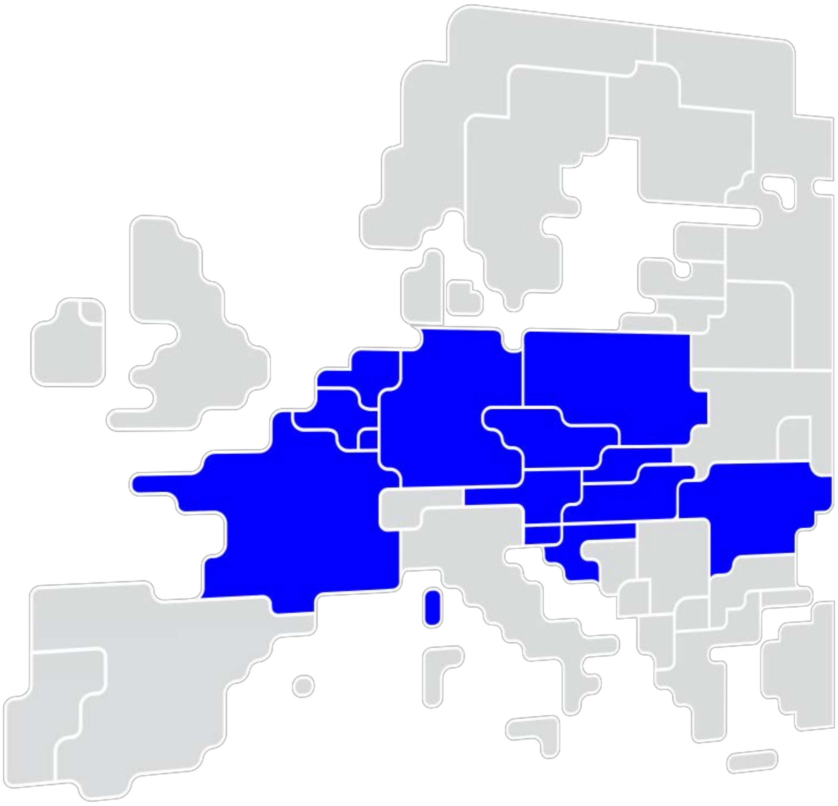
CORE

Explanatory document

to the balancing timeframe capacity calculation methodology of the Core capacity calculation region

in accordance with article 37(3) of the Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing

November 2022



Content

Definitions

1. 'AAC' is the already allocated capacity which has been allocated as an outcome of the latest capacity calculation in the Core CCR;
2. ‘aFRR’ means automatic frequency restoration reserve
3. ‘AOF’ means allocation optimisation function
4. ‘ATC’ means the available transmission capacity, which is the transmission capacity that remains available after the allocation procedure and which respects the physical conditions of the transmission system;
5. ‘ATP’ means the Affected TSO Procedure – Request for modification of CZCL or NPL submitted by party set as affected TSO.
6. ‘Balancing Platforms’ means European platforms for the exchange of balancing energy from frequency restoration reserves with manual and automatic activation as well as from replacements reserves and the imbalancing netting process
7. BTCC means Balancing Timeframe Capacity Calculation
8. BTCC MTU is the balancing timeframe capacity calculation market time unit, which means the time unit for the intraday capacity calculation and is equal to 15 minutes;
9. ‘CZCL’ means cross-zonal capacity limits refers to the security operational limits
10. ‘CCC’ means the coordinated capacity calculator, as defined in article 2(11) of the CACM Regulation, of the Core CCR, unless stated otherwise;
11. ‘CCR’ means the capacity calculation region as defined in article 2(3) of the CACM Regulation;
12. ‘CGM’ means the common grid model as defined in article 2(2) of the CACM Regulation and means the intraday CGM established in accordance with the CGMM;
13. ‘CGMM’ means the common grid model methodology, pursuant to article 17 of the CACM Regulation;
14. ‘CMM’ means capacity management module;
15. ‘CNE’ means a critical network element;
16. ‘CNEC’ means a CNE associated with a contingency used in capacity calculation. For the purpose of this methodology, the term CNEC also cover the case where a CNE is used in capacity calculation without a specified contingency;
17. ‘Core CCR’ means the Core capacity calculation region as established by the Determination of capacity calculation regions pursuant to article 15 of the CACM Regulation;
18. Core TSOs are 50Hertz Transmission GmbH (“50Hertz”), Amprion GmbH (“Amprion”), Austrian Power Grid AG (“APG”), CREOS Luxembourg S.A. (“CREOS”), ČEPS, a.s. (“ČEPS”), Eles d.o.o. sistemski operater prenosnega elektroenergetskega omrežja (“ELES”), Elia System Operator S.A. (“ELIA”), Croatian Transmission System Operator Ltd. (HOPS d.o.o.) (“HOPS”), MAVIR Hungarian Independent Transmission Operator Company Ltd. (“MAVIR”), Polskie Sieci Elektroenergetyczne S.A. (“PSE”),

RTE Réseau de transport d'électricité ("RTE"), Slovenská elektrizačná prenosová sústava, a.s. ("SEPS"), TenneT TSO GmbH ("TenneT GmbH"), TenneT TSO B.V. ("TenneT B.V."), National Power Grid Company Transelectrica S.A. ("Transelectrica"), TransnetBW GmbH ("TransnetBW");

19. 'CROSA' or 'coordinated regional operational security assessment' means a process of an operational process of an operational security analysis performed by RSC(s) in accordance with article 78 of the SO Regulation

20. 'cross-zonal CNEC' means a CNEC of which a CNE is located on the bidding zone border or connected in series to such network element transferring the same power (without considering the network losses);

21. 'CZCA' means cross-zonal capacity allocations for the exchange of balancing capacity or sharing of reserves

22. 'CZCL(max) means Cross-Zonal Capacity Limit – maximum limit for capacity of the interconnector(s), border, or technical profile that can be used between two bidding zone.

23. 'DACF' day-ahead congestion forecast

24. 'default flow-based parameters' means the pre-coupling backup values calculated in situations when the intraday capacity calculation fails to provide the flow-based parameters in three or more consecutive hours. These flow-based parameters are based on previously calculated flow-based parameters;

25. 'external constraint' means a type of allocation constraint that limits the maximum import and/or export of a given bidding zone;

26. 'FB' means flow-based;

27. 'flow-based domain' means a set of constraints that limit the cross-zonal capacity calculated with a flow-based approach;

28. 'FRCE' means Frequency Restoration Control Error

29. 'FRM' means the flow reliability margin, which is the reliability margin as defined in article 2(14) of the CACM Regulation applied to a CNE;

30. 'HVDC' means a high voltage direct current network element;

31. 'IDCC' means the intraday capacity calculation process in Core CCR

32. 'ID CC MTU' is the intraday capacity calculation market time unit, which means the time unit for the intraday capacity calculation and is equal to 60 minutes;

33. 'IDCF' means intraday congestion forecast

34. 'IDCZGCT' means Intraday Cross Zonal Gate Closure Time and defines the end time of the ID market

35. 'IN' means imbalance netting

36. 'INPF' means imbalance netting process function

37. ‘internal CNEC’ means a CNEC, which is not cross-zonal;

38. ‘‘LFC’ means load frequency control

39. ‘LTA’ means Long Term Allocation and refers to the yearly and monthly long-term capacities

40. ‘mFRR’ means manual frequency restoration reserve

41. ‘MinRAM’ means minimum RAM and refers to a minimum margin provided by each CNEC

42. ‘NP’ or ‘NP’ means a net position of a bidding zone, which is the net value of generation and consumption in a bidding zone;

43. ‘NPL’ means a net position limit of a bidding zone. A limitation of total import or total export from a bidding zone

44. ‘NTC’ means Net Transfer Capacity

45. ‘oriented bidding zone border’ means a given direction of a bidding zone border (e.g. from Germany to France);

46. ‘PTDF’ or ‘$PTDF$’ means a power transfer distribution factor;

47. ‘zone-to-slack $PTDF$’ means the PTDF of a commercial exchange between a bidding zone and the slack node;

48. ‘zone-to-zone $PTDF$’ means the PTDF of a commercial exchange between two bidding zones;

49. ‘‘RA’ means a remedial action as defined in article 2(13) of the CACM Regulation;

50. ‘RAM’ or ‘RAM’ means a remaining available margin;

51. ‘reference net position or exchange’ means a position of a bidding zone or an exchange over HVDC interconnector assumed within the CGM;

52. ‘ROSC’ means Regional Operational Security Coordination within Core CCR

53. ‘RR’ means replacement reserve

54. ‘SIDC’ means the single intraday coupling;

55. ‘slack node’ means the single reference node used for determination of the PTDF matrix, i.e. shifting the power infeed of generators up results in absorption of the power shift in the slack node. A slack node remains constant for each BTCC MTU;

56. ‘SO Regulation’ means Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation;

57. ‘standard hybrid coupling’ means a solution to capture the influence of exchanges with non-Core bidding zones on CNECs that is not explicitly taken into account during the capacity allocation phase;

58. ‘U’ is the reference voltage;

59. the notation x denotes a scalar;

60. the notation $\vec{x}$ denotes a vector;

61. the notation $\mathbf{x}$ denotes a matrix.

1. INTRODUCTION

This document gives background information and rationale for the CCR Core proposal for a methodology to calculate cross-zonal capacities within the balancing timeframe, being developed in accordance with article 37(3) of the EB Regulation.

The Commission Regulation (EU) 2017/2015 establishing a guideline on electricity balancing (hereafter referred to as the 'EB Regulation') proposes the application of a cross-zonal capacity calculation methodology within the balancing timeframe for the exchange of balancing energy and for operating the imbalance netting process (hereafter referred to as 'BTCC').

The EB regulation introduces the balancing capacity calculation method in article 37 (3) and foresees this CCR Capacity Calculation Methodology for the Balancing time frame to be submitted by the end of 2022.

Before this new methodology is implemented, left-over capacities after the intraday cross-zonal gate-closure time shall be used as described in Art 37(2).

The aim of this explanatory document is to provide additional information with regard to the BTCC and how the Core CCR will provide capacities for Balancing Energy/Platforms/Products.

For higher legibility the document is structured as follows:

- Chapter 1 and 2 give a general presentation of the EB Regulation requirements and the balancing timeframe capacity calculation methodology including the approach for finalization of the methodology
- Chapter 3 describes the high-level business process of the balancing timeframe capacity calculation and shows interrelations to other methodologies and processes
- Chapter 4 introduces a comprehensive description of the balancing timeframe capacity calculation methodology, deliverables and timelines

1.1. Core TSO deliverable report

No later than 24 months after implementation of this BT CCM, Core TSOs shall provide a report to the Core NRAs in which detailed plans are described on how to conclude on the additional number of recomputations based on more recent forecasts of balancing timeframe capacities. The scope of this assessment is detailed in Chapter 4. In addition, the Core TSO will investigate additional measures to increase capacities during the validation phase as described in Article 10.

It should therefore be considered that this Explanatory Note describes the current status of the BT CCM (November 2022) for the intended go-live after ROSC v2, but will be amended according to further developments and study.

2. EB REGULATION REQUIREMENTS FOR CROSS-ZONAL CAPACITY CALCULATION WITHIN THE BALANCING TIMEFRAME

Article 37(3) of the EB Regulation enables all TSOs within the CCR Core to develop a proposal for a methodology for a capacity calculation methodology within the balancing timeframe for the exchange of balancing energy or for operating the imbalance netting process. In general, TSO should frequently update the cross-zonal capacities used for the balancing timeframe.

3. HIGH LEVEL BUSINESS PROCESS

The following section gives an overview of the main principles regarding the foreseen high-level business process.

The BTCC defines the balancing timeframe as the timeframe close to real-time in which TSOs take actions to achieve the frequency targets of the synchronous area, and the Frequency Restoration Control Error (FRCE) quality targets of the load frequency control (LFC) block immediately before real time to ensure security of supply.

Therefore, unlike in other timeframes, there is no opportunity to make amendments after the closure of the market e.g. no possibility of additional capacity increasing measures as the balancing timeframe is very close to real-time and almost no time is available to activate RAs. For the same reason, virtual capacities (e.g. minRAM application or LTA inclusion) are not foreseen and need to be excluded for the capacity calculation within the balancing timeframe because of the short timeframe.

In addition, technical limitations and interrelations with other methodologies or processes are considered for BTCC to create an efficient and robust process.

3.1. Conceptual Approach

The conceptual approach for the balancing timeframe capacity calculation focuses on robustness and integration into the current and future process landscape while providing maximum capacities to the balancing platforms.

Therefore, one of the main objectives is to create synergies with the ROSC & IDCC implementation as much as possible to create a coherent process and sequential order as shown in Figure 3.1.

Figure 3.1: Order of ROSC, IDCC and BTCC

The starting point for the whole process chain is the ROSC process that creates DA and ID grid models. These grid models contain all agreed RAs and build the basis for the FB computation of the ID capacity calculation process. Afterwards, when the ID market has closed, the capacities will be updated within BTCC using the latest results from market allocations.

With the introduction of BTCC, the following changes are planned and alignment is still needed in order to enable optimal efficiency:

- Increase of the overall number of FB computations on DACF and IDCF models from 2 to 4
    - Align timings with planned DA CROSA and 3 ID CROSAs
    - Update of ID CCM could be necessary as only 2 FB computations are foreseen today
- Introduction of 96 dedicated ATC/NTC extractions within the balancing timeframe (every 15 minutes after each IDCZGCT)
    - Performed after each IDCZGT to consider all market allocations before updating BT capacities
    - Independency of the number of FB re-computation as former ID FB parameters will be reused as starting point

The output of the FB computations will be then used for the ID and BT process creating also potential benefits for the ID market as increasing the number of FB computations leads also to more frequent updates of ID capacity.

This approach is flexible as e.g. an increase of CROSA runs could also allow more updates of IDCC and BTCC, which results in the application of more recent grid models for both processes.
Streamlining and prioritizing the development in a way that is making sense is the main driver for this approach:

1. Aiming to use grid models that are congestion free after CROSA and thus create the optimal starting point for the capacity calculation
2. Offering updated capacities to the intraday market by increasing the frequency of the FB computations
3. Offering optimal capacities considering the latest market allocations within the balancing timeframe by better utilizing former calculated FB Domains

Thus, maximum efficiency can be created by offering optimal capacity while maintaining operational security. The high frequent ATC/NTC extraction is the best alternative to a FB allocation in balancing as it takes into account the latest ID trades updates after IDCZGCT for each 15 min MTU.

This concept is chosen to consider some major technical limitations of a capacity calculation process close to real-time as that it is not possible to perform a FB computation on a grid model including all recent updates after the IDCZGCT:

- neither from the input side, as updated grid models are not immediately available,
- nor from IT performance point of view, as the FB process cannot be performed in 18 minutes to meet the deadlines of the CMM (the 18 minutes is defined by the TERRE platform since the NTC and AAC should be provided to the CMM at t- 42min).

However, at a later stage, Core TSOs plan to investigate the added value of getting closer to real-time. Therefore, a study is foreseen as part of a TSO deliverable report.

3.2. Interactions with other methodologies

There are many interrelations with current and future process changes and milestones of ROSC, IDCC, balancing processes. Implementation of EB regulation article 40-42 and ID capacity allocation which is illustrated in Figure 3.2.

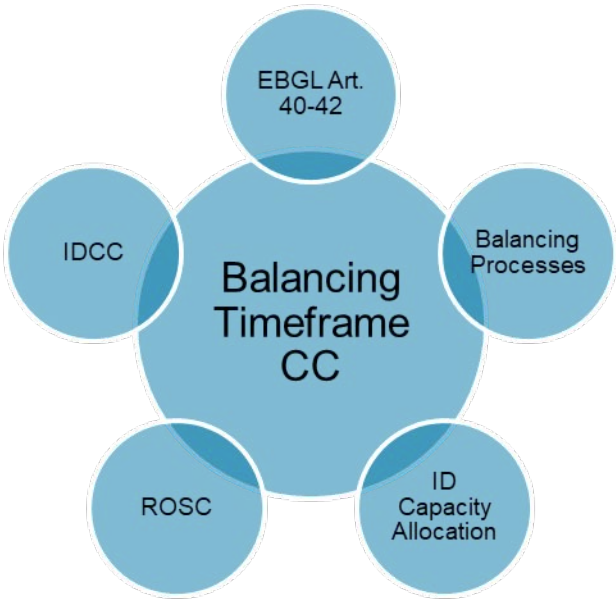


Figure 3.2: BTCC overview interrelations

3.2.1 Interaction with IDCC

- BTCC shall be consistent with the cross-zonal capacity calculation methodology applied in the ID time frame and thus defines the basic principles.
- Cross-zonal capacity remaining after the intraday cross-zonal gate closure time will be provided to the balancing platforms until BTCC is in operation, according to article 37.2 EB Regulation.
- Initially IDCC will provide NTCs for SIDC, this may change in the future.
- Planned for the first IDCC computation go-live in June 2023 and the year after for the second IDCC computation.

3.2.2 Interaction with ROSC

- The added value of the BTCC will be present, if more precise/secure/reliable input data (CGM) after DA or ID CROSAs will be available.
- 3 ID CROSAs will be introduced with ROSC V2.
- Process timings to be aligned.
- Planned ROSC V2 go-live in June 2025.

3.2.3 Interaction with other articles of EB regulation

- After implementation of EB regulation Art 40-42 reserved capacity for balancing (CZCA) need to be considered during BTCC
- Capacity allocated due to Balancing Cooperation cannot be treated as schedules (No netting)

3.2.4 Interaction with SIDC

- SIDC provides already allocated capacity (AAC) after LT, DA and ID allocations

3.2.5 Interaction with balancing platforms

- TERRE (RR process), MARI (mFRR process), PICASSO (aFRR process) and IGCC (IN process) use the same Capacity Management Module (CMM)
- CMM and Balancing Projects work together with the BTCC of all CCRs
- Harmonization over CCRs e.g., alignment on types of inputs, formats, timing is required
- Partly consumer-provider relation
- Set deadlines for input delivery T-42min (TERRE) and T-30min (MARI)

Figure 3.3 shows an overview of the planned CMM which manages the available capacities for various balancing processes (TERRE, MARI, PICASSO, IGCC).

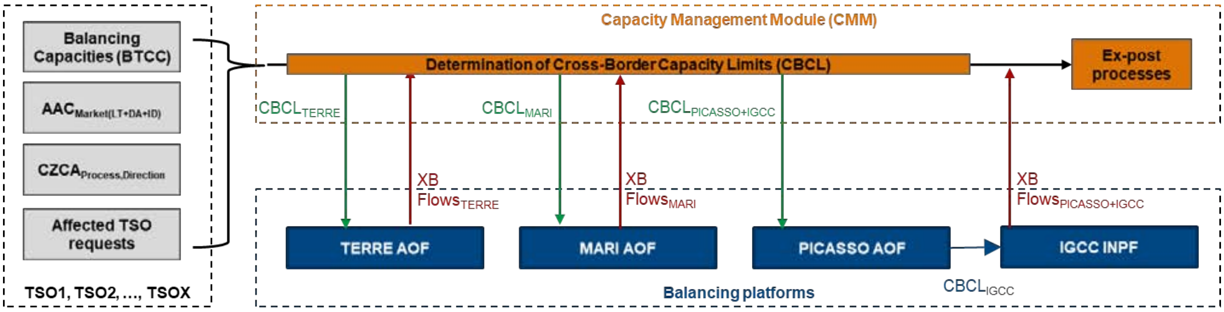


Figure 3.3: Overview Capacity Management Module

The BTCC process delivers the cross-zonal capacities that can be allocated for the balancing processes. In addition, the CZCA-s (Cross Zonal Capacity Allocations – EB regulation article 40-42) specific for each balancing platform allow a reservation of capacities upfront which could be provided to the balancing platforms.

An assessment of the CZCA impact on all the Core processes is ongoing. The impact of this assessment might trigger a review of the BTCC methodology at a later stage.
The Flow-Based methodology is currently not considered in any balancing platforms or Capacity Management Module which require the calculation of NTC values.

4. DETAILED DESCRIPTION OF THE BTCC PROCESS

In this chapter the balancing timeframe capacity calculation process is described in more detail.

4.1. General BTCC calculation process

The basic principle of the BTCC process consists in re-using the latest IDCC outputs (ID FB domain) as the main input for BTCC. Increasing the number of FB computations in the future (expected from 2 to 4, which is still to be aligned with future amendments of ID CCM) will enable to have a FB computation after each DA/ID CROSA. That way, all agreed RAs are implemented leading to the latest grid model being used as a starting point for all FB computations. The previous steps (retrieving secured grid models from CROSA, computing FB domain) are not properly run specifically for BTCC, but part of latest CROSA and IDCC processes. This is illustrated in Figure 4.1.

Based on the latest ID capacities input, ATC extraction will be performed 96 times a day (for each MTU) in the balancing timeframe, taking into account the final AAC after IDCZGCT. That way, the most up to date information can be considered for balancing timeframe.

Despite the very limited time available before the capacity provision deadline (H-42min for TERRE, H-30min for MARI / PICASSO, while H-60 is the Intraday Cross-Zonal Gate Closure Time), the Core TSOs keep the possibility to update the capacities to assure grid security during the validation phase. This should be coordinated.

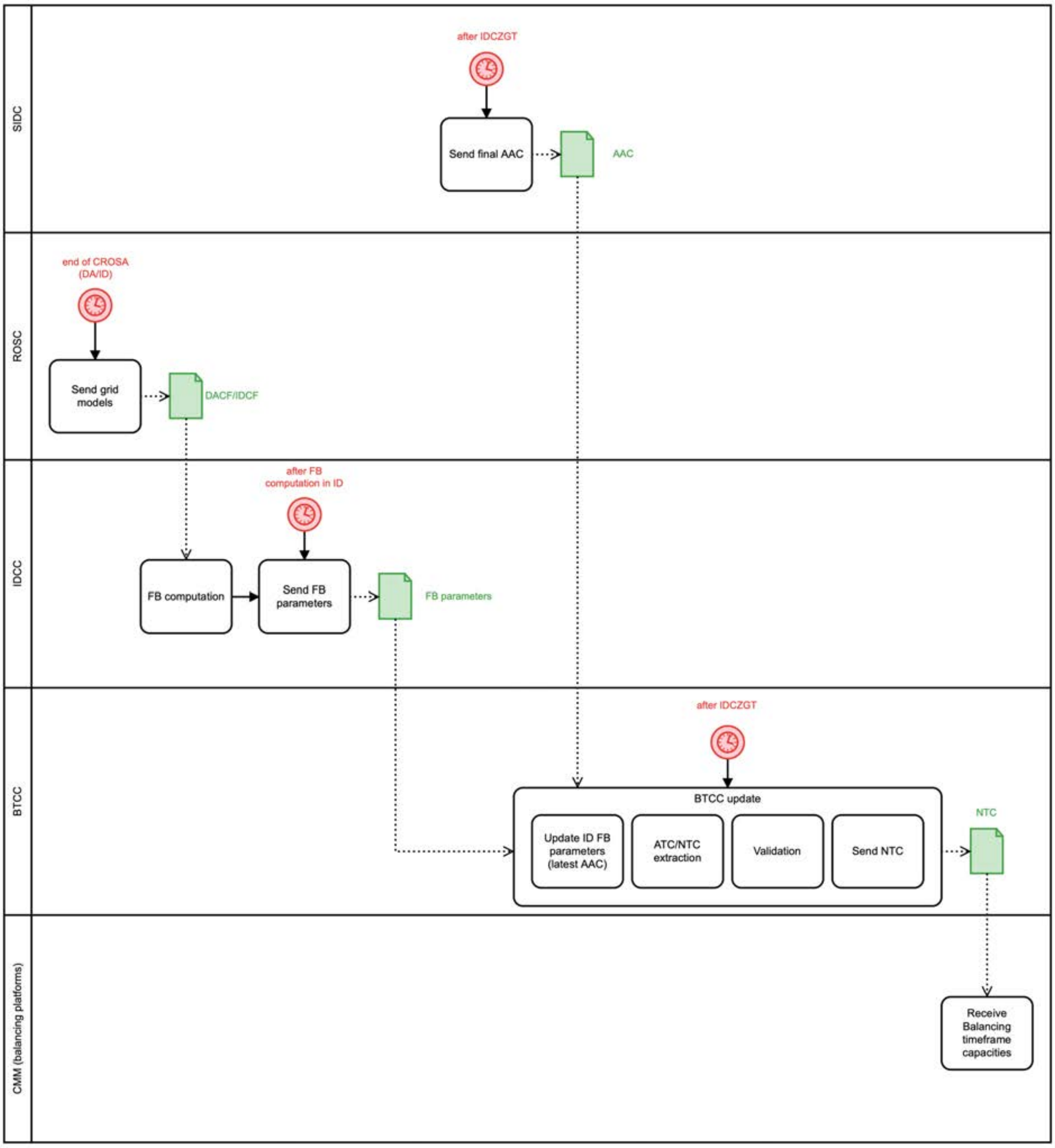


Figure 4.1: High level BTCC process

4.2. Inputs

The results of the latest IDCC process (FB computations) are used as the basis for updating BT capacities. These Flow-Based domains will be built using the grid models available after each CROSA (1 DA CROSA and 3 ID CROSA grid models outputs).

The following paragraphs provides more details about the inputs used.

4.2.1 Reliability margin methodology

According to Article 5 of the proposal, the flow reliability margin (FRM) defines the methodology of determining the level of reliability margin per critical network element and contingency (CNEC).

FRM is based on the assessment of the uncertainties involved in the FB CC process, it shall cover the following forecast uncertainties of the Balancing Timeframe:

(a) cross-zonal exchanges on bidding zone borders outside the Core CCR;

(b) generation pattern including specific wind and solar generation forecast;

(c) generation shift key;

(d) load forecast;

(e) topology forecast;

(f) unintentional flow deviation due to frequency containment process; and

(g) flow-based capacity calculation assumptions including linearity and modelling of external (non-Core) TSOs' areas.

The Core TSOs shall aim at reducing uncertainties by studying and tackling the drivers of uncertainty.

The Core TSOs shall use FRM values not higher than the FRM values used in the Core intraday capacity calculation. Under assurance of operational security, Core TSOs may further reduce the FRM.

4.2.2 Power transfer distribution factors

The BTCC process reuses the same $\boldsymbol{PTDF}$ matrix calculated during Core intraday capacity calculation process.

4.2.3 Remaining available margin (RAM)

According to Article 6 of the proposal, the remaining available margin of a CNE or a CNEC is the remaining capacity that can be given to the balancing market. This remaining available margin is calculated in two steps during BTCC process. The first step aims to update RAM values from IDCC taking into account BTCC FRM values in accordance with Article 5. The second step aims to take into account latest already allocated capacities (AAC) in the SIDC after ID CZGCT. The formulas to calculate the updated RAM values for BTCC can be found in the Article 6 of the methodology.

4.3. Description of the balancing timeframe capacity calculation process

The first step of the balancing timeframe capacity calculation is to update RAM values resulting from the latest intraday capacity calculation process by reflecting the FRM values defined for the BTCC process.

The updated RAM values for every CNEC are then used for the following steps of the capacity calculation. After receiving the latest AAC after ID CZGT the RAM values of the flow-based parameters are updated so that the latest allocations, that represent all energy trades allocated during the ID market, are taken into account.

Then, the same iterative approach as defined for the ID timeframe will be used to extract the available transfer capacities and thus gradually update the available capacities while respecting the constraints of the flow-based domain.

The iterative method consists mainly of the following actions for each iteration step k:

- Step one, for each CNEC and external constraint of the flow-based parameters the remaining available margin based on ATCs at iteration k-1 will be calculated

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

Equation 1

with

$\overrightarrow{RAM}_{ATC}(k)$	remaining available margin for ATC calculation at iteration k. $\overrightarrow{RAM}_{ATC}(0)$ indicates the starting point.
$\overrightarrow{ATC}_{k-1}$	ATCs at iteration k-1
$\mathbf{pPTDF}_{zone-to-zone}$	positive zone-to-zone power transfer distribution factor matrix

- For each CNEC, share $RAM_{ATC}(k)$ with equal shares among the Core oriented bidding zone borders with strictly positive zone-to-zone power transfer distribution factors on this CNEC;

- From those shares of $RAM_{ATC}(k)$, the maximum additional bilateral oriented exchanges are calculated by dividing the share of each Core oriented bidding zone border by the respective positive zone-to-zone PTDF.

- For each Core oriented bidding zone border, $\overrightarrow{ATC}_k$ is calculated by adding to $\overrightarrow{ATC}_{k-1}$ the minimum of all maximum additional bilateral oriented exchanges for this border obtained over all CNECs and external constraints as calculated in the previous step;

- Go back to step one;

Then, iterate until the difference between the sum of ATCs of iterations k and k-1 is smaller than 1kW.

Thereby, the consideration of already reserved capacities for the balancing timeframe or cross-zonal capacity allocations (CZCA) will be processed in accordance with the Core Intraday Capacity calculation methodology which concept will be described in more detail as part of one of the next ID methodologies amendments. An impact assessment on all Core CC timeframes processes is currently performed: the current BTCC design could potentially be impacted depending on the final global methodology.

Due to the increased number of ATC extractions, it is expected to better utilize the FB Domains and achieve more optimal capacities within the balancing timeframe.

Figures 4.2 and 4.3 highlight the differences between using the SIDC Leftover capacities and the updates according to the BTCC methodology on a situation that leads to block available capacities in certain directions in SIDC leftover.

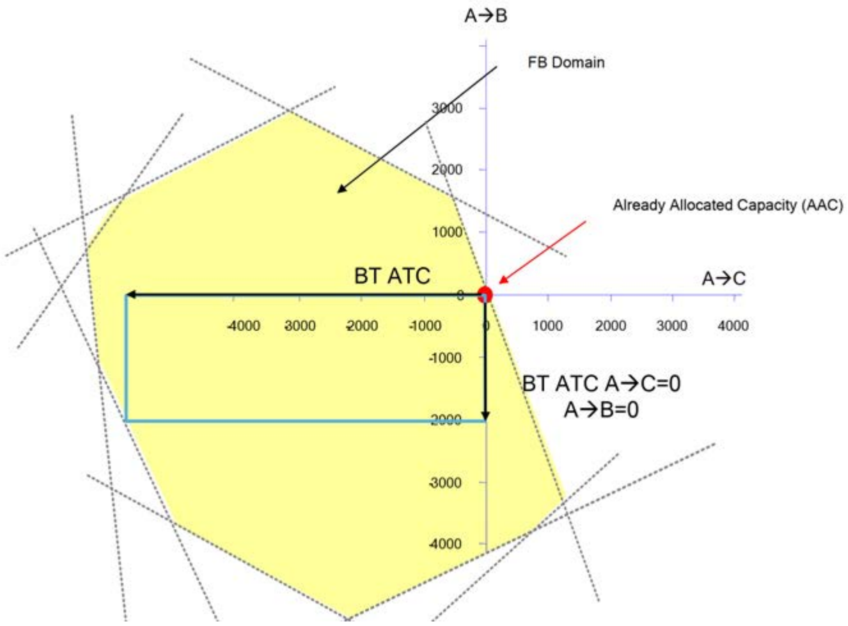


Figure 4.2: ATCs from IDCC (SIDC Leftover)

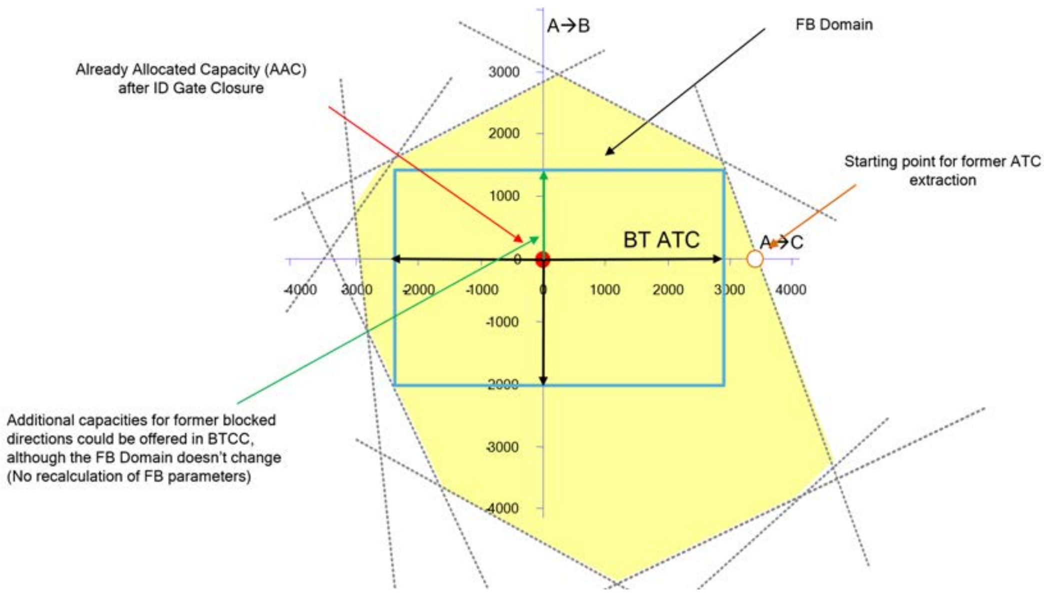


Figure 4.3: BTCC using a new ATC extraction for BTCC

Figure 4.3 shows that capacities for the former blocker direction (A to B) can be offered for the balancing timeframe solely due to the new ATC extraction, although the FB Domain didn't change. As this is done 96 times a day, after each IDCZGT, more capacities can be freed up and used for the balancing platforms, in particular for market directions that were fully used by the ID market.

Afterwards, the calculated ATC are converted to NTC by adding the AAC.
During the capacity calculation, the Evolved Flow Based (EFB) methodology is used to model and allow efficient allocation for cross-zonal capacities on HVDC interconnectors within Core CCR. Therefore, the

influence of DC cable exchanges and ATC exchanges on the margins of the CNEs in the FB model are taken into account i.e. PTDFs need to be computed that reflect the impact of the ATC exchanges or DC cable exchanges on the margins of the FB constraints.

For modelling exchanges with connected (C)NTC regions, the impact of exchange between both regions on the critical network elements with contingencies (CNECs) the BTCC methodology considers the same principles as the IDCC methodology.

After the ATC/NTC extraction, Core TSOs have the possibility to update and validate the capacities before provision to the balancing platforms. The objective of this process step is to ensure operational security in real-time. Therefore, each TSO can decrease capacities on its own borders after coordination with neighbouring TSOs. During the validation, additional or more recent information can be considered.

In addition, it is proposed to further investigate the possibility to increase capacities during the validation phase if deemed necessary to maintain operational security as part of a deliverable report.

Finally, the capacities are sent to the Capacity Management Module for the balancing platforms where they are ready for allocation of balancing energy. Each Core TSO has the possibility to decrease balancing capacities on its own border at any time after the capacities provision deadline to the Balancing Platform. The new value of balancing capacities resulting from the update is distributed towards balancing platform which is active at that point in time, and which can utilize the update values in upcoming activation runs.

TSOs act as data providers of key inputs (NTC, AAC, NPL, CZCA, $CZCL_{max}$ and ATP) for the calculation of CZCLs and NPLs which are distributed to balancing platforms in a sequence defined by the nature of the balancing process operated by each balancing platform after the IDCZGCT. Any update of CZCL input received from TSOs leads to the immediate recalculation of CZCL by the Capacity Management Module and delivery of updated CZCL to the balancing platform which process is active at a given point in time.

4.4. Transparency framework

Final ATC/NTC cross-zonal capacities the for the exchange of balancing energy and for operating the imbalance netting process will be published for each market time unit of the business day on a dedicated online communication platform. In case of a fallback capacity calculation process is triggered, fallback ATC/NTC will be published instead.

4.5. Post go-live study

Core TSOs commit to performing a post go-live study to assess the benefits of increasing the frequency of Flow-Based computations based on more recent grid models forecast available. The analysis shall focus on the overall efficiency of such an implementation.

The final scope and objectives of the study phase will be aligned with the spirit of EB regulation articles 37 and 3 as mentioned in chapter 2.

Using more frequent and recent information could impact the forecast quality. However, the actual benefits or drawbacks in terms of grid security and capacities cannot be assessed at the moment, in particular due to the uncertainties regarding the impact of the upcoming operational processes as ID CROSAs from ROSC and IDCC.

An investigation based on actual-data from the upcoming processes is required as there is no certainty that the closer-to-real-time grid models created in between CROSA runs are congestion free and building an optimal basis for a capacity calculation process or leading to an enhancement of the operational security.

The scope of the study should contain one year of data after the implementation of the BTCC methodology to reflect different seasonal effects as winter and summer situations and consider all effects as altered ID allocations due to updated ID capacities from the latest methodology changes. However, some preparatory steps as defining the final study scope and development of required analysis tools can be initiated earlier.

This study is one of the keystones of the proposed multi-step approach when aiming for an optimal solution for BTCC by using more improved forecasts while respecting technical limitations that prevent performing FB computations on grid models including all recent information after ID CZGCT in 18 minutes and its potential drawbacks.

The results of the study will be used to amend the proposed BTCC methodology in the future and define the final process for calculating capacities within the balancing timeframe.

4.6. Timescale and foreseen phases for implementation

The TSOs of the Core CCR shall start the implementation process of the balancing timeframe capacity calculation methodology with the entry into force of this methodology and will consist of the following steps:

(a) internal parallel run, during which the TSOs will test the operational processes for the balancing capacity calculation process and the balancing capacity validation, and develop the appropriate IT tools and infrastructure;

(b) external parallel run, during which the TSOs will continue testing their internal processes and IT tools and infrastructure. In addition, the Core TSOs will involve the external stakeholders participants to test the effects of applying this methodology on the system. This phase shall not be shorter than 3 months.

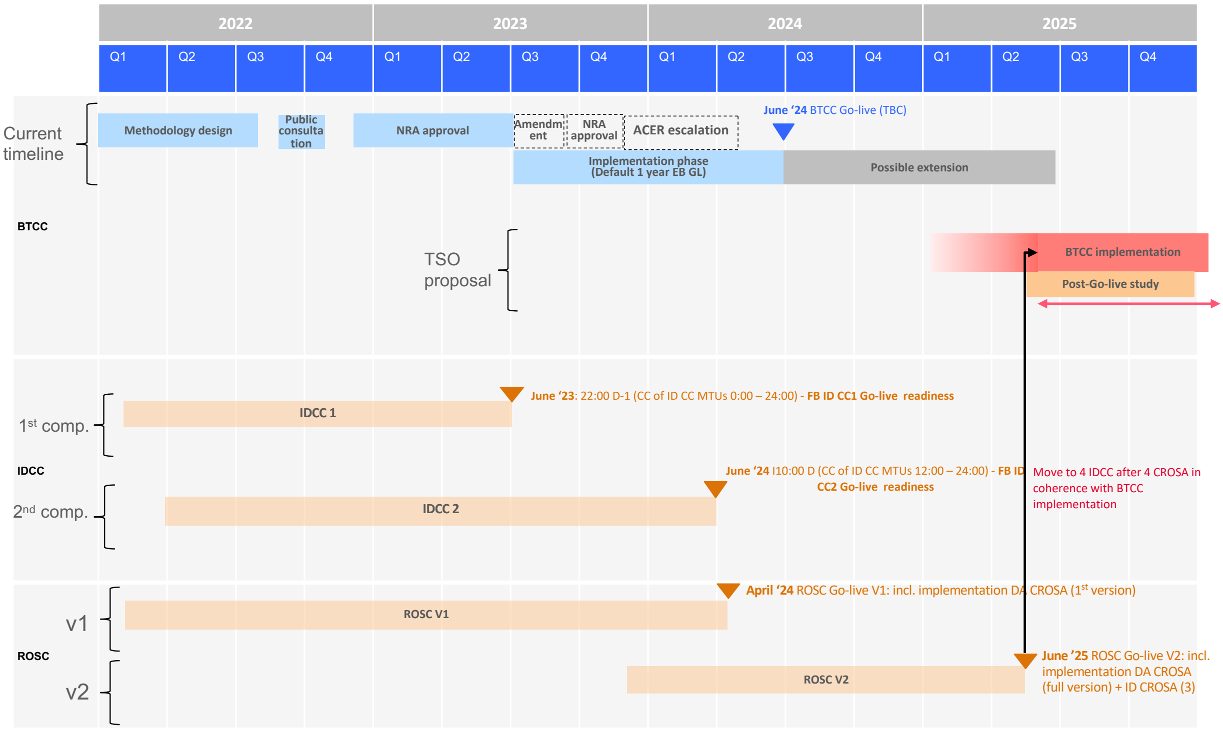
As depicted in the previous paragraphs 3.2 and 4.5, the Core TSOs propose the following stepwise approach for the implementation of a coherent, optimized, robust and safe BTCC process:

1. Increase the overall number of FB computations on DACF and IDCF models from 2 to 4

2. Introduction of 96 dedicated ATC/NTC extractions within the balancing timeframe (for each MTU)

3. A post go-live study phase, which would focus on the possible benefits of getting a process with higher frequency and closer to real-time input updates (FB domain computation).

Figure 4.4 highlights the dependencies of BTCC process with ROSC and IDCC. It is especially relevant to highlight that BTCC first step implementation (based on the aforementioned points 1 and 2) should take place after the implementation of 3 ID CROSAs and the additional IDCC computations (2 to 4 FB computations):



4.4. Implementation timeline

The proposal is to rely on an implementation approach, which is feasible along with multiple parallel implementation streams (start small and iterate towards the end-goal: multi-step approach). The final scope would be clarified by a post-go-live study once experience and data from IDCC / ROSC processes are available.

This proposal also fulfills the legal requirements of the EB regulation article 37 (updating capacities within the BT, consistency with IDCC, avoiding market distortions) and is in line with the defined objectives in EB regulation article 3: apply the principle of optimization between the highest overall efficiency and *lowest total costs for all parties involved;* take into consideration agreed European standards and technical specifications.