Explanatory Note of the Coordinated methodology for GRIT CCR

Consultation document

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Contents

1. Introduction

This technical document sets out the main principles for the Coordinated Capacity Calculation Forward Capacity Allocation methodology (CCC-FCA methodology) for long-term timeframe applied in the Greece-Italy area (GRIT). It contains a description of both the methodology and the calculation process in compliance with the Forward Capacity Allocation guideline (hereafter FCA).

The participating TSOs for this calculation are Terna (IT) and ADMIE (GR).

The border between Greece and the connecting Italian Bidding Zone and all the borders between internal Italian Bidding Zones are considered.

2. Coordinated calculation methodology

2.1. Capacity calculation process

The yearly and monthly CCC-FCA processes designed in the GRIT CCR are respectively represented in figure 1 and figure 2.

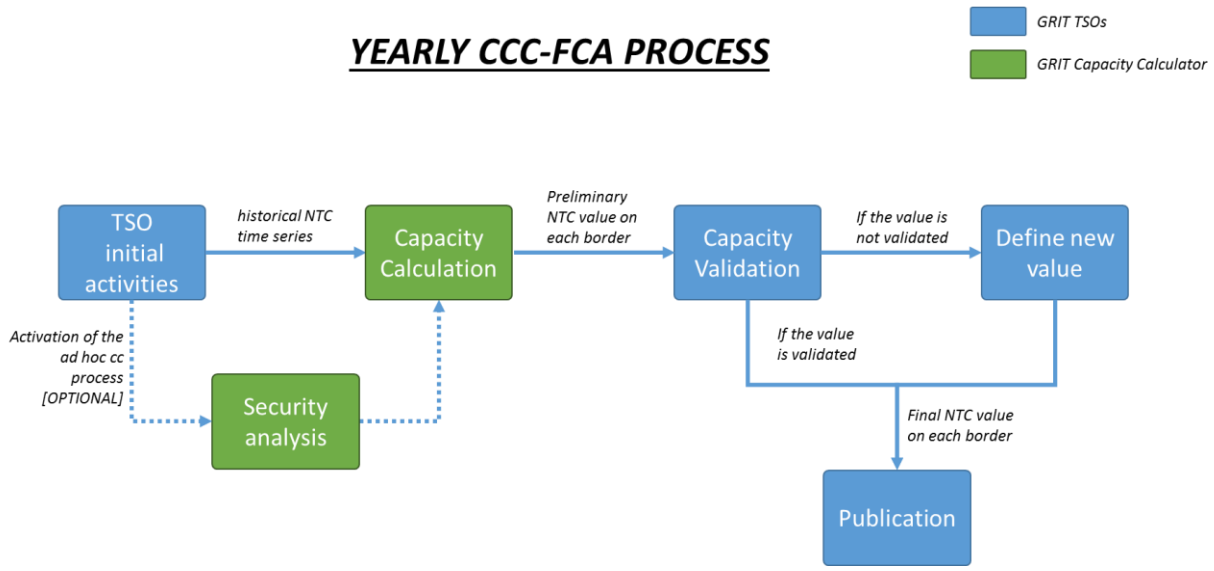

Figure 1 Yearly CCC-FCA process

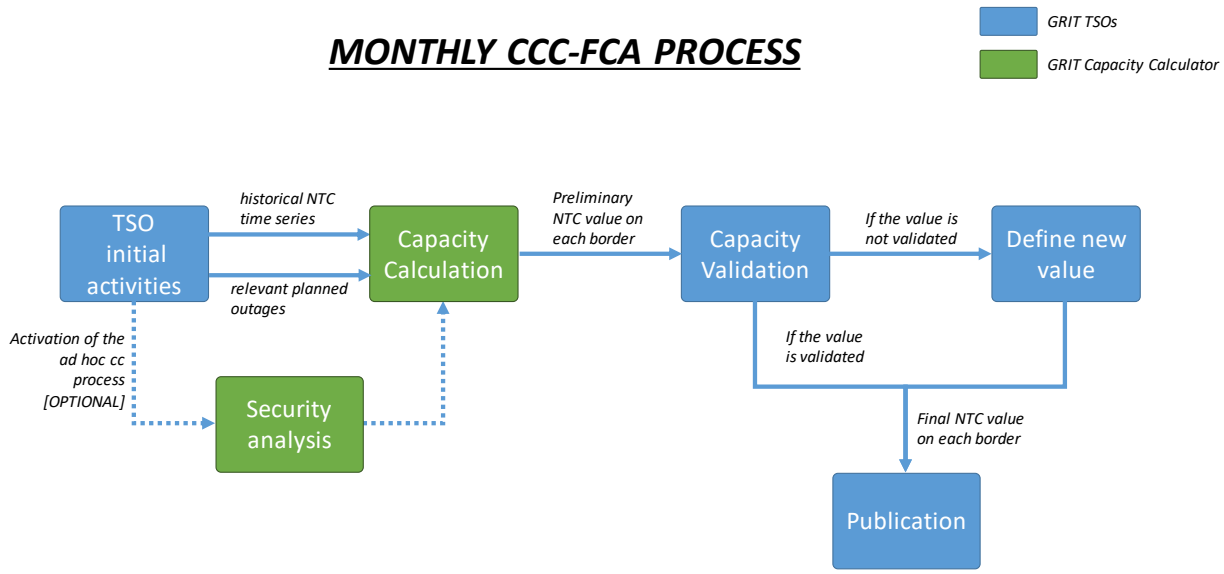

Figure 2 Monthly CCC-FCA process

In line with article 8 of the CCC-FCA methodology, in the yearly CCC-FCA process, respectively for peak and off-peak hours for each border and direction, the capacity is computed as the maximum value between:

a) the 50° percentile of the historical series;
b) the 10% of the 95° percentile of the historical series increased, when relevant and if positive, of the difference between the TTC value computed according to Article 10 and the 95° percentile of the historical series.

Point a) provides the cross-border capacity value that has been available at least the 50% of the hours in the last 2 years. This value is considered a balanced estimation (not too conservative, not too optimistic) of the expected available capacity for the coming year.

Point b) acts as a floor for the yearly capacity value, if point a) is too low due to unexpected events registered in the recent years. This floor is estimated as the 10% (since it is aimed to act as a floor) of a proxy of the maximum cross-border capacity on this border (95° percentile).

In case of:

- planned outages expected in the year under assessment (Y) that could imply a relevant reduction of the cross zonal capacity, or
- relevant infrastructures expected to be commissioned before the start of the year under assessment (Y) that could imply a relevant increase of the cross zonal capacity,

The statistical approach could lead respectively to too optimistic or too conservative estimations. For this reason, a dedicated security assessment could be activated upon request of the relevant TSOs.

If a TSO decide to activate such process, it shall define:

- relevant scenario(s) (eg. for planned outages only scenarios representing the period of the year when the relevant outages are scheduled will be considered).
- relevant Year-ahead Common Grid Model(s) to be adopted as initial case for the computations.

Then, in order to improve the quality of the assessment, the GRIT TSOs shall adapt the CGM(s) reflecting the expected conditions under assessment (eg. including planned outages).

The capacity calculation algorithm applied by the Regional Capacity Calculator shall be fully aligned with the one adopted the DA CCC process described in Annex 1 of the Greece-Italy 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.

The minimum value between all the assessed scenarios will be considered as the final outcome of the ad hoc capacity calculation process. The difference (if positive) between this value and the the 95° percentile of the historical series represents the expected TTC increase due to the new investments and it will be added to the above mentioned floor value.

As an example, results of a back-testing procedure described in article 8 of the CCC-FCA methodology carried out on 2016-2017 data for the yearly timeframe are show below:

Section	50°percentile	10% of the 95°percentile	Final Value
NORD-->CNOR	3600	400	3600
CNOR-->NORD	1300	230	1300
CNOR-->CSUD	1800	210	1800
CSUD-->CNOR	2700	270	2700
SUD-->CSUD	4500	460	4500
CSUD-->SARD	720	72	720
SARD-->CSUD	900	90	900
ROSN-->SUD	2450	245	2450
ROSN-->SICI	1100	110	1100
SICI-->ROSN	1200	120	1200
IT-->GR	500	50	500
GR-->IT	500	50	500

peak hours

Section	50°percentile	10% of the 95°percentile	Final Value
NORD-->CNOR	3700	400	3700
CNOR-->NORD	2300	250	2300
CNOR-->CSUD	2100	210	2100
CSUD-->CNOR	2700	270	2700
SUD-->CSUD	4600	460	4600
CSUD-->SARD	720	72	720
SARD-->CSUD	870	90	870
ROSN-->SUD	2200	245	2200
ROSN-->SICI	1100	110	1100
SICI-->ROSN	1200	120	1200
IT-->GR	500	50	500
GR-->IT	500	50	500

off-peak hours

Figure 3. Example of yearly CCC-FCA process results

In line with article 9 of the CCC-FCA methodology, in the monthly CCC-FCA process, for each day of the delivering month, respectively for peak and off-peak hours for each border/direction, the capacity is computed as the minimum value between:

a) for each planned outage in the day that could impact cross-zonal capacity, the 50° percentile of the historical series considering only relevant hours in past where the same element was out of service;
b) the maximum value between:
    i. the 95° percentile of the historical series of the hours of the same Season of the day under assessment;
    ii. when relevant, the TTC value computed according to Article 10
c) when relevant, the TTC value computed according to Article 10.

When planned outages are expected in the delivering day D, point a) provides the cross-border capacity value that has been available at least the 50% of the hours in the last 2 years when the same outages were in place. The 50° percentile value is considered a balanced estimation (not too conservative, not too optimistic) of the expected available capacity for day D.

Point b) is typically relevant for days D when no outages are planned. In this case, point b.i) is a proxy of the maximum cross-border capacity expected for day D while b.ii) provides a potential increase of this value in case of new investments.

Point c) is relevant when special outages are expected which effects on cross-border capacity cannot be appreciated with a statistical approach.
As an example, results of a back-testing procedure described in article 9 of the CCC-FCA methodology carried out on 2016-2017 data for the monthly timeframe are show below for some internal Italian borders and different months. On the top part of the figure, values for a (summer) day with outages are reported, while in the bottom part of the figure, values for a (winter) day without outages are shown.

With outages

	planned outage n°1	historical series	
50°percentile	1300	1500	Final Value
95°percentile	1400	2300	1300

peak hours

	planned outage n°1	historical series	
50°percentile	1000	2300	Final Value
95°percentile	1400	2300	1000

off-peak hours

Without outages

	historical series	
50°percentile	1300	Final Value
95°percentile	2200	2200

peak hours

	historical series	
50°percentile	2500	Final Value
95°percentile	2500	2500

off-peak hours

Figure 4. Example of monthly CCC-FCA process results for internal Italian borders

As an example, results of a back-testing procedure carried out on 2016-2017 data for the monthly timeframe are show below for Greece-Italy border. Since there are no differences between peak and off-peak results as well as between summer and winter months, only two tables are provided: one representing a day without planned outages of the HVDC link, and one representing a day with a planned outage.

	planned outage	historical series	
50°percentile	0	500	Final Value
95°percentile	0	500	0

	historical series	
50°percentile	500	Final Value
95°percentile	500	500

Figure 5. Example of monthly CCC-FCA process results for Greece-Italy borders

2.2. Inputs

In order to allow the Coordinated Capacity Calculator to perform the relevant CCC-FCA processes, each TSO for the GRIT region shall provide the following relevant input data:

- the historical NTC time series of the last two years for each relevant border/direction;
- when relevant, list of relevant planned outages for each border/direction expected in the delivery period.

2.3. Capacity calculation approach

Due to the specificities of the GRIT CCR, GRIT TSOs will use coordinated NTC approach to determine the cross-border capacities for each border of the GRIT CCR. This choice is mainly driven by the network structure of the GRIT Region, which is mainly “non-meshed”.

The methodology for the CCC-FCA is based on statistical approach that take properly into account all sources of uncertainty related to the long-term capacity calculation timeframes. In fact, cross-border capacity on the borders of the GRIT CCR are strictly dependent from grid element availability and, for some borders, from load and RES infeed conditions. Since yearly and monthly forecasts of these elements are affected by a huge degree of uncertainty, any deterministic scenario-based security assessment approach could lead to overestimate or underestimate cross-border capacity. A statistical approach could indeed reflect in a better way the level of desired firmness of the computed value.

A detailed security analysis is activated only in case relevant events are expected for the delivery period which cannot be explained by historical series (eg. multiple planned outages, commissioning of relevant new grid investments). In case this process is activate according to Article 10 of the CCC-FCA methodology, The Coordinated Capacity Calculator will apply the calculation process detailed in Annex 1 of the Greece-Italy TSOs proposal of common capacity calculation methodology for day-ahead and intraday market timeframe in accordance with Article 21 of Commission Regulation (EU) 2015/1222.

2.4. Reliability Margin (RM)

Since a statistical approach is considered to take properly into account all sources of uncertainty (eg. long-lasting unplanned outages, outages planned after the computation deadline, RES and load variability) related to the long-term capacity calculation timeframes, GRIT TSOs do not apply any reliability margin, adopting NTC values equal to the computed TTC values.

2.5. The final validation

Once the coordinated capacity calculator has calculated the TTC, it provides the concerned TSOs with these values. Each TSO then has the opportunity to validate the TTC value calculated centrally or can reduce the value in case the centralized calculation could not see a particular constraint. Such constraints cannot be monitored by the CCC-FCA process. Those constraints could be, but not limited to unplanned outages that occur after the deadline to update the inputs.

The TSO requesting a capacity reduction is required to provide a reason for this reduction, its location and the amount of MW to be reduced in accordance with article 26.5 of CACM regulation.

Where the two TSOs of a bidding zone border request a capacity reduction on their common border, the coordinated capacity calculator will select the minimum value provided by the TSOs. The reason associated to this value will be the one taken into account in all report required by relevant legislation.

3. Fallback procedure

Since a statistical approach is applied, a failure of the CCC-FCA process is considered very improbable.

Anyhow:

- in the case of failure of the yearly CCC-FCA process, values of the previous yearly CCC-FCA process will be applied;
- in the case of failure of the monthly CCC-FCA process, values of the yearly CCC-FCA process will be applied.

Above mentioned values shall be anyhow validated by the relevant TSOs.

4. Transparency

GRIT TSOs shall:

- fulfill the obligations from the Transparency regulation 543/2013;
- publish yearly, NTC values computed in the yearly CCC-FCA process;
- publish monthly, NTC values computed in the monthly CCC-FCA process.

GRIT TSOs will participate in the elaboration of the ENTSO-E biennial report on capacity calculation and allocation, which will be provided each two years and updated under request of the relevant authorities, according to Article 26 of FCA GL. For GRIT region, this report will contain the capacity calculation approach used, statistical indicators on reliability margins where they are applied, statistical indicators of cross-zonal capacity, quality indicators for the information used for the capacity calculation and, if appropriate, proposed measures to improve capacity calculation.

The Agency shall decide whether to publish all or part of this report.

5. Timescale for the CCC-FCA methodology implementation

Article 4(8) of the FCA Regulation requires that:

"*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.*"

When the new CCC_FCA methodology goes live, the calculation will be performed by the coordinated capacity calculator based on input provided by the TSOs, and finally validated by the TSOs.

5.1. Timeline for implementation of the CCM

- January 2019: Submission of the methodology for approval
- July 2019: Approval of the methodology by the GRIT NRAs
- S1 2020: Start of the Capacity Calculation for the for the yearly timeframe parallel run
- No later than S2 2020: Go-Live criteria of the Capacity Calculation for the yearly timeframe are met
- S2 2020: Start of Capacity Calculation for the for the monthly timeframe parallel run
- No later than S1 2021: Go-Live criteria of the Capacity Calculation for the monthly timeframe are met