# 1. Introduction

The objective of this Explanatory note is to provide a background information for changes in Baltic CoBA Imbalance Settlement Rules and an overview of the imbalance price methodology in terms of the main components used in the determination of the balancing energy reference price, and the additional component that is applied to the balancing energy reference price for the calculation of the imbalance price.

# 2. Definitions and interpretation

All definitions and abbreviations used in the Baltic CoBA Imbalance Settlement Rules must be applied and used as defined in the EB regulation including the following definitions:

**'Accounting period'** means calendar month;

**'Area balancing price'** means the balancing energy market price that reflects the cross-border marginal price for the satisfied balancing energy demand (either through bid activation or demand netting) for normal activation as calculated by the European mFRR platform AOF, and the marginal price of local activations for normal activation purposes;

**'Balancing energy reference price'** means either the area balancing price or the value of avoided activation;

**'Baltic coordinated balancing area (Baltic CoBA)'** means a cooperation between Estonia, Latvia and Lithuania with respect to the exchange of balancing services, sharing of reserves, operating the imbalance netting process and imbalance settlement.

**'Common merit order list (CMOL)'** means a 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;

**'Negative balancing energy'** means the energy activated from downward balancing energy bids;

**'Neutrality component'** means an additional component that is used in the calculation of the imbalance prices through the application of which the Baltic TSOs achieve financial neutrality during a respective accounting period;

**'Normal activation'** means an energy volume, representing both the satisfied balancing energy demand (either through bid activation or demand netting) as calculated by the European mFRR platform AOF and the activation of balancing energy bids from Baltic CMOL with aim of minimizing the Baltic ACE;

**'Open balance provider'** means an electricity trader or transmission system operator, which provides power system balancing services to the Baltic CoBA;

**'Positive balancing energy'** means the energy activated from upward balancing energy bids;

'**Single imbalance pricing**' means that, for a given ISP in a given imbalance price area, the price for negative imbalance and the price for positive imbalance are equal in sign and size;

'**Value of avoided activation**' means a reference price that can be calculated by the TSO or TSOs of a given imbalance price area after the balancing energy gate closure time for a given ISP, at least when there is no balancing energy demand for that imbalance price area for that ISP or no balancing energy activation for that imbalance price area for that ISP.

# 3. Background

Since 1st of January 2018, Elering AS, AS "Augstsprieguma tīkls", LITGRID AB (hereinafter: Baltic TSOs) have harmonised the imbalance settlement principles with regard to single imbalance pricing and single imbalance portfolio model in accordance with the Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing (hereinafter: EBGL) within all three Baltic areas.

EBGL Article 52(2) establishes that the harmonisation of imbalance settlement and imbalance pricing rules should be expanded within Member States and encompass at least:

a. the calculation of an imbalance adjustment pursuant to Article 49 and the calculation of a position, an imbalance and an allocated volume following one of the approaches pursuant to Article 54(3).

b. the main components used for the calculation of the imbalance price for all imbalances pursuant to Article 55 including, where appropriate, the definition of the value of avoided activation of balancing energy from frequency restoration reserves or replacement reserves.

c. the use of single imbalance pricing for all imbalances pursuant to Article 55, which defines a single price for positive imbalances and negative imbalances for each imbalance price area within an imbalance settlement period; and

d. the definition of conditions and methodology for applying dual imbalance pricing for all imbalances pursuant to Article 55, which defines one price for positive imbalances and one price for negative imbalances for each imbalance price area within an imbalance settlement period, encompassing:

    i. conditions on when a TSO may propose to its relevant regulatory authority in accordance with Article 37 of Directive 2009/72/EC the application of dual pricing and which justification must be provided.

    ii. the methodology for applying dual pricing.

The TSOs of the Member States developed the "All TSOs' proposal to further specify and harmonise imbalance settlement in accordance with Article 52(2) of the Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing" which was adopted by the Decision[1] (hereinafter: MHMI) of the Agency for the Cooperation of Energy Regulators (ACER).

[1] [1] ACER Decision on the imbalance settlement harmonisation methodology: Annex I: https://acer.europa.eu/en/Electricity/MARKET-CODES/ELECTRICITY-BALANCING/10%20ISH/Action%205%20-%20ISH%20ACER%20decision%20annex%20I.pdf

In accordance with EBGL Article 52(4), the implementation date for the MHMI is no later than 18 months after approval by all relevant regulatory authorities.

The Baltic TSOs have developed the Baltic CoBA Imbalance Settlement Rules (hereinafter: Baltic ISR) in order to conform to the methodology established in the MHMI and submit it for public consultation to the Baltic BRPs and NRAs.

The Baltic TSOs aim to implement the Baltic ISR by January 1st, 2022.

# 4. Scope

Pursuant to Article 7(2) of the MHMI, the main components used in the determination of the balancing energy reference price are the area balancing price for positive balancing energy, the area balancing price for negative balancing energy, the value of avoided activation, and the direction of the Baltic total system imbalance.

The calculation of the area balancing price shall follow the rules for calculating the balancing price in accordance with the Baltic balancing market rules with exception to paragraphs 27.1. - 27.3, which in the context of this methodology shall not apply.

Pursuant to Article 7(3) of the MHMI, the balancing energy reference price shall be determined in one of the following ways, depending on the activation of balancing energy and/or satisfied balancing energy demand for normal activation:

(a) In case only positive balancing energy has been activated for this ISP, the balancing energy reference price in that imbalance area shall be set as the area balancing price for positive balancing energy;
(b) In case only negative balancing energy has been activated for this ISP, the balancing energy reference price in that imbalance area shall be set as the area balancing price for negative balancing energy;
(c) In case both positive and negative balancing energy has been activated for this ISP, the balancing energy reference price in that imbalance area shall be set as either the area balancing price for positive balancing energy or the area balancing price for negative balancing energy, depending on the direction of the Baltic total system imbalance in accordance with Article 8(2) of the MHMI.
(d) In case there is neither positive nor negative balancing energy activated for this ISP, the balancing energy reference price shall be set as the value of avoided activation.

Pursuant to Article 9(6)(c) of the MHMI, TSOs are allowed to apply an additional component for the calculation of the imbalance price, in order to achieve financial neutrality.

Pursuant to Article 55(4)(a) of the EB GL, the imbalance price cannot be less than the weighted average cost of positive activated balancing energy, and pursuant to Article 55(5)(a) of the EB GL, the imbalance price cannot be higher than the weighted average cost of negative activated balancing energy.

The following chapters describe each of the components in more detail.

## 4.1 Area balancing price for positive and negative balancing energy

Baltic TSOs shall use the area balancing price as the balancing energy reference price during ISPs when there has been balancing energy activated as normal activation through local activations and/or via satisfied balancing energy demand, either through the activation of bids or netting of demand, as calculated by the European mFRR balancing energy platform.

The area balancing prices are calculated separately for each Baltic area, based on marginal pricing principle in accordance with the Baltic balancing market rules with exception to paragraphs 27.1. -27.3, which in the context of this methodology shall not apply.

The area balancing price is equal to the marginal price, which shall reflect the prices of activated balancing energy bids for normal activation though local activations and/or the price of the satisfied demand, either through the activation of bids or netting of demand, as calculated by the European mFRR balancing energy platform.

The area balancing price for positive balancing energy is calculated from the bid prices, which were activated for upward direction and/or based on the satisfied balancing demand for positive balancing energy as calculated by the European mFRR balancing energy platform. Correspondingly, the area balancing price for negative balancing energy is calculated from the bid prices, which were activated for downward direction and/or based on the satisfied balancing demand for negative balancing energy as calculated by the European mFRR balancing energy platform.

In the event that there has been both positive and negative balancing energy bids activated as normal activation through local activations incl. satisfied balancing energy demand, then the direction of the Baltic total system imbalance shall determine whether the area balancing price for positive balancing energy or the area balancing price for negative balancing energy shall be used as the balancing energy reference price, as follows:

a) In case the direction of the Baltic total system imbalance is long (i.e. the Baltics are in imbalance surplus), the balancing energy reference price shall be the area balancing price for negative balancing energy;
b) In case the direction of the Baltic total system imbalance is short (i.e. the Baltics are in imbalance deficit), the balancing energy reference price shall be the area balancing price for positive balancing energy.

## 4.2 The direction of the Baltic total system imbalance

The Baltic total system imbalance represents the net imbalance volume of the Estonian, Latvian and Lithuanian imbalance areas.

The direction of the Baltic total system imbalance determines the balancing energy reference price in each imbalance area during ISPs, when there has been both positive and negative

balancing energy activated locally and/or balancing energy demand has been satisfied through the European mFRR balancing energy platform.

The direction of the Baltic total system imbalance for ISP is determined for the whole of Baltic by separately aggregating:

(a) the positive balancing energy volume activated locally and/or positive balancing energy demand satisfied through the European mFRR balancing energy platform for normal activation and the volume of positive energy from unintended exchanges of energy; and
(b) the negative balancing energy volume activated locally and/or negative balancing energy demand satisfied through the European mFRR balancing energy platform for normal activation and the volume of negative energy from unintended exchanges of energy.

The direction of the Baltic total system imbalance shall therefore be determined based on the dominating direction of the aforementioned aggregated volumes.

The Baltic TSOs propose to use the direction of the Baltic total system imbalance as one of the inputs for calculating the value of avoided activation (please refer to chapter describing the value of avoided activation).

## 4.3 The value of avoided activation

The value of avoided activation shall be used as the balancing energy reference price for those ISPs where there has been no balancing energy activated locally and/or no balancing energy demand satisfied through the European mFRR balancing energy platform for normal activation.

Pursuant to Article 10(4) of the MHMI, for the calculation of the value of avoided activation, a TSO may use only the balancing energy bid prices available to them for that ISP.

The Baltic TSOs shall calculate the value of avoided activation from the balancing energy bids available in the Baltic CMOL, which have been submitted by the local Baltic BSPs.

The balancing energy bids that participate in the calculation of the value of avoided activation must have availability status of at least one (1) minute that shall be determined after the end of the corresponding ISP. The value of avoided activation shall be calculated and published no later than 30 minutes after end of the corresponding ISP. The value of avoided activation shall be the same in Estonia, Latvia and Lithuania.

The following table describes the two options for the calculation of the value of avoided activation. Both options share the same aforementioned criteria.

| | **Option A** | **Option B** |
|---|---|---|
| **Description** | The value of avoided activation is determined from either the lowest priced bid for positive balancing energy or the highest priced bid for negative balancing energy depending on the direction of the Baltic total system imbalance. | The value of avoided activation is determined as the average price of lowest priced bid for positive balancing energy and the highest priced bid for negative balancing energy. |

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|---|---|---|
| **Impact** | - Better incentive for BRPs<br>- Higher balancing energy reference price<br>- Lower neutrality component | - Lower balancing energy reference price<br>- Higher neutrality component. |

The Baltic TSOs have proposed to apply Option A, by which the direction of the Baltic total system imbalance eventually determines, whether the available bid price for positive or negative balancing energy shall be used in the determination of the value of avoided activation:

c) In case the direction of the Baltic total system imbalance is long (i.e. the Baltics are in imbalance surplus), the value of avoided activation is set at the highest priced available bid for negative balancing energy (i.e. downward balancing bid);
d) In case the direction of the Baltic total system imbalance is short (i.e. the Baltics are in imbalance deficit), the value of avoided activation is set at the lowest priced available bid for positive balancing energy (i.e. upward balancing bid).

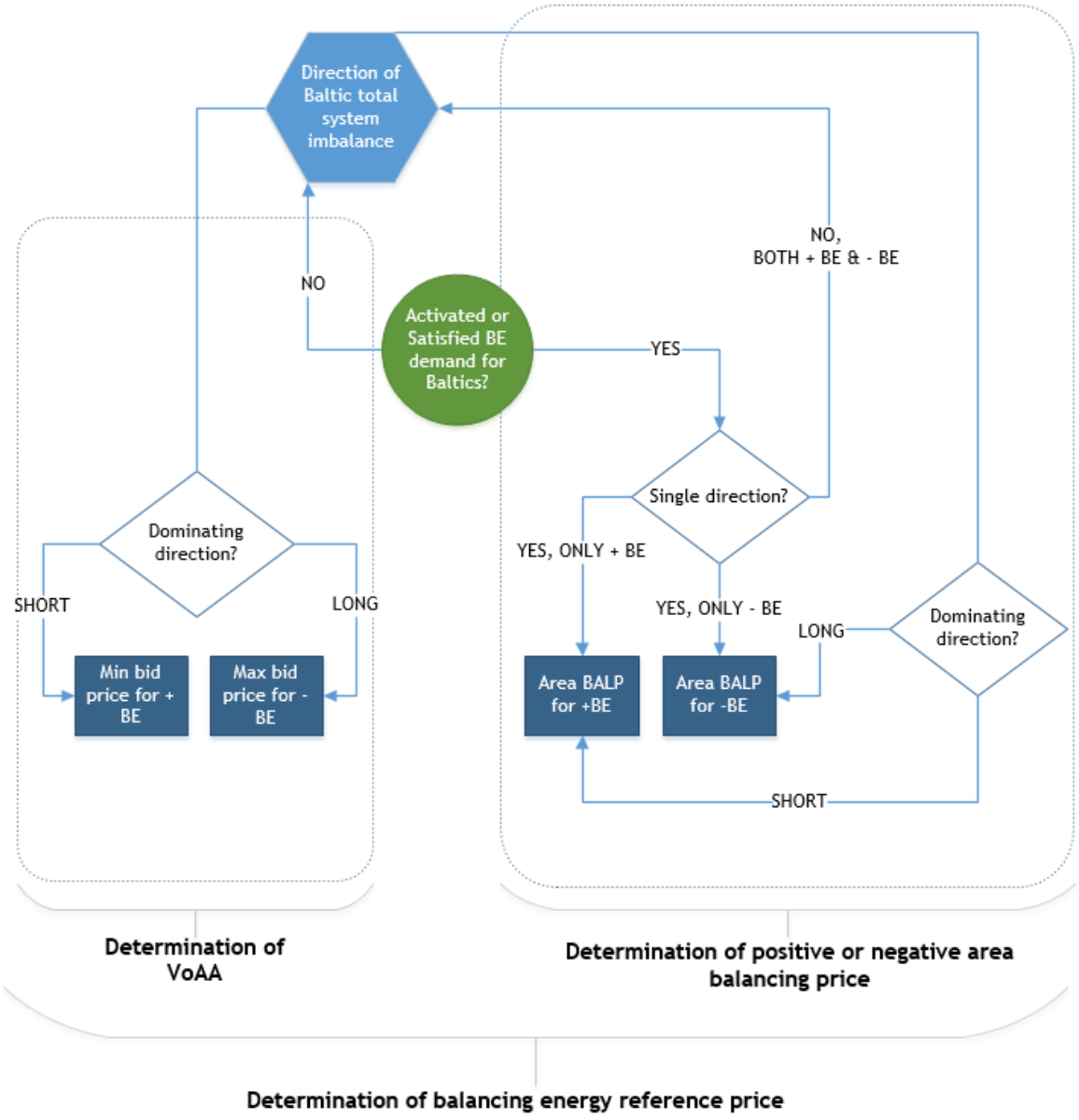
With option B, the calculation of the value of avoided activation is solely based on the available bid prices for available positive and negative balancing energy i.e. the direction of the Baltic total system imbalance plays no role in the determination of the value of avoided activation.

The Baltic TSOs have included an appendix to this explanatory note (**Appendix_1_to_the_Explanatory_note-Modelled_imbalance_prices**), which includes the resulting balancing energy reference prices, neutrality component and the final imbalance prices calculated based on 2020 data by using either of the two methodologies for the determination of the value of avoided activation. For comparison, the actual imbalance prices and neutrality component information is provided for reference.

Data on the balancing energy bid prices could be found here: https://baltic.transparency-dashboard.eu/node/33.

Data on the system imbalance could be found here: https://baltic.transparency-dashboard.eu/node/44.

The following graph provides a summary on how the balancing energy reference price shall be determined:




**Area BALP** means Area balancing price
**+BE** means positive balancing energy
**-BE** means negative balancing energy

## 4.4 Neutrality component

The Baltic TSOs shall apply a neutrality component (formerly referred to as the targeted component), which is related to the financial neutrality of the Baltic TSOs, in accordance with Article 9(6)(c) of the MHMI.

The aim of the neutrality component is to socialise the expenses and/or income, which the Baltic TSOs incurred during the respective accounting period from the settlement of unintended exchanges of energy with the Baltic open balance provider, activated balancing energy for normal activation incl. the satisfied balancing energy demand, and the expenses and/or income, which the TSOs would have incurred if settlement of BRP imbalances would have been based solely on the balancing energy reference price (instead of the imbalance price).

The following formula depicts the calculation of the neutrality component:

$$P_{ntc_t} = \frac{\sum_{t=1}^{T}(C_{bal_t}+C_{OBP_t})+\sum_{t=1}^{T}\sum_{n=1}^{N}(E_{imb_{t,n}}*P_{bal_{t,n}})}{\sum_{t=1}^{T}\left|\sum_{n=1}^{N}E_{imb_{t,n}}\right|-\left|\sum_{n=1}^{N}O_{imb_{t,n}}\right|^2},$$ , whereas

$C_{bal_t}$ - Total costs (+)/ revenue (-) of activated balancing energy incurred by Baltic TSOs in the $ISP_t$ (EUR);

$C_{OBP_t}$ - Total costs (+)/ revenue (-) of energy delivered by/ to open balance provider in the $ISP_t$ (EUR);

$E_{imb_t}$ - BRP's imbalance in $ISP_t$ (MWh).

$O_{imb_t}$ - System imbalance resulting from over activation in $ISP_t$ (MWh).

$P_{bal_t}$ - Balancing energy reference price during $ISP_t$ (EUR/MWh);

*N* - Total number of BRPs in CoBA;

*n* - Particular BRP.

The neutrality component shall be the same value for each ISP and each imbalance price area within the accounting period.

In order to respect the lower limit imbalance price boundary condition set out in Article 55(4) and the upper limit imbalance price boundary condition set out in 55(5) of the EB GL, the application of the neutrality component shall depend on the activation of balancing energy and/or satisfied balancing energy demand for normal activation:

(a) In case only positive balancing energy has been activated for this ISP, the neutrality component shall be added to the balancing energy reference price i.e. the area balancing price for positive balancing energy;
(b) In case only negative balancing energy has been activated for this ISP, the neutrality component shall be deducted from the balancing energy reference price i.e. the area balancing price for negative balancing energy;
(c) In case both positive and negative balancing energy has been activated for this ISP, or in case there is neither positive nor negative balancing energy activated for this ISP, the neutrality component shall be either added or deducted from the balancing energy reference price depending on the direction of the Baltic total system imbalance:

i. in case the direction of the Baltic total system imbalance is short, the neutrality component shall be added to the balancing energy reference price – the area balancing price for positive balancing energy or the value of avoided activation – of the respective imbalance price area;
ii. in case the direction of the Baltic total system imbalance is long, the neutrality component shall be deducted from the balancing energy reference price – the area balancing price for negative balancing energy or the value of avoided activation – of the respective imbalance price area.