
South West Europe TSOs proposal for a common long-term capacity calculation in accordance with Article 10 of Commission Regulation (EU) 2016/1719 of 26 September 2016 establishing a guideline on forward capacity allocation

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TSOs of the South West Europe Region, taking into account the following:

Whereas

- (1) This document (hereafter referred to as “South West Europe Borders LT common capacity calculation methodology”), including its annexes, is a common proposal developed by all Transmission System Operators (hereafter referred to as “TSOs”) within the South West Europe Capacity Calculation Region (hereafter referred to as “South West Europe Region”) regarding the proposal for the common capacity calculation methodology for long-term time frames. This proposal is required by Article 10 of Regulation (EU) 2016/1719 on Forward Capacity Allocation (the “FCA Regulation”).
- (2) This proposal (hereafter referred to as the “LT CCC methodology proposal”) takes into account the general principles and goals set in Commission Regulation (EU) 2016/1719 establishing a guideline on Forward Capacity Allocation (hereafter referred to as the “FCA 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 FCA Regulation is the coordination and harmonisation of capacity calculation and allocation in the long-term cross-border markets. To facilitate these aims, it is necessary to calculate in a coordinated manner by the TSOs the available cross-border capacity.
- (4) Articles 10 to 15 of the FCA Regulation constitute the legal basis for this proposal and define several specific requirements that the LT CCC 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 10 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 11;*
 - (ii) *the methodologies for determining operational security limits, contingencies relevant to capacity calculation and allocation constraints that may be applied in accordance with Article 12;*
 - (iii) *the methodology for determining the generation shift keys in accordance with Article 13;*
 - (iv) *the methodology for determining remedial actions to be considered in capacity calculation in accordance with Article 14.*
 - (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;*



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- (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 14;*
 - (v) *for the flow-based approach, a mathematical description of the calculation of power transfer distribution factors and of the calculation of available margins on critical network elements;*
 - (vi) *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;*
 - (vii) *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 15.”*
- (5) Article 9 of the FCA Regulation defines the capacity calculation time frames as *“forward, for at least the annual and monthly market.”*
 - (6) Article 10 (1) of the FCA Regulation defines the deadline to submit the proposal for a common capacity calculation methodology for long-term time frames as *no later than six months after the approval of the common coordinated capacity calculation methodology referred to in Article 9(7) of Regulation (EU) 2015/1222.*
 - (7) Article 10 (2) of the FCA Regulation defines the approach to use in the common capacity calculation methodology shall be either a coordinated net transmission capacity approach or a flow-based approach, and Article 10 (5) of the FCA Regulation specifies that: *“All TSOs in each capacity calculation region may jointly apply the flow-based approach for long-term capacity calculation time frames on the following conditions: (a) the flow-based approach leads to an increase of economic efficiency in the capacity calculation region with the same level of system security; (b) the transparency and accuracy of the flow-based results have been confirmed in the capacity calculation region; (c) the TSOs provide market participants with six months to adapt their processes.”*
 - (8) Article 10 (3) of the FCA Regulation requires that *the capacity calculation methodology shall be compatible with the capacity calculation methodology established for the day-ahead and intraday time frames pursuant to Article 21(1) of Regulation (EU) 2015/1222.*



- (9) Article 2 (8) of Regulation (EU) 2015/1222 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”*.
- (10) In the context of this proposal, the definition of “coordinated capacity calculator” is important and is defined in Article 2 (11) of Regulation (EU) 2015/1222 as: *“the entity or entities with the task of calculating transmission capacity, at regional level or above”*.
- (11) Article 4 (8) of the FCA Regulation requires a proposed timescale for the implementation and a description of the expected impact of the LT CCC methodology Proposal on the objectives of the FCA Regulation. The impact is presented below in the point (11) of this Whereas Section.
- (12) The LT CCC methodology Proposal contributes to and does not in any way hinder the achievement of the objectives of Article 3 of the FCA Regulation:

Article 3 (a) of the FCA Regulation aims at *promoting effective long-term cross-zonal trade with long-term cross-zonal hedging opportunities for market participants*.

The LT CCC methodology Proposal serves the objective of promoting effective long-term cross-zonal trade with long-term cross-zonal hedging opportunities for market participants by defining a set of harmonised rules for forward capacity allocation. Establishing common and coordinated processes for the capacity calculations within the long-term market time frames contributes to achieving this aim.

Article 3 (b) of the FCA Regulation aims at *optimising the calculation and allocation of long-term cross-zonal capacity*.

By coordinating the timings for the delivery of inputs, calculation approach and validation requirements of the CCC between TSOs and the coordinated capacity calculator, the LT CCC methodology Proposal contributes to the objective of optimising the calculation and allocation of cross-zonal capacity.

Article 3 (c) of the FCA Regulation aims at *providing non-discriminatory access to long-term cross-zonal capacity*.

The LT CCC methodology Proposal contributes to the objective of providing non-discriminatory access to long-term cross-zonal capacity by coordinating the capacity calculation with updated inputs for the long-term market time frames at regional level to ensure its reliability.

Article 3 (f) of the FCA Regulation aims at *ensuring and enhancing the transparency and reliability of information on forward capacity allocation*.

The LT CCC methodology Proposal contributes to the objective of ensuring and enhancing the transparency and reliability of information on forward capacity allocation 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 (g) of the FCA 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 South West Europe region, the results of the coordinated capacity



calculation contribute to determine the most limiting branches within this region, by then help TSOs for a more efficient development of the electricity transmission system.

- (13) In conclusion, the LT CCC methodology Proposal contributes to the general objectives of the FCA Regulation.

SUBMIT THE FOLLOWING LT CCC METHODOLOGY PROPOSAL TO THE NATIONAL REGULATORY AUTHORITIES OF THE REGION:



Article 1

Subject matter and scope

The long-term common capacity calculation methodology as determined in this LT CCC methodology Proposal is the common proposal of all South West Europe TSOs in accordance with Article 10 of the FCA Regulation.

The participating TSOs to the coordinated capacity calculation are therefore REE (Spain), REN (Portugal) and RTE (France).

Article 2

Definitions and interpretation

1. For the purposes of the LT CCC methodology Proposal, the terms used shall have the meaning given to them in Article 2 of Regulation (EC) 714/2009, Article 2 of Regulation (EC) 2013/543, Article 2 of Regulation (EC) 2015/1222 and Article 2 of Regulation (EC) 2016/1719.
2. In addition, the following definitions shall apply:
 - a. ‘CCC’ means common capacity calculation.
 - b. ‘Common Grid Model’ means the common grid model built for each capacity calculation time frame in accordance with Article 18 of the FCA Regulation.
 - c. ‘ENTSO-E’ means European Network of Transmission System Operators for Electricity.
 - d. ‘IGM’ means Individual Grid Model.
 - e. ‘LT’ means long-term.
 - f. ‘REE’ means Red Eléctrica de España, the Spanish system operator.
 - g. ‘REN’ means Redes Energéticas Nacionais, the Portuguese system operator.
 - h. ‘RTE’ means Réseau de Transport d’Electricité, the French system operator.
 - i. ‘SP-FR border’ means bidding zone border between Spain and France.
 - j. ‘SP-PT border’ means bidding zone border between Spain and Portugal.
 - k. ‘SWE capacity calculation for day-ahead’ means the capacity calculation done in SWE Region for day ahead according with SWE DA&ID CC methodology.
 - l. ‘SWE DA&ID CC methodology’ means South West Europe 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.
 - m. ‘FCA Regulation’ means Commission Regulation (EU) 2016/1719 of 26 September 2016 establishing a guideline on forward capacity allocation.
3. In this LT CCC 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 LT common capacity calculation methodology based on the coordinated net transmission capacity approach within the South West Europe Capacity Calculation Region. The common capacity calculation methodologies within other Capacity Calculation regions and other time frames are outside the scope of this proposal.

Article 4

Cross-zonal capacities for the long-term market

For the long-term time frames, values for cross-zonal capacity for each forward capacity allocation and at least on annual and monthly time frames shall be calculated using the LT coordinated capacity calculation methodology.

Article 5

Reliability margin methodology

1. The TSOs of SWE Region shall use, for the long-term capacity calculation, the same reliability margin methodology used in the SWE capacity calculation for day-ahead.
2. As defined in Article 11 of FCA, the reliability margin mentioned above shall be in line with Article 22 of Regulation (EU) 2015/1222 and based on the analysis of the following data:
 1. 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;
 2. uncertainties which could affect capacity calculation and which could occur between SWE capacity calculation for day-ahead and real time, for the market time unit being considered.
3. For the methodology referred in Article 5 (1), the percentile 95 shall be used.

Article 6

Methodologies for operational security limits and contingencies

1. The TSOs of SWE Region shall use, for the long-term capacity calculation, the same methodologies for operational security limits and contingencies used in the SWE capacity calculation methodology for day-ahead.
2. For the capacity calculation, the TSOs of SWE Region shall only monitor the operational security limits and contingencies on network elements significantly influenced by cross-zonal power exchanges.
3. The coordinated capacity calculator shall use the critical network elements for the capacity calculation performed within SWE Region in order to determine the maximum net transmission capacity for each bidding-zone border.



4. The methodology to select the monitored elements is in line with article 21(1)(b)(ii) of Regulation (EU) 2015/1222 since it is an objective way to use in the capacity calculation only monitored elements inside bidding zones that are significantly taking part in the cross-zonal exchange. This way cross-zonal and internal exchanges are treated on the same level of importance, avoiding undue discrimination of one over the other.

Article 7 Generation shift keys methodology

1. The TSOs of SWE Region shall define the generation shift keys methodology in accordance with Article 13 of FCA Regulation.
2. RTE shall define generation shift keys proportional for each base case scenarios with all expected generating units in the IGM, reflecting RTE's best forecast of market behaviour.
3. REE shall define generation and load shift keys based on a merit order list, reflecting the best forecast of market behaviour with all available loads that are enabled to participate in balancing markets, and all available generation.
4. REN shall define generation and load shift keys based on a merit order list, reflecting the best forecast of market behaviour with all available loads that are enabled to participate in balancing markets, and all available generation.

Article 8 Methodology for remedial actions in capacity calculation

1. The TSOs of SWE Region shall define the remedial actions in accordance with Article 14 of FCA Regulation.
2. Each TSO of SWE Region shall define individually the remedial actions of its responsibility area to be used in the capacity calculation within SWE Region for each calculation scenario.
3. The remedial actions to be defined by each TSO of SWE Region shall be either preventive (pre-fault) or curative (post-fault). The TSOs of SWE Region may use the following remedial actions:
 - a. Changing the tap position of a phase shifter transformer.
 - b. 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.
 - c. HVDC modulation.
 - d. Modification of generation.
 - e. Activation/deactivation of FACTS, reactance(s), capacitor(s).
4. The TSOs of SWE Region shall review the list of the remedial actions that can be used in the capacity calculation within SWE Region at least once a year.



5. For each calculation scenario, in order to improve computation time and precision, SWE TSOs can adapt the list of available remedial actions offered for the capacity calculation. These remedial actions are adapted to the grid situation and forecast.
6. Each TSO of SWE Region shall inform the coordinated capacity calculator in a timely manner on any change in its remedial actions within SWE Region to ensure an efficient capacity calculation.
7. RTE and REE 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 FR-ES border.
8. REN and REE 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 PT-ES border.
9. Each TSO of the SWE Region may decide, based on regulation, to make available costly remedial actions. Where a costly remedial action is used in the capacity calculation process, it shall be performed in accordance with the provisions of the methodology for coordinated redispatching and countertrading with cross-border relevance as defined in Article 35 of Regulation (EU) 2015/1222. It shall also be applied only when economically relevant at Union level.
10. Based on expertise and experience, SWE TSOs can identify a costly remedial action which effects can be economically and technically relevant at Union Level in order to include it in the list of available remedial actions To prove so, SWE TSOs will then proceed with the following steps:
 - a. SWE TSOs will compare the potential statistical cost of this identified curative remedial action over a year with the average gain in global welfare over a year applying this remedial action, estimated over 4 representing timestamps.
 - b. If the gain in welfare is higher than the cost, the remedial action can be used in the capacity calculation.
 - c. Once a year, or when a significant change will impact the remedial action effectiveness or cost, the economic and technical relevance of the remedial action is reassessed and the remedial action is removed from the capacity calculation if it is not efficient anymore.

Article 9

Cross-zonal capacity validation methodology

1. The TSOs of SWE Region shall validate the cross-zonal capacities calculated by the coordinated capacity calculator of the SWE Region.
2. The coordinated capacity calculator shall make available the common grid model for SWE Region in the extreme scenarios for the relevant calculation scenarios to the TSOs of SWE Region.
3. Where required, TSOs can validate the cross-zonal capacities calculated by performing security analysis with grid models provided in accordance with Article 9.2.
4. Where one or more SWE 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 new value. The final cross-zonal capacity is the minimum value sent by the SWE TSOs of the border considered.

5. In accordance with Article 15 of FCA regulation and the referred Article 26 (5) of CACM regulation, the coordinated capacity calculator shall, every three months, report all reductions made during the validation of cross-zonal capacity to all regulatory authorities of the SWE region. This report shall include the location and amount of any reduction in cross-zonal capacity and shall give reasons for the reductions.

Article 10 **Long-term capacity calculation**

1. In accordance with Article 9 of FCA Regulation, the TSOs of SWE Region shall calculate cross-zonal capacities for each bidding-zone border of SWE Region.
2. The TSOs of SWE Region shall provide the coordinated capacity calculator the last updated information on the transmission systems in a timely manner for each LT capacity calculation.
3. The TSOs of SWE Region shall provide the coordinated capacity calculator with the previously allocated cross-zonal capacities on each border of the SWE Region when applicable.
4. The coordinated capacity calculator shall retrieve the most recent common grid model for the corresponding time frame. Until the common grid model is available at ENTSO-E level, or for those time frames not covered by common grid model methodology according with All TSOs' proposal for a common grid model methodology in accordance with Article 18 of FCA, the coordinated capacity calculator shall merge the individual grid models provided by each TSO of the SWE Region. During the merging process, quality checks of the information provided by each TSO of the SWE Region shall be performed by the coordinated capacity calculator.
5. The coordinated capacity calculator shall calculate the capacity on a set of calculation scenarios, defined as the product of combining the CGMs with the planned outages, the seasonal operational security limits and the remedial actions sent by the TSOs.
6. The capacity calculation process is based on a Remedial Action Optimization methodology which aims to find the higher secure capacity based on the inputs provided by the TSOs and applying a dichotomy. The algorithm tests several levels of cross-zonal exchange and determines if this exchange is safe after the occurrence of all the monitored contingencies, applying available remedial actions when necessary. The TSOs of the SWE Region will use a precision of 50 MW for the calculation in order to maintain a good balance between operationally acceptable calculation time and market needs.
7. The coordinated capacity calculator shall define the values of TTC for each calculation scenario up to the first unsecured situation. These values shall be provided to TSOs of the SWE Region for validation.



8. The coordinated capacity calculator of the SWE Region shall provide with the validated NTCs after application of the reliability margin defined in accordance with Article 5 for each bidding-zone border of SWE Region.

Article 11

Fallback procedures

1. Prior to each long-term capacity calculation timeframe, the TSOs of SWE Region shall ensure the coordinated capacity calculator is provided with the last coordinated cross-zonal capacity values calculated within the previous long term capacity calculation.
2. For the capacity calculation performed in yearly timeframe, 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 SWE TSOs shall validate the last coordinated cross-zonal capacities calculated for the previous year timeframe and review them where relevant.
3. For the capacity calculation performed in other timeframes, 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 SWE TSOs shall validate the last coordinated cross-zonal capacities calculated within the corresponding superior long-term capacity calculation timeframe and review them where relevant.

Article 12

Publication and Implementation of the LT CCC methodology Proposal

1. The TSOs of SWE Region shall publish the CCC methodology Proposal without undue delay after all national regulatory authorities have approved the proposed CCC methodology or a decision has been taken by the Agency for the Cooperation of Energy Regulators in accordance with Article 4 (9), Article 4 (10) and 4 (11) of the FCA Regulation.
2. The TSOs of SWE Region shall implement the long-term CCC methodology Proposal no later than Q2 2021.

Article 13

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 LT CCC methodology Proposal 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 be obliged to dispel any inconsistencies by providing a revised translation of this LT CCC methodology Proposal to their relevant national regulatory authorities.