Rules on balancing

The rules on balancing provide principles for balancing the electricity power system within the hour, and are drawn up based on the Estonian Electricity Market Act § 39 (1) 3^1.

1. Terms

Aggregator – a legal entity that organises and submits balancing bids to the transmission system operator through either aggregation of consumption or production capacity;

Balance Responsible Party – legal entity that in order to ensure balance, has a balance agreement with its system operator based on regulations established by the Electricity Market Act and the legislations imposed on it;

Balancing – all activities or processes through which the transmission system operator ensures that the electricity system frequency stays within stable fixed limits during different time horizons;

Balancing Bid – balancing energy bid that is submitted to the transmission system operator by the balancing service provider and which meets the requirements established by the transmission system operator;

Balancing Energy – balancing reserve or emergency reserve activated by the transmission system operator to ensure balance either for increasing or decreasing production and consumption, according to the law and legislations, and contracts concluded by the transmission system operator;

Balancing Service Provider – producer, consumer, balance responsible party or aggregator, who offers balancing service to the transmission system operator;

Common Merit Order List (CMOL) – list of balancing energy bids sorted by product and 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 transmission system operators in order to bring the 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;

Down-regulation – the sale of additional amounts of electrical energy by the transmission system operator, due to either lower energy consumption or greater energy production in the system than forecasted, for the need of countertrade or if the security of the electricity system's supply is endangered;

Emergency reserve capacity – capacity reserve held or pre-ordered by the transmission system operator to manage emergencies that may occur in the electricity system;

Imbalance – imbalance energy that the transmission system operator buys and sells to/from the balance responsible party based on a balance agreement in order to ensure the balance of the balance responsible party;

Imbalance adjustment – amount of balancing energy that the transmission system operator has activated, and which is allocated to the balance report of a balance responsible by imbalance settlement periods while taking into consideration the direction of the activated balancing energy bid;

Up-regulation – purchase of additional amount of energy by the transmission system operator, due to either greater energy consumption or lower energy production in the system than forecasted, 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 power systems of Belarus, Russia, Latvia and Lithuania (commonly referred to as the United Systems). Under normal operation, the frequency of the Estonian power system is ensured by the Russian transmission system operator through the use of automatic frequency reserves. Should the Estonian power system become isolated from the other power systems, the frequency of the Estonian power system shall be ensured by the Estonian transmission system operator. In order to manage the synchronous work in the United Systems as well as to ensure that the frequency deviations are kept between the required limits, a common cooperation organisation, commonly referred to as BRELL, has been established.

The balance of the the Estonian power system is ensured through coordination with other transmission system operators' control centres that belong to the BRELL cooperation organisation, and also with the Finnish transmission system operator's control centre due to direct current (HVDC) interconnectors between Estonia and Finland.

Elering, the Estonian transmission system operator, activates balancing reserves and emergency reserves in real time to balance the Estonian power system's balance. To ensure the normal operation of the Estonian power system, Elering uses manually activated frequency restoration reserves. Elering does not buy or activate any other types of reserves, for example automatically activated frequency containment reserve, and automatically activated frequency restoration reserve or replacement reserve. In the event the Estonian

power system's forecasted alternating current (AC) area control error (ACE) is not within the allowed limits, then the dispatcher, before deciding on any balancing actions, checks the total Baltic ACE. If the total Baltic ACE is not within the allowed range of ± 50 MWh, the dispatcher may activate balancing energy bids from the common merit order list (CMOL) to balance the Estonian power system. If the total Baltic ACE is in the allowed range of ± 50 MWh, the decision whether to activate balancing energy bids or not is made depending on each particular case.

Starting from January 1st, 2018, the Baltic transmission system operators shall establish the function of common coordinated balance control i.e. the power systems of Estonia, Latvia and Lithuania shall be regarded as a single coordinated balancing area (CoBA), with one Baltic transmission system operator being responsible for minimizing the Baltic total ACE with manual frequency restoration reserves activated from the Baltic CMOL.

3. Balancing reserves and their use for balancing

Balancing reserves are used to balance inaccuracies in the balance responsible parties consumption and/or production forecasts, 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.

All balancing reserve bids are compiled into a Baltic common merit order list (CMOL). Each market participant can submit balancing reserve bids to its Connecting TSO, which in turn then submits the bids to the Baltic CMOL. Balancing bids can be submitted for both up-regulation as well as for down-regulation. 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.

Submitting balancing reserve bids to the transmission system operator is voluntary for market participants. The premise for submitting bids is a bilateral agreement concluded with Elering. The bilateral agreement stipulates the procedures and requirements for bidding.

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

4. Requirements for balancing bids

Balancing bids submitted to Elering by Estonian market participants need to correspond to requirements described in the table below. 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

Parameter that characterises balancing bid	Requirement for which the parameter has to correspond to
	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 MAX = no restrictions
(e) Deactivation Period	≤15 min
(f) Pricing method	Until 31.12.2107 according to pay-as-bid €/MWh Starting from 01.01.2018 according to marginal pricing €/MWh
(g) Minimum and maximum price	MIN = not determined MAX = 5000 €/MWh
(h) Divisibility	Yes
(i) Minimum and maximum duration of Delivery Period	MIN = 1 min 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.

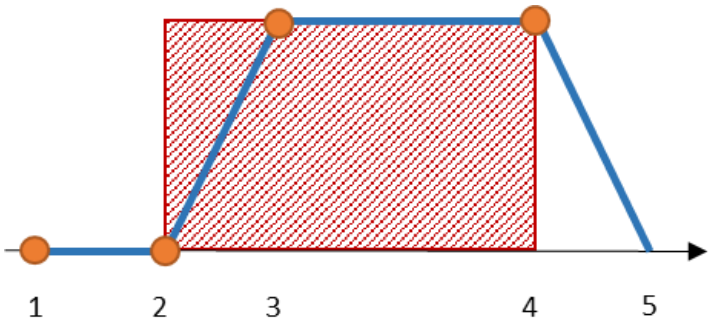

Figure 1: Settlement product for Baltic mFRR market

In addition to the requirements provided in the table, balancing service providers need to take into account the following requirements:

- All balancing bids have to be sent to Elering's respective IT-system;
- Elering must have the possibility to identify balancing reserve activation through its SCADA system.

More precise requirements and procedures for submitting balancing bids are fixed in the bilateral agreement between Elering and the market participant.

5. Emergency reserves and their use in balancing

Emergency reserves are used in case of unexpected tripping of production capacity, electrical equipment that influences cross-border transmission capacity or when the security of the power system's supply is endangered. Emergency reserves are not used to balance inaccuracies in the balance responsible party's predictions of consumption or production. Emergency reserve can only be used for up-regulation.

According to "Contract of keeping and using emergency reserves in BRELL power circle", all parties ensure the availability of at least 100 MW of emergency reserve capaciy. These emergency reserves can only be used in case of BRELL power systems' operational events.

All BRELL parties have the responsibility to mutually enable the use of 100 MW of emergency reserves to one another. In total, this contract gives Elering access to additional cross-border emergency reserves of up to 400 MW.

The emergency reserves retained for BRELL have to be activated in full capacity within 20 minutes starting from activation order, and its uninterrupted full capacity realisation needs to be guaranteed for at least 12 continuous hours. If necessary and technically possibe, transmission system operators can mutually agree to extend the realisation time of emergency reserve for a period longer than 12 hours.

According to the BRELL agreement, Elering has to ensure the availability of an additional 150 MW (all in all 250 MW) of emergency reserves in order to enable maximum import from HVDC interconnectors EstLink 1 and EstLink 2 (in order to be ready for the tripping of EstLink 2 in a situation, where the import of electricity energy from Finland to Estonia is in

full capacity). 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

For reserve power located in Estonia, an activation order for the necessary amount of balancing reserves is submitted by Elering's control center to a person appointed by the balancing service provider. The order to activate balancing bids from Kiisa emergency reserve power is submitted through Elering's SCADA system.

For reserve power located outside of Estonia, a cross-border activation order is given 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 transmission 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, for up-regulation, bids with lower price, and for down-regulation, bids with higher price are preferred first whenever it is technically feasible.
- Cross-border reserve power activation can only happen in case there is available cross-border transmission capacity after the day-ahead and intraday market, except in a case of countertrading.

Elering carries out cross-border countertrading the following reasons:

- To bring active power flows of alternating current cross-border lines or lines inside the power system into permitted limits;
- To compensate for active power deficiencies or surpluses that is subject to the failure or tripping of HVDC interconnectors.

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

To carry out countertrading, generation 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). The increased and reduced generation has to be within the same range to ensure that the power balances of each power systems in balance.

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

- **Balancing reserves**

Elering does not pre-order balancing reserves, i.e. 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 increased consumption). Energy price will be established according to the valid pricing method. Information about balancing bid amounts and energy prices produced in activation is exchanged amongst transmission system operators between themselves, and between Elering and Estonian market participants in accordance with the relevant contracts.

- **Emergency reserves**

As a rule, Elering does not buy emergency reserve capacity from market participants or other electricity transmission system operators. Only in 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. The information regarding the procedure on how bids for emergency reserves are submitted and activated, the requirements to which the emergency reserve bids must correspond to, the principles on how the energy of the emergency reserve is priced and the criteria on how the emergency reserve bids are selected from the list of bids and etc. is all provided in the corresponding agreement.

When activating the emergency reserve of another BRELL party, the initiator of the power reserve activation has to compensate only the price of the energy produced. The price of energy will be established according to the activated bid (pay-as-bid). The cost of guaranteeing emergency reserve capacity will be covered completely by the party that ordered the capacity. BRELL's parties exchange information about emergency reserve amounts and prices of energy produced in activation according to bilateral contracts.

8. Imbalance price calculation method

The principles on how imbalance energy is sold and purchased incl. the principles of payment thereof are fixed according to the legislation and the standard terms and conditions of the balance agreement.

The transmission system operator calculates the price for every imbalance settlement period for imbalance energy bought as well as sold under "The Unified Method for Determining the Balancing Electricity Price". The methodology is agreed with the Estonian Competition Authority.

9. Settlement of balancing bids

Settlement of balancing bids is carried out according to the following principles:

- The transmission system operator calculates and settles the balancing energy volume with the balancing service provider according to the activated balancing bid.
- The start-time of the activated balancing bid is regarded as the time stated by the transmission system operator in the activation order of the balancing bid and the ordered capacity must be maintained until the end of the operational hour;
- Every balancing service provider must have a balance responsible party.
- The activated balancing energy volume shall be taken into account as an imbalance adjustment in the balance responsible party's balance report;

- The accounting period for financial settlement is one calendar month;
- Balancing energy volumes are calculated for every imbalance settlement period with an accuracy of 1 kWh.