

# **Explanatory document to the Intraday Capacity Calculation Methodology of the Central Europe Capacity Calculation Region**

in accordance with article 20ff. of the Commission Regulation (EU)  
2015/1222 of 24<sup>th</sup> July 2015 establishing a guideline on capacity allocation  
and congestion management

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## **1. Introduction**

The Commission Regulation (EU) 2015/1222 establishing a guideline on Capacity Calculation and Congestion Management ('CACM') requires the development and implementation of a common Intraday Capacity Calculation Methodology ('ID CCM') per Capacity Calculation Region ('CCR').

The CACM Regulation aims at harmonizing capacity calculation of CCR, this includes the possibility to merge CCRs in case this is deemed most efficient. Therefore, on 16 December 2025 ACER approved the amendment on the determination of capacity calculation regions (Decision No 10/2025). This decision extends the merger of Core CCR and Italy North CCR into Central Europe CCR to the Intraday timeframe.

In this explanatory document Central Europe TSOs and iTCP aim at explaining the background to the articles and technical proposals resulting from the merger of Core & Italy North CCRs included in the proposal for the CE ID CCM.

Should it become necessary, within the scope of the testing, validation and operational functioning activities of the capacity calculation process, to introduce improvements aimed at enhancing the effectiveness, accuracy or efficiency of the process itself and of the methodology, the TSOs, where appropriate, will implement such improvements. These evaluations and potential improvements may be carried out both during the parallel run phase and subsequently within the operational phase, in order to ensure the continuous enhancement of the capacity calculation process and the reliability of its results, in compliance with the regulatory framework.

## **2. Consideration of CACM 2.0 outcomes and inclusion of changes in current Core ID CCM amendments**

For the initial submission of the CE ID CCM, some of the changes related to on-going discussions in the Core CCR or related to the new version of the Capacity Calculation and Congestion Management were not taken into account in the drafting. These changes will be considered in future amendments of the CE ID CCM so as to ensure coherence amongst all methodologies and compliance with the latest network codes.

These changes cover some of the following topics:

- **Consideration of CACM 2.0 outcomes:** As of the date of draft of the CE ID CCM, the amendment of the CACM regulation has not been officially published yet. The changes resulting from this document will be taken into account in the first amendment of the CE ID CCM.
- **Consideration of changes related to the Core ID CCM 6<sup>th</sup> amendment submission:** The CE ID CCM is based on the TSO submitted version of the Core ID CCM 6<sup>th</sup> amendment. As of the date of draft of the CE ID CCM, the 6<sup>th</sup> amendment of the Core ID CCM has not yet been approved by the Core NRAs, consequently it is possible that the Core 6<sup>th</sup> amendment may contain some of the updates which will

not reflected in the CE ID CCM. Some of these changes may cover but not be limited to: changes on article 5 in regard to the consideration of internal CNECs, Advanced Hybrid Coupling in Intraday, SEM inclusion, as well as any considerations for the inclusion of minimum RAM in CE IDCC.

### **3. Advanced Hybrid Coupling**

In regard to the implementation of AHC in CE IDCC, CE TSOs will take into account the work which is currently being done in Core CCR to propose an implementation timeline. At this stage looking at the uncertainties around the timeline of implementation of the AHC in Core IDCC, CE TSOs have proposed to include further details the implementation timeline of AHC in a future amendment of the CE ID CCM. The AHC in CE CCR will be based on the same concepts as the ones which have been introduced in the latest amendment of the Core ID CCM. The wording in articles 14 and 27 reflect this assessment.

### **4. Consideration of CE DA article 25**

Article 25 of the CE DACC Methodology, which covers the IDCC(a) process for the transitional period between the CE DACC go-live and the CE IDCC go-live, will not be applicable anymore once the CE ID CCM is implemented. The IDCC(a) process will then be covered by the CE ID CCM.

The basic concept of the IDCC(a) process in CE, as described in CE DA CCM Art. 25, remains the same with the exception that the Italy North capacities are no longer defined in ATC but are part of the CE FB Domain. The CE ID CCM. Art. 11 of this methodology focuses on the IDCC(a) process. However, Art. 11 is less extensive as the sections of CE DA CCM Art. 25, which refer to IDCC in general, are already covered by other articles in this methodology.

### **5. Interaction with parallel projects for go live planning**

Following from the current roadmap of FB in IDA, the CE ID CCM assumes the go-live of CE IDCC is after the go-live of FB in IDA, which is planned for Q4 2027. However, following from the current roadmap, CE IDCC will go live before FB in ICT.

The CE ID CCM has no changes with respect to the Core ID CCM concerning the interaction with ROSC. According to the current roadmap, ROSC will go-live after CE IDCC.

### **6. Consideration of minimum RAM**

In the CE ID CCM, the consideration of implementation of some form of minimum RAM in IDCC depends on other on-going work in the Core CCR as well as any future obligations imposed by the amendment of the CACM regulation. Thus, at this stage, CE TSOs have proposed in article (26) a general wording in CE ID CCM to reflect the different possible options of implementation. The CE TSOs shall revisit this article in a future amendment to reflect a more accurate way forward based on the outcomes of the on-going work in Core CCR as well as the CACM amendment.

## 7. Circular flows around HVDC interconnectors

**Disclaimer:** *In general, CE TSOs do not see the usage of PTDF-threshold as an adequate way forward as it implies neglecting some physical effects in the grid. Therefore, the PTDF-threshold for the evolved flow-based internal Virtual Hubs shall only be applied if there is no adequate alternative solution ready to solve given issues of circular flows in the proximity of the evolved flow-based Virtual Hubs. The PTDF-threshold can be considered as an interim solution until an adequate alternative solution is in place. A PTDF threshold is not considered for any other use case.*

The evolved flow-based method described in Article 13 has been introduced with the commissioning of the ALEGrO HVDC link between Belgium and Germany and is applicable for any additional *evolved flow-based internal Virtual Hub* in CE CCR. The Day-Ahead and Intraday-schedules of HVDC interconnectors modelled with EFB are determined during market coupling with the aim of maximizing the overall social welfare. This can lead to very frequent undesired behaviour during real-time grid operation as the set point of HVDC interconnectors can be chosen to relieve very distant network elements with a very low sensitivity to exchanges over the HVDC interconnectors in order to maximize the social welfare during Intraday Market Coupling. This has been observed for the ALEGrO HVDC interconnector in the past. The slight relief of a very distant market limiting CNEC is achieved by an HVDC interconnector setpoint which leads to circular flows and full loading in the surrounding area of the HVDC interconnector. In real-time grid operation the high loading of the surrounding area might lead to n-1 violations, application of (costly) remedial actions and can impact capacity in a negative way.

In order to prevent such a behaviour of existing and future HVDC interconnectors on CE CCR borders, CE TSOs aim to keep the possibility of applying a zone-to-zone PTDF threshold for Internal Virtual Hubs (IVH) in the context of the *evolved flow-based* method. In this regard, a past analysis performed for the ALEGrO HVDC interconnector showed that introducing a PTDF-threshold of 0.5% prevents this undesired impact.

Upon introducing a new Internal Virtual Hub, the PTDF threshold gets a start value of 0 which equates to no threshold being implemented. CE TSOs may alter the threshold when they deem it necessary or after running a parameter study with the objective of finding the best trade-off between maximizing operational security and maximizing economical social welfare. However, this threshold shall not exceed 1%. CE TSOs shall report on a quarterly basis on any change of the threshold.

At the moment, there is no coordinated process in place, which would allow a frequent deviation from the Day-Ahead and Intraday schedules of HVDC interconnectors. A PTDF threshold may be applied per HVDC interconnector during the transition period preceding the go-live of a coordinated process to determine the operational HVDC setpoint of the respective HVDC interconnector pursuant to Article 76(1) of the SO Regulation.

## 8. CH Integration

The introduction of the new CE CCR shall lead to a change of the methodology for determining intraday capacities on all CH borders. The iTCP (CH), which will be participating in the IDCC(a) process as of the go-live of CE DACC, will participate in all IDCC process when CE IDCC goes live.

To reflect the most recent information available regarding iTCP bidding zone borders in the capacity calculation, nominations on iTCP borders have been added to the capacity calculation inputs.

In the absence of an electricity agreement between EU and CH, CH does not participate in the SIDC, and therefore capacities on Swiss borders continue to be provided as ATCs for explicit allocation. Consequently, an ATC extraction process is required following the validation of the flow-based capacity calculation results.

Unlike the DA process, CH borders are included directly in the common ATC extraction process applied to all CE bidding-zone borders, ensuring a consistent and non-discriminatory treatment of all borders.

The objective of the ATC extraction is to derive a feasible set of bilateral capacities from the validated flow-based domain while respecting all network constraints.

### Extraction of ATCs incl. CH bidding zone borders

The final flow-based parameters, consisting of the remaining available margins (RAMs) and power transfer distribution factors (PTDFs), form the basis for the determination of ATCs.

The iterative ATC extraction algorithm is applied to all CE and CH borders simultaneously, using positive zone-to-zone PTDFs derived from the validated zone-to-slack PTDFs:

$$pPTDF_{zzz}(A > B) = \max(0, PTDF_{zzs}(A) - PTDF_{zzs}(B))$$

where A, B are two different bidding zones. The iterative procedure to determine the ATCs starts from the latest market results. As such, the RAMs need to be adjusted in the following way:

$$\overline{RAM}_{ATC}(k) = \overline{RAM}_{ATC}(0) - pPTDF_{zone-to-zone} \overline{ATC}_{k-1}$$

$\overline{RAM}_{ATC}(k)$  remaining available margin for ATC calculation at iteration k

$\overline{ATC}_{k-1}$  ATCs at iteration k-1

$pPTDF_{zone-to-zone}$  positive zone-to-zone power transfer distribution factor matrix

For each constraint, the RAM is shared equally among the bidding-zone borders with a positive influence on that constraint. These shares of margin are converted into bilateral capacities using the corresponding positive zone-to-zone PTDFs. The process is repeated until convergence is reached, meaning that no further capacity can be allocated without violating the validated flow-based domain.

In situations where one or more constraints have a negative RAM before the start of the iterative process, negative ATCs may first be determined to restore feasibility of the ATC domain.

### **Result of the extraction**

At the end of the process, those constraints for which no remaining margin is available are identified as the limiting constraints of the ATC extraction.

The resulting ATCs represent the maximum bilateral exchanges that can be accommodated while respecting the validated flow-based domain and are subsequently used for the allocation processes on CH borders and ATC-based allocations in SIDC when FB allocation is not possible.

For the IDA flow-based allocations, the ATCs for CH borders are considered in the CE flow-based domain (without iTCP) by adjusting the RAMs.

## **9. Allocation constraints**

The scope of this section refers to methodological aspects concerning the use of allocation constraints (AC) in the Intraday calculation.

Considering TSOs part of the Central Europe CCR, PSE, Eirgrid, SONI and Terna intend to use allocation constraints. The general provision for applying allocation constraints are listed in Article 7, while Annex I contains the list of CE TSOs that will use allocation constraints together with detailed technical and legal reasoning for the need to use allocation constraints. Additionally, provisions were proposed indicating to CE TSOs the conditions that must be met for a given CE TSO to apply for the possibility of using allocation constraints in the future. It is proposed that a request to use allocation constraints by any CE TSO (other than those listed in Annex 1) should be preceded by the submission of a proposal for amendment of the methodology to all CE national regulatory authorities, along with the submission of an appropriate explanation of the need to use the AC.

For PSE, Eirgrid, SONI & Terna, the legal justification for use of Allocation Constraints are described in annex 1 of the CE ID CCM.

## **10. Timescale for implementation**

The implementation timeline provided in Article 27 is under the precondition that the CE ID CCM is approved 6 months after the submission to CE NRAs. It has been linked to the successful implementation of the CE DACC process as this is a prerequisite for the implementation of the CE IDCC process.

CE TSOs aim to propose a reasonable timeline for their methodological and technical readiness to implement the CE IDCC process. This timeline is based on considerable uncertainty that must be pointed out as effects on the performance of the tools, especially XBID and EUPHEMIA, due to the parallel upcoming implementation of Advanced Hybrid Coupling in Intraday, the integration of the Celtic interconnector or the introduction of flow-based allocation in SIDC, cannot be estimated at present.