APPROVAL BY THE GREECE-ITALY REGULATORY AUTHORITIES

OF

THE GREECE-ITALY TSOs PROPOSAL OF COMMON CAPACITY CALCULATION METHODOLOGY FOR THE DAY-AHEAD AND INTRADAY TIMEFRAME IN ACCORDANCE WITH ARTICLE 21 OF COMMISSION REGULATION 2015/1222 OF 24 JULY 2015 ESTABLISHING A GUIDELINE ON CAPACITY ALLOCATION AND CONGESTION MANAGEMENT

12 July 2018

I. Introduction and legal context

This document elaborates an agreement of the Greece-Italy Regulatory Authorities (in the following: GRIT NRAs), agreed on 12 July 2018 at Greece-Italy Energy Regional Regulators' forum, on the Greece-Italy TSO proposal of common capacity calculation methodology for the day-ahead and intraday timeframe (in the following: GRIT CCM), submitted as required by Article 20 (2) and in accordance with Article 21 of Commission Regulation 2015/1222 of 24 July 2015 establishing a Guideline on Capacity Allocation and Congestion Management (in the following: CACM).

This agreement of the GRIT NRAs shall provide evidence that a decision on the GRIT CCM does not, at this stage, need to be adopted by ACER pursuant to Article 9(12) of CACM. It is intended to constitute the basis on which the GRIT NRAs will each subsequently issue their national decisions pursuant to Article 9(10) of CACM to approve the GRIT CCM submitted as required by Article 20 (2) and in accordance with Article 21 of CACM by the Greece-Italy TSOs.

The legal provisions that lie at the basis of the GRIT CCM, and this GRIT NRAs agreement on the above mentioned methodology, can be found in Articles 3, 8, 9, 14, 20, 21, 22, 23, 24, 25, 26, 29, 30, 46 and 58 of CACM. They are set out here for reference.

Article 3
Objectives of capacity allocation and congestion management cooperation
This Regulation aims at:

(a) Promoting effective competition in the generation, trading and supply of electricity;
(b) Ensuring optimal use of the transmission infrastructure;
(c) Ensuring operational security;
(d) Optimising the calculation and allocation of cross-zonal capacity;
(e) (…);
(f) (…);
(g) Contributing to the efficient long-term operation and development of the electricity transmission system and electricity sector in the Union;
(h) (…);
(i) (…);
(j) (…).

Article 8
TSOs' tasks related to single day-ahead and intraday coupling
1. In Member States electrically connected to another Member State all TSOs shall participate in the single day-ahead and intraday coupling.
2. TSOs shall:

[…]
(c) establish and perform capacity calculation in accordance with Articles 14 to 30;
[…]
(e) calculate and send cross zonal capacities and allocation constraints in accordance with Articles 46 and 58;
[…]

Article 9

Adoption of terms and conditions or methodologies

1. *TSOs and NEMOs shall develop the terms and conditions or methodologies required by this Regulation and submit them for approval to the competent regulatory authorities within the respective deadlines set out in this Regulation. Where a proposal for terms and conditions or methodologies pursuant to this Regulation needs to be developed and agreed by more than one TSO or NEMO, the participating TSOs and NEMOs shall closely cooperate. TSOs, with the assistance of ENTSO for Electricity, and all NEMOs shall regularly inform the competent regulatory authorities and the Agency about the progress of developing these terms and conditions or methodologies.*

   […]

5. *Each regulatory authority shall approve the terms and conditions or methodologies used to calculate or set out the single day-ahead and intraday coupling developed by TSOs and NEMOs. They shall be responsible for approving the terms and conditions or methodologies referred to in paragraphs 6, 7 and 8.*
6. *(…)*
7. *The proposals for the following terms and conditions or methodologies shall be subject to approval by all regulatory authorities of the concerned region:*

   a. the common capacity calculation methodology in accordance with Article 20(2);

   […]
8. *(…)*
9. *The proposal for terms and conditions or methodologies shall include a proposed timescale for their implementation and a description of their expected impact on the objectives of this Regulation. Proposals on terms and conditions or methodologies subject to the approval by several or all regulatory authorities shall be submitted to the Agency at the same time that they are submitted to regulatory authorities. Upon request by the competent regulatory authorities, the Agency shall issue an opinion within three months on the proposals for terms and conditions or methodologies.*
10. *Where the approval of the terms and conditions or methodologies requires a decision by more than one regulatory authority, the competent regulatory authorities shall consult and closely cooperate and coordinate with each other in order reach an agreement. Where applicable, the competent regulatory authorities shall take into account the opinion of the Agency. Regulatory authorities shall take decisions concerning the submitted terms and conditions or methodologies in accordance with paragraphs 6, 7 and 8, within six months following the receipt of the terms and conditions or methodologies by the regulatory authority or, where applicable, by the last regulatory authority concerned.*
11. *(…)*
12. *In the event that one or several regulatory authorities request an amendment to approve the terms and conditions or methodologies submitted in accordance with paragraphs 6, 7 and 8, the relevant TSOs or NEMOs shall submit a proposal for amended terms and conditions or methodologies for approval within two months following the requirement from the regulatory authorities. The competent regulatory authorities shall decide on the amended terms and conditions or methodologies within two months following their submission. Where the competent regulatory authorities have not been able to reach an agreement on terms and conditions or methodologies pursuant to paragraphs (6) and (7) within the two-month deadline, or upon their joint request, the Agency shall adopt a decision concerning the amended terms and conditions or methodologies within six months, in accordance with Article 8(1) of Regulation (EC) No 713/2009. If the relevant TSOs or NEMOs fail to submit a proposal for amended terms and conditions or methodologies, the procedure provided for in paragraph 4 of this Article shall apply.*
13. *(…)*
14. *TSOs and NEMOs responsible for establishing the terms and conditions or methodologies in accordance with this Regulation shall publish them on the internet after approval by the competent regulatory authorities or, if no such approval is required, after their establishment, except where such information is considered as confidential in accordance with Article 13.*

Article 14

Capacity calculation time-frames

1. *All TSOs shall calculate cross-zonal capacity for at least the following time-frames:*
   (a) day-ahead, for the day-ahead market;
   (b) intraday, for the intraday market.
2. *For the day-ahead market time-frame, individual values for cross-zonal capacity for each day-ahead market time unit shall be calculated. For the intraday market time-frame, individual values for cross-zonal capacity for each remaining intraday market time unit shall be calculated.*
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.*
4. *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.*

Article 20

Introduction of flow-based capacity calculation methodology

1. *For the day-ahead market time-frame and intraday market time-frame the approach used in the common capacity calculation methodologies shall be a flow-based approach, except where the requirement under paragraph 7 is met.*
2. *No later than 10 months after the approval of the proposal for a capacity calculation region in accordance with Article 15(1), all TSOs in each capacity calculation region shall submit a proposal for a common coordinated capacity calculation methodology within the respective region. The proposal shall be subject to consultation in accordance with Article 12. […]*

[…]

7. *TSOs may jointly request the competent regulatory authorities to apply the coordinated net transmission capacity approach in regions and bidding zone borders other than those referred to in paragraphs 2 to 4, if the TSOs concerned are able to demonstrate that the application of the capacity calculation methodology using the flow-based approach would not yet be more efficient compared to the coordinated net transmission capacity approach and assuming the same level of operational security in the concerned region.*

Article 21

Capacity calculation methodology

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) *(…)*
(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) *(…)*

(c) a methodology for the validation of cross-zonal capacity in accordance with Article 26.

2. *For the intraday capacity calculation time-frame, the capacity calculation methodology shall also state the frequency at which capacity will be reassessed in accordance with Article 14(4), giving reasons for the chosen frequency.*
3. *The capacity calculation methodology shall include a fallback procedure for the case where the initial capacity calculation does not lead to any results.*
4. *[…]*

Article 22
Reliability margin methodology

1. *The proposal for a common capacity calculation methodology shall include a methodology to determine the reliability margin. The methodology to determine the reliability margin shall consist of two steps. First, the relevant TSOs shall estimate the probability distribution of deviations between the expected power flows at the time of the capacity calculation and realised power flows in real time. Second, the reliability margin shall be calculated by deriving a value from the probability distribution.*
2. *The methodology to determine the reliability margin shall set out the principles for calculating the probability distribution of the deviations between the expected power flows at the time of the capacity calculation and realised power flows in real time, and specify the uncertainties to be taken into account in the calculation. To determine those uncertainties, the methodology shall in particular take into account:*
   (a) 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;
   (b) uncertainties which could affect capacity calculation and which could occur between the capacity calculation timeframe and real time, for the market time unit being considered.
3. *In the methodology to determine the reliability margin, TSOs shall also set out common harmonised principles for deriving the reliability margin from the probability distribution.*
4. *On the basis of the methodology adopted in accordance with paragraph 1, TSOs shall determine the reliability margin respecting the operational security limits and taking into account uncertainties between the capacity calculation time-frame and real time, and the remedial actions available after capacity calculation.*
5. *For each capacity calculation time-frame, the TSOs concerned shall determine the reliability margin for critical network elements, where the flow-based approach is applied, and for cross-zonal capacity, where the coordinated net transmission capacity approach is applied.*

Article 23

Methodologies for operational security limits, contingencies and allocation constraints

1. *Each TSO shall respect the operational security limits and contingencies used in operational security analysis.*
2. *If the operational security limits and contingencies used in capacity calculation are not the same as those used in operational security analysis, TSOs shall describe in the proposal for the common capacity calculation methodology the particular method and criteria they have used to determine the operational security limits and contingencies used for capacity calculation.*
3. *If TSOs apply allocation constraints, they can only be determined using:*
   (a) *constraints that are needed to maintain the transmission system within operational security limits and that cannot be transformed efficiently into maximum flows on critical network elements; or*
   (b) *constraints intended to increase the economic surplus for single day-ahead or intraday coupling.*

Article 24

Generation shift keys methodology

1. *The proposal for a common capacity calculation methodology shall include a proposal for a methodology to determine a common generation shift key for each bidding zone and scenario developed in accordance with Article 18.*
2. *The generation shift keys 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 common grid model. That forecast shall notably take into account the information from the generation and load data provision methodology.*

Article 25

Methodology for remedial actions in capacity calculation

1. *Each TSO within each capacity calculation region shall individually define the available remedial actions to be taken into account in capacity calculation to meet the objectives of this Regulation.*
2. *Each TSO within each capacity calculation region shall coordinate with the other TSOs in that region the use of remedial actions to be taken into account in capacity calculation and their actual application in real time operation.*
3. *3. To enable remedial actions to be taken into account in capacity calculation, all TSOs in each capacity calculation region shall agree on the use of remedial actions that require the action of more than one TSO.*
4. *Each TSO shall ensure that remedial actions are taken into account in capacity calculation under the condition that the available remedial actions remaining after calculation, taken together with the reliability margin referred to in Article 22, are sufficient to ensure operational security.*
5. *Each TSO shall take into account remedial actions without costs in capacity calculation.*
6. *Each TSO shall ensure that the remedial actions to be taken into account in capacity calculation are the same for all capacity calculation time-frames, taking into account their technical availabilities for each capacity calculation timeframe.*

Article 26

Cross-zonal capacity validation methodology

1. *Each TSO shall validate and have the right to correct cross-zonal capacity relevant to the TSO's bidding zone borders or critical network elements provided by the coordinated capacity calculators in accordance with Articles 27 to 31.*

2. *Where a coordinated net transmission capacity approach is applied, all TSOs in the capacity calculation region shall include in the capacity calculation methodology referred to in Article 21 a rule for splitting the correction of cross- zonal capacity between the different bidding zone borders.*
3. *Each TSO may reduce cross-zonal capacity during the validation of cross-zonal capacity referred to in paragraph 1 for reasons of operational security.*

[…]

Article 29
Regional calculation of cross-zonal capacity

[…]

8. *Each coordinated capacity calculator applying the coordinated net transmission capacity approach shall:*
   (a) use the common grid model, generation shift keys and contingencies to calculate maximum power exchange on bidding zone borders, which shall equal the maximum calculated exchange between two bidding zones on either side of the bidding zone border respecting operational security limits;
   (b) adjust maximum power exchange using remedial actions taken into account in capacity calculation in accordance with Article 25;
   (c) adjust maximum power exchange, applying rules for avoiding undue discrimination between internal and cross-zonal exchanges in accordance with Article 21(1)(b)(ii);
   (d) apply the rules set out in accordance with Article 21(1)(b)(vi) for efficiently sharing the power flow capabilities of critical network elements among different bidding zone borders;
   (e) calculate cross-zonal capacity, which shall be equal to maximum power exchange adjusted for the reliability margin and previously allocated cross-zonal capacity

[…]

Article 30
Validation and delivery of cross-zonal capacity

1. *Each TSO shall validate the results of the regional capacity calculation for its bidding zone borders or critical network elements, in accordance with Article 26.*
2. *(…)*
3. *Each coordinated capacity calculator shall provide the validated cross-zonal capacities and allocation constraints for the purposes of allocating capacity in accordance with Articles 46 and 58.*

Article 46
Provision of input data

1. *Each coordinated capacity calculator shall ensure that cross-zonal capacity and allocation constraints shall be provided to relevant NEMOs in time to ensure the publication of cross-zonal capacity and of allocation constraints to the market no later than 11.00 market time day-ahead.*

[…]

Article 58
Provision of input data

1. *Each coordinated capacity calculator shall ensure that cross-zonal capacity and allocation constraints are provided to the relevant NEMOs no later than 15 minutes before the intraday cross-zonal gate opening time.*

[…]

II. The Greece-Italy TSOs proposal

The GRIT CCM was consulted by the Greece-Italy TSOs through ENTSO-E for one month from (8 August 2017 to 9 September 2017, in line with Article 20 and Article 12 of CACM.[1] The GRIT CCM was received by the last Regulatory Authority of the Greece-Italy Capacity Calculation Region on 21 September 2017. The proposal includes proposed timescales for its implementation and a description of its expected impact on the objectives of CACM, in line with Article 9(9) of CACM.

According to Article 9(12) of CACM, on 12 March 2018, GRIT NRAs agreed on a request for amendments to the TSOs proposal.

The amended GRIT CCM was received by the last NRA concerned on 23 May 2018, thus a decision is required by 23 July 2018.

The GRIT CCM is based on a Coordinated Net Transmission Capacity (in the following: CNTC) approach:

a) the cross-zonal capacity is computed by increasing the generation on the export side and by decreasing the generation on the import side; increase and decrease in each node are set according to the Generation Shift Keys (in the following: GSK), based on merit order list for the Italian bidding zones and proportional to the remaining available capacity in each base case for the Greek bidding zone; the step at each iteration is selected by the mean of a dichotomy process;
b) the day-ahead capacity calculation process starts in D-2 and it is based on D-2 Common Grid Models; the intraday capacity calculation process is performed in the end of D-1, basing on D-1 Common Grid Models;
c) the reliability margin is not considered at this stage and it is assumed equal to 0;
d) only network elements significantly influenced by cross-zonal power exchanges are included in the contingency and network constraints list;
e) a dynamic assessment is run by the Italian TSO, Terna, at least once a year, to detect further possible limitations to be applied on the Italian internal bidding zone borders;
f) both preventive and curative remedial actions are defined; costly curative remedial actions are allowed, in accordance with national legislation;
g) cross-zonal capacity computed by the coordinated capacity calculator is validated by each TSO: in particular a reduction may be asked; the final capacity value is the minimum value sent by each TSO during the validation process;
h) until the Intraday Capacity Calculation process has been concluded, the Capacity for the Single Intraday Coupling is set between zero and the capacity calculated on the day-ahead timeframe;
i) in case the capacity calculation process is not able to produce a result, the TSOs validate the last coordinated cross-zonal capacities: in particular the last coordinated values relevant for the long term timeframe are used as a fallback for the day-ahead timeframe, while the last coordinated values relevant for the day-ahead timeframe are used as a fallback for the intraday timeframe;
j) the capacity calculation methodology for the day-ahead market will be implemented no later than S1 2020, while the capacity calculation methodology for the intraday market will be implemented no later than S2-2020.

[1] The public consultation is available on the ENTSO-e website: https://consultations.entsoe.eu/markets/capacity-calculation-methodology-proposal-grit-ccr/

III. The Greece-Italy Regulatory Authorities position

On the first GRIT CCM

GRIT NRAS requested GRIT TSOs to fulfil the following amendments:

- refer to GRIT Capacity Calculation Region (CCR), as set according to Article 15 of CACM, instead to GRIT Region;
- include the demonstration justifying the adoption of CNTC approach;
- include more details about the capacity calculation process;
- include clarifications how to avoid discrimination between internal and cross-zonal exchanges;
- delete any references to the merging of individual grid models and clarify that the capacity calculation is based on the unique common grid model built in accordance with Articles 17 and 28 of CACM;
- include the statistical model to compute reliability margin, amending Article 6 accordingly;
- define how often the reliability margin is recalculated
- include a specific threshold to identify network elements to be monitored, as well as describe how operational security limits and contingencies are selected apart from taking into account the PTDF and Voltage Sensitivity Ratios;
- clarify how dynamic assessment is taken into account in the capacity calculation process and why it is considered only by Terna in the validation process and not as an additional constraint;
- duly justify why no dynamic assessment to detect possible additional limitations is performed for the Greek bidding zone;
- move the definition of permanent and temporary current/power limit from the explanatory note to the methodology;
- move some details about generation and load shift keys from the explanatory note to the methodology;
- include a description of the Remedial action optimization;
- clarify the relation between the costly curative remedial actions activated in the Italian Integrated Scheduling Process and the costly curative remedial actions taken into account in the capacity calculation process;
- specify the frequency at which the remedial actions are reassessed;
- define extreme scenarios in Article 10(3)
- amend Articles 11(7) and 12(7) of GRIT CCM to make them coherent with Articles 46(1) and 58(1) of CACM about data provision;
- clarify the frequency of calculation of intraday capacity values;
- define the last coordinated cross-zonal capacities in Articles 13(1) and 13(3);

On the amended GRIT CCM

GRIT NRAs are fine with the amended proposal: almost all of the requests were fulfilled by Greece-Italy TSOs.

There is still one doubt left that GRIT NRAs would like to raise.

Article 12(6) of the proposal states that, until the Intraday Capacity Calculation process has been concluded, the Capacity for the Single Intraday Coupling is set between zero and the capacity calculated on the day-ahead timeframe. GRIT NRAS would welcome some more clarifications about what the term capacity used in this statement refers to. In particular the link between the capacity made available to the intraday market, the capacity made available to the day-ahead market and the capacity already allocated in the day-ahead market should be clarified.

Conclusions

The GRIT NRAs have consulted and closely cooperated and coordinated to reach agreement that **they approve the amended GRIT CCM submitted by the Greece-Italy TSOs pursuant to Article 20 of CACM**. The GRIT NRAs must make their national decisions to approve the capacity calculation methodology, on the basis of this agreement, by 23 July 2018.