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

Among:

AS "Augstsprieguma tikls"
Elering AS
LITGRID AB
PSE S.A.
Svenska kraftnat
Fingrid Oyj

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Vilnius, Riga, Tallinn, Helsinki, Stockholm, Warsaw

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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) 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. This Methodology foresees to apply coordinated net transmission capacity (CNTC) approach in Baltic CCR.

(4) 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.

(5) 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.

(6) 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.

(7) This Methodology also takes into account and acts upon the fact that the Baltic States are foreseen to be synchronized with the Continental Europe Synchronous Area by double circuit line connecting Poland and Lithuania. Upon synchronisation, the capacity of this line will have to be, in large part, kept for reliability margins in a case of unexpected tripping of aforementioned double circuit line (with simultaneous transfer of Baltic System into island operation) or outage (of load or generation/infeed) in the Baltic System. Transmission system operators will continue offering maximum capacity for cross-border trading, compliant with operational security limits and considering possible contingencies in the Polish and Lithuanian systems, including those resulting from aforementioned unexpected events. The specific situation of this interconnection

is hereby taken into consideration for the calculation of the total capacity and contingencies pursuant to Article 16(8) of Regulation (EU) 2019/943.

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

1 SUBJECT MATTER AND SCOPE

1.1. 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.

1.2. 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.

1.3. No physical capacity allocation (both implicitly and explicitly) other than balancing capacity market allocations are 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.

2 DEFINITIONS

2.1. For the purposes of the Long-term CCM, terms used in this document shall have the meaning of the definitions included in 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.

BSPS – Baltic State Power Systems (Republic of Estonia, the Republic of Latvia and the Republic of Lithuania)

Cross-Border Interconnection – is a physical transmission link (e.g. tie-lines) which connects two power systems.

CGM (Common Grid Model) – electrical system grid model agreed between TSOs describing the main characteristic of the power system (generation, loads and grid topology) and rules for changing these characteristics during the capacity calculation process in accordance with Article 17 of the CACM Regulation.

CGMES – Common grid model exchange standard.

Elering – Elering AS, Transmission System Operator of the Republic of Estonia.

Fingrid – Fingrid Oyj, electricity transmission system operator of the Republic of Finland.

Litgrid – LITGRID AB, electricity transmission system operator of the Republic of Lithuania.

Market Coupling Operator (MCO)/Nominated electricity Market Operator (NEMO) - the operator/-s of day-ahead and Intraday Markets in Baltic CCR.

NTC – coordinated Net Transmission Capacity of the designated Cross-Border Interconnections is the maximum Trading Capacity, which is permitted in transmission Cross-Border Interconnections compatible with Operational Security standards and taking into account the technical uncertainties on planned network conditions for each TSO.

PSE – PSE S.A., electricity transmission system operator of the Republic of Poland.

Shift Key – means a method of translating a net position change of a given power system into estimated specific injection increases or decreases in the Common Grid Model. Shift Key is settled as generation, renewable generation and load.

SvK – Svenska kraftnat, electricity transmission system operator in Sweden.

SO GL – European Commission Regulation (EU) No 2017/1485 establishing a Guideline on electricity transmission system operation.

TRM – Transmission Reliability Margin which shall have meaning of "reliability margin" definition of CACM.

TTC - Total Transfer Capacity of the designated Cross-Border Interconnections is the maximum transmission of active power, which is permitted in transmission Cross-Border Interconnections compatible with Operational Security standards applicable for each TSO.

Trading Capacity – the maximum available Cross-Zonal Capacity for trade in Day-Ahead Market and Intraday Market.

CESA – Continental Europe synchronous area.

MTU – Market time unit.

Internal Baltic AC interconnectors – Interconnectors between Baltic TSOs in Baltic area, covering Lithuania – Latvia and Latvia – Estonia cross-borders.

Baltic AC interconnectors – Interconnectors in Baltic area, covering Lithuania – Latvia, Lithuania – Poland, Latvia – Estonia cross-borders.

3 TRANSMISSION RELIABILITY MARGIN CALCULATION METHODOLOGY

3.1. The Transmission Reliability Margin (hereinafter referred to as "TRM") is a capacity margin needed for secure operation of interconnected power systems considering the planning errors, including the errors due to imperfect information at the time the transfer capacities have been computed.

3.2. TRM calculation methodology is covering AC interconnectors of BSPS.

3.3. For determining of the TRM values for each Cross-Border Interconnection, the statistical data of historically planned and actual power flows (historical physical flows) shall be used for each MTU. TRM shall be determined as the arithmetic average of the deviations between the expected power flows at the time of the capacity calculation and realised power flows in real time value plus standard deviation based on historical data. TRM shall be rounded to the nearest integer. TRM shall be calculated for each cross-border direction according to formula (1):

$$TRM = \frac{\sum_{i=1}^{n} X_i}{n} + \sqrt{\frac{\sum_{i=1}^{n} (X_i - \overline{X})^2}{n-1}} \qquad (1)$$

where:

$\mathbf{X_i}$ - data sets of the i-th element, defined as deviation of planned power flow from actual power flow (actual flow subtracted from planned flow) over Cross-Border Interconnection;

$\overline{X}$ arithmetic average value of X_i equal to $\frac{\sum_{i=1}^{n} X_i}{n}$;

n - number of elements in the data set.

3.4. TRM shall be recalculated every month or more frequently upon TSOs agreement using last 1 year or latest available historical period data. Historical data for TRM evaluation shall be acquired since Baltic TSOs synchronisation with CESA.

3.5. For initial operation period after Baltic TSOs synchronisation with CESA, fixed TRM values shall be applied to AC interconnections of BSPS. These values shall be applied for 1 month period. After this period, TRM shall be calculated according to principles set out in 3.3 and 3.4. Fixed values provided in Table 1.

Table 1. Fixed TRM values for initial operation period

Border	EE-LV	LV-EE	LT-LV	LV-LT	LT-PL	PL-LT
TRM value	50 MW	50 MW	50 MW	50 MW	100 MW	100 MW

4 OPERATIONAL SECURITY LIMITS, CRITICAL NETWORK ELEMENTS, CONTINGENCIES AND ALLOCATION CONSTRAINTS

4.1. Each Baltic CCR TSO shall define list of critical network elements (CNEs) of its control area for capacity calculation process. Elements could be all cross-border interconnectors, lines, transformers, HVDC elements.

4.2. CNEs for capacity calculation shall be defined considering impact computation principles defined in methodology according to art. 75 of SOGL annex 1 and factor determining impact for CNE shall be cross zonal power flow exchange. Internal CNEs which power flow filtering influence factor according to art. 75 of SOGL annex 1 is less than percentage, defined by TSOs based on operational and planning expertise, shall be excluded from capacity calculation process. TSO shall update CNE list in case of significant change in grid topology when influence value for CNE element significantly changed from average value and CNE became relevant/irrelevant for capacity calculation process.

4.3. Contingency Analysis is performed at least for those contingencies which are agreed among Baltic TSOs in the Contingency Lists. Contingency Lists shall be agreed and provided among Baltic TSOs and provided to Coordinated Capacity Calculator (hereafter referred to as “CCC”) for Capacity Calculation.

4.4. Each Baltic CCR TSO shall provide Contingency List to be used in capacity calculation process in accordance with art. 33 of SOGL. Contingency list shall include contingencies of TSO observability area. Contingency can be:

- Line, cable;
- Transformer;
- Generator;
- Load;
- Busbar;
- Multiple elements combined;
- HVDC;

4.5. Allocation constraints shall be considered as a constraint on the cross-border and/or on the

global net position (the sum of all cross-border exchanges for a certain bidding zone), thus limiting the net position of the respective bidding zone with regards to all CCRs which are part of long term calculation process.

4.6. Each Baltic CCR TSO and CCC shall perform regular review of CNEs, Contingencies, Allocation constraints and other input data and evaluate their relevance and application in capacity calculation process. Such evaluation shall be performed at least every two years.

5 GENERATION AND LOAD SHIFT KEYS (GLSK)

5.1. The TSOs of Baltic region shall define the generation shift keys in accordance with Article 24 of the CACM Regulation.

5.2. The generation and load shift keys (hereinafter referred to as "GLSK") shall represent the best forecast of the relation of a change in the net position of a bidding zone to a specific change of generation or load in the CGM. That forecast shall notably take into account the information from the generation and load data provision methodology according to Article 16 of CACM. Shift key strategy per power system area shall be the responsibility of each involved TSO, which has to be communicated with other TSOs and CCC before commencing TTC calculation process in case of deviation from default GLSK strategy set out in paragraph 5.3.

5.3. GLSK strategy consists of GLSK definition principle/-s and ranking sequence/-s. GLSK strategy consists of default GLSK ranking sequence and default GLSK definition and it shall be used as default unless specified otherwise by respective TSO. Each TSO may choose GLSK definition principle/-s and ranking sequence/-s and shall notify other TSOs and CCC about chosen GLSK definition principle/-s and ranking sequence/-s.

5.4. Following generation and/or load ranking sequence (generation or load shift shall be proportional to the base case generation/load) shall be used as default:

a. Internal specific area generation shift.
b. HVDCs setpoint change.
c. Neighbouring system generation shift (including HVDCs setpoint change, if HVDC's flow goes into synchronous area).
d. Load shifting in specific area.

5.5. If TSO does not specify GLSK definition principle/-s, as a default proportional to the base case GLSK definition principle shall be applied for TSO. GLSK definition principle representing proportional to the base case generation/load shift key strategy shall be performed according to following rules:

5.5.1. The participation of node n in the shift, among generation nodes (GSK) is given by:

$$K_g\,(n,a) = G(a)\,\frac{P_g(n,a)}{\sum_i P_i(i,a)} \qquad (2)$$

Where:

K_G(n, a) – calculated GSK value of evaluated specific generation in node n, belonging to area a.

P_g(n, a) – generation in node n, belonging to area a.

$\sum \mathbf{P_i(i, a)}$ – total sum of evaluated generators belonging to area a.

G(a) – Participation factor for generation nodes in area “a”

5.5.2. The participation of node n in the shift, among load nodes (LSK) is given by:

$$K_l\,(n,a) = L(a)\,\frac{P_l(n,a)}{\sum_i P_i(i,a)} \qquad (3)$$

Where:

$\mathbf{K_l(n, a)}$ – calculated LSK value of evaluated specific load in node n, belonging to area a.

$\mathbf{P_l(n, a)}$ – active load in node n, belonging to area a.

$\sum \mathbf{P_i(i, a)}$ – total sum of active loads belonging to area a.

L(a) – Participation factor for load nodes in area “a”

5.5.3. The sum of G(a) and L(a) for each area is to be equal to 1 (i.e. 100%).

5.6. GLSK strategy applied in Nordics is described in detail in Nordic CCR Capacity Calculation Methodology.

6 REMEDIAL ACTIONS (RAS)

6.1. Relevant TSOs shall provide relevant CCC with information on available and applicable non-costly remedial actions that shall be used in capacity calculation process.

6.2. List of possible remedial actions in Baltic CCR, which can be used during capacity calculation process shall cover changes of network topology.

6.3. Non-costly remedial actions are such actions which don't result in additional costs to TSO in case of planned operational regime for which capacity calculation is performed. Costly remedial actions are such actions which result in additional costs to TSO even in case of planned operational regime for which capacity calculation is performed.

6.4. Non-costly remedial actions shall be fully exploited before an internal Critical Network Element may affect cross border trade.

7 COMMON RULES CAPACITY CALCULATION METHODOLOGY FOR LONG-TERM TIME FRAMES

7.1. 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.

7.2. 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.

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

7.4. 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 out in Article 29 of CACM Regulation.

7.5. 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 with Article 3 of the CGMM developed in accordance with Article 18 and 19 of the FCA Regulation. Unless and until these scenarios have been developed, the default scenarios as defined in Article 3(1) of CGMM shall be used. On those scenarios outage sets can be applied as stipulated in 7.2 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.

7.6. Long-term cross-zonal CCM for each Baltic CCR border is given below in Sections 9-10. Long-term cross-zonal capacity calculation process shall be performed by CCC following requirements of Section 4 of FCA Regulation.

7.7. Limits of transmission capacity on the Polish-Lithuanian border shall be determined pursuant to Section 11, using the latest available CGM models in accordance with Article 3 of the CGMM developed in accordance with Article 18 and 19 of the FCA Regulation or special models prepared by TSOs for respective periods in which its closed 110 kV distribution grid is included as well as latest forecast of a load, generation and topology.

8 TTC CALCULATION METHODOLOGY

8.1. The Cross-Border Interconnection TTC determination for AC interconnectors shall be done by performing Contingency Analyses based on N-1 criterion on a CGM, while taking into account the intra and intersystem Operational Security limits according to Section 4 of synchronous area and Control Area of Baltic TSOs.

8.2. TTC is maximum power flow value on cross border between two bidding zone areas resulted from modelling net position variation and performing contingency analysis. TTC value is obtained by summing up power flow values of cross-border lines above 110 kV after Operational Security or stability limits are reached for any CNE after modelling net position increase in exporting area and decrease in importing area and performing N-1 contingency analysis.

8.3. TSOs and Capacity Calculator shall not limit cross-zonal exchanges due to Critical Network Elements not significantly impacted by cross zonal trade according to Article 29.3(b) of CACM Regulation and Section 4 unless performed Contingency Analyses determines threat to Operational Security or when operational security analyses show that boundaries of stability limits are exceeded during operation of the transmission system.

8.4. While calculating TTC and performing Contingency Analyses after applying of N-1 criteria following Operational Security limits shall be not exceeded:

- Permanently allowed thermal limits, that correspond to the relevant ambient temperature, of network elements, i.e. the maximum amount of electric current that a given network element

can conduct without sustaining damage or being in violation of safety requirements;

- Voltage and load stability limits in network nodes, i.e. maximum and minimum voltage levels permitted at given network node in order to prevent equipment damage or voltage collapse respectively;

- Dynamic and or any other time dependent stability limit (including frequency, oscillatory and rotor angle stability), based on TSOs internal stability assessment procedure.

8.5. Capacities from SvK side for Sweden – Lithuania interconnector is calculated according to following principle:

Total Transfer Capacity (TTC) of a DC interconnector Sweden – Lithuania in both directions corresponds only to the full capacity of the DC line, in case of no failure on the interconnector, including converter stations. If the HVDC link is not in service due to a planned or an unplanned outage TTC is 0. The Cross-Border Interconnection TTC determination for DC interconnectors is defined according to:

$$TTC_{SE\text{-}LT} = \propto_{SE\text{-}LT} \cdot P_{SE\text{-}LT,\,MAX\,THERMAL} \quad (4)$$

Where**:**

$\propto_{SE\text{-}LT}$ - Availability factor of equipment defined through scheduled and unscheduled outages, $\alpha_{SE\text{-}LT}$ being a real number in between and including 0 and 1.

$P_{maxthermal}$ - Thermal capacity for the HVDC link.

8.5.1. Capacities from Litgrid side for Sweden – Lithuania interconnector and capacities for EE – FI interconnectors from Elering and Fingrid side are calculated according to principles set out in paragraph 8.4.

9 COORDINATED NTC CALCULATION PRINCIPLES FOR INTERNAL BALTIC AC INTERCONNECTORS

9.1. For the long-term capacity calculation timeframes, CNTC (Coordinated Net transmission Capacity) approach is applied in the Baltic CCR.

9.2. Capacity Calculator shall calculate NTC value for Internal Baltic AC interconnections following equation:

$$NTC = TTC – TRM \quad (5)$$

where:

TTC - Total Transfer Capacity according to actual power system network status, identified during TTC evaluation, defined in Section 8;

TRM - transmission reliability margin value calculated according to the methodology described in Section 3 of this Methodology.

9.3. In case if during capacity validation process neighbouring TSOs determine different NTC values for the same Cross-Border Interconnection the lowest value shall be used as a coordinated value.

9.4. Trading Capacity shall be defined for both interconnection directions according to formula (5). In case if during capacity validation process different NTC values are calculated for the same Cross-Border Interconnection direction the lowest value shall be used as a coordinated value.

$$NTC_{A\text{-}B;\ B\text{-}A} = \min(A\ NTC_{A\text{-}B};\ B\ NTC_{A\text{-}B});\ \min(A\ NTC_{B\text{-}A};\ B\ NTC_{B\text{-}A}) \quad (6)$$

where:

$NTC_{A\text{-}B;\ B\text{-}A}$ – coordinated NTC values according to formula (5) for each interconnection direction between area A and B;

A $NTC_{A\text{-}B}$; A $NTC_{B\text{-}A}$ – as calculated by party A according to formula (5);

B $NTC_{A\text{-}B}$; B $NTC_{B\text{-}A}$ – as calculated by party B according to formula (5) .

10 COORDINATED NTC CALCULATION PRINCIPLES FOR DC INTERCONNECTORS

10.1. CCC shall calculate NTC value for Baltic DC interconnectors using formula (5) considering input data provided from TSOs.

10.2. TRM value referenced in formula (5) for DC interconnectors shall be equal to 0 MW.

10.3. TTC calculation approach defined in Section 8 for DC interconnectors shall be applied by Capacity Calculator assigned by Baltic CCR.

10.4. Coordinated capacity value shall be obtained by evaluating minimum value according to principles defined in 9.4 and formula (6).

11 TOTAL TRANSFER CAPACITY (TTC) CALCULATION FOR LITHUANIAN - POLAND AC CROSS-BORDERS INTERCONNECTOR

11.1. While calculating TTC, list of considered CNE and contingencies should be determined according to Section 4.

11.2. While calculating TTC and performing contingency analyses after applying of N-1 criteria following operational security limits shall be not exceeded:

11.2.1. Permanently allowed thermal limits, that correspond to the relevant ambient temperature, of network elements, i.e. the maximum amount of electric current that a given network element can conduct without sustaining damage or being in violation of safety requirements.

11.2.2. Voltage and load stability limits in network nodes, i.e. maximum and minimum voltage levels permitted at given network node in order to prevent equipment damage or voltage collapse respectively.

11.2.3. Dynamic stability limits including:

i. transient stability.

ii. small signal stability (see further description in paragraph 11.3).

11.2.4. Frequency stability limit is assessed based on commonly agreed and coordinated availability of frequency support measures between Baltic TSOs. Measure 11.2.4.ii is agreed between relevant Baltic TSOs, Swedish TSO and Finnish TSO. The respective values in both directions are calculated by Lithuanian TSO taking into account the following commonly agreed and coordinated measures/parameters:

i. Forecasted inertia level in BSPS.

ii. Available fast frequency response settings on HVDC links in BSPS.

iii. Forecasted available fast frequency reserves amount provided by Battery Energy Storage Systems (BESS) in BSPS.

iv. Disconnection of AC interconnection with CESA shall not cause rate of change of frequency (ROCOF) greater than 1 Hz/s and activation of load shedding in BSPS.

11.3. TTC values for relevant direction calculated considering small signal operational security stability limits (according 11.2.3.ii) shall be defined by applying following approach:

$$TTC_{SS(PL>LT)} = \min (TTC_{1(PL>LT)}; TTC_{2(PL>LT)}); \quad TTC_{SS(LT>PL)} = \min (TTC_{1(LT>PL)}; TTC_{2(LT>PL)}) \qquad (7)$$

Where:

$TTC_{SS(PL>LT)}$; $TTC_{SS(LT>PL)}$ – Total Transfer Capacity considering dynamic small signal stability limits.

$TTC_{1(PL>LT)}$; $TTC_{1(LT>PL)}$ – small signal stability limit with N-1 line outages evaluation in directions to PL>LT and LT>PL.

$TTC_{2(PL>LT)}$; $TTC_{2(LT>PL)}$ – security limit based on small signal stability criteria without N-1 line outages evaluation shall be calculated considering security limits based on small signal stability criteria and possible loss of **biggest infeed in Baltic PS** in directions to PL>LT and LT>PL.

$$TTC_{2(PL>LT)} = TTC_{0(PL>LT)} - MaxInf; \quad TTC_{2(LT>PL)} = TTC_{0(LT>PL)} - MaxDem \qquad (8)$$

Where:

$TTC_{0(PL>LT)}$; **$TTC_{0(LT>PL)}$** – small signal stability limit without N-1 line outages for direction PL>LT and LT>PL.

MaxInf - biggest N-1 infeed disconnection in BSPS.

MaxDem - biggest N-1 demand disconnection in BSPS.

11.4. The hourly values of matched TTC according to Operational security limits defined in 11.2.1 - 11.2.3 in direction to Lithuania are calculated according to the following formula:

$$TTC_{PL>LT} = \min (PL\ TTC_{SS(PL>LT)}; LT\ TTC_{SS(PL>LT)}; TTC_{(PL>LT)(F)}) \qquad (9)$$

where:

PL $TTC_{SS(PL>LT)}$ – TTC between LT and PL bidding areas in direction to Lithuania, determined by PL TSO, considering Operational security limits defined in 11.2.1 - 11.2.3 and 11.3.

LT $TTC_{SS(PL>LT)}$ – TTC between LT and PL bidding areas in direction to Lithuania, determined by LT TSO, considering Operational security limits defined in 11.2.1 - 11.2.3 and 11.3.

$TTC_{(PL>LT)(F)}$ – TTC of Lithuania-Poland Cross-Border interconnection in direction to Lithuania calculated by Lithuanian TSO considering frequency stability limits as in 11.2.4.

11.5. The hourly values of matched TTC according to Operational security limits defined in 11.2.1 - 11.2.3 in directions to Poland are calculated according to the following formula:

$$TTC_{LT>PL} = \min (PL\ TTC_{SS(LT>PL)}; LT\ TTC_{SS(LT>PL)}; TTC_{(LT>PL)(F)}) \qquad (10)$$

where:

PL $TTC_{SS(LT>PL)}$ – TTC between LT and PL bidding areas in direction to Poland, determined by PL TSO, considering Operational security limits defined in 11.2.1 - 11.2.3 and 11.3.

LT $TTC_{SS(LT>PL)}$ – TTC between LT and PL bidding areas in direction to Poland, determined by LT TSO, considering Operational security limits defined in 11.2.1 - 11.2.3 and 11.3.

$TTC_{(LT>PL)(F)}$ – TTC of Lithuania-Poland Cross-Border interconnection in direction to Poland calculated by Lithuanian TSO considering frequency stability limits as in 11.2.4.

NTC CALCULATION RULES BETWEEN LITHUANIAN AND POLISH POWER SYSTEMS

11.6. NTC values for Lithuania-Poland Cross-Border Interconnection in direction to Lithuania shall be calculated by using following formula:

$$NTC_{(PL>LT)} = TTC_{(PL>LT)} - TRM_{(PL>LT)} \quad (11)$$

where:

$TTC_{(PL>LT)}$ – TTC of Lithuania-Poland cross border interconnection in direction to Lithuania calculated by Polish and Lithuanian TSO's according to formula (9) as in 11.4.

$TRM_{(PL>LT)}$ – transmission reliability margin due to unintentional deviations in the Lithuania-Poland cross border interconnection. For initial operation period after Baltic TSOs synchronisation with CESA, TRM shall be calculated and applied according to paragraph 3.5, but not higher, than 30% of $TTC_{(PL>LT)}$.

11.7. NTC values for Lithuania-Poland Cross-Border Interconnection in direction to Poland shall be calculated by using following formula:

$$NTC_{(LT>PL)} = TTC_{(LT>PL)} - TRM_{(LT>PL)} \quad (12)$$

where:

$TTC_{(LT>PL)}$ – TTC of Lithuania-Poland cross border interconnection in direction to Poland calculated by Polish and Lithuanian TSO's according to formula (10) as in 11.5.

$TRM_{(LT>PL)}$ – transmission reliability margin due to unintentional deviations in the Lithuania-Poland cross border interconnection. For initial operation period after Baltic TSOs synchronisation with CESA, TRM shall be calculated and applied according to 3.5, but not higher, than 30% of $TTC_{(LT>PL)}$.

12 LONG-TERM CAPACITY CALCULATION RULES FOR YEAR-AHEAD TIMEFRAME

12.1. For LV-LT, LT-PL, LT-SE4 Year-Ahead timeframe long-term capacity calculation process shall publish results to market participants and transparency platform by 15th of December as the latest.

12.2. For EE-LV and EE-FI Year-Ahead timeframe long-term capacity calculation process shall publish results to market participants and transparency platform by 8th of November as the latest.

12.3. Capacity calculation for Year-Ahead timeframe shall be performed on a yearly CGM. Scenarios and timestamps for yearly CGM shall be set according to CGMM methodology.

12.4. Capacity calculation for Year-Ahead timeframe shall be performed at least for each month of the year using latest available CGM scenario and yearly coordinated outages plan applied. Capacities shall also be calculated for each cross-border capacity impacting planned outages or outages combination period also including new infrastructure plans and generation/load patterns.

12.5. TTC and NTC values shall be calculated considering system security and net position variation in accordance with Section 8.

13 LONG-TERM CAPACITY CALCULATION RULES FOR MONTH-AHEAD TIMEFRAME

13.1. For Month-Ahead timeframe long-term capacity calculation process shall provide results 6 days before analysed month the latest.

13.2. Capacity calculation for Month-Ahead timeframe shall be performed on a latest available CGM or yearly CGM. Data for CGM shall be updated accordingly.

13.3. Capacity calculation for Month-Ahead timeframe shall be performed at least for each day of the month using latest available CGM scenario and yearly or latest available coordinated outages plan applied. Capacities shall also be calculated for each cross-border capacity impacting planned outages or outages combination period also including new infrastructure plans and generation/load patterns.

13.4. TTC and NTC values shall be calculated considering system security and net position variation in accordance with sections Section 8.

14 LONG-TERM CAPACITY CALCULATION FOR OTHER TIMEFRAMES

14.1. In case particular TSO needs to offer or publish capacities for any other timeframe, the calculation results from preceding timeframe shall be used by default.

14.2. If, for the case mentioned in point 14.1, there are any changes to outages defined respectively in yearly or monthly outage plan, NTC's used for processed timeframe shall be re-calculated for relevant cross-borders to ensure transparency of the capacities for the market.

14.3. The results of recalculation process shall be published as relevant TSO and CCC commonly agree.

14.4. Capacity calculation for any other timeframe shall be performed using the latest available CGM as described in paragraph 7.5 and 7.7 and outage plan to calculate capacities.

14.5. TTC and NTC values shall be calculated considering system security and net position variation in accordance with sections in Section 8.

15 RULES FOR TAKING INTO ACCOUNT PREVIOUSLY ALLOCATED CROSS-ZONAL CAPACITY

15.1. When determining Cross-zonal capacities for any long-term timeframe defined in this methodology, previously allocated capacities shall be considered. Cross-zonal capacities shall be reduced, where appropriate, by the amount of previously allocated capacities for long-term transmission rights (if present).

16 RULES FOR EFFICIENTLY SHARING POWER FLOW CAPABILITIES OF CNES AMONG DIFFERENT BIDDING-ZONE BORDERS

16.1. In Baltic CCR rules for efficiently sharing the power flow capabilities of CNEs among different Bidding Zone borders are not needed, as there is no such CNEs in Baltic CCR that would clearly and in majority cases influence power flow capabilities of several borders at once. Therefore, there is no sharing of the power flow capabilities of Critical Network Elements between Bidding Zone borders and this Methodology doesn't contain the rules for efficiently sharing the power flow capabilities of Critical Network Elements among different Bidding Zone borders.

17 RULES FOR SHARING THE POWER FLOW CAPABILITIES OF CNES AMONG DIFFERENT CCRS

17.1. No CNEs relevant for multiple CCRs within Baltic CCR are identified, therefore all CNEs are treated equally in the capacity calculation process ensuring proper sharing of power-flow capacities of CNEs among different CCRs.

18 RULES ON THE ADJUSTMENT OF POWER FLOWS OF CROSS-ZONAL CAPACITY DUE TO RAS

18.1. CCC shall take into account in the capacity calculation RAs as defined in Section 6 to increase the cross-zonal capacity for the long-term time frame. If RAs are agreed during capacity calculation for any long-term timeframe process, TSOs shall ensure availability of agreed RAs or provide alternative RAs to maintain operational security.

19 CROSS-ZONAL CAPACITY VALIDATION METHODOLOGY

19.1. 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.

19.2. 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.

20 FALLBACK PROCEDURE

20.1. 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, coordinate capacities and publish for respective cross-border interconnections among themselves as set in accordance with article 7 and provide coordinated capacities to CCC.

21 PUBLICATION OF DATA

21.1. 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.

21.2. 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).

22 REPORT PROVISION AND DATA PUBLICATION

22.1. According to CACM article 26(5) CCC shall, every three months, report all reductions made during the validation of cross-zonal capacity to all regulatory authorities of the capacity calculation region. This report shall include the location and amount of any reduction in cross-zonal capacity and shall give reasons for the reductions.

22.2. Following article of 24(5) of the FCA regulation, each TSO shall, upon request, provide to their regulatory authorities a report detailing how the value of long-term cross-zonal capacity for a specific time frame has been obtained. Following the objectives of forward capacity allocation, in particular Article 3(f) of the FCA regulation, to complete the objective of “ensuring and enhancing the transparency and reliability of information on forward capacity allocation”, CCC, together with the TSOs will ensure the publication of all relevant data items per calculated scenario used in the capacity calculation.

22.3. Relevant data items shall be counted as the data items provided in the "list of relevant information to be communicated by ENTSO for Electricity to the Agency" as described in Article 63(3) of the FCA regulation. Abovementioned data items provided for relevant time frame must match data items described for relevant capacity calculation approach in the Baltic region.

23 IMPLEMENTATION OF THE LONG-TERM CCM

23.1. The TSOs shall implement this Long-term CCM within 6 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 and not earlier than Baltic states electrical system synchronisation with continental Europe synchronous area.

23.2. Baltic CCR TSOs' shall publish Long-term CCM on the internet after approval by the competent regulatory authorities.

23.3. Until CCC is ready to perform their functions, capacity calculation and coordination is performed by TSOs related to respective borders.

24 LANGUAGE

24.1. 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.