Baltic Harmonised Imbalance Settlement Model Document

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1. Update on the Baltic harmonised imbalance settlement model

On June 27, 2016 Baltic TSOs launched public consultations on the Baltic CoBA elements by sending out invitation letters to Baltic electricity market participants and relevant stakeholders as well as placing information on the websites of Baltic TSOs inviting the market participants to submit their answers by August 15, 2016. The Baltic TSOs received several responses prompting the TSOs to re-analyse and make changes to some of the building blocks, which were included in the Baltic TSOs preliminary imbalance model proposal.[1,2]

On February 17th, 2017 the Baltic TSOs submitted to the market participants the final proposal, titled the Baltic Imbalance Settlement Document Model[3] .

On April 18th, 2017 the Baltic TSOs submitted to the NRAs the agreed Settlement Model with the purpose to seek support from the Baltic NRAs to achieve the harmonisation of the imbalance settlement principles as detailed and proceed with relevant national regulatory amendments and developments in each Baltic State. The agreed settlement model included the proposal for single imbalance price calculation and imbalance service cost components, including neutrality charge calculation and views on the administrative cost allocation methodologies. On June 5th, 2017 the Baltic NRAs issued a joint response letter to the Baltic TSOs, indicating that although the efforts carried out by the TSOs to achieve the harmonization of imbalance settlement principles within the Baltic States are highly appreciated, some aspects of the model cannot be introduced due to conflicts with current laws and regulations. The Baltic NRAs drew attention to the fact that in order to implement the imbalance settlement design as the TSOs proposed, valid laws and regulations in each Baltic State should be followed and therefore the proposals of changes in laws and regulations should be pursued by cooperating with the responsible governmental authorities in each Baltic State. Because of concerns that the subsequent amendments to local laws might not get passed duly on time, and provided that the adoption of the European wide regulation, the Guidelines on Electricity Balancing[4], is foreseen, yet not guaranteed, to take

[1] http://www.ast.lv/eng/par_ast/news___events/5682-baltic-tsos-launch-a-public-consultation-on-the-baltic-balancing-market-elements

[2] http://www.ast.lv/eng/par_ast/news___events/6105-summary-of-baltic-tsos-launched-public-consultation-on-the-baltic-balancing-market-elements

[3] http://www.ast.lv/files/files/20170217_Baltic_Imbalance_settlement_model.pdf

[4] https://www.entsoe.eu/major-projects/network-code-development/electricity-balancing/Pages/default.aspx

place during December 2017, the Baltic TSOs propose to proceed with the harmonised imbalance settlement model in the following form:

Building block	***Effective from 01/01/2018***	***Effective not earlier than 01/01/2019****
Balance responsibility	*Full*	*Full*
Cost coverage/base	*Neutrality costs between balance service and grid service. Full cost of balancing.*	*Neutrality costs between balance service and grid service. Full cost of balancing.*
ACE cost recovery model	*Included via targeted component, monthly average component*	*Included via targeted component, monthly average component*
Imbalance settlement period	*60 minutes*	*60 minutes*
Settlement model	*Single portfolio model*	*Single portfolio model*
Reference for short/long position	*Baltic's total imbalance position*	*Baltic's total imbalance position*
Pricing model for imbalance	*Single pricing*	*Single pricing*
Imbalance price formula	*mFRR reference price +/- targeted component (c)*	*mFRR reference price +/- predetermined targeted component (c)*
mFRR reference price	*Marginal mFRR or local Elspot Published: H+1*	*Marginal mFRR or local Elspot Published: H+1*
Targeted component (EUR/MWh) formula	$\frac{TSOs' net\ cost\ or\ revenue\ due\ to\ balancing\ trades\ (EUR)}{\sum\ absolute\ volumes\ of\ hourly\ Baltic\ CoBA\ imbalance\ positions\ (MWh)}$	$\frac{TSOs' net\ cost\ or\ revenue\ due\ to\ balancing\ trades\ (EUR)_{M-2}}{\sum\ absolute\ volumes\ of\ hourly\ Baltic\ CoBA\ imbalance\ positions\ (MWh)_{M-2}}$
Imbalance price calculation	***As soon as possible, but not later than by M+5 (5th business day)***	*Final H+1*
Balancing cost recovery model for neutrality	***Actual targeted component (c)***	*Predefined targeted component + neutrality component M+9*
Neutrality component (EUR/MWh) formula	*not applicable*	$\frac{TSOs' net\ cost\ or\ revenue\ due\ to\ balancing\ trades\ (EUR)}{\sum\ absolute\ volumes\ of\ BRPs' total\ hourly\ imbalance\ volumes\ (MWh)}$
Administrative cost component	*Individual per system (NRAs methodology)*	*Individual per system (NRAs methodology)*

* Proposed Baltic harmonized imbalance settlement model should be implemented after relevant national legal laws will be changed but not earlier than 01/01/2019

2. Description of Baltic Imbalance Settlement Model for BRPs

This chapter provides more detailed information on the Baltic imbalance settlement model incl. the alterations for 2018.

2.1. Single Portfolio Model

The Baltic TSOs propose to adopt a single portfolio model meaning that both production and consumption are dealt within the same portfolio. The concept of the single portfolio model is to give the right incentives for market participants to balance the system, based on transparency and sharing of information.

The calculation of imbalance for single portfolio consists of aggregated planned and measured data and imbalance adjustment trades per imbalance settlement period, whereas:

- Planned balance reflects the final net volume of commercial transactions for each imbalance settlement period on organised markets or between BRPs.
- Measured balance reflects the net volume of realized physical generation and consumption per imbalance settlement period over the connection points in which the BRP is responsible for.
- Imbalance adjustment reflects the activated mFRR balancing bids activated by order of the TSO, the resource of which belongs to the BRP's balance area.

BRPs shall submit to the local TSO the planned balance in which there must be balance between production and purchases vs consumption and sales. The forecasted and/or systematic purchase or sale of imbalance electricity is not allowed. The rules for measurement data exchange between TSO and network operators and rules for defining the balance area of BRPs shall be set individually per each price area. The algebra for a single balance portfolio is the following:

Planned balance	*Net balance schedule, whereas Production + Purchase = Consumption + Sale*
Measured balance	*∑(P_in-P_out) metered data in a BRP's portfolio*
Imbalance	*Measured – Planned –/+ portfolio's Imbalance Adjustment*

Imbalances will be settled in each direction. When a BRP's imbalance position is long i.e. its imbalance is at a surplus, it means that more electricity had been produced or less consumed than the BRP had initially contracted. When a BRP's imbalance position is short i.e. its imbalance is at a deficit, it means that less electricity had been produced or more consumed than the BRP had initially contracted. Therefore, the resulting imbalance calculated for the BRP's balance portfolio shall be either positive or negative, whereas positive imbalance indicates that the TSO has bought the surplus imbalance from a BRP and a negative imbalance conversely means that the TSO has sold imbalance to the BRP to cover its shortage.

The following is an example of imbalance calculation in a single portfolio model (MWh):

I. NET POSITION (PLANNED BALANCE)	***-5***
- *incl. Planned consumption (purchases from Power Exchange and/or through bilateral agreements)*	*10*
- *incl. Planned production (sale to Power Exchange and/or through bilateral agreements)*	*5*
II. NET MEASURED BALANCE	***-2***
- *incl. measured consumption (the sum of Pout values per metering points)*	*8*
- *incl. measured production (the sum of Pin values per metering points)*	*6*
III. ACTIVATED IMBALANCE ADJUSTMENT (upward regulation)	***1***
IV. IMBALANCE VOLUME	***2***

2.2. Single Pricing Model

The Baltic TSOs have decided to adopt a single price model meaning that BRPs shall receive exactly the same price regardless whether their imbalance position is at a surplus or deficit. The imbalance price shall be determined based on the direction of the Baltic ACE and the mFRR (manual frequency restoration reserve) balancing activations carried out to minimize Baltic ACE.

The imbalance prices shall be determined as follows:

Imbalance price methodology		***Baltic CoBA imbalance position***	
		Short	***Long***
BRP imbalance	*Short*	*mFRR reference price + targeted component (c)*	*mFRR reference price – targeted component (c)*
	Long		

- If the Baltic CoBA imbalance direction is short, the targeted component (c) shall be added to the marginal mFRR upward regulation price;
- If the Baltic CoBA imbalance direction is long, the targeted component (c) shall be deducted from the marginal mFRR downward regulation price;

- In the event the Baltic CoBA's imbalance is zero, thus meaning that there were no mFRR balancing bids activation and no trade of not netted ACE with open balance provider, the reference imbalance price in each balancing area shall be set with the respective day-ahead price of each area;
- In the event the Baltic CoBA imbalance direction is short, and no upward regulation activated, the reference price shall be the local day-ahead price with the addition of the targeted component (c);
- In the event the Baltic CoBA imbalance direction is long, and no downward regulation activated, the reference price shall be the local day-ahead price with the deduction of the targeted component (c).

2.2.1. mFRR Reference Price

The Baltic TSOs have agreed to implement a centralized balance control function starting from 2018. The TSOs will nominate a coordinator amongst themselves, who will be responsible for initiating the activation of balancing energy bids with the purpose of minimizing the Baltic total not netted ACE towards the Open balance provider.

The mFRR reference price shall be established for each balance area – EE, LV, and LT –, and determined based on the resulting activities carried out in the Baltic balancing market:

- mFRR marginal price for upward regulation shall be the most expensive activated upward regulation bid in the mFRR market during the hour for the purpose of balancing the Baltic CoBA;
- mFRR marginal price for downward regulation shall be the least expensive activated downward regulation bid in the mFRR market during the hour for the purpose of balancing the Baltic CoBA;
- In situations when there is no congestion between the cross-borders of the balance areas, the mFRR reference price shall be identical in all three Baltic balance areas;
- When congestion of transmission capacity in the balancing market occurs, the balance areas obtain individual mFRR reference prices. If such congestion occurs between two adjacent balance areas, the Baltic area will be split into two separate price areas. The

balance areas unaffected by congestion of transmission capacity in the balancing market shall still be treated as a single price area, and will therefore share the same mFRR reference price.

Only those balancing mFRR balancing bids shall affect the Baltic mFRR marginal pricing, which have been activated for the purpose of balancing the Baltic CoBA. Bids activated by the request of neighbouring systems such as the Nordics, Poland or Russia/Belarus or due to congestion management shall not participate in the forming of the Baltic mFRR marginal pricing.

2.2.2. Targeted Component

The targeted component (*c*) shall be established for the Baltic CoBA not netted ACE residual and other costs/revenues related with trade of balancing energy recovery. The application of the targeted component shall be determined based on the imbalance direction of the Baltic CoBA. The component shall be the same for each balance area in the Baltics as the Baltic TSOs will share the common settlement budget for all trades related to Baltic balance management. The targeted component will be aimed at capturing the full cost of balancing, and calculated taking into account the actual ACE and other costs/revenues related with trade of balancing energy.

The following section provides examples on how imbalance prices in the Baltic CoBA shall be determined:

	Example I			
	Estonia	***Latvia***	***Lithuania***	• *Baltic CoBA imbalance position is short;* • *no congestion of transmission capacity in the balancing market between the price areas – same balancing price in all balance areas;* • *mFRR balancing bids are activated in Latvia (60 €/MWh) and Estonia (80 €/MWh);* • *all balance areas share the same marginal mFRR reference price of 80 €/MWh;*
NordPool Day-Ahead Price €/MWh	*45 €/MWh*	*45 €/MWh*	*45 €/MWh*	
Activated mFRR Price €/MWh	*80 €/MWh*	*60 €/MWh*	-	
mFRR balancing price for upward regulation €/MWh	*80 €/MWh*			

Targeted Component €/MWh	*10 €/MWh*	• *targeted component for the month is set at 10 €/MWh;* • *all Baltic price areas share the same imbalance price of 90 €/MWh.*
Imbalance Price €/MWh	*90 €/MWh*	

	Example II			
	Estonia	***Latvia***	***Lithuania***	• *Baltic CoBA imbalance position is short;* • *congestion of transmission capacity in the balancing market occurs between EE and LV balance areas - EE shall have different balancing price than LV and LT;* • *mFRR balancing bid is activated in Lithuania (70 €/MWh);* • *EE mFRR reference price is set equal to day-ahead price of 45 €/MWh. LV and LT shall share the same marginal upward regulation price of 70 €/MWh;* • *targeted component for the month is set at 10 €/MWh;* • *EE area imbalance price shall be 55 €/MWh;* • *LV and LT areas shall share the same imbalance price of 80 €/MWh.*
NordPool Day-Ahead Price €/MWh	*45 €/MWh*	*50 €/MWh*	*50 €/MWh*	
Activated mFRR Price €/MWh	*-*	*-*	*70 €/MWh*	
mFRR balancing price for upward regulation €/MWh	*45 €/MWh*	*70 €/MWh*		
Targeted Component €/MWh	*10 €/MWh*			
Imbalance Price €/MWh	*55 €/MWh*	*80 €/MWh*		

From 2018 January 1 - The targeted component will consist of a €/MWh value calculated at least by the 5th business day of next month. The component will be based on the actual costs incurred during the settlement month. Therefore, the final imbalance prices shall be published also at least by the 5th business day of the month.

$$Targeted\ component\ (\frac{EUR}{MWh}) = \frac{TSOs'net\ cost\ or\ revenue\ due\ to\ balancing\ trades\ (EUR)}{\sum absolute\ volumes\ of\ hourly\ Baltic\ imbalance\ positions\ (MWh)}$$

Not earlier than 2019 January 1 - The targeted component will consist of a €/MWh value predetermined prior to the forthcoming settlement month. This enables to publish final imbalance prices H+1.

$$Predetermined\ targeted\ component\ \left(\frac{EUR}{MWh}\right) = \frac{TSOs'net\ cost\ or\ revenue\ due\ to\ balancing\ trades\ (EUR)_{M-2}}{\sum absolute\ volumes\ of\ hourly\ Baltic\ imbalance\ positions\ (MWh)_{M-2}}$$

2.3. Neutrality Charge

From 2018 January 1 Baltic TSOs will not implement additional neutrality charge component. The targeted component will consist of the actual average cost of underlying settlement month**,** calculated by 5th business day of next month.

Not earlier than 2019 January 1 – as the imbalance prices will be published H+1, the Baltic TSOs will implement additional neutrality component for BRPs.

Based on GL EB each national regulatory authority (NRA) shall ensure that all TSOs under their competence do not incur economic gains or losses with regard to the financial outcome of the settlement pursuant to balancing and each TSO may develop a proposal for a settlement mechanism separate to settle the full cost of balancing. While the targeted component aims at recovering the full cost of balancing, and also to ensure that imbalances are settled more with the price that reflects the actual cost of balancing, the net financial proceeds or losses arising from the balance service through the application of the single imbalance price model shall be settled by a neutrality mechanism employed by the Baltic TSOs via common settlement budget. This shall guarantee that no costs related to balancing shall be carried on out to the next month, but will instead be settled in the same month.

All trades related to Baltic's balance management shall be shared and settled between Baltic TSOs equally based on the following principles:

- Each connected TSO shall be responsible for carrying out settlement (report and financial settlement) within their balance area and for settling the activated mFRR and ER mFRR trades with the BSPs/TSOs and imbalance settlement trades with BRPs;
- Each TSO shall be responsible for submitting to other TSOs the settlement data for imbalance trades with BRPs and balancing trades with BSPs activated for Baltic balance purposes;
- Settlement Coordinator shall aggravate all trades related to Baltic balance management and calculate monthly based financial result for Baltic TSOs.

Total Revenues from Balancing Trades, EUR	***Total Costs from Balancing Trades, EUR***
Sale of not netted imbalance (ACE)	*Purchase of not netted imbalance (ACE)*
Sale of mFRR trade for balancing purposes	*Purchase of mFRR and ER mFRR trade for balancing purposes*
Sale of imbalance energy for BRPs	*Purchase of imbalance energy from BRPs*

The neutrality charge could be positive or negative based on actual cost/revenues of balancing trades compared with revenues from predetermined targeted component (c) that was included to imbalance price. The following shows an example of how the neutrality charge would be calculated:

	Purchase of Baltic CoBA Not Netted ACE €	Sale of Baltic CoBA Not Netted ACE €	Purchase of mFRR balancing trades to balance Baltic CoBA €	Sale of mFRR balancing trades to balance Baltic CoBA €	Purchase of imbalance power from BRPs based on H+1 imbalance prices €	Sale of imbalance power to BRPs based on H+1 imbalance prices €	Baltic TSOs Preliminary Net Position €	Baltic BRPs Total Imbalance Volume, MWh	Baltic TSO's Neutrality Charge €/MWh
00 - 01	0	30	-3 750	0	-1 700	5 100	-320	110	0,56
01 - 02	-500	0	0	0	-2 250	3 500	750	125	0,56
02 - 03	-4 500	0	-5 850	0	0	9 000	-1 350	150	0,56
03 - 04	-7 200	0	-5 525	0	0	9 750	-2 975	160	0,56
04 - 05	0	30	0	800	-1 500	1 000	330	280	0,56
05 - 06	-4 000	0	0	0	-1 700	6 600	900	110	0,56
06 - 07	0	90	0	1 400	-900	0	590	140	0,56
07 - 08	-2 000	0	-5 000	0	-400	8 800	1 400	120	0,56
SUM	-18 200	150	-20 125	2 200	-8 450	43 750	-675	1 195	-

The imbalance prices shall remain as published, but the neutrality charge shall be acquired from or redistributed to the BRPs when actual settling of accounts between the BRP and its local TSO occurs.

NEUTRALITY CHARGE EUR/MWh

Accounts for all trades EUR / BRPs total imbalance volumes in Baltic areas:

- if the neutrality account per month is positive, TSOs will be net payers to BRPs
- if the neutrality account per month is negative, BRPs will be net payers to TSOs

2.4. Administrative Cost Recovery

The imbalance price shall not include a component for covering administrative costs. Furthermore, the administrative costs shall also be independent from the monthly financial neutrality settlement. Instead the mechanisms applied for covering administrative costs shall be

set individually by each TSO and be subject to NRA approval. A neutrality component for all network users will be in line with the current draft edition of the GL EB, according to which each TSO may set up a proposal for an additional settlement mechanism to cover administrative costs.

The Baltic TSOs initial proposals for administrative cost recovery:

	Proposal for administrative cost component: after NRAs approval	***Administrative cost component based on current national regulation***
ELERING	*0,0X €/MWh for consumption and production in BRP's portfolio (monthly based allocation)*	*Charge for sold/purchased imbalance volume €/MWh, included to BRPs imbalance price*
AST	*Fixed fee + charge for sold/purchased imbalance volume €/MWh*	*Fixed fee + charge for sold/purchased imbalance volume €/MWh*
LITGRID	*Charge for sold/purchased imbalance volume €/MWh*	*Charge for sold/purchased imbalance volume €/MWh*

Annex I Definitions

Balance Responsible Party (BRP) means a market-related entity or its chosen representative responsible for its imbalances.

Balancing means all actions and processes, on all timelines, through which TSOs ensure, in a continuous way, to maintain the system frequency within a predefined stability range, and to comply with the amount of reserves needed per frequency containment process, frequency restoration process and reserve replacement process with respect to the required quality.

Balancing Market means the entirety of institutional, commercial and operational arrangements that establish market-based management of balancing.

Balancing Service Provider (BSP) means a market participant with reserve providing units or reserve providing groups able to provide balancing services to TSOs.

Baltic Not Netted ACE means the Baltic's not netted imbalance towards Russia, which is settled through the trade of imbalance energy with the open balance provider of the Baltic system.

Connecting TSO means the TSO which operates the control area in which balancing service providers and balance responsible parties shall be compliant with the terms and conditions related to balancing.

Imbalance means an energy volume calculated for a balance responsible party and representing the difference between the allocated volume attributed to that balance responsible party, and the final position of that balance responsible party and any imbalance adjustment applied to that balance responsible party, within a given imbalance settlement period.

Imbalance Adjustment means an energy volume representing the balancing energy from a balancing service provider and applied by the connecting TSO for an imbalance settlement period to the concerned balance responsible parties, for the calculation of the imbalance of these balance responsible parties.

Imbalance Price means the price, positive, zero, or negative, in each imbalance settlement period for an imbalance in each direction.

Imbalance Settlement means a financial settlement mechanism aiming at charging or paying balance responsible parties for their imbalances.

Imbalance Settlement Period (ISP) means time units for which balance responsible parties' imbalance is calculated.

mFRR (Manual Frequency Restoration Reserves) means the active power reserves activated manually to restore system frequency to the nominal frequency and for synchronous area consisting of more than one LFC area power balance to the scheduled value.

Marginal Pricing means a principle according to which the price of the last activated balancing energy offer following merit order applies to all activated bids during the particular imbalance settlement period.

Position means energy volume representing the sum of scheduled commercial transactions of a balance responsible party, on organised electricity markets or between balance responsible parties, for the calculation of imbalance, or, where appropriate, means an energy volume representing scheduled injections, scheduled withdrawals or the sum of scheduled injections and withdrawals of a balance responsible party, for the calculation of the imbalance of that balance responsible party.

Single Portfolio means grid injection and offtake volumes are netted into a single balance responsibility account.

Single Pricing means a single imbalance price for system shortage and a single imbalance price for system surplus.