# 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 for the Baltic CoBA unintended exchange of energy;

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

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

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

# 41  3. Background

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

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

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

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

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

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

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

66      ii.  the methodology for applying dual pricing.

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

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[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

72  In accordance with EBGL Article 52(4), the implementation date for the MHMI is no later than
73  18 months after approval by all relevant regulatory authorities.

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

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

# 4. Scope

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

84  The calculation of the area balancing price shall follow the rules for calculating the balancing
85  price in accordance with the Baltic balancing market rules with exception to paragraphs 27.1. -
86  27.3, which in the context of this methodology shall not apply.

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

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

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

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

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

## 110 4.1 Area balancing price for positive and negative
## 111 balancing energy

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

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

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

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

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

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

## 141 4.2 The direction of the Baltic total system imbalance

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

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

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

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

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

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

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

## 4.3   The value of avoided activation

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

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

168  The Baltic TSOs shall calculate the value of avoided activation from the balancing energy bids
169  available in the Baltic CMOL, which have been submitted by the local Baltic BSPs. The Baltic
170  TSOs shall exclude from the calculation of the VoAA those balancing energy bids that originate
171  from the power station(s) that are in the ownership of a TSO.

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

177  The following table describes the two options for the calculation of the value of avoided
178  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 | The value of avoided activation is determined as the average price of lowest priced bid for positive balancing energy and the highest |

| | negative balancing energy depending on the direction of the Baltic total system imbalance. | priced bid for negative balancing energy. |
|---|---|---|
| **Impact** | - Better incentive for BRPs<br>- Higher balancing energy reference price<br>- Lower neutrality component | - Lower balancing energy reference price<br>- Higher neutrality component. |

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

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

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

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

198  Data on the balancing energy bid prices could be found here: https://dashboard.electricity-
199  balancing.eu/en/bids/standard-prices.

200  Data on the system imbalance could be found here: https://dashboard.electricity-
201  balancing.eu/en/imbalance/volumes.

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

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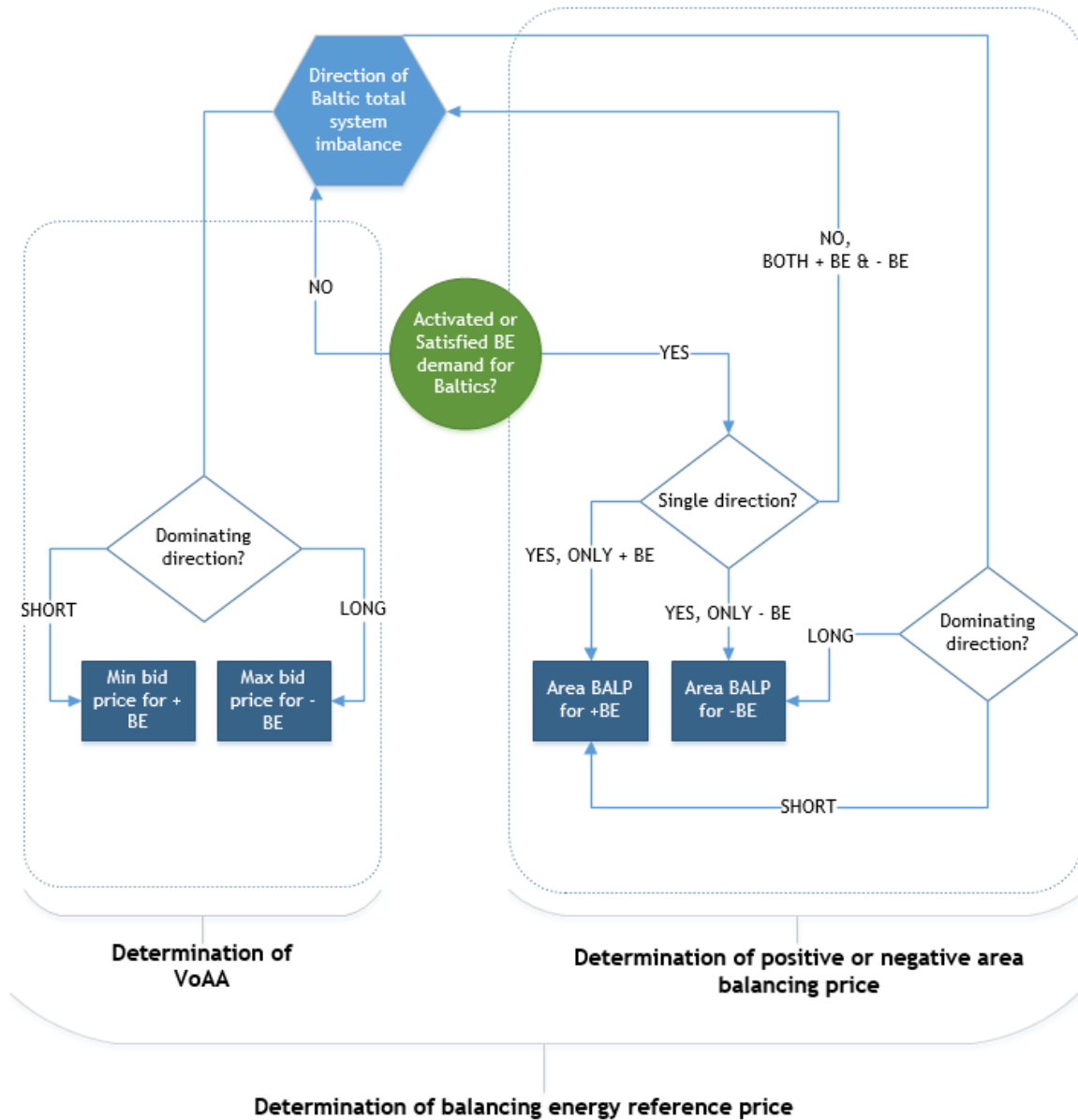
**Area BALP** means Area balancing price
**+BE** means positive balancing energy
**-BE** means negative balancing energy

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## 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.

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

219     The following formula depicts the calculation of the neutrality component:

220
$$
P_{ntc_t} = \frac{\sum_{t=1}^{T}(C_{bal_t}+C_{OBP_t})+\sum_{t=1}^{T}\sum_{n=1}^{N}(E_{imb_{t,n}}*P_{bal_{t,n}})}{\sum_{t=1}^{T}\left|\sum_{n=1}^{N} E_{imb_{t,n}}\right| - \left(\sum_{t=1}^{T}\left|\sum_{n=1}^{N} O_{imb_{t,n}}\right|*2\right)}, \text{, whereas}
$$

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

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

225     $E_{imb_t}$    - BRP's imbalance in $ISP_t$ (MWh). A negative sign indicates BRP's energy shortage and
226     BRP shall procure shortage energy from the TSO at the imbalance price. A positive sign,
227     indicates BRP's surplus and BRP shall sell the energy surplus to TSO at the imbalance price;

228     $O_{imb_t}$    - System imbalance resulting from over activation in $ISP_t$ (MWh), which is equal to the
229     net BRP imbalance volume. The Baltic TSOs define over activation as the occurrence in which
230     due to unforeseeable changes in the real-time portfolios of the Baltic BRPs, the direction of the
231     Baltic total system imbalance has changed in an opposite direction compared to which the TSOs
232     had activated balancing energy. In case of no over-activation, the system imbalance resulting
233     from over activation shall be zero. The system imbalance resulting from over activation is
234     multiplied by two (2) in order to achieve full financial neutrality of the TSOs.

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

236     $N$       - Total number of BRPs in CoBA;

237     $n$       - Particular BRP.

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

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

244    (a) In case only positive balancing energy has been activated for this ISP, the neutrality
245          component shall be added to the balancing energy reference price i.e. the area balancing
246          price for positive balancing energy;

247    (b) In case only negative balancing energy has been activated for this ISP, the neutrality
248          component shall be deducted from the balancing energy reference price i.e. the area
249          balancing price for negative balancing energy;

250    (c) In case both positive and negative balancing energy has been activated for this ISP, or
251          in case there is neither positive nor negative balancing energy activated for this ISP, the
252          neutrality component shall be either added or deducted from the balancing energy
253          reference price depending on the direction of the Baltic total system imbalance:

254             i. in case the direction of the Baltic total system imbalance is short, the
255                neutrality component shall be added to the balancing energy reference
256                price – the area balancing price for positive balancing energy or the value
257                of avoided activation – of the respective imbalance price area;

258           ii. in case the direction of the Baltic total system imbalance is long, the
259                neutrality component shall be deducted from the balancing energy
260                reference price – the area balancing price for negative balancing energy
261                or the value of avoided activation – of the respective imbalance price
262                area.

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