Methodology for the market-based allocation process of cross-zonal capacity for the exchange of balancing capacity for the Baltic CCR

in accordance with Article 41(1) of the Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing

16 July 2024

Whereas

(1) This document provides a methodology for a market-based allocation process of cross-zonal capacity for the exchange of balancing capacity and sharing of reserves (hereafter referred to as "this methodology") in accordance with article 41(1) of Commission Regulation (EU) 2017/2195 of 23 November establishing a guideline on electricity balancing (hereafter referred to as the "EB Regulation") for the geographic area covering the Baltic capacity calculation region (hereinafter referred to as the "Baltic CCR") as defined in accordance with Article 15 of Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management (hereafter referred to as the "CACM Regulation").

(2) This methodology takes into account the general principles and goals set out in the EB Regulation as well as Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation (hereafter referred to as the "SO Regulation"), the CACM Regulation and Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity (hereafter referred to as the "Electricity Regulation").

(3) The Transmission System Operators of the Baltic CCR (hereafter referred to as the "TSOs") intend to exchange balancing capacity and plan for that reason to develop common and harmonised rules and processes for this exchange and procurement in accordance with Article 33 of the EB Regulation. To secure this exchange of balancing capacity, the TSOs intend to submit an application proposal in accordance with Article 38(1) of the EB Regulation to allocate cross-zonal capacity across timeframes using the market-based allocation process pursuant to Article 41 of the EB Regulation. This methodology shall define the details of a market-based cross-zonal capacity allocation process.

(4) This methodology is based on an optimisation process that seeks to maximise the sum of actual economic surplus from the procurement of balancing capacity and sharing of reserves and the forecasted estimation of economic surplus for the single day-ahead coupling. Consistent with the EB Regulation's aims as stated in its Article 3, this optimisation process enhances the efficiency of balancing and of European and national balancing markets. The pricing method, the firmness regime and the sharing of congestion income for cross-zonal capacity that has been allocated for the exchange of balancing capacity ensures equal treatment with cross-zonal capacity allocated for the exchange of energy.

(5) The optimisation process used to allocate cross-zonal capacity effectively trades off the use of cross-zonal capacity for the exchange of balancing capacity and sharing of reserves with the use of cross-zonal capacity for the exchange of energy in the day-ahead market. The forecasted market value of cross-zonal capacity for the exchange of energy that is used in this process is calculated based on the latest available day-ahead energy prices in the connecting bidding zones. The value of cross-zonal capacity for the exchange of balancing capacity is calculated within the optimisation process itself and formed by the actual balancing capacity bids submitted by the balancing service providers ("BSPs"). The TSOs will, as part of this allocation processes' implementation, collect information on and review the accuracy and efficiency of the forecasting methodology used. This review will include a comparison of the forecasted and actual market values of cross-zonal capacity for the exchange of energy.

(6) This methodology generally contributes to the achievement of the objectives of Article 3 of the EB Regulation. In particular, this methodology serves the following objectives:

(a) This methodology enables the allocation of cross-zonal capacity for the exchange of balancing capacity to a region with common and harmonised rules and processes for the exchange and procurement of balancing capacity developed in accordance with Article 33 of the EB Regulation, and therefore facilitates the coupling of local balancing capacity markets. By doing so, this methodology contributes to an efficient utilisation of balancing capacity resources across bidding zone borders in order to secure the volume of balancing capacity needed to maintain operational security. The market-based cross-zonal capacity allocation process is using submitted bids from BSPs and a transparent forecasting method for estimating the value of cross-zonal capacity for the single day-ahead coupling to allocate cross-zonal capacity for balancing capacity procurement in the respective region. Hence, this methodology fosters effective competition in a non-discriminatory and transparent way in balancing markets (Article 3(1)(a) of the EB Regulation), enhances the efficiency of balancing as well as the efficiency of European and national balancing markets (Article 3(1)(b) of the EB Regulation) and contributes to the objective of integrating balancing markets and promoting the possibilities for exchanges of balancing services while contributing to operational security (Article 3(1)(c) of the EB Regulation).

(b) This methodology takes into account the impact on the day-ahead market by using the forecasted market value of cross-zonal capacity in the day- ahead market for the objective to maximise the total economic surplus of both the day-ahead energy and balancing capacity markets. By allowing the exchange of balancing capacity, leading to a more efficient balancing capacity market and price formation, it also contributes to efficient investment signals in new capability for providing balancing capacity. Therefore, this methodology contributes to the efficient long-term operation and development of the electricity transmission system and electricity sector in the Union while facilitating the efficient and consistent functioning of the day-ahead, intraday and balancing markets (Article 3(1)(d) of the EB Regulation).

(c) This methodology ensures that the procurement of balancing services is fair, objective, transparent and market-based, avoids undue barriers to entry for new entrants, fosters the liquidity of balancing markets while preventing undue distortions within the internal market in electricity (Article 3(1)(e) of the EB Regulation), since it will foster liquidity for the procurement of balancing capacity in integrated balancing capacity markets while taking into account the impacts on the day-ahead market. The allocation of cross-zonal capacities by the market-based capacity allocation process provides a transparent input for the procurement of balancing capacity in an objective way and is based on market inputs from the balancing capacity and day-ahead energy markets.

(d) This methodology does not negatively impact the objectives in accordance with Articles 3(1)(f) and (g) of the EB Regulation.

TITLE 1
General provisions

Article 1
Subject matter and scope

1. This document is the methodology for the market-based allocation process of cross-zonal capacity for the exchange of balancing capacity and sharing of reserves in accordance with Article 41(1) of the EB Regulation for the Baltic CCR. It is based on the comparison of the forecasted market value of cross-zonal capacity for the exchange of energy and the actual market value of cross-zonal capacity for the exchange of balancing capacity and sharing of reserves in accordance with Article 39 of the EB Regulation.

2. This methodology also includes the algorithm principles for the cross-zonal capacity allocation function.

3. This methodology covers the bidding zone borders of the Baltic CCR.

4. The application of this methodology shall be subject to the methodology pursuant to Article 38(1)(b) of the EB Regulation, which shall define the bidding zone borders, the market timeframe and the duration of application in accordance with Article 38(2)(a) of the EB Regulation.

5. Two or more TSOs willing to exchange balancing capacity and/or willing to perform sharing of reserves by applying the market-based capacity allocation shall use a common and harmonised set of rules and processes for the exchange and procurement of balancing capacity in accordance with Article 33(1) of the EB Regulation, and respecting the requirements set out in Article 32 of the EB Regulation.

6. A TSO applying a central dispatching model and the market-based cross-zonal allocation process shall convert as far as possible the integrated scheduling process bids into standard balancing capacity product bids, pursuant to Article 27(3) of the EB Regulation. In this case, each reference to the standard balancing capacity bids in this methodology, shall be understood for this TSO as a reference to the integrated scheduling process bids converted into standard balancing capacity bids.

Article 2
Definitions and interpretation

1. For the purposes of this methodology , terms used in this methodology shall have the meaning of the definitions included in Article 2 of the EB Regulation, Article 3 of the SO Regulation and Article 2 of the CACM Regulation, Article 2 of the Commission Regulation (EU) 2016/1719 of 26 September establishing a guideline on forward capacity allocation (hereafter referred to as the "FCA Regulation"), Article 2 of the Electricity Regulation, Article 2 of the Commission Regulation (EU) No 543/2013 of 14 June 2013 on submission and publication of data in electricity markets and amending Annex I to Regulation (EC) No 714/2009 of the European Parliament and of the Council (hereafter referred to as "Transparency Regulation") and Directive (EU) 2019/944.

2. The following additional definitions shall also apply:

(a) 'cross-zonal capacity allocation function' means the functionality that optimises the allocation of cross-zonal capacity across the day-ahead market timeframe and the market timeframe for the exchange of balancing capacity and sharing of reserves;

(b) 'economic surplus from the exchange of balancing capacity and sharing of reserves' means the sum for the relevant time period of (i) the TSOs' surplus for the exchange of balancing capacity and sharing of reserves, (ii) the BSPs' surplus for the exchange of balancing capacity and sharing of reserves and (iii) the congestion income. The surplus for BSPs is the difference between the balancing capacity price and the prices of the accepted balancing capacity bids multiplied by the accepted volume of the balancing capacity bids. The surplus for TSOs is the difference between the technical price limit and the balancing capacity price multiplied by the volume of the TSO demand;

(c) 'mark-up' is a positive numerical value with units of EUR/MWh which means an addition per day ahead market time unit to the forecasted market value of cross-zonal capacity for the exchange of energy, calculated in order to take intoaccount the uncertainty in the forecasted market value of cross-zonal capacity for the exchange of energy during the allocation of the cross-zonal capacity for the exchange of balancing capacity and sharing of reserves;

(d) 'positive forecast error' is a positive numerical value with units of EUR/MWh which means an underestimation per day ahead market time unitof the initial forecasted market value of cross-zonal capacity for the exchange of energy;

(e) 'reference day' means the day which is used to define the forecasted market value of cross-zonal capacity for the exchange of energy;

(f) 'TSO demand' means the balancing capacity volume to be procured within the scope of the methodology pursuant to Article 33(1) of the EB Regulation by the connecting TSO and defined per scheduling area and bidding zone in accordance with Article 32(1) of the EB Regulation;

(g) 'Demand reduction resources' - resources provided by the Baltic TSOs or other service providers for the reduction of the demand, to be procured from primary and back-up resources, according to EBGL Article 32(1);

(h) 'Primary resources' – resources provided by the BSPs for the balancing capacity market auctions;

(i) 'Back-up resources' - additional resources provided for balancing market auctions in case of unsatisfactory balancing capacity market optimization results;

(j) 'The Baltic countries' – the joint geographical area of Estonia, Latvia and Lithuania.

3. In this methodology, unless the context requires otherwise:

(a) the singular also includes the plural and vice versa;

(b) the table of contents and headings are inserted for convenience only and do not affect the interpretation of this methodology;

(c) any reference to cross-zonal capacities shall include also the reference to allocation constraints as applied in the respective capacity calculation methodology pursuant to Article 20 of the CACM Regulation;

(d) any reference to legislation, regulation, directive, order, instrument, code or any other enactment shall include any modification, extension or re-enactment of it then in force; and

(e) any reference to an Article without an indication of the document shall mean a reference to this methodology.

TITLE 2
Market-based allocation process of cross-zonal capacity for the exchange of balancing capacity and sharing of reserves

Article 3
Principles for applying market-based cross-zonal capacity allocation process

1. The market-based capacity allocation process shall be executed by the cross-zonal capacity allocation function and shall determine the amount of cross-zonal capacities to be allocated to the exchange of standard balancing capacity products or sharing of reserves for each day ahead market time unit following the objective in Article 8(4).

2. TSOs shall use standard balancing capacity products for frequency restoration reserves and replacement reserves pursuant to Article 25(2) of the EB Regulation and submit all balancing capacity bids from standard balancing capacity products to the capacity procurement optimisation function pursuant to Article 33(3) of the EB Regulation. TSOs shall not modify or withhold any balancing capacity bids and shall include them in the procurement process, except under conditions set out in Article 26 and Article 27 of the EB Regulation.

3. A single gate closure time shall apply for all balancing capacity markets where this methodology is applied irrespective of time zone differences, such that one gate closure time shall be applied for the submission of all standard balancing capacity bids. This gate closure time shall be set D-1 after the pre-final capacity calculation and before the final day-ahead capacity calculation. For TSOs applying a central dispatching model and applying this methodology, the gate closure time for the submission of the integrated scheduling process bids that are converted to the standard balancing capacity bids shall be defined in the national terms and conditions pursuant to Articles 24(5) and 24(6) of the EB Regulation.

4. For each application of this methodology, the validity period of standard balancing capacity bids shall be equal or a multiple of the day-ahead market time unit and shall be less or equal to the total amount of day-ahead market time unit of the concerned day.

5. The pricing principle used for the settlement of standard balancing capacity bids between TSOs and BSPs for each application of this methodology shall be based on cross-zonal marginal pricing (pay-as-cleared).

6. The cross-zonal capacity allocation function shall allow linking of bids which participate in the market-based cross-zonal capacity allocation process, in accordance with the defined linking provisions pursuant to the methodology pursuant to Article 33(1) of the EB Regulation. Besides the exemption pursuant to Article 7(4)(b), such links shall only be allowed within the market-based allocation process.

7. All TSOs applying this market-based process shall ensure compatibility between the cross-zonal capacity allocation function and the capacity procurement optimisation function, including the selection of standard balancing capacity bids which determine the output of the cross-zonal capacity allocation function in accordance with Article 8(5).

8. According to Article 38(4) of the EB Regulation, cross-zonal capacities allocated to the exchange of standard balancing capacity products or sharing of reserves where this market-based allocation process is applied, shall be:

(a) exclusively provided to the cross-border FRR control processes in accordance with Article 149 of the SO Regulation until all TSOs of a bidding zone border are connected to the respective platform pursuant to Articles 20 and 21 of the EB Regulation;

(b) exclusively provided to the respective platform, pursuant to Articles 19 to 21 of the EB Regulation, of the standard balancing capacity product it was allocated for, starting from the connection of the TSOs from the concerned bidding zone border to the respective platform.

9. The process of releasing allocated cross-zonal capacity for the exchange of balancing capacity and sharing of reserves, pursuant to Article 38(9) of the EB Regulation, shall be:

(a) coordinated by the cross-border control process in accordance with Article 149 of the SO Regulation until the connection of the TSOs to the platforms pursuant to Article 19 to 21 of the EB Regulation;

(b) coordinated between the platforms for balancing energy pursuant to Articles 19 to 21 of the EB Regulation, starting from the connection of the TSOs to these platforms.

Article 4
Notification process for the use of the market-based allocation process

1. Each TSO intending to apply this market-based allocation process shall notify all TSOs of the same synchronous area(s) 3 (three) months prior to entering into operation in accordance with Article 150 of the SO Regulation and inform all stakeholders and all TSOs through an announcement on the ENTSO-E website, at least 3 (three) months prior to entering into operation. This announcement on the ENTSO-E website shall include:

(a) the TSOs involved;

(b) the expected date for the exchange of balancing capacity and sharing of reserves pursuant to Article 33(1) of the EB Regulation with the market-based allocation process to enter into operation;

(c) the detailed description of the specifications, including the market timeframe, in accordance with article 38(2) of the EB Regulation;

(d) the forecast of the average expected amount of frequency restoration power interchange due to the cross-zonal FRR activation process or reserve replacement power interchange due to the cross-zonal RR activation process;

(e) the maximum limit(s) of cross-zonal capacity for exchange of balancing capacity as defined pursuant to Article 5(1) and maximum amount of exchange or sharing of reserves pursuant to Article 5(3); and

(f) the type and direction of standard balancing capacity product which will be exchanged or shared.

2. All TSOs applying this methodology, shall share the algorithm applying the cross-zonal capacity allocation function with all Baltic CCR TSOs, of a cooperation applying the market-based process in accordance with Article 38(1) of the EB Regulation.

3. The TSOs intending to apply this methodology shall publish 3 (three) months ahead of the application of this methodology on the ENTSO-E website the expected costs and benefits of such an application of this methodology.

Article 5
Process to define the maximum volume of allocated cross-zonal capacity for the exchange of balancing capacity and sharing of reserves

1. In accordance with Article 41(1)(d) of the EB Regulation, the process to define the maximum volume of allocated cross-zonal capacity for the exchange of balancing capacity and sharing of reserves for the cross-zonal capacity allocation function shall be as follows:

   (a) by default the maximum volume of cross-zonal capacity allocated for the exchange of balancing capacity and sharing of reserves shall be calculated as a percentage value of cross-zonal capacity calculated for the day-ahead timeframe in accordance with the capacity calculation methodologies developed pursuant to Article 20(2) of the CACM Regulation and the value shall be the following:

       i.   50% for the borders between any two bidding zones which are inside the Baltic countries;

       ii. 10% for all other bidding zone borders in the Baltic CCR;

   (b) to resolve a situation where the limit for the maximum volume of cross-zonal capacity allocated for the exchange of balancing capacity in accordance with paragraph 1(a) is not sufficient to satisfy TSO demand in a bidding zone, a TSO may increase the percentage limit pursuant to paragraph 1(a) on the relevant bidding zone borders or critical network elements for the relevant day-ahead market time units. The limit for the maximum volume of cross-zonal capacity allocated for the exchange of balancing capacity shall only be increased to the point until the TSO demand is satisfied and the higher percentage value defined in this paragraph of the calculated cross-zonal capacity calculated for day ahead market timeframe. If this maximum limit is still not sufficient to satisfy a TSO demand, a fall-back procedure pursuant to Article 7(6) shall be initiated. TSOs shall notify the regulatory authorities of the Baltic CCR about each increase of the limit for the maximum volume of cross-zonal capacity allocated for the exchange of balancing capacity above the threshold set in paragraph 1(a). This notification shall include at least the final volume percentage and value in MW of cross-zonal capacity allocated for the exchange of balancing capacity and the reasons for the shortage of balancing capacity bids in the importing bidding zone, including the list of all available bids in the algorithm, per each bidding zone. The notification shall take place no later than two weeks after such increase. The annual impact of such increases shall be reported pursuant to Article 12(8)(b). The higher percentage value shall be the following:

       i.   70% for the borders between any two bidding zones which are inside the Baltic countries;

       ii. 20% for all other bidding zone borders in the Baltic CCR;

   (c) if increases pursuant to paragraph (1)(b) occur due to a structural local shortage of BSPs' bids for a standard balancing capacity product in a bidding zone, in the case when over a two-week period it is observed that for at least 25% of market time units the process set in paragraph (1)(a) is executed, the limit for the maximum volume of cross-zonal capacity allocated for the exchange of balancing capacity and sharing of reserves in accordance with paragraph (1)(a) may be increased by 2 percentage points on the bidding zone borders which require an increase of this

limit. Such increase of the default limit shall be reported to stakeholders and the regulatory authorities of the Baltic CCR at least two weeks in advance of application. This process can be performed repeatedly up until the increased percentage value of the calculated cross-zonal capacity calculated for day ahead market timeframe set in this paragraph is reached. The applied default limits shall be published in accordance with Article 12(7). Following the increase of the default limit, if the structural local shortage of BSPs' bids is remedied, in the case when over a two-week period it is observed that during no hours the maximum threshold set by the process in this paragraph is reached, the increased limit shall be reduced by 2 percentage points on the bidding zone borders which no longer require the increase on the limit. Such decrease of the default limit shall be reported to stakeholders and the regulatory authorities of the Baltic CCR at least two weeks in advance of application. This process can be performed repeatedly in the cross-zonal capacity allocation function down to the default limit of 50% of the calculated cross-zonal capacity calculated for day ahead market timeframe, provided that TSO demand is still satisfied. The applied default limits shall be published in accordance with Article 12(7). The increased percentage value that can be reached by the process set in this paragraph is as follows:

    i. 70% for the borders between any two bidding zones which are inside the Baltic countries;

    ii. 20% for all other bidding zone borders in the Baltic CCR;

2. The exchange of balancing capacity and sharing of reserves shall, in addition to the limit defined in accordance with paragraph 1, be limited by the rules for the exchange and sharing of reserves in accordance with Title 8, Chapter 1 and 2 of the SO Regulation through the:

    (a) maximum procurement volume of balancing capacity per direction for a specific bidding zone, or a set of bidding zones due to operational security requirements pursuant to Article 165(3)(g) of the SO Regulation;

    (b) minimum procurement volume of balancing capacity per direction for a specific bidding zone, or a set of bidding zones defined in accordance with the dimensioning process pursuant to Article 157(2)(g) of the SO Regulation.

Article 6
Determination of the forecasted market value of cross-zonal capacity for the exchange of energy in single day-ahead coupling

1. The initial forecasted market value of cross-zonal capacity for the exchange of energy defined for each direction, for each bidding zone border and for each day-ahead market time unit shall be:

    (a) equal to the positive market spread for each day-ahead market time unit of the reference day for the direction of the positive market spread; or

    (b) equal to zero for each day-ahead market time unit of the reference day for the direction of the negative market spread or in case of zero market spread.

2. The initial forecasted market value of cross-zonal capacity for the exchange of energy will be adjusted when the available cross-zonal capacity available for the exchange of energy is changed and the cross-zonal capacity is congested before the adjustment, after the adjustment or both. The adjustment in the market value of cross-zonal capacity for the exchange of energy is based on the expected changes in bidding zones' dispatch and the corresponding changes in bidding zone's clearing prices. The adjustment to the clearing prices in bidding zones shall be dependent on the forecast change of the net position of the bidding zone in a linear manner.

$$MCP_{1,a} = MCP_{0,a} + \alpha_a \times \Delta V_a$$

Where:

α_a– DAM price volume sensitivity of bidding zone a [€/MWh^2];

$MCP_{0,a}$ – the forecast DAM price from the reference day methodology in bidding zone a [€/MWh];

$MCP_{1,a}$ – the anticipated DAM price after the shift in net position in bidding zone a [€/MWh];

ΔV_a – change of net position from the forecast value for bidding zone a [MWh].

3. A mark-up shall be added to the initial forecasted market value of cross-zonal capacity calculated in accordance with paragraph 1, in order to take into account the uncertainty of the forecasted market value of cross-zonal capacity. This mark-up is defined for each direction as follows:

   (a) if there is a negative or zero market spread for the initial forecasted market value of cross-zonal capacity in accordance with paragraph 1, the mark-up will be 0.1 EUR/MWh; and

   (b) if there is a positive market spread, for the initial forecasted market value of cross-zonal capacity in accordance with paragraph 1, the mark-up will be 1 EUR/MWh.

4. If the average positive forecast error over the last 30 days, per bidding zone border and per direction, excluding the 5% hours with the highest positive forecast errors, is 1 EUR/MWh higher or lower than the mark-up applied the day before, the TSOs of this bidding zone border shall respectively increase or decrease the mark-up pursuant to paragraph 3(b) with 1 EUR/MWh for the respective direction. The mark-up for a positive market spread, can never be lower than the default value pursuant to paragraph 3(b) and never higher than 5 EUR/MWh. The updated mark-ups shall be published pursuant to Article 12(2).

5. The forecasted market value for the exchange of energy or sharing of reserves per product, per day ahead market time unit, for each direction and per bidding zone border shall be equal to the sum of the initial forecasted market value pursuant to paragraph 1, the adjustments deriving from paragraph 2 and the mark-up pursuant to paragraphs 3 and 4.

6. The reference day shall be:

   (a) the previous working day whenever cross-zonal capacity is allocated for a working day;

   (b) the previous weekend day or bank holiday whenever cross-zonal capacity is allocated for a weekend day; and

   (c) the previous Sunday or bank holiday whenever cross-zonal capacity is allocated for a bank holiday in any of the relevant bidding zones.

7. The TSOs shall monitor the efficiency of the forecasting methodology pursuant to Article 12(8).

Article 7
Determination of the market value of cross-zonal capacity for the exchange of balancing capacity and sharing of reserves

1. The actual market value of cross-zonal capacity for the exchange of balancing capacity and sharing of reserves between all bidding zones where this methodology is applied shall be:

   (a) equal to the change of economic surplus from the exchange of balancing capacity and sharing of reserves per MW of cross-zonal capacity allocated;

   (b) defined per day-ahead market time unit;

(c) calculated per standard balancing capacity product, separately;

(d) calculated based on the standard upward balancing capacity bids or standard downward balancing capacity bids submitted to the capacity procurement optimisation function pursuant to Article 33(3) of the EB Regulation; and

(e) calculated based on TSO demand.

2. The actual market value of cross-zonal capacity for the exchange of balancing capacity and sharing of reserves between bidding zones, where this methodology is applied, shall be calculated based on the change of economic surplus due to the exchange of balancing capacity and sharing of reserves, resulting from the change of available cross-zonal capacities allocated to the market timeframe for the exchange of balancing capacity and sharing of reserves.

3. The TSOs shall not put a price on the TSO demand used in the market-based allocation process.

4. TSOs may increase the TSO demand of a certain standard balancing capacity product to:

    (a) select an indivisible bid if such an increase would decrease the overall procurement costs for the respective standard balancing capacity product; or

    (b) substitute an lower quality standard balancing capacity product if such substitution is based on firm bid(s) from BSPs during the time of the market-based process and would decrease the combined overall procurement costs for both standard balancing capacity product or in case of volume shortage of the lower quality standard balancing capacity product and if there is no possibility for a similar lower quality standard balancing capacity product to participate directly in the market-based process.

5. TSOs may decrease the TSO demand of a certain standard balancing capacity product in case of sharing of reserves.

6. If the demand for a standard balancing capacity product of TSOs in a region where market-based cross-zonal capacity allocation is applied, exceeds the available amount of bids for the relevant standard balancing capacity product, while taking into account the maximum volume of allocated cross-zonal capacity for the exchange of balancing capacity and sharing of reserves in accordance with Article 5, a additional iterations of the cross-zonal capacity allocation function shall be commenced. Such procedures shall be described in the methodology pursuant to Article 33(1) and 38(1) of the EB Regulation.

7. If the cross-zonal capacity allocation function cannot provide results due to any technical issues and unexpected circumstances, fallback conditions shall be in effect. Such procedures shall be described in the methodology pursuant to Article 33(1) and Article 38(1) of the EB Regulation.

8. If a TSO demand for a standard balancing capacity product per bidding zone exceeds the available amount of locally submitted BSP bids in the bidding zone for the respective standard balancing capacity product but the maximum volume of allocated capacity is enough to cover the deficit, the market-based capacity allocation shall be performed. To calculate the change of economic surplus from the exchange of balancing capacity and sharing of reserves in such a case, the difference between the technical price limit and the marginal price of the importing BSP bids shall be considered as the change of economic surplus of the TSO of the bidding zone with insufficient bids. In case of insufficient local bids to meet the local TSO demand and a simulations scarcity situation in SDAC, the maximum between technical price limit applied in SDAC and the highest local BSP's bid price shall be used as the technical price limit for the market-based cross-zonal capacity allocation.

Article 8
Determination of the allocated volume of cross-zonal capacity for the exchange of balancing capacity and sharing of reserves

1. The cross-zonal capacity allocation function shall determine the allocated volume of cross-zonal capacity for the exchange of balancing capacity and sharing of reserves considering the selection of balancing capacity bids via the capacity procurement optimisation function.

2. The inputs to the algorithm for the cross-zonal capacity allocation function are:

    (a) the forecasted day-ahead market prices of each of the bidding zones included in the forecast process;

    (b) the price-volume sensitivity parameter of each of the bidding zones included in the forecast process which depicts the estimated increase or decrease in systems costs per bidding zone if forecasted level of dispatch in a certain bidding zone is increased or decreased;

    (c) the forecasted net positions of each of the bidding zones included in the forecast process;

    (d) the list of balancing capacity bids from balancing service providers for each bidding zone, day-ahead market time unit and standard balancing capacity product sorted in order of their bid prices;

    (e) the volume of capacity provided by demand reduction resources used to reduce the amount of balancing capacity to be procured from primary and back-up resources to cover the TSO demand;

    (f) the volume of available capacity provided by back-up resources used to satisfy TSO demand in case primary and demand reduction resources, and increase of cross-zonal capacity limits does not fully cover TSO demands;

    (g) the TSO demand for each bidding zone, day-ahead market time unit and standard balancing capacity product; and

3. The constraints to the algorithm for the cross-zonal capacity allocation function are:

    (a) the volume of cross-zonal capacity that can be allocated for the exchange of energy and for the exchange of balancing capacity and sharing of reserves, combined;

    (b) the maximum volume of allocated cross-zonal capacity for the exchange of balancing capacity and sharing of reserves defined pursuant to Article 5(1);

    (c) the minimum and maximum procurement volume of balancing capacity defined pursuant to Article 5(3); and

    (d) the tolerance band for the reduced/increased TSO demand as a function of the available cross-zonal capacities, based on:
        i.   sharing of reserves agreement of two or more TSOs to be applied with market-based allocation pursuant to Article 7(5);
        ii. substitution of reserves for volume shortage by another standard balancing capacity product pursuant to Article 7(4)(b);
        iii. substitution of reserves for cost minimisation by another standard balancing capacity product pursuant to Article 7(4)(b).

4. The objective of the cross-zonal capacity allocation function shall be the maximisation, per trading day, of the sum of

    (a) the expected economic surplus for SDAC, based on the forecasted market value for the exchange of energy pursuant to Article 6(5), and

    (b) the economic surplus from the exchange of balancing capacity and sharing of reserves based on the actual market value for the exchange of balancing capacity pursuant to Article 7(2).

5. The mathematical formulation of the objective function is as follows:

$$F_{obj} = \sum_i (bidcost_i \times bidvolume_i \times selected_i) + \sum_a \left[\Delta V_a \times MCP_{0,a} + \alpha_a \times \Delta V_a^2 \times \frac{1}{2} \right]$$

Where:

$bidcost_i$ - the cost of balancing capacity bid i [(€/MW)/h)];

$bidvolume_i$ - the volume of balancing capacity bid i [MW];

$selected_i$ - the boolean determining whether balancing capacity bid i is accepted or not;

ΔV_a - the deviation of the forecast net position of bidding zone a [MWh];

$MCP_{0,a}$ - the forecasted reference day day-ahead market price in bidding zone a [€/MWh];

α_a - the price/volume sensitivity of day-ahead bidding zone a [€/MWh^2].

6. The output from the algorithm for the cross-zonal capacity allocation function, per standard balancing capacity product and for each day-ahead market time unit is the available cross-zonal capacity allocated to the exchange of balancing capacity and sharing of reserves.

7. Each marginal volume of cross-zonal capacity shall be allocated to the exchange of energy in case the actual market value of cross-zonal capacity for the exchange of balancing capacity and sharing of reserves pursuant to Article 7(2) is lower or equal to the forecasted market value of cross-zonal capacity for the exchange of energy pursuant to Article 6(5).

8. Netting of cross-zonal capacity allocated to the exchange of balancing capacity and sharing of reserves isnot possible between:

   (a) standard upward and downward balancing capacity bids;

   (b) standard balancing capacity bids from different standard balancing capacity products.

9. In case where cross-zonal capacity allocated to the exchange of balancing capacity and sharing of reserves would be allocated such that cross-zonal capacity for upward and downward balancing capacity would be allocated in the same cross-zonal capacity direction, cross-zonal capacity allocated for upward balancing capacity products can be used by downward balancing capacity products; and vice versa.

Article 9
Firmness regime for the allocation of cross-zonal capacity

1. The cross-zonal capacity allocated for the exchange of balancing capacity and sharing of reserves shall be firm after the optimisation by the cross-zonal capacity allocation function.
2. In the event of force majeure or emergency situations, curtailment of cross-zonal capacities which were allocated using the cross-zonal capacity allocation function shall be proportionally distributed between

the affected cross-zonal capacity allocated for the exchange of energy and for the exchange of balancing capacity and sharing of reserves in accordance with Article 41(4) of the EB Regulation. TSOs can deviate from this principle by proposing a more cost efficient, non-discriminatory solution in the proposal pursuant to Article 33(1) of the EB Regulation.

3. Costs of ensuring firmness of cross-zonal capacity allocated for the exchange of balancing capacity and sharing of reserves shall include follow up costs of ensuring firmness of procured standard balancing capacity bids in accordance with paragraph 1, which are caused by the curtailment of firm cross-zonal capacity in the event of force majeure or emergency situations. These costs also include the additional costs from the procurement of balancing capacity due to the non-availability of the balancing capacity given the curtailment of cross-zonal capacity.

4. The costs of ensuring firmness shall be shared in accordance with the regional methodologies developed in accordance with Article 74 of the CACM Regulation and Article 76 of the SO Regulation for the cases that fall within the scope of these methodologies.

5. Any costs of ensuring firmness which are outside the scope of the methodologies referred to in paragraph 4 shall be borne by the TSO requesting the curtailment.

Article 10
Pricing of cross-zonal capacity

1. TSOs allocating cross-zonal capacity for the exchange of balancing capacity and sharing of reserves applying this methodology within the Baltic CCR shall calculate the cross-zonal capacity price for the volume of cross-zonal capacity that is allocated for the exchange of balancing capacity and sharing of reserves.

2. The price of cross-zonal capacity allocated for the exchange of balancing capacity and sharing of reserves shall be calculated separately for each market time unit and each standard balancing capacity product.

3. The prices in EUR/MW of cross-zonal capacity per day ahead market time unit in each direction shall be equivalent to the difference in cross-zonal marginal prices of a standard balancing capacity product in bidding zones applying the market-based allocation process pursuant to Article 38(1) of the EB Regulation.

Article 11
Sharing of congestion income

1. The congestion income shall be calculated per application of the market-based process pursuant to Article 38(1) of the EB Regulation and day-ahead market time unit and shall be equal to the volume of cross-zonal capacity allocated to the exchange of balancing capacity and sharing of reserves multiplied by the price of cross-zonal capacity allocated in accordance with Article 10. The congestion income pursuant to paragraph 1 will be shared in accordance with the methodology of Article 73 of the CACM Regulation and in accordance with Article 41(4) of the EB Regulation.

2. On a monthly basis TSOs of a cooperation applying the market-based process in accordance with Article 38(1) of the EB Regulation shall compare the monthly congestion income calculated in accordance with paragraph 1 with the congestion income which could have been generated for the amount of cross-zonal capacity allocated for the exchange of balancing capacity and sharing of reserves if allocated to the single day ahead coupling instead. The TSOs of a cooperation applying the market-based process in accordance with Article 38(1) of the EB Regulation shall inform all TSOs and regulatory authorities of the CCR and ACER of the outcome of this assessment.

3. If the comparison pursuant to paragraph 2 shows a deficit on a monthly basis of generated congestion income following the allocation of cross-zonal capacities for the exchange of balancing capacity and sharing of reserves, the TSOs of a cooperation applying the market-based process in accordance with Article 38(1) of the EB Regulation should pay a compensation to the single day ahead coupling to cover such deficit. The costs of such compensation shall be split among the TSOs of a cooperation applying the market-based process in accordance with Article 38(1) of the EB Regulation in accordance with the distribution of shares of overall decreased procurement costs per TSO from the application of the market-based process in the relevant month. The compensation to the single day-ahead coupling should be shared among all TSOs in accordance with the shares of decreased congestion income pursuant to the comparison in accordance with paragraph 3.

Article 12
Publication of information

1. The TSOs applying this market-based capacity allocation process shall publish all relevant and required information on the transparency website of ENTSO-E according to Article 12(5) of the EB Regulation.

2. The TSOs applying this market-based capacity allocation process shall publish the following information on the allocation of cross-zonal capacity for the exchange of balancing capacity and sharing of reserves as soon as possible but no later than one hour before the single day-ahead coupling gate closure time, as defined in accordance with Article 47(2) of the CACM Regulation, pursuant to Article 12(3)(h) of the EB Regulation:

    (a) date and time when the decision on allocation was made;

    (b) period of the allocation;

    (c) volumes allocated including the actual percentage limit applied in accordance with Article 5 (1)(a) to (c); and

    (d) market values used as a basis for the allocation process in accordance with Articles 6(5) and 7(2).

3. The TSOs applying this market-based capacity allocation process shall publish the following information on the use of allocated cross-zonal capacity for the exchange of balancing capacity and sharing of reserves as soon as possible but no later than 1 (one) week after the use of allocated cross-zonal capacity, pursuant to Article 12(3)(i) of the EB Regulation:

    (a) volume of allocated and used cross-zonal capacity per day-ahead market time unit;

    (b) volume of released cross-zonal capacity for subsequent time frames per day ahead market time unit in accordance with Article 38(8) of the EB Regulation;

    (c) estimated realised costs and benefits of the allocation process. The TSOs will, based on the bid data for the respective standard balancing capacity product, estimate the reduction in

procurement costs and estimated welfare gains compared to fulfilling the TSO demand without allocating cross-zonal capacity for exchange of the respective standard balancing capacity product. These estimated costs and benefits will be published as values for each bidding zone, day ahead market time unit and each standard balancing capacity product for the balancing capacity market where this methodology is applied.

4. Each TSO applying this market-based allocation process and increased the TSO demand in accordance with Article 7(4)(b) shall publish information at least on the amount of the increase and the anonymised bid curve from the standard balancing capacity not participating in the market-based process on which basis the TSO demand was increased by no later than one day after the performed market-based allocation process.

5. The TSOs applying this market-based allocation process shall publish the description of the requirements of the algorithm for the cross-zonal capacity allocation function at least one month before its application.

6. The TSOs applying this market-based allocation process and using the option of Article 8(2)(d) shall publish a detailed description how the possible costs associated to the congestion income assessment pursuant to Article 11(4) are considered in the determination of the allocated volume of cross-zonal capacity for the exchange of balancing capacity and sharing of reserves at least one month before the option is used.

7. The TSOs applying this market-based allocation process shall publish an overview of the applicable default limits for the maximum volume of cross-zonal capacity allocated for the exchange of balancing capacity pursuant to Article 5(1)(a) and (c).

8. The TSOs shall monitor the efficiency of the forecasting methodology and conduct analysis on the default limit for the maximum volume of cross zonal capacity allocated for the exchange of balancing capacity and sharing of reserves and shall, by six months after the go-live of the market-based allocation process and subsequently at least once a year, submit a report to the relevant regulatory authorities. This report shall include at least:

   (a) a comparison of the forecasted and actual market values of cross-zonal capacity for the exchange of energy;

   (b) assessment of occurred increases of the limits for the maximum volume of cross-zonal capacity allocated for the exchange of balancing capacity and sharing of reserves in accordance with Article 5(1)(b), including statistics on the amount of incidents, increased volumes and percentages, reasons for the incidents and an analysis of the economic surplus effects on the SDAC;

   (c) assessment of the impact on the price formation of the single day-ahead coupling due to the allocation of cross-zonal capacity for the exchange of balancing capacity and sharing of reserves;

   (d) assessment of impacts on the economic surplus of the SDAC and economic surplus from the exchange of balancing capacity and sharing of reserves from the application of the market-based allocation process and the specific impact following an increase of a default limit for the maximum volume of cross- zonal capacity allocated for the exchange of balancing capacity and sharing of reserves pursuant to the process described in Article 5(1)(c);

   (e) assessment of the adjustment process according to Article 6 (2), including assessment of the number of hours the adjustment has been made and assessment on the magnitude of the adjustments made;

   (f) where necessary, proposals to improve the accuracy of the forecasted market values, including a different limit for the maximum volume of cross zonal capacity pursuant to Article 5(1) or different mark-up values per bidding zone border pursuant to Article 6(2) based on the results of the relevant analysis; and
   (g) an assessment on the need to adjust the percentage limits on cross-zonal capacity allocation described in Article 5(1).

9. During implementation pursuant to Article 13(2), the TSOs shall inform regulatory authorities about the progress and the outcome of the performed verification processes for implementing the market-based allocation process.

TITLE 3
Final provisions

Article 13
Publication and implementation of the methodology for market-based capacity allocation

1. The TSOs shall publish this methodology without undue delay on the ENTSO-E website after a decision has been made by the European Union Agency for the Cooperation of Energy Regulators in accordance with Article 6(2) of the EB Regulation.

2. The TSOs shall implement this methodology by the time the cross zonal capacity on all bidding zone borders of the Baltic CCR is calculated in accordance with the capacity calculation methodology developed pursuant to the CACM Regulation, by establishing the cross-zonal capacity allocation function to be ready for application of the market-based allocation process for the exchange of balancing capacity and sharing of reserves, where two or more TSOs intend to commonly procure balancing capacity.

Article 14
Language

The reference language for this methodology shall be English. For the avoidance of doubt, where the TSOs need to translate this methodology into their national language(s), in the event of inconsistencies between the English version published by the TSOs in accordance with Article 7 of the EB Regulation and any version in another language, the relevant TSOs shall, in accordance with national legislation, provide the relevant national regulatory authorities with an updated translation of this methodology.