
SEE CCR TSOs' proposal of common capacity calculation methodology for the day-ahead and intraday market timeframe in accordance with Article 21 of Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management

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All TSOs, taking into account the following:

Whereas

- (1) This document (hereafter referred to as “South East Europe common capacity calculation methodology”, or “SEE common capacity calculation methodology”) is a common proposal developed by all Transmission System Operators (hereafter referred to as “TSOs”) within the South East Europe Capacity Calculation Region (hereafter referred to as “SEE Region”), on the common capacity calculation performed for the capacity allocation within the day-ahead and intraday market timeframes. This proposal is required by Article 20 (2) and developed in accordance with Article 21 of “CACM Regulation”.
- (2) This proposal (hereafter referred to as the “CC methodology Proposal”) takes into account the general principles and goals set in Commission Regulation (EU) 2015/1222 establishing a guideline on capacity allocation and congestion management (hereafter referred to as the “CACM Regulation”) as well as 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 (hereafter referred to as “Regulation (EC) No 714/2009”).
- (3) The goal of the CACM Regulation is the coordination and harmonization of capacity calculation and allocation in the day-ahead and intraday cross-border markets. To facilitate these aims the TSOs in the Capacity Calculation Region shall calculate in a coordinated manner the available cross-border capacity.
- (4) Article 21 (1) of the CACM Regulation constitutes the legal basis for this proposal and defines several specific requirements that the CC methodology Proposal should take into account:

“1. The proposal for a common capacity calculation methodology for a capacity calculation region determined in accordance with Article 20(2) shall include at least the following items for each capacity calculation time-frame:

 - (a) methodologies for the calculation of the inputs to capacity calculation, which shall include the following parameters:*
 - (i) a methodology for determining the reliability margin in accordance with Article 22;*
 - (ii) the methodologies for determining operational security limits, contingencies relevant to capacity calculation and allocation constraints that may be applied in accordance with Article 23;*
 - (iii) the methodology for determining the generation shift keys in accordance with Article 24;*
 - (iv) the methodology for determining remedial actions to be considered in capacity calculation in accordance with Article 25.*
 - (b) a detailed description of the capacity calculation approach which shall include the following:*

- (i) *a mathematical description of the applied capacity calculation approach with different capacity calculation inputs;*
 - (ii) *rules for avoiding undue discrimination between internal and cross-zonal exchanges to ensure compliance with point 1.7 of Annex I to Regulation (EC) No 714/2009;*
 - (iii) *rules for taking into account, where appropriate, previously allocated cross-zonal capacity;*
 - (iv) *rules on the adjustment of power flows on critical network elements or of cross-zonal capacity due to remedial actions in accordance with Article 25;*
 - (v) *for the coordinated net transmission capacity approach, the rules for calculating cross-zonal capacity, including the rules for efficiently sharing the power flow capabilities of critical network elements among different bidding zone borders;*
 - (vi) *where the power flows on critical network elements are influenced by cross-zonal power exchanges in different capacity calculation regions, the rules for sharing the power flow capabilities of critical network elements among different capacity calculation regions in order to accommodate these flows.*
- (c) *a methodology for the validation of cross-zonal capacity in accordance with Article 26.”*
- (5) Article 14 of the CACM Regulation, with reference to the day ahead timeframe, defines the following: “1. (...) TSOs shall calculate cross- zonal capacity for (...) (a) “day-ahead, for the day-ahead market“ and “2. For the day-ahead market time-frame, individual values for cross-zonal capacity for each day-ahead market time unit shall be calculated.”, and “3. For the day-ahead market time-frame, the capacity calculation shall be based on the latest available information. The information update for the day-ahead market time-frame shall not start before 15:00 market time two days before the day of delivery”.
- (6) Article 14 of the CACM Regulation, with reference to the intraday ahead timeframe, defines the following: “1. (...) TSOs shall calculate cross- zonal capacity for (...) (b) intraday, for the intraday market;” and “ 3. All TSOs in each capacity calculation region shall ensure that cross-zonal capacity is recalculated within the intraday market time-frame based on the latest available information. The frequency of this recalculation shall take into consideration efficiency and operational security”
- (7) Article 20 (1) of the CACM Regulation defines the approach to use in the common capacity calculation methodologies as “flow-based approach” after the conditions Article 20 (4) are met and (4) specifies that: “No later than six months after at least all South East Europe Energy Community Contracting Parties participate in the single day-ahead coupling, the TSOs from at least Croatia, Romania, Bulgaria and Greece shall jointly submit a proposal to introduce a common capacity calculation methodology using the flow-based approach for the day-ahead and intraday market time-frame“. So, CC methodology Proposal is based on coordinated net transmission capacity approach.
- (8) Article 2 (8) of the CACM Regulation defines the “coordinated net transmission capacity

approach” as “the capacity calculation method based on the principle of assessing and defining ex ante a maximum energy exchange between adjacent bidding zones”.

- (9) In the context of this proposal, the definition of “*coordinated capacity calculator*” is important and is defined in Article 2 (11) of the CACM Regulation as: “*the entity or entities with the task of calculating transmission capacity, at regional level or above*”.
- (10) Article 9 (9) of the CACM Regulation requires that the proposed timescale for the implementation and the expected impact of the CC methodology Proposal on the objectives of the CACM Regulation is described. The impact is presented below (point (11)) of this Whereas Section.
- (11) The CC methodology Proposal contributes to and does not in any way hinder the achievement of the objectives of Article 3 of the CACM Regulation:

Article 3 (a) of the CACM Regulation aims at promoting effective competition in the generation, trading and supply of electricity. The CC methodology Proposal serves the objective of promoting effective competition in the generation, trading and supply of electricity by defining a set of harmonized rules for capacity calculation and congestion management, which contributes to the effectiveness of the single day-ahead and intraday coupling. Establishing common and coordinated processes for the capacity calculations within the day-ahead and intraday market timeframes contributes to achieve this objective.

Article 3 (b) of the CACM Regulation aims at ensuring optimal use of the transmission infrastructure. The CC methodology Proposal contributes to achieve the objective of ensuring optimal use of the transmission infrastructure by using last available inputs based on the best possible forecast of transmission systems at the time of each capacity calculation, updated in a timely manner.

Article 3 (c) of the CACM Regulation aims at ensuring operational security. The CC methodology Proposal contributes to achieve the objective of ensuring operational security by coordinating the capacity calculation with updated inputs for the day-ahead and intraday market timeframe at regional level to ensure its reliability.

Article 3 (d) of the CACM Regulation aims at optimizing the calculation and allocation of cross-zonal capacity. By coordinating the timings for the delivery of inputs, calculation approach and validation requirements of the CC between TSOs and the coordinated capacity calculator, the CC methodology proposal contributes to achieve the objective of optimizing the calculation and allocation of cross-zonal capacity.

Article 3 (g) of the CACM Regulation aims at contributing to the efficient long-term operation and development of the electricity transmission system and electricity sector in the Union. By using the best possible forecast of the transmission systems at the time of each capacity calculation within the SEE region, the results of the coordinated capacity calculation contributes to determine the most limiting branches within this region, thus supporting TSOs for a more efficient development of the electricity transmission system.

- (12) In conclusion, the CC methodology Proposal contributes to the general objectives of the CACM Regulation.

**SUBMIT THE FOLLOWING CC METHODOLOGY PROPOSAL TO ALL NATIONAL
REGULATORY AUTHORITIES:**

Article 1

Subject matter and scope

The common capacity calculation methodology as determined in this coordinated Capacity Calculation (CC) methodology Proposal is the common proposal of all SEE TSOs in accordance with Article 21 of the CACM Regulation.

Article 2

Definitions and interpretation

1. For the purposes of the CC methodology Proposal, the terms used shall have the meaning set forth in Article 2 of Regulation (EC) 714/2009, Article 2 of Regulation (EC) 543/2013, which amends the previous, and Article 2 of Regulation (EC) 2015/1222.
2. In addition, the following definitions shall apply:
 - a. 'ADMIE' is the Greek Transmission System Operator;
 - b. 'ESO EAD' is the Bulgarian Transmission System Operator;
 - c. 'Transelectrica' is the Romanian Transmission System Operator;
 - d. 'GR-BG border' means bidding zone border between Greece and Bulgaria ;
 - e. 'BG-RO' means bidding zone between Bulgaria and Romania ;
 - f. 'D-1' means the day before the day of delivery;
 - g. 'D-2' means two days before the day of delivery;
 - h. 'D-2 Common Grid Model' means the common grid model built for each market time unit two days before the day of delivery for the day-ahead capacity calculation timeframe in accordance with Article 17 of the CACM Regulation;
'D-1 Common Grid Model' means the common grid model built for each market time unit on the day before the day of delivery for the intraday capacity calculation timeframe in accordance with Article 17 of the CACM Regulation;
 - i. 'NTC' means the net transfer capacity that amounts to the maximum total exchange program (MW) for commercial purposes between adjacent bidding zones for each market time unit in a specific direction. NTC is obtained by subtracting the reliability margin to the TTC;
 - j. 'TTC' means the total transfer capacity that amounts to the maximum total exchange program (MW) complying with the operational security limits between adjacent bidding zones for each market time unit in a specific direction.
3. In this CC methodology Proposal, 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 this proposal; and
 - c) 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.

Article 3

Application of this proposal

This proposal applies solely to the common capacity calculation methodology within the SEE Region. Common capacity calculation methodologies within others Capacity Calculation Regions or others timeframes are outside the scope of this proposal.

Article 4

Cross-zonal capacities for the day-ahead market

For the day-ahead market time-frame, individual values for cross-zonal capacity for each day-ahead market time unit shall be calculated using the common capacity calculation methodology started in D-2 on D-2 Common Grid Models.

Article 5

Cross-zonal capacities for the intraday market

For the intraday market time-frame, individual values for cross-zonal capacity for each remaining intraday market time unit shall be calculated using the common capacity calculation methodology performed in the end of D-1 or during the day D based on D-1 or ID Common Grid Models.

Article 6

Reliability margin methodology

1. For the capacity calculation performed in D-2, the TSOs of SEE Region shall compute the reliability margin in line with Article 22 of the CACM Regulation and based on the analysis of the following data:
 - unintended deviations of physical electricity flows within a market time unit caused by the adjustment of electricity flows within and between control areas, to maintain a constant frequency;
 - uncertainties which could affect capacity calculation and which could occur between D-2 and real time, for the market time unit being considered.
2. For the capacity calculation performed in the end of D-1 and during the day D, the TSOs of SEE Region shall compute the reliability margin in line with Article 22 of the CACM Regulation and based on the analysis of the following data:
 - unintended deviations of physical electricity flows within a market time unit caused by the adjustment of electricity flows within and between control areas, to maintain a constant frequency;
 - uncertainties which could affect capacity calculation and which could occur between the respective capacity calculation and real time, for the market time unit being considered.
3. For a transitory period, the TSOs of the SEE region shall define the reliability margin as such:
 - For the south Romanian borders the reliability margin for the capacity calculation performed in D-2 is calculated as the maximum value between the applicable fix value of reliability margin used for the long term capacity calculation and a percentage of the total TTC value at the south Romanian borders covering most of the unsecured situations based on preliminary analysis of the concerned TSOs;
 - For the north Greek borders the reliability margin for the capacity calculation performed in D-2 is calculated as the maximum value between the applicable fix value of reliability margin used for the long term capacity calculation and a percentage of the total TTC value at the north Greek borders covering most of the unsecured situations based on preliminary analysis of the concerned TSOs;
 - For the GR-BG border the reliability margin for the capacity calculation performed in D-2 is a maximum value of ratio of the total RM that is applied for the total north Greek borders, a fix value or a percentage of TTC at this border;
 - For the RO-BG border the reliability margin for the capacity calculation performed in D-2 is a maximum value of ratio of the total RM that is applied for the total north Greek borders, a fix value or a percentage of TTC at this border;

- For the BG-RO border and the GR-BG border the reliability margins for the capacity calculation performed in the end of D-1 and during the day D, are defined as the same reliability margins as calculated for the capacity calculation performed in D-2;
4. The TSOs of the SEE region shall review once a year the reliability margins for each bidding zone border of the SEE region.
 5. The transitory period shall be 1 year after the beginning of testing of the methodology. After this period SEE TSOs will provide to SEE NRAs a report with the final proposal for reliability margin.

Article 7

Methodologies for operational security limits, contingencies and allocation constraints

1. For the capacity calculation, the TSOs of SEE Region shall only monitor the operational security limits and contingencies on network elements significantly influenced by cross-zonal power exchanges. The selection of these critical network elements and contingencies shall be based on analysis updated at least once a year by the TSOs of the SEE region in the different network states.
2. The TSOs of SEE Region shall review the list of critical network elements to be monitored in the capacity calculation process at least once a year.
3. The coordinated capacity calculator shall use the critical network elements in accordance with Article 7.1 for the capacity calculation performed within SEE Region in order to determine the maximum net transmission capacity for each bidding zone border.
4. Allocation constraints could be identified corresponding to operating constraints out of SEE CCR, which might impede keeping the transmission system within agreed security limits.

Article 8

Generation Load shift keys methodology

1. The TSOs of SEE Region shall define the generation shift keys methodology in accordance with Article 24 of CACM Regulation.
2. Generation shift keys should be developed in accordance with the ENTSO-E Generation and Load Shift Key Implementation Guide as currently drafted and amended. Following agreement with the coordinated capacity calculator, TSOs of the SEE region should specify generation shift keys according to one of the following descriptions:
 - Generation shift keys based proportional to the remaining available capacity on generation;
 - Generation shift keys based proportional to the actual generation in the D-2 CGM for each market time unit;
 - Generation shift keys with fixed values based on the D-2 CGM for each peak and off-peak situations;
 - Generation shift keys based on participation factors;
 - Generation shift keys based on merit order list.

Article 9

Methodology for remedial actions in capacity calculation

1. The TSOs of SEE Region shall define the remedial actions in accordance with Article 25 of CACM Regulation.

2. Each TSO of SEE Region shall define individually the remedial actions of its responsibility area to be used in the capacity calculation within SEE Region.
3. The remedial actions to be defined by each TSO of SEE Region shall be either preventive (pre-fault) or curative (post-fault). The TSO of SEE Region may use the following remedial actions, but not limited to:
 - Changing the tap position of a phase shifter transformer (PST),
 - Topology measure: opening or closing of a line, cable, transformer, bus bar coupler or switching of a network element from one bus bar to another,
 - Activation/deactivation of reactance(s), capacitor(s).
4. Each TSO of SEE Region shall inform the coordinated capacity calculator in a timely manner on any change in its remedial actions within SEE Region to ensure an efficient capacity calculation.
5. The TSOs of SEE Region shall coordinate, prior to the capacity calculation, the remedial actions that can be shared with each other to maximize the available cross-zonal capacities for the SEE borders.
6. In case a remedial action is made available for the capacity calculation in the SEE region, the TSOs taking control for the remedial action shall take care when defining it and its potential application in other CCRs to ensure power system operation.

Article 10

Cross-zonal capacity validation methodology

1. The TSOs of SEE Region shall validate the cross-zonal capacities calculated by the coordinated capacity calculator of the SEE Region for the SEE borders.
2. Where one or more SEE TSOs do not validate the cross-zonal capacity calculated, the concerned TSO(s) shall provide the coordinated capacity calculator with the updated amount of cross-zonal capacities for the border considered and the reasons for the reduction. The final cross-zonal capacity is the minimum value sent by the SEE TSOs of the borders considered.

Article 11

Day-ahead capacity calculation

1. In accordance with Article 8 of CACM Regulation, the TSOs of SEE Region shall calculate cross-zonal capacities for each bidding zone border of SEE Region.
2. The TSOs of SEE Region shall provide the coordinated capacity calculator with the last updated information on the transmission systems in a timely manner for the capacity calculation that is started in the end of D-2.
3. The coordinated capacity calculator shall merge the individual grid model provided by each TSO of the SEE region. During the merging process, quality checks of the input data provided by each TSO of the SEE Region shall be performed by the coordinated capacity calculator.
4. The capacity calculation process will take into account Remedial Action coordination.
5. The coordinated capacity calculator shall define the values of TTC for each market time unit for the south Romanian borders, BG-RO border, for the north Greek borders and for the BG-GR border. These

values shall be provided to TSOs of the SEE Region for validation of BG-RO and BG-GR borders.

6. The coordinated capacity calculator of the SEE Region shall provide the SEE TSOs with the validated NTCs after application of the reliability margin defined in accordance with Article 6 for each the BG-RO, BG-GR borders.

Article 12

Intraday capacity calculation

1. In accordance with Article 8 of CACM Regulation, the TSOs of SEE Region shall calculate cross-zonal capacities for each bidding zone border of SEE Region.
2. The TSOs of SEE Region shall provide the coordinated capacity calculator with the last updated information on the transmission systems in a timely manner for the intraday capacity calculation that is performed in the end of D-1 and during the day D.
3. The coordinated capacity calculator shall merge the individual grid model provided by each TSO of the SEE region. During the merging process, quality checks of the input data provided by each TSO of the SEE Region shall be performed by the coordinated capacity calculator.
4. The capacity calculation process will take into account Remedial Action coordination.
5. The coordinated capacity calculator shall define the values of TTC for each market time unit for the south Romanian borders, BG-RO border, for the north Greek borders and for the BG-GR border. These values shall be provided to TSOs of the SEE Region for validation of BG-RO and BG-GR borders.
6. The coordinated capacity calculator of the SEE Region shall provide the SEE TSOs with the validated NTCs after application of the reliability margin defined in accordance with Article 6 for each bidding zone border of SEE Region (BG-RO and BG-GR borders).
7. The TSOs of SEE Region shall review the frequency of recalculation two years after the implementation of the capacity calculation for the intraday market timeframe.

Article 13

Fallback procedures

1. Prior to each capacity calculation started in D-2, the TSOs of SEE Region shall ensure the coordinated capacity calculator is provided with the last coordinated cross-zonal capacities calculated within the long term timeframe.
2. For the capacity calculation performed in D-2, where an incident occurs in the capacity calculation process and the coordinated capacity calculator is unable to produce results within the allotted time for the calculation process, the SEE TSOs shall validate the last coordinated cross-zonal capacities calculated within the long term timeframe and review it where relevant.
3. Prior to each capacity calculation performed in the end of D-1 and during the day D, the TSOs of SEE Region shall ensure the coordinated capacity calculator is provided with the last coordinated cross-zonal capacities calculated within the day-ahead timeframe on each border of the SEE Region.

4. For the capacity calculation performed in the end of D-1 and during the day D, where an incident occurs in the capacity calculation process and the coordinated capacity calculator is unable to produce results, the SEE TSOs shall validate the last cross-zonal capacities calculated within SEE Region for the market time unit considered and review it where relevant.

Article 14

Publication and Implementation of the CC methodology Proposal

1. The TSOs of SEE Region shall publish the CC methodology Proposal without undue delay after relevant national regulatory authorities have approved the proposed CC methodology or a decision has been taken by the Agency for the Cooperation of Energy Regulators in accordance with Article 9 (10), Article 9 (11) and 9 (12) of the CACM Regulation.
2. The TSOs of SEE Region shall implement the CC methodology Proposal for the capacity calculation started in D-2 no later than 1st January 2020.
3. The TSOs of SEE Region shall implement the CC methodology Proposal for the capacity calculation performed in the end of D-1 no later than 1st July 2020.
4. The deadlines defined in Article 14.2, Article 14.3 can be modified on request from all TSOs of SEE Region to their national regulatory authorities, where testing period does not meet necessary conditions for implementation.

Article 15

Language

1. The reference language for this common capacity calculation Proposal shall be English.
2. For the avoidance of doubt, where TSOs need to translate this CC methodology Proposal into their national language(s), in the event of inconsistencies between the English version published by TSOs in accordance with Article 9 (14) of the CACM Regulation and any version in another language, the relevant TSOs shall be obliged to dispel any inconsistencies by providing a revised translation of this CC methodology Proposal to their relevant national regulatory authorities.