requirements described in the table below. However, the criterion for the standard product applies to all Baltic market participants.

| **Parameter that characterises balancing bid** | **Requirement for which the parameter has to correspond to** |
|---|---|
| (a) Preparation Period | The time between the activation time of the balancing energy bid agreed during the phone call or the time between the message for the activation of the balancing bid has been received and the instructed time of activation in said bid. |
| (b) Ramping Period | ≤15 min |
| (c) Full Activation Time | ≤15 min |
| (d) Minimum and maximum quantity | MIN = 1 MW<br>MAX = no restrictions |
| (e) Deactivation Period | ≤15 min |

| Parameter that characterises balancing bid | Requirement for which the parameter has to correspond to |
|---|---|
| (f) Pricing method | Pay as bid €/MWh |
| (g) Minimum and maximum price | MIN = not determined<br><br>MAX = 5000 €/MWh |
| (h) Divisibility | To be defined by BSP (divisible or not divisible) |
| (i) Minimum and maximum duration of Delivery Period | MIN = 1 min<br><br>MAX = 60 min (but not more than until the end of operational hour). |
| (j) Validity Period | 60 min |
| (k) Mode of Activation | Manual |
| (l) Minimum duration between the end of Deactivation Period and the following activation | Not determined |
| (m) Settlement volume determination: Required start of delivery end time of the order | Block product of between required start of delivery and end time of order (figure 1) |
| (n) Gate closure of the BSP offers | H-45min |
| (o) Firmness of the offers | All received offers are firm (fixed). BSP has responsibility to inform TSO if there are unplanned technical restrictions to execute the offer after the Gate closure but not later than exact order. |

Baltic TSOs have agreed on Baltic mFRR products settlement as Figure 1 below illustrates, were: 1 – time of the phone call (activation request); 2 – start time of the order; 3 – time of full activation; 4 – end time of the order; Period 1-2 is Preparation time; Period 2-3 is Ramping time; Period 2-4 is Settlement period; Period 4-5 is Deactivation time.

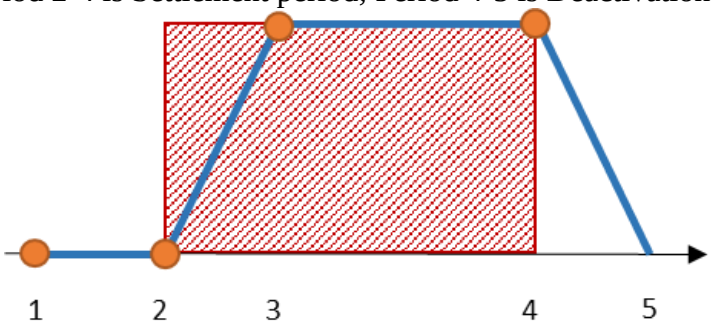


Figure 1: Settlement product for Baltic mFRR market

In addition to the requirements given in the table, balancing bidders need to take into account the following requirements:

- All balancing bids have to be sent to Elering's respective IT-system;
- Elering has to have a chance to identify balancing reserve activation through its SCADA system.

More precise requirements and procedures for making balancing reserve bids will be fixed in a bilateral contract between Elering and the market participant.

## 5. Emergency reserves and their use in securing balance

Emergency reserve is used in the case of unexpected tripping of production capacity, electrical equipment that influence cross-border transmission capacity or when the security of the power system's supply is endangered. Emergency reserve is not used to balance inaccuracy in the balance provider's predictions of consumption or production. Emergency reserve is only used for up-regulation.

According to "Contract of keeping and using emergency reserves in BRELL power circle", all parties of BRELL's contract ensure that an emergency reserve of at least 100 MW is retained. That emergency reserve can only be used in case of BRELL's power systems' operational events.

All BRELL parties to the contract have taken the responsibility to mutually enable the use of 100 MW emergency reserve. In total, this contract enables Elering access to 400 MW cross-border emergency reserves.

The emergency reserve retained for BRELL has to be activated in full capacity within maximally 20 minutes starting from the order to activate, and its uninterrupted full capacity realisation needs to be guaranteed for at least 12 hours. In the existence of need and technical possibility, system operators can mutually agree to extend the realisation time of emergency reserve for a period longer than 12 hours.

To enable maximum import of direct current connections EstLink 1 and EstLink 2 (to be ready for tripping of EstLink 2 in a situation, where the import of electricity energy from Finland to Estonia is in full capacity), Elering has to additionally ensure retaining another 150 MW (all in all 250 MW) emergency reserve of what is enacted in respective of BRELL's contract. Elering retains emergency reserves in its own emergency reserve power stations – Kiisa AREJ 1 (110 MW) and Kiisa AREJ 2 (140 MW).

## 6. Cross-border reserve power activation

To activate reserve power located in Estonia, an order to activate the necessary amount of balancing reserve by balancing reserve bidder's appointed person is granted by Elering's control centre. An order to activate Kiisa emergency reserve power stations is granted through Elering´s SCADA system.

For reserve power located outside Estonia, a cross-border activation order is granted to the adjoining electricity transmission system operator's control centre dispatcher, who arranges reserve power activation in its area of responsibility. Activating reserve power located in Estonia for adjoining system operator will only be done through the Elering control centre.

When activating cross-border reserve power the following circumstances need to be considered:

- When activating reserve powers, cheaper bids need to be preferred, where it is technically possible.
- Cross-border reserve power activation can only happen in case there is free cross-border transmission capacity after trade in a day-ahead market and intraday market, except in a case of countertrading.

Elering carries out cross-border countertrading mainly in relation with the following needs:

- To take active power flows of cross-border or inside power system alternating current lines into permitted limits;
- To compensate active power deficiency or surplus, that is subjected to direct current failure or tripping.

Countertrading does not influence cross-border electrical energy trades that were carried out according to the distribution mechanism agreed amongst market participants. All cross-border electrical energy trades made for operational hour are guaranteed by system operators. Countertrading is carried out only during operational hours. Countertrading is not carried out preventively.

To carry out countertrading, generating is increased in an area, where the active power flow enters (entered) and is reduced in an area, where the active power flow exits (exited). To ensure keeping power balances of power systems in balance, increased and reduced generation has to be within the same range.

## 7. Paying for capacity of reserves and for energy used for balancing

- **Balancing reserves**

Elering does not pre-order balancing reserves, thus market participants are not paid for making bids on balancing reserves. When activating up-regulation reserve, Elering pays market participants for produced energy (or reduced consumption) and when activating down-regulation reserve, market participants pay Elering accordingly for reducing their production (or additional consumption). Energy price will be paid as bid. Information about balancing bid amounts and energy prices produced in activation is exchanged amongst system operators between themselves, and between Elering and Estonian market participants in accordance to the bilateral contracts.

- **Emergency reserves**

As a rule, Elering does not buy emergency reserve capacity from market participants or other electricity transmission system operators. Only in exceptional cases when for some reason it is not possible to receive sufficient emergency reserve capacity from the Kiisa emergency reserve power stations, Elering may buy emergency reserve capacity from market participants or other electricity transmission system operators. In that instance, Elering pays for every reserved MW according to the bilateral agreement. The price of energy will be pay as bid.

When activating the emergency reserve of another BRELL party to the contract, the initiator of power reserve activation has to compensate only the price of energy produced. The price of energy will be paid as bid. The cost of guaranteeing emergency reserve capacity will be

covered completely by the party that ordered to reserve the granted emergency reserve. BRELL's parties to the contract exchange information about emergency reserve amounts and prices of energy produced in activation according to bilateral contracts.

## 8. Imbalance price calculation method

Buying and selling balance energy and arranging payment is carried out under conditions and orders fixed in the Electricity Market Act, network regulation and balance contract.

The system operator calculates the price for every trade period for balance energy bought as well as sold under "The Unified Method for Determining the Balancing Electricity Price" fixed by the Competition Authority.

All activations of balancing reserves that are made to ensure Estonian power system balance, are taken into account when calculating balance energy price. Other system operator's balancing energy' sales/purchases (countertrading and balancing service mediation to other system operators), that are not conducted to ensure system balance, are not taken into account.

According to the method, balance energy price is formed in a way that enables it to cover

1) Justified expenses made to buy balancing power;
2) Justified expenses made to explain balance;
3) System operator's balance energy expenses to buy balance energy;
4) Expenses in relation to up-regulation;
5) Capital's expense of adjustable property used to buy and sell balance energy;
6) And to ensure justified profitability.

Balance energy price formation is based on a principle according to which for each financial year system the operator's commercial income is equal to the sum of commercial expenses and justified profitability.

The system operator publishes the balance energy purchase – and sales prices on its webpage by trading periods by 16.30pm on the third workday following the same trading period.

## 9. Explaining balancing bids

Explaining balancing bids are in accordance with the following principles:

- System operator explains and calculates balancing energy amount with balance service bidder according to activated balance bid.
- The beginning of the balancing bid is the time when the balancing bid was ordered by the system operator and balancing power continues to the end of the hour unless the regulation was ended by system operator earlier.
- Every balancing service bidder needs to have a balance provider, whose balance report reflects a balancing bid.
- System operator takes into account balancing energy in balance provider's balance report over trading periods and considers the direction of balancing .
- Calendar month is the calculation period that is the base of financial calculations in relation to balance.
- Balancing energy amount is defined within 1kWh accuracy for every trading period.