

DECISION No 02/2019
OF THE AGENCY FOR THE COOPERATION OF
ENERGY REGULATORS

of 21 February 2019

**on the Core CCR TSOs' proposals for the regional design of the day-ahead
and intraday common capacity calculation methodologies**

THE AGENCY FOR THE COOPERATION OF ENERGY REGULATORS,

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

Having regard to Regulation (EC) No 713/2009 of the European Parliament and of the Council of 13 July 2009 establishing an Agency for the Cooperation of Energy Regulators¹, and, in particular, Articles 8(1) thereof,

Having regard to Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management, and, in particular, Article 9(12) thereof,

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

Having regard to the favourable opinion of the Board of Regulators of 20 February 2019, delivered pursuant to Article 15(1) of Regulation (EC) No 713/2009,

Whereas:

1. INTRODUCTION

- (1) Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management (the 'CACM Regulation') laid down a range of requirements for cross-zonal capacity allocation and congestion management in the day-ahead and intraday markets in electricity. These requirements also include

¹ OJ L211, 14.8.2009, p. 1.

the development of the capacity calculation methodology ('CCM') in each of the capacity calculation regions ('CCR') in accordance with Article 20 *et seq.* of the CACM Regulation.

- (2) Pursuant to Article 9(1) and (7)(a) as well as Article 20(2) of the CACM Regulation, transmission system operators ('TSOs') of each CCR are required to develop a common proposal for a common coordinated CCM within the respective region and submit it to the concerned regulatory authorities for approval. Then those regulatory authorities should reach an agreement and take a decision on the proposal for the CCM within six months after the receipt of the proposal by the last regulatory authority, according to Article 9(10) of the CACM Regulation, or, if they require the TSOs to amend the proposal, within two months after the receipt of the amended proposal by the last regulatory authority, according to Article 9(12) of the CACM Regulation. When the regulatory authorities fail to reach an agreement within the six-month period or within the two-month period after the resubmission, the Agency, pursuant to Article 9(11) and (12) of the CACM Regulation, is called upon to adopt a decision concerning the TSOs' proposal in accordance with Article 8(1) of Regulation (EC) No 713/2009.
- (3) The present Decision of the Agency follows from the request of all the regulatory authorities of the Core CCR ('Core regulatory authorities') that the Agency adopts a decision on the amended proposal for the day-ahead CCM ('DA CCM') and on the amended proposal for the intraday CCM ('ID CCM'), which the TSOs of the Core CCR ('Core TSOs') submitted to all Core regulatory authorities for approval and on which those regulatory authorities could not agree on. As those two proposals are interrelated and very similar, and to a large degree even identical, it is appropriate to decide on them in the same decision. Annex I to this Decision ('Decision on Core CCM') sets out the DA CCM and Annex II to this Decision sets out the ID CCM as decided by the Agency.

2. PROCEDURE

2.1. Proceedings before regulatory authorities

- (4) Article 20 of the CACM Regulation requires all TSOs of each CCR to submit a proposal for a common coordinated CCM for their region, no later than ten months after the approval of the proposal for the CCR. As the Agency's Decision on the definition of the CCRs was issued on 17 November 2016², the Core TSOs were required to submit a proposal for a common coordinated CCM by 17 September 2017.
- (5) On 27 June 2017, the Core TSOs published for public consultation the draft 'Core TSOs' proposal for the regional design of the day-ahead common capacity calculation

² Agency Decision No 06/2016 on the Electricity Transmission System Operators' Proposal For The Determination Of Capacity Calculation Regions

methodology in accordance with Article 20 ff. of Commission Regulation (EU) 2015/1222 of 24 July 2015³ and the draft 'Core TSOs' proposal for the regional design of the intraday common capacity calculation methodology in accordance with Article 20 ff. of Commission Regulation (EU) 2015/1222 of 24 July 2015'. The consultation lasted from 30 June 2017 until 31 July 2017.

- (6) On 15 September 2017, the Core TSOs submitted to the Core regulatory authorities a 'Core TSOs' proposal for the regional design of the intraday common capacity calculation methodology in accordance with Article 20ff. of Commission Regulation (EU) 2015/1222 of 24 July 2015' and a 'Core TSOs' proposal for the regional design of the day-ahead common capacity calculation methodology in accordance with Article 20ff. of Commission Regulation (EU) 2015/1222 of 24 July 2015' (each hereinafter referred to as the 'Proposal' and jointly as the 'Proposals').
- (7) On 9 March 2018, the Core regulatory authorities issued two requests for amendment, one for each TSOs' Proposal.
- (8) On 4 June 2018, the Core TSOs submitted amended proposals for the Core day-ahead and intraday CCMs (hereinafter referred to, respectively, as the 'Amended DA Proposal' and as the 'Amended ID Proposal', and jointly as the 'Amended Proposals'). The Amended Proposals were received by the last Core regulatory authority on 19 June 2018.

2.2. Proceedings before the Agency

- (9) In a letter received by the Agency on 21 August 2018, the Chair of the Core Energy Regulators' Regional Forum³, on behalf of all Core regulatory authorities, informed the Agency that on 16 August 2018, the Core regulatory authorities did not reach a unanimous agreement to either approve the proposals, to request the Agency to extend the deadline for decision or to request the Agency to adopt a decision on the Amended Proposals pursuant to Article 21 et seqq. of the CACM Regulation. In accordance with the Rules of Procedure of the Core Energy Regulators' Regional Forum, all Core regulatory authorities referred the Amended Proposals to the Agency, for the Agency to adopt a decision, pursuant to Article 9(12) of the CACM Regulation.
- (10) In a document titled 'Non-paper of all Core regulatory authorities on the Core TSOs' regional design of the day-ahead common capacity calculation methodology in accordance with Article 20ff. of Commission Regulation (EU) 2015/1222 of 24 July 2015 and on the Core TSOs' regional design of the intraday common capacity calculation methodology in accordance with Article 20ff. of Commission Regulation

³ The Core regulatory authorities' platform to consult and cooperate for reaching a unanimous agreement on NEMO's and TSO's proposals.

(EU) 2015/1222 of 24 July 2015' ('Non-paper') and dated 18 September 2018, all Core regulatory authorities explained that, although the Amended Proposals presented significant improvements with respect to the Proposals, all Core TSOs did not fully take account the regulatory authorities' request for amendment. Further, the Core regulatory authorities observed that the Amended Proposals were neither detailed, nor consistent, nor fully compliant with the CACM Regulation and that it lacked clear, transparent and harmonised definitions, as well as defined and justified thresholds or values. The document listed nineteen issues in the Amended Proposals for which the Core regulatory authorities suggested that the Agency takes into account a commonly agreed view, as well as ten issues in the Amended Proposals for which the Core regulatory authorities did not share a commonly agreed view. The Core regulatory authorities suggested that the Agency's decision increases the overall quality of the methodologies and gives more clarity on the compliance with European legislation.

- (11) The issues, for which the Core regulatory authorities shared a commonly agreed view, were:
- (a) The general quality of the Amended Proposals;
 - (b) The completeness and relevance of all definitions;
 - (c) The information and justification on the order and the necessity of each and every described step in calculating capacities for the day-ahead timeframe;
 - (d) The methodology for selection of critical network elements with contingencies (a critical network element is hereinafter referred to as 'CNE', whereas a critical network element with contingency as 'CNEC');
 - (e) The methodology for operational security limits;
 - (f) The validation phase and the final adjustment values;
 - (g) The generation shift keys methodology;
 - (h) The methodology for remedial actions in capacity calculation;
 - (i) The mathematical description of the capacity calculation approach;
 - (j) The adjustment for minimum Remaining Available Margin ('RAM');
 - (k) Some aspects of the long term allocated capacities ('LTA') inclusion;
 - (l) The rules on adjustment of power flows on CNEs due to remedial actions;
 - (m) The calculation of the final flow-based domain;
 - (n) The fallback process;

- (o) The capacity validation methodology;
 - (p) The methodology reviews and updates;
 - (q) The publication of data, monitoring and information to regulatory authorities;
 - (r) The timescale for implementation of the Core flow-based DA CCM;
 - (s) The number of recalculations for the intraday calculations;
- (12) The Non-paper suggested that the Agency further reviews:
- (a) The approach to avoiding undue discrimination;
 - (b) The methodology for CNEC selection;
 - (c) The methodology for allocation constraints;
 - (d) The reliability margin methodology;
 - (e) Some other aspects of the LTA inclusion;
 - (f) The capacity validation methodology;
 - (g) The publication of data in compliance with Regulation (EU) No 1227/2011 of the European Parliament and of the Council of 25 October 2011 on wholesale energy market integrity and transparency and with Directive 2008/114/EC of 8 December 2008 on the identification and designation of European critical infrastructures;
 - (h) The approach to the cross-zonal capacities for the intraday market;
 - (i) The timescale for the implementation of the capacity calculation methodologies;
 - (j) The adjustment for minimum RAM in the ID CCM.
- (13) On 4 December 2018, the Agency launched a public consultation on the Amended Proposals, inviting all market participants to submit their comments by 24 December 2018. The consultation document asked stakeholders to provide views on seven topics which were deemed as the most relevant: (i) the issue of undue discrimination between internal and cross-zonal trade; (ii) capacity validation, i.e. the possibility for TSOs to reduce the cross-zonal capacity resulting from capacity calculation to ensure operational security; (iii) the quality of the capacity calculation input parameters; (iv) the allocation constraints limiting total import or export of a bidding zone; (v) the intraday capacity calculation with regard to the adjustment of minimum RAM and LTA inclusion; (vi) the transparency of the methodology and (vii) the implementation timeline. The summary and evaluation of the responses received are presented in Annex III to this Decision.

(14) Moreover, the Agency closely cooperated with all Core regulatory authorities and TSOs and further consulted on the amendments to the proposed CCMs during numerous teleconferences and meetings and through exchanges of amendments. In particular, the following procedural steps were taken:

- 11 September 2018: teleconference with all Core regulatory authorities;
- 26 September 2018: communication to all Core regulatory authorities and all Core TSOs in the context of the Core Implementation Group meeting;
- 27 September 2018: discussion with all regulatory authorities in the framework of the Agency's Electricity Working Group ('AEWG');
- 4 October 2018: teleconference with all Core regulatory authorities;
- 12 October 2018: teleconference with all Core regulatory authorities;
- 18 October 2018: teleconference with all Core regulatory authorities;
- 19 October 2018: technical workshop in Ljubljana with all Core TSOs;
- 19 October 2018: the Agency circulated a draft of the proposed amendments to the DA CCM;
- 26 October 2018: teleconference with all Core regulatory authorities;
- 27 October 2018: the Agency circulated an updated draft of the proposed amendments to the DA CCM;
- 31 October 2018: discussion with all regulatory authorities in the framework of the AEWG;
- 8 November 2018: workshop in Ljubljana with all Core regulatory authorities and TSOs;
- 20 November 2018: discussion with all regulatory authorities in the framework of the AEWG;
- 22 November 2018: teleconference with all Core regulatory authorities and TSOs;
- 30 November 2018: teleconference with all Core regulatory authorities and TSOs;
- 5 December 2018: the Agency circulated an updated draft of the proposed amendments to the DA CCM to all Core regulatory authorities and TSOs;
- 7 December 2018: teleconference with all Core regulatory authorities and TSOs;

- 12 December 2018: the Agency circulated an updated draft of the proposed amendments to the DA CCM to all Core regulatory authorities and TSOs; discussion with all regulatory authorities in the framework of the Agency's Board of Regulators;
- 14 December 2018: teleconference with all Core regulatory authorities and TSOs;
- 19 December 2018: the Agency circulated an updated draft of the proposed amendments to the DA CCM, as well as an initial draft of the proposed amendments to the ID CCM to all Core regulatory authorities and TSOs;
- 21 December 2018: teleconference with all Core regulatory authorities and TSOs;
- 10 January 2019: discussion with all regulatory authorities in the framework of the AEWG;
- 10 January 2019: the Agency circulated an updated draft of the proposed amendments to the DA CCM to all Core regulatory authorities and TSOs;
- 11 January 2019: teleconference with all Core regulatory authorities and TSOs;
- 16 January 2019: the Agency circulated updated drafts of the proposed amendments to the DA CCM and the ID CCM to all Core regulatory authorities and TSOs;
- 18 January 2019: teleconference with all Core regulatory authorities and TSOs.
- 21 January 2019: the Agency circulated updated drafts of the proposed amendments to the DA CCM and the ID CCM to all Core regulatory authorities and TSOs;
- 23 January 2019: teleconference with all Core regulatory authorities and TSOs; discussion with all regulatory authorities in the framework of the Agency's Board of Regulators;
- 6 February 2019: teleconference with all the regulatory authorities.

3. THE AGENCY'S COMPETENCE TO DECIDE ON THE AMENDED PROPOSALS

- (15) Pursuant to Article 9(12) of the CACM Regulation, where the regulatory authorities have requested the relevant applicants (i.e. all the TSOs of the concerned region) to amend the proposal and have not been able to reach an agreement on the amended terms and conditions or methodologies within two months after their resubmission, or upon the regulatory authorities' joint request, the Agency shall adopt a decision concerning the amended terms and conditions or methodologies within six months, in accordance with Article 8(1) of Regulation (EC) No 713/2009.

- (16) According to the letter of the Chair of the Core Energy Regulators' Regional Forum of 21 August 2018, all Core regulatory authorities have not been able to reach an agreement on the Amended Proposals within two months after their resubmission, and subsequently referred the Amended Proposals to the Agency.
- (17) Therefore, under the provisions of Article 9(12) of the CACM Regulation, the Agency became responsible to adopt a decision concerning the submitted Amended Proposals by the referral of 21 August 2018.

4. SUMMARY OF THE AMENDED PROPOSALS

- (18) The Amended DA Proposal consists of the following elements:
- (a) The 'Whereas' section and Articles 1 to 4, which include general provisions, the scope of application and the definitions;
 - (b) Articles 5 to 11, which include methodologies for the calculation of the inputs, i.e. the selection of CNECs, the operational security limits, the calculation of the final adjustment value, the allocation constraints, the reliability margin, the generation shift keys and the remedial actions in capacity calculation;
 - (c) Articles 12 to 21, which include a detailed description of the capacity calculation approach; i.e. a step-by-step mathematical description of the capacity calculation, followed by further details on some of those steps, including the adjustment for minimum RAM, the long-term allocated capacity inclusion, the rules on adjustment of power flows on CNECs, the consideration of non-Core CCR borders, the calculation of the final flow-based domain, and the capacity validation methodology;
 - (d) Articles 22 to 24, which include requirements on necessary updates and data provision, including provisions regarding the monitoring and the provision of information to regulatory authorities;
 - (e) Article 25, which is dedicated to the implementation timeline;
 - (f) Article 26, which includes provisions on language.
- (19) The Amended ID Proposal consists of the following elements:
- (a) The 'Whereas' section and Articles 1 to 5, which include general provisions, the scope of application and the definitions, as well as an introduction to cross-zonal capacities for the intraday market and intraday capacity re-calculation;
 - (b) Articles 6 to 12, which include methodologies for the calculation of the inputs, i.e. the selection of CNECs, the operational security limits, the calculation of the final

- adjustment value, the allocation constraints, the reliability margin, the generation shift keys and the remedial actions in capacity calculation;
- (c) Articles 13 to 19, which include a detailed description of the capacity calculation approach; i.e. a step-by-step mathematical description of the capacity calculation, followed by further details on some of those steps, including the rules on adjustment of power flows on CNECs, the consideration of non-Core CCR borders, the calculation of the final flow-based domain, and the capacity validation methodology;
 - (d) Articles 20 to 22, which include requirements on necessary updates and data provision, including provisions regarding the monitoring and the provision of information to regulatory authorities;
 - (e) Article 23, which is dedicated to the implementation timeline;
 - (f) Article 24, which includes provisions on language.

5. SUMMARY OF THE OBSERVATIONS RECEIVED BY THE AGENCY

5.1. Initial observations of the regulatory authorities

- (20) According to the letter of the Chair of the Core Energy Regulators' Regional Forum of 21 August 2018, the Core regulatory authorities jointly observed shortcomings of the Amended Proposals.
- (21) The Core regulatory authorities found the Amended Proposals neither sufficiently detailed, nor consistent, nor fully compliant with the CACM Regulation. They observed that the Amended Proposals did not fulfil all the requirements and objectives listed in the CACM Regulation, and included many references indicating that national legislation could repeal or overrule the framework and principles established by European regulations and respective methodologies. Further, the Core regulatory authorities observed that the Amended Proposals were lacking clear, transparent and harmonised definitions, as well as defined and justified thresholds or values.
- (22) Further, the Core regulatory authorities did not agree on several features of the Amended Proposals, and most significantly:
 - (a) Firstly, the Core regulatory authorities could not agree on the application of the requirement 'to avoid undue discrimination between internal and cross-zonal exchanges' in accordance with Article 21(1)(b)(ii) of the CACM Regulation;
 - (b) Secondly, and consequently, the Core regulatory authorities could not agree on a preferred technical solution in the Amended Proposals to remedy undue discrimination. In particular, the Core regulatory authorities debated the proportionality of the selection of CNECs described in the Amended Proposals, in

combination with the use of a minimum RAM. The Core regulatory authorities debated the necessity to impose further measures to mitigate the negative effects of loop flows on capacity calculation.

- (c) Thirdly, the Core regulatory authorities could not agree on a preferred approach to the calculation of the flow reliability margin ('FRM').

5.2. Consultation of the Core regulatory authorities and TSOs

(23) During the close cooperation phase between the Agency and all Core regulatory authorities and TSOs as detailed in paragraph (14) above, and beyond the above-mentioned issues, the Agency:

- (a) tried to clarify the default approaches to capacity calculation and the framework for deviations, in particular the necessary level of transparency over the reasons for deviations and measures taken for their resolution (e.g. regarding CNEC selection, a threshold for minimum RAM or capacity reductions occurring during the capacity validation);
- (b) with respect to the treatment of non-discrimination, and in particular CNEC selection and a threshold value regarding minimum RAM, further discussed the proportionate rules and thresholds to be applied in the short term, then in the longer run, and the appropriate transition phase from this initial phase to the final one;
- (c) with respect to remedial actions, further discussed options for TSOs limit the impact of loop flows on capacity calculation with application of remedial actions and the non-costly remedial action optimisation ('NRAO').

5.3. Public consultation

(24) Answers to the public consultation (see paragraph (13) above) further shed light on stakeholders' concerns regarding the above-mentioned issues, in particular:

- (a) Regarding the selection of CNECs, many stakeholders supported the economic efficiency criterion for the selection of CNECs, whereas others considered that the physical impact should be the only criterion.
- (b) Regarding the approach to minimum RAM, stakeholders commented on the appropriate threshold value and potential negative consequences, in particular an increase in redispatching costs.
- (c) Stakeholders generally requested additional transparency, in particular in the context of the validation phase.

- (d) Stakeholders commented on the implementation timeline, debating the added value of an ambitious timeline against the negative consequences of a hasty process, e.g. regarding increased costs and operational risks.

6. ASSESSMENT OF THE AMENDED PROPOSALS

6.1. Legal framework

- (25) Article 9(1) and (7)(a) of the CACM Regulation requires TSOs to provide the proposal for a common CCM in accordance with Article 20(2) of the CACM Regulation to all regulatory authorities for their approval.
- (26) Article 20 of the CACM Regulation sets general requirements regarding the development of a proposal for a common coordinated CCM and its implementation. In that context, TSOs in each capacity calculation region are required to submit a proposal for a CCM no later than 10 month after the approval of the proposal for a capacity calculation region in accordance with Article 15(1) of the CACM Regulation. This proposal for a common coordinated CCM needs to be consulted in accordance with Article 12 of the CACM Regulation. Moreover, the proposal for CCM from the regions 'North-West Europe' ('NWE'), 'Central Eastern Europe' ('CEE'), as well as from regions referred to in Article 20(3) and (4) of the CACM Regulation has to be complemented with a common framework for coordination and compatibility of flow-based methodologies across regions to be developed in accordance with Article 20(5).
- (27) Article 21 of the CACM Regulation specifies various requirements for the content of the proposal for a CCM, referring to further specifications in Articles 22, 23, 24 and 25.
- (28) Article 22 of the CACM Regulation sets out requirements related to the reliability margin methodology to be necessarily included in the CCM.
- (29) Article 23 of the CACM Regulation lays down requirements related to operational security limits, contingencies and allocation constraints; it specifies that the operational security limits and contingencies used in capacity calculation shall be the ones used by default in operational security analysis and then clarifies the conditions for deviations.
- (30) Article 24 of the CACM Regulation stipulates requirements related to the generation shift keys methodology, namely that a methodology must be developed and applied for each generation shift key used for each bidding zone and scenario developed in accordance with Article 18 of the same Regulation. The principle underpinning such methodology is that the generation shift keys must represent the best forecast of the relation of a change in the net position of a bidding zone to a specific change of generation or load in the common grid model.
- (31) Article 25 of the CACM Regulation specifies requirements related to the methodology for remedial actions in capacity calculation.

- (32) Article 26 of the CACM Regulation sets requirements related to the methodology for the validation of cross-zonal capacity.
- (33) Article 27 of the CACM Regulation defines general requirements related to the capacity calculation process.
- (34) Article 28 of the CACM Regulation provides for requirements related to the creation of a common grid model. However, these are not directly relevant for capacity calculation methodology.
- (35) Article 29 of the CACM Regulation sets requirements related to the regional calculation of cross-zonal capacity.
- (36) Article 30 of the CACM Regulation sets requirements related to the validation and delivery of cross-zonal capacity.
- (37) As a general requirement, Article 9(9) of the CACM Regulation provides for that the proposal 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 same Regulation.

6.2. Assessment of the legal requirements

6.2.1. Assessment of the requirements for the development and for the content of a proposal for a capacity calculation methodology

6.2.1.1. Development of the proposal for a capacity calculation methodology

- (38) The Amended Proposals fulfil the requirements of Articles 9(1), 9(7)(a) and 9(12) of the CACM Regulation, as all Core TSOs jointly developed a proposal for a common CCM for the Core CCR, submitted it for approval to all Core regulatory authorities and resubmitted the jointly developed Amended Proposals within two months following a request for amendment from the Core regulatory authorities.
- (39) The Amended Proposals fulfil the requirements of Article 20(1) of the CACM Regulation as Article 4 of the Amended DA Proposal and of the Amended ID Proposal define that the flow-based approach is used for capacity calculation.
- (40) The Amended Proposals partly fulfil the requirements of Article 20(2) of the CACM Regulation, as the Proposal was submitted on 15 September 2017, which is within 10 months after the adoption of the determination of CCRs (i.e. the Decision on the determination of CCRs was adopted on 17 November 2016, as detailed in Section 2.1 above). The Proposal was also subject to consultation as described in Section 2.1. However, the Amended Proposals were not complemented with a common framework for coordination and compatibility of flow-based methodologies across regions as required by Article 20(2) of the CACM Regulation. First, this requirement assumes that

the Core CCR is split into two regions, i.e. Central West Europe and Central East Europe, whereas the determination of CCRs puts these regions into one CCR. Nevertheless, in the Agency's view, such a requirement is still applicable within the meaning of this paragraph and the Core TSOs should define a joint framework with other CCRs, referred to in Article 20(3) and (4) of the CACM Regulation (i.e. the CCR Italy North and the CCR South East Europe). Despite this obligation not being met, the Agency considers that the Amended Proposals can be approved with respect to this requirement, since the requirement for a common framework for coordination and compatibility of flow-based methodologies across regions is only applicable when all the regions referred to in Article 20(2) of the CACM Regulation are aiming to develop a flow-based methodology. In the present case however, the CCRs Italy North and SEE are aiming to implement the coordinated NTC approach and therefore such common framework cannot be developed at this stage.

6.2.1.2. Required content of the proposal for a capacity calculation methodology

- (41) The Amended Proposals partially fulfil the requirements of Article 21 of the CACM Regulation regarding the content of the CCM.
- (42) The Amended Proposals meet the requirements of Article 21(a) of the CACM Regulation as they include:
 - (a) a methodology for determining the reliability margin (Article 9 of the Amended DA Proposal and Article 10 of the Amended ID Proposal);
 - (b) the methodologies for determining operational security limits (Article 6 of the Amended DA Proposal and Article 7 of the Amended ID Proposal), contingencies relevant to capacity calculation (Article 5 of the Amended DA Proposal and Article 6 of the Amended ID Proposal) and allocation constraints that may be applied (Article 8 of the Amended DA Proposal and Article 9 of the Amended ID Proposal);
 - (c) the methodology for determining the generation shift keys (Article 10 of the Amended DA Proposal and Article 11 of the Amended ID Proposal); and
 - (d) the methodology for determining remedial actions to be considered in capacity calculation (Article 11 of the Amended DA Proposal and Article 12 of the Amended ID Proposal).
- (43) The Amended Proposals partially meet the requirements of Article 21(1)(b) of the CACM Regulation as they include:
 - (a) a mathematical description of the applied capacity calculation approach (Articles 12 to 20 of the Amended DA Proposal and Articles 13 to 18 of the Amended ID Proposal);

- (b) rules for avoiding undue discrimination between internal and cross-zonal exchanges (Article 5(6)(a) of the Amended DA Proposal, but not provided in the Amended ID Proposal);
 - (c) rules for taking into account previously allocated cross-zonal capacity (Articles 12 and 14 of the DA CCM and Article 13 of the Amended ID Proposal);
 - (d) rules on the adjustment of power flows on critical network elements or of cross-zonal capacity due to remedial actions (Article 15 of the Amended DA Proposal and Article 14 of the Amended ID Proposal);
 - (e) a mathematical description of the calculation of power transfer distribution factors (Article 12(3) of the Amended DA Proposal and Article 13(3) of the Amended ID Proposal) and of the calculation of available margins on critical network elements (Article 12(10) of the Amended DA Proposal and Article 13(10) of the Amended ID Proposal); and
 - (f) where the power flows on critical network elements are influenced by cross-zonal power exchanges in different CCRs, the rules for sharing the power flow capabilities of critical network elements among different CCRs in order to accommodate these flows (Article 17 of the Amended DA Proposal and Article 16 of the Amended ID Proposal).
- (44) The Amended Proposals meet the requirements of Article 21(1)(c) as they include a methodology for the validation of cross-zonal capacity actions (Article 21 of the Amended DA Proposal and Article 19 of the Amended ID Proposal).
- (45) The Amended ID Proposal partially meets the requirements of Article 21(2) of the CACM Regulation as Article 5 of the Amended ID Proposal contains the choice of the frequency with which intraday cross-zonal capacity will be reassessed, but no justification for the proposed two intraday recalculations is provided.
- (46) The Amended Proposals meet the requirements of Article 21(3) of the CACM Regulation as they include a fall-back procedure for the case where the initial capacity calculation does not lead to any results (Article 19 of the Amended DA Proposal and Article 18 of the Amended ID Proposal)⁴.

⁴ Although the CACM Regulation refers to 'does not lead to any results', the Agency understands this to mean 'does not lead to the final results (i.e. cross-zonal capacities) for all market time units'.

6.2.1.3. Proposed timescale for implementation

- (47) The Amended Proposals generally fulfil the requirements of Article 9(9) of the CACM Regulation with regard to the proposed timescale for implementation of the CCMs.
- (48) Article 25 of the Amended DA Proposal and Article 23 of the Amended ID Proposal provide that after the adoption of the CCM, the Core TSOs will start implementing both methodologies such that the DA CCM and ID CCM will be operationally ready by the first semester of 2020 and by the first semester of 2021, respectively. The Amended Proposals also specify that the implementation process will consist of internal parallel testing during which TSOs will test their processes, IT tools and simulate the market results based on cross-zonal capacities calculated with the new methodologies. Then, during the external parallel run, TSOs aim to involve the nominated electricity market operators ('NEMOs') and market participants so they are able to prepare themselves for the implementation of the methodologies. During the implementation period, TSOs propose to monitor the performance of the new methodologies in coordination with the Core regulatory authorities.
- (49) Yet, the Agency finds it necessary to amend Article 25 of the Amended DA Proposal and Article 23 of the Amended ID Proposal to improve clarity and enforceability of the implementation provisions and to adjust the timelines to the delays imposed in the adoption of the DA and ID CCM.
- (50) First, the Agency has introduced a firm implementation timeline for the implementation of the DA CCM such that it should be implemented no later than 1 December 2020. This implementation timeline reflects the additional delays due to the late adoption of the methodology and the fact that some fundamental elements of the DA CCM have been amended by this Decision.
- (51) For the ID CCM, the Agency also provided firm implementation deadlines which are structured into three different stages. The updating of cross-zonal capacities remaining after the single day-ahead coupling ('SDAC') should be implemented by the time of implementation of the DA CCM. The first calculation of intraday cross-zonal capacities should be implemented by twelve months after the implementation of the DA CCM, whereas the second calculation of intraday cross-zonal capacities should be implemented by twelve months after the implementation of the first calculation of intraday cross-zonal capacities.
- (52) The Agency has defined the above mentioned deadlines after consultation with all TSOs, regulatory authorities and market participants. The Agency understands that those deadlines are such that the risk for TSOs of not meeting the adequate capacity calculation performance criteria by the deadlines is minimal, provided that TSOs dedicate the required time and resources to the task.

- (53) The Agency reaffirmed the two phase implementation proposed within the Amended Proposals, i.e. the internal parallel testing during which TSOs are developing and testing their processes and IT tools and simulating the impact of cross-zonal capacities on the market and the external parallel testing during which NEMOs and market participants are able to test the impact of the new methodologies on their processes. The Agency also clarified the scope of the monitoring of the effects and the performance of the application of the DA CCM, including the performance criteria and reporting in the quarterly and annual reports.
- (54) The Agency removed references to specific implementation timelines with regard to FRM and advanced hybrid coupling as these are implicitly already tackled within the dedicated Articles. For the ID CCM, the Agency added provisions on a transitional solution for the updating of cross-zonal capacities remaining from the SDAC and optionally a transitional solution for the calculation of intraday cross-zonal capacities based on existing intraday capacity calculation initiatives. These provisions are complemented by Annex 2 to the ID CCM, which provides clarity on when and how intraday cross-zonal capacities shall be calculated.
- (55) The Amended Proposals fail to address the requirement of Article 27(2) of the CACM Regulation as they do not provide an explicit obligation to set up jointly the CCC and to establish rules governing its operations. The Agency added this obligation to Article 28 of the DA CCM and Article 26 of the ID CCM.

6.2.1.4. Description of the expected impact on the objectives of the CACM Regulation

- (56) The recitals within both Amended Proposals provide a description of the expected impact of the methodologies on the objectives of the CACM Regulation. All the objectives set in Article 3 of the CACM Regulation are addressed in the recitals, except for the objective of contributing to the efficient long-term operation and development of the electricity transmission system and electricity sector in the Union in accordance with Article 3(g) of the CACM Regulation.
- (57) The Agency added a description of the impact on the objective pursuant to Article 3(g) of the CACM Regulation and improved the description of the impact on other objectives where it was inadequate.

6.2.2. Assessment of the requirements for the capacity calculation inputs

- (58) Articles 21(1)(a), 22, 23, 24, 25, 27(4) and 29(1) of the CACM Regulation provide requirements for the capacity calculation inputs. These involve reliability margin, operational security limits and contingencies, allocation constraints, generation shift keys and remedial actions used in capacity calculation. While the common grid model is also considered as a capacity calculation input, the methodology governing its establishment is defined in the common grid model methodology pursuant to Article 17 of the CACM Regulation and therefore falls outside the scope of the CCM.

6.2.2.1. Methodology for reliability margin

- (59) Article 9 of the Amended DA Proposal and Article 10 of the Amended ID Proposal aim to address the requirements of Article 22 of the CACM Regulation. These articles of the Amended Proposals describe in detail the methodology for establishing the reliability margin, but fail to fulfil all the requirements of Article 22 of the CACM Regulation. First, the Amended Proposals specify that the calculation of reliability margin is performed in three steps, whereas Article 22(1) and (2) of the CACM Regulation requires a calculation in two steps. The Agency therefore removed the possible third step as defined in Article 9(2)(c) of the Amended DA Proposal and in Article 10(2)(c) of the Amended ID Proposal.
- (60) The Amended Proposals fail to establish common harmonised principles for deriving the reliability margin from the probability distribution as required by Article 22(3) of the CACM Regulation. Instead, the Amended Proposals provide two options for deriving the reliability margin from the probability distribution, one by drawing reliability margin for each CNEC from specific probability distribution associated to that CNEC and the other by drawing a single reliability margin for all CNECs of the same CNE from a probability distribution calculated for that CNE. Since the Agency has no evidence to support one approach to be adopted as a harmonised approach, the Amended Proposals have been amended so that this choice shall be made once TSOs have performed the first calculation of probability distributions, as this will allow a comparison of both approaches. Since this calculation can only be performed after the implementation of the CCMs, the Agency added an obligation for TSOs to perform this analysis and comparison and to make a proposal for amendment of the CCMs eighteen months after the implementation of the CCMs. This proposal should specify which option should be used for the calculation of reliability margin. This proposal should also be accompanied with the analysis of both options and an assessment of their benefits and drawbacks.
- (61) Finally, the Agency removed those provisions in Article 9 of the Amended DA Proposal and in Article 10 of the Amended ID Proposal, which aim to describe the meaning and justification of the methodology for calculating the reliability margin and the proposals for further studies and assessments, since these have been effectively replaced by the requirement for an amendment of the DA and ID CCM eighteen months after their implementation.

6.2.2.2. Methodology for operational security limits

- (62) Articles 5 and 6 of the Amended DA Proposal and Articles 6 and 7 of the Amended ID Proposal aim to fulfil the requirements of Article 23(1) and Article 23(2) of the CACM Regulation, which require that TSOs use in capacity calculation those operational security limits and contingencies that are used in operational security analysis, or if this is not the case, that TSOs describe in the CCM the particular method and criteria they use to determine operational security limits and contingencies used for capacity

calculation. These requirements relate to the choice of CNEs, contingencies and operational security limits applicable for CNEs. Article 5 of the Amended DA Proposal and Article 6 of the Amended ID Proposal specify the methodology for selecting CNEs and contingencies (i.e. CNECs), whereas Article 6 of the Amended DA Proposal and Article 7 of the Amended ID Proposal specify the methodology for calculating operational security limits applicable for the CNECs defined pursuant to Article 5 of the Amended DA Proposal and to Article 6 of the Amended ID Proposal, respectively, which are the electrical current and power limits of CNEs.

- (63) The Amended Proposals generally fulfil the requirement of Article 23(1) and (2) of the CACM Regulation. The Amended Proposals request that the list of contingencies used in operational security is established pursuant to Article 33 of Commission Regulation EU) (the ‘SO Regulation’) and the association of contingencies to CNEs is done pursuant to Article 75 of the SO Regulation. Until the methodology to be established pursuant to Article 75 of SO Regulation enters into force, Article 5 of the Amended DA Proposal and Article 6 of the Amended ID Proposal clarify that the association of contingencies to CNEs is done based on each TSO’s needs and operational experience. Article 6 of the Amended DA proposal and Article 7 of the Amended ID Proposal request that the Core TSOs respect the operational security limits used in the operation security analysis carried out pursuant to Article 72 of the SO Regulation.
- (64) As regards the selection of CNEs, Article 5 of the Amended DA Proposal and Article 6 of the Amended ID Proposal do not refer to operational security analysis, but they do provide the criteria used to determine the CNEs. These criteria are specified in Article 5(5) and (6) of the Amended DA Proposal and Article 6(5) and (6) of the Amended ID Proposal.
- (65) The Agency amended the structure of Article 5 of the Amended DA Proposal and Article 6 of the Amended ID Proposal to provide clarity with regard to the selection of CNECs and to distinguish between the TSOs’ tasks related to the capacity calculation inputs and the CCC’s tasks related to the capacity calculation process. This is needed because the Amended Proposals introduce a selection criterion based on power transfer distribution factors (‘PTDF’), but these are not available at the time of defining the capacity calculation inputs, but only during the capacity calculation process. Article 5 of the Amended DA Proposal and Article 6 of the Amended ID Proposal were therefore separated into Article 5 of the CCMs, dedicated to the inputs that TSOs must provide in relation to the CNECs with the aim to define the initial list of CNECs for each TSO, and, respectively, Article 14 and 15 of the DA CCM and Article 15 and 16 of the ID CCM, related to the definition of a common list of CNECs relevant for the day-ahead capacity calculation. For this reason, the Agency removed all the provisions from Article 5 of the CCMs, which relate to the selection of CNECs into different categories as this subject is tackled during the capacity calculation process in Article 15 of the DA CCM and Article 16 of the ID CCM.

- (66) The Agency further clarified the tasks to be performed by the Core TSOs when providing the inputs for CNECs and isolated them from the CCC's obligations so that Article 5 of the Amended DA Proposal and Article 6 of the Amended ID Proposal contain obligations on the Core TSOs only. In this context, the concept that TSOs define which network elements with contingency need to be monitored during the NRAO has been preserved, but separated from the process of definition of CNECs. For this purpose the Agency introduced a separate process by which TSOs define monitored network elements with contingency ('MNEC') as separate inputs to capacity calculation and these MNECs need to be monitored during the NRAO.
- (67) In Article 6 of the Amended DA Proposal and Article 7 of the Amended ID Proposal, the Agency clarified that the CNECs shall have only one associated operational security limit pursuant to Article 72 of the SO Regulation, i.e. the thermal limit of the CNEs, associated with their maximum admissible current limit (I_{max}).
- (68) When defining I_{max} , the Agency limited possible options to calculate it only to three, and grouped the approaches associated to a fixed limit in the Amended Proposals into one category to which only those elements that are both not sensitive to ambient conditions and installed in the primary power circuit are eligible. The Agency excluded secondary equipment from this category. As a principle, secondary equipment should not limit I_{max} , as the costs of replacing such equipment are low, in particular in comparison with the expected gain from replacing them.
- (69) The Agency further clarified that, as a consequence of a temporary limit applied to a CNE, various CNECs associated with the same CNE may have different values for I_{max} . The Agency also rephrased and clarified the assumption on the power factor $\cos(\varphi)$.
- (70) In order to maximise the available capacity on the CNECs, the Agency reinforced the obligation for the Core TSOs gradually to replace the seasonal limits to calculate I_{max} with a dynamic limit, which ensures that I_{max} represents the maximum current under expected ambient conditions for a given market time unit. In order to ensure an efficient implementation of this requirement and to fulfil the objectives set in Articles 3(b) and 3(d) of the CACM Regulation, (i.e. respectively ensuring an optimal use of the transmission infrastructure and optimising the calculation and allocation of cross-zonal capacity), TSOs should focus on the most limiting CNEs and compare the costs and benefits of installing the equipment needed to implement dynamic limit on those CNEs. When benefits outweigh costs, TSOs should install such equipment within three years.
- (71) The Agency also clarified several other issues in Article 5 and 6 of the Amended DA Proposal and Article 6 and 7 of the Amended ID Proposal: (i) the terms employed (e.g. unplanned outage) by introducing definitions and ensuring the use of a unique denomination in association with a given notion throughout the text, (ii) the processes, which are now described along chronological steps, with a clear separation of obligations among parties involved in those steps, and (iii) the obligations, mainly by

reverting from passive to active verbal forms, thereby ensuring that parties upon whom the obligation falls are explicitly mentioned.

6.2.2.3. *Methodology for allocation constraints*

- (72) Article 8 of the Amended DA Proposal and Article 9 of the Amended ID Proposal aim to fulfil the requirements set by Article 23(3) of the CACM Regulation. They specify that three TSOs are faced with operational security limits, which cannot be efficiently transformed into maximum flows on the CNEs. Therefore, pursuant to Article 23(3)(a), these TSOs need allocation constraints to cope with the underlying limits. These three TSOs proposed to use only one type of allocation constraint, which is an external constraint that is limiting the overall import or export possibility of a bidding zone, either towards all other bidding zones participating in the SDAC or single intraday coupling ('SIDC') or only towards other Core bidding zones participating in the SDAC or SIDC.
- (73) The justifications provided by the concerned TSOs in Appendix 1 to the Amended DA Proposal were different. Dutch TSO (TenneT TSO B.V.) proposed to use an export constraint to mitigate the uncertainty caused by the generation shift key at large export volumes⁵ and an import constraint to address voltage stability in its network. Belgian TSO (Elia) proposed to use import and export constraints to address dynamic and voltage stability of its network. Polish TSO (PSE) proposed to use import and export constraints to address the need to guarantee sufficient balancing capacity in the Polish system.
- (74) The Agency considers that the Amended Proposals do not fulfil the requirements of Article 23(3) of the CACM Regulation as they do not provide sufficient justification for these allocation constraints, namely a clear legal basis, a clear identification of the underlying operational security limits and a reason as to why they cannot be addressed in other ways considering the alternatives to address the underlying problems. Further, the Amended Proposals do not fulfil Article 21(1)(a)(ii) of the CACM Regulation as they do not provide sufficient clarity on the methodology to calculate the values for external constraints.
- (75) Regarding the Polish allocation constraints, no sufficient evidence has been provided that an external constraint is actually addressing an operational security problem that could not be otherwise addressed by other means. PSE claims that it needs to limit the total export/import capacity in order to ensure that balancing service provides (generating units) do not sell/buy too much energy in the day-ahead market because of

⁵ Generation shift key is designed to represent the changes in generation (and load) units at moderate import or export volumes of a bidding zone. If the actual import or export of a bidding zone is much larger, then the forecast error caused by the generation shift key is much larger.

high exports/imports, as consequently they may not be able to provide sufficient upward/downward reserve capacity within the integrated scheduling process. Therefore, PSE proposes to ensure sufficient reserve capacity within integrated scheduling process by limiting how much electricity can be exported/imported in the SDAC and SIDC. However, the Agency is of the opinion that this is not the only available option, and other options may include, *inter alia*:

- (a) Procuring reserves explicitly (outside integrated scheduling process) before SDAC.
 - (b) Procuring reserves within integrated scheduling process, but shifting the imbalance risk resulting from the SDAC and integrated scheduling process to balancing service providers (generating units). They would be able to trade freely in the day-ahead market, but they would face additional obligations to provide sufficient balancing reserves resulting from the integrated scheduling process. If the two markets would create an imbalance in their positions, they would be able to re-trade their position in the intraday market. This means that if they sold too much electricity in the day-ahead market (and thereby cannot provide balancing reserves as required from the integrated scheduling process), they would buy back some electricity in the intraday market, otherwise they would be faced with penalties for energy imbalance or penalty for not providing reserve capacity to TSO.
 - (c) Procuring reserves explicitly (outside integrated scheduling process) after SDAC. This would imply that if balancing service providers (generating units) sold too much energy in the day-ahead market, they would be willing to buy this energy back in the intraday market and would thus provide an offer to TSO to provide balancing capacity. Alternatively, they could speculate that balancing capacity would provide more income for them and would thus refrain from selling energy in the day-ahead market.
- (76) The justifications provided in the Amended DA Proposal therefore present allocation constraints as the only and the most efficient option, without supporting evidence. The Agency is of opinion that such justification may be accepted as a temporary solution because TSOs need time to analyse the alternatives and to implement them if efficient. After a transition period, TSOs must justify permanent solutions by providing a clear legal basis, a clear identification of the underlying operational security problem, and clear evidences demonstrating that the problem cannot be addressed in other ways.
- (77) Therefore, Article 8 of the Amended DA Proposal and Article 9 of the Amended ID Proposal need to be amended as follows. During the transition period, the concerned TSOs should more regularly calculate the values of allocation constraints and when these allocation constraints are causing a loss of economic surplus (i.e. when they have a non-zero shadow price) TSOs should analyse the effectiveness of the allocation constraint in preventing the violation of the underlying operational security limits and analyse alternative solutions to address the underlying operational security limits.

- (78) If during the transition period TSOs fail to find alternatives to address the underlying problems, they may provide a proposal for an amendment of the methodology to continue applying the allocation constraints. Such a proposal should include: (i) the technical and legal justifications for the need to continue using the external constraints, indicating the underlying operational security limits and why they cannot be transformed efficiently into I_{max} and F_{max} , and (ii) the methodology to calculate the value of external constraints, including the frequency of recalculation.

6.2.2.4. Methodology for generation shift key

- (79) Article 10 of the Amended DA Proposal and Article 11 of the Amended ID Proposal aim to address the requirements of Article 21(1)(a)(iii) and Article 24(1) of the CACM Regulation, which require that the CCM defines a methodology to determine a common generation shift key for each bidding zone and scenario. The requirement set by Article 24(2) of the CACM Regulation, that generation shift keys represent the best forecast of the relation of a change in the net position of a bidding zone with a specific change of generation or load in the common grid model, taking into account in particular the information from the generation and load data provision methodology, is addressed by Article 10(1) and (3) of the Amended DA Proposal and Article 11(1) and (3) of the Amended ID Proposal, which describe some general rules and principles for the determination of generation shift keys.
- (80) The Amended Proposals fulfil the requirements of Article 24 of the CACM Regulation. Nevertheless, the Agency observes that the Amended Proposals fail to address the harmonisation of the generation shift keys. This is required by Article 21(4) of the CACM Regulation, which requires that all TSOs in each CCR shall, as far as possible, use harmonised capacity calculation inputs. While the Amended Proposals provide common generic principles for the establishment of generation shift keys, they do not provide any principle or methodology specifying how the best forecast of the relation of a change in the net position of a bidding zone is achieved. In addition, the Amended Proposals include a set of TSO-specific methodologies.
- (81) In order to ensure the harmonisation of generation shift keys as far as possible, the Agency replaced all the TSO-specific methodologies with a common principle that the best forecast is achieved by focusing on the observed historical response of generation and/or load units to changes in net positions, clearing prices and other fundamental factors, and thereby contributing to minimising the reliability margins. While this principle does not ensure a complete harmonisation of generation shift keys, it does provide for a common harmonised principle for generation shift keys.
- (82) The Agency considers that, in the first step of implementation of the CCM, a general harmonised principle is sufficient to ensure compliance with Article 21(4) of the CACM Regulation. Article 10(4) of the Amended DA Proposal and Article 11(4) of the Amended ID Proposal also provide a generic and non-binding requirement to study the possibility of further improvements of generation shift keys and coordinate their

implementation. The Agency removed this requirement as it does not provide clarity and enforceability of its implementation and replaced it with a firm obligation to deliver a proposal for further harmonisation of the generation shift key methodology within eighteen months after the implementation of the methodology, as specified in Article 9(6) of the CCMs.

- (83) Finally, the Agency clarified the legal responsibilities of the parties involved (e.g. by reverting passive forms into active forms), thereby ensuring the proper enforceability of the provisions.

6.2.2.5. Methodology for remedial actions in capacity calculation

- (84) Article 11 of the Amended DA Proposal and Article 12 of the Amended ID Proposal aim to address the requirements of Article 21(1)(a)(iv) and Article 25 of the CACM Regulation with regard to the use of remedial actions in capacity calculation.
- (85) The Amended Proposals fulfil Article 21(1)(a)(iv) of the CACM Regulation, whereas they only partly fulfil the requirements of Article 25 of the CACM Regulation. More specifically, the Amended Proposals do not fulfil the requirements of Article 25(2) and (5) of the CACM Regulation.
- (86) Article 25(2) of the CACM Regulation requires that the TSOs within a CCR coordinate the use of remedial actions in the CCM. This coordination should be achieved during the following two processes: (i) non-costly remedial actions should be coordinated during the NRAO, and (ii) during the capacity validation, all remedial actions should be coordinated to the extent possible in order to ensure that calculated cross-zonal capacities are not likely to lead to operational security violations with all the available remedial actions. To enable this coordination, the Agency added an obligation such that each TSO shall provide the CCC with all the expected available costly and non-costly remedial actions for the purpose of the NRAO and capacity validation.
- (87) Article 25(5) of the CACM Regulation requires TSOs to take into account non-costly remedial actions in the capacity calculation. Article 25(4) of the CACM Regulation allows limiting the scope of remedial actions taken into account in capacity calculation to ensure that *'the available remedial actions remaining after calculation, taken together with the reliability margin referred [...] are sufficient to ensure operational security'*. In order to reflect both obligations, the Agency clarified the scope of remedial actions, which TSOs may withhold from capacity calculation to *'only those RAs, which are needed to ensure operational security in real-time operation and for which no other (costly) RAs are available, or those offered to day-ahead capacity calculation in other CCRs in which the concerned TSO also participates'*. In addition, the Agency mandated the CCC to monitor and report annually on unjustified systematic withholdings of non-costly remedial actions.

- (88) The Agency added a new paragraph to Article 10 of the DA CCM to prevent non-discrimination during the coordination of remedial actions. Namely, when the coordination of remedial actions in capacity calculation, as required by Article 25(2) of the CACM Regulation, would increase loop flows and thereby undue discrimination between internal and cross-zonal exchanges, the CCM should provide for measures that prevent such outcomes. One such measure is, in the Agency's view, needed during the definition of remedial actions as capacity calculation inputs, where TSOs should be allowed to define initial settings of remedial actions which aim to ensure that the level of loop flows is reduced below the level that is considered not to induce undue discrimination. This option provided to TSOs is without prejudice to the coordination of remedial actions during the NRAO and capacity validation. However, these two processes should also be designed in a way to meet the same objective. This is further elaborated in Article 16 of the DA CCM and Article 17 of the ID CCM. The option for individual TSOs to define initial settings of remedial actions is also without prejudice to the coordination of remedial actions during the processes after capacity calculation (e.g. the methodology for coordinated redispatching and countertrading established pursuant to Article 35 of the CACM Regulation).
- (89) When defining the target value for loop flows which do not induce discrimination, the Agency considers that this value is implicitly defined when TSOs determine the minimum capacity which aims to address undue discrimination. The minimum capacity is expressed in the DA CCM as a minimum RAM factor (R_{amr}), which should by default be equal to 0.7 (i.e. 70% of the maximum admissible flow (F_{max}) of CNECs should be offered for cross-zonal exchanges, see Section 6.2.3.3 for further details). As the remaining 30% of the maximum admissible flow (F_{max}) of CNECs can only be used for FRM or loop flows in case of cross-zonal CNECs (i.e. cross-zonal CNECs have no internal flows), the target value should by default be equal to 30% of the maximum admissible flow (F_{max}) reduced by the reliability margin. In case a TSO is applying a different value for the minimum RAM factor (e.g. in the case of derogations or action plans in accordance with Union legislation), this means that it uses different assumptions for the reliability margin and loop flows on cross-zonal CNECs. For this reason, the target value should be consistent with the assumptions made when defining the minimum RAM factor.

6.2.2.6. Review and update of capacity calculation inputs

- (90) Article 22 of the Amended DA Proposal and Article 20 of the Amended ID Proposal, in combination with specific paragraphs on the review and update of capacity calculation inputs in Articles 5, 6, 8, 9, 10, and 11 of the Amended DA Proposal and Articles 6, 7, 9, 11, and 12 of the Amended ID Proposal, fully comply with the requirements of Article 27(4) of the CACM Regulation by addressing regular reviews and updates of the capacity calculation inputs.

6.2.3. Assessment of the requirements for the capacity calculation process

(91) Section 4 of Chapter I of the CACM Regulation addresses the capacity calculation process, which is a process after the definition of the capacity calculation inputs and before the validation of the capacity calculation results. Namely, Article 21(1)(b) and Article 29(2) to (11) of the CACM Regulation address the various methodologies and steps performed by the CCC during the capacity calculation process.

6.2.3.1. *Mathematical description of the capacity calculation approach*

(92) Article 12 of the Amended DA Proposal and Article 13 of the Amended ID Proposal aim to provide a mathematical description of the capacity calculation approach for the calculation of PTDFs and the RAM on CNECs. They are complemented, respectively, by Article 16 of the Amended DA Proposal and Article 15 of the Amended ID Proposal for the cases where HVDC interconnectors are located on Core bidding zone borders.

(93) The Articles referred to in the previous paragraph generally fulfil the requirements of the CACM Regulation with regard to the mathematical description of the capacity calculation approach. Nevertheless, the Agency found necessary to amend these Articles in order to improve the clarity and the structure of this part of the CCMs.

(94) The Agency reordered the articles in the Amended Proposals chronologically, such that the articles follow the order in which the calculation steps they describe are performed. The Agency also structured the mathematical description of the capacity calculation approach into a generic description, which gathers Articles 12, 16 and 17 of the Amended DA Proposal and Articles 13, 15 and 16 of the Amended ID Proposal, and a specific description, which gathers Articles 13, 14, 15 and 17 to 21 of the Amended DA Proposal and Articles 14 and 16 to 19 of the Amended ID Proposal, such that the provisions and mathematical formulas of the generic mathematical descriptions are used in the specific mathematical descriptions.

(95) Article 12 of the Amended DA Proposal and Article 13 of the Amended ID Proposal cover the generic mathematical description for the calculation of the power transfer distribution matrix as required by Article 21(1)(b)(i) of the CACM Regulation. The Agency introduced several amendments to improve clarity of the provisions. First, the Agency removed paragraph 5 of these Articles. This paragraph only provides a generic explanation of the problem without explicit and mandated requirements or obligations on the TSOs or the CCC. Second, the Agency completed equation 6 in Article 12 of the Amended DA Proposal and Article 13 of the Amended ID Proposal, which calculates maximum zone-to-zone PTDF. It now includes the PTDFs which are calculated for HVDC interconnectors. These PTDFs were not considered in the Amended Proposals. Third, the Agency moved Article 12(10) of the Amended DA Proposal and Article 13(10) of the Amended ID Proposal, describing the calculation of the RAM, to Article 16 of the DA CCM and Article 17 of the ID CCM, respectively, as this is the first time in the capacity calculation process that the RAM is calculated.

- (96) Article 16 of the Amended DA Proposal and Article 16 of the Amended ID Proposal describe the integration to the CCM of HVDC interconnectors on the bidding zone borders of the Core CCR. To reflect the chronology of the calculation steps, the Agency moved this description to Article 12 of the DA CCM and Article 13 of the ID CCM, respectively. Further, the Agency edited the content of these Articles to improve clarity and consistency without modifying their meaning.
- (97) First, the Agency included Article 12(6) of Amended DA Proposal into Article 12 of the DA CCM and Article 13(6) of the Amended ID Proposal into Article 13 of the ID CCM. In this way, Article 12 of the DA CCM and Article 13 of the ID CCM now combine all the provisions related to HVDC interconnectors within the Core CCR. Second, the Agency removed the specific provisions on outage of HVDC interconnector as this does not deviate from the general rules to define contingencies in accordance with Article 5 of the CCMs. Finally, the Agency placed some relevant explanatory text in a footnote.
- 6.2.3.2. *Rules for sharing the power flow capabilities of the critical network elements among different capacity calculation regions*
- (98) Article 17 of the Amended DA Proposal and Article 16 of the Amended ID Proposal aim to address the requirements of Article 21(1)(b)(vii) and 29(8)(d) of the CACM Regulation, which require that, where the power flows on CNEs are influenced by cross-zonal power exchanges in different CCRs, the DA CCM and the ID CCM define the rules for sharing the power flow capabilities of CNEs among different CCRs in order to accommodate these flows. Article 17 of the Amended DA Proposal and Article 16 of the Amended ID Proposal describe the treatment of the impact of cross-zonal exchanges in neighbouring CCRs on the CNEs in the Core CCR.
- (99) Article 17 of the Amended DA Proposal and Article 16 of the Amended ID Proposal propose a two-step approach to address the above requirements. First, a standard hybrid coupling approach takes explicitly into account the impact of exchanges outside the Core CCR, by reducing the RAM on the Core CNECs by a volume corresponding to the expected impact. Second, TSOs plan to implement advanced hybrid coupling, taking such impact into account implicitly. In this approach, the capacity of a Core CNEC is simultaneously given to cross-zonal exchanges on bidding zone borders within and outside the Core CCR and the SDAC or the SIDC algorithm determines to which exchanges on which bidding zone borders it will be allocated.
- (100) To reflect the chronology of the calculation steps, the Agency moved this description to Article 13 of the DA CCM and Article 14 of the ID CCM. Further, the Agency edited the content of these Articles to improve clarity and consistency, without further modifying their meaning. Furthermore, the Agency removed all the explanatory text from these two Articles.

- (101) As regards the second step to address the impact of cross-zonal exchanges over bidding zone borders in neighbouring CCRs, the Agency has concerns over the enforceability of the proposed implementation of advanced hybrid coupling as described in the Amended Proposals.
- (102) First, the Amended Proposals lack explicit and mandated requirements or obligations on TSOs regarding advanced hybrid coupling. Article 17 of the Amended DA Proposal and Article 16 of the Amended ID Proposal only describe the concept of advanced hybrid coupling.
- (103) Article 25(7) of the Amended DA Proposal states that ‘Core TSOs aim to be operationally compatible two (2) years after the Core flow-based day-ahead market coupling go live for the market’. Similarly, Article 23(6) of the Amended ID Proposal states that ‘after the implementation of the intraday common capacity calculation methodology Core TSOs are willing to work on supporting a solution, in addition to standard hybrid coupling, that fully takes into account the influences of the adjacent CCRs during the capacity allocation i.e. the so-called [Advanced Hybrid Coupling] concept, in close cooperation with adjacent involved CCRs. A decision will be taken based on a study to be delivered two (2) years after the go-live of the common intraday capacity calculation’.
- (104) In order to ensure enforceability of the provisions, the Agency replaced these statements with a requirement in Article 13(4) of the DA CCM and Article 14(4) of the ID CCM for the Core TSOs to propose an amendment to each CCM no later than eighteen months after the implementation of the CCM. This proposal must specify the methodology to apply advanced hybrid coupling, and the timeline to implement it.
- (105) Second, the Agency is generally concerned about the legal compliance of the advanced hybrid coupling with the CACM Regulation. The CACM Regulation clearly establishes CCRs and allocates each bidding zone border to only one CCR. Namely, Article 29(10)(a) of the CACM Regulations specifies that *‘[e]ach coordinated capacity calculator shall set flow-based parameters for each bidding zone within the capacity calculation region, if applying the flow-based approach’*. This implies that such parameters cannot be applied for bidding zones outside of the CCR. The geographical scope of the Amended Proposals is limited to the bidding zone borders of the Core CCR. However, as a consequence of the advanced hybrid coupling, cross-zonal capacities (i.e. flow-based parameters) within the Core CCR would implicitly limit cross-zonal exchanges in other CCRs. While the Agency agrees that the advanced hybrid coupling may likely be the optimal and least discriminatory solution to address cross-regional impacts, such a solution may, however, not be compatible with the CACM Regulation.
- (106) Regardless of the interpretation of the CACM Regulation, the proposed amendments should be compatible with the applicable legal framework at the time when TSOs need

to make a proposal for amending the CCMs to address the requirements on advanced hybrid coupling.

6.2.3.3. *Rules for avoiding undue discrimination between internal and cross-zonal exchanges*

(107) Article 5 and Article 13 of the Amended DA Proposal and Article 6 of the Amended ID Proposal aim to address the following requirements of Article 21(1)(b)(ii) in combination with Article 29(7)(d) of the CACM Regulation:

(a) defining the 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; and

(b) requiring that the CCC calculates the flows on CNEs for each scenario (taking into account contingencies), and adjust them by assuming no cross-zonal power exchanges within the CCR, applying the rules for avoiding undue discrimination between internal and cross-zonal power exchanges established in accordance with Article 21(1)(b)(ii) of the CACM Regulation.

(108) Both the above mentioned requirements of the CACM Regulation refer to point 1.7 of Annex I to Regulation (EC) No 714/2009. This point specifies: *‘When defining appropriate network areas in and between which congestion management is to apply, TSOs shall be guided by the principles of cost-effectiveness and minimisation of negative impacts on the internal market in electricity. Specifically, TSOs shall not limit interconnection capacity in order to solve congestion inside their own control area, save for the abovementioned reasons and reasons of operational security. If such a situation occurs, this shall be described and transparently presented by the TSOs to all the system users. Such a situation shall be tolerated only until a long-term solution is found. The methodology and projects for achieving the long-term solution shall be described and transparently presented by the TSOs to all the system users.’*

(109) In November 2016, the Agency adopted Recommendation No 02/2016 on the common capacity calculation and redispatching and countertrading cost sharing methodologies⁶, which provides the Agency’s understanding of point 1.7 of Annex I to Regulation (EC) No 714/2009. This Recommendation establishes three high-level principles, among which two principles specifically address point 1.7 of Annex I to Regulation (EC) No 714/2009. These two principles are:

6

https://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Recommendations/ACER%20Recommendation%2002-2016.pdf

- (a) Principle 1: Limitations on internal network elements should not be considered in the cross-zonal capacity calculation methods. If congestion appears on internal network elements, it should in principle be resolved with remedial actions in the short term, with the reconfiguration of bidding zones in the mid-term and with efficient network investments in the long term. Any deviation from the general principle, by limiting cross-zonal capacity in order to solve congestion inside bidding zones, should only be temporarily applied and in those situations when it is: (i) needed to ensure operational security, and (ii) economically more efficient than other available remedies (taking into account the EU-wide welfare effects of the reduction of cross-zonal capacity) and minimises the negative impacts on the internal market in electricity.
- (b) Principle 2: The capacity of the cross-zonal network elements considered in the common capacity calculation methodologies should not be reduced in order to accommodate loop flows. Loop flows are significantly reducing the amount of cross-zonal capacities and have a negative impact on the functioning of the market and cross-border trade and their volume should be therefore minimised. Any deviation from this general principle, by limiting cross-zonal capacity in order to accommodate loop flows, should only be temporarily applied and in those situations when it is: (i) needed to ensure operational security, and (ii) economically more efficient than other available remedies (taking into account the EU-wide welfare effects of the reduction of cross-zonal capacity) and it minimises the negative impacts on the internal market in electricity.
- (110) The two sub-sections below (selection of critical network elements and minimum capacity available for cross-zonal exchanges) provide the Agency's assessment of how the Amended Proposals comply with the above-mentioned requirements.

Selection of critical network elements

- (111) Article 5(6) of the Amended DA Proposal and Article 6(6) of the Amended ID Proposal define the criteria for the selection of CNECs used in capacity calculation. Article 5(6)(a) of the Amended DA Proposal and Article 6(6)(a) of the Amended ID Proposal specify that all cross-zonal network elements and only those internal network elements, which are significantly influenced by the changes in bidding zone net positions in accordance with Article 29(3) of the CACM Regulation, will be taken into account in the common capacity calculation and will determine the cross-zonal capacity. According to these Articles, cross-zonal network elements are always considered as being significantly influenced, whereas a common threshold of 5% is established to determine whether internal network elements should be considered as significant, meaning that any internal network element, which is impacted by the exchange between any two bidding zones by more than 5%, may limit cross-zonal capacities.
- (112) The Agency finds the proposed principle for the selection of CNECs inadequate to address undue discrimination between internal and cross-zonal exchanges and not

efficient. Namely, point 1.7 of Annex I to Regulation (EC) No 714/2009 and the Agency's Recommendation No 02/2016 provide for that internal network elements should not limit cross-zonal capacity, unless this is economically more efficient than other available remedies and minimises the negative impacts on the internal market in electricity or if it is needed to ensure operational security. The significance threshold of 5% applicable for internal network elements does not reflect the requirement that internal network elements may limit cross-zonal capacity if this is more economically efficient or needed to ensure operational security. The Agency also notes that the principle of significant impact is an important element for defining the final list of CNECs for capacity calculation as required by Article 29(3)(b) of the CACM Regulation. This principle establishes that, during the capacity calculation process, those CNECs⁷ that are not significantly influenced by the changes in bidding zone net positions are ignored. This exclusion criterion therefore operates on an already established list of CNECs, which implies that the CNECs themselves need to be defined prior to the application of this criterion. The Amended Proposals, however, establish the significance criterion of Article 29(3)(b) of the CACM Regulation as the only criterion to define CNECs, rather than as an additional criterion for the subsequent determination of the CNECs to be ignored according to Article 29(3)(b) of the CACM Regulation. In the Agency's view, establishing the significance criterion as the only criterion for determining CNECs is not only incompliant with Article 29(3)(b) of the CACM Regulation, but also incompliant with point 1.7 of Annex I to Regulation (EC) No 714/2009, which requires economic efficiency and operational security to be the main criterions for internal congestions to limit cross-zonal capacities, and therefore do not address the undue discrimination as required by the CACM Regulation.

- (113) In addition, as expressly confirmed by Article 27(4)(d) of the CACM Regulation and also acknowledged by the proposal for a recast of Regulation (EC) No 714/2009⁸, determining CNECs is an integral part of the methodologies for the calculation of the inputs to capacity calculation and these are part of the DA and ID CCMs. Consequently, the determination of CNECs in the context of the DA and ID CCMs has to conform also to the overarching objectives of Article 3 of the CACM Regulation, including the optimal use of the transmission infrastructure (Article 3(b)), the efficient long-term operation and development of the electricity transmission system (Article 3(g)) and

⁷ The Agency understands that Article 29(3)(b) of the CACM Regulation, although referring to CNEs, is understood to actually apply to CNECs and the Amended Proposals also apply the same understanding.

⁸ See Recital (14a) of the Proposal for a Regulation of the European Parliament and of the Council on the internal market for electricity (recast), COM(2016)0861 – C8-0492/2016 – 2016/0379 (COD), as agreed in the context of the inter-institutional negotiations by provisional agreement PE634.488 of 24 January 2019 ('Proposal for a recast of Regulation (EC) No 714/2009'): *The minimum level of capacity that should be used in coordinated capacity calculation should be a percentage of the capacity of a critical network element, as defined following the selection process under the guideline on capacity allocation and congestion management, after respecting operational security limits in contingency situation.*

non-discriminatory access to cross-zonal capacity (Article 3(j)). Likewise, the determination of CNECs has to satisfy the general requirement of Article 16(1) of Regulation (EC) No 714/2009 that network congestion problems should be addressed with non-discriminatory market-based solutions, which give efficient economic signals to the market participants and transmission system operators involved. It is now the duty of the Agency (as it was initially the task of the regulatory authorities) to give effect to those requirements and objectives when assessing the Amended Proposals. In the Agency's view, selecting CNECs solely on the basis of significance is not sufficient to ensure the optimal use of the transmission infrastructure, the efficient long-term operation and development of the electricity transmission system, non-discriminatory access to cross-zonal capacity, and an efficient solution of congestion problems.

- (114) Therefore, the Agency found it necessary to amend the Amended Proposals in order to determine the 'criticality' of internal network elements, based on economic efficiency and operational security. The economic efficiency criterion allows TSOs to include internal network elements in capacity calculation if TSOs are able to demonstrate that including them is economically the most efficient solution to address congestion on the internal network element. When demonstrating such efficiency, TSOs should consider alternative solutions such as the application of remedial actions, the reconfiguration of bidding zones and investments in network infrastructure.
- (115) However, as this demonstration may require significant effort and time for TSOs, the Agency deems it reasonable to provide a transitional solution during which TSOs need to analyse which congestions on internal network elements are most efficiently addressed with capacity calculation and allocation. For this purpose, the Agency added an obligation on TSOs to develop a proposal for amendment of the CCMs within eighteen months after its implementation. In this proposal, the TSOs should define which internal network elements may continue to be included in capacity calculation and complement this proposal with the necessary analyses demonstrating their economic efficiency. In the Agency's view, TSOs should also demonstrate that they have diligently explored all the alternatives sufficiently in advance taking into account their required implementation time, such that they could be applied or implemented by the time the decision by the Core regulatory authorities on their proposal is expected to be made. The transition period, during which the criterion of significant impact would be the only criterion for including internal network elements in capacity calculation, would thus end when the proposal for amendment of the CCMs is approved by the Core regulatory authorities. The Agency also added an obligation on TSOs to perform the economic efficiency analysis every two years and, if necessary, to make a proposal for amendment of the CCMs with an updated list of internal network elements to be included in capacity calculation.
- (116) The condition for the inclusion of internal network elements in capacity calculation when this is needed for operational security has been addressed by the Agency within the validation process. The Agency added a paragraph (see Article 20(6) of the DA CCM and Article 19(3) of ID the CCM), which allows TSOs exceptionally to include

internal network elements in capacity calculation in cases where other means (namely non-costly and costly remedial actions) are not sufficient to ensure operational security.

- (117) To adopt the necessary changes on undue discrimination with regard to the selection of CNEs, the Agency significantly amended Article 5 of the Amended Proposals, namely the provisions addressing the selection of CNEs. Paragraph 1 of this Article now specifies the conditions by which an internal network element may become a CNEC, whereas the new paragraphs 5 to 9 specify the process by which the list of internal CNECs is regularly reviewed and approved by the Core regulatory authorities as described in paragraphs (114) and (115) above.
- (118) The Agency also introduced an additional provisions in Articles 14 and 15 in the DA CCM and an additional provisions in Article 15 and 16 in the ID CCM to clarify the processes by which the CCC merges the individual lists of CNECs and of MNECs into common lists and applies additional exclusion criteria to the common list of CNECs based on the concept of significant impact as required by Article 29(3)(b) of the CACM Regulation.

Minimum capacity available for cross-zonal exchanges

- (119) Article 13 of the Amended DA Proposal defines another process in capacity calculation aiming to ensure undue discrimination between internal and cross-zonal exchanges. This process establishes the principle of minimum capacity (minimum RAM) as a measure to ensure that internal congestions and loop flows, if present, do not reduce cross-zonal capacity to the degree that would lead to undue discrimination between internal and cross-zonal exchanges. In Article 13(2) of the Amended DA Proposal, the Core TSOs propose that the minimum RAM be 20% of the maximum admissible flow (F_{max}) thereby implying that the RAM on all CNECs should never be below 20% of the maximum admissible flow. Article 13 of the Amended DA Proposal also provides exceptions to this rule (i) during the definition of the capacity calculation inputs (i.e. the initial list of CNECs), when a TSO can exclude a specific CNEC from the application of the minimum RAM, and (ii) during the capacity validation process, when a TSO can reduce the final RAM below the minimum RAM. Both of the above cases involve situations where TSOs do not have enough available remedial actions to guarantee the minimum RAM.
- (120) While the Amended ID Proposal does not define such guaranteed minimum RAM, Article 6(8) of the Amended ID Proposal specifies that the Core TSOs shall study the added value for ensuring such a margin.
- (121) The Agency considers the approach of defining a RAM as an adequate solution, which can effectively avoid undue discrimination. This is because it can minimise the negative impact of internal congestions and loop flows on cross-zonal capacities. However, the Agency finds the proposed minimum RAM of 20% of the maximum admissible flow (F_{max}) insufficient for avoiding undue discrimination: First, the proposed value of 20%

of the maximum admissible flow (F_{max}) implies that up to 80% of the technical capacity of CNECs (i.e. the maximum admissible flow (F_{max})) can be reserved for flows resulting from internal exchanges and reliability margin. Second, as the reliability margin is expected to be rather low, this further implies that the vast majority of the technical capacity of CNECs would be used for internal exchanges and very little capacity would remain to accommodate cross-zonal exchanges. This, in the Agency's view, constitutes undue discrimination and is not in line with point 1.7 of Annex I to Regulation (EC) No 714/2009 and the Agency's Recommendation No 02/2016.

- (122) The Agency's Recommendation No 02/2016 provides clarity on the way to address, in accordance with point 1.7 of Annex I to Regulation (EC) No 714/2009, undue discrimination related to internal network elements and loop flows. For critical network elements, which are established based on Principle 1 (i.e. cross-zonal elements and internal elements, which are efficient to be used in capacity calculation), Principles 1 and 2 also include a requirement that the volume of reductions of their technical capacity needs to be limited and justified (see paragraph (109) and the Recommendation No 02/2016 for details). When defining such capacity reductions, it is important to detail first all possible capacity reductions that determine the RAM. In case of internal CNECs, the RAM is calculated as the maximum admissible flow (F_{max}) reduced by the reliability margin, the flows resulting from internal exchanges in the bidding zone where the internal CNEC is located (internal flows), the flows resulting from internal exchanges in other bidding zones than the one where the internal CNEC is located (loop flows) and the flows resulting from capacity allocation outside the CCR (unscheduled allocated flows). In case of cross-zonal CNECs, the RAM is calculated as the maximum admissible flow (F_{max}) reduced by the reliability margin, the flows resulting from internal exchanges (loop flows) and the flows resulting from capacity allocation outside the CCR (unscheduled allocated flows). These components are further highlighted in Table 1 below:

Table 1: Reductions of the maximum admissible flow (F_{max}) in case of internal and cross-zonal CNECs

Reductions	Internal CNEC	Cross-Zonal CNEC
Reliability Margin	YES	YES
Loop flows	YES	YES
Internal flows	YES	NO
Unscheduled allocated flows	YES	YES

- (123) The requirement on the minimum available margin as a mean to address undue discrimination between internal and cross-zonal exchanges sets an implicit requirement

to define a cap for the reductions of the maximum admissible flow (F_{max}) to take into account the flows resulting from internal exchanges (i.e. loop flows and internal flows). However, since the reliability margin can also be significantly influenced by uncertainties arising from internal exchanges, it is also important to cap the reliability margin. In the Agency's understanding, the avoidance of undue discrimination with the concept of minimum RAM therefore essentially defines what is the level of loop flows, internal flows and reliability margin that avoids undue discrimination between internal and cross-zonal exchanges.

In addressing this question, the Agency approached TSOs, regulatory authorities and stakeholders for opinions or facts related to loop flows, internal flows and reliability margins that could be expected in a situation without undue discrimination. For the reliability margin, the Agency analysed the reliability margins in the existing CWE flow-based capacity calculation, which shows that the average reliability margin is around 12% of the maximum admissible flow (F_{max})⁹. With respect to loop flows and internal flows, the Agency obtained preliminary data on these flows from the Nordic TSOs based on flow-based capacity calculation in the Nordic CCR, which is considered as a region with a relatively well-defined bidding zone configuration. Figure 1 below shows the cumulative distribution of the total volume of loop flows and internal flows for all CNECs expressed as a percentage of the maximum admissible flow (F_{max})¹⁰. This figure shows that, in 90% of cases, this percentage is below 20% (in the positive direction and 16 % in the negative direction) of the maximum admissible flow (F_{max})¹¹. This shows that, in a relatively well-defined bidding zone configuration, the level of loop flows is likely to be lower than 15% (considering the likely overestimations as described in the footnote 7) in the vast majority of cases. If loop flows and internal flows were to be capped to 15% of the maximum admissible flow (F_{max}) in capacity calculation, the application of remedial actions would be needed in a rather small number of cases. This is because not all capacity offered would actually be utilised on all CNECs (usually only a couple of CNECs are fully utilised in capacity allocation and these may not be the ones with loop flows and internal flows higher than 15%) and because the reliability margin would likely cover many of the cases where the offered capacity would be fully utilised.

⁹ Average relative FRM over all CNEs (excluding allocation constraints) in the CWE area over 2016-2018

¹⁰ This figure shows reference flows without cross-zonal exchanges within a CCR which in case of Nordic CCRs are very similar to the sum of loop and internal flows, however for those CNECs which are close to bidding zone borders outside Nordic CCR, the loop flows and internal flows may be overestimated. Further, the statistics is made on a selection of critical network elements, which does not apply any specific criteria for internal network elements to be defined as CNECs. This may further overestimate the statistics on the volume of loop flows and internal flows.

¹¹ A CNEC may have a physical flow in positive or negative direction.

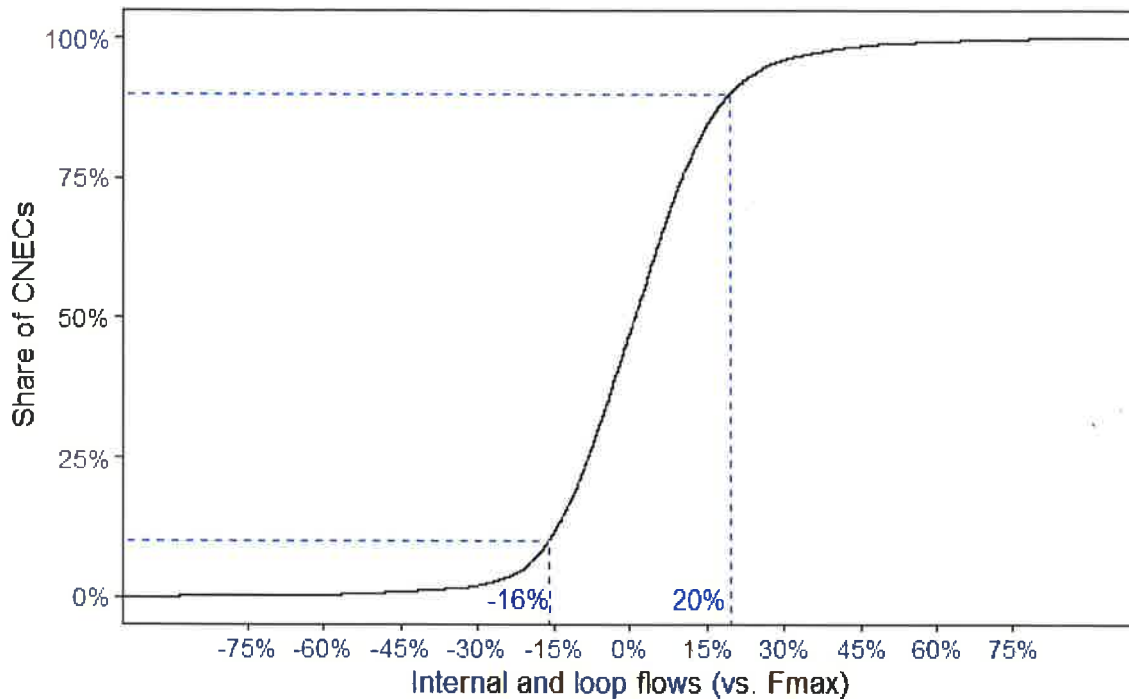


Figure 1: Probability distribution of internal and loop flows in the Nodic CCR

- (124) Due to the above reasons, the Agency considers that, based on the currently best available information, the total volume of loop flows, internal flows and reliability margin in a situation of well-defined bidding zone configuration should not exceed a total value of 30% of the maximum admissible flow (F_{max})¹². This means that at least 70% of the maximum admissible flow (F_{max}) of the CNECs should be offered for cross-zonal exchanges. This value for minimum capacity has also been defined as an acceptable threshold in the inter-institutional negotiations on the Proposal for a recast of Regulation (EC) No 714/2009¹³, which is expected to enter into force during 2019. According to this proposal, *[t]ransmission system operators shall not limit the volume of interconnection capacity to be made available to market participants in order to solve congestion inside their own bidding zone or as a means of managing flows*

¹² This estimate is rather conservative and is based on limited existing information. The Agency notes that in the context of Market Monitoring Report issued by the Agency annually more optimistic assumptions have been made. Therefore, the Agency considers that with better information on the functioning of flow based capacity calculation in Continental Europe this value should be reassessed and improved.

¹³ See Article 14 of the Proposal for a recast of Regulation (EC) No 714/2009.

resulting from transaction internal to bidding zones'¹⁴. However, this requirement is considered to be complied with if TSOs offer at least 70% of the maximum admissible flow (F_{max}) of internal and cross-zonal CNECs¹⁵. It is important also to note that the minimum value of 70% refers to the available capacity for cross-zonal exchanges, which involves capacity offered for cross-zonal exchanges within the Core CCR (i.e. RAM) and the capacity for cross-zonal exchanges in other CCRs (i.e. unscheduled allocated flows). Therefore, the RAM for CNECs in the Core CCR needs to be higher than or equal to 70% of the maximum admissible flow (F_{max}) reduced by the unscheduled allocated flow on such CNECs.

- (125) To implement the above solution for avoiding undue discrimination, the Agency amended Article 13 of the Amended DA Proposal in several ways. As this solution requires to separate internal and loop flows from unscheduled allocated flows, the Agency provided a calculation formula for both, i.e. $F_{0,core}$ are the flows on CNECs in a situation without any cross-zonal exchanges within the Core CCR, whereas $F_{0,all}$ are the flows on CNECs in a situation without any commercial exchange between bidding zones within Continental Europe and between bidding zones within Continental Europe and bidding zones of other synchronous areas. The Agency then provided a calculation formula for unscheduled allocated flows, which are the difference between $F_{0,core}$ and $F_{0,all}$ and they represent the flows on CNECs resulting from cross-zonal exchanges on bidding zone borders outside the Core CCR.
- (126) Then, the Agency provided a formula for the adjustment of minimum RAM as a function of the minimum RAM factor (R_{amr}), which by default is equal to 0.7 (i.e. 70% of the maximum admissible flow (F_{max}) as described above). In order to prevent that the RAM in the Core CCR fell to extremely low or even negative values due to high unscheduled allocated flows, the Agency provided a second absolute minimum threshold from RAM to be equal or higher than 20% of the maximum admissible flow (F_{max}) with the objective that, regardless of the value of unscheduled allocated flow, the RAM for the Core CCR should never fall below 20% of the maximum admissible flow (F_{max}). As all Core TSOs have committed to guarantee this value of RAM in their Amended Proposals independently of the volume of unscheduled allocated flows, the Agency considers that this value should not be questionable. With this absolute threshold, the Agency provided a final formula for the adjustment of minimum RAM, which is the maximum of the following two minimum values:
- (a) 70% of the maximum admissible flow (F_{max}) reduced by unscheduled allocated flows; or

¹⁴ Article 14(7) of the Proposal for a recast of Regulation (EC) No 714/2009.

¹⁵ Article 14(7a) of the Proposal for a recast of Regulation (EC) No 714/2009.

- (b) 20% of the maximum admissible flow (F_{max}).
- (127) The minimum RAM factor of 70% is therefore defined by the Agency as the default minimum level for the RAM, which can be further reduced by unscheduled allocated flows. However such a reduction cannot result in a RAM below 20% of the maximum admissible flow (F_{max}). Despite this general obligation, the Agency considers that this value may be changed by means of a granted derogation or action plan set to address structural congestion(s) if these are provided in accordance with the relevant Union legislation. For this reason, the Agency explicitly provided such an option in Article 17 of the DA CCM. In case of such derogations or action plans, the threshold value of 70% should be replaced by a linear trajectory as described below.
- (128) The aim of the linear trajectory is that TSOs achieve the target threshold value by the end of 2025 and the start of this trajectory is defined based on the existing possibilities of TSOs. The Agency therefore provided clarity on such linear trajectory where the ending value is equal to 70% from the start of 2026 and the starting value is defined as a maximum of the two following values:
- (a) the average capacity of all the CNECs of a Member State available for cross-zonal trade on all the bidding zone borders in all CCRs in the last year before the start of the derogation or action plan (where applicable); or
 - (b) the average capacity of all the CNECs of a Member State available for cross-zonal trade on all the bidding zone borders in all CCRs in the last three years before the start of the derogation or action plan (where applicable).
- (129) The Agency provided in Annex 2 to the DA CCM the concrete formulas and underlying data used for the calculation of the starting value of the trajectory. The Agency also clarified that, in case the decisions for derogations granted or action plans set in accordance with the relevant Union legislation define specific values of minimum RAM factors for the linear trajectory, then the concerned TSOs shall use these values and communicate them to all the other Core TSOs, Core regulatory authorities and the Agency for information.
- (130) Finally, the Amended ID Proposal did not include the application of the adjustment of the minimum RAM. The Agency agrees with the omission of this concept in the ID CCM, since in the DA CCM the adjustment of minimum RAM is applied with the implicit assumptions that it will likely cause overloadings of some CNECs, and that there is sufficient time to implement remedial actions to address these overloadings before delivery starts. In the intraday timeframe, however, the second assumption cannot be made since the time between the identifications of such overloadings and the first delivery hour is too short to enable coordination and application of remedial actions to address the overloadings. For this reason, the possible application of validation reductions in the DA CCM is even more important with regard to undue discrimination, since the ID CCM is not able to correct for possible reductions of cross-zonal capacities

in the day-ahead capacity calculation below the levels required to avoid undue discrimination (i.e. defined by the adjustment of minimum RAM). Nevertheless, the Agency preserved the obligation referred to in Article 6(8) of the Amended ID Proposal such that TSOs should analyse the possibility to introduce the adjustment of minimum RAM also in the ID CCM and report about the outcome of such analysis to the Core regulatory authorities and, if relevant, also provide a proposal for amendment of the ID CCM if this analysis shows that adjustment of minimum RAM is also feasible in the ID CCM.

6.2.3.4. Rules for taking into account previously allocated cross-zonal capacity

- (131) Article 14 of the Amended DA Proposal aims to address the requirements of Articles 21(1)(b)(iii), 29(3)(c) and 29(7)(c) of the CACM Regulation by defining the rules for the CCC to take previously allocated cross-zonal capacity into account in the capacity calculation.
- (132) Article 14 of the Amended DA Proposal defines ‘previously allocated capacities’ and sets a process ensuring that the RAM of each CNEC remains non-negative when taking the previously allocated capacities into account in the capacity calculation.
- (133) Article 14 of the Amended DA Proposal conditions the applicability of this process to the establishment of the long-term capacity calculation pursuant to Commission Regulation (EU) 2016/1719 of 26 September establishing a guideline on forward capacity allocation (the ‘FCA Regulation’). Until the process is applicable, Article 14 of the Amended DA Proposal sets as a default approach an annual coordination of the long term allocated capacities by the Core TSOs.
- (134) Article 14 of the Amended DA Proposal generally meets the requirements of the CACM Regulation.
- (135) To reflect the chronology of the calculation steps, the Agency moved the content of Article 14 of the Amended DA Proposal to Article 18 of the DA CCM. Further, the Agency edited the content of the Article to improve clarity and consistency, without modifying its meaning, and in particular the Agency removed all the explanatory text.
- (136) To ensure full compliance of the default approach with the requirements set in Article 21(1)(b)(iii) of the CACM Regulation, the Agency clarified that, until the previously allocated capacity is calculated pursuant to the FCA Regulation, the Core TSOs should commonly coordinate only the changes in long-term calculated capacities with the support of the CCC. The Agency considers that requiring a fully coordinated long-term capacity calculation before the methodology pursuant to the FCA Regulation is implemented would not make sense as it would further delay the implementation of the CCMs (and duplicate the work on implementation of long-term capacity calculation). For this reason, the Agency considers that it is sufficient that TSOs coordinate only the

changes in long-term allocated capacities until the full implementation of the long-term capacity calculation.

- (137) Further, the Agency clarified the treatment of allocation constraints in the context of the inclusion of previously allocated capacity.
- (138) Finally, the Amended ID Proposal does not include the application of the LTA inclusion. The Agency agrees with the omission of this concept in the ID CCM, since in the DA CCM the LTA inclusion is applied with the implicit assumptions that it will likely cause overloadings of some CNECs, and that there is sufficient time to implement remedial actions to address these overloadings before the delivery starts. In the intraday timeframe, however, the second assumption cannot be made since the time between the identification of such overloadings and the first delivery hour is too short to enable coordination and application of remedial actions to address the overloadings.

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

- (139) Article 15 of the Amended DA Proposal and Article 14 of the Amended ID Proposal aim to address:
- (a) the requirement of Articles 21(1)(b)(iv) and 25 of the CACM Regulation, by defining the rules on the adjustment of power flows on CNEs or of cross-zonal capacity due to remedial actions;
 - (b) the requirement of Article 29(7)(f) of the CACM Regulation, which prescribes that the CCC adjusts the available margins on CNEs or PTDFs using the available remedial actions to be considered in capacity calculation in accordance with Article 25 of the same Regulation.
- (140) Article 15 of the Amended DA Proposal and Article 14 of the Amended ID Proposal establish a procedure which coordinates and optimises non-costly remedial actions, as inputs to capacity calculation, in order to optimise cross-zonal capacities.
- (141) To reflect the chronology of the capacity calculation steps, the Agency moved the content of Article 15 of the Amended DA Proposal and Article 14 of the Amended ID Proposal to Article 16 of the DA CCM and Article 17 of the ID CCM, respectively.
- (142) The Agency first edited the content of these Articles to improve clarity and consistency, without modifying their meaning, and in particular the Agency removed all the explanatory text, and renamed the Articles and procedure into the NRAO to indicate that it covers only non-costly remedial actions.
- (143) Further, as Articles 21(1)(b)(iv) and 29(7)(f) of the CACM Regulation do not set requirements for the NRAO, the Agency evaluated Article 15 of the Amended DA

Proposal and Article 14 of the Amended ID Proposal against the objectives of the CACM Regulation.

- (144) Article 15 of the Amended DA Proposal and Article 14 of the Amended ID Proposal partly fulfil the objectives of the CACM Regulation. While they generally fulfil the requirement of coordination of remedial actions in capacity calculation as required by Article 25(2) of the CACM Regulation, such coordination is limited to non-costly remedial actions only and it may lead to undue discrimination as described in Section 6.2.3.3. Besides, the Amended Proposals do not describe how the result of the optimisation affects the capacity calculation process. Finally, the Amended Proposals do not request the monitoring of this optimisation, in order to ensure that it enhances economic efficiency while ensuring operational security.
- (145) The coordination of non-costly remedial actions described in Article 15 of the Amended DA Proposal and Article 14 of the Amended ID Proposal maximise the lowest relative RAM on CNEC (i.e. the RAM divided by the corresponding PTDF value), with the objective of increasing the overall market efficiency, regardless of the causes for a low relative available margin. This approach can lead to undue discrimination when the lowest RAM is on an internal CNEC located within a bidding zone with a significant structural congestion. This is because the optimisation in Article 15 of the Amended DA Proposal and Article 14 of the Amended ID Proposal can use non-costly remedial actions to increase the RAM on such internal CNEC at the expense of shifting some of the physical flows from this internal CNECs to some other cross-zonal CNECs, thereby increasing the amount of loop flows on the borders of bidding zones and decreasing the amount of available cross-zonal capacity on cross-zonal CNECs.
- (146) According to the Agency's understanding of point 1.7 of Annex I to Regulation (EC) No 714/2009, as also explained in the Agency's Recommendation No 02/2016, cross-zonal capacity should not be reduced in order to accommodate loop flows or internal network constraints, unless it is demonstrated to be economically more efficient than other available remedies. Therefore, Article 15 of the Amended DA Proposal and Article 14 of the Amended ID Proposal do not meet the requirements set by Article 21(1)(b)(ii) in combination with Article 29(7)(d) of the CACM Regulation, and further by point 1.7 of Annex I to Regulation (EC) No 714/2009.
- (147) To avoid undue discrimination during the coordination of non-costly remedial actions, the Agency improved the NRAO to add an additional constraint that loop flows may increase only up to the maximum level, which is still low enough to avoid undue discrimination and is defined by TSOs as part of the capacity calculation inputs in the DA CCM and in consistency with the minimum RAM factor as described in paragraph (123) above. On the other hand, if loop flows on some cross-zonal CNECs are already higher than the maximum level, the NRAO should not increase them further on those cross-zonal CNECs and the adjustment of minimum RAM should address the undue discrimination on such CNECs.

- (148) Following discussions with the Core TSOs and regulatory authorities, the Agency clarified how the outputs of this optimisation are taken into account in later capacity calculation steps.
- (149) Article 15 of the Amended DA Proposal and Article 14 of the Amended ID Proposal do not address the coordination of costly remedial actions considered capacity calculation as required in Article 25(2) of the CACM Regulation. To address this requirement, the Agency added a new step in capacity validation in the DA CCM (see paragraph (167)) to coordinate all remedial actions when validating cross-zonal capacities. For the ID CCM such coordination is not feasible due to insufficient time.
- (150) Finally, in order to ensure that the NRAOs lead to an efficient market outcome while ensuring operational security, the Agency added an obligation for the Core TSOs to monitor and regularly report to the Core regulatory authorities about the impact of the NRAO on cross-zonal capacities and on the economic efficiency.

6.2.3.6. Calculation of the final flow based parameters before and after validation

- (151) Article 18 of the Amended DA Proposal and Article 17 of the Amended ID Proposal aim to address the requirements of Article 21(1)(b)(i) of the CACM Regulation, which demands that the proposal provide a mathematical description of the capacity calculation process, and Article 29(7)(e) of the CACM Regulation, which provides requirements on the calculation of the RAM.
- (152) Articles 4(6) and 18 of the Amended DA Proposal and Articles 4(6) and 17 of the Amended ID Proposal are unclear about the capacity calculation steps to calculate the final flow based parameters. Namely, these Articles do not provide clarity as to the point at which the capacity validation is performed. After further consultation with the Core TSOs, the Agency established a common understanding of the proposed capacity calculation process, which can be described as follows:
- (a) after the coordination of non-costly remedial actions (i.e. the NRAO), the CCC calculates new flow-based parameters, i.e. the final PTDF matrix (\mathbf{PTDF}_f) and the reference flow (F_{ref}), which in the DA CCM are then used for the calculation of the LTA inclusion and the adjustment of minimum RAM. This is followed by the calculation of the RAM, which is used as input for the capacity validation (RAM_{bv});
 - (b) the RAM before validation is validated in the capacity validation, which, in the ID CCM, provides already the final flow-based parameters constituted of the remaining available margin (RAM_{bn}) and the final PTDF matrix (\mathbf{PTDF}_f), whereas in the DA CCM, the validation results in initial flow-based parameters, which are further updated in the next step to take into account long-term nominations;
 - (c) in the DA CCM, the CCC removes the redundant initial flow-based parameters and publishes the remaining ones;

- (d) in the DA CCM, after the TSOs receive the long-term nominations, the CCC updates the initial flow-based parameters to obtain the final flow-based parameters;
 - (e) as a final step, the CCC publishes the final flow-based parameters and send them to the NEMOs for capacity allocation.
- (153) To accommodate and clarify the above process, the Agency split Article 18 of the Amended DA Proposal such that Article 19 of the DA CCM describes the calculation of the final flow-based parameters before validation, whereas the calculations after validation as well as the publication of the final flow-based parameters and their delivery to the NEMOs are described in Article 21 of the DA CCM. Article 17 of the Amended DA Proposal was amended such that the calculation of flow-based parameters before validation is described in Article 18 of the ID CCM, whereas the publication of final flow-based parameters and their delivery to the NEMOs is added at the end of Article 19, which describes the capacity validation.
- (154) Article 4(7) of the Amended DA Proposal aims to address Article 46 of the CACM Regulation, which requires that the CCC provide cross-zonal capacity and allocation constraints to the relevant NEMOs in time to ensure the publication of cross-zonal capacity and of allocation constraints to the market no later than 11.00 market time day-ahead. This Article further requires that, if a CCC is unable to provide for cross-zonal capacity and allocation constraints one hour prior to the day-ahead market gate closure time, that CCC notify the relevant NEMOs. In such cases, cross-zonal capacity and allocation constraints shall be provided by the CCC no later than 30 minutes before the day-ahead market gate closure time. While the former requirement has been addressed by the Amended Proposals, the Agency added an additional paragraph to Article 21 of the DA CCM to clarify the latest delivery of final flow-based parameters to the NEMOs in case of delays in the regular capacity calculation process.
- (155) Article 19 of the Amended DA Proposal and Article 18 of the Amended ID Proposal aim to address the requirement of Article 21(3) of the CACM Regulation, which requires that the CCMs include a fallback procedure for the case where the initial capacity calculation does not lead to any results.
- (156) Article 19 of the Amended DA Proposal defines two fallback procedures to calculate cross-zonal capacities based on (i) the technique where the missing values are obtained by combining the closest available flow based parameters or (ii) the default flow-based parameters, which are based on long-term allocated capacities that could be increased for this purpose by TSOs. Article 18 of the Amended ID Proposal defines one fallback procedure to calculate cross-zonal capacities based on the latest previously calculated cross-zonal capacity.
- (157) Article 19 of the Amended DA Proposal and Article 18 of the Amended ID Proposal generally meet the requirements of Article 21(3) of the CACM Regulation.

- (158) To reflect the chronology of the calculation steps, the Agency moved these Articles to Article 22 of the DA CCM and Article 20 of the ID CCM, respectively. Further, the Agency edited the content of these Articles to improve clarity and consistency, without modifying their meaning. In particular, the Agency removed all the explanatory text. The Agency also renamed these two Articles into 'capacity calculation fallback procedure' to clearly differentiate these Articles from the calculation of available transfer capacities ('ATC') for capacity allocation fallback procedure in accordance with Article 23 of the Amended DA Proposal.
- (159) Article 20 of the Amended DA Proposal aims to address implicitly the requirements of Article 44 and Article 50 of the CACM Regulation, which require that TSOs establish a fallback procedure for capacity allocation in the event that the SDAC process is unable to produce results. Article 20 of the Amended DA Proposal aims to calculate cross-zonal capacities to be allocated in accordance with such a procedure. Article 20 of the Amended DA Proposal implicitly assumes that the capacity allocation fallback procedure requires the calculation of ATCs, and therefore provides a calculation method to convert flow-based parameters into ATCs.
- (160) Article 20 of the Amended DA Proposal generally meets the requirements of the CACM Regulation.
- (161) To reflect the chronology of the calculation steps, the Agency moved this description to Article 23 of the DA CCM. Further, the Agency edited the content of the Article to improve clarity and consistency, without modifying its meaning. In particular, the Agency removed all the explanatory text. The Agency also renamed the Article and procedure into 'calculation of ATCs for SDAC fallback procedure' to clearly differentiate this Article from the capacity calculation fallback procedure pursuant to Article 19 of the Amended DA Proposal.
- (162) Article 18(3) of the Amended ID Proposal explains that where capacity allocation mechanisms (within the SIDC) cannot accommodate flow-based parameters and requires ATCs on each bidding zone border, the CCC or the Core TSOs shall derive these from the latest cross-zonal capacities calculated within the Core CCR and provide them to the NEMOs. As the methodology to convert the flow-based parameters into ATCs is far from being a straightforward one, the Agency found it necessary to provide clarity on this conversion in the ID CCM. For this purpose, the Agency added a new Article 21 in the ID CCM titled 'calculation of ATCs for SIDC fallback procedure', which specifies the method for converting the final flow-based parameters into ATCs on the Core bidding zone borders for each direction. This method is equivalent to the method used in Article 23 of the DA CCM, which defines the conversion of the final day-ahead flow-based parameters into ATCs for the SDAC fallback procedure.

6.2.4. Assessment of the requirements for the capacity validation

- (163) Article 21 of the Amended DA Proposal and Article 19 of the Amended ID Proposal aim to address requirements set in Articles 21(1)(c), 26 and 30 of the CACM Regulation, by defining how Core TSOs shall validate cross-zonal capacity, and how they may reduce it for reasons of operational security. The Amended Proposals provide several requirements for Core TSOs to assess and amend when necessary the outcome of the capacity calculation process performed by the CCC, i.e. to reduce cross-zonal capacity resulting from the flow-based capacity calculation for reasons of operational security.
- (164) The requirements set in Article 26 of the CACM Regulation are addressed in the Amended Proposals as follows:
- (a) Article 21(1) of the Amended DA Proposal and Article 19(1) of the Amended ID Proposal specify that each Core TSO must validate and has the possibility to correct the cross-zonal capacity, pursuant to Article 26(1) of the CACM Regulation;
 - (b) Article 21(1) of the Amended DA Proposal and Article 19(1) of the Amended ID Proposal further define the situations under which such correction may occur, related to operation security, pursuant to Article 26(3) of the CACM Regulation;
 - (c) Article 21(6) of the Amended DA Proposal and Article 19(7) of the Amended ID Proposal require coordination among neighbouring CCCs, pursuant to Article 26(4) of the CACM Regulation;
 - (d) Article 21(5) of the Amended DA Proposal and Article 19(6) of the Amended ID Proposal require the publication of a quarterly report on all reductions which occurred during the validation of cross-zonal capacity, pursuant to Article 26(5) of the CACM Regulation;
- (165) Further, the requirements set in Article 30(1) and (2) of the CACM Regulation are also implicitly addressed by Article 21 of the Amended DA Proposal and Article 19 of the Amended ID Proposal.
- (166) Article 21(1) of the Amended DA Proposal and Article 19(1) of the Amended ID Proposal generally fulfil the requirements of Articles 21(1)(c), 26 and 30 of the CACM Regulation. However, Article 21(1) of the Amended DA Proposal and Article 19(1) of the Amended ID Proposal do not require individual TSOs to coordinate the use of remedial actions included in capacity validation, which essentially consists in verifying whether a TSO has enough remedial actions to guarantee the calculated cross-zonal capacities. A unilateral verification by individual TSOs cannot be accepted as it does not verify the possibilities given by the application of coordinated remedial actions.
- (167) Furthermore, as outlined in paragraph (149)), the Amended Proposals do not completely fulfil Article 25(2) of the CACM Regulation which requires coordination

of remedial actions used in capacity calculation. As the Amended Proposals provided this obligation only for non-costly RAs, the Agency finds it necessary to add this obligation also for costly ones in the context of capacity validation (see paragraph (170) below).

- (168) The Amended Proposals do not specify any limitations on the reductions and whether a TSO may reduce cross-zonal capacities to zero or even to negative values. The Amended Proposals do not describe in sufficient detail the content of the report which the CCC has to issue every three months. The suggested content does not provide the Core regulatory authorities with a full overview of the situation and the reasons which led to capacity reductions. Further, the Amended Proposals do not require the Core TSOs to provide the CCC with all the information needed for the elaboration of such a report.
- (169) To reflect the chronology of the calculation steps, the Agency amended Article 21 of the Amended DA Proposal which now constitutes Article 20 of the DA CCM. Furthermore, Article 7 of the Amended DA Proposal was amended to be integrated into Article 20 of the DA CCM, without changing its meaning. Similarly, the Agency amended Article 19 of the Amended ID Proposal which now constitutes Article 19 of ID CCM and Article 8 of the Amended ID Proposal was amended to be integrated into Article 19 of the ID CCM without changing its meaning.
- (170) In order to ensure coordination of remedial actions in capacity validation and to fulfil the requirement of Article 25(2) of the CACM Regulation, the Agency split the capacity validation process in the DA CCM into two main steps.
- (a) The first capacity validation step conducted by the CCC in coordination with the Core TSOs aims at ensuring that all available remedial actions taken into account in capacity calculation are coordinated among the Core TSOs. This step aims to verify whether the available remedial actions are sufficient to avoid possible violations of operational security limits due to calculated cross-zonal capacities and, if they are not, TSOs may reduce cross-zonal capacities. As this step may require TSOs to implement a rather sophisticated coordination process that is not in practice today, the DA CCM allows for a gradual implementation of this step to avoid delaying the implementation of the DA CCM.
- (b) The second validation step is conducted individually by each Core TSO, and is very similar to the one proposed in Article 21 of the Amended DA Proposal. This step may also lead to reductions of cross-zonal capacity.
- (171) An additional coordinated step in validation is in the Agency's understanding only feasible in the day-ahead timeframe for the moment (and therefore the coordinated validation was not included in the ID CCM), because the timings of day-ahead capacity calculation allow for such coordination. After consultation of the Core TSOs, the Agency understands that the coordination of remedial actions is a rather time

consuming process as it involves a lot of communication and verification procedures and therefore could be gradually implemented within the day-ahead capacity calculation process (which starts at 15:00 market time two days before delivery and ends at 10:30 market time on the day before delivery). In the intraday timeframe, the capacity calculation has much stricter time constraints (expected to start not before 19:00 market time and end at 21:45 market time on the day before delivery), and the Agency understands that such coordination is not feasible in the intraday timeframe until fully automated solutions for such coordination can be applied.

- (172) The Agency also consulted the Core TSOs and regulatory authorities on whether TSOs may reduce cross-zonal capacities in day-ahead capacity validation to zero or even to negative values. Based on this consultation, the Core TSOs clarified that capacity reductions in day-ahead capacity validation should be restricted to ensure that all combinations of previously allocated capacity remain feasible, in order to avoid a negative impact on the market (due to e.g. zero or negative cross-zonal capacities) and to ensure the adequacy of congestion income for the remuneration of long-term transmission rights. Based on this understanding, the Agency added this constraint to capacity validation in the DA CCM.
- (173) Pursuant to Article 26(3) of the CACM Regulation, and to ensure non-discrimination of cross-zonal exchanges while fulfilling operational security, as an exceptional measure when all available remedial actions are not sufficient to ensure operational security on a network element which is not a CNE taken into account in capacity calculation and allocation, the Agency allows TSOs to include such a network element in capacity calculation and allocation, thus effectively reducing cross-zonal capacity to ensure operational security.
- (174) The Agency updated the description of the report to be issued by the CCC every three months, in order to ensure that the Core NRAs receive a complete description of the situations leading to capacity reductions. As a result, the following additional information is requested for each CNE affected by a capacity reduction:
- (a) the corresponding flow components calculated during capacity calculation;
 - (b) the forecasted physical flow and the realised physical flow;
 - (c) the detailed reason for violations, including the operational security limit(s) that would have been violated with the calculated cross-zonal capacities, and under which circumstances they would have been violated; and
 - (d) the proposed measures to avoid similar reductions in the future.
- (175) In order to ensure that the CCC has access to the data required for the report referred to in the previous paragraph, the Agency provided an obligation for the Core TSOs which have reduced capacity on CNEs to provide the CCC with detailed information about these reductions, as well as the information on the measures to alleviate such reductions

in the future. When these reductions occur frequently, the concerned TSOs should also provide to the CCC an action plan describing how such deviations are expected to be alleviated and solved in the future and the CCC should annex this action plan to the quarterly report.

- (176) The Agency also provided an obligation that the quarterly report on reductions of cross-zonal capacity during capacity validation should be published. Article 26(6) provides that the regulatory authorities of the capacity calculation region shall decide whether to publish all or part of the report. The Agency understands that such a decision can be made in the context of deciding on the proposal for a common coordinated CCM in accordance with Article 9(7)(a) of the CACM Regulation. The Agency consulted with Core regulatory authorities and they agreed that such a decision should be made within the decision on the Amended Proposals. Therefore, the Agency's competence to decide on this methodology includes also the competence to decide to publish this report. For this reason, the Agency included this report to the joint quarterly report as referred to in Article 27(5) of the DA CCM and 25(5) of the ID CCM and is to be published by the CCC.
- (177) Further, the Agency edited the content of Article 21 of the Amended DA Proposal and Article 19 of the Amended ID Proposal to improve clarity and consistency, without modifying their meaning beyond what is described above.

6.2.5. Assessment of the requirements specific to intraday capacity calculation

6.2.5.1. *Intraday capacity calculation timeframes*

- (178) Article 5 of the Amended ID Proposal aims to address Article 14(4) of the CACM Regulation which requires that all TSOs in each CCR ensure that cross-zonal capacity is recalculated within the intraday market time-frame based on the latest available information and that the frequency of this recalculation takes into consideration efficiency and operational security.
- (179) Article 5 of the Amended ID Proposal specifies two intraday capacity re-calculations, one at the end of the day before delivery and the other in the morning of the delivery day. This Article also defines some principles by which the frequency of re-calculations will be re-evaluated and, if needed, how additional intraday re-calculations will be introduced.
- (180) Article 4(9) of the Amended ID Proposal also specifies that the Core TSOs shall provide cross-zonal capacities to the NEMOs 15 minutes before the intraday cross-zonal gate opening time which is set at 15:00 market time on the day before delivery. This Article also specifies that the Core TSOs may refrain from providing any cross-zonal capacity until the intraday common capacity calculation has been finalised or until a final deadline of 22:00 market time on the day before delivery, whichever is earlier.

- (181) The Agency found it necessary to improve the Amended ID Proposal in several ways. First, the provisions on the number and timings of intraday re-calculations defined in Article 5 of the Amended ID Proposal are not sufficiently clear and enforceable. Second, the Amended ID Proposal does not specify the methodology used for intraday capacity re-calculations. Finally, the Amended ID Proposal does not specify the methodology to calculate cross-zonal capacities provided to the NEMOs before the intraday cross-zonal gate opening time.
- (182) To clarify the above aspects, the Agency added a new paragraph to Article 4 of the ID CCM which specifies that intraday capacity calculation consists of three calculation processes: one is for updating the cross-zonal capacities remaining after the SDAC with a target start of allocation at 15:00 market time on the day before delivery and the other two are the calculation and re-calculation of cross-zonal capacities based on a full capacity calculation process (i.e. inputs, process, validation) and with a target start of allocation at 22:00 market time on the day before delivery and 10:00 market time on the delivery day. The Agency notes that these timings are fully aligned with the timings of intraday auctions as established in the methodology for pricing intraday cross-zonal capacity established pursuant to Article 55 of the CACM Regulation but should be reviewed after the Core TSOs gain more experience with the operation of these methodologies. For the sake of clarity, the Agency named the first calculation as ‘calculation’ and the subsequent calculation as ‘re-calculation’.
- (183) As regards the methodology used to calculate cross-zonal capacities provided to the NEMOs before the intraday cross-zonal gate opening time (i.e. updating of cross-zonal capacities remaining after the SDAC), the Agency added a new Article 11 to the ID CCM, which provides a description and formula for calculating such capacities. When doing so, the TSOs may decide not to offer cross-zonal capacities remaining after the SDAC which are stemming from the LTA inclusion and adjustment for minimum RAM which are used in the DA CCM. This is because, these two processes are applied in the DA CCM with the implicit assumptions that they will likely cause overloadings of CNECs, and that there is sufficient time to implement remedial actions to address these overloadings before the delivery starts. In the intraday timeframe, however, the second assumption cannot be made since the time between the identifications of such overloadings and the first delivery hour is too short to enable coordination and application of remedial actions to address the overloadings.
- (184) In Article 11 of the DA CCM, the Agency clarified that TSOs may decide to offer zero cross-zonal capacities remaining after the SDAC at the intraday cross-zonal gate opening time if they consider that offering non-zero cross-zonal capacity could endanger operational security. The Agency considers that for the moment it cannot prohibit this flexibility to TSOs, since the Core TSOs are currently faced with extensive violations of operational security resulting from the outcome of day-ahead trading within and between bidding zones due to poorly designed bidding zones (i.e. electricity trading within and between well-defined bidding zones should generally not lead to major operational security violations). This requires an extensive evaluation process for

performing operational security analysis and addressing the violations with coordinated application of remedial actions. If during this process, the market is open for trading, TSOs may have difficulty in addressing these violations due to constantly changing market situations.

- (185) The Core TSOs currently have difficulties coping with a market design where the TSOs' congestion management activities (capacity calculation, operational security analysis, coordination of remedial actions) would be performed in parallel to continuous electricity trading. Nevertheless, the Agency considers that TSOs should gradually adapt to such a market design since in a continuous system, trading should not stop every time TSOs need to perform their processes. The Agency notes that within some Core bidding zones the intraday market is open for trading as of 15:00 market time on the day before delivery, which means that TSOs are already today faced with parallel processes, although to a lesser extent. For the above reasons, the Agency considers it reasonable to provide TSOs with a transitional period during which they should gradually get ready for parallel operation of intraday market and their congestion management processes. In order to avoid the impact of such parallel operation on the implementation of the ID CCM, this transition period should end six months after the implementation of the first intraday capacity calculation pursuant to the ID CCM. For the sake of clarity, the Agency added an explanatory table in Annex 2 to the ID CCM explaining which cross-zonal capacities should be offered to the SIDC along two time axes (one with regard to the intraday timeframe and the other with regard to the years until full implementation of the ID CCM).

6.2.5.2. Other specific issues related to the intraday capacity calculation methodology

- (186) In Article 21 of the ID CCM, the Agency provided a clarification for the calculation of intraday cross-zonal capacities in case the SIDC is not able to accommodate flow-based parameters. In such a case, the flow-based parameters need to be converted into ATC values for specific bidding zone borders. This conversion should generally be done by TSOs. However, TSOs should be able to delegate this process to the NEMOs in order to prevent unnecessary time delays and interruptions of the SIDC in case where intraday auctions are based on flow-based parameters and continuous trading is based on ATCs. The Agency also clarified that the transitional option for TSOs to offer zero cross-zonal capacities at the intraday cross-zonal gate opening time should be coordinated by all Core TSOs in case these capacities are in the form of flow-based parameters, whereas in case they are in the form of ATCs this option may be applied per bidding zone border.
- (187) In Article 2 and Article 4(10) of the ID CCM, the Agency provided clarity about the market time unit for intraday capacity calculations. Since currently the intraday market time unit inside bidding zones and on the bidding zone borders varies across the EU (i.e. due to non-harmonised imbalance settlement periods), the Agency found it necessary to clarify what market time unit in the context of intraday capacity calculations means. The Agency introduced the specific definition of intraday capacity calculations market time unit, which is the same as day-ahead capacity calculations

market time unit and is equal to 60 minutes. This means that all intraday capacity calculations shall be performed on an hourly basis. However, as explained in Article 4(10), the NEMOs may convert the cross-zonal capacity values into a higher time resolution (e.g. 15 or 30 minutes) on specific borders where this is allowed.

6.2.6. Assessment of the requirements for consultation, transparency and stakeholder involvement

6.2.6.1. *Consultation and involvement of stakeholders*

- (188) When drafting the day-ahead and intraday CCMs, the Core TSOs aimed to address the requirements of Articles 12, 20(2) and (8) of the CACM Regulation regarding the involvement of stakeholders.
- (189) First, as indicated in paragraph (5) above, the Core TSOs fulfilled the requirements of Articles 12 and 20(2) of the CACM Regulation, since stakeholders were consulted on the draft methodologies for day-ahead and intraday capacity calculation, pursuant to Article 12(1) of the CACM Regulation, during a public consultation which ran from 27 June 2017 to 27 July 2017. In addition, the Core regulatory authorities were regularly informed and consulted, pursuant to Articles 12(1) and (2) of the CACM Regulation. The justifications regarding the consideration given to the views expressed by stakeholders during the public consultation in the further drafting of the CCMs were provided in a consultation report published on 15 September 2017¹⁶.
- (190) Second, the Amended Proposals require the involvement of stakeholders during the testing of the CCM alongside the existing one, for a duration of at least six months before implementing the new CCM. The Amended Proposals therefore meet the requirements of Article 20(8) of the CACM Regulation as Article 25(4) of the Amended DA Proposal, in combination with Table 1 in Appendix 2 to the Amended DA Proposal, describes the so-called external parallel run during which the new CCM will be tested within the SDAC in parallel with the existing one with the involvement of NEMOs and stakeholders for a minimum of six months. Article 23 of the Amended ID Proposal is less clear on the external parallel run, its duration and the involvement of stakeholders for the testing of the ID CCM. To address the latter concern, the Agency aligned the requirements for the involvement of stakeholders during the testing of both the day-ahead and intraday CCMs, while maintaining the difference in the ID CCM where the parallel testing of the new CCM within the SIDC is not possible (due to the continuous nature of the SIDC). This means that instead of this parallel test of both methodologies

¹⁶ See https://www.entsoe.eu/network_codes/ccr-regions/#core.

in the SIDC, TSOs will publish new intraday cross-zonal capacities to enable stakeholders to evaluate on their own its impact on the SIDC.

6.2.6.2. Transparency and publication of information

- (191) Article 23 of the Amended DA Proposal and Article 21 of the Amended ID Proposal aim to address the objective of ensuring and enhancing the transparency and reliability of information as defined by Article 3(f) of the CACM Regulation. These two Articles are defining the requirements for:
- (a) a dedicated online communication platform (Article 23(1) of the Amended DA Proposal and Article 21(1) of the Amended ID Proposal);
 - (b) information to be published on the communication platform after implementation of the DA CCM (Article 23(2) of the Amended DA Proposal) and ID CCM (Article 21(2) of the Amended ID Proposal);
 - (c) a process to review and define the final, exhaustive and binding list of items to be published on the communication platform (Article 23(3) of the Amended DA Proposal and Article 21(3) of the Amended ID Proposal).
- (192) The Amended Proposals partly achieve the objective set in Article 3(f) of the CACM Regulation. The Agency, after consulting the Core TSOs and regulatory authorities in the context of the cooperation detailed in Section 2.2 above, as well as taking account of the outcome of the public consultation (see Annex III), amended the Amended Proposals in order to reinforce transparency as follows:
- (a) the Agency edited the content of Article 23 of the Amended DA Proposal and Article 21 of the Amended ID Proposal to improve clarity and consistency, without modifying its meaning beyond the issues described below. In particular the Agency removed all the explanatory text;
 - (b) the Agency introduced firm publication deadlines for all information to be published;
 - (c) in order to guarantee accuracy, consistency and comparability of the information published on the platform, the Agency clarified the granularity of the information to be published, and, in particular, for each information item related to a CNEC. The Agency provided an obligation that this information is published for each CNEC of the final flow-based parameters before pre-solving. Further, the Agency requested that the static grid models be updated every six months;
 - (d) in order to guarantee complete transparency over the calculation process, the Agency provided additional obligation for the publication of shadow prices and flows resulting from net positions for the SDAC by 14:00 market time of the day

- before delivery which is approximately one hour after the results of the SDAC should be published;
- (e) the Agency expanded the publication requirements regarding information over situations when relevant parties deviate from the default approach defined in the CCMs, namely:
- (i) the method for determining the maximum admissible flow I_{max} ;
 - (ii) the indication of when spanning and/or default flow-based parameters were applied;
 - (iii) the indication of whether a CNEC is redundant or not;
 - (iv) the indication of whether a remedial action resulting from the NRAO is curative or preventive, and in case of the former, a list of CNEC identifiers describing the CNECs to which the remedial action was associated;
- (f) the Agency added additional information requirements regarding validation reductions and in particular the CNECs, TSOs and reasons associated with the validation reductions;
- (g) the Agency strengthened the obligation on the publication of name and location of CNECs, in particular it:
- (i) requested that the name and location be published separately for CNE and contingency;
 - (ii) provided an exemption to the publication of locational information on infrastructure that is classified as 'sensitive critical infrastructure protection related information' in the relevant Member States as provided for in point (d) of Article 2 of Council Directive 2008/114/EC of 8 December 2008 on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection. The Agency requests that, in such case, the locational information of a CNEC be replaced with a unique and stable identifier;
 - (iii) requested transparency over changes in identifiers referred to in (ii).
- (193) To address the requirement of Article 20(9) of the CACM Regulation, the Agency also added an obligation on the Core TSOs to establish and make available a tool, which enables market participants to evaluate the interaction between cross-zonal capacities and cross-zonal exchanges between bidding zones.
- (194) Furthermore, the Agency clarified the process by which the Core regulatory authorities may request the publication of additional information by TSOs.

- (195) In addition to improving the requirements on transparency and data publication, the Agency also found necessary to improve the Amended Proposals to ensure the quality and availability of the published data. For this purpose, the Agency added a new Article 26 to the DA CCM and a new Article 24 to the ID CCM to provide additional requirements related to data quality.
- (196) These two additional Articles are providing obligations on TSOs to establish and publish a common procedure for monitoring and ensuring the quality and availability of the data on the dedicated online communication platform including the relevant obligations to publish the results of the quality monitoring on an annual basis. The process of quality monitoring should focus on the quality of the data with automatic quality checks, ease-of-use of the data retrieval as well as monitoring satisfaction of stakeholders and Core regulatory authorities with data quality.

6.2.6.3. Reporting and monitoring by regulatory authorities

- (197) Article 24 of the Amended DA Proposal and Article 22 of the Amended ID Proposal aim to address the requirements regarding the implementation of rules related to the roles and responsibilities of the TSOs, pursuant to Article 37(1)(q) of Directive 2009/72/EC, and ensuring the compliance of TSOs with their obligations under Union legislation in accordance with Article 37(1)(q) of the same Directive. These two Articles define a comprehensive list of information that the Core TSOs should deliver to the Core regulatory authorities on a monthly basis. They also include a process to improve this list in cooperation with the Core regulatory authorities.
- (198) The Agency improved two aspects of these two Articles.
- (a) First the Agency aligned the requirements of these Articles with Article 25 of the DA CCM and Article 23 of the ID CCM on the publication of data, such that the information which has already been published by TSOs does not need to be additionally provided to the Core regulatory authorities. For this purpose, the scope of additional data for the monitoring by regulatory authorities has been reduced only to locational information which has been classified as ‘sensitive critical infrastructure protection related information’ and for this purpose withheld from publication (see paragraph (192) above). Furthermore, the Agency clarified the process by which the Core regulatory authorities may request additional information from TSOs for their monitoring duties.
- (b) Second, the Agency added two additional paragraphs to these two Articles in order to provide an overview of all the reporting obligations on TSOs provided in other articles of the CCMs. All the reporting obligations have been structured into two reports, one with an annual frequency and the other with a quarterly frequency. The annual report shall provide information on: (i) systematic withholdings of non-costly remedial actions, (ii) accuracy of non-Core exchanges in the common grid model, (iii) efficiency of the NRAO, quality of the data published on the dedicated

online communication platform, and (iv) monitoring of the effects and performance of the application of the CCMs after their implementation. The quarterly report shall provide information on: (i) the effectiveness of relevant allocation constraints, (ii) reductions of cross-zonal capacity in capacity validation in accordance with Article 26(5) of the CACM Regulation, and (iii) the monitoring of the effects and performance of the application of the CCMs before their implementation.

7. CONCLUSION

- (199) For all the above reasons, the Agency considers the Amended Proposals in line with the requirements of the CACM Regulation, provided that the amendments described in this Decision are integrated in the Amended Proposals, as presented in Annexes I and II to this Decision.
- (200) Therefore the Agency approves the Amended Proposals subject to the necessary amendments and to the necessary editorial amendments. To provide clarity, Annexes I and II to this Decision set out the Amended Proposals as amended and as approved by the Agency,

HAS ADOPTED THIS DECISION:

Article 1

The day-ahead and the intraday capacity calculation methodologies of the Core capacity calculation region, developed pursuant to Article 20 of Regulation (EU) 2015/1222, are adopted as set out in Annexes I and II to this Decision.

Article 2

This Decision is addressed to:

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

Slovenská elektrizačná prenosová sústava, a.s.,
TenneT TSO B.V.,
TenneT TSO GmbH and
TransnetBW GmbH.

Done at Ljubljana, on 21 February 2019.

*For the Agency
Director ad interim*

Alberto POTOTSCHNIG

Annexes:

Annex I – Day-ahead capacity calculation methodology of the Core capacity calculation region in accordance with Article 20ff. of the Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management

Annex II – Intraday capacity calculation methodology of the Core capacity calculation region in accordance with Article 20ff. of the Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management

Annex III – Evaluation of responses to the public consultation on the amendments of the proposal for common capacity calculation methodology for the Core capacity calculation region

In accordance with Article 19 of Regulation (EC) No 713/2009, 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 the Agency within two months of the day of notification of this Decision.