All Baltic CCR TSOs' Common Capacity Calculation Methodology for Long-term Time Frames in Accordance with Article 10(1) of the Commission Regulation (EU) 2016/1719 of 26 September 2016 Establishing a Guideline on Forward Capacity Allocation

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All Baltic CCR TSOs, taking into account the following,

Whereas

(1) This document is developed by Baltic Capacity Calculation region (hereafter referred to as "Baltic CCR") Transmission System Operators (hereafter referred to as "TSOs") as common Capacity Calculation Methodology for Long-Term time frames (hereafter referred to as "Long-term CCM") in accordance with Article 10(1) of Commission Regulation (EU) 2016/1719 establishing a guideline on forward capacity allocation (hereafter referred to as the "FCA Regulation").

(2) The Long-term CCM shall be compatible with the capacity calculation methodology established for the day-ahead and intraday time frames according to Article 10(3) of FCA Regulation.

(3) In accordance with Article 4(8) of the FCA Regulation, the proposed Long-term CCM across the Baltic CCR is:

- promoting effective long-term cross-zonal trade with long-term cross-zonal hedging opportunities for market participants,
- providing non-discriminatory access to long-term cross-zonal capacity,
- ensuring fair and non-discriminatory treatment of TSOs, the Agency, regulatory authorities and market participants,
- respecting the need for a fair and orderly forward capacity allocation and orderly price formation,

as methodology foresees long-term capacity calculation without setting limitations to dates of auctions and without introduction of any limitations for auction participants.

(4) The goal of the FCA Regulation is the coordination and harmonisation of forecasted cross-zonal capacity calculation and capacity allocation in the forward markets. Moreover, the requirements are set for the TSOs to cooperate on the level of capacity calculation regions (hereinafter referred to as "CCRs"), on a pan-European level and across bidding zone borders. The Article 10(2) of FCA Regulation also sets rules for establishing capacity calculation methodologies based either on the coordinated net transmission capacity approach or on the flow-based approach.

(5) The objective of providing Long-term CCM is two-fold. Firstly, market participants in the power market aim at forecasting future day-ahead pricing of the different bidding zones, acting as an input to the strategies for operation and investment decisions. The goal of Long-term CCM is to provide the market participants with the information of expected capacity between bidding zones, as this information has an impact on demand and supply of electricity and hence the day-ahead pricing. Secondly, the calculation of long-term capacity will act as input to the issuing of long-term transmission rights on bidding zone borders where long-term transmissions rights are implemented.

(6) Long-term CCM is ensuring and enhancing the transparency and reliability of information on forward capacity allocation, as the Long-term CCM determines the main principles and main processes for long-term capacity calculation timeframes. The Methodology enables TSOs in a transparent way to provide information on forecasted cross-zonal capacities for long-term transmission rights auctions where applicable on Baltic CCR borders.

(7) In this Long-term CCM, unless the context requires otherwise:

a) headings are inserted for convenience only and do not affect the interpretation of this Long-term CCM; and
b) 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.
c) references to an "Article" are, unless otherwise stated, references to an article of this Long-term CCM.

SUBMIT THE FOLLOWING LONG-TERM CCM TO ALL REGULATORY AUTHORITIES OF THE BALTIC CCR:

Article 1
Subject matter and scope

The common CCM for long-term timeframes as determined in this document shall be considered as the common Long-term Methodology of Baltic CCR TSOs in accordance with Article 10(1) and Article 21 of FCA Regulation.

Long-term CCM covers long-term capacity calculation timeframes, which are foreseen by Article 9 of FCA Regulation and any timeframe included in the regional design of long-term transmission rights pursuant to Article 31 of FCA Regulation.

No physical capacity allocation (both implicit and explicit) is made before day-ahead implicit allocation and no physical capacity is reserved (both implicitly and explicitly) for long-term capacity on the Baltic CCR borders.

Article 2
Definitions

For the purposes of the Long-term CCM, terms used in this document shall have the meaning of the definitions included in the adopted capacity calculation methodology of Baltic CCR in accordance with Article 20(2) of CACM Regulation (hereafter referred to as CCM), Article 2 of the Commission Regulation (EU) 2015/1222 establishing a guideline on capacity allocation and congestion management (hereafter referred to as "CACM Regulation"), Article 2 of the FCA Regulation, Article 2 of Regulation (EC) No 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003 and Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC.

Article 3
Transmission reliability margin (TRM) calculation methodology

Article 11 of FCA Regulation sets requirement to include reliability margin methodology in Long-term CCM. TRM value shall be calculated as it is defined in Article 7 of CCM.

Article 4
Operational security limits, contingencies and allocation constraints

Article 12 of FCA Regulation sets requirement to include methodologies for operational security limits and contingencies in Long-term CCM. Therefore, aforementioned lists of input data and allocation constraints shall be calculated as it is defined in Article 3 of CCM.

Article 5
Generation and load shift keys (GSKs)

Article 13 of FCA Regulation sets requirement to include methodology to determine generation and load shift keys in Long-term CCM. GSKs shall be calculated as it is defined in Article 4 of CCM.

Article 6
Remedial actions (RAs)

Article 14 of FCA Regulation sets requirement to TSOs to ensure that those remedial actions are taken into account in the long-term capacity calculation process, which are technically available in the real time operation. Therefore, RAs shall be taken into account as it is defined in Article 5 of CCM.

Article 7
Common capacity calculation methodology for long-term time frames

Long-term cross-zonal capacity shall be calculated for each timeframe which are foreseen by Article 9 of FCA Regulation and any timeframe included in the regional design of long-term transmission rights pursuant to Article 31 of FCA Regulation. Capacity calculation process shall be performed as separate calculation for each long-term timeframe.

TSOs cannot start long-term capacity calculation process for any of the upcoming year's timeframes before agreeing on preliminary transmission infrastructure outage plans, which taking into account provisions of Article 97 of Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation (SO GL) will be earliest on 1st of November of current year.

Long-term cross-zonal capacity shall be calculated for all Baltic CCR borders after TSOs and Common Capacity Calculator (hereafter referred to as "CCC") have all information (at least preliminary) needed for calculations – i.e. information mentioned in Articles 3 to 6 of this methodology, common grid model, as well as transmission infrastructure outage plans. Usage of preliminary or final information depends on dates of Long-term Transmission Rights auctions.

For yearly timeframe long-term capacity calculation process shall provide results by 15th of November as the latest.

The long-term cross-zonal capacity for respective border and respective timeframe is calculated according to Article 23(2) of FCA Regulation and applying requirements set in Article 29 of CACM Regulation.

The uncertainties in long-term cross-zonal capacity calculation will be taken into account by applying a security analysis based on multiple scenarios in accordance to Article 3 of the common grid model methodology developed in accordance with Article 18 and 19 of the FCA Regulation (hereinafter referred to as 'CGMM'). Unless and until these scenarios have been developed, all TSOs shall use the default scenarios as defined in Article 3(1) of CGMM. On those scenarios TSOs can apply outage sets to take into account all available information for capacity calculation including transmission lines' outage plans, which can change on daily basis for long-term capacity calculation process.

Long-term cross-zonal CCM for each Baltic CCR border is given below in sections 7.1 – 7.5. Long-term cross-zonal capacity calculation process shall be performed by CCC and TSOs

following requirements of Section 4 of FCA Regulation. Total Transfer Capacity (TTC) values used in sections 7.1-7.5 of this methodology shall be calculated as it is defined in CCM.

7.1 Long-term Capacity Calculation Rules Between Estonian and Latvian Power Systems

7.1.1 TSOs and CCC calculate Long-term Net Transmission Capacity (NTC) value for Estonia-Latvia Cross-Border Interconnection using following equation:

$$NTC = \min(((TTC_1 + \sum_{i=1}^{n} K_i \cdot P_i) - TRM);\ TTC_2 - TRM) \quad (1)$$

where:
TTC_1 – Total Transfer Capacity after (N-1) Situation has occurred from actual power system network status according to Instruction for parallel operation in the Cross-Border Interconnection between Estonian, Russian and Latvian power systems. The value of TTC_1 is independent on influence of ambient temperatures – values at 0 (zero) temperature shall be used;

TTC_2 – Total Transfer Capacity value for actual power system network status, according to Instruction for parallel operation in the Cross-Border Interconnection between Estonian, Russian and Latvian power systems. The value of TTC_2 is dependent from the influence of ambient temperature of particular capacity calculation time period to transmission line conductors;
P_i – all available amount of assured emergency power reserves for respective power system *I (shall be provided by respective TSOs).*

n – number of power systems;

K_i – reserve power distribution coefficients considering location of the assured emergency power reserve P_i and down regulation according to Table 1 of this Methodology;

TRM – shall be calculated according to the methodology described in Article 3 of this Methodology.

7.1.2 In case if during capacity validation process neighboring TSOs determine different Long-term NTC (cross-zonal capacity) values for the same Cross-Border Interconnection the lowest value shall be used as a coordinated value.

Table 1. Reserve power distribution coefficients

Amount of down regulation power, %	Cross-Border Interconnections	Reserves location			
		Lithuania	Latvia	Belarus	Estonia
100	Estonia-Russia → Latvia	0,62	0,74	0,45	
	Latvia →Russia-Estonia				0,74
50	Estonia-Russia → Latvia	0,48	0,60	0,31	
	Latvia →Russia-Estonia				0,52
0	Estonia-Russia → Latvia	0,34	0,45	0,16	
	Latvia →Russia-Estonia				0,29

7.2. Long-term Capacity Calculation Rules Between Lithuanian and Latvian Power Systems

7.2.1 TSOs and Capacity calculator calculate Long-term NTC (cross-zonal capacity) values for Lithuania-Latvia Cross-Border Interconnection, taking into account assured emergency power reserves for TSOs to ensure readiness for normal operation after (N-1) Situation has occurred, by using following formula:

$$NTC = (TTC_1 + \sum_{i=1}^{n} K_i \cdot P_i) - TRM \quad (2)$$

where:

$$(TTC1 + \sum_{i=1}^{n} K_i \cdot P_i) \leq TTC \quad (3)$$

where:

TTC_1 – Total Transfer Capacity after (N-1) Situation has occurred from actual power system network status according to Instruction for parallel operation in the Lithuania-Latvia Cross-Border Interconnection;

P_i – all available amount of assured emergency power reserves for respective power system i (shall be provided by respective TSO).

K_i – reserve power distribution coefficients considering location of the assured emergency power reserve Pi and down regulation according to

Table 2 of this Methodology

n – number of power systems;

TTC – Total Transfer Capacity in actual power system network status according to Instruction for parallel operation in the Lithuania-Latvia Cross-Border Interconnection;

TRM –shall be calculated according to the methodology described in Article 3 of this Methodology.

7.2.2 In case if during capacity validation process neighboring TSOs determine different Long-term NTC (cross-zonal capacity) values for the same Cross-Border Interconnection the lowest value shall be used as a coordinated value.

Table 2. Reserve power distribution coefficients

Amount of down regulation power, %	Cross-Border Interconnections	Reserves location			
		Lithuania	Latvia	Belarus	Estonia
100	Latvia→Lithuania	0,88		0,72	
	Lithuania→ Latvia		0,88		0,62
50	Latvia→Lithuania	0,61		0,44	
	Lithuania→ Latvia		0,72		0,46
0	Latvia→Lithuania	0,34		0,16	
	Lithuania→ Latvia		0,55		0,29

7.3 Long-term Capacity Calculation Rules Between Estonian and Finnish Power Systems

7.3.1 TTCs on cross-border Estonia-Finland are validated and calculated by respective TSOs and calculated by CCC on both sides of the interconnector using CGMs that represent the AC-networks of observable areas of synchronous areas that each belong to.

7.3.2 Long-term Capacity is defined according to formula NTC=TTC-TRM in each side of HVDC link.

7.3.3 Long-term NTC between Finland and Estonia is calculated according to formula:

$$NTC_{FI\text{-}EE} = \min (FI\ NTC_{FI\text{-}EE}; EE\ NTC_{FI\text{-}EE}) \quad (4)$$

where:

FI $NTC_{FI\text{-}EE}$ – NTC between FI and EE Bidding Zones, determined by operational security limits in Baltic CCR TSOs' synchronous areas or technical limitation on HVDC interconnection (from Finland side),

EE $NTC_{FI\text{-}EE}$ – NTC between FI and EE Bidding Zones, determined by operational security limits in Baltic CCR TSOs' synchronous or technical limitation on HVDC interconnection (from Estonia side).

7.4 Long-term Capacity Calculation Rules Between Lithuanian and Swedish Power Systems

7.4.1 TTCs on cross-border Lithuania-Sweden are checked and calculated by respective TSOs on both sides of the interconnector using CGMs that represent the AC-networks of observable areas of synchronous areas that each belong to. The Capacity calculator shall calculate the cross-border TTC for the Lithuania-Sweden border based on the input from respective TSO.

7.4.2 Long-term Capacity is defined according to formula NTC=TTC-TRM in each side of HVDC link.

7.4.3 NTC between Sweden and Lithuania that is allocated to the market is calculated according to formula:

$$NTC_{SE\text{-}LT} = \min (SE\ NTC_{SE\text{-}LT}; LT\ NTC_{SE\text{-}LT}) \quad (5)$$

where:

SE $NTC_{SE\text{-}LT}$ – NTC between SE and LT Bidding Zones, determined by operational security limits in Baltic CCR TSOs' synchronous areas or technical limitation on HVDC interconnection (from Sweden side);

LT $NTC_{SE\text{-}LT}$ – NTC between SE and LT Bidding Zones, determined by operational security limits in Baltic CCR TSOs' synchronous areas or technical limitation on HVDC interconnection (from Lithuania side).

7.5 Long-term Capacity Calculation Rules Between Lithuanian and Polish Power Systems

7.5.1 TTCs on cross-border Lithuania-Poland are checked and calculated by respective TSOs and Capacity calculator on both sides of the interconnector using on Lithuanian side Baltic CGMs that represent the AC-networks of observable area and on Polish Individual Grid Model supplemented by subtransmission 110 kV grid in Polish side.

7.5.2 Long-term Capacity is defined according to formula NTC=TTC-TRM in each side of HVDC link by respective TSOs and Capacity calculator.

7.5.3 The matched LT NTC are defined according to the following formulas taking into account the losses depending on the direction and number of the circuits of Elk Bis-Alytus 400 kV line in operation:

For direction from Lithuania to Poland (settlement point) in Elk Bis 400 kV:

7.5.4 Two circuits of Elk Bis-Alytus 400 kV line in operation:

$$NTC_{LT\text{-}PL} = \min (PL\ NTC_{LT\text{-}PL}; LT\ NTC_{LT\text{-}PL}; 488\ MW) \quad (6)$$

7.5.5 One circuit of Elk Bis-Alytus 400 kV line in operation:

$$NTC_{LT\text{-}PL} = \min (PL\ NTC_{LT\text{-}PL}\ ; LT\ NTC_{LT\text{-}PL}; 485\ MW) \quad (7)$$

where:

PL $NTC_{LT\text{-}PL}$ – NTC between LT and PL Bidding Zones, determined by operational security limits in Baltic CCR TSOs' synchronous areas or technical limitation on HVDC interconnection (from Poland side), if calculated NTC between LT and PL Bidding Zones is less than 50 MW, then PL $NTC_{LT\text{-}PL}$ shall be set to 0 MW;

LT $NTC_{LT\text{-}PL}$ – NTC between LT and PL Bidding Zones, determined by operational security limits in Baltic CCR TSOs' synchronous areas or technical limitation on HVDC interconnection (from Lithuania side), if calculated NTC between LT and PL Bidding Zones is less than 50 MW, then LT $NTC_{LT\text{-}PL}$ shall be set to 0 MW;

488 MW – technical capacity of the Link in Settlement Point ($NTC_{SettlementPoint}$) when both circuits of Elk Bis-Alytus line are in operation (i.e. decreased the 500 MW input power of BtB by technical losses of HVDC converter, two circuits of 400 kV line and shunt reactors);

485 MW – technical capacity of the Link in Settlement Point ($NTC_{SettlementPoint}$) when one circuit of Elk Bis - Alytus line is in operation (i.e. decreased the 500 MW input power of BtB by technical losses of HVDC converter, one circuit of 400kV line and shunt reactors).

For direction from Poland to Lithuania (Settlement Point in Alytus 330kV):

7.5.6 Two circuits or one circuit of Elk Bis-Alytus 400 kV line in operation:

$$NTC_{LT\text{-}PL} = \min (PL\ NTC_{LT\text{-}PL}; LT\ NTC_{LT\text{-}PL}; 492\ MW) \quad (8)$$

where:
PL $NTC_{LT\text{-}PL}$ – NTC between LT and PL Bidding Zones, determined by operational security limits in Baltic CCR TSOs' synchronous areas (from Poland side), if calculated NTC between LT and PL Bidding Zones is less than 50 MW, then PL $NTC_{LT\text{-}PL}$ shall be set to 0 MW;

LT $NTC_{LT\text{-}PL}$ – NTC between LT and PL Bidding Zones, determined by operational security limits in Baltic CCR TSOs' synchronous areas (from Lithuania side), if calculated NTC between LT and PL Bidding Zones is less than 50 MW, then LT $NTC_{LT\text{-}PL}$ shall be set to 0 MW;

492 MW – technical capacity of the Link in Settlement Point ($NTC_{SettlementPoint}$) when both circuits or one circuit of Elk Bis - Alytus line are in operation (i.e. decreased the 500 MW input power of BtB by technical losses of HVDC converter).

Article 8
Cross-zonal capacity validation methodology

Each TSO shall perform the validation of cross-zonal capacities on its bidding zone border(s) to ensure that the results of regional calculation of cross-zonal capacity will ensure operational security. When performing the validation, the TSOs shall consider operational security, taking into account new and relevant information obtained during or after the most recent capacity calculation.

According to Article 24 of FCA Regulation and Article 26 of CACM Regulation, each TSO shall validate and have the right to correct long-term cross-zonal capacity relevant to the TSO's bidding zone borders provided by the CCC. If TSO correct or calculates different cross-zonal capacities, the capacities shall be resent to CCC for re-coordination of relevant cross-border. The reason of correction or rejection shall be collected by TSOs and provided to CCC.

Each TSO may reduce long-term cross-zonal capacity during the validation of cross-zonal capacity referred to in Article 8.1 for reasons of operational security.

TSOs shall, upon request, provide to their regulatory authorities a report detailing how the value or reduction of long-term cross-zonal capacity for a specific long-term capacity calculation time frame has been calculated.

Article 9
Fallback procedure

If long-term cross-zonal capacities cannot be calculated by CCC, the CCC informs relevant TSOs on inability to calculate capacities. Then relevant TSOs calculate and coordinate capacities for respective cross-border interconnections among themselves as set in accordance with article 7 and provide coordinated capacities to CCC.

Article 10
Publication of data

Calculated long-term capacities shall be published in ENTSO-E Transparency platform as soon as available after calculations for all Baltic CCR borders by TSOs or CCC of Baltic CCR but not later than foreseen according to Article 11 of Regulation 543/2013.

Long-term capacities calculated according to this methodology and published at ENTSO-E Transparency Platform can be updated at any time before, during and/or after long term transmission rights auctions in case of changes of input data used in calculations (update of calculation input preliminary data e.g. transmission infrastructure outage plans).

Article 11
Implementation of the Long-term CCM

The TSOs shall implement this Long-term CCM within 3 months after national regulatory authorities approval of the Long-term CCM within the Baltic CCR or a decision has been taken by the Agency for the Cooperation of Energy Regulators in accordance with Article 4(4) and/or Article 4(10) and/or Article 4(11) of the FCA Regulation, but not earlier than implementation of the Baltic CCR TSOs' Common Methodology for Splitting Long-Term Cross-Zonal Capacity in Accordance with Article 16 of FCA Regulation.
Baltic CCR TSOs' shall publish Long-term CCM on the internet after approval by the competent regulatory authorities.
Until CCC is established and is ready to perform their functions, capacity calculation and coordination is performed by TSOs related to respective borders.

Article 12
Language

The reference language for this Long-term CCM shall be English. For the avoidance of doubt, where TSOs need to translate this Long-term CCM into their national language(s), in the event of inconsistencies between the English version published by TSOs in accordance with Article 4(13) of the FCA 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 the Long-term CCM.