

**DECISION No 03/2023
OF THE EUROPEAN UNION AGENCY
FOR THE COOPERATION OF ENERGY REGULATORS**

of 18 January 2023

**on the long-term capacity calculation methodology
of the Core capacity calculation region**

THE EUROPEAN UNION AGENCY FOR THE COOPERATION OF ENERGY REGULATORS,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EU) 2019/942 of the European Parliament and of the Council of 5 June 2019 establishing a European Union Agency for the Cooperation of Energy Regulators¹ ('ACER'), and, in particular, Article 5(3) and Article 6(10) thereof,

Having regard to Commission Regulation (EU) 2016/1719 of 26 September 2016 establishing a guideline on forward capacity allocation ('FCA Regulation')², and, in particular, Article 4, paragraphs (5), (7)(a) and (10) thereof,

Having regard to the outcome of the consultation with the concerned regulatory authorities and transmission system operators,

Having regard to the outcome of the consultation with ACER's Electricity Working Group ('AEWG'),

Having regard to the favourable opinion of the Board of Regulators of 13 January 2023, delivered pursuant to Article 22(5)(a) of Regulation (EU) 2019/942,

Whereas:

¹ [OJ L 158, 14.6.2019, p. 22.](#)

² [OJ L 259, 27.9.2016, p. 42.](#)

1 INTRODUCTION

- (1) The FCA Regulation sets out requirements for cross-zonal capacity allocation and congestion management in the long-term time frame in electricity. These requirements include the development of a common capacity calculation methodology ('CCM') in each of the capacity calculation regions ('CCR') in accordance with Article 10 of this Regulation.
- (2) Pursuant to Article 4(1), Article 4(7)(a) as well as Article 10 of the FCA Regulation, transmission system operators ('TSOs') of each CCR, such as those of the Core CCR ('Core TSOs'), are required to jointly develop a proposal for a common CCM for long-term time frames within their respective region and submit it to the regulatory authorities of that region for approval. The regulatory authorities are required to reach an agreement and take a decision on the proposal for CCM within six months after the receipt of the proposal by the last regulatory authority, according to Article 4(9) of the FCA Regulation. Where the regulatory authorities have not been able to reach an agreement within the six-month period, or upon their joint request, ACER shall adopt a decision concerning the proposal within 6 months, in accordance with Article 4(10) of the FCA Regulation, as well as Article 5(3) and point (b) of the second subparagraph of Article 6(10) of Regulation (EU) 2019/942.
- (3) By Decision No 14/2021 of 3 November 2021 on the long-term capacity calculation methodology of the Core capacity calculation region ('Decision 14/2021'), ACER approved the Core TSO's proposal of November 2021 for a 'common coordinated long-term capacity calculation methodology in accordance with article 10 of Commission Regulation (EU) 2016/1719', on which the regulatory authorities of the Core CCR ('Core regulatory authorities') could not agree. ACER approved the long-term CCM ('LT CCM') proposed by the Core TSOs subject to amendments.
- (4) Following an appeal by Polish TSO Polskie Sieci Elektroenergetyczne S.A. ('PSE') against Decision 14/2021, ACER's Board of Appeal remitted the case to the competent body of ACER by Decision A-001-2022 of 7 July 2022 ('BoA Decision A-001-2022').
- (5) The present Decision replaces Decision 14/2021. Annex I to this Decision sets out the Core LT CCM as decided by ACER.

2 PROCEDURE

2.1 Proceedings before the Core regulatory authorities

- (6) By letter of 29 August 2019, the Core TSOs informed the Core regulatory authorities and ACER that they had failed to meet the deadline set out in Article 10(1) of the FCA Regulation regarding the development of a proposal for the Core LT CCM.³
- (7) During a teleconference of 5 December 2019 between representatives of the European Commission, ACER, the Core regulatory authorities and the Core TSOs, the following was agreed:
 - (a) By 9 December 2019, the Core TSOs would submit to the Core regulatory authorities the results of their first experimentation and a high-level explanation, followed by an oral assessment of the results during the Core Implementation Group (IG) meeting of 13 December 2019;
 - (b) By 17 December 2019, the Core TSOs would provide a report with a more detailed assessment of the preliminary results, together with an updated timeline for adopting the methodology; and
 - (c) By 19/20 December 2019, the European Commission would discuss the results of the first experimentation with ACER and the Core regulatory authorities, and define the way forward.
- (8) By email of 27 January 2020, the Core TSOs provided to the Core regulatory authorities the “Core TSOs’ Long-Term Capacity Calculation Interim Experimentation Report” (‘Experimentation Report’). In the accompanying letter, the Core TSOs proposed further experimentation.
- (9) During a conference call on 11 February 2020 between the European Commission, ACER, the Core regulatory authorities and the Core TSOs, it was questioned whether further experimentations would bring fundamentally different results to those already presented by the TSOs. It was decided to stop experimentations and to explore three alternative approaches: (a) a statistical approach with coordinated NTC allocation, (b) a scenario-based approach with flow-based allocation; and (c) a statistical approach

³ Article 10(1) of the FCA Regulation requires the submission of the proposal no later than six months after the approval of the common coordinated capacity calculation methodology referred to in Article 9(7) of Commission Regulation (EU) 2015/1222 (‘CACM Regulation’). This methodology was approved for the Core CCR on 21 February 2019 by ACER Decision No 02/2019. Therefore, the Core TSOs were required to submit the proposal for the Core LT CCM by 21 August 2019.

with flow-based allocation. The Core TSOs agreed to provide a high-level qualitative analysis of the three alternative approaches by 20 March 2020.

- (10) At the Core IG meeting of 15 April 2020, the Core TSOs informed that there was no agreement among them as to the preferred approach. ACER proposed for the Core LT CCM the scenario-based approach with flow-based allocation, and with a possibility for a coordinated NTC as a transitional solution. The Core TSOs were asked to provide their position on ACER's proposed approach.
- (11) At the Core IG meeting of 25 May 2020, the Core regulatory authorities supported the approach proposed by ACER.
- (12) By email of 3 September 2020, the Core TSOs communicated that at their Steering Group meeting of 2 September 2020, they had agreed to focus on the targeted methodology for the implementation, i.e. with flow-based calculation and allocation, consequently to leave aside coordinated NTC extraction including the ideas of min-max bounds or variable minimum RAM calibrated on historical capacities that would have been included in the methodology, and to continue the discussion on the implementation timeline.
- (13) On 16 September 2020, the Core TSOs launched a public consultation on a proposal for a common LT CCM based on a direct implementation of a scenario-based flow-based approach. On 21 October 2020, the Core regulatory authorities provided their shadow opinion on the consulted proposal to the Core TSOs.
- (14) On 26 November 2020, the Core TSOs started the formal submission process to the Core regulatory authorities. The last Core regulatory authority received the Proposal on 23 December 2020. The formal submission included the following documents:
 - (a) Core CCR TSOs common coordinated long-term capacity calculation methodology in accordance with Article 10 of Commission Regulation (EU) 2016/719 of 26 September 2016 establishing a guideline on forward capacity allocation ('the Proposal')⁴; and
 - (b) Explanatory document to the Core CCR TSOs common coordinated long-term capacity calculation methodology in accordance with Article 10 of Commission Regulation (EU) 2016/1719 of 26 September 2016 establishing a guideline on forward capacity allocation ('Explanatory document');

⁴ The Core TSOs' Proposal is referred to in this Decision as 'the Proposal'. The same proposal amended by ACER and provided in Annex I to this Decision is referred to as 'the amended Proposal'.

- (c) Consultation Report on Core CCR TSOs' methodology for long-term capacity calculation in accordance with Article 10 of the Commission Regulation (EU) 2016/1719 of 26 September 2016 establishing a guideline on forward capacity Allocation.⁵

2.2 Proceedings before ACER

- (15) By letter of 29 April 2021, the Chair of the Core Energy Regulators' Regional Forum (CERRF)⁶, acting on behalf of the Core regulatory authorities, referred the Proposal to ACER for a decision pursuant to Article 4(10) of the FCA Regulation. As explained in the letter, the Core regulatory authorities jointly concluded that the Proposal insufficiently takes into account their shadow opinion of 21 October 2020 and provides an excessively long implementation timeline. Furthermore, the Core regulatory authorities concluded that they are not in a position to approve the submitted Proposal, or request further amendments, since they are not able to find a common agreement on several key aspects of the Proposal.
- (16) A detailed description of the individual and joint positions of the Core regulatory authorities are presented in the "Non-paper of all Core regulatory authorities on Core TSOs common coordinated long-term capacity calculation methodology proposal in accordance with Article 10 of Commission Regulation (EU) 2016/1719 of 26 September 2016 establishing a guideline on forward capacity allocation" ('non-paper') provided to ACER on 2 June 2021. In particular, the Core regulatory authorities had divergent views on the following key aspects of the Proposal:
- (a) Methodology for allocation constraints;
 - (b) Methodology for critical network elements and contingencies (CNECs)⁷ selection;
 - (c) Scenarios and calculation timestamps;
 - (d) Computation of power transfer distribution factors (PTDF);

⁵ Available at: https://eepublicdownloads.entsoe.eu/clean-documents/Network%20codes%20documents/Implementation/ccr/methodologies/20201125_Core_LTCC_Public_Consultation_Report.pdf.

⁶ CERRF is a platform of the Core regulatory authorities to consult and cooperate for reaching a unanimous agreement on NEMO's and TSO's proposals.

⁷ The acronym for Critical Network Element is 'CNE' and for Critical Network Element with Contingency it is 'CNEC'.

- (e) Computation of the remaining available margin (RAM) on critical network elements;
 - (f) Validation methodology;
 - (g) Long-term product definition;
 - (h) Publication of data; and
 - (i) Timescale for implementation and connection to other acts.
- (17) On 5 July 2021, ACER launched a public consultation⁸ on the Proposal, inviting all the interested parties to submit their comments by 31 July 2021. In the consultation survey, ACER asked stakeholders to provide views on six key aspects of the Proposal: (i) application of the flow-based approach; (ii) selection of critical network elements; (iii) application of minimum remaining available margin (minimum RAM); (iv) application of allocation (external) constraints limiting total import or export of a bidding zone; (v) implementation timeline and revision of the methodology; (vi) other proposed amendments, such as the application of alternating current (AC) load flow, fallback procedure and data publication. The summary and evaluation of the responses received are presented in Annex II to this Decision.⁹ ACER also organised a public consultation workshop with all the interested stakeholders, on 9 July 2021.
- (18) Moreover, ACER has engaged in extensive discussions with the Core TSOs and the Core regulatory authorities and consulted them on the amendments to the proposed LT CCM via numerous teleconferences and exchanges of documents, including a hearing phase between 3 and 17 September 2021. ACER has also carried out an experimentation of the proposed LT CCM by simulating the yearly capacity calculation and auctions on the basis of the grid data from 2020 provided by the Core TSOs and market participants' bids available at the Joint Allocation Office (JAO). The complete experimentation results were shared with all Core regulatory authorities and TSOs.
- (19) In particular, the following procedural steps have been taken:
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| 26 May 2021 | Kick-off meeting (teleconference) with the Core TSOs and the Core regulatory authorities; |
| 2 June 2021 | Working meeting (teleconference) with the Core TSOs and the Core regulatory authorities; |

⁸ [PC 2021 E 06](#).

⁹ Non-confidential responses are published on ACER's consultation page: [PC 2021 E 06](#).

8 June 2021	Information on the Core LT CCM process provided to the Forward Capacity Allocation Task Force (FCA TF);
16 June 2021	Working meeting (teleconference) with the Core TSOs and the Core regulatory authorities;
21 June 2021	Mathematical formulation of explicit flow-based auctions provided to the Core TSOs and the Core regulatory authorities;
30 June 2021	Working meeting (teleconference) with the Core TSOs and the Core regulatory authorities;
1 July 2021	Information on the Core LT CCM process provided at the Core regulatory authorities meeting;
5 July 2021	Draft amended Proposal for the Core LT CCM provided to the Core TSOs and the Core regulatory authorities;
7 July 2021	Working meeting (teleconference) with the Core TSOs and the Core regulatory authorities;
7 August 2021	Preliminary flow-based capacity calculation results from ACER's experimentation provided to the Core TSOs and the Core regulatory authorities;
24 August 2021	Information on the Core LT CCM process provided to the FCA TF;
30 August 2021	Draft amended Proposal for the Core LT CCM, including ACER's reasoning for amendments, as well as draft experimentation results (auctions simulations) provided to the Core TSOs and the Core regulatory authorities;
31 August 2021	Working meeting (teleconference) with the Core TSOs and the Core regulatory authorities;
31 August 2021	Full experimentation results (auctions simulations with original bids from 2020) and examples of the minimum RAM and PTDF threshold application provided to the Core TSOs and the Core regulatory authorities;
1 September 2021	ENTSO-E feedback regarding the common grid modelling action plan provided to the Core TSOs and the Core regulatory authorities;
3 September 2021	Draft amended Proposal for the Core LT CCM, public consultation replies and additional examples of minimum RAM

- application provided to the Core TSOs and the Core regulatory authorities (start of the hearing phase);
- 7 September 2021 Working meeting (teleconference) with the Core TSOs and the Core regulatory authorities, dedicated to the experimentation results;
- 7 September 2021 Information on the Core LT CCM process provided to the AEWG;
- 8 September 2021 Additional experimentation results (auctions with bids with averaged prices), minimum RAM examples and the example of calculating clearing prices and congestion revenue provided to the Core TSOs and the Core regulatory authorities;
- 9 September 2021 Information on the Core LT CCM process provided to the Core national regulatory authorities meeting;
- 10 September 2021 Additional experimentation results (auctions with minimum RAM based on historical NTC values) provided to the Core TSOs and the Core regulatory authorities;
- 15 September 2021 Oral hearing of the French TSO and the French regulatory authority;
- 16 September 2021 Oral hearing of the Dutch, Belgian and French regulatory authorities;
- 17 September 2021 Examples of calculation of economic surplus (social welfare) and maximum non-simultaneous bilateral exchanges provided to the Core TSOs and the Core regulatory authorities;
- 17 September 2021 Closure of the hearing phase;
- 8 October 2021 AEWG's advice on the draft amended Proposal for the Core LT CCM;
- 27 October 2021 BoR's opinion on the draft amended Proposal for the Core LT CCM;
- 3 November 2021 BoR's favourable opinion on the final amended Proposal for the Core LT CCM.
- (20) On 15 November 2021, ACER published its Decision 14/2021.
- (21) On 3 January 2022, PSE brought an appeal against Decision 14/2021.

(22) On 7 July 2022, by Decision A-001-2022, the Board of Appeal declared part of PSE's appeal as well-founded and remitted the case to the competent body of ACER. The Board of Appeal found an error in the way in which Article 17(1)(c) of Annex I to Decision 14/2021 restricted the TSOs' right to correct long-term capacity at the validation stage. Article 17(1)(c) of Annex I to Decision 14/2021 provided that a Core TSO may do an individual validation adjustment where the TSO requiring an adjustment provides justification that the calculated level of a RAM is unable to ensure operational security, which cannot be modelled via the input data for the capacity calculation process. According to the Board of Appeal, this provision did not cover security constraints that can be modelled, and which are overwritten by the minRAM application (precisely because they can be modelled), thereby creating an ambiguity.

(23) Following the BoA Decision A-001-2022, the following steps were taken:

7 October 2022	Teleconference meeting with PSE;
17 October 2022	Teleconference meeting with PSE;
19 October 2022	Information on the Core LT CCM amendment process provided to the Core regulatory authorities;
20 October 2022	Information on the Core LT CCM amendment process provided to the Core regulatory authorities and TSOs at the Core Implementation Group meeting;
11 November 2022	Draft amended Decision and Core LT CCM provided to the Core TSOs and Core regulatory authorities;
23 November 2022	Discussion of ACER's intended revisions of the Decision and Core LT CCM at the AEWG;
25 November 2022	Oral hearing meeting with Core TSOs and regulatory authorities;
5 December 2022	AEWG's advice on the draft amended Decision and Core LT CCM;
13 January 2023	BoR's favourable opinion on the draft amended Decision and Core LT CCM.

3 ACER'S COMPETENCE TO DECIDE ON THE PROPOSAL

(24) Pursuant to point (b) of the first subparagraph of Article 5(3) of Regulation (EU) 2019/942, all regulatory authorities of the region concerned shall unanimously agree on proposals for terms and condition or methodologies for the implementation of those network codes or guidelines that were adopted before 4 July 2019 and require the

approval of all the regulatory authorities of the region concerned; pursuant to the second subparagraph of Article 5(3) of Regulation (EU) 2019/942, those regulatory authorities may refer the proposals to ACER for approval pursuant to point (b) of the second subparagraph of Article 6(10) of Regulation (EU) 2019/942, and they shall do so pursuant to point (a) of the second subparagraph of Article 6(10) of that Regulation where they did not reach a unanimous agreement.

- (25) Pursuant to Article 4(7)(a) of the FCA Regulation, which has been adopted as a guideline before 4 July 2019, the proposal for a common capacity calculation methodology pursuant to Article 10 of the same Regulation shall be subject to approval by all regulatory authorities of the concerned region.
- (26) Pursuant to Article 4(10) of the FCA Regulation, where the regulatory authorities have not been able to reach an agreement on the submitted proposal within 6 months, or upon their joint request, ACER shall adopt a decision concerning the submitted proposal in accordance with Article 5(3) and the second subparagraph of Article 6(10) of Regulation (EU) 2019/942.
- (27) Pursuant to Article 4(5) of the FCA Regulation, ACER, before approving the terms and conditions or methodologies, shall revise the proposals where necessary, after consulting the respective TSOs, in order to ensure that they are in line with the purpose of the FCA Regulation and contribute to market integration, non-discrimination, effective competition and the proper functioning of the market.
- (28) On 29 April 2021, the Core regulatory authorities informed ACER that they are not able to reach an agreement on the Proposal, nor request amendments, and have jointly requested ACER to take a decision in that matter. Therefore, ACER is competent to decide on the Proposal based on Article 4(10) of the FCA Regulation, Article 5(3) and point (b) of the second subparagraph of Article 6(10) of Regulation (EU) 2019/942.

4 SUMMARY OF THE PROPOSAL

- (29) The Core TSOs' Proposal for the LT CCM consists of the following elements:

‘Whereas’	Recitals 1 to 16	Explains the purpose of the LT CCM and how it promotes the objectives of the FCA Regulation;
Title 1	Articles 1 to 3	General provisions cover the subject matter and the scope of the methodology, definitions and a high-level long-term capacity calculation process;
Title 2	Articles 4 to 11	Treatment of input describes methodologies for the calculation of the inputs, i.e. reliability margin, operational security limits, allocation constraints, critical network elements with contingencies, generation shift keys, remedial actions in capacity calculation, scenarios and calculation

timestamps, and integration of cross-zonal high voltage direct current interconnectors;

Title 3	Articles 12 to 16	Description of the capacity calculation process provides a description of the capacity calculation approach; i.e. treatment of inputs and capacity calculation outputs, calculation of PTDF, the calculation of RAM on CNECs, consideration of non-Core bidding zone borders and the fallback procedure;
Title 4	Article 17	Validation process provides the capacity validation methodology;
Title 5	Article 18	Updates set out the provisions on methodology review and updates;
Title 6	Articles 19 to 20	Report covers the publication of data, provision of information for monitoring by the regulatory authorities;
Title 7	Articles 21 to 22	Implementation and language sets out the implementation timeline for the methodology and language provisions; and
Annex 1		Provides the justification for calculation of external constraints and its application.

5 SUMMARY OF THE OBSERVATIONS RECEIVED BY ACER

5.1 Initial views of the Core regulatory authorities

- (30) In the letter of the Chair of the CERRF of 29 April 2021, and the non-paper of 2 June 2021, the Core regulatory authorities reported shortcomings of the Proposal.
- (31) In the non-paper, the Core regulatory authorities have reached an agreement on several aspects of the Proposal, in particular:
- (a) The Core regulatory authorities recognise that the process of preparing scenarios and calculation timestamps could improve in several aspects, such as base case quality and the application of the common grid model exchange standard ('CGMES') format;
 - (b) The Core regulatory authorities expect that in order to be efficiently implemented in the future, the Proposal should provide concrete steps, or at least references, for the formation of the long-term products, and its correlation with applied network scenarios;

- (c) Regarding the calculation of reference flow (Fref), the Core regulatory authorities are of the view that common grid models should be robust enough to support the alternating current ('AC') load flow solution;
 - (d) The Core regulatory authorities support the increase in transparency of the LT CCM;
 - (e) The Core NRAs agree that the proposed implementation timescale of five years is excessively long for the required developments.
- (32) In the non-paper, the Core regulatory authorities failed to reach an agreement on several aspects of the Proposal, in particular:
- (a) The application of the allocation constraints, in particular the external constraints, by the Dutch and the Polish TSOs, as explained in Annex 1 of the Proposal;
 - (b) The methodology for CNEC selection, in particular its compatibility with the DA CCM;
 - (c) The application of the PTDF sensitivity threshold for the long-term capacity allocation;
 - (d) The level of minimum RAM threshold; and
 - (e) The proposed validation methodology.

5.2 Engagement with the Core TSOs and the Core regulatory authorities

- (33) During the decision-making process for Decision 14/2021, ACER engaged in in-depth discussions with the Core TSOs and the Core regulatory authorities. In particular, ACER:
- (a) took into account the Core TSOs' proposals and the improvements aspects suggested by the Core regulatory authorities with regard to the application of common grid models on the basis of the Common Grid Model Methodology ('CGMM')¹⁰ pursuant to Article 18 of the FCA Regulation, and proposed amendments to the Proposal which enable a flexible modelling approach (increased CGM granularity and application of planned outages), suitable for the Core LT CCM, until the next CGMM amendment;

¹⁰ <https://eepublicdownloads.entsoe.eu/clean-documents/nc-tasks/CGMM%20amended%20proposal%20approved.pdf>

- (b) specified the capacity calculation outputs in relation to the possible application for the long-term flow-based capacity auctions, providing the definition of these outputs as a union of constraints calculated on the basis of all applied common grid models at yearly and monthly auctions respectively;
 - (c) provided concrete analyses to support the application of AC load flow for the reference flow calculation, based on experimentation;
 - (d) aligned transparency requirements with the corresponding requirements of the Core DA CCM;
 - (e) discussed the implementation process in detail, in order to define a feasible implementation deadline in the light of required developments;
 - (f) analysed the need for the application of allocation constraints to ensure compatibility with their application in the day-ahead time frame;
 - (g) discussed the reasons for ensuring compatibility between the initial CNEC list applied in the long-term time frames with the one applied in the day-ahead time frame;
 - (h) provided relevant examples to support the proposal to omit the PTDF sensitivity threshold for the long-term capacity allocation, based on the need to maintain the additivity of applied PTDF values and the consequential clearing prices;
 - (i) carried out necessary experimentation to support the decision of the minimum RAM selection, by simulating the yearly auctions with different level of minimum RAM applied; and
 - (j) aligned the validation methodology with realistic assumptions regarding its application in the long-term time frame.
- (34) Following the remittal of the case by BoA Decision A-001-2022, ACER consulted PSE about possible ways to address the error found by the Board of Appeal and informed the Core regulatory authorities and the TSOs at meetings on 19 and 20 October accordingly.
- (35) At the Core Implementation Group meeting on 20 October 2022 amendments of the Core long-term splitting methodology were discussed, including the combined application of minimum RAM at yearly level and long-term splitting factor, which would ensure the availability of minimum RAM upon the yearly capacity calculation process. Some Core TSOs and regulatory authorities were of the opinion that such a provision is more suitable for the Core LT CCM than for the Core long-term splitting methodology. To this end, ACER proposed to use the opportunity of amending the Core

LT CCM to also modify the provisions related to the application of splitting factor in combination with yearly minimum RAM.

- (36) In response to ACER's preliminary position for the present Decision, which focused on the changes to the proposed Core LT CCM compared to the one under Decision 14/2021, the following comments were received:
- (a) All Core TSOs submitted a joint response. They expressed legal and substantive concerns against including the proposed modification related to the application of the splitting factor in the present methodology amendment. They did not object the proposed changes to Article 17(1) and (2), but suggested improvements of the wording in Article 17(2);
 - (b) URE partially shared the TSOs' legal concerns against including the proposed modification related to the application of the splitting factor in the present methodology amendment; and
 - (c) ILR commented on the consequences of the application of proposed modification to the different levels of minimum RAM.

5.3 Public consultation

- (37) Responses to ACER's public consultation (see paragraph (17) above) are summarised in Annex II to this Decision. A summary of key comments is provided below:
- (a) Majority of stakeholders supported the application of a flow-based approach, while some did not agree that the flow-based approach would be more efficient than the coordinated NTC-based approach;
 - (b) Majority of stakeholders supported ACER's proposal for a more coordinated approach to the CNEC selection.
 - (c) Majority of stakeholders supported the application of a minimum RAM value higher than 20% of maximum flow (F_{max}) provided in the Core TSOs' Proposal;
 - (d) Majority of stakeholders were against the inclusion of external constraints, while some stakeholders saw the need to apply them in the long-term time frame;
 - (e) Some stakeholders were concerned about the 2.5 years implementation deadline proposed by ACER and stressed the importance of providing sufficient time for the application of the Core LT CCM;
 - (f) Some stakeholders highlighted the need for additional transparency in data publication, in particular in the context of the reliability margin, operational security limits, and capacity validation.

5.4 Consultation of the AEWG

- (38) With regard to the draft Decision underlying Decision 14/2021, the AEWG provided its advice on 8 October 2021 and broadly endorsed that draft Decision, noting that:
- (a) the set minRAM values of 20% (yearly) + 10% (monthly) seem to be a good starting point, further analyses are needed during the implementation period;
 - (b) the final Core LT CCM Decision should balance the need for proper governance related to crucial elements of the methodology with avoiding barriers for the timely implementation of the methodology; and
 - (c) stakeholders should be informed in more detail about the consequences of the Core LT CCM Decision.
- (39) Five regulatory authorities provided individual comments during the consultation phase. These related to:
- (a) the setup of minimum RAM values and/or its governance; in particular, two regulatory authorities were concerned about the possibility of amending the minRAM values by the Core TSOs' Steering Committee;
 - (b) the need to inform market participants about the experimentation results provided at the market electricity system committee (MESC) held on 29 September 2021; and
 - (c) potential interactions of the Core LT CCM with other methodologies.
- (40) With regard to the present Decision, the AEWG provided its advice on 5 December 2022 and broadly endorsed the draft Decision. In that context, ARERA, the Italian Regulatory authority, noted that regulatory authorities other than those of the Core CCR should be invited to the technical discussions concerning the Core CCR, and that in particular ARERA should be involved in the technical debates in view of the expectation that the Italy North CCR and the Core CCR would be merged. ARERA did not have any content-related comments on the present LT CCM.
- (41) ACER has considered AEWG's advices and the individual comments in finalising this Decision, and further discussed bilaterally with the respective regulatory authorities, where needed.

6 ASSESSMENT OF THE PROPOSAL

6.1 Legal framework

- (42) Article 4(1), Article 4(7) (a) and Article 10(1) of the FCA Regulation require the TSOs of each CCR to develop a proposal for a common long-term CCM within their

respective region and submit it to the regulatory authorities of that region for approval by the deadline set out in the Regulation.

- (43) Article 10(1) of the FCA Regulation further specifies that the TSOs of a CCR shall submit the proposal for a common long-term CCM no later than six months after the approval of the common coordinated capacity calculation methodology referred to in Article 9(7) of the CACM Regulation, and that such proposal shall be consulted in accordance with Article 6 of the FCA Regulation.
- (44) Article 10(2) of the FCA Regulation requires that the approach used in the common long-term CCM shall be either a coordinated NTC approach or a flow-based approach.
- (45) Article 10(5) of the FCA Regulation sets out three conditions for the application of the flow-based approach for long-term capacity calculation time frames. First, the flow-based approach must lead to an increase of economic efficiency in the CCR with the same level of system security. Second, the transparency and accuracy of the flow-based results must be confirmed in the CCR. Third, the TSOs must provide market participants with six months to adapt their processes.
- (46) Article 10(3) of the FCA Regulation requires that the common long-term CCM shall be compatible with the DA and IT CCM pursuant to Article 21(1) of the CACM Regulation.
- (47) Pursuant to Article 10(4) of the FCA Regulation, uncertainty associated with long-term capacity calculation time frames shall be taken into account when applying a security analysis pursuant to subparagraph (a) of that paragraph; or a statistical approach based on historical cross-zonal capacity for DA or ID time frames under conditions listed in subparagraph (b) of that paragraph.
- (48) Pursuant to Article 10(6) of the FCA Regulation, where a security analysis based on multiple scenarios is applied for developing the CCM, the requirements for the capacity calculation inputs, the capacity calculation approach and the validation of cross-zonal capacity as provided for in Article 21(1) of the CACM Regulation, except Article 21(1)(a)(iv) where relevant, shall apply.
- (49) In terms of capacity calculation approach, Article 21(1)(b) of the CACM Regulation requires that such approach shall include the following:
 - (a) a mathematical description of the applied capacity calculation approach with different capacity calculation inputs;
 - (b) rules for avoiding undue discrimination between internal and cross-zonal exchanges to ensure compliance with point 1.7 of Annex I to Regulation (EC) No 714/2009. While this Regulation, including point 1.7 of Annex I, has been repealed by Regulation (EU) 2019/943, the principle of non-discrimination has been retained under Article 16 of Regulation (EU) 2019/943.

- (c) rules for taking into account, where appropriate, previously allocated cross-zonal capacity;
 - (d) rules on the adjustment of power flows on critical network elements or of cross-zonal capacity due to remedial actions in accordance with Article 25 of the CACM Regulation;
 - (e) for the flow-based approach, a mathematical description of the calculation of power transfer distribution factors and of the calculation of available margins on critical network elements;
 - (f) where the power flows on critical network elements are influenced by cross-zonal power exchanges in different capacity calculation regions, the rules for sharing the power flow capabilities of critical network elements among different capacity calculation regions in order to accommodate these flows.
- (50) Article 10(7) of the FCA Regulation requires that the common long-term CCM applies the requirements for the fallback procedures and the requirement provided for in Article 21(3) of the CACM Regulation.
- (51) Article 11 of the FCA Regulation requires that the proposal for a common long-term CCM includes a reliability margin methodology in line with requirements of Article 22 of the CACM Regulation.
- (52) Article 12 of the FCA Regulation requires that the proposal for a common CCM includes methodologies for operational security limits and contingencies which comply with Article 23, paragraphs (1) and (2), of the CACM Regulation.
- (53) Article 13 of the FCA Regulation requires that the proposal for a common CCM includes a methodology to determine generation shift keys which complies with Article 24 of the CACM Regulation.
- (54) Article 14 of the FCA Regulation states that if remedial actions are taken into account in the long-term capacity calculation, each TSO shall ensure that those remedial actions are technically available in real time operation and meet the requirements set out in Article 25 of the CACM Regulation.
- (55) Article 15 of the FCA Regulation requires that the proposal for a common CCM shall include a cross-zonal validation methodology which complies with Article 26 of the CACM Regulation.
- (56) Regarding the capacity calculation process, Article 21(2) of the FCA Regulation requires that coordinated capacity calculators ('CCC') shall calculate the long-term cross-zonal capacities, and Article 21(3) of the FCA Regulation requires that it complies with the relevant requirements set in Article 27 of the CACM Regulation.

- (57) Regarding regional calculations of long-term cross-zonal capacities, Article 23(2) of the FCA Regulation requires that Article 29 of the CACM Regulation (except Article 29(4) where relevant) applies to long-term capacity calculation time frames in CCRs where TSOs apply security analysis based on multiple scenarios.
- (58) Article 24 of the FCA Regulation sets requirements related to the validation and delivery of cross-zonal capacity.
- (59) In addition, Article 4(8) of the FCA Regulation requires that the proposals for terms and conditions or methodologies include a proposed timescale for their implementation and a description of their expected impact on the objectives of the Regulation.

6.2 Assessment of the legal requirements

6.2.1 Assessment of the requirements for the development of the LT CCM

6.2.1.1 Development of the Proposal

- (60) In developing the Proposal, the Core TSOs partially fulfilled the requirements of Article 4(1), Article 4(7)(a) and Article 10(1) of the FCA Regulation. As required by these Articles, the Proposal covers a common LT CCM for the Core CCR, it has been developed jointly by the Core TSOs and subject to public consultation in accordance with Article 6 of the FCA Regulation (see next paragraph). However, the Core TSOs failed to submit the Proposal to the Core regulatory authorities by the required deadline, as noted in paragraphs (6) to (8).
- (61) In developing the Proposal, the Core TSOs met the publication requirements set out in Article 6 of the FCA Regulation. In particular, on 16 September 2020 the Core TSOs organised a month-long public consultation on the draft Proposal, in line with Article 6(1) of the FCA Regulation. In November 2020, the Core TSOs have published a report¹¹ from the consultation providing justification for including or not the views resulting from the consultation, as required by Article 6(3) of the FCA Regulation.

6.2.1.2 Assessment of the general requirements (Article 10 of the FCA Regulation)

- (62) The Proposal is compliant with Article 10(2) of the FCA Regulation in that the capacity calculation is based on a flow-based approach, as noted in Recital (11) of the Proposal.
- (63) The Proposal does not fully comply with Article 10(3) of the FCA Regulation. Generally, compatibility with the DA and ID CCM is ensured by applying the same principles in the calculation of cross-zonal capacity and consistency in terms of considering the capacity calculation inputs across the different time frames. However,

¹¹ See footnote 5.

the selection of the initial CNEC list provided in Article 7 of the Proposal is not consistent with the selection of CNECs in the DA and ID CCM. ACER has amended the Proposal in this respect, in order to fully align it with the selection of CNECs in the DA and ID CCM (see section 6.2.2.3.1 of this Decision).

- (64) The Proposal complies with Article 10(4) of the FCA Regulation as it applies a security analysis based on multiple scenarios.
- (65) The Proposal does not specify how it complies with the conditions for the application of the flow-based approach set out in Article 10(5) of the FCA Regulation. ACER has amended the Proposal in order to ensure compliance with these conditions, and in the following paragraphs provides additional demonstration of meeting these conditions:
- (a) Regarding the condition of Article 10(5)(a) according to which the flow-based approach must increase economic efficiency in the CCR with the same level of system security, ACER has performed an experimentation with the following steps:
- (i) The aim was to compare the proposed long-term flow-based approach with the existing Net Transmission Capacity (NTC) approach, by comparing the simulated flow-based auctions with different levels of minimum RAM, with the realised NTC-based auctions, by using the same bids from realised auctions;
- (ii) ACER used the TSOs' network input data from 2020 to calculate the flow-based parameters, and the data from realised NTC-based yearly long-term auctions from 2020, from the Joint Allocation Office ('JAO');
- (iii) The outcomes of yearly NTC-based auctions from 2020 (data marked with 'ntc' in Figure 1) were compared with the simulated flow-based yearly auctions (data marked with 'fb' in Figure 1) with the same bids from the realised yearly auctions. At the 'fb' auctions, the calculated flow-based parameters were adjusted with the minimum RAM which reflects the NTC values applied at the yearly auctions, thus providing the same level of system security for both the currently applied NTC approach and the proposed flow-based approach;
- (iv) The simulations have shown that the application of the flow-based approach increases economic efficiency in the Core CCR (characterised by highly meshed network and physically interdependent bidding zone borders) while maintaining the same level of system security. In such circumstances, the flow-based auctions ('fb') provide a 27% higher economic surplus (increase from 350 million EUR to 446 million EUR).

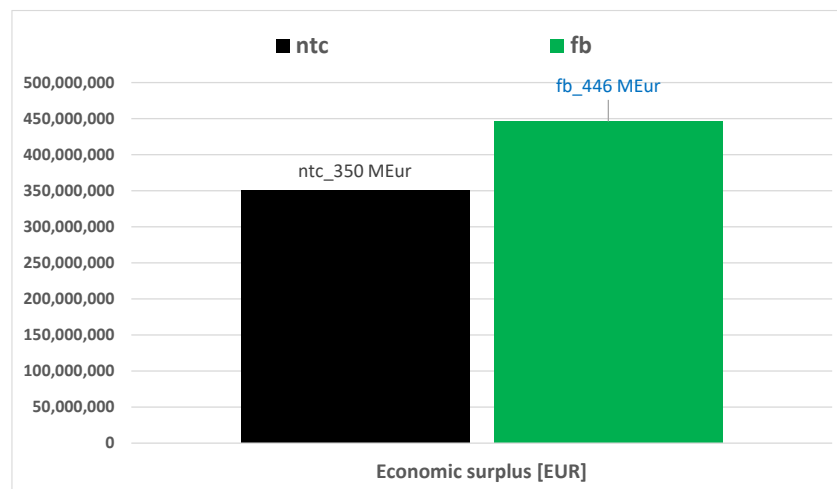


Figure 1: ACER’s experimentation: comparison of Core NTC-based yearly auctions from 2020 with simulated flow-based yearly auctions with the same network security level

- (b) In ACER’s view, the Proposal does not fully comply with Article 10(5)(b) of the FCA Regulation requiring transparency and accuracy of the flow-based results to be confirmed in a CCR. ACER has thus amended the Proposal so that it meets this requirement:
- (i) In order to enhance transparency, ACER has amended the provisions related to the publication of data, taking into account the recommendations of the Core regulatory authorities provided in the non-paper (Article 20 of the amended Proposal, see section 6.2.6.3 for more details).
 - (ii) In order to improve accuracy of the flow-based results, ACER has amended the application of AC load flow for the calculation of maximum flow (see paragraph (78)) and reference flow (see paragraph (114)), as well as removed the PTDF sensitivity threshold (see paragraph (105));
- (c) The Proposal complies with Article 10(5)(c) of the FCA Regulation, as it provides a sufficiently long transitional period to the market participants to adapt their processes. The initial implementation phase of 5 years has been shortened by ACER to 3 years (see section 6.2.7), which still allows to provide the minimum period of 6 months required by Article 10(5)(c) of the FCA Regulation for testing the new approach with market participants.
- (66) The Proposal complies with Article 10(6) of the FCA Regulation as it applies security analyses based on multiple scenarios pursuant to subparagraph (a) of Article 10(4) of the FCA Regulation and refers to the requirements set out in Article 21(1) of the CACM Regulation, as provided in paragraphs (68) and (69).

- (67) The Proposal complies with Article 10(7) of the FCA Regulation, as it defines a fallback procedure in case the initial capacity calculation does not lead to any results, and refers to Article 21(3) of the CACM Regulation.
- (68) The Proposal includes all the elements listed in Article 21(1)(a) of the CACM Regulation (as required by Article 10 of the FCA Regulation):
- (a) a methodology for determining the reliability margin in Article 4 of the Proposal;
 - (b) a methodology for determining operational security limits in Article 5 of the Proposal;
 - (c) a methodology for allocation constraints in Article 6 of the Proposal and in Annex 1 of the Proposal;
 - (d) a methodology for determining contingencies relevant to capacity calculation in Article 7 of the Proposal;
 - (e) a methodology for determining generation shift keys in Article 8 of the Proposal; and
 - (f) a methodology for determining the remedial actions to be considered in capacity calculation in Article 9 of the Proposal.
- (69) The Proposal includes a detailed description of the capacity calculation approach in line with the requirements of Article 21(1)(b), subparagraphs (i), (iii), (iv), (v) and (vii), of the CACM Regulation (as required by Article 10 of the FCA Regulation),¹² as it includes:
- (a) a mathematical description of the applied capacity calculation approach, including the calculation of PTDF and RAM values, in Articles 13 and 14 of the Proposal;
 - (b) rules for taking into account previously allocated cross-zonal capacity in Article 14 of the Proposal;
 - (c) rules on the adjustment of power flows on critical network elements or of cross-zonal capacity due to remedial actions in Article 9 of the Proposal; and
 - (d) rules for sharing the power flow capabilities of critical network elements among different CCRs in order to accommodate these flows, in Article 15 of the Proposal.

¹² Article 21(1) (b) (vi) of the CACM Regulation does not apply as it refers to the NTC approach.

- (70) ACER notes that the Proposal does not sufficiently include rules for avoiding undue discrimination between internal and cross-zonal exchanges, required by Article 21(1)(b)(ii) of the CACM Regulation. ACER has amended the Proposal requiring consistency of the initial CNEC selection with the DA CCM. As such, the rules governing the CNEC selection under DA CCM which avoid undue discrimination between internal and cross-zonal exchanges, would also apply to the long-time frame. ACER's amendment thus brings the Proposal in compliance with Article 21(1)(b)(ii) of the CACM Regulation.
- (71) The Proposal includes, in its Article 17, a methodology for the validation of cross-zonal capacity in line with Article 21(1)(c) of the CACM Regulation (as required by Article 10 of the FCA Regulation).

6.2.2 *Assessment of the requirements for the capacity calculation inputs*

- (72) Articles 11 to 14 of the FCA Regulation provide requirements for the capacity calculation inputs by referring to the corresponding provisions of the CACM Regulation, requiring methodologies for reliability margin, operational security limits and contingencies, generation shift keys and the rules for the use of remedial actions. In addition, for the LT CCM with a security analysis based on multiple scenarios, Article 23(2) of the FCA Regulation refers to Article 29 of the CACM Regulation, which includes, in paragraph 1, the requirement for TSOs to provide the CCC with the above mentioned capacity calculation inputs. While the CGM is also considered as a capacity calculation input for capacity calculation where security analysis based on multiple scenarios is applied, the methodology governing its establishment is defined in the CGMM pursuant to Article 22 of the FCA Regulation and therefore falls outside the scope of the LT CCM.

6.2.2.1 *Methodology for reliability margin*

- (73) Article 4 of the Proposal meets the requirement of Article 11 of the FCA Regulation, in that it applies a flow reliability margin from the DA flow-based calculation for the long-term time frames.
- (74) While there are more uncertainties in the long-term time frames than in the day-ahead one, ACER considers that the day-ahead reliability margin can be efficiently used in the long-term time frame under certain conditions. ACER notes that these conditions are met in the Proposal, as amended by ACER, therefore making the flow reliability margin from the day-ahead capacity calculation process suitable for the long-term time frames. In particular:
- (a) The union of flow-based constraints from all calculation scenarios is used as a common set of constraints for each long-term auction, as this represents sufficiently conservative consideration of various constraints from different applied CGMs;

- (b) The AC load flow is applied for the calculation of reference flow in the long-term time frame, as the day-ahead Core flow-based approach applies the direct current (DC) load flow, but does not take into account the inaccuracies originating from the differences between AC and DC load flow;
 - (c) The fact that applying options at the long-term explicit auctions of cross-zonal capacity does not allow for the formal consideration of netting of counter flows, ensures a sufficiently conservative capacity calculation approach.
- (75) Having consulted with the Core TSOs and the Core regulatory authorities, ACER has amended Article 4 of the Proposal by adding a paragraph about the reliability margin for potential new critical network elements, with the initial flow reliability margin of 10% of the F_{max} , which is also the value used in the Core DA CCM.

6.2.2.2 Methodologies for operational security limits and contingencies

- (76) Article 5 and Article 7 of the Proposal relate to Article 12 of the FCA Regulation, which – by referring to the corresponding provisions of the CACM Regulation – requires that the TSOs apply the same operational security limits and contingencies that are used in operational security analysis, or, in the alternative, that the TSOs describe in the capacity calculation methodology the particular method and criteria for determining operational security limits and contingencies in the capacity calculation. These requirements relate to the choice of CNEs, contingencies and operational security limits applicable for CNEs. Article 5 of the Proposal specifies the methodology for the applicable operational security limits, whereas Article 7 of the Proposal specifies the methodology for determining critical network elements with contingencies.

6.2.2.3 Operational security limits

- (77) The Proposal complies with the requirements of Article 23(1) and (2) of the CACM Regulation (referenced in Article 12 of the FCA Regulation). Article 5 of the Proposal requires the TSOs to apply the same operational security limits as in the operational security analysis pursuant to Article 25 of Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation, in a form of maximum current (' I_{max} ').
- (78) With regard to the calculation of maximum flow (F_{max}), the Proposal defines a formula based on the reference voltage and the power factor equal to 1. Since, according to ACER's proposal described in paragraph (114), AC load flow would be used for the reference flow calculation, ACER has amended the calculation of F_{max} , by applying the voltages and the power factor resulting from the AC load flow, with the floor of 0.95 for both. The reference voltages and power factor equal to 1 would be used in case of AC load flow implausibility, as a fallback.
- (79) In its experimentation on the basis of four CGMs, ACER has demonstrated the application of AC load flow values for the F_{max} calculation, which is by definition

more accurate than using the reference values and power factor equal to 1. ACER has showed that using the AC load flow values also slightly increases the RAM values on average, and that auction simulations with AC load flow values of F_{max} have a slightly higher economic surplus. These experimentation results have been shared with all Core TSOs and regulatory authorities.

6.2.2.3.1 Critical network elements and contingencies

- (80) Article 7 of the Proposal provides the definition of the initial and final CNEC list. The selection is based on principles which treat all cross-border elements as CNEs, while the only limitation of the internal CNEs is the sensitivity towards the cross-zonal exchanges with a zone-to-zone PTDF threshold of 5%. As a result of this proposed approach, the LT CNEC list would potentially contain more internal CNECs than the corresponding day-ahead or intraday CNEC list, as at day-ahead and intraday processes, the internal CNECs are selected also taking into account the principles of economic efficiency.
- (81) ACER notes that Article 10(3) of the FCA Regulation requires that the long-term capacity calculation methodology shall be compatible with the capacity calculation methodology established for the day-ahead and intraday time frames. In ACER's view, the initial selection of CNECs in long-term time frames should be the same as the initial selection of CNEC applied in the day-ahead and intraday time frame. Therefore, the LT CCM determines the CNECs by means of reference to the CNECs selected under the DA CCM. This way the LT CCM ensures coherence in all market time units, which is vital, resulting in a uniform initial list of CNECs applicable to all time frames.¹³ The only exception to this compatibility may be the new network elements that are expected to come into operation during the time frame for which the capacities are being calculated. Accordingly, ACER has amended Article 7 of the Proposal to ensure that the selection of CNECs is the same as selection of CNECs in the DA and ID time frame.
- (82) Some TSOs and one regulatory authority expressed concerns during the proceedings, that including additional internal CNECs would be required compared to DA and ID CCM in order to avoid an over-allocation of cross-zonal capacity in the long-term time frames causing either negative financial consequences or operational security problems. These TSOs and the regulatory authority explained that over-allocation of cross-zonal capacity would occur if the day-ahead cross-zonal capacities needed to be lower than long-term capacities and in such cases the costs of remuneration of LTTRs would be higher than the congestion income from reallocation of these LTTRs because not all

¹³ By dynamically referring to the DA CCM, the LT CCM ensures coherence with the CNEC selection mechanism established in the DA CCM also in respect of the outcome of the pending judicial proceedings in case T-283/19, Germany v ACER, and the judgment of 7.11.2022 in case T-631/19, BNetzA v ACER.

LTTRs could be reallocated. On the other hand if TSOs needed to reallocate all LTTRs to day-ahead time frame, this could in case of over-allocation in long term time frame imply operational security problems in the day-ahead time frame.

- (83) To address these concerns, ACER first notes that negative financial consequences due to over-allocation are unlikely because, according to Article 20 of the DA CCM (validation of flow-based parameters), the day-ahead cross-zonal capacities cannot be decreased below the level allocated in the long-term time frames. While ACER acknowledges that such prohibition could in theory lead to operational security problems in case of over-allocation, ACER has invited TSOs to review the prohibition of reduction of cross-zonal capacities in the DA CCM as this prohibition has been proposed by the TSOs themselves, and does not stem from any legal requirement. Secondly, ACER notes that if the day-ahead cross-zonal capacities could be reduced below the level of allocated long-term capacities, this would not necessarily imply negative financial consequences. These negative financial consequences would only occur if some long-term capacities were not reallocated in the day-ahead time frame and long-term congestion income would need to be used instead. However, the long term congestion income can either be lower or higher than remuneration costs and therefore, the TSOs could either lose or benefit from this situation. On average however, TSOs are not expected to lose or benefit from any situation where not all LTTRs are reallocated in the day-ahead time frame.
- (84) Furthermore, ACER is of the view that over-allocation in the long-term time frames is highly unlikely due to the application of a conservative approach in the calculation and allocation of the long-term cross-zonal capacities. In particular, ACER notes that:
- (a) The long-term auctions would simultaneously apply the union of constraints by all common grid models, with increased number of considered CGMs as described in Article 10 of the amended Proposal;
 - (b) The long-term time frame applies the explicit auctions for physical transmission rights ('PTR') or financial transmission rights-options ('FTR-options'), which means that the corresponding flows are calculated in a worst-case manner, i.e. as if all burdening transactions would realise, and none of the relieving transactions would realise (thus without applying any netting among burdening and relieving flows). This further implies that the flows assumed in long term capacity calculation will less likely consume the available capacity in the form of RAM in the day-ahead time frame. Hence, the minimum RAM value in the long-term time frame is not directly comparable with the minimum RAM value in the day-ahead time frame¹⁴.

¹⁴ The minimum RAM in the day-ahead time frame is applied in the capacity calculation for the market coupling process assuming that cross-zonal capacities are allocated as obligations (in the sense that allocation by default

as it would likely not be fully exploited. For the same reason, allowing for a higher minimum RAM in the long-term time frame would not endanger network security;

- (c) The level of minimum RAM provided in the long-term time frames (20% of F_{max} in the yearly time frame and 10% of F_{max} in the monthly time frame) is in sum much lower than the minimum requirement for the day-ahead time frame (70% of F_{max} ¹⁵) which the TSOs in any case need to accommodate on the same CNECs pursuant to Article 16(8) of Regulation (EU) 2019/943;
- (d) According to the experimentation results, the minimum RAM of 30% (which to the high extent mirrors the simulated case of 30% of F_{max}) actually implies somewhat less allocation of cross-zonal capacities compared to the actual auctions. The concern is therefore the opposite, i.e. that the methodology might under-allocate cross-zonal capacities. Yet ACER at this stage is unable to impose higher allocation through the further increase of minimum RAM, until the security concerns are verified in the implementation phase;
- (e) Despite over-allocation is unlikely, Article 17 of the amended Proposal provides the possibility to adjust (i.e. to decrease) the corresponding RAM even below the minimum RAM value in the capacity validation phase if the TSOs' analysis shows that the calculated level of RAM is unable to ensure operational security, as specified in paragraphs (1) and (2) of Article 17 (see section 6.2.4).

6.2.2.4 *Methodology for allocation constraints*

- (85) Article 6 of the Proposal provides a possibility for TSOs to apply allocation constraints, in accordance with Articles 21(1)(a)(ii) and Article 23(3)(a) of the CACM Regulation. These additional constraints were envisaged as the external constraints, i.e. export/import limits of the Dutch and Polish bidding zones, which the relevant TSOs also exercise in the day-ahead time frame. This approach is further justified in Annex 1 to the Proposal. During the discussions with ACER, the Core TSOs as well as the Core regulatory authorities had diverging views as to whether external constraints should be applied in the long-term time frame, or not.

means that these capacities shall be used) and, consequently the capacities causing relieving flows on a CNEC allow for consideration of netting effect, i.e. further allocation of capacities causing burdening flows on the same CNEC. While this allows for higher capacity allocation it also means that it is much more likely that the flows assumed in capacity calculation will consume the available capacity in the form of RAM in the day-ahead time frame.

¹⁵ Indeed the CEP requirement of 70% includes also the unscheduled allocated flows (UAF) by the non-Core CCRs, however such flows are not of the extent to use the remaining 40% of the F_{max} .

- (86) ACER considers that the reasoning of the Core TSOs in Annex 1 of the Proposal is suitable for external constraints applied in the day-ahead time frame only, and not in the long-term time frame. Accordingly, ACER has deleted Annex 1 from the Proposal as it is not relevant to the LT CCM.
- (87) Based on the discussions with the Core TSOs and the Core regulatory authorities, ACER understands that as long as the external constraints are applied in the day-ahead time frame, they are also required in the long-term one, in order to avoid over-allocation.
- (88) Therefore, ACER has amended Article 6 of the Proposal by allowing for external constraints in the long-term time frame only as long as they serve to accommodate the existing day-ahead external constraints. In addition, ACER has strengthened the monitoring of the applied values of external constraints by specifying the relevant monitoring requirements.

6.2.2.5 Methodology for generation shift keys

- (89) Article 8 of the Proposal relates to the requirement of Article 13 of the FCA Regulation which, by reference to Article 24 of the CACM Regulation, requires that the LT CCM includes a methodology to determine a common generation shift key for each bidding zone and scenario. The Proposal complies with Article 24 of the CACM Regulation in this respect.
- (90) Article 8(2) of the Proposal aims towards the harmonisation of the generation shift keys methodology in relation to the corresponding process in the DA CCM. Namely, it requires the Core TSOs to amend the generation shift keys methodology in the long-term time frames not later than twelve months after the implementation of the proposal for further harmonisation of the corresponding methodology of the Core DA CCM.
- (91) Article 12(1) of the Proposal specifies that the TSOs shall provide the generation shift keys to the CCC and therefore complies with Article 29(1) of the CACM Regulation (referred to in Article 23(2) of the FCA Regulation).

6.2.2.6 Methodology for remedial actions in long-term capacity calculation

- (92) Article 9 of the Proposal allows the Core TSOs to define remedial actions in the long-term capacity calculation, in line with Article 14 of the FCA Regulation.
- (93) However, during the proceedings, the Core TSOs proposed a new approach, whereby they should not consider remedial actions in the long-term capacity calculation. The TSOs argued that the long-term capacity calculation assumes very high uncertainty for assessing the availability of remedial actions far ahead of the real-time system operation, and that, in such circumstances, the process of coordination or even consideration of remedial actions would increase the complexity of the capacity calculation process without a clear added value.

- (94) ACER notes that Article 14 of the FCA Regulation does not require the application of remedial actions in the long-term time frame. Based on the discussions with the Core TSOs and the Core regulatory authorities, ACER thus amended Article 9 of the Proposal to omit the use of remedial actions, as proposed by the Core TSOs.

6.2.2.7 Provision of information on previously allocated capacities

- (95) Article 12 of the Proposal covers the provision of information about the already allocated capacities from previous time frames.
- (96) ACER extended the paragraph 12 of the Proposal, specifying that this information is relevant as the input from preceding yearly auction to monthly auctions, and that it needs to include the returned capacity.

6.2.3 Assessment of the requirements for the capacity calculation process

- (97) Article 10 and Chapter 1, Section 4, of the FCA Regulation regulate the capacity calculation process in the long-term time frames. In particular, these provisions refer to Article 21(1)(b), Article 27 and Article 29 of the CACM Regulation, which specify the necessary content and detail all the steps of the capacity calculation process for the day-ahead and intraday capacity calculation.
- (98) In Article 3 and Article 12 of the Proposal, the Core TSOs sufficiently specified the CCC role of calculating the long-term cross-zonal capacities, pursuant to Article 21(2) of the FCA Regulation. In addition, ACER amended the Recitals of the Proposal, explaining the planned operational changes related to the CCC role. Namely, as of 1 July 2022, after the regional coordination centres ('RCC') entered into operation,¹⁶ the RCCs of the Core CCR are expected to take over the role of the CCC in the LT CCM.

6.2.3.1 Rules for taking into account previously allocated cross-zonal capacity

- (99) ACER notes that the mathematical formulation of the RAM calculation in Article 14 of the Proposal does not consider the flows originating from the previously allocated cross-zonal capacity. ACER has amended Article 14 in order to adapt it to the flow-based approach and to comply with Article 29(7)(c) of the CACM Regulation. More specifically, ACER has introduced a formula describing the conversion of the previously allocated cross-zonal capacities, decreased for returned capacities, into the required flows at the CNEC level. Since cross-zonal capacities are previously allocated in the form of options for a specific direction, only positive zone-to-zone PTDFs can be used to calculate the relevant flow per each CNEC.

¹⁶ See Article 35(2) of Regulation (EU) 2019/943.

6.2.3.2 Rules on the adjustment of power flows on critical network elements or of cross-zonal capacity due to remedial actions

- (100) Article 21(1)(b)(iv), Article 25 and Article 29(7)(f) of the CACM Regulation (as referred to in the FCA Regulation) require the consideration of remedial actions and the corresponding flows on CNECs resulting from their application. Article 14 of the Proposal provides the calculation of RAM with its components, however it fails to include the adjustment of power flows by remedial actions application, pursuant to the initial wording of Article 9 of the Proposal.
- (101) Since Article 9 of the Proposal has been amended in order to omit remedial actions in the long-term capacity calculation (see paragraphs (92) to (94)), ACER considers that amending the mathematical formulation of the RAM calculation to adjust the power flows due to remedial actions is not necessary.

6.2.3.3 Mathematical description of the capacity calculation approach

- (102) Article 12, Article 13 and Article 14 of the Proposal provide the list of capacity calculation inputs and a mathematical description of the applied capacity calculation approach in accordance with Article 21(1)(b)(i) of the CACM Regulation and referring specifically to the flow-based approach of Article 21(1)(b)(v) of the CACM Regulation.
- (103) Based on the discussions with the Core TSOs and the Core regulatory authorities, ACER has improved the mathematical approach, and supplemented the necessary missing elements of the capacity calculation inputs and outputs, as explained in the dedicated sub-chapters.

6.2.3.3.1 Capacity calculation inputs

- (104) Article 12 of the Proposal provides for the capacity calculation inputs and outputs. In order to align the capacity calculation inputs with Article 9 of the amended Proposal, ACER has removed the provision related to the delivery of remedial actions. Also, in the inputs provided by the CCC, ACER has added the provision of the returned allocated capacities.
- (105) Article 12(3) of the Proposal requires the provision of a sensitivity threshold for the consideration of PTDF in the capacity calculation, in order to reduce the influence of certain allocated transactions to the distant borders. Most of the Core regulatory authorities and ACER disagreed with this approach, as it is important that the allocation uses the calculated flow-based parameters in the most accurate way possible and ensures the additivity of market clearing prices to the maximum extent. ACER has demonstrated that the applied PTDF sensitivity threshold would have a detrimental effect on the additivity of clearing prices and accepted quantities at explicit auctions, leading to different outcomes. Therefore, ACER has removed the provision on the PTDF sensitivity threshold.

(106) In the non-paper, the Core regulatory authorities were of the view that for effective implementation, the Proposal should provide concrete steps, or at least references, for the formation of the long-term products, and its correlation with applied network scenarios. While the definition of long-term product is subject to the harmonised allocation rules (HAR), ACER considers it relevant to clearly specify the form of flow-based capacity calculation output that needs to be provided as the input to the allocation process. ACER has therefore expanded Article 12 of the Proposal, requiring that a union of flow-based constraints from all applied long-term scenarios is provided.

6.2.3.3.2 Calculation of Power Transfer Distribution Factors

(107) Article 13 of the Proposal sets out the principles for the calculation of power transfer distribution factors. In order to align Article 13 with the amended Article 12, ACER has removed paragraph (3) on the provision of sensitivity threshold for the inclusion of PTDF in the allocation. ACER has also moved paragraph (2) of Article 13 on calculation of flows to Article 14, which covers the RAM calculation.

(108) In Article 13 of the Proposal, ACER has inserted a new paragraph (2) on the slack node treatment through different CGMs of a long-term calculation. Also, ACER has inserted a new paragraph (4) with a mathematical formulation for the calculation of the maximum zone-to-zone PTDF of CNECs, required for the filtering of the final list of CNECs, provided in Article 14 in the amended Proposal.

6.2.3.3.3 Calculation of the available margin before validation

(109) Article 14 of the Proposal sets out the principles for the calculation of the remaining available margin as well as the application of minimum RAM. ACER has rearranged Article 14, aligning the formulations and notations with other amendments of the LT CCM and the Core DA CCM, where appropriate.

(110) ACER has moved the determination of the final CNEC list from Article 7(3) of the Proposal to Article 14(1) of the amended Proposal, as it is a step in the capacity calculation process and not capacity calculation inputs. A minimum threshold of the maximum zone-to-zone PTDF, below which all CNECs shall be removed from the list of CNECs, set to 5% in the Proposal, remains unchanged in the amended Proposal. ACER considers that this threshold ensures that CNECs having the maximum zone-to-zone PTDF below 5% are not limiting cross-zonal capacities.

(111) ACER has moved the provision on the calculation of flows without Core exchanges (F0) from Article 13(2) of the Proposal to Article 14(2) of the amended Proposal, as it is a step in the calculation of the available margin.

(112) Article 13(2) of the Proposal assumes DC load flow for the calculation of reference flow (Fref). In the non-paper, the Core regulatory authorities indicated that common grid models should be robust enough to support the AC load flow solution. As a more accurate representation of network conditions, AC load flow provides the active power

losses, reactive power flows and losses and the voltages different from reference voltage, while DC load flow is lossless, without reactive power or voltage results. Therefore, DC load flow requires at least the supplemented treatment of active power losses, which are of the typical size of 5500-7500 MW for the CGM of Continental Europe.

- (113) In its experimentation, ACER has analysed the alternatives of applying AC load flow, with the DC load flow solution ('DC1') with assignment of active power imbalance of each modelled area proportionally to the loads, and the hybrid solution ('DC2') of applying AC load flow to determine the losses in (n-0) topology, and then assigning the losses of each network branch to the accidental nodes, where the CGM adjusted in this way can be used for the advanced DC load flow solution for contingency topologies (n-1). The comparison of AC load flow results for two CGMs at the level of critical network elements, showed that the DC1 solution records high differences on certain CNEs, while the differences for the DC2 solution are smaller. The detailed results of these simulations has been shared with the Core TSOs and the Core regulatory authorities.
- (114) Since ACER considers that gaining additional precision in obtaining reference flow is an important element in the RAM calculation, it is a valid reason for introducing the AC load flow, having in mind that, contrary to the day-ahead process, the long-term process provides sufficient time for its application. In case of implausibility to apply the AC load flow in certain CGMs, the DC solutions can be considered as a fallback. To reflect this, ACER has amended Article 14(3) of the Proposal accordingly.
- (115) Article 14(2) of the Proposal provides the value of minimum RAM of 20% of F_{max} , which automatically refers to the yearly time frame, without specifying the separate minimum RAM value for the monthly time frame.
- (116) ACER notes that the minimum RAM of 20% represents the current level of the minimum RAM applied in the Core day-ahead flow-based capacity calculation. However, ACER has concerns that both the level of proposed minimum RAM for the long-term time frame and the fact that no minimum RAM is appointed to the monthly auctions, would be inadequate to promote the effective long-term cross-zonal trade with long-term cross-zonal hedging opportunities for market participants, being one of the key objectives listed in Article 3 of the FCA Regulation.
- (117) Majority of respondents to ACER's public consultation supported the application of a minimum RAM higher than 20%. This was also the view of one regulatory authority in the non-paper, while all the other Core regulatory authorities found the value of 20% acceptable, but were open to further modifications. However during the hearing, many Core regulatory authorities raised concerns about the insufficiency of a 20% minimum RAM value.
- (118) During the proceedings, ACER has demonstrated through a number of examples that it is necessary to define two separate minimum RAM values higher than zero, in order to

ensure the offered capacity at both yearly and monthly auctions. The application of a splitting factor according to the methodology for splitting long-term cross-zonal capacity pursuant to Article 16 of the FCA Regulation cannot ensure the minimum capacity at the monthly time frame.

- (119) The main part of ACER's experimentation is the consideration of different levels of minimum RAM for the simulation of yearly flow-based auctions based on the 2020 data and comparison of the results with the realised NTC-based yearly auctions at the Core borders for 2020.
- (a) The results of the experimentation are illustrated in Figure 2, and present the outcomes of flow-based auctions with minimum RAM levels of 20%, 30% and 40% at the yearly flow-based auctions. The auctions with 30% of Fmax provide similar economic surplus as the realised yearly NTC auctions for 2020, along with lower allocated quantities¹⁷;
- (b) with the same level of system security as with the currently applied NTC approach, the equivalent minimum RAM (obtained on the basis of applied NTC values) at certain CNECs would need to be quite high. The minimum RAM at the congested CNECs in the observed experimentation case 'fb' was in the range between 20% and 80%, with an average of 43% of Fmax. The outcome of this analysis is provided in paragraph (65);

¹⁷ The NTC allocation at different borders is independent, therefore bids on a given border do not compete with bids on other borders. Consequently, certain capacities may be allocated on a given border even if the offered prices are lower than the bids on another border for an order of magnitude.

On the contrary, flow-based explicit auctions apply the interdependent optimisation of quantities (converted into flow contributions via PTDF) and offer prices across all borders of a region. Therefore, the bids with a higher price formally allocated on one border might outbid the low-price bids on another border, as their common influence is observed at each CNEC in a flow-based region.

The optimisation criterion is the maximisation of economic surplus, which provides more valuable quantities to be allocated, and this might in turn result in a lower total amount of allocated quantities. This is the expected outcome of coordinated flow-based auctions.

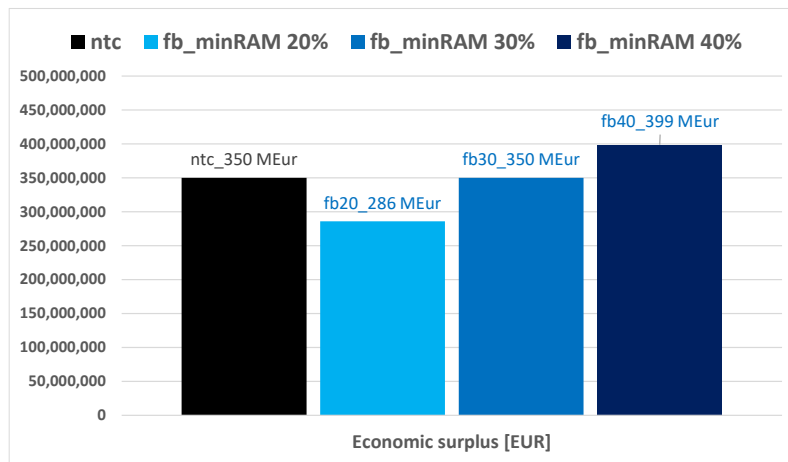


Figure 2: ACER's experimentation: comparison of Core NTC-based yearly auctions from 2020 with simulated flow-based yearly auctions with different level of minimum RAM

- (120) On the basis of discussions during the proceedings, applied simulations, and the need to ensure offered capacities at both the yearly and monthly time frame, ACER has amended Article 14 of the Proposal by providing the minimal values of minimum RAM at the level of 20% of Fmax for yearly auctions and 10% of Fmax for monthly auctions.
- (121) During the hearing phase, the majority of the Core TSOs expressed concerns about the application of the proposed level of minimum RAM (20% for yearly auctions and 10% for monthly auctions) due to operational security risks. In ACER's view, the proposed values of minimum RAM are the minimum required for ensuring compliance with the objective of effective long-term cross-zonal trade referred to in Article 3 of the FCA Regulation.
- (122) ACER sees no network security concerns from the application of the proposed minimum RAM values. Moreover, any potential operational security risks in this respect are in any case mitigated by the possibility to efficiently reduce the capacities during the capacity validation, if necessary, in accordance with Article 17(1) and Article 17(2) of the amended Proposal (as further explained in section 6.2.4). In paragraph (84) ACER provided the additional explanations why the minimum RAM values at the long-term time frames are not directly comparable with the minimum RAM at the day-ahead time frame and why the proposed level of minimum RAM at the long term time frame would not endanger network security.
- (123) ACER considers that its proposal on the minimum RAM values strikes a balance between the opposite expectations of the Core regulatory authorities, market participants and the Core TSOs. Notwithstanding the above, in view of the concerns expressed by the Core TSOs and the Core regulatory authorities, and bearing in mind

the limitations of ACER's experimentation¹⁸, ACER has provided a possibility for the Core TSOs to increase the minimum RAM values¹⁹ during the implementation phase. Such adjustment would have to be (a) based on a comprehensive analysis performed by the Core TSOs and consistent with the objectives of the FCA Regulation, and (b) consulted with the Core regulatory authorities and stakeholders. ACER has amended Article 14(5) of the Proposal to reflect this possibility.

- (124) ACER notes that the above adjustment is without prejudice to the Core regulatory authorities' right to request amendments to the LT CCM, including the applied values of minimum RAM, at any time, pursuant to Article 4(12) of the FCA Regulation. However, in ACER's view, requesting amendments should not delay the implementation of the LT CCM.
- (125) Notwithstanding the above possibilities to change the minRAM values, ACER considers that any eventual security concerns requiring lower capacities than those provided, could be addressed in the validation phase. The validation methodology pursuant to Article 17(1) and Article 17(2) of the amended Proposal allows to decrease the RAM value even below the minimum RAM if the operational security needs to be ensured (as further explained in section 6.2.4).
- (126) ACER notes that the draft Proposal for the Core LT CCM consulted with the AEWG provided the Core TSOs with a wider margin of discretion to amend the minimum RAM values²⁰ based on further experimentations. ACER has duly considered the AEWG advice and the individual comments submitted by the regulatory authorities (see paragraph (38)) and has amended the Proposal as follows:
- (a) ACER has kept the minimum RAM values of 20% (yearly) and 10% (monthly) since they have been endorsed by the AEWG (see paragraph (38), point (a)).
 - (b) ACER has restricted the TSOs' discretion to amend the minimum RAM values in order to ensure balance between the need for appropriate governance regarding the key aspects of the methodology and the need for timely implementation (see paragraph (38), point (b)). Namely, the Core TSOs may now only increase the minRAM values based on their experimentation, up to 40% for the yearly time frame and up to 20% for the monthly time frame. The Core TSOs may not go above these limits nor decrease the minRAM without the amendment process pursuant to

¹⁸ This is related to the limited number of observed cases and the limited number of CGMs considered for the calculation of flow-based approach.

¹⁹ With upper limits: minimum RAM of 40% for the yearly time frame and 20% for the monthly time frame.

²⁰ The Proposal consulted with AEWG provided only for lower limits (15% for yearly time frame and 10% for monthly time frame). No upper limits were proposed.

Article 4(12) of the FCA Regulation. ACER considers that these new limits are reasonable for the following reasons:

- (i) The Core TSOs' discretion to decrease the minimum RAM values is not necessary since, as noted in paragraph (125), the Core TSOs may always decrease the RAM value even below the minimum RAM during the validation phase, if necessary, in accordance with Article 17(1) and Article 17(2) of the amended Proposal (as explained in section 6.2.4); and
 - (ii) The Core TSOs' discretion to increase the minimum RAM values up to 40% (yearly) and 20% (monthly) is based on the results of ACER experimentations, in particular the obtained level of economic surplus, as well as a typical ratio²¹ among realised yearly and monthly capacities allocated at the yearly and monthly auctions in Core CCR. These values are expected to provide a sufficient range to enable adequate economic surplus without endangering system security. However, ACER notes that the exact values would need to be determined on the basis of further experimentations by the Core TSOs.
- (c) In addition to the above amendments, ACER has commenced a process of increased stakeholder engagement in order to properly inform the market participants about the consequences of the Core LT CCM Decision (see paragraph (38), point (c)). As a first step, ACER scheduled a meeting with EFET and Eurelectric on 15 October 2020, to provide more details on the proposed methodology and to hear their concerns in this respect. The Core regulatory authorities were invited to this meeting.
- (127) ACER is of the view that the minimum RAM values of 20% for the yearly and 10% for the monthly time frame provide a higher level of security, but likely lower economic surplus than the currently applied long-term NTC values at the Core CCR borders. ACER expects that through additional experimentations during the implementation the Core TSOs gain confidence in the applied long-term flow-based approach and apply higher minimum RAM values, which would provide higher surpluses under secure network conditions²².

²¹ According to the data from JAO, the ratio between the allocated capacities at yearly auctions for 2020 and monthly auctions for January 2020 was approximately 68%:32%.

²² Following the discussion on the proposed modification of the application of the splitting factor (see recitals (35) and (36)), ACER came to the conclusion that it is not appropriate to include such a modification in the present amendment of the Core LT CCM.

6.2.4 *Assessment of the requirements for the capacity validation*

- (128) Article 17 of the Proposal describes the capacity validation process performed by the Core TSOs and the CCC, in line with Article 26 of the CACM Regulation, as required by Article 15 of the FCA Regulation.
- (129) In that regard it is first to note, in view of Articles 15 and 24 of the FCA Regulation and Article 26 of the CACM Regulation and in view of BoA Decision A-001-2022, that the TSOs have a right to correct cross-zonal capacity at the validation stage, and to reduce such capacity for reasons of operational security.²³ However, this right is not absolute and it is not solely for individual TSOs to decide which operational security concerns justify correcting long-term capacity.²⁴ ACER is entitled, and indeed mandated, to determine, with a greater level of technical detail than that contained in the regulatory framework, how operational security is best protected and under which conditions TSOs are entitled to exercise their right to correct long-term capacity at the validation stage. The respective powers of ACER find their limits where the TSOs' right to correct operational security is restricted in such a way that operational security could no longer be guaranteed or that the regulatory framework would be violated.²⁵
- (130) In view of the need to specify the conditions under which TSOs may correct long-term capacity at the validation stage, ACER amended Article 17 of the Proposal by listing the situations in which a TSO may change the long-term capacity on their own CNECs during the validation process. ACER considers that, for the reasons explained in recitals (133) to (136), the list mentions all situations possibly requiring a correction of the long-term capacity for reasons of operational security during the validation stage. Having an exhaustive list of situations is also consistent with the approach applied in the Core DA CCM. Such a list does not limit the TSOs' right to perform individual validation, nor the TSO's right to correct long-term capacities in a way that operational security could no longer be guaranteed because, in line with Articles 15 and 24 of the FCA Regulation or Article 26 of the CACM Regulation, the listing only specifies and categorises, in a more detailed and comprehensive manner, all the different reasons of operational security to correct (i.e., reduce) long-term capacity covered by those Articles. Given this specification and categorisation, it also does not violate the regulatory framework.
- (131) ACER has removed paragraph (1)(a) of Article 17 of the Proposal as it referred to exceptional contingency or forced outages and those outages cannot efficiently be assessed in the long-term time frames.

²³ BoA Decision A-001-2022, para. 53.

²⁴ BoA Decision A-001-2022, para. 59.

²⁵ BoA Decision A-001-2022, para. 60.

- (132) Considering that remedial actions are not taken into account in the long-term time frame (see section 6.2.2.6), ACER has amended Article 17(1)(b) of the Proposal (Article 17(1)(c) of the amended Proposal) by deleting the reference to the availability of remedial actions. The amended Article complies with Article 26(3) of the CACM Regulation.
- (133) ACER has amended paragraph (1)(d) of Article 17 of the Proposal by removing the consideration of reactive power flows, as it is not necessary when the AC load flow is applied for the reference flow calculation. Instead, the consideration of power factor and voltage is addressed in Article 17(1)(b) of the amended Proposal.
- (134) ACER has introduced paragraph (1)(c) in Article 17 of the amended Proposal to cover exceptional topologies from the outage planning coordination process, which are not modelled through the reference timestamps and CGMs defined in Article 10(2) of the amended Proposal. In this way the TSOs can analyse and include the effects of planned outages valid for the timestamps other than the reference timestamps, if these outages influence the capacities on their own CNECs considerably, without the need to increase the overall number of reference timestamps. This allows the TSOs adjusting the RAM without burdening the central capacity calculation process performed by the Core CCC.
- (135) ACER has introduced paragraph (1)(d) in Article 17 of the amended Proposal to list the situations and operational security limits which the flow-based approach (being based on static AC or DC load flow) is unable to capture. According to Article 1(7) of the CACM Regulation, ‘operational security limits’ means the acceptable operating boundaries for secure grid operation such as thermal limits, voltage limits, short-circuit current limits, frequency and dynamic stability limits. While thermal limits can be modelled with the flow-based approach and be considered in the input data for the capacity calculation process, other limits referred to under Article 1(7) of the CACM Regulation might not be. Listing these additional operational security limits, i.e. voltage limits, short-circuit current limits, frequency and dynamic stability limits, in paragraph (1)(d) of Article 17 of the amended Proposal ensures that TSOs can make the necessary adjustments to the RAM during the validation process also for these reasons of operational security.
- (136) There may be situations where the operational security limits could be modelled with the input data for the flow-based approach, but they would be overwritten by the application of the minimum RAM. However, such operational limits can also require an adjustment of the RAM during the validation process. To ensure that such adjustments are possible, ACER has added paragraph (1)(e) in Article 17 of the amended Proposal which refers to them explicitly. Addressing also PSE’s concern underlying the error found by the Board of Appeal in Article 17(1)(c) of Annex I to Decision 14/2021, this provision covers operational security issues which can be modelled via the input data, but still need an adjustment in the validation phase because the capacity calculation process does not fully capture them.

- (137) ACER has extended paragraph (2) of Article 17 of the Proposal to enable TSOs to decrease the RAM value even below the minimum RAM if necessary, for the situations listed under points (b) to (e) of Article 17(1) of the amended Proposal.
- (138) ACER has introduced paragraph (3) of Article 17 of the Proposal to ensure that the TSOs' individual validation adjustments in the situations listed under points (c) to (e) of Article 17(1) of the amended Proposal are justified.
- (139) ACER has also introduced changes to the reporting obligations listed in Article 17, paragraphs (4), (5) and (6) of the Proposal, so that they are fully consistent with the requirements of Article 26 of the CACM Regulation.
- (140) Finally, ACER specified that Article 17 of the amended Proposal concerns only the individual validation by the Core TSOs. The coordinated validation which is currently left out of the amended Proposal, may be considered as a potential amendment of the LT CCM at a later date, once the LT CCM has been fully implemented.

6.2.5 Assessment of the requirement for the fallback procedures

- (141) Article 16 of the Proposal provides for a fallback procedure, as required by Article 10(7) of the FCA Regulation, which further refers to Article 21(3) of the CACM Regulation. However, ACER notes that this Article lacks transparency on the proposed approach, and refers to the bilateral NTC values. Based on the discussions with the Core TSOs and the Core regulatory authorities, ACER has added more details in this Article to increase transparency and replaced the reference to the NTC values with a reference to the latest available flow-based capacity calculation outputs.

6.2.6 Assessment of other requirements

6.2.6.1 Scenarios and common grid models

- (142) Article 19 of the FCA Regulation requires that all TSOs in CCRs where security analysis based on multiple scenarios is applied, shall jointly develop a common set of scenarios to be used in the common grid model for each long-term capacity calculation time frame. The development of a common set of scenarios must be consistent with the requirements of Article 18 of the CACM Regulation. That Article specifies in its paragraph (1) that the common scenarios shall be used to describe a specific forecast situation for generation, load and grid topology for the transmission system in the common grid model. The CGMM for the long-term time frame has been developed pursuant to Article 18 of the FCA Regulation.
- (143) Article 10 of the Proposal covers the application of scenarios. The Core TSOs are of the view that the CGMs defined pursuant to Article 3 of the CGMM are not sufficiently suitable for the application in the Core LT CCM, since the CGMM:

- (a) provides for 8 CGMs for the yearly time frame, while the Core TSOs consider that 24 CGMs are required;
 - (b) provides for 2 CGMs for the monthly time frame, while the Core TSOs consider that 2 CGMs per each week of the corresponding month are required;
 - (c) provides CGMs with planned outages applied only if they relate to the whole modelled period, while the Core TSOs consider that the most critical topology in terms of planned outages needs to be applied; and
 - (d) provides for the fixed calculation timestamps, while the Core TSOs consider that the timestamps should be flexibly selectable according to the highest number of simultaneous planned outages pursuant to the outage planning coordination (OPC) process.
- (144) For the reasons outlined in paragraph (143), the Proposal defines a regional Core procedure for the development of the additional CGMs on the basis of initial CGMs from the CGMM, but with the application of the same net positions and OPC data to reflect the required planned outages.
- (145) The Core TSOs also recognised a potential delay in the provision of monthly CGMs²⁶ and envisaged their development in the proposed Core temporary regional procedure.
- (146) On the one hand, ACER takes into account the need to ensure availability and proper granularity of the application of planned outages in the CGMs used for the LT CCM, highlighted by the Core TSOs. On the other hand, ACER also sees the importance of ensuring coordination of the CGMs at the European level, in line with Article 18 of the FCA Regulation and Article 18 of the CACM Regulation. A coordinated use of the CGMs for the long-term capacity calculation across all the European CCRs is of mutual benefit and increases the accuracy and credibility of calculated cross-zonal capacities.
- (147) Therefore, ACER has amended Article 10 of the Proposal, pragmatically allowing for a temporary procedure of the CGM development in the Core CCR, to ensure the required specifics of the CGMs' application in the Core CCR. This temporary procedure may increase the granularity of the required CGMs, apply the outage topologies pursuant to the OPC data, and have flexible timestamps for the additional CGMs (excluding the initial timestamps defined pursuant to CGMM). The Core TSOs may apply the temporary procedure only until the first next CGMM amendment,

²⁶ As reported by ENTSO-E at the working meeting of 31 August 2021 with the Core TSOs and the Core regulatory authorities.

assuming the willingness of the Core TSOs and ENTSO-E to support the inclusion of the elements of the temporary procedure in the CGMM amendment.²⁷

6.2.6.2 Governance

- (148) In order to ensure efficient cooperation of the Core TSOs with regard to the implementation, operation, decision-making, amendment and dispute resolution processes, ACER has added a new Article 19 to the Proposal, covering governance aspects. In this Article, ACER has envisaged a Core TSOs' governance process and structure which is common for all the Core methodologies carried out by Core TSOs. To this aim, Article 19 of the amended Proposal designates the Core TSOs' steering committee as the main decision-making body for the implementation of the LT CCM.
- (149) ACER notes that Article 19 does not aim to create parallel TSO structures in the Core CCR. When requiring the establishment of a steering committee, Article 19(2) does not decide whether the steering committee is established outside or within the existing TSOs structures. Thus, Article 19(2) leaves this decision to the Core TSOs.
- (150) Upon request of a Core regulatory authority, ACER has added paragraph (4) to Article 19 of the amended Proposal to clarify that the decisions adopted by the Core TSOs' common bodies and the steering committee are without prejudice to regulatory decisions adopted by the competent regulatory authorities.

6.2.6.3 Transparency and monitoring

- (151) Article 19 of the Proposal (Article 20 of the amended Proposal) specifies publication requirements to promote the objective of transparency and reliability of information on forward capacity allocation pursuant to Article 3(f) of the FCA Regulation.
- (152) In order to enhance transparency and reliability of the provided information, ACER has amended Article 19 of the Proposal, taking into account the relevant recommendations of the Core regulatory authorities provided in the non-paper. In Article 20 of the amended Proposal, ACER has listed the most relevant information to be published by the Core TSOs, also requiring the publication of a handbook to facilitate stakeholders' understanding of the published data.

²⁷ In its appeal of 3 January 2022, PSE contested Article 10 of the amended Proposal as approved by Article 10 of Annex I to Decision 14/2021, arguing in essence that its provisions would infringe Article 10(3) and Article 10(4) of the FCA Regulation, by setting rules for the usage of the CGMM or temporary procedures for building this CGM in the long-term capacity calculation which would result in planned outages not being sufficiently reflected in the capacity calculation process (see BoA Decision A-001-2022, para. 14). In that regard, the Board of Appeal found no error in Article 10 of Annex I to Decision 14/2021 and dismissed the related plea of PSE as unfounded (see BoA Decision A-001-2022, para. 96).

- (153) Article 20 of the Proposal (Article 21 of the amended Proposal) specifies the monitoring arrangements and reporting to the Core regulatory authorities. ACER has improved the proposed monitoring framework by removing the obsolete requirements, such as PTDF sensitivity threshold, and adding the provisions on the annual monitoring report.
- (154) ACER has also deleted paragraph (7) of Article 19 of the Proposal, relating to situations where no capacity can be allocated to the monthly auctions. With the introduction of the minimum RAM in the monthly time frame, such situation is no longer expected.

6.2.6.4 Reviews and updates

- (155) Article 18 of the Proposal sets out the conditions for reviews and updates of the LT CCM. ACER has amended this Article to bring it in line with the requirements of Article 27(4) of the CACM Regulation (referred to in Article 21(3) of the FCA Regulation) and to promote transparency and reliability of information in line with Article 3(f) of the FCA Regulation. The amended Article 18 provides for the necessary reviews of the inputs to the long-term capacity calculation, including the time reviews and a procedure in case of possible updates. ACER has also provided the possibility for the Core TSOs and the CCC to revise the methodology 18 months after its full implementation, and if relevant, to submit a proposal for its amendment.
- (156) In line with the non-paper of the Core regulatory authorities, ACER has added paragraph (8) in Article 18 of the amended Proposal, specifying the deadline for the application of CGMES format.

6.2.7 Implementation timescale and expected impact on the objectives of the FCA Regulation

- (157) The Proposal meets the requirement of Article 4(8) of the FCA Regulation related to the implementation timescale. Article 21 of the Proposal provides a timescale of 5 years for the implementation of the LT CCM, split into implementation phases.
- (158) However, as noted in paragraph (15), the Core regulatory authorities are of the view that the proposed timescale of 5 years is excessively long. Taking into account the Core regulatory authorities' view, and considering the required developments and the experience with the flow-based approach acquired in the day-ahead time frame, ACER has shortened the proposed implementation timeline, specifying that the first long-term auctions to be implemented are yearly flow-based auction for 2025, and the monthly flow-based auction for January 2025. Any eventual delay in the implementation of either of these auctions for whichever reason, should not delay the implementation of the other auction.

(159) The Proposal meets the requirement of Article 4(8) of the FCA Regulation to provide a description of the expected impact of the Core LT CCM on the objectives of the FCA Regulation. This impact is described in Recitals (3) to (9) of the Proposal.²⁸

6.3 Transitional solution for the calculation and allocation of long-term cross-zonal capacities

(160) Article 21 of the Proposal (Article 22 of the amended Proposal) provides that the Core TSOs would continue to apply the existing NTC capacity calculation approach until the implementation of the flow-based capacity calculation methodology.

(161) While a flow-based LT CCM provides flow-based parameters for the allocation of cross-zonal capacities, the following EU-wide terms and conditions or methodologies would need to be amended in order to support the allocation based on flow-based parameters:

- (a) the requirements for the single allocation platform pursuant to Article 49 of the FCA Regulation ('SAP');
- (b) the harmonised allocation rules pursuant to Article 51 of the FCA Regulation ('HAR');
- (c) the congestion income distribution methodology pursuant to Article 57 of the FCA Regulation (FCA CIDM);
- (d) the methodology for sharing costs incurred to ensure firmness and remuneration of long-term transmission rights pursuant to Article 61 of the FCA Regulation ('FRC').

(162) In this respect, ACER has requested ENTSO-E to report on the status of these planned amendments. In particular, by letter of 12 July 2021, ACER has formally requested all TSOs to submit the relevant proposals for amendments of the above terms and conditions and methodologies as soon as possible, and no later than 1 June 2022. On 14 December 2021, the TSOs presented the preliminary timeline for the submission of the proposals for amendment of the FCA methodologies. By letter of 26 January 2022 ACER agreed with the proposed timeline. Consequently, on 28 September 2022 all TSOs provided the proposals for the SAP, FCA CIDM and FRC, while the proposal for the HAR is scheduled for delivery by 1 March 2023.

(163) For the efficient functioning of the flow-based approach at the long-term time frame, certain regional terms and conditions or methodologies for the Core CCR should also

²⁸ ACER has introduced a number of editorial changes to improve the description of the expected impact.

be amended, such as the methodology for splitting long-term cross-zonal capacity pursuant to Article 16 of the FCA Regulation, and the regional design of long-term transmission rights pursuant to the Article 31 of the FCA Regulation.

6.4 Editorial amendments

(164) ACER has introduced a number of editorial amendments to improve clarity, conciseness, consistency and readability of the Proposal, while preserving the intended meaning of the content. These editorial amendments generally relate to amendments of wording and improvements of structure.

7 CONCLUSION

(165) For the above reasons, ACER considers that the amendments which are detailed in section 6, and which have been consulted with the Core TSOs and the Core regulatory authorities, are necessary in order to ensure that the Proposal is in line with the purpose of the FCA Regulation and contributes to market integration, non-discrimination, effective competition and the proper functioning of the market.

(166) Therefore, ACER approves the Proposal subject to the necessary substantive and editorial amendments. Annex I to this Decision sets out the LT CCM for the Core CCR, as amended and approved by ACER,

HAS ADOPTED THIS DECISION:

Article 1

The long-term capacity calculation methodology of the Core capacity calculation region pursuant to Article 10 of Regulation (EU) 2016/1719 is approved as set out in Annex I to this Decision.

Article 2

ACER's Decision No 14/2021 of 3 November 2021 on the long-term capacity calculation methodology of the Core capacity calculation region is repealed.

Article 3

This Decision is addressed to:

Austrian Power Grid AG
Elia System Operator S.A.
ČEPS a.s.
Réseau de Transport d'Electricité
HOPS d.o.o., Hrvatski operator prijenosnog sustava
MAVIR ZRt
Creos Luxembourg S.A.
TenneT TSO B.V.
Polskie Sieci Elektroenergetyczne S.A.
C.N.T.E.E. Transelectrica S.A.
ELES, d.o.o. sistemski operater prenosnega elektroenergetskega omrežja
Slovenská elektrizačná prenosová sústava, a.s.
50Hertz Transmission GmbH
Amprion GmbH
TenneT TSO GmbH
TransnetBW GmbH

Done at Ljubljana, on 18 January 2023.

- SIGNED -

*For the Agency
The Director*

C. ZINGLERSEN

Annexes:

- | | |
|----------|--|
| Annex I | Long-term capacity calculation methodology of the Core capacity calculation region |
| Annex Ia | Long-term capacity calculation methodology of the Core capacity calculation region (track-change version, for information only) |
| Annex II | Evaluation of responses to the public consultation on the proposal for long-term capacity calculation methodology of the Core capacity calculation region (for information only) |

In accordance with Article 28 of Regulation (EU) 2019/942, the addressees may appeal against this Decision by filing an appeal, together with the statement of grounds, in writing at the Board of Appeal of ACER within two months of the day of notification of this Decision.

In accordance with Article 29 of Regulation (EU) 2019/942, the addressees may bring an action for the annulment before the Court of Justice only after the exhaustion of the appeal procedure referred to in Article 28 of that Regulation.