

# Coordinated Capacity Methodology for SEE CCR (GR-BG-RO)

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Dr Nikolaos Athanasiadis

Head of Cross Border Regional Subsection  
ADMIE, Greece

# Synopsis

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# Introduction (1)

- The SEE CCM is applied for the day-ahead (DA) and intraday market (ID) time-frames in the SEE CCR. It is in compliance with the Article 21 of the Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline Capacity Allocation and Congestion Management guideline (CACM).
- The participating TSOs are ADMIE (GR), ESO EAD (BG) and Transelectrica (RO), the following borders are considered :Greece-Bulgaria, Bulgaria-Romania.

# Introduction (2)

- 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.
- 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, the common capacity calculation methodology proposal is based on Coordinated Net Transmission Capacity approach.**

# Introduction (3)

- Despite coordinated application of capacity calculation, SEE TSOs remain responsible for maintaining operational security. For this reason each SEE TSO shall validate and have the right to correct cross-zonal capacity relevant to the TSOs bidding zone border for reasons of operational security during the validation process. The validation process may lead to reductions of cross-zonal capacities. Thus, transparency, monitoring and reporting is necessary.
- The methodology establishes significant reporting requirements in order for the stakeholders, regulatory authorities and other interested parties to verify that the transmission infrastructure is operated efficiently and in the interest of consumers.
- The methodology contributes to the general objectives of the CACM Regulation to the benefit of all market participants and electricity end consumers.

# CCRs and CCM current status (1)

- ‘Capacity Calculation Region’ means the geographic area in which coordinated capacity calculation is applied
- Based on the requirements of CACM guideline, TSOs per Capacity Calculation Region have to implement a number of regional methodologies relevant to cross border congestion management. One of the main methodologies is among others the Capacity Calculation Methodology (CCM).

# CCRs and CCM current status (2)

CCR 1	<b>Nordic</b>
CCR 2	<b>Hansa</b>
CCR 3	<b>Core</b>
CCR 4	<b>Italy North</b>
CCR 5	<b>Greece-Italy (GRIT)</b>
CCR 6	<b>South-West Europe (SWE)</b>
CCR 7	<b>Ireland and United Kingdom (IU)</b>
CCR 8	<b>Channel</b>
CCR 9	<b>Baltic</b>
CCR 10	<b>South-east Europe (SEE)</b>

- CCR 3 (CORE region): 50Hertz, Amprion, APG, CREOS, ČEPS, ELES, ELIA, HOPS, MAVIR, PSE, RTE, SEPS, TenneT NL, TenneT DE, Transelectrica and TransnetBW. For this region the CCM is flow based.
- CCR 5 (GRIT region): ADMIE and Terna. The border between Greece and the connecting Italian Bidding Zone and all the borders between internal Italian Bidding Zones were considered. For this region the methodology is NTC based and was approved in July 2018.

# CCRs and CCM current status (3)

CCR 10 (SEE region): ADMIE, ESO EAD and Transelectrica

The status of the CCM for SEE CCR is as follows:

- the CMM for SEE CCR submitted by the TSOs from SEE CCR to the SEE NRAs on 15.01.2018.
- TSOs from SEE CCR received the first RfA of CCM from SEE NRAs on 16.06.2018.
- the first amendment of CCM was sent to NRAs on 23.08.2018.
- on the 26.10.2018 TSOs received the second RfA from the SEE NRAs.
- on 19.12.2018 SEE TSOs organized a common telco with NRAs from SEE CCR in order to received the shadow opinion on the second amendment of CCM.
- on 14.01.2019 TSOs from SEE received the shadow opinion for the second amendment of CCM.
- the second amendment of CCM based on the shadow opinion of NRAs from SEE CCR on 7.02.2019 was submitted to the NRAs from SEE CCR.



# Inputs

- Individual Grid Model/Common Grid Model
- CNEs, security limits and contingencies
- Generation shift keys
- Reliability Margins
- Remedial actions.

# Inputs

## Individual /Common Grid Model (1)

Basis for the Individual Grid Model (IGM), adopted in the CC process, is a scenario assumed to be representative of the expected conditions for the market time unit under assessment

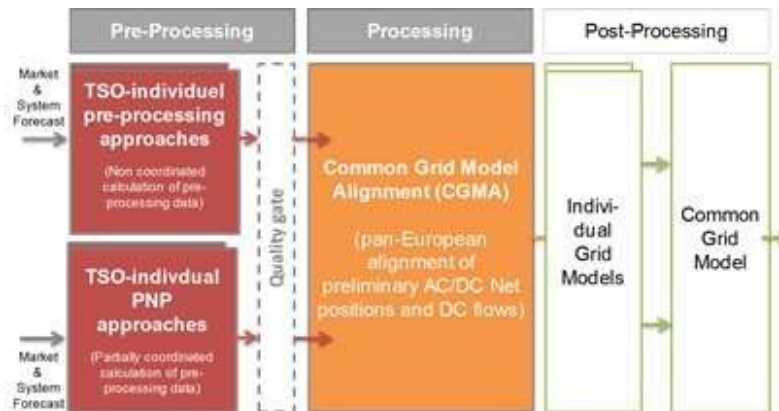
The scenarios contain structural data, topology and forecast (obtaining the so called “Base Case – Individual Grid Model”) of:

- Grid topology: outages of grid elements is adapted according to the approved outages plans;
- Load conditions: most recently updated load forecast is implemented;
- Conventional generation sheet:
  - o for the day-ahead CC process, the best available forecast is adopted,
  - o for the intraday CC process, the last available market results are adopted;
- Renewable generation infeed: the best available forecasts are adopted;
- Net positions and initial cross-border exchanges.

# Inputs

## Individual /Common Grid Model (2)

- Day-Ahead timeframe  
Forecasting of the net positions two days before the delivery day in SEE  
CCR is based on a common process established in ENTSO-E: the Common Grid Model Alignment (CGMA). This centrally operated process ensures the grid balance of the models used for the CC across Europe. The process is described in the CGMAM, which was approved by all TSOs in ENTSO-E.
- Main concept of the CGMAM (Common Grid Model Alignment Methodology) is presented below:



# Inputs

## Individual /Common Grid Model (3)

- The CGMAM input data are created in the pre-processing phase, which shall be based on the best available forecast of the market behavior and Renewable Energy Source (RES) generation.
- Pre-Processing Data (PPD) of CGMA are based on either an individually or regionally coordinated forecast. Basically the coordinated approach shall yield a better indicator about the final net position than an individual forecast. Therefore, TSOs in SEE CCR agreed to prepare the PPD in a coordinated way.
- The result of the CGMA process is the “Balanced Net Position” (BNP) for each control area and for each market time unit.
- The TSOs of the SEE CCR will adopt the net position of their control area as the result of the CGMA process, based on which the net positions on each relevant border can be defined and used at the relevant IGM models.

CGMA process is referring to the scenarios for which market schedules are not available (from 2 days ahead up to year ahead).

Intra-Day timeframe

The net position of each bidding zone of the SEE region and the cross-border exchanges on each border are defined according to the latest available market results.

# Inputs

## Individual /Common Grid Model (4)

- CGM creation that will be done by Merging Agents (MAs) (RSCs).
- MA will validate the IGMs delivered by the TSOs
- Merging Agent shall be responsible for creation of hourly CGMs for the purpose of day-ahead and intraday capacity calculation.
- MA will deliver CGMs to TSOs and Coordinated Capacity Calculator

# Inputs

## CNEs, security limits and contingencies (1)

- A Critical Network Element (CNE) is a network element (a line/ transformer) either within a bidding zone or between bidding zones impacted by SEE cross-border trades and monitored during the CC process under certain operational conditions since it is considered that overload of these elements will endanger grid security and limit cross border exchanges.
- Each TSO of the SEE CCR shall define a list of proposed CNEs. The list of CNEs shall be provided to the CCC (Coordinated Capacity Calculator), who shall monitor the CNEs during the coordinated NTC calculation process. Based on CACM, Coordinated Capacity Calculator (CCC) is “the entity or entities with the task of calculating transmission capacity, at regional level or above”.

# Inputs

## CNEs, security limits and contingencies (2)

- Each TSO of the SEE CCR shall define a list of proposed contingencies used in operational security analysis that are relevant for the set of CNEs. The contingencies of a TSO shall be located within the observability area of that TSO.

A contingency can be an unplanned outage of:

- a line, a cable, or a transformer;
- a busbar;
- a generating unit;
- a load; or
- a set of the aforementioned contingencies.

# Inputs

## CNEs, security limits and contingencies (3)

- Each TSO of the SEE CCR shall provide to the CCC a list of the proposed CNECs. The CCC shall merge the list of CNECs provided by all SEE CCR TSOs into a single list, which shall constitute the initial list of CNECs.
- SEE TSOs shall not apply allocation constraints.
- In accordance with CACM Regulation, the day-ahead and intraday common capacity calculation methodology shall describe the rules to mitigate possible discrimination between the treatment of internal and cross-zonal transactions.
- The TSOs of SEE CCR shall monitor only the elements from initial list of CNECs significantly impacted by cross-zonal power exchange. The CCC shall calculate the sensitivity factors for selecting the CNECs that are significantly impacted by cross-zonal power exchange.



# Inputs

## CNEs, security limits and contingencies (4)

- The sensitivity factors calculated as a percentage as follows:

$$SF_{CNEC} = \frac{P_f - P_i}{\Delta P} \times 100$$

$SF_{CNEC}$	Sensitivity factor for CNEC;
$P_f$	CNEC active power flow after $\Delta P$ ;
$P_i$	CNEC active power flow based on the relevant CGM;
$\Delta P$	Increase of the exchange with 100 MW through the north Greek borders, respectively south Romania borders.

- SEE CCR cross-zonal network elements are by definition considered to be significantly impacted. The other CNECs from initial list shall have a sensitivity factor equal or higher than 5% to be taken into account in all steps of the common capacity calculation to determine the cross-zonal capacity.

# Inputs

## CNEs, security limits and contingencies (5)

- The maximum permanent admissible current/power limit (PATL) means the maximum loading that can be sustained on a transmission line, cable or transformer for an unlimited duration without risk to the equipment, determined by each TSO in line with its operational security policy.
- The temporary current/power limit (TATL) means the maximum loading that can be sustained for a limited duration without risk to the equipment (e.g. 120% of permanent physical limit can be accepted during 20 minutes). Each SEE TSO is responsible for deciding, in line with their operational security policy, if temporary limit should be used.
- As thermal limits can vary in function of weather conditions, different values could be calculated and set for the different seasons within a year.
- Overload occurs when there is violation of the maximum admissible current limit (in IGM models).
- The maximum admissible limit is not reduced by any security margin, as all uncertainties in capacity calculations are covered by the reliability margin.

# Inputs

## Generation/load shift keys

GLSKs (Generation /Load shift keys) are needed to transform any change in the balance of one bidding zone into estimated specific injection increases or decreases. GLSKs are elaborated on the basis of the forecast information about the generating units and, if necessary, the loads.

Each SEE TSO shall define for its bidding zone and for each MTU a GSK, which translates a change in a bidding zone net position into a specific change of injection or withdrawal in the CGM. This expectation shall be based on the observed historical response of generation units to changes in net positions, clearing prices and other fundamental factors, and thereby contributing to minimizing the RM.

For the application of the methodology, SEE TSOs could define:

- 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 based on participation factors;
- Generation shift keys based on merit order list.

# Inputs

## Reliability margins (1)

- The day-ahead and intraday common capacity calculation methodologies are based on forecast models of the transmission system. Therefore, the outcomes are subject to inaccuracies and uncertainties. The aim of the reliability margin is to cover a level of risk induced by forecast errors.

The *RM*s cover the following forecast uncertainties :

- cross-zonal exchanges on bidding zone borders outside SEE CCR;
- generation pattern including specific wind and solar generation forecast;
- generation shift key;
- load forecast;
- topology forecast;
- unintentional flow deviation due to the operation of frequency containment reserves.

# Inputs

## Reliability margins (2)

- For the capacity calculation performed for day ahead/intraday market time-frame, the TSOs of SEE CCR shall compute the *RMs* for the BG-GR and BG-RO borders in accordance with Article 22 of the CACM Regulation and based on the analysis of the following data:
- Unintended deviations (UD) of physical electricity flows within a MTU caused by the adjustment of electricity flows within and between control areas, to maintain a constant frequency;
- Uncertainties (UN) which could affect capacity calculation and which could occur between the respective capacity calculation time and real time, for the MTU being considered (between D-2 and real time for the day ahead timeframe).

# Inputs

## Reliability margins (3)

- Regarding the *UD* for control-related reasons, deviations occur between the scheduled values and the actual values during the exchange of energy between neighboring control areas. This implies that at any moment the exchange between two control areas can be significantly higher than the scheduled exchanged, endangering the security of supply.
- Regarding the *UN* the CNTC methodology is based on different inputs provided by TSOs, they are based on best available forecast at the time of the capacity calculation for renewable energy sources, consumption, generation or available network elements and those could differ from the real-time situation.

The RMs determination is based on a probability distribution function of the deviations between the expected power flows at the time of the capacity calculation and realized power flows in real time.

# Inputs

## Reliability margins (4)

The RMs on the SEE CCR borders are calculated in a three-step approach:

- In a first step, for each MTU of the observatory period, the relevant CGMs are updated in order to take into account the real-time situation of the RAs that are considered in the common capacity calculation. This step is undertaken by copying the real-time configuration of these RAs and applying them into the historical CGM where the capacity calculation was performed. The power flow on BG-RO and BG-GR borders of the SEE CCR, as expected with the common capacity calculation methodology is then compared with the real time power flow observed on the same borders. All differences for all MTUs of a one-year observation period shall constitute the probability distribution function of deviations between the expected flows at the time of capacity calculation and realized flows in real time.

# Inputs

## Reliability margins (5)

- The impact on the capacity shall be defined with the following equation:

$$F_{err} = \frac{F_{real} - F_{up\ CGM}}{SF_{border}}$$

$F_{err}$	Active power flow error due to <i>UD</i> and <i>UN</i> ;
$F_{real}$	Active power flow through the border in real time;
$F_{up\ CGM}$	Active power flow through the border in the updated relevant CGM;
$SF_{border}$	Sensitivity factor for SEE CCR border in base case;

$$SF_{border} = \frac{F_f - F_i}{\Delta P} \times 100$$

$F_f$	Active power flow through the border after $\Delta P$ ;
$F_i$	Active power flow through the border based on the relevant CGM;
$\Delta P$	Increase of the exchange with 100 MW through the SEE CCR border.



# Inputs

## Reliability margins (6)

- in a second step and in accordance with Article 22(3) of the CACM Regulation the 95th percentiles of the probability distributions for the BG-RO and BG-GR borders of the SEE CCR shall be calculated. This means that the TSOs apply a common risk level of 5 % and thereby the RM values cover 95% of the historical forecast errors within the observation period.
- a possible third step could be to undertake an operational adjustment on the values derived previously, by modifying the computed RM values to a value within the range which will retain system security between 1% and 20% of the TTC calculated under normal weather conditions.
- The RM values shall be updated every year (including the risk level) . The *RMs* values remain fixed until the next update.

# Inputs

## Remedial actions (1)

- Remedial Actions (RAs) refer to all measures applied in due time by TSOs (individually within their bidding zone or coordinated if they impact multiple grids) in order to relieve overloads on certain CNEs, i.e. to keep system in secure state and to maximize cross-border capacities.
- In accordance with CACM, SEE TSOs shall define RAs to be taken into account in the day-ahead and intraday common capacity calculation. The relevant RAs shall be coordinated between TSOs, and communicated to other TSOs and the CCC (Coordinated Capacity Calculator).
- The CCC which receives the RAs from the TSOs, coordinates the process and either proposes the initial recommendations from the TSOs or develops new proposals for the TSOs.
- In general, depending on whether remedial actions cause costs or not, they are classified as A) non-costly and B) costly remedial actions. Costly remedial actions include cross border redispatching , countertrading and curtailment of capacities.

# Inputs

## Remedial actions (2)

The RAs defined by each SEE TSOs shall be either preventive (pre-fault, used at the operational planning stage) or curative (post-fault, used after the contingency), .

TSOs should create a list of non-costly available RAs that will be applied when specific combination of CNECs occurs.

The SEE TSOs may use the following non-costly RAs, but are not limited to:

- changing the tap position of a PST,
- topological action: opening or closing of one or more line(s), cable(s), transformer(s), bus bar coupler(s), or switching of one or more network element(s) from one bus bar to another, connection/disconnection of reactor(s), capacitor(s).

Only non-costly RAs will be considered for capacity calculation.

The RAC (Remedial Action Coordination) in the day-ahead and intraday common capacity calculation shall be an automated, coordinated, and repeatable optimization process performed by the CCC. The CCC shall take into account in capacity calculation, RAs to increase the cross-zonal capacity.

# Inputs

## Remedial actions (3)

The RAC objective is to enlarge the capacity domain around the balanced net position of the Common Grid Model Alignment process, with the objective function to minimize the overload of the CNECs and/or the violation of the nodes voltage.

The variables are the switching states of the topological measures and tap positions.

In accordance with CACM Regulation, at the day-ahead and intraday common capacity calculation methodology, an exchange of foreseen remedial actions in each CCR, with sufficient impact on the cross-zonal capacity in other CCRs, should be coordinated among CCCs.

# Mathematical description of the capacity calculation approach (1)

The CCC (coordinated capacity calculator) shall define the values of TTC for each MTU for the north Greek borders, BG-GR border, south Romanian borders, BG-RO border. These values shall be provided to TSOs of the SEE CCR for validation of BG-RO and BG-GR borders.

- The *TTC* on the BG-GR direction is a ratio of the total *TTC* value calculated from all north Greek systems (power systems of Albania, FYROM, Bulgaria and Turkey) to the Greek system:

$$TTC_{BG-GR} = k_{BG-GR} \cdot TTC_{north\ GR\ systems-GR}$$

$TTC_{BG-GR}$

$k_{BG-GR}$

$TTC_{north\ GR\ systems-GR}$

*TTC* on the BG-GR direction

splitting factor for BG-GR direction

*TTC* from all north Greek systems to the Greek system

- For the GR-BG direction, exactly the opposite procedure applies

$$TTC_{GR-BG} = k_{GR-BG} \cdot TTC_{GR-north\ GR\ systems}$$

# Mathematical description of the capacity calculation approach (2)

- The  $TTC$  on the BG-RO direction is a ratio of the total  $TTC$  value calculated from all south Romanian systems (power systems of Bulgaria and Serbia) to the Romanian system:

$$TTC_{BG-RO} = k_{BG-RO} \cdot TTC_{south\ RO\ systems - RO}$$

$TTC_{BG-RO}$	$TTC$ on the BG-RO direction
$k_{BG-RO}$	splitting factor for BG-RO direction
$TTC_{south\ RO\ systems-RO}$	$TTC$ from all south Romanian systems to the Romanian system

- For the RO-BG direction, exactly the opposite procedure applies

$$TTC_{RO-BG} = k_{RO-BG} \cdot TTC_{RO- south\ RO\ systems}$$

$TTC_{RO-BG}$	$TTC$ on the RO-BG direction
$k_{RO-BG}$	splitting factor for RO-BG direction
$TTC_{RO- south\ RO\ systems}$	$TTC$ from the Romanian system to all south Romania systems

# Mathematical description of the capacity calculation approach (3)

- The splitting factor used for day-ahead and intraday capacity calculation in the year  $Y$  will be based on the NTC values from the last two years. This approach is based on the Article 3(h) of the CACM Regulation that contributes to the objective of respecting the need for a fair and orderly market and price formation and ensures a fair distribution of costs and benefits between the involved TSOs.
- The splitting factors used at the NTC computation will comply with the security operation in accordance with Article 3(c) of the CACM Regulation, will not alter the signals for investments to TSOs given by the congestion income and allow reasonable financial planning according with Article 73 of the CACM Regulation.

# Mathematical description of the capacity calculation approach (4)

- The splitting factor for BG-GR direction is determined with the following equation:

where:  $k_{BG-GR} = NTC_{BG-GR} / NTC_{north\ GR\ systems-GR}$

$k_{BG-GR}$       splitting factor as percentage to be applied for BG-GR direction for day-ahead and intraday capacity calculation in the year Y

$NTC_{BG-GR}$       Average value of the NTC for the direction BG-GR (excluding the period when the tie-line BG-GR was out of operation for maintenance) in the last two years

$NTC_{north\ GR\ systems-GR}$       Average value of the total NTC for the direction north GR systems -GR (excluding the period when the tie-line BG-GR was out of operation for maintenance) in the last two years

- The splitting factor for BG-RO direction is determined with the following equation:

$k_{BG-RO} = NTC_{BG-RO} / NTC_{south\ RO\ systems-RO}$

$k_{BG-RO}$       splitting factor as percentage to be applied for BG-RO direction for day-ahead and intraday capacity calculation in the year Y

$NTC_{BG-RO}$       Average value of the NTC for the direction BG-RO in the last two years

$NTC_{south\ RO\ systems-RO}$       Average value of the total NTC for the direction south RO systems-RO in the last two years

- For the GR-BG, RO-BG directions, a similar procedure in the opposite is used.



# Mathematical description of the capacity calculation approach (5)

- The CCC of the SEE CCR shall provide to the SEE TSOs with the validated *NTCs* values after application of the *RM*s for the BG-RO and BG-GR borders.
- The NTC on the BG-GR border is determined with the following equations:

$$NTC_{BG-GR} = TTC_{BG-GR} - RM_{BG-GR}$$

$$NTC_{GR-BG} = TTC_{GR-BG} - RM_{GR-BG}$$

- The NTC on the BG-RO border is determined with the following equations:

$$NTC_{BG-RO} = TTC_{BG-RO} - RM_{BG-RO}$$

$$NTC_{RO-BG} = TTC_{RO-BG} - RM_{RO-BG}$$

# Mathematical description of the capacity calculation approach (6)

- The *ATC* (available transmission capacity) for day-ahead /intraday market time-frame of BG – GR border is determined below, taking into account the *NTC* values calculated before and *ANC* (*already nominated capacity*):

$$ATC_{BG-GR} = NTC_{BG-GR} - ANC_{BG-GR} + ANC_{GR-BG}$$

$$ATC_{GR-BG} = NTC_{GR-BG} - ANC_{GR-BG} + ANC_{BG-GR}$$

- The *ATC* for day-ahead market/intraday market time-frame of BG – RO border is determined below, taking into account the *NTC* values calculated before and *ANC*:

$$ATC_{BG-RO} = NTC_{BG-RO} - ANC_{BG-RO} + ANC_{RO-BG}$$

$$ATC_{RO-BG} = NTC_{RO-BG} - ANC_{RO-BG} + ANC_{BG-RO}$$

- If the *ATC* values are negative, no capacity will be made available. The CCC and TSOs of the SEE CCR shall ensure that the day-ahead validated cross-zonal capacity shall be provided to relevant entity no later than the day-ahead firmness deadline as defined in accordance with CACM Regulation and the intraday validated cross-zonal capacity shall be provided to relevant entity no later than 15 minutes before the intraday cross-zonal gate opening time.

# SEE business process (1)

In accordance with Article 46 of CACM Regulation, the CCC and TSOs of the SEE CCR shall ensure that the day ahead cross-zonal capacity shall be provided to relevant entities before the day-ahead firmness deadline as defined in accordance with Article 69 of CACM Regulation.

Intraday cross-zonal capacity calculation shall be performed in the following sequence :

- Updating of cross-zonal capacities remaining after day-ahead CC for all intraday CC MTUs between 00:00 and 24:00 of day D and providing them as intraday cross-zonal capacities to relevant entity no later than 15 minutes before the intraday cross-zonal gate opening time;
- Calculation of intraday cross-zonal capacities for all intraday CC MTUs between 00:00 and 24:00 of day D. The cross-zonal capacities resulting from this calculation shall be published and submitted to relevant entity no later than 15 minutes before the target start of allocation at 22:00 D-1;
- Re-calculation of intraday cross-zonal capacities for all intraday CC MTUs between 12:00 and 24:00 of day D. The cross-zonal capacities resulting from this re-calculation shall be published and submitted to NEMOs no later than 15 minutes before the target start of allocation at 10:00 D-1.

# SEE business process (2)

SEE TSOs, or an entity delegated by the SEE TSOs, shall send for each market time unit the AAC (already allocated capacities) and ANC (already nominated capacities) to the coordinated capacity calculator, without undue delay. In accordance with article 81 of CACM Regulation, the delegating TSOs in such a case shall remain responsible for ensuring compliance with the obligations under the CACM Regulation.

The day-ahead capacity calculation is based on the unique D-2 CGM built in accordance with Articles 17 and 28 of CACM Regulation.

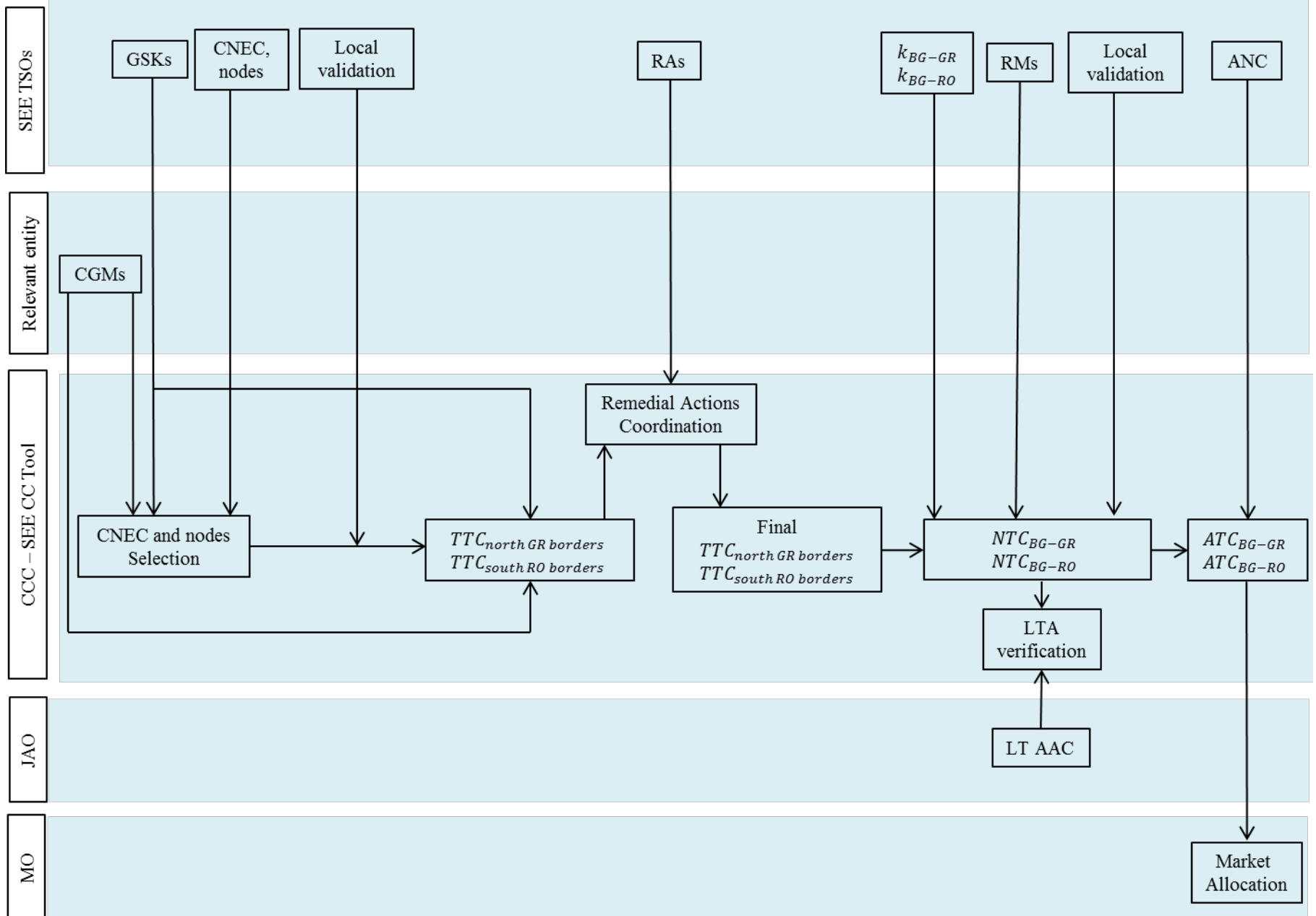
The intraday capacity calculation is based on the unique D-1 and Intraday CGM built in accordance with Articles 17 and 28 of CACM Regulation.

# SEE business process (3)

For the day ahead and intraday common capacity calculation in the SEE CCR, performed by the CCC, the high-level process flow includes five steps until the final *CNTC* domain for the relevant market time-frame is set:

- first, for the capacity calculation inputs (such as RMs, CNEs, contingencies, GSKs), a quality check process shall be performed by the CCC;
- the second process step is to determine the relevant *CNECs* used during common capacity calculation;
- the third step is to determine the *NTC* values for each direction and border of SEE CCR;
- after *NTC* values computation, the resulting cross-zonal capacities are validated by the TSOs of the SEE CCR;
- finally, the *ATC* (available transmission capacities) are calculated for day ahead/intraday market time-frame taking into account the *ANC* (already nominated capacities) from the previous market time frame.

# SEE business process (4)



# Cross-zonal capacity validation

Each SEE TSO shall, in accordance with CACM Regulation, validate and have the right to correct cross-zonal capacity relevant to the TSO's bidding zone borders for reasons of operational security.

In exceptional situations cross-zonal capacities can be decreased by TSOs. These situations are:

- an occurrence of an exceptional contingency or forced outage pursuant to SO GL;
- when RAs, that are needed to ensure the calculated capacity, are not sufficient to ensure operational security;
- extremely low demand of a TSO which leads to low system inertia and high voltage conditions and so require a minimum number of power plants on the grid;
- a mistake in input data, that leads to an overestimation of cross-zonal capacity from an operational security perspective.

When one or more SEE TSOs do not validate the cross-zonal capacity calculated, the concerned TSO(s) shall provide the CCC 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 border considered.

Any reduction of cross-zonal capacities during the validation process shall be communicated and justified to the SEE national regulatory authorities.

# Backup and Fallback procedures

- Where a critical deadline is reached and the inputs could not be provided to the concerned party on time, then fallbacks are applied, meaning that SEE TSOs and the coordinated capacity calculator could use other inputs to perform their tasks.
- Prior to the day-ahead common capacity calculation, the TSOs of SEE CCR shall provide to the CCC the coordinated cross-zonal capacities defined according with the long-term capacity calculation processes. For day-ahead market time-frame are used as fallback solution the NTCs values calculated for yearly and monthly processes.
- Prior to the intraday common capacity calculation, the TSOs of SEE CCR shall provide to the CCC the coordinated cross-zonal capacities calculated within the day-ahead capacity calculation processes.



# Monitoring and reporting to NRAs

- Monitoring data shall be provided towards the SEE NRAs as basis for supervising a non-discriminatory and efficient SEE congestion management. The provided monitoring data shall also be the basis for the biennial report to be provided according to CACM Regulation.
- The final, exhaustive and binding list of all monitoring items, respective templates and the data access point shall be developed by the SEE TSOs in cooperation with NRAs. All technical and statistical information related to the methodology shall be made available upon request to the NRAs in the SEE CCR

# Timescale for implementation of the CC methodology

The TSOs of the SEE CCR shall implement the day-ahead common capacity calculation methodology no later than 1<sup>st</sup> of July 2020.

The TSOs of the SEE CCR shall implement intraday capacity calculation within the following timeframes:

- (a) Update of cross-zonal capacities remaining after day-ahead CC for all intraday CC MTUs between 00:00 and 24:00 of day D by the deadline of implementation of day-ahead capacity calculation;
- (b) Calculation of intraday cross-zonal capacities for all intraday CC MTUs between 00:00 and 24:00 of day D by 3 months after the implementation of day-ahead capacity calculation methodology; and
- (c) Re-calculation of intraday cross-zonal capacities for all intraday CC MTUs between 12:00 and 24:00 of day D by 12 months after the implementation of calculation of intraday cross-zonal capacities pursuant to point (b).

Parallel runs (internal/external) will start at the beginning of 2020, during which TSOs will test the operational processes for capacity calculation inputs, capacity calculation process, capacity validation, develop the appropriate IT tools and infrastructure and involve market participants to test the effects on the market.