Methodology for pricing balancing energy and cross-zonal capacity used for the exchange of balancing energy or operating the imbalance netting process

in accordance with Article 30(1) of Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing

24 January 2020

All TSOs' proposal on methodologies for pricing balancing energy and cross-zonal capacity used for the exchange of balancing energy or operating the imbalance netting process pursuant to Article 30(1) and Article 30(3) of Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing

18 December 2018

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Content

ALL TSOS, TAKING INTO ACCOUNT THE FOLLOWING:

Whereas

~~This document is a common proposal developed by all Transmission System Operators (hereafter referred to as "TSOs") regarding~~

(1) <u>This document sets out</u> the methodologies for pricing balancing energy and cross-zonal capacity used for the exchange of balancing energy or operating the imbalance netting process <u>(hereafter referred to as "INP")</u> pursuant to Article 30(1) ~~and Article 30(3)~~ of the Regulation (~~EC~~<u>EU</u>) 2017/2195 establishing a guideline on electricity balancing (hereafter referred to as the "~~EBGL"),.~~<u>EB Regulation").</u> This ~~proposal~~<u>methodology</u> is hereafter referred to as the "~~PP").~~<u>pricing methodology".</u>

(2) ~~The PP~~<u>This pricing methodology</u> takes into account the general principles and goals set in the ~~EBGL,~~<u>EB Regulation</u> ~~(EC~~<u>, the Regulation (EU)</u> 2017/1485 establishing a guideline on electricity transmission system operation (hereafter referred to as the "~~SOGL~~<u>SO Regulation</u>"), the Regulation (~~EC) No 714/2009 of~~ <u>EU) 2019/943 on</u> the ~~European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in~~<u>internal market for</u> electricity (hereafter referred to as the "Electricity Regulation"). <u>This pricing methodology takes into account the proposal developed by all Transmission System Operators (hereafter referred to as "TSOs") for pricing balancing energy and cross-zonal capacity used for the exchange of balancing energy or operating the INP pursuant to Article 30(1) of the EB Regulation.</u>

(3) The goal of ~~EBGL~~<u>the EB Regulation</u> is the integration of balancing markets. To facilitate this goal, it is necessary to develop implementation frameworks for European platforms for balancing energy exchange from frequency restoration reserves with automatic and manual activation, replacement reserves and ~~imbalance netting process~~<u>the INP</u> pursuant to ~~Article~~<u>Articles</u> 19 to 22 of the ~~EBGL.~~<u>EB Regulation.</u> Additionally, Article 30 of ~~EBGL~~<u>the EB Regulation</u> formulates the requirements regarding the pricing of balancing energy and cross-zonal capacity.

(4) <u>This pricing methodology sets marginal pricing (pay-as-cleared) as the main principle for pricing balancing energy bids as required by</u> Article 30~~(1)(a)~~<u>(1)(a)</u> of ~~EBGL constitutes the legal basis for this proposal:~~

(4) ~~"1. By one year after~~ the ~~entry into force of this~~<u>EB</u> Regulation~~, all TSOs shall develop a proposal for a methodology to determine prices for~~ .

   <u>Article 30(1)(b) of</u> the ~~balancing energy~~<u>EB Regulation</u> requires that ~~results from~~ the ~~activation~~<u>pricing methodology defines how the price</u> of balancing energy ~~bids for the frequency restoration process pursuant to Articles 143 and 147 of Regulation (EU) 2017/1485, and the reserve replacement process pursuant to Articles 144 and 148 of Regulation (EU) 2017/1485. Such methodology shall:~~

   ~~(a) be based on marginal pricing (pay-as-cleared);~~

(5) ~~(b) define how the activation of~~<u>is affected by the</u> balancing energy bids activated for purposes other than balancing~~affects the balancing energy price~~, while also ensuring that at least balancing energy bids activated for internal congestion management shall not set the marginal price of balancing energy~~.~~<u>. Standard balancing energy product bids selected by the activation optimisation function (hereafter referred to as the "AOF") are all remunerated at the cross-border marginal price for balancing energy, as long as they are activated by respecting the merit order. Activations for the purpose of internal congestion management are not possible in the European platforms,</u>

pursuant to Articles 19 to 21 of the EB Regulation, since, the only locational information they handle is the load-frequency control area or the bidding zone; no locational information with respect to the internal network position is provided with the bids.

*(c) establish*Article 30(1)(c) of the EB Regulation foresees a pricing methodology that establishes at least one price of balancing energy, for each imbalance settlement period~~;~~

(d) give correct price signals and incentives to market participants;

(e) take into account the pricing method in the day-ahead and intraday timeframes."

"3. The proposal pursuant to paragraph 1 shall also define a methodology for . This pricing *of cross-zonal capacity used for exchange of balancing energy or for operating the imbalance netting process. Such* methodology *shall be consistent with the requirements established under Commission Regulation (EU) 2015/1222, and:*

(a) reflect market congestion;

(b) be based on the prices for balancing energy from activated balancing energy bids, determined in accordance either with the pricing method pursuant to paragraph 1(a), or if applicable, the pricing method pursuant to paragraph 5;

(c) not apply any additional charges for the exchange of balancing energy or for operating the imbalance netting process, except a charge to compensate losses if this charge is also taken into account in other timeframes."

(6) ~~Article 3 of the PP sets the pricing methodology based on marginal pricing (pay-as-cleared) as required by Article 30(1)(a) of EBGL.~~

(7) ~~Article 30(1)(b) of EBGL requires to define the impact on the price from the activation for other purposes than balancing. Standard balancing energy bids selected by the activation optimisation Function (hereafter referred to as the "AOF") for system constraint purpose will be remunerated based on pay-as-bid in accordance with Article 8 of the PP and shall not set the marginal price. The activation purpose proposal does not foresee activation for other purposes than balancing for aFRR Platform.~~

(8)(6) ~~Article 30(1)(c) of EBGL foresees a pricing proposal that establish at least one price of balancing energy, for each imbalance settlement period. Article 3 of the PP~~ determines the number of prices per uncongested area and per standard balancing energy ~~products~~product, for the relevant – for each European balancing ~~energy pricing period~~platform – market time unit (hereafter referred to as the "~~BEPP~~". ~~Article 4, Article 5, Article 6 and Article 7 of the PP~~MTU"). This pricing methodology require that at least one price ~~will be established~~ is established for each MTU and that the MTU is shorter than or equal to the imbalance settlement period, hence satisfying the requirement for at least one price of balancing energy for each imbalance settlement period ~~by defining the BEPP~~.

(9)(7) Article 30(1)(d) of ~~EBGL~~the EB Regulation requires ~~a proposal~~ that the pricing methodology gives correct price signals and incentives to market participants. This requirement is fulfilled by choosing the cross-border marginal price (hereafter referred to as ~~the basis for the proposal.~~"CBMP") which ensures that a single marginal price is propagated across all areas among which there is no congestion. Moreover, ~~the~~this pricing methodology differentiates between the different products and processes in ~~Article 4, Article 5, Article 6 and Article 7 of the PP~~this pricing methodology, ensuring that ~~the~~this pricing methodology values the different product properties ~~and~~. Additionally, it is consistent with the congestions identified within each

process, resulting for the selection of the balancing energy bids, while establishing the ~~cross-border marginal prices. This consistency with the congestions would not have been ensured if the BEPP for automatic frequency restoration reserves (aFRR) would have been chosen equal to 15 minutes~~CBMPs at each clearing.

(10)(8) Article 30(1)(e) of ~~EBGL asks to take~~the EB Regulation requires taking into account the pricing method in day-ahead and intraday market timeframes. ~~Article 4, Article 5, Article 6 and Article 7 of the PP fulfil~~, when setting up the pricing methodology. This pricing methodology fulfils this requirement by proposing a ~~cross-border marginal price~~CBMP methodology, which is consistent ~~to the~~ with the pricing applicable in the single day-ahead market ~~pricing~~coupling. Moreover, ~~the PP~~this pricing methodology proposes to determine prices based on each relevant market clearing and therefore does not impose the same marginal price across different processes (i.e. market clearings ~~and not to introduce cross-process pricing~~) as it is also not the case for the day-ahead and intraday market prices.

(9) Article 20(2) of the EB Regulation allows the introduction of technical price limits, if it is deemed necessary by the TSOs. This pricing methodology sets the technical price limits for balancing energy prices, including both bidding and clearing prices, equal to 99,999€/MWh and -99,999€/MWh for both positive and negative balancing energy. These price limits are not lower that the limits imposed within the day-ahead and intraday timeframes and do not restrict price formation.

(11)(10) Article 30(3) of ~~EBGL~~the EB Regulation requires that cross-zonal capacity pricing reflects market congestions, is based on balancing energy prices and does not require additional charges. ~~Article 9 of the PP~~This pricing methodology fulfils this requirement by defining the cross-zonal capacity price as the ~~price~~CBMP difference between the uncongested areas for the respective products and processes. ~~This requirement of EBGL would not have been met with a BEPP for aFRR equal to 15 minutes. The price for~~The cross-zonal capacity used for the ~~imbalance netting process implemented by~~ INP is by default priced at zero since the use of cross-zonal capacity in the ~~imbalance netting process function is 0 €/MWh due to the fact that the imbalance netting process~~INP is not ~~based~~dependent on ~~a common merit order activation~~any prices of balancing energy and ~~does not require the usage of common pricing mechanisms and standard products~~therefore its economic value cannot be determined.

(12)(11) ~~The PP~~This pricing methodology contributes to the objective ~~stated~~of fostering effective competition, non-discrimination and transparency in ~~Article~~balancing markets (Articles 3(1)(a) ~~and~~ of the EB Regulation) and 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 ~~EBGL~~the EB Regulation) as follows:

(a) By proposing a methodology based on cross-border marginal pricing for the pricing of all standard balancing energy product bids, ~~the PP~~ this pricing methodology fosters effective competition and integration of balancing markets since the methodology ~~will be~~is harmonised for all balancing energy bids, including balancing energy bids converted to standard products from specific products or integrated scheduling process bids. This pricing methodology applies also to specific balancing energy product bids, as long as the TSO using these specific products has not proposed a different methodology for their pricing, hence contributing to the integration of balancing markets.

(b) The effective competition is also fostered by the choice of the ~~BEPP~~MTU for the pricing of balancing energy that results from ~~aFRR~~the activation of balancing energy bids for the

frequency restoration process with automatic activation, which ~~will be~~is set equal to the AOF optimisation cycle. This approach ~~will maximise~~maximises the time periods with price convergence and ~~lower~~lowers incentives to add mark-ups on balancing energy bid prices motivated by limited cross-zonal capacity in areas with limited internal competition. ~~The fostering of effective cross-border competition is a core condition to make the application of a marginal pricing approach successful.~~

(c) ~~PP~~The integration of balancing markets and the promotion of possibilities for exchanges of balancing services, while contributing to operational security, is also achieved by the approach followed for pricing the standard mFRR balancing energy product bids. Establishing a single common merit order list for both activation types – direct and scheduled – ensures the maximum liquidity, providing to the TSOs more possibilities for exchanges of balancing energy. On the other hand, the remuneration of the directly activated standard mFRR balancing energy product bids at a price at least equal to the scheduled ones, safeguards the availability of these bids to the TSOs, since they are needed for solving issues related to operational security.

~~(c)~~(d) This pricing methodology ensures non-discrimination because ~~the~~this pricing methodology is applied in the same way to all standard balancing energy ~~products~~product bids regardless of location, technology or other factors. The same applies for the pricing of cross-zonal capacity.

~~(d)~~(e) ~~Currently, prices are determined by each TSO in a non-harmonised way. In~~ This pricing methodology, in combination with ~~European regulation on~~ the Regulation (EU) 543/2013 and the publication requirements of Article 12 of EB Regulation, fosters transparency~~, cross-border marginal pricing also fosters the transparency of~~ in the balancing markets~~,~~ since ~~prices are derived from the~~ they impose obligations to TSOs for timely publication of market ~~clearing calculated by~~data related to the ~~activation optimisation function~~operation of the ~~respective common platform.~~European balancing platforms, with respect to pricing.

~~(13)~~(12) In combination with the implementation frameworks, ~~the PP~~this pricing methodology contributes to the objective stated in Article 3(1)(b) of ~~EBGL.~~the EB Regulation. The cross-border marginal pricing incentivises the balancing service providers (hereafter referred to as "BSPs") to submit bids with prices equal to the respective marginal costs. At the same time, the AOF selects the overall cheapest bids for the satisfaction of the balancing energy demand. The result ~~will~~should decrease balancing costs, and hence, increase efficiency of the balancing energy markets.

~~(14)~~(13) ~~The PP~~This pricing methodology contributes to the efficient long-term operation and development of the electricity transmission system, by correctly reflecting the cross-zonal capacity value, through the appropriate calculation of the cross-border marginal pricing. Additionally, this pricing methodology facilitates the consistent functioning of the markets across timeframes, as required in the objective ~~stated in~~of Article 3(1)(d) of ~~EBGL~~the EB Regulation, since the ~~proposed~~cross-border marginal pricing applied with this methodology is ~~consistent with~~ based on the same principle as the day-ahead pricing methodology. Moreover, the ~~proposal~~approach to calculate different prices for different processes corresponds to the approach of the day-ahead and intraday markets and hence this methodology facilitates consistency across the market timeframes.

~~(15)~~(14) ~~The PP~~ This pricing methodology contributes to the objectives stated in Article 3(1)(e) of ~~EBGL~~the EB Regulation since ~~the pricing methodology~~ it is non-discriminatory, ensuring a fair

context for the BSPs. Moreover, cross-border marginal pricing lowers the barrier for new entrants since no complex probabilistic bidding strategy is required to maximise the earnings from participation in the balancing ~~markets.~~energy platforms. Additionally, this pricing methodology fosters liquidity by establishing one cross-border marginal price for each process, and also by establishing a single common merit order list for both activation types of standard mFRR balancing energy product bids.

(16)(15)   ~~The PP~~This pricing methodology is technology neutral and non-discriminatory, which means that it does not favour a specific technology to provide balancing energy. Nonetheless, it contributes to the objectives stated in ~~Article~~Articles 3(1)(f) ~~of EBGL~~ and ~~Article~~ 3(1)(g) of ~~EBGL~~the EB Regulation, since the integrated balancing energy market combined with lowered entry barriers, stemming from the establishment of the marginal pricing as a general rule, facilitate the participation of demand response, energy storage and renewable energy sources.

(17)(16)   In conclusion, ~~the PP~~this pricing methodology meets the objectives of ~~EBGL~~the EB Regulation.

<div align="center">Abbreviations</div>

The list of abbreviations used in this PP is following:

1. aFRR: frequency restoration reserves with automatic activation

2. BEPP: balancing energy pricing period

3. BSP: balancing Service Provider

4. CBMP: cross-border marginal price

5. EBGL: guideline on electricity balancing

6. EU: European Union

7. HVDC: high-voltage direct current

8. mFRR: frequency restoration reserves with manual activation

9. MWh: megawatt hour

10. PP: pricing proposal

11. RR: replacement reserves

12. SOGL: guideline on electricity transmission system operation

13. TSO: transmission system operator

SUBMIT THE FOLLOWING PP TO ALL REGULATORY AUTHORITIES:

Article 1   ~~Article 1~~

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Subject ~~Matter~~matter and ~~Scope~~scope

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~~1.   The PP is the common proposal of all TSOs in accordance with Article 30(1) and Article 30(3) of EBGL.~~

1.   ~~The PP defines the~~ This pricing methodology ~~to determine~~is developed in accordance with Articles 30(1) and 30(3) of the EB Regulation.

2.   This pricing methodology determines the prices of balancing energy resulting from the activation of balancing energy product bids for frequency restoration ~~reserves~~process with automatic activation (hereafter referred to as "~~aFRR"),~~aFRP") and the frequency restoration ~~reserves~~process with manual activation (hereafter referred to as "~~mFRR")~~mFRP") pursuant to articles 143 and 147 of the SO Regulation and the replacement reserves process (hereafter referred to as "~~RR").~~ RRP") pursuant to articles 144 and 148 of the SO Regulation. This methodology applies to all balancing energy product bids, except when a TSO defines a different pricing methodology in accordance with Article 30(4) of the EB Regulation for locally activated specific products not-converted into standard products in accordance with Article 26(3)(b) of the EB Regulation. For the application of the methodology to balancing energy product bids for locally activated specific products not-converted into standard products, all the references in this pricing methodology to standard balancing energy product bids shall equally apply to specific balancing energy product bids.

3.   ~~The PP~~This pricing methodology also defines the ~~methodology for~~ pricing of cross-zonal capacity used for the exchange of balancing energy and for operating the ~~imbalance netting process~~INP.

4.   ~~Article 2~~This pricing methodology is without prejudice to the introduction of a shortage pricing function for balancing energy as referred in Article 20(3) of the Regulation (EU) 2019/943, within the national terms and conditions related to balancing pursuant to article 18 of the EB Regulation.

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Article 2

Definitions and ~~Interpretation~~interpretation

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1.   For the purposes of ~~the PP~~this pricing methodology, the terms used shall have the meaning given to them in Article 2 of the Electricity Regulation, Article ~~3~~2 of ~~SOGL~~the EB Regulation and Article ~~2~~3 of ~~EBGL~~the SO Regulation.

2.   In addition, in ~~the PP~~this pricing methodology the following terms shall apply:

(a)   'accepted bid ~~energy~~ volume' means the balancing energy volume from a balancing energy product bid to be settled in accordance with national terms and conditions related to balancing~~.~~ pursuant to Article 18(5)(h) of the EB Regulation, which requires the development of the rules for the determination of the volume of balancing energy to be settled with the balancing service provider pursuant to Article 45 of the EB Regulation;

(b)   'aFRR balancing border' means a set of physical transmission lines linking adjacent LFC areas of TSOs participating ~~TSOs. The optimisation algorithm calculates~~in the ~~automatic frequency restoration power interchange for each~~ aFRR ~~balancing border. For the purposes of the optimisation, each aFRR balancing border has a mathematically defined negative and positive direction for the automatic frequency restoration power exchange.~~ Platform;

(c)   'aFRR-Platform' means the European platform for the exchange of balancing energy from frequency restoration reserves with automatic activation as referred to in Article 21(1) of the EB Regulation;

1. ~~'~~'demand' means an individual TSO's demand for balancing energy ~~pricing period' (hereafter referred to as "BEPP") means a time interval for which cross-border marginal prices (hereafter referred to as "CBMP") are calculated.~~

(d) ~~'cross-border capacity limits' means~~representing the ~~limits which serve as constraints~~activation request for ~~the exchange of~~ balancing energy ~~on bidding zone borders~~ and~~/~~ can be price inelastic or ~~LFC areas and are determined in accordance with the implementation frameworks for the exchange of balancing energy from replacement reserves, from frequency restoration reserves with manual and automatic activation or for the imbalance netting process.~~elastic;

1. ~~'demand' means a TSO demand for activation of any balancing standard product bids~~

(e) 'direct activation' means ~~a~~an mFRR-Platform process for bid activation in the context of Article 145(5) of SO Regulation that can occur at any point in time ~~to resolve large imbalances within the Time To Restore Frequency~~;

(f) ~~-~~'IN-Platform' means the European platform for the ~~imbalance netting process~~INP as referred to in Article 22(1) of the EB Regulation;

(g) 'mFRR balancing border' means a set of physical transmission lines linking adjacent ~~bidding zones, where~~LFC areas of TSOs participating in the mFRR-Platform. In case an LFC area consists of more than one bidding zone, ~~or LFC areas of participating TSOs. The optimisation algorithm calculates the cross-border manual frequency restoration power exchange for each mFRR balancing border. For the purposes of the optimisation, each~~the mFRR balancing border ~~has a mathematically defined negative and positive direction for the manual frequency restoration power interchange.~~means a set of physical transmission lines linking adjacent bidding zones;

(h) 'mFRR-Platform' means the European platform for the exchange of balancing energy from ~~frequency restoration reserves with manual activation~~mFRR as referred to in Article 20(1) of the EB Regulation;

1. ~~'price indeterminacy'~~'point of scheduled activation' means ~~that there is no unambiguous intersection point between~~ the ~~consumer and supply curves.~~

(i) ~~'rejected bid' means a bid~~point in time from which ~~is part of~~ full activation time is measured for the ~~common merit order list~~scheduled activation of ~~the AOF but is not a selected bid.~~standard mFRR balancing energy product bids;

(j) ~~_~~'RR-Platform' means the European platform for the exchange of balancing energy from ~~replacement reserves~~RR pursuant to Article 19(1) of the EB Regulation;

(k) 'RR balancing border' means a set of physical transmission lines linking adjacent bidding zones, of ~~participating TSOs. The optimisation algorithm calculates the cross-border reserve replacement power exchange for each RR balancing border. For the purposes of the optimisation, each RR balancing border has a mathematically defined negative and positive direction for the manual frequency restoration power interchange.~~TSOs participating in the RR-Platform;

(l) 'scheduled activation' means an mFRR-Platform process for bid activation in the context of Article 145(5) of SO Regulation that takes place at the point of scheduled activation relative to the validity period of the respective balancing energy bid;

(l)(m)   'standard aFRR balancing energy product' means the standard product for balancing energy from ~~frequency restoration reserves with automatic activation~~aFRR, pursuant to Article 25(1) of the EB Regulation;

(m)(n)   'standard mFRR balancing energy product' means the standard product for balancing energy from ~~frequency restoration reserves with manual activation~~mFRR, pursuant to Article 25(1) of the EB Regulation;

(n)(o)   'standard RR balancing energy product' means the standard product for balancing energy from ~~replacement reserves~~RR, pursuant to Article 25(1) of the EB Regulation;

(o)(p)   'selected bid' means a bid that ~~is selected by~~ the AOF selects and ~~must be fully or partially activated.~~requests its activation from the participating TSO;

(p)(q)   'uncongested area' means the widest area, constituted by bidding zones ~~and/or LFC areas~~, where the exchange of balancing energy and the netting of demands is not restricted by the cross-~~border capacity limits calculated in accordance with the implementation frameworks for the exchange of balancing energy from replacement reserves, from frequency restoration reserves with manual and automatic activation as well as for the imbalance netting process.~~ zonal capacities or by the allocation constraints, during a specific market time unit.

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

a) the singular indicates the plural and vice versa;

b) headings are inserted for convenience only and do not affect the interpretation of ~~the PP; and~~this pricing methodology;

c) any reference to cross-zonal capacities shall include also the reference to allocation constraints as defined in the Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management ('CACM Regulation');

~~c)~~d) any reference to legislation, regulations, directives, orders, instruments, codes or any other enactment shall include any modification, extension or re-enactment of it when in force~~.~~; and

~~d)~~e) any reference to an Article without an indication of the document shall mean a reference to ~~the PP~~this pricing methodology.

~~Article 3~~

Article 3
General ~~Principles~~principles

1. The CBMP shall be calculated by the activation optimisation ~~function~~functions as follows:

~~4.~~ the AOF of ~~each platform~~ the RR-Platform shall calculate ~~from the selected bids:~~

~~(a)~~ one CBMP for standard RR balancing energy product bids selected for the balancing purpose for~~:~~

~~1.~~ both activation directions~~;~~

~~1.~~ ~~each BEPP;~~

(a) , for each market time unit for standard RR balancing energy product bids (hereafter referred to as "RR MTU") and for each uncongested area;

(b) one CBMP for standard the AOF of the mFRR Platform shall calculate one CBMP for standard mFRR balancing energy product bids with scheduled activation type selected for the balancing purpose for:

1. both activation directions;

1. each BEPP;

(c)(b) , for each market time unit for standard mFRR balancing energy product bids (hereafter referred to as "mFRR MTU")and for each uncongested area;

(d) the AOF of the mFRR Platform shall calculate one CBMP for standard mFRR balancing energy product bids with direct activation type selected for the balancing purpose for:

i. each activation direction;

ii. the BEPP the common merit order list was created, for each mFRR MTU, and for the subsequent BEPP;

(e)(c) each uncongested area;

(f) the AOF of the aFRR Platform shall calculate one CBMP for standard aFRR balancing energy product bids selected for the balancing purpose for:

1. both either activation directions;

1. each BEPP;

(g)(d) direction, for each market time unit for standard aFRR balancing energy product bids (hereafter referred to as "aFRR MTU")and for each uncongested area;.

5. Different applicable CBMPs for different bidding zones or different LFC areas in one uncongested area may occur if the optimisation algorithm of the AOF:

1. takes into account HVDC interconnection losses; or

6.2. only in case of the mFRR Platform and the RR Platform:RR-Platform if bidding zones are linked by an interconnector with a loss factor greater than zero or having a scheduling step greater than MTU.

1. combines optimisation priorities which may lead to conflict for determining the CBMP; or

1. selects bid for system constraints activation.

3. The maximum price for all balancing energy product bids and the maximum value of the CBMP shall be 99,999 €/MWh. The minimum price for all balancing energy product bids and the minimum value of the CBMP shall be -99,999 €/MWh.

7.4. Each TSO shall determine the accepted bid energy volume of each selected bid for each BEPPMTU.

8.5. The CBMP as defined in paragraph 1 of this Article is determined based on the results of the optimization without considering the requests for system constraint purposeshall reflect the equilibrium that clears the market per MTU, per uncongested area and where applicable per direction, as revealed by applying the uniform price auction principle.

9. Each TSOThe calculation of the CBMP as defined in this article shall settle each positive accepted bid energy volume from atake into account equally all standard or specific balancing energy product for each BEPP withbids selected by the maximumAOF of the respective CBMP established in accordance with Article 4, Article 5, Article 6, Article 7 or Article 8 of this PP and the respective bid price, except where Article 7(6) of this PP applies.

10. Each TSO shall settle each negative accepted bid energy volume from a standard or specific balancing energy product for each BEPP with the minimum of the respective CBMP established in accordance with Article 4, Article 5, Article 6, Article 7 or Article 8 of this PP and the respective bid price, except where Article 7(6) of this PP applies.

11.6. In accordance with Article 30(4) of the EBGL each TSO may apply different pricing methodology for locallyplatform, independently of their activation purpose, as long as they are activated specific products not converted into standard products in accordance with Article 26(3)(b) of the EBGLby respecting the merit order.

12.7. All TSOs shall jointly monitor and annually report on the volumes and prices.balancing energy volumes and prices, per product, settled in accordance with national terms and conditions related to balancing pursuant to article 18(5)(i) of the EB Regulation. The report shall include individually for each TSO the proportion of the accepted bid volumes per standard product remunerated with bid prices higher than the CBMP for positive balancing energy product bids or lower than the CBMP of the respective BEPP. for negative balancing energy product bids. The report shall be part of the European report pursuant to Article 59(1) of the EB Regulation, and the abovementioned proportion shall be part of the performance indicator described in Article 59(4)(e) of the EB Regulation.

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Article 4
Additional ~~Provisions~~provisions for the ~~Pricing~~pricing of ~~Standard RR Balancing Energy Product Bids~~

Article 4   ~~The BEPP for~~balancing energy from standard RR balancing energy product bids

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1. The RR MTU shall be 15 minutes. The first ~~BEPP~~RR MTU of each day shall begin ~~right after~~at 00:00 and end at 00:15.market time. The ~~BEPPs~~RR MTUs shall be consecutive and not overlapping.

2. The CBMP for ~~standard RR~~ balancing energy from standard RR product bids in each uncongested area shall be equal to the price ~~at the intersection of the consumer and supply curves which consist of:~~

1. ~~the consumer curve consisting of~~

1. ~~satisfied positive RR demands and selected downward standard RR balancing energy product bids;~~

2. ~~unsatisfied positive RR demands and rejected downward standard RR balancing energy product bids which have a lower price than the last selected downward standard RR balancing energy product bid or satisfied positive demand~~

1. ~~the supply curve consisting of~~

1. ~~satisfied negative RR demands and selected positive standard RR balancing energy product bids;~~

2. ~~unsatisfied negative RR demands and rejected upward standard RR balancing energy product bids which have a higher price than the last selected upward standard RR balancing energy product bid or satisfied negative RR demand;~~

3. ~~Where there are no single intersection points between the consumer and supply curves as defined in paragraph 2 of this article, the cross-border~~ calculated by the AOF based on the principle of marginal ~~price is given by the price indeterminacy~~pricing (pay-as-cleared). All TSOs performing the reserve replacement process pursuant to Part IV of Regulation (EU) 2017/1483 shall publish the detailed mathematical calculation~~:~~ ~~The~~ of the CBMP ~~is determined as the middle point of the two following bounds:~~

1. ~~The first bound is defined considering the following prices:~~

   1. ~~the selected downward standard RR balancing energy product bid~~<u>together</u> with the ~~lowest price;~~

   2. ~~the satisfied elastic positive RR demand with the lowest price;~~

   3. ~~the rejected upward standard RR balancing energy product bids; and~~

   4. ~~the unsatisfied elastic negative RR demand with the lowest price.~~

2. ~~The second bound is defined considering the following prices:~~

   1. ~~the selected upward standard RR balancing energy product bid with the highest price;~~

   2. ~~the satisfied elastic negative RR demand with the highest price; and~~

   3. ~~the rejected downward standard RR balancing energy product bids; and~~

   4. ~~the unsatisfied elastic positive RR demand with the highest price.~~

   4. ~~In case~~<u>detailed description of the optimisation algorithm</u> one ~~bound is not defined, the CBMP should be set at the other bound.~~

2. <u>month before the deadline for the implementation of the mFRR platform, pursuant to</u> Article ~~5~~<u>12(3)(k) of the EB Regulation.</u>

Additional ~~Provisions for the Pricing of Standard mFRR Balancing Energy Product Bids with Scheduled Activation Type~~

Article 5 ~~The BEPP for~~<u>provisions for the pricing of</u> standard mFRR balancing energy product bids with scheduled activation type

1. <u>The "mFRR MTU</u> shall be 15 minutes. The first ~~BEPP~~<u>mFRR MTU</u> of each day shall begin ~~right after~~ <u>at</u> 00:00~~:00 and end at 00:15.~~ <u>market time.</u> The ~~BEPPs~~<u>mFRR MTUs</u> shall be consecutive and not overlapping.

1. ~~The CBMP for standard mFRR balancing energy product bids with scheduled activation type in each uncongested area shall be equal to the price~~ <u>at the intersection of the consumer and supply curves which consist of:</u>

1. ~~the consumer curve consisting of~~

1. ~~satisfied positive mFRR demands and selected downward standard mFRR balancing energy product bids;~~

2. ~~unsatisfied positive mFRR demands and rejected downward standard mFRR balancing energy product bids which have a lower price than the last selected downward standard mFRR balancing energy product bid or satisfied positive mFRR demand.~~

3. ~~the supply curve consisting of~~

1. ~~satisfied negative mFRR demands and selected positive standard mFRR balancing energy product bids;~~

2. ~~unsatisfied negative mFRR demands and rejected upward standard mFRR balancing energy product bids which have a higher price than the last selected upward standard mFRR balancing energy product bid or satisfied negative mFRR demand.~~

1. Where there are no single intersection points between the consumer and supply curves as defined in paragraph 2 of this article, the CMBP is given~~calculated~~ by the ~~price indeterminacy~~AOF based on the principle of marginal pricing (pay-as-cleared). All TSOs shall publish the detailed mathematical calculation~~: The~~ of the CBMP ~~is determined as the middle point of the two following bounds:~~

1. ~~The first bound is defined considering the following prices:~~

    1. ~~the selected downward standard mFRR balancing energy product bid~~together with the ~~lowest price;~~

    2. ~~the satisfied elastic positive mFRR demand with the lowest price;~~

    3. ~~the rejected upward standard mFRR balancing energy product bids;~~

    4. ~~the unsatisfied elastic negative mFRR demand with the lowest price.~~

2. ~~The second bound is defined considering the following prices:~~

    1. ~~the selected upward standard mFRR balancing energy product bid with the highest price;~~

    2. ~~the satisfied elastic negative mFRR demand with the highest price;~~

    3. ~~the rejected downward standard mFRR balancing energy product bids;~~

    4. ~~the unsatisfied elastic positive mFRR demand with the highest price.~~

    2. ~~In case~~detailed description of the optimisation algorithm one ~~bound is not defined, the CBMP shall be set by the other bound.~~

2. month before the deadline for the implementation of the mFRR platform, pursuant to Article ~~6~~12(3)(k) of the EB Regulation.

Additional ~~Provisions for the Pricing of Standard mFRR Balancing Energy Product Bids with Direct Activation Type~~

~~Article 4~~Article 6   ~~The BEPP for~~provisions for the pricing of standard mFRR balancing energy product bids with direct activation type ~~shall be 15 minutes. The first BEPP of each day shall begin right after 00:00 and end at 00:15. The BEPPs shall be consecutive and not overlapping.~~

1. The CBMP for the standard mFRR balancing energy product bids with direct activation type in each uncongested area shall be determined as follows:

    (a) First step: The ~~activation optimisation function~~AOF of the mFRR-Platform selects ~~upward~~positive and ~~downward~~negative standard mFRR balancing energy product bids with direct activation type. All standard mFRR balancing energy product bids with direct activation type selected ~~not earlier than 7.5 minutes before~~after the ~~beginning~~point of scheduled activation of the ~~BEPP~~mFRR MTU and no later than ~~7.5 minutes after~~ the ~~beginning~~point of scheduled activation of the ~~BEPP~~next mFRR MTU shall be the input for the second step.

    (b) Second step:

        (i) The CBMP for positive ~~accepted bid~~standard mFRR balancing energy ~~volume~~product bids with direct activation type shall be the highest price of all ~~upward~~positive standard

mFRR balancing energy product bids with direct activation type selected in accordance with paragraph ~~2~~1(a) in the same uncongested area.

    (ii)   The CBMP for negative ~~accepted bid energy volume~~ standard mFRR balancing energy product bids with direct activation type shall be the lowest price of all ~~downward~~negative standard mFRR balancing energy product bids with direct activation type selected in accordance with paragraph ~~2~~1(a) ~~of this article~~ in the same uncongested area.

1.   ~~Third step: Each TSO shall determine the accepted bid energy volume of bids selected in accordance with (a) which shall be attributed to the same BEPP and the subsequent BEPP:~~

    (c) ~~The~~ Third step: For each mFRR MTU:

        (i)   the CBMP for the positive ~~accepted bid energy volume~~ standard mFRR balancing energy product bids with direct activation type shall be the maximum of the CBMP determined in accordance with paragraph ~~2~~1(b)(i) of this article and the CBMP for standard mFRR balancing energy product bids with scheduled activation type for the respective ~~BEPP;~~mFRR MTU; and

    (ii)   ~~The~~the CBMP for the negative ~~accepted bid energy volume~~standard mFRR balancing energy product bids with direct activation type shall be the minimum of the CBMP determined in accordance with paragraph ~~2~~1(b)(ii) of this Article and the CBMP for standard mFRR balancing energy product bids with scheduled activation type for the respective ~~BEPP~~mFRR MTU.

2. ~~Article 7~~For each mFRR MTU, each participating TSO shall determine the accepted bid volume of bids selected in accordance with paragraph 1(a) which shall be attributed to the same mFRR MTU and to the subsequent mFRR MTU for the respective direction.

~~Article 5~~Article 7

Additional ~~Provisions~~provisions for the ~~Pricing~~pricing of ~~Standard~~standard aFRR ~~Balancing Energy Product Bids~~balancing energy product bids

1.   The ~~BEPP~~MTU for standard aFRR balancing energy product bids (hereafter referred to as "aFRR MTU") is equal to the optimisation cycle of the AOF~~.~~ of the aFRR-Platform. The first ~~BEPP~~aFRR MTU of each day shall begin right ~~after~~at 00:00 market time. The ~~BEPPs~~aFRR MTUs shall be consecutive and not overlapping.

2.   For each ~~BEPP~~aFRR MTU a single CBMP shall be determined in each uncongested area. This shall either be a CBMP for positive balancing energy in accordance with paragraph 3 of this article, or a CBMP for negative balancing energy in accordance with paragraph 4 of this article, or a CBMP determined for the ~~price indeterminacy~~ case with no selected bids in accordance with paragraph 5 of this article.

3.   The CBMP for selected ~~upward~~positive standard aFRR balancing energy product bids in an uncongested area shall be equal to the highest price of all selected ~~upward~~positive standard aFRR balancing energy product bids in the same uncongested area.

4.   The CBMP for selected ~~downward~~negative standard aFRR balancing energy product bids in an uncongested area shall be equal to the lowest price of all selected ~~downward~~negative standard aFRR balancing energy product bids in the same uncongested area.

5. Where there are no selected ~~upward~~positive or ~~downward~~negative aFRR balancing energy product bids in an uncongested area, the CBMP shall be equal to the middle point between ~~first rejected upward~~the lowest positive and ~~first rejected downward~~highest negative available standard aFRR balancing energy product bids.

6. ~~For an~~ Each participating TSO shall ensure in accordance with national terms and conditions related to balancing pursuant to article 18(5)(i) of the EB Regulation that each accepted bid ~~energy~~ volume for positive balancing energy from a standard aFRR balancing energy product bid ~~that has no bid price for~~ for each aFRR MTU is remunerated with the maximum of the CBMP determined in accordance with paragraph 2 and the respective ~~BEPP each TSO shall ensure the pricing of this~~ bid price.

~~6.~~7. Each participating TSO shall ensure in accordance with national terms and conditions related to balancing pursuant to article 18(5)(i) of the EB Regulation that each accepted bid ~~in accordance with the terms and conditions for BSPs~~volume for negative balancing energy from a standard aFRR balancing energy product bid for each aFRR MTU is remunerated with the minimum of the CBMP determined in accordance with paragraph 2 and the respective bid price.

~~Article 8~~
~~Additional Provisions for Pricing for System Constraint Purpose Activations~~

1. ~~Each~~For the application of paragraphs 6 and 7 when a standard aFRR balancing energy product bid ~~selected for system constraint purpose shall be remunerated with its~~has no valid bid price ~~if it fulfils the following criteria~~

1. ~~The bid is selected by~~ for ~~the activation optimisation function in an optimisation with activation for system constraint purpose.~~

~~7.~~8. ~~The upward standard balancing energy~~respective validity period, the latest bid price ~~is higher than the CBMP of an optimisation without system constraint purpose but otherwise identical input parameters as~~from the ~~optimisation in paragraph 1(a).~~ previous validity period(s) shall be used.

2. ~~The downward standard balancing energy bid price is lower than the CBMP of an optimisation without system constraint purpose but otherwise identical input parameters as the optimisation in paragraph 1(a) of this article.~~

3. ~~Each standard balancing energy bid selected for system constraints purpose shall be remunerated with the CBMP if it fulfils the criterion paragraph 1(a) of this article but neither fulfils the criterion paragraph 1(b) nor paragraph 1(c) of this article.~~

1. ~~Standard energy bids selected for system constraint purpose shall not set the CBMP for standard balancing energy bids selected for balancing purposes.~~

~~Article 6~~Article 8   ~~Article 9~~
Pricing of ~~Cross-Zonal Capacity~~cross-zonal capacity

2. ~~All TSOs shall determine the~~ ~~cross-zonal capacity~~ price for the ~~following borders:~~

1. ~~All TSOs shall determine~~ use of the cross-zonal capacity ~~price~~ for the exchange of balancing energy ~~exchange~~ resulting from the:

   (a) activation of standard RR balancing energy product bids for each RR balancing border~~.~~;

   (b) ~~All TSOs shall determine the capacity price for the exchange balancing energy exchange resulting from~~ activation of standard mFRR balancing energy product bids for each mFRR balancing border~~.~~ that corresponds to a bidding zone border; and

   (c) ~~All TSOs shall determine the capacity price for the exchange balancing energy exchange resulting from~~ activation of standard aFRR balancing energy product bids for each aFRR balancing border~~.~~ that corresponds to a bidding zone border.

   ~~All TSOs shall determine~~and for operating the ~~capacity price for energy exchange resulting from imbalance netting process performed explicitly by the imbalance netting process~~INP for each relevant aFRR balancing border.

1.2. The cross-zonal capacity price for the balancing energy exchange resulting from the activation of standard balancing energy product bids ~~shall correspond~~as referred to in paragraph 1(a), (b) and (c), shall be equal to the difference between the CBMPs ~~resulting from the cross-border capacity limits determined in accordance with the implementation frameworks~~of the respective uncongested areas on the balancing borders separating two uncongested areas, calculated pursuant to Articles 4, 5, 6 and 7 of this pricing methodology.

2.3. ~~The~~Within an uncongested area, the cross-zonal capacity price for the balancing energy exchange resulting from the activation of standard energy product bids shall be 0 €/MWh ~~within an uncongested area.~~.

3.4. The price for the cross-zonal capacity ~~price for energy exchange resulting from~~used for:

   (a) the ~~imbalance netting process~~INP performed implicitly by the ~~activation optimisation function~~AOF of the aFRR-Platform; and

   (b) the netting of demands in the RR-Platform and the mFRR-Platform

   shall be 0 €/MWh within an uncongested area and shall correspond to the difference between the CBMPs of the respective uncongested areas on the balancing borders separating two uncongested areas, calculated pursuant to Articles 4, 5, 6 and 7 of this pricing methodology.

4.5. The price for the cross-zonal capacity ~~price for energy exchange resulting from imbalance netting process~~used for operating the INP performed ~~explicitly~~ by the ~~imbalance netting process function~~AOF of the IN-Platform shall be 0 €/MWh.

<div align="center">

~~Article 7~~Article 9   ~~Article 10~~
Implementation ~~Timeline~~timeline

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1. All TSOs shall implement this methodology when implementing the European balancing platforms for the exchange of balancing energy or the operation of the INP, in accordance with the Articles 19, 20, 21 and 22 of the EB Regulation. Each TSO shall apply ~~this PP~~the relevant provisions of this pricing methodology for standard and specific balancing energy ~~products~~product bids as well as the provisions ~~of Article 9~~for calculating the price for cross-zonal capacity in accordance with Article 8(1) to Article 9(4~~8(5~~) once the TSO ~~is connected to~~becomes participating TSO of the respective European balancing

platform ~~for the exchange of balancing energy in accordance with the Articles 19, 20 or 21 of the EBGL. For the avoidance of doubt, once a TSO becomes participating TSO of a European balancing platform, the TSO shall~~.

~~1.~~2. The TSOs participating in the RR-Platform shall implement and apply this methodology for the pricing ~~proposal for~~ of balancing energy from standard ~~and specific products~~RR balancing energy product bids by 1st July 2022.

~~1.   Each TSO shall apply the pricing methodology for the cross-zonal capacity for operating the imbalance netting process in accordance with Article 9(4) of this PP within one month after the approval of the PP.~~

~~Article 8~~Article 10   ~~Article 11~~
Publication of the ~~PP~~pricing methodology

1. The TSOs shall publish ~~the PP~~this pricing methodology without undue delay ~~after all NRAs have approved the proposal or~~pursuant to Article 7 of EB Regulation after a decision has been taken by the Agency for the Cooperation of Energy Regulators in accordance with ~~Article~~Articles 5(7), ~~Article~~ 6(1) and ~~Article~~ 6(2) of ~~EBGL~~the EB Regulation.

~~Article 9~~Article 11   ~~Article 12~~
Language

1. The reference language for ~~the PP~~this pricing methodology shall be English.

2. For the avoidance of doubt, where TSOs need to translate ~~the PP~~this pricing methodology into their national language(s), in the event of inconsistencies between the English version published by TSOs in accordance with Article 3~~0~~7 of ~~EBGL~~the EB Regulation and any version in another language, the relevant TSOs shall be obliged to dispel any inconsistencies by providing a revised translation of ~~the PP~~this pricing methodology to their relevant national regulatory authorities.