First amendment of the Day-Ahead Capacity Calculation Methodology of the Central Europe Capacity Calculation Region

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

1 July 2026

Whereas

TSOs of the CE CCR ("CE TSOs"), take into account the following:

(1) The update of remaining cross-zonal capacities after SDAC to be used for intraday is amended to (a) facilitate a transition from Central Europe Capacity Calculation Region applicable in the Day-Ahead timeframe to a Core and Italy North Capacity Calculation Region applicable in the Intraday timeframe through a coordinated calculation of cross-zonal capacity; (b) cover future SIDC developments such as Flow-based IDAs; (c) include iTCP in the capacity calculation to further increase the coordination between Central Europe CCR and iTCP and (d) ensure consistency with Core Intraday CCM and Italy North Intraday CCM.

(2) CE TSOs aim to make maintaining operational security, which is a crucial condition of DA CCM, independent from the amount of long-term allocated capacities (LTA). This will allow LTA pursuant to FCA GL to be set without a direct link to operational security. To reach this aim, this amendment foresees that the LTA inclusion must end at the latest with the first delivery period of the long-term capacities calculated according to the Core or Italy North LT CCM – whichever comes latest – pursuant to FCA GL. It is an option to do this even earlier. In addition to the inclusion of LTA as such, LTA have been used in the DA CCM for several further purposes. Therefore, besides the mere removal of LTA inclusion as such, this amendment foresees substitute solutions for all of these purposes. This includes a new approach for default flow-based parameters as part of the capacity calculation fallback and a revision of the determination of ATCs for SDAC fallback. Furthermore, a minimum level of cross-zonal capacity is ensured by introducing a floor level of 20 percent of the maximum admissible power flow after validation (for CE and iTCP CZC collectively) and, after deducting the impact of iTCP NTCs, in the final flow-based parameters for CE. The latter also safeguards against small cross-zonal capacity due to LTAs that are still allocated as physical transmission rights. CE TSOs and iTCP may deviate from the RAM floor level of 20 percent of the maximum admissible power flow on their own CNECs if operational security cannot be maintained otherwise. The concerned CE TSOs and iTCP shall communicate such deviations immediately to market participants via an Urgent Market Message (UMM) broadcasted on the JAO website[1]. The concerned CE TSOs and iTCP shall provide to the CCC a report with a justification why the application of the RAM floor level would have led to the inability to maintain operational security and an action plan describing how such situations will be avoided in the future. This report will become an annex to the quarterly report.

(3) With this amendment, CE TSOs and iTCP propose the Country GSK as a harmonised GSK methodology alongside the "Nodal Forecasting Error" as the key metric to evaluate GSK quality. Furthermore, rules for monitoring GSK quality and deviating GSK methodologies are proposed. Considering that these proposed amendments are based on the outcome of the Core GSK study, a new paragraph is introduced exempting CE TSOs from certain requirements until the CE GSK study has been conducted, and the ensuing amendment has been approved by the

[1] https://www.jao.eu/news?roles_target_id_group=tso

CE and iTCP regulatory authorities.

(4) This amendment introduces updates to Article 7 and to the iterative process under Article 24.5(b), including the insertion of a new Section 7.b to clarify the application of the allocation constraints referenced in Articles 7.2(c) and 7.2(d) within the SDAC fallback procedure pursuant to Article 24. Furthermore, enhancements to the iterative method for calculating ATCs in the SDAC fallback framework are incorporated to ensure full compliance with the allocation-constraint provisions established in Annex I – Italy.

(5) The purpose of this amendment is to further detail the methodology used by Terna for calculating the value of the applied ramping constraints. In the first version of the CE DA CCM, Terna had indicated that an update concerning the methodological approach for calculating ramping constraints would be submitted no later than 18 months after the initial submission of the methodology. The information is presented in Annex 1 of the CE DA CCM.

(6) The Celtic interconnector will create a new bidding zone border assigned to the CE CCR once it becomes operational. Consequently, the bidding zone border between the Single Electricity Market in Ireland and Northern Ireland ('SEM') and France ('FR'), attributed to EirGrid, SONI, and RTE, will be incorporated into the CE Day-Ahead CCM. To enable this integration and to accommodate the needs of EirGrid and SONI, CE TSOs propose amendments to update the definition of 'F0, all' and 'slack node' to cover CE bidding zones in different synchronous area, and define the 'SEM' as a single bidding zone for Ireland and Northern Ireland; to allow the delegation of a CE TSO obligation in providing capacity calculation inputs to another CE TSO; to establish the approach of integrating CE HVDC interconnectors between synchronous areas; to update the wording in the calculation of 'F0,all' to cover CE bidding zone in different synchronous areas; to include reference exchanges between bidding zones across different synchronous areas; and to specify that the operationalization of SEM-FR border is dependent on the commissioning of Celtic cable and its readiness for commercial operation. Article 7 and Annex 1 are updated to include EirGrid and SONI among the list CE TSOs applying allocation constraints together with the corresponding justification and methodology.

(7) To take into account the upcoming inner-German HVDC lines as a corrective measure for the NRAO, these grid elements are added in this amendment where applicable.

(8) Specification of operational security limits: These are founded on the SO Regulation. With this amendment, the CE TSOs propose to amend the existing wording to clarify and resolve an editorial inconsistency. The proposal does not alter the meaning of the stipulations regarding operational security limits. The proposed amendment is accompanied by a minor adaptation to make clear that certain aspects of operational security may, but do not have to be addressed by allocation constraints. This allows, where possible, to continue considering such aspects by operational security limits on CNEs.

(9) The purpose of this amendment is to align the CE DA CCM with Core DA CCM 4th amendment and Core ID CCM 6th amendment. Article 4 (8) details the steps of capacity calculation. Article 16 refers to the CNEC selection. However, 110 kV elements shall be added during the capacity validation referred to in Article 20. Moving the reference to 110 kV elements from Article 15 (2) to Article 20 (23)

makes it possible to add 110 kV network elements as CNECs during the capacity validation to the final CNEC list if the listed conditions are fulfilled - i.e. maxz2zPTDF higher than 5%.

(10) To consider the GCEU court ruling on the Core DA & ID CCM regarding internal CNECs, Article 5 is updated.

(11) To clarify the timelines for which annual, half-yearly and quarterly reports will be delivered to regulatory authorities, Article 29 is updated.

(12) To ensure correct usage of the terms market time unit and time unit, an additional definition for DA CC MTU is added to the methodology to distinguish between granularity of units throughout the methodology.

(13) In the context of the 4th Amendment of the Core DA CCM, Core TSOs identified and corrected editorial mistakes, and amended the formula for computing the maximum zone-to-zone PTDF (Equation 5 of the Core DA CCM). This amendment is intended to ensure alignment of the CE DA CCM with the corresponding corrections introduced by the 4th Amendment of the Core DA CCM. The adaptations to the CE DA CCM therefore include both the editorial changes and the correction of the formula for computing the maximum zone-to-zone PTDF (Equation 5 in the CE DA CCM).

(14) The first version of the CE DA CCM included provisions related to not-modelled tie-lines, which were introduced to account for tie-lines below 220 kV on the Italy North bidding zone borders not represented in the Common Grid Model. In view of the capability to explicitly model these network elements, CE TSOs and iTCP consider that the concept of not-modelled tie-lines is no longer required. Consequently, this amendment repeals the provisions related to not-modelled tie-lines, including Annex 2 and all associated references throughout the methodology.

(15) For the purposes of this first amendment to the CE CCR TSOs' Day-Ahead Capacity Calculation Methodology, terms used in this document shall have the meaning of the definitions included in Article 2 of the CACM Regulation, of Electricity Regulation, Directive 2019/944, Commission Regulation (EU) 2016/1719 (hereafter referred to as the 'FCA Regulation'), Commission Regulation (EU) 2017/2195 and Commission Regulation (EU) 543/2013.

Article 1
The update of remaining cross-zonal capacities after SDAC to be used for intraday

1. Article 2. Definitions and interpretation shall be amended by adding paragraph 97 accordingly:
   "'market topology' means a set of bidding zones and their interconnections together with associated network constraints used by the coupling algorithm."
2. Article 25. Update of remaining cross-zonal capacities after SDAC to be used for intraday shall be replaced and read accordingly:
   "
   1. This article is applicable by CE TSOs and iTCP until the implementation of a CE ID CCM.

   2. The update of cross-zonal capacities remaining after the SDAC to be used for intraday solely applies within the CE CCR. Capacity calculation processes

within other CCRs or for other time frames are not in the scope of this methodology.

3. The update of cross-zonal capacities remaining after SDAC to be used for intraday shall be performed as follows:

   IDCC(a): The cross-zonal capacities remaining after SDAC shall be updated for all ID CC TUs between 00:00 and 24:00 of day D and providing them as intraday cross-zonal capacities to relevant NEMOs with a target end time of 15 minutes before the intraday cross-zonal gate opening time, at 15:00 market time of day D-1. In case intraday cross-zonal capacities cannot be provided before the intraday cross-zonal gate opening time, the intraday cross-zonal capacities can be provided to the continuous trading platform until 17:20; This shall be calculated using the flow-based approach as defined in this article.

4. Further cross-zonal intraday capacities can be subsequently recalculated for relevant borders as defined in Core ID CCM and Italy North ID CCM.

5. As long as iTCP is not included in subsequent coordinated CE ID capacity calculations, iTCP and neighbouring TSOs shall have the right to adjust ID ATCs on its bidding zone borders pursuant to Annex 5.

6. The calculation of cross-zonal capacities remaining after SDAC for all ID CC TUs shall consist of three main stages:

   (a) the creation of capacity calculation inputs by the CE TSOs and iTCP;

   (b) the capacity calculation process by the CCC; and

   (c) the capacity validation by the CE TSOs and iTCP in coordination with the CCC.

7. The update of remaining cross-zonal capacities after SDAC shall be performed by the CCC, the CE TSOs and iTCP according to the following procedure:

   Step 1. The CCC shall use or recalculate the final flow-based parameters from day-ahead capacity calculation each CNEC of the day-ahead flow-based domain;

   Step 2. The CCC shall calculate the RAM_{UID} based on the day-ahead market results pursuant to paragraph 15;

   Step 3. The CCC shall gradually calculate initial ATCs from flow-based parameters according to paragraph 22;

   Step 4. The CE TSOs, iTCP and the CCC shall, according to Annex 3 and 4, validate the cross-zonal capacity and decrease RAM or set a maximum ATC when operational security is jeopardised, which results in the $RAM_{f,ID}$;

   Step 5. The CCC shall gradually calculate final ATCs from final flow-based parameters considering maximum ATC set in previous step according to paragraph 22;

Step 6. The CCC shall update flow-based parameters in case SIDC is unable to accommodate flow-based parameters for certain bidding-zone borders according to paragraph 24;

Step 7. The CCC shall publish ATCs the $PTDF_f$ and $RAM_{f,ID}$ values in accordance with paragraph 25 and provide them to NEMOs for capacity allocation.

8. In addition to the cross-zonal capacities remaining after SDAC pursuant to paragraph 5(a), the CE TSOs and iTCP, or an entity delegated by the CE TSOs or iTCP, shall send to the CCC, for each ID CC TU of the delivery day, the following additional input by the times established in the process description document:

   (a) the CE net positions or, alternatively, the already allocated capacities resulting from the SDAC.

   (b) The nominated cross-border exchanges of explicit DA-market for iTCP bidding-zone borders

9. If the CE TSOs provided to the CCC the already allocated capacities on bidding zone borders instead of the net positions, the CCC shall convert them into net positions. All capacity updates, calculations and re-calculations pursuant to paragraph 4, including all steps pursuant to paragraph 3, shall be performed per ID CC TU. Cross-zonal capacities shall be provided to the NEMOs for each ID CC TU, but for capacity allocation they may be converted into a higher time resolution in accordance with the market time unit applicable on specific bidding zone border(s).

10. In case operational security limits cannot be transformed efficiently into $Imax$ and $Fmax$ pursuant to Article 6, the CE TSOs may transform them into allocation constraints.

11. PSE, Terna and EirGrid/SONI may apply allocation constraints as one or more of the following five options:

    (a) a constraint on the CE net position (the sum of cross-zonal exchanges within the CE CCR and on AHC borders for a certain bidding zone in the SIDC), thus limiting the net position of the respective bidding zone with regards to its imports and/or exports to other bidding zones in the CE CCR. This option shall be applied until option (b) can be applied.

    (b) a constraint on the global net position (the sum of all cross-zonal exchanges for a certain bidding zone in the SIDC), thus limiting the net position of the respective bidding zone with regards to all CCRs, which are part of the SIDC. This option shall be applied when: (i) such a constraint is approved within all day-ahead capacity calculation methodologies of the respective CCRs, (ii) the respective solution is implemented within the SIDC algorithm and (iii) the respective bidding zone borders are participating in SIDC.

(c) a constraint limiting the sum of import/export from/to a set of interconnectors. This option shall be applied when: (i) the respective solution is implemented within the SIDC algorithm and (ii) the respective bidding zone borders are participating in SIDC.

(d) a ramping constraint (flow ramping limit) limiting the maximum variation of the CE net position in the SIDC (or import/export from/to a set of interconnectors) from one MTU to the next.

(e) ramping constraints (flow ramping limits) that limit the maximum flow change on HVDC interconnectors between synchronous areas from one TU to the next.

12. For iTCP bidding zone borders within the CE CCR, that are not included in SIDC, allocation constraints used by Terna are directly applied in the calculation performed by the CCC.

13. The CCC shall use or recalculate the flow-based parameters resulting from CE day-ahead capacity calculation and the net positions resulting from already allocated capacities on CE CNECs in SDAC and the nominated exchanges from iTCP DA-Market to calculate the updated day-ahead cross-zonal capacities, in the form of flow-based parameters, to be used as intraday cross-zonal capacities at the intraday cross-zonal gate opening time.

14. The CCC may recalculate the flow-based parameters resulting from day-ahead capacity calculation, provided that the provisions of the CE day-ahead capacity calculation methodology are applied, where such recalculation is necessary to reflect changes in the market topology between day-ahead and intraday time frame or where it constitutes a technically more efficient solution.

15. For the updated CE intraday flow-based parameters, the PTDF values shall be the final PTDFs resulting from the day-ahead capacity calculation or the recalculation, and the RAM shall be derived as:

$$\overrightarrow{RAM}_{UID} = \overrightarrow{RAM}_{f,DA} - \boldsymbol{PTDF}_{\boldsymbol{f,DA}}\,\overrightarrow{NP}_{AAC,DA} - \boldsymbol{PTDF}_{\boldsymbol{zone-to-zone}} \cdot (\overrightarrow{EX}_{ref,iTCP} - \overrightarrow{EX}_{nom,iTCP})$$

Equation 1

with

$\overrightarrow{RAM}_{UID}$	updated remaining available margin for intraday cross-zonal capacities on CE bidding zone borders
$\overrightarrow{RAM}_{f,DA}$	Recalculated or final remaining available margin resulting from the day-ahead capacity calculation on CE bidding zone borders
$\boldsymbol{PTDF}_{\boldsymbol{f,DA}}$	final power transfer distribution factor matrix resulting from the day-ahead capacity calculation on CE CNECs

$\overrightarrow{NP}_{AAC,DA}$	net positions resulting from already allocated capacities in SDAC
$\boldsymbol{PTDF}_{zone-to-zone}$	Final zone-to-zone power transfer distribution factor matrix resulting from the day-ahead capacity calculation on CE CNECs
$\overrightarrow{EX}_{ref,iTCP}$	Reference Exchanges on iTCP bidding-zone borders from day-ahead capacity calculation
$\overrightarrow{EX}_{nom,iTCP}$	Nominated Exchanges on iTCP bidding-zone borders

16. For each CNEC, each CE TSO and iTCP may decrease the $RAM_{\mathrm{f,DA}}$ by decreasing the AMR_{DA} while ensuring that there is no undue discrimination between internal and cross-zonal exchanges in line with Article 21(1)(b)(ii) of the CACM Regulation.

17. For each CNEC, each CE TSO may decrease the RAM_{UID} by excluding any margins reserved for cross-zonal capacity allocations (CZCA) for the exchange of balancing capacity or sharing of reserves, according to the methodology developed pursuant to article 38(3) of EB Regulation.

18. Irrespective of the options provided to each TSO pursuant to this paragraph, each TSO shall ensure that on each CNEC $\overrightarrow{RAM}_{UID}$ is non-negative. In case of a required reduction due to situations as defined in Annex 3 paragraph 3(a), (b), (c), and (d), a TSO may use a positive value for IVA for its own CNECs.

    After individual validation adjustments, the final remaining available margin for intraday cross-zonal capacity ($\overrightarrow{RAM}_{f,ID}$) shall be calculated by the CCC for each CE CNEC and allocation constraint as follows:

$$\overrightarrow{RAM}_{f,ID} = \overrightarrow{RAM}_{UID} - \overrightarrow{IVA}_{ID}$$

Equation 24

with

$\overrightarrow{RAM}_{f,ID}$	final remaining available margin for CE intraday cross-zonal capacity
$\overrightarrow{RAM}_{UID}$	updated remaining available margin for CE intraday cross-zonal capacities
$\overrightarrow{IVA}_{ID}$	intraday individual validation adjustment

19. In case SIDC is unable to accommodate flow-based parameters for certain bidding-zone borders, the CCC shall convert them into available transmission capacities for each CE and iTCP oriented bidding zone border where SIDC is unable to accommodate flow-based parameters and for each ID CC TU. The CE TSOs and iTCP may delegate this responsibility to a third party.

20. In parallel to IVA validation pursuant to Annex 3 and as long as SIDC is not able to directly apply flow-based parameters for all CE bidding-zone borders and as long as flow-based parameters are converted to available transmission capacities for iTCP bidding zone borders, the CE TSOs and iTCP may also perform ATC based individual validation pursuant to Annex 4.

21. The final **PTDF**f of all or only a subset of CE CNECs can be adjusted before the ATC extraction by setting the positive zone-to-zone PTDFs below a certain threshold to zero. The following outputs are the outcomes of the calculation for each ID CC TU:

    a) ATCs; and

    b) constraints with zero margin before and after the calculation of ATCs.

    c) An ATC limitation on specific borders as set by relevant TSOs as output of the local validation as defined in Annex 4: $ATC_{A\to B\ \text{validated}}$

22. The calculation of the ATCs is an iterative procedure, which gradually calculates ATCs for each ID CC TU, while respecting the constraints of the final flow-based parameters pursuant to paragraph 9 and 14:

    (a) The initial ATCs are set equal to zero for each CE and iTCP oriented bidding zone border, i.e.:

$$\overrightarrow{ATC}_{k=0} = 0$$

Equation 3

with

$\overrightarrow{ATC}_{k=0}$	the initial ATCs before the first iteration

    (b) The remaining available margin at iteration zero is equal to the updated remaining available margin for intraday cross-zonal capacities according to paragraph 13.

    (c) Before starting the iterative method applied to calculate the positive ATCs, all the remaining available margins for ATC calculation at iteration k=0 ($\overrightarrow{RAM}_{ATC}(0)$) shall be adjusted to be non-negative:

$$\overrightarrow{RAM}_{ATC}(0) = \max\left(0; \overrightarrow{RAM}_{f,ID}\right)$$

Equation 4

with

$\overrightarrow{RAM}_{ATC}(0)$	Remaining available margin for ATC calculation at iteration $k = 0$
$\overrightarrow{RAM}_{f,ID}$	final remaining available margin for intraday cross-zonal capacity

(d) The iterative method applied to calculate the ATCs for intraday cross-zonal capacity procedure consists of the following actions for each iteration step k:

i. for each CNEC and allocation constraint of the flow-based parameters pursuant to paragraph 1, calculate the remaining available margin based on ATCs at iteration *k*-1:

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

Equation 5

with

$\overrightarrow{RAM}_{ATC}(k)$	remaining available margin for ATC calculation at iteration *k*
$\overrightarrow{RAM}_{ATC}(0)$	Remaining available margin for ATC calculation at iteration $k = 0$
$\overrightarrow{ATC}_{k-1}$	ATCs at iteration *k*-1
$\mathbf{pPTDF}_{\boldsymbol{zone-to-zone}}$	positive zone-to-zone power transfer distribution factor matrix

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

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

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

v. $\overrightarrow{ATC}_k$ is limited to a maximum value of $ATC_{A\rightarrow B\ \text{validated}}$ if such value has been introduced by TSOs on the border A→B as a result of the ATC validation phase as described in Annex 4. Then go back to step i;

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

vii. the resulting ATCs after day-ahead market coupling stem from the ATC values determined in iteration k, after rounding down to integer values.

viii. at the end of the calculation, there are some CNECs and allocation constraints with no remaining available margin left. These are the limiting constraints for the calculation of ATCs after day-ahead market coupling.

(e) positive zone-to-zone PTDF matrix ($\mathbf{pPTDF}_{\boldsymbol{zone-to-zone}}$) for each CE oriented bidding zone border shall be calculated from the $\mathbf{PTDF}_{\boldsymbol{f}}$ as follows (for HVDC interconnectors integrated pursuant to Article 12, Equation 7 shall be used):

$$pPTDF_{zone-to-zone,A\rightarrow B} = \max\left(0, PTDF_{zone-to-slack,A} - PTDF_{zone-to-slack,B}\right)$$

Equation 6

with

$pPTDF_{zone-to-zone,A\rightarrow B}$	positive zone-to-zone $PTDFs$ for CE oriented bidding zone border A to B
$PTDF_{zone-to-slack,m}$	zone-to-slack $PTDF$ for CE bidding zone or virtual hub m

(f) For bidding-zone borders consisting of both HVDC and AC interconnectors, the capacity share of the respective bidding-zone border shall be split between AC and HVDC within the ATC Extraction algorithm.

23. Ramping constraints pursuant to Article 25(8)(d) shall limit the maximum variation of the calculated ATCs between consecutive MTUs for the respective iTCP bidding-zone borders within CE CCR not included in SIDC.

24. In case SIDC is unable to accommodate flow-based parameters for certain bidding-zone borders flow-based parameters for bidding-zone borders using flow-based in SIDC shall be updated by:

(a) considering ATCs for non-flow-based bidding-zone borders according to Equation 33.

$$\overrightarrow{RAM}_{fb,ID} = \overrightarrow{RAM}_{f,ID} - \mathbf{pPTDF}_{\boldsymbol{zone-to-zone}}\,\overrightarrow{ATC}_{non-fb}$$

Equation 7

With

$\overrightarrow{RAM}_{fb,ID}$	Final remaining available margin for flow-based domain
$\mathbf{pPTDF}_{zone-to-zone}$	positive zone-to-zone power transfer distribution factor matrix
$\overrightarrow{ATC}_{non-fb}$	ATCs for bidding-zone borders where SIDC is unable to accommodate flow-based parameters and iTCP bidding-zone borders

(b) removing the PTDFs of non-flow-based bidding zones from the flow-based parameters

(c) The CCC shall remove those $\overrightarrow{RAM}_{fb,ID}$ and $\mathbf{PTDF_f}$ values which are redundant and may therefore be removed without impacting the possible allocation of cross-zonal capacity. The pre-solved CNECs and external constraints shall thus ensure that the capacity allocation shall not exceed any limiting CNEC or external constraint

25. According to Article 21(3) of the CACM Regulation, when the intraday capacity calculation for specific ID CC TUs does not lead to the final flow-based parameters due to, inter alia, a technical failure in the tools, an error in the communication infrastructure, or corrupted, missing or delayed input data, the CE TSOs and the CCC shall define the missing parameters by calculating the default flow-based parameters. The calculation of default flow-based parameters shall be based on previously calculated flow-based parameters for the same delivery market time unit. The latest (day-ahead) available flow-based domain, which may be corrected during local validation in accordance with Annex 3, for the considered delivery ID CC TU is first converted to zero balance by setting all CE net positions to zero. The RAM on each CNEC (including allocation constraints) is then decreased by the adjustments for minRAM. The redundant constraints are removed, and pre-solved constraints are adjusted for the net positions resulting from the SDAC and the SIDC.

26. CE TSOs and the CCC shall publish at least the following information and data items for each IDCC TU:

i. Maximum and minimum possible net position of each bidding zone;
ii. Maximum possible bilateral exchanges between all pairs of CE bidding zones;
iii. names of CNECs (with geographical names of substations where relevant and separately for CNE and contingency) and allocation constraints of the final flow-based parameters before pre-solving and the TSO defining them;
iv. for each CNEC of the final flow-based parameters before pre-solving, the EIC code of CNE and Contingency;
v. detailed breakdown of RAM for each CNEC of the final flow-based parameters before pre-solving: I_{max}, U, F_{max}, FRM, F_{ref}, $F_{0,\text{ce}}$, $F_{0,\text{all}}$, F_{uaf}, IVA_{DA}, IVA_{ID}, CVA;

vi. value of each allocation constraint before pre-solving;
vii. indication of whether default flow-based parameters were applied;
viii. indication of whether a CNEC is redundant or not;
ix. Initial NTC and ATC before validation
x. Final NTC and ATCs (after validation) for SIDC;
xi. value of each allocation constraint before pre-solving;
xii. information about the validation reductions:
    - the identification of the CNEC;
    - the TSO invoking the reduction;
    - the volume of reduction (IVA);
    - the detailed reason(s) for reduction in accordance with Article 18(2) and 18(3), including the operational security limit(s) that would have been violated without reductions, and under which circumstances they would have been violated;

The CCC shall include in its quarterly report as defined in Article 27(5) the flows resulting from net positions resulting from intraday auctions on each CNEC and allocation constraint of the final flow-based parameters. This requirement is valid after the SIDC will directly apply the flow-based parameters.

27. With the aim to maximize capacities whilst maintaining operational security, a reassessment of all the parameters defined in Article 25 shall be performed during both parallel run steps outlined in Article 30 of this methodology."

2. In Annex 3. "IVA validation process for updated intraday capacities":
   1) the phrase "CE TSOs" is replaced by "CE TSOs and iTCP" throughout the text of this Annex 3;
   2) in paragraph 5 reference to art. 25(8) is changed to art. 25(10).

3. In Annex 4. "ATC based validation process for updated intraday capacities" the phrase "CE TSOs" is replaced by "CE TSOs and iTCP" throughout the text of this Annex 4 with exception to paragraph 4 in which the phrase "CE TSOs and CCC" is replaced by "CE TSOs, iTCP and the CCC".

4. Annex 5. "Other transitional arrangements" shall be added accordingly:
"

Annex 5: Other transitional arrangements

1. The iTCP and neighbouring TSOs have the right to adjust ID ATCs on the bidding zone borders between the iTCP bidding zone and the neighbouring bidding zones pursuant to this Annex.

2. The adjustments to ID ATCs on iTCP bidding zone borders shall be used in case adjustments are needed to maximise cross-zonal capacity and/or

maintain operational security. The maximum of ID ATC increase per iTCP bidding zone border shall be set during the parallel run, outlined in Article 30.

3. The ID ATC on a bidding zone border shall always be the lowest value of all ID ATCs set by all impacted TSOs for this bidding zone border.

4. No later than 4 months after the implementation of CE DA CCM CE TSOs shall regularly publish the ID ATC adjustments pursuant to paragraph 1 including justifications for each ATC adjustment.

   This justification shall be based on the assessment of the day-ahead congestion forecast common grid models and shall include the concerned CNECs on which the need for decrease or increase of flow or capacity was identified to maximise cross-zonal capacity and/or maintain operational security.

5. The adjustment to ID ATCs on iTCP bidding zone border takes place after CE IDCC(a) pursuant to Article 25 and shall be based on a day-ahead congestion forecast common grid model.

6. The adjustment to ID ATCs on iTCP bidding zone borders shall consist of the following three steps:

   (a) the assessment of an increase or the need to decrease ID ATCs;

   (b) the exchange of assessed maximum ATC per bidding zone border;

   (c) the calculation of the lowest value for each iTCP bidding zone border.

7. The following list shall be used for the assessment of ID ATCs on iTCP bidding zone borders pursuant to paragraph 6(a):

   (a) Final ATCs resulting from CE IDCC(a) pursuant to Article 25;

   (b) Day-ahead congestion forecast common grid models.

8. The resulting ATCs for iTCP bidding-zone borders to be used for intraday stem from the ATC values determined pursuant to paragraph 6(c)."

5. The term "iCTP" is replaced by "iTCP" throughout the text of the methodology.

Article 2
Removal of LTA inclusion

1. In Whereas (25) the following sentence is added at the end:
   "CE TSOs will cease to apply LTA inclusion at the latest as of the first delivery period of the long-term capacities calculated according to the Core or Italy North Long Term Capacity Calculation Methodologies – whichever comes latest –

pursuant to the FCA Regulation. This shall serve to decouple maintaining of operational security from the amount of LTAs."

2. Article 2. "Definitions and interpretation" shall be amended by updating paragraph 44 accordingly:
   "Repealed"

3. Article 2. "Definitions and interpretation" shall be amended by updating paragraph 83 accordingly:
   "'CZC' means cross-zonal capacity whereas this capacity is to be understood as the "flow-based parameters" (flow-based domain), or in case the extended LTA approach pursuant to Article 18(1)(a) is applied, the union of the flow-based parameters and "LTA values" (LTA domain);"

4. Article 2. "Definitions and interpretation" shall be amended by adding paragraph 94 accordingly:
   "$\|\vec{x}\|_2$ denotes the Euclidean norm of a vector;"

5. Article 2. "Definitions and interpretation" shall be amended by adding paragraph 95 accordingly:
   "r denotes the factor for determining the floor level of the RAM before adjustment for long-term nominations and of the RAM of the final flow-based parameters in case of deviations from the standard floor level."

6. Article 4. "Day-ahead capacity calculation process" shall be amended by updating paragraph 4 letter (a) and (b) by adding a following sentence at the end of these provisions:
   "as long as the CE TSOs apply the rules as referred to in Article 18(1)(a)"

7. Article 4. "Day-ahead capacity calculation process" shall be amended by updating paragraph 8, Step 9 accordingly:
   "Step 9. The CCC shall, according to Article 21, consider the capacities for iTCPs, subject to Article 13(2), and remove the redundant CNECs and redundant allocation constraints from final $PTDF_f$ and RAM'_{bn} and publish these as pre-final flow-based parameters in accordance with Article 27;"

8. Article 16. "Non-costly remedial actions optimisation" shall be amended by updating paragraph 7 letter (d) accordingly:
   "an estimate of the market clearing point (and related market welfare) which may have occurred, should the NRAO not have taken place (but including other capacity calculation steps such as minRAM, LTA inclusion [as long as the CE TSOs apply the rules as referred to in Article 18(1)(a)] and an estimate of the validation phase.)"

9. Article 18. "Long-term allocated capacities (LTA) inclusion" shall be replaced and read accordingly:

   "

1. In accordance with Article 21(1)(b)(iii) of the CACM Regulation, the CE TSOs shall apply the following rules for taking into account the previously-allocated cross-zonal capacity:

   (a) the rules ensure that cross-zonal capacities can accommodate all combinations of net positions that could result from previously-allocated cross-zonal capacity.

   (b) Repealed.

   (c) previously-allocated capacities on all bidding zone borders of the CE CCR and on the AHC borders shall be the long-term allocated capacities (LTA) based on historical values of long-term allocated capacities and any change shall be commonly coordinated and agreed by all CE TSOs with the support of the CCC.

   (d) the CE TSOs shall cease to apply the rules as referred to in paragraph 1(a) in accordance with the provisions in Article 30(6).

1a. As long as the CE TSOs apply the rules set out in paragraph 1(a), these rules shall be implemented by extended LTA inclusion, whereby the cross-zonal capacities consist of a flow-based domain without LTA inclusion and an LTA domain.

2. In case an allocation constraint restricts the CE net positions pursuant to Article 7(2)(a), it shall be added as an additional row to the $\mathbf{PTDF}_f$ matrix and to the $\vec{F}_{max}$, $\vec{F}_{ref}$, $\overrightarrow{FRM}$, and $\overrightarrow{AMR}$ vectors as follows:

   (a) the $PTDF$ value in the column related to the bidding zone applying the concerned allocation constraint is set to 1 for an export limit and -1 for an import limit, respectively;

   (b) the $PTDF$ values in the columns related to all other bidding zones are set to zero;

   (c) the F_{max} value is set to the amount of the allocation constraint;

   (d) the F_{ref} value is set to the CE net position in the CGM of the bidding zone or EVH applying the allocation constraint, i.e. NP_{ref} in the equation below; and

   (e) the FRM and AMR values are set to zero;"

10. Article 19. "Calculation of flow-based parameters" before validation shall be amended by updating paragraph 1 accordingly:
"

   1. Based on the initial flow-based domain and on the final list of CNECs, the CCC shall calculate for each CNEC the RAM before validation, relying on the following sequential steps:

(a) the calculation of F_{ref} and $PTDF_f$ through the NRAO according to Article 16;

(b) the calculation[2] of the adjustment for minimum RAM (AMR) according to Article 17;

(c) Repealed.

(d) the calculation of RAM before validation as follows:

$$\overrightarrow{RAM}_{bv} = \vec{F}_{max} - \overrightarrow{FRM} - \vec{F}_{0,CE} + \overrightarrow{AMR}$$

Equation 16

with

$\vec{F}_{max}$	Maximum active power flow pursuant to Article 6
$\overrightarrow{FRM}$	Flow reliability margin pursuant to Article 8
$\vec{F}_{0,CE}$	Flow without commercial exchanges in the CE CCR including iTCP and without commercial exchanges on AHC borders, described in Equation 10. For allocation constraints, in line with Article 18(2), this flow is equal to zero.[8]
$\overrightarrow{AMR}$	Adjustment for minimum RAM pursuant to Article 17
$\overrightarrow{RAM}_{bv}$	Remaining available margin before validation

"

11. Article 20. "Validation of flow-based parameters" shall be amended by updating paragraph 3 accordingly:
    "The capacity validation shall be based on the flow-based domain with RAM_{bv}. As long as the CE TSOs apply the rules as referred to in Article 18(1)(a), the capacity validation shall be based on the convex hull of the flow-based domain with RAM_{bv} and the LTA domain."

12. Article 20. "Validation of flow-based parameters" shall be amended by updating paragraph 4 accordingly:

    "In the process of cross-zonal capacity validation the CE TSOs and iTCP shall exchange information on all expected available (non-costly and costly) RAs in the CE CCR, defined in accordance with Article 22 of the SO Regulation. In case the cross-zonal capacity could lead to violation of operational security, all CE TSOs and iTCP in coordination with the CCC shall verify whether such violation can be avoided with the application of RAs. In this process, the CCC shall coordinate

[2] AMR, $F_{0,CE}$ and FRM do not apply to allocation constraints, and shall be zero for such constraints.

with neighbouring CCCs on the use of RAs having an impact on neighbouring CCRs. For those CNECs where all available RAs are not sufficient to avoid the violation of operational security, the CE TSOs and iTCP in coordination with the CCC may reduce the RAM_{bv} to the maximum value which avoids the violation of operational security. This reduction is called ‘coordinated validation adjustment’ (CVA) and the adjusted RAM is called ‘RAM before individual validation’ (RAM_{biv}).”

13. Article 20. Validation of flow-based parameters shall be amended by updating paragraph 6 letter (a) accordingly:

    “the CZC domain based on the flow-based parameters before validation pursuant to Article 19 and, as long as the CE TSOs apply the rules as referred to Article 18(1)(a)), the LTA domain;”

14. Article 20. “Validation of flow-based parameters” shall be amended by updating paragraph 19 accordingly:

    “The CCC shall calculate for each CNEC:

    (a) the RAM before individual validation as follows;

$$\overrightarrow{RAM}_{biv} = \overrightarrow{RAM}_{bv} - \overrightarrow{CVA}$$

Equation 17

“

15. Article 20. “Validation of flow-based parameters” shall be amended by updating paragraph 26 accordingly:

    “After coordinated and individual validation adjustments, the RAM_{bn} before adjustment for long-term nominations shall be calculated by the CCC for each CNEC and allocation constraint according to *Equation 18*:

$$\overrightarrow{RAM}_{bn} = \max(\overrightarrow{RAM}_{bv} - \overrightarrow{CVA} - \overrightarrow{IVA}, 0.2 \cdot \overrightarrow{F_{max}})$$

Equation 18

with

$\overrightarrow{RAM}_{bn}$	remaining available margin before adjustment for long-term nominations
$\overrightarrow{RAM}_{bv}$	remaining available margin before validation pursuant to Article 19(d)
$\overrightarrow{CVA}$	coordinated validation adjustment
$\overrightarrow{IVA}$	individual validation adjustment

$\overrightarrow{F_{max}}$	maximum admissible power flow

"

16. Article 20. "Validation of flow-based parameters" shall be amended by adding paragraph 26a accordingly:

"CE TSOs and iTCP may deviate from the calculation of the $\overrightarrow{RAM_{bn}}$ pursuant to paragraph 26 on their own CNECs by specifying a lower factor than 0.2 for the floor level in case operational security cannot be maintained otherwise. In such a case, the CCC shall compute $\overrightarrow{RAM_{bn}}$ for the CNECs of the concerned CE TSOs as follows.

$$\overrightarrow{RAM_{bn}} = \max(\overrightarrow{RAM_{bv}} - \overrightarrow{CVA} - \overrightarrow{IVA}, r \cdot \overrightarrow{F_{max}})$$

Equation 19

with

$\overrightarrow{RAM_{bn}}$	remaining available margin before adjustment for long-term nominations
$\overrightarrow{RAM_{bv}}$	remaining available margin before validation pursuant to Article 19(d)
$\overrightarrow{CVA}$	coordinated validation adjustment
$\overrightarrow{IVA}$	individual validation adjustment
$\overrightarrow{F_{max}}$	maximum admissible power flow
r	TSO-specific factor with $0 \leq r < 0.2$

The concerned CE TSOs and iTCP shall immediately inform market participants via a market message about such deviation and the reduced floor factor r. The concerned CE TSOs and iTCP shall provide to the CCC a report with a justification why the calculation of RAM_{bn} pursuant to paragraph 26 would have led to the inability to maintain operational security and an action plan describing how such situations will be avoided in the future. This report and action plan shall be added as an annex to the quarterly report as defined in Article 29(5)."

17. Article 20. "Validation of flow-based parameters" shall be amended by updating paragraph 28 accordingly:

"Repealed."

18. Article 21. "Calculation and publication of final flow-based parameters" shall be amended by updating paragraph 1 accordingly:

“In order to determine the capacities for the CE bidding zone borders, the capacities calculated for the iTCP bidding-zone borders pursuant to Article 23 shall be deducted as follows

$$\overrightarrow{RAM'}_{bn} = \overrightarrow{RAM}_{bn} - \mathbf{pPTDF}_{\boldsymbol{zone-to-zone}} \, \overrightarrow{NTC}_{iTCP}$$

Equation 20

with

$\overrightarrow{RAM'}_{bn}$	Remaining available margin after deduction of iTCP bidding zone borders capacity and before adjustment for long-term nominations
$\mathbf{pPTDF}_{\boldsymbol{zone-to-zone}}$	Positive zone-to-zone power transfer distribution factor matrix
$\overrightarrow{NTC}_{iTCP}$	NTCs for the iTCP bidding-zone borders with CE CCR

19. Article 21. “Calculation and publication of final flow-based parameters” shall be amended by updating paragraph 2 by adding the following sentence at the end of this provision:

“as long as the CE TSOs apply the rules as referred to in Article 18(1)(a).”

20. Article 21. “Calculation and publication of final flow-based parameters” shall be amended by updating paragraph 3 accordingly:

“After the CCC receives all nominations of allocated long-term cross-zonal capacity (long-term nominations) on CE bidding zone borders, it shall calculate for each CNEC and allocation constraint the flow resulting from these nominations (F_{LTN}). This is done by multiplying the net positions reflecting the long-term nominations with the $\mathbf{PTDF}_{\boldsymbol{f}}$. This step is described with *Equation 21*:

$$\vec{F}_{LTN} = \mathbf{PTDF}_{\boldsymbol{f}} \, \overrightarrow{NP}_{LTN}$$

Equation 21

with

$\vec{F}_{LTN}$	flow resulting from CE LTN
$\mathbf{PTDF}_{\boldsymbol{f}}$	power transfer distribution factor matrix
$\overrightarrow{NP}_{LTN}$	CE net positions resulting from LTN

“

21. Article 21. “Calculation and publication of final flow-based parameters” shall be amended by updating paragraph 4 accordingly:

“CE DA flow-based capacity calculation final flow-based parameters are computed as follows:

$$\overrightarrow{RAM_f} = \max\ (\overrightarrow{RAM'}_{bn} - \vec{F}_{LTN}, \min(0.2\ \cdot \overrightarrow{F_{max}}\ , \overrightarrow{RAM'}_{bn}))$$

Equation 22

with

$\overrightarrow{RAM'}_{bn}$	Remaining available margin after deduction of iTCP bidding zone borders capacity and before adjustment for long-term nominations
$\vec{F}_{LTN}$	flow after consideration of LTN
$\overrightarrow{F_{max}}$	maximum admissible power flow
$\overrightarrow{RAM_f}$	Final CE remaining available margin

"

22. Article 21. "Calculation and publication of final flow-based parameters" shall be amended by updating paragraph 5 by adding a following sentence at the end of this provision:

    "as long as the CE TSOs apply the rules as referred to in Article 18(1)(a)."

23. Article 21. "Calculation and publication of final flow-based parameters" shall be amended by adding paragraph 5a accordingly:

    "For the CNECs for which the $\overrightarrow{RAM_{bn}}$ was computed pursuant to Article 20(26a), the CCC shall compute RAM_f as follows:

$$\overrightarrow{RAM_f} = \max\left(\overrightarrow{RAM'}_{bn} - \vec{F}_{LTN}, \min(r \cdot \overrightarrow{F_{max}}\ , \overrightarrow{RAM'}_{bn})\right)$$

Equation 23

with

$\overrightarrow{RAM'}_{bn}$	Remaining available margin after deduction of iTCP bidding zone borders capacity and before adjustment for long-term nominations
$\vec{F}_{LTN}$	flow after consideration of LTN
$\overrightarrow{F_{max}}$	maximum admissible power flow
$\overrightarrow{RAM_f}$	Final CE remaining available margin
r	TSO-specific factor with $0 \leq r < 0.2$

The TSO specific floor factor r shall be identical per concerned CE TSO or iTCP to the factor used in Article 20(26a)."

24. Article 21. "Calculation and publication of final flow-based parameters" shall be amended by updating paragraph 6 accordingly:

    "The final flow-based parameters shall consist of $\mathbf{PTDF}_f$ and RAM_f for pre-solved CNECs and allocation constraints. In accordance with Article 46 of the CACM Regulation, the CCC shall ensure that, for each DA CC MTU, the final flow-based parameters and, as long as the CE TSOs apply the rules as referred to in Article 18(1)(a), the LTA domain adjusted for long-term nominations be provided to the relevant NEMOs as soon as they are available and no later than 10:30 market time day-ahead. If DA CC MTU is different than MTU used by the relevant NEMOs, then CCC shall convert them before sending, by applying duplication of all DA CC MTU. The CCC shall also publish these flow-based parameters for each DA CC MTU of the following day no later than 10:30 market time day-ahead."

25. Article 22. "Validation of flow-based parameters" shall be replaced and read accordingly:
"

1. According to Article 21(3) of the CACM Regulation, when the day-ahead capacity calculation for specific DA CC MTUs does not lead to the final flow-based parameters due to, *inter alia*, a technical failure in the tools, an error in the communication infrastructure, or corrupted or missing input data, the CE TSOs, iTCP and the CCC shall calculate the remaining missing results by using one of the two capacity calculation fallback procedures pursuant to paragraph 2 or paragraph 3 to 7, respectively.

2. When the day-ahead capacity calculation fails to provide the flow-based parameters for strictly less than three consecutive hours, the CCC shall calculate the missing flow-based parameters with the spanning method. The spanning method is based on the union of the previous and subsequent available flow-based parameters (resulting in the intersection of the two flow-based domains), adjusted to zero CE net positions (to delete the impact of the reference net positions of the CE bidding zones and VHs). All flow-based constraints from the previous and subsequent data sets are first converted into zero CE net positions. Then all previous and subsequent constraints are combined, the redundant constraints are removed, and the pre-solved constraints are adjusted for the long term nominations in accordance with Article 21. In case the extended LTA inclusion approach is applied, the LTA domain for missing hours contains for each CE border and each AHC border the minimum of the long-term allocated capacities values of the hours for which the previous and subsequent flow-based parameters are available.

3. When the day-ahead capacity calculation fails to provide the flow-based parameters for three or more consecutive hours, the CE TSOs and iTCP shall define the missing parameters by calculating the default flow-based parameters. Such calculation shall also be applied in cases of impossibility to span the missing parameters pursuant to paragraph 2 or in the situation as described in Article 20 (25).

4. The intermediate default flow-based parameters shall be determined in advance and updated at least on a monthly basis.

5. The CCC shall compute intermediate default flow-based parameters based on all historical flow-based parameters from the 12 previous months, excluding DA CC MTUs for which capacity calculation fallback procedures pursuant to this article have been applied. If there have been structural changes of the CE bidding zones, IVHs or EVHs within the time period of the historical flow-based parameters or there will be such change between this time period and the period for which the initial default flow-based parameters will be applied, the CCC may, in coordination with all CE TSOs, use an alternative basis for the computation of the initial default flow-based parameters, including but not

limited to using data from a parallel run and shortening the time period of the historical data.

(a) The CCC shall determine a list M of CNEs which are part of pre-solved CNECs in more than a predefined percentage of the historical flow-based domains pursuant to paragraph 5.

(b) For each CNE m on the list pursuant to the previous paragraph, the CCC shall determine one "representative CNEC" described by $\overrightarrow{PTDF}_{m,rep,initial}$ and $RAM_{m,rep,initial}$, and an associated $F_{m,max}$.

i. The CCC shall determine a list L of all pre-solved CNECs from the historical flow-based domains pursuant to paragraph 5 which are associated with the CNE m.

ii. Each CNEC l of the list pursuant to the previous paragraph shall be adjusted for historical long-term nominations and normalised by computing $\overrightarrow{PTDF}_{l,norm}$ and $RAM_{l,norm}$, and an associated $F_{max,l,norm}$.

$$\overrightarrow{PTDF}_{l,norm} = \frac{\overrightarrow{PTDF}_l}{\left\|\overrightarrow{PTDF}_l\right\|_2}$$
$$RAM_{l,norm} = \frac{RAM_l + F_{LTN,l}}{\left\|\overrightarrow{PTDF}_l\right\|_2}$$
$$F_{max,l,norm} = \frac{F_{max,l}}{\left\|\overrightarrow{PTDF}_l\right\|_2}$$

Equation 24

with

$\overrightarrow{PTDF}_l$	$PTDF$ of CNEC l from historical flow-based parameters
RAM_l	Final RAM of CNEC l from historical flow-based parameters
$F_{LTN,l}$	Flow after consideration of LTN in historical flow-based parameters, pursuant to Art. 21(3)
$F_{max,l}$	F_{max} of CNEC l from historical flow-based parameters

iii. The PTDFs of the representative CNEC, $\overrightarrow{PTDF}_{m,rep,initial}$, shall be computed as the normalised mean of the normalised PTDFs of all CNECs in L.

$$\overrightarrow{PTDF}_{m,mean} = \frac{1}{|L|}\sum_{l=1}^{|L|}\overrightarrow{PTDF}_{l,norm}$$

$$\overrightarrow{PTDF}_{m,rep,initial} = \frac{\overrightarrow{PTDF_{mean}}}{\left\|\overrightarrow{PTDF_{mean}}\right\|_2}$$

Equation 24a

with

$\overrightarrow{PTDF}_{m,mean}$	mean normalised PTDFs across all CNECs in L

iv. The RAM of the representative CNEC, $RAM_{m,rep,initial}$, shall be computed as the PR_{DFP}-percentile of the normalised RAMs.

$$RAM_{m,rep,initial} = Q_{PR_{DFP}\%}\left(\{RAM_{l,norm}: l \in L\}\right)$$

Equation 24b

with

PR_{DFP}	RAM percentile rank for default flow-based parameters

v. The F_{max} of the representative CNEC, $F_{m.max}$, shall be computed as the PR_{DFP}-percent quantile of the normalised F_{max} values.

$$F_{max,m,rep} = Q_{PR_{DFP}\%}\left(\{F_{max,l,norm}: l \in L\}\right)$$

Equation 24c

(c) The CCC shall form the initial default flow-based parameters by forming the union of all representative CNECs and removing redundant CNECs, thus keeping the pre-solved representative CNECs.

(d) Each CE TSO has the right to validate and, if needed to consider the effect of planned outages of network elements, reduce the RAM of the representative CNECs from the initial default flow-based parameters, where the CNEs are fully or partly located in its own control area. Such reduction shall be provided in the form of an Individual Validation Adjustment $IVA_{m,rep}$ per representative CNEC m. Any such reduction shall be communicated and justified to market participants and to all Core regulatory authorities in accordance with Article 27 and Article 29, respectively.

(e) The intermediate default flow-based parameters shall consist of the representative CNECs of the initial default flow-based parameters with unmodified $PTDF$ and modified RAM

$$\overrightarrow{PTDF}_{m,rep} = \overrightarrow{PTDF}_{m,rep,initial}$$
$$RAM_{m,rep} = RAM_{m,rep,initial} - IVA_{m,rep}$$

Equation 24d

(f) The CCC shall publish the intermediate flow-based parameters.

6. CE TSOs may alter the percentage referred to in paragraphs 5(b) and the percentile rank PR_{DFP} as long as this is within the boundaries of Article 3 (b), (c) and (d) CACM, having regard to the exceptional nature of the application of default flow-based parameters. The CCC shall report quarterly on the initial set-up and any change in these percentages, together with its impact and a due justification. The CCC shall also publicly announce such change at least two working days before it takes effect.

7. For each DA CC MTU for which the default flow-based parameters are applied pursuant to paragraph (3), the intermediate default flow-based parameters shall be adapted as follows, to obtain the final parameters:

   (a) First, adding the allocation constraints from the current process pursuant to Article 7(2)(a) and Article 18(2); and

   (b) Secondly, adjust for long-term nominations pursuant to Article 21,

   This shall be done by using the union of the complemented allocation constraints pursuant to paragraph 7(a) and the parameters $\mathbf{PTDF}_{\boldsymbol{rep}}$, $\overrightarrow{RAM}_{rep}$ and $\vec{F}_{max,rep}$ as replacements for $\mathbf{PTDF}_{\boldsymbol{f}}$, $\overrightarrow{RAM'}_{bn}$ and $\vec{F}_{max}$, respectively.

8. As long as the CE TSOs apply the rules as referred to in Article 18(1)(a), the calculation of default flow-based parameters may be based on long-term allocated capacities as provided by TSOs pursuant to Article 4(4)(a). In this case the capacities on the bilateral CE bidding zone borders and on AHC borders shall be defined based on the LTA capacity on that specific oriented bidding zone border:

   (a) increased by the minimum of the two adjustments provided by the TSO(s) on each side of the CE bidding zone border, pursuant to Article 4(4)(b) and

   (b) adapted by the adjustment provided by the CE TSO on its adjacent AHC border, pursuant to Article 4(4)(b).

   These capacities are then adjusted for long-term nominations, to obtain the final parameters.

9. The default NTC values for iTCP bidding-zone borders with CE CCR shall be agreed among CE TSOs and iTCP. The agreed default NTC values on each oriented iTCP bidding zone border with CE CCR, may be increased by the minimum of the two adjustments provided by the TSO(s) sharing an iTCP bidding-zone border."

26. Article 23. "Calculation of capacities for iTCP" shall be amended by updating paragraph 4, letter b, number viii accordingly:

"the resulting NTCs for iTCP bidding-zone borders with CE CCR stem from the NTC values determined in iteration *k*, after rounding down to integer;"

27. Article 24. "Calculation of ATCs for SDAC fallback procedure for CE bidding borders" shall be amended by updating paragraph 3 accordingly:

"The following inputs are required to calculate ATCs for SDAC fallback procedure, respecting the allocation constraints, for each DA CC MTU:

(a) the LTA values may be used as long as the CE TSOs apply the rules as referred to in Article 18(1)(a);

(b) the flow-based parameters $\mathbf{PTDF}_f$ and $\overrightarrow{RAM_f}$ in accordance with Article 16 and Article 21 respectively;

(c) if defined, the allocation constraints pursuant to Article 7(2)(a), (c), (d); and

(d) if defined, the global allocation constraints shall be assumed to constrain the CE net positions pursuant to Article 7(6), and shall be described following the methodology described in Article 18(2). Such constraints shall be adjusted for offered cross-zonal capacities on the remaining non-CE bidding zone borders, and their values should be equal to the smallest allocation constraint value among the MTUs corresponding to the considered DA CC MTU."

28. Article 24. "Calculation of ATCs for SDAC fallback procedure for CE bidding borders" shall be amended by updating paragraph 5 accordingly:

"The calculation of the ATCs for SDAC fallback procedure is an iterative procedure, which gradually calculates ATCs for each DA CC MTU, while respecting the constraints of the final flow-based parameters pursuant to paragraph 3:

(a) The initial ATCs are set to zero, i.e.:

$$\overrightarrow{ATC}_{k=0} = \vec{0}$$

Equation 29

with

$\overrightarrow{ATC}_{k=0}$	the initial ATCs before the first iteration

(b) The iterative method applied to calculate the ATCs for SDAC fallback procedure consists of the following actions for each iteration step *k*:

i. for each CNEC and allocation constraint referred to in Article 7(2)(a) and 7(2)(b) of the flow-based parameters pursuant to paragraph 3, calculate the remaining available margin based on ATCs at iteration *k*-1:

$$\overrightarrow{RAM}_{ATC}(k) = \overrightarrow{RAM}_f - \mathbf{pPTDF}_{zone-to-zone}\,\overrightarrow{ATC}_{k-1}$$

Equation 30

with

$\overrightarrow{RAM}_{ATC}(k)$	remaining available margin for ATC calculation at iteration *k*
$\overrightarrow{RAM}_{f}$	final remaining available margin
$\overrightarrow{ATC}_{k-1}$	ATCs at iteration *k*-1
$\mathbf{pPTDF}_{zone-to-zone}$	positive zone-to-zone power transfer distribution factor matrix

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

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

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

v. go back to step i;

vi. iterate until the difference between the sum of ATCs of iterations *k* and *k*-1 is smaller than 1kW;

vii. the resulting ATCs for SDAC fallback procedure stem from the ATC values determined in iteration *k*, after rounding down to integer values. For the borders where allocation constraints are referred to in Article 7(2)(c) and 7(2)(d), the ATC values are limited as defined by Annex 1 in the methodology.

viii. at the end of the calculation, there are some CNECs and allocation constraints with no remaining available margin left. These are the limiting constraints for the calculation of ATCs for SDAC fallback procedure.

(c) If defined, ramping constraints pursuant to Article 7(2)(d) shall limit the maximum variation of the calculated ATCs between consecutive MTUs on the respective CE bidding zone borders.

(d) positive zone-to-zone PTDF matrix ($\mathbf{pPTDF}_{\boldsymbol{zone-to-zone}}$) for each CE and AHC oriented bidding zone border shall be calculated from the $\mathbf{PTDF}_{\boldsymbol{f}}$ as follows (for HVDC interconnectors integrated pursuant to Article 12, Equation 7 shall be used):

$$pPTDF_{zone-to-zone,A\rightarrow B} = \max\left(0, PTDF_{zone-to-slack,A} - PTDF_{zone-to-slack,B}\right)$$

Equation 31

with

$pPTDF_{zone-to-zone,A\rightarrow B}$	positive zone-to-zone $PTDFs$ for CE and AHC oriented bidding zone border A to B
$PTDF_{zone-to-slack,m}$	zone-to-slack $PTDF$ for CE bidding zone or virtual hub m

(e) For bidding-zone borders consisting of both HVDC and AC interconnectors, the capacity share of the respective bidding-zone border shall be split between AC and HVDC within the ATC Extraction algorithm."

29. Article 24. "Calculation of ATCs for SDAC fallback procedure for CE bidding borders" shall be amended by updating paragraph 6 accordingly:

"As long as the CE TSOs apply the rules as referred to in Article 18(1)(a), the ATCs for SDAC fallback procedure are set equal to the LTAs for each CE and AHC oriented bidding zone border, reduced by LTN, i.e.:

$$\overrightarrow{ATC} = \overrightarrow{LTA} - \overrightarrow{LTN}$$

Equation 32

with

$\overrightarrow{ATC}$	the ATC for SDAC fallback procedure
$\overrightarrow{LTA}$	the LTA on CE and AHC oriented bidding zone borders
$\overrightarrow{LTN}$	the nomination of the long-term allocated capacity on CE and AHC oriented bidding zone borders

"

30. Article 24. “Calculation of ATCs for SDAC fallback procedure for CE bidding borders” shall be amended by adding paragraph 7 accordingly:

“If the calculation pursuant to paragraph 5 cannot be performed during the regular day-ahead capacity calculation process, CE TSOs may use ATCs for SDAC fallback procedure from a previous run of the process, but based on default flow-based parameters according to Article 22. Allocation constraints shall be treated as follows in this case:

(a) the global allocation constraints from the current process, processed pursuant to paragraph 3(d), shall be used to proportionally cap the ATCs of the relevant bidding zones prior to subtracting the LTN;

(b) the allocation constraints pursuant to paragraph 3(c) from the current process shall be used to proportionally cap the ATCs of the relevant bidding zones prior to subtracting the LTN.”

31. Article 30. “Timescale for implementation” shall be amended by adding paragraph 6 accordingly:

“CE TSOs shall cease to apply the rules for taking into account LTAs pursuant to Article 18(1)(a) no later than as of the first delivery period of the long-term capacities calculated according to the Core or Italy North Long Term Capacity Calculation Methodologies – whichever comes latest – pursuant to the FCA Regulation. CE TSOs shall announce the date of discontinuation at least one (1) month prior to its entry into force.”

Article 3
Harmonised GLSK methodology

1. Article 9. “Generation shift key methodology” shall be replaced and read accordingly:

“

1. Each CE TSO and iTCP shall define, for its bidding zone within the CE CCR and for each DA CC TU, a GSK which translates a change in a bidding zone net position into a specific change of injection or withdrawal in the CGM. A GSK shall have fixed values which means that for one DA CC TU, the relative contribution of generation or load to the change in the bidding zone net position shall remain the same, regardless of the volume of the change.

2. The quality of the GSK shall be quantified by evaluating the nodal forecasting error (NFE). The NFE is defined as the sum of absolute deviations between nodal power injections or withdrawals in the DACF IGM at the Day-Ahead market clearing point (MCP) and those in the D2CF IGM shifted to the Day-Ahead MCP using the GSK.

3. For a given DA CC TU, the GSK shall only include actual generation and/or load[3] present in the CGM for that DA CC TU. The CE TSOs and iTCP shall

[3] And other elements connected to the network, such as storage equipment.

consider the available information on generation or load in the CGM in order to select the nodes that will be assigned GSK values. Nodes in the CGM may be excluded from the calculation of GSK values if they do not contribute to the minimisation of the NFE.

4. The CE TSOs and iTCP belonging to the same bidding zone shall jointly define a common GSK for that bidding zone and shall agree on a methodology for such coordination. For Germany and Luxembourg, each TSO shall calculate its individual GSK and the CCC shall combine them into a single GSK for the whole German-Luxembourgian bidding zone, by assigning relative weights to each TSO's GSK. The German and Luxembourgian TSOs shall agree on these weights, based on the share of the generation and load in each TSO's control area that is responsive to changes in net position, and provide them to the CCC.

5. The CCC shall define GSKs for the EVHs according to Article 13(3)(b) as follows:

   (a) In case an EVH represents only HVDC interconnectors, the GSK shall be defined by all converter stations of the HVDC interconnectors, weighted based on the respective trans-mission capacity.

   (b) In case an EVH represents only AC interconnectors, the CCC shall use the GSK of the adjacent bidding zone provided by the TSOs of that bidding zone. If this GSK is not available, the CCC shall define a GSK based on all positive injections in the IGM of the adjacent bidding zone.

   (c) In case an EVH represents both HVDC interconnectors and AC interconnectors, the respective CE TSO or iTCP shall define a single combined GSK based on the GSK for the HVDC and the GSK for the AC interconnectors.

6. Within 24 months after the implementation of this methodology in accordance with Article 30, all CE TSOs and iTCP shall develop a proposal for further harmonisation of the generation shift key methodology and submit it by the same deadline to all CE and iTCP regulatory authorities as a proposal for amendment of this methodology in accordance with Article 9(13) of the CACM Regulation. CE TSOs and iTCP shall reuse as much as possible of any similar activity already carried out in the Core region and thus potentially shorten the time needed for submitting the proposal for amendment. The proposal shall at least include a harmonised generation shift key methodology combined with, where necessary, rules and criteria for TSOs to deviate from the harmonised generation shift key methodology.

7. If the development of a proposal for further harmonisation of the GSK pursuant to paragraph 6 does not result in findings that materially differ from those of a comparable activity carried out for the Core CCR, CE TSOs and iTCP shall implement a harmonised GSK methodology, whereby the GSK values of each node in a TSO's IGM shall be defined in proportion to the absolute values of power injections and withdrawals in the IGM.

8. CE TSO and iTCP may deviate from the harmonised GSK methodology pursuant to paragraph 4 if the deviating strategy outperforms the harmonised GSK in terms of the NFE.

    (a) As part of the reporting obligation pursuant to Article 29(4), the CCC shall monitor on an annual basis, for each CE TSO and iTCP applying a GSK methodology deviating from the harmonised GSK methodology pursuant to paragraph 7, the difference between the NFE of the harmonised GSK and their applied GSK methodology.

    (b) A positive NFE difference indicates that a CE TSO and iTCP's GSK outperforms the harmonised GSK.

    (c) In case the reported NFE difference is negative, the concerned TSOs shall apply the harmonised GSK methodology as soon as possible.

    (d) When switching to a deviating GSK methodology, the concerned TSOs shall provide an analysis covering a period of at least 6 months that shows that the deviating GSK methodology outperforms the harmonised GSK methodology.

9. Notwithstanding the provisions in paragraphs 7, 8(c) and 8(d), CE TSOs and iTCP shall be exempted from the requirements set out in the aforementioned paragraphs until the proposal pursuant to paragraph 6 has been approved by the CE and iTCP regulatory authorities."

2. Article 29. "Monitoring, reporting and information to the CE regulatory authorities" shall be amended by adding letter (f) in paragraph 4 accordingly:
   "according to Article 9(5)(a), CE TSOs and iTCP shall report to the CCC on GSK quality."

3. Article 29. Monitoring, reporting and information to the CE regulatory authorities shall be amended by adding letter (g) in paragraph 4 accordingly:
   "according to Article 22(5)(d), CE TSO shall report on the reductions of default flow-based parameters with due justifications."

Article 4
Methodology for allocation constraints

1. Article 7. "Methodology for allocation constraints" shall be amended by replacing term "four" by "five" in paragraph 2.

2. Article 7. "Methodology for allocation constraints" shall be amended by updating letter (d) in paragraph 2 accordingly:
   "a ramping constraint (flow ramping limit) limiting the maximum variation of the CE net position of a bidding zone in SDAC (or import/export from/to a set of interconnectors) from one MTU to the next."

3. Article 7. "Methodology for allocation constraints" shall be amended by adding letter (e) in paragraph 2 accordingly:

"ramping constraints (flow ramping limits) that limit the maximum flow change on HVDC interconnectors between synchronous areas from one MTU to the next."

4. Article 7. "Methodology for allocation constraints" shall be amended by updating paragraph 4 first sentence accordingly:

   "Allocation constraints pursuant to Articles 7(2)(a) to (c) may be used by PSE, Terna, and EirGrid/SONI, and allocation constraints pursuant to Article 7(2)(d) only by Terna, as listed in Annex 1 during a transitional period of two years following the implementation of this methodology in accordance with Article 30(2) in accordance with the reasons and the methodology for the calculation of allocation constraints as specified in Annex 1 to this methodology."

5. Article 7. "Methodology for allocation constraints" shall be amended by adding letter (d) in paragraph 4 accordingly:

   "Allocation constraints pursuant to Article 7(2)(e) may be used by EirGrid/SONI without a transitional period and reporting required in Article 7(4)."

6. Article 7. "Methodology for allocation constraints" shall be amended by updating paragraph 6 accordingly:

   "For the SDAC fallback procedure, pursuant to Article 24,

   (a) allocation constraints referred to in Article 7(2)(b) shall be modelled as the same type of constraints referred to in Article 7(2)(a).

   (b) allocation constraints referred to Article 7.2(c) and 7.2(d) shall be included in the ATC extraction"

Article 5
Methodology for ramping constraints

1. Annex 1: "Justification of usage and methodology for calculation of allocation constraints" shall be amended by updating Section 2 accordingly:
   "

2- Italy

TERNA may use allocation constraints to limit the import from the Northern Italian interconnectors.

Technical and legal justification

Allocation constraints are defined by the Italian TSO and shared with the other TSOs and CCC as a maximum value of acceptable import from the whole Northern Italian Interconnection. Capacity allocation constraints are a legally prescribed means, defined by CACM Regulation (Art. 23(3) and art. 21(1)(a)(ii) CACM).

Allocation constraints are used by Terna to take into account operational security constraints related to margins, voltage control and dynamic system stability within the Italian grid, in particular during low demand/high renewable infeed periods.

These three kinds of constraints are needed to maintain the transmission system within secure operations, but cannot be translated efficiently in form of maximum flows on critical network elements. Hence the constraints above shall be expressed via allocation constraints in the market coupling algorithms.

If this constraint was implemented as a reduction in the cross-zonal capacities, it would mean that TERNA would have to guess the most probable direction of the market (imports and/or exports on particular interconnectors) and consequently estimate the reductions on the different interconnectors. In the flow based approach, this would mean estimating the RAM reduction on each CNEC, with the consequent risk of not distributing the constraint, in an optimal way, on the individual interconnections, overestimating the constraint on one interconnection and underestimating it on the other, or vice versa.

On the other hand, the use of allocation constraints ensures that the market decides how to allocate capacity in the most efficient way among the different Northern Italian Interconnections, considering that the allocation constraint is provided to the market as a constraint limiting the import at the Northern Italian Border.

The scope of Allocation Constraint is to make the Italian TSO able to activate the needed set of power plants, applying redispatching actions at national level.

The minimum set of dispatchable power plants to be activated in order to provide system services according to the criteria of System Operation Guidelines (e.g. voltage regulation, primary reserve…), is quantified performing steady-state security analysis and dynamic assessments on several scenarios considered representative of the expected system conditions.

Ramping constraints (known also as 'flow ramping limits') are used for limiting the maximum variation of import/export from/to a set of interconnectors from one MTU to the next. Due to the peculiar structure of the Italian network as a long peninsula AC-meshed with the European bulk system only on the northern borders, large variations of exchange programs between one MTU and the next may endanger the grid security during real time operations leading to challenging management of the voltage and frequency profiles. In fact, the transient variations induced by the exchange control program may require such a relevant reserve margin that could lead to technical unfeasibility both in terms of active and reactive power.

Furthermore, the growing trend of production from renewable sources makes the issue even more critical due to the uncertainty of the actual production from renewable sources.

Methodology to calculate the value of allocation constraints

The allocation constraint, defined as the maximum value of acceptable import from the Northern Italian interconnectors, is computed according to the following formula:

$$Import_{max}^{h} = [L^{h} - DR^{h}] - [ND^{h} + VRI^{h}] + P^{h}$$

Where:

L: hourly load forecast

DR: downward reserve defined according to the uncertainties related to load and RES forecasts

ND: infeed expected from non-dispatchable power plants
VRI: is the infeed from the minimum set of dispatchable power plants
P: available pumping capacity

When determining the allocation constraints, TERNA considers the most recent information on the technical characteristics of generation units, forecasted power system load as well as downward reserve defined according to the uncertainties related to load and RES forecasts. The available pumping capacity helps mitigate the effect of allocation constraint.

Allocation constraints are determined in the evening of D-2 for all the MTUs concerning both the DA and Intra-Day processes.

In order to take into account the allocation constraints, pursuant to Article (7)(2)(c) in case of SDAC fallback procedure, at the end of the calculation, the ATC for AT->IT, SI->IT and FR->IT borders shall be minor or equal to the Allocation constraints split among AT->IT, SI->IT and FR->IT borders, respectively:

$$Final\ ATC_{AT\to IT} = \min\ (AC_{AT\to IT}\ ;\ ATC_{k,_{AT\to IT}})$$

$$Final\ ATC_{SI\to IT} = \min\ (AC_{SI\to IT}\ ;\ ATC_{k,_{SI\to IT}})$$

$$Final\ ATC_{FR\to IT} = \min\ (AC_{FR\to IT}\ ;\ ATC_{k,_{FR\to IT}})$$

The AC values (for AT->IT, SI->IT, FR->IT borders) are calculated splitting the allocation constraint per border, based on the splitting factors calculated by using the $\overrightarrow{ATC_k}$values (Article (24)(5)(vii)).

$$AC_{x\to IT} = AC * SF_{x\to IT};\qquad \textit{where x in (FR,AT,SI)}$$

$$SF_{x\to IT} = ATC_{k,_{x}\to IT} / \sum_{x=1}^{3} ATC_{k,_{x}\to IT}$$

Methodology to calculate the value of ramping constraints

The ramping constraint is defined as the maximum value of variation of exchange (import/export) from/to a set of interconnectors from one MTU to the next from the Northern Italian interconnectors:

$$|Exchange_{max}^{MTU} - Exchange_{max}^{MTU-1}| \leq Ramping$$

Ramping constraints are determined for all the MTUs concerning both the DA and Intra-Day markets.

In establishing ramping constraints, TERNA adopts a statistical approach based on historical generation data declared by power plants enabled to provide ancillary services, taking into account technical feasibility with respect to both active and reactive power, as well as renewable energy source (RES) forecasts.
Terna sets ramping limits using the maximum MW/min gradient. The ramping value is then calculated using a specific formula:

$$Ramping = Gradient * time\ ramp$$

With:

$Gradient$: $maximum\ gradient\ \left[\frac{MW}{min}\right]$

$time\ ramp$: $[min]$

An update regarding the parameters values may be provided no later than the timelines referred to in Article 7.4(b).

In order to take into account the ramping constraints, pursuant to Article (7)(2)(d) in case of SDAC fallback procedure, at the end of the calculation, ATCs shall be summed up and limited considering the maximum variation of the calculated ATCs between consecutive MTUs as described below.

For import direction, the Final ATC for AT->IT, SI->IT and FR->IT borders computed after the application of allocation constraint shall be used.

The ramping constraint is applied on the total ATC defined as:

$$\mathrm{ATC}_{\mathrm{(FR,AT,SI)\rightarrow IT,AC}} = \sum_{x=1}^{3} Final\ ATC_{x\rightarrow IT}$$

where x in (FR,AT,SI)

The result after applying the ramping constraint is $\mathrm{ATC}_{\mathrm{(FR,AT,SI)\rightarrow IT,AC,AfterRamping}}$ and it is split for each border.

$$\mathrm{ATC}_{\mathrm{Final},x\rightarrow IT,\mathrm{AC}} = \mathrm{ATC}_{\mathrm{(FR,AT,SI)\rightarrow IT,AC,AfterRamping}} * Coef_{x\rightarrow IT}$$

where:

$$Coef_{x\rightarrow IT} = \frac{Final\ ATC_{x\rightarrow IT}}{\mathrm{ATC}_{\mathrm{(FR,AT,SI)\rightarrow IT,AC}}}$$

For the export direction, the ATC for IT->AT, IT->SI and IT->FR borders computed by the SDAC fallback procedure in Article (24) shall be used.

The ramping constraint is applied on the total ATC defined as:

$$\mathrm{ATC}_{\mathrm{IT\rightarrow(FR,AT,SI)}} = \sum_{x=1}^{3} ATC_{IT\rightarrow x}$$

where x in (FR,AT,SI)

The result after applying the ramping constraint is $\mathrm{ATC}_{\mathrm{IT\rightarrow(FR,AT,SI),AfterRamping}}$ and it is split for each border.

$$\mathrm{ATC}_{\mathrm{Final},IT\rightarrow x} = \mathrm{ATC}_{IT\rightarrow(\mathrm{FR,AT,SI}),\mathrm{AfterRamping}} * Coef_{IT\rightarrow x}$$

where:

$$Coef_{IT\rightarrow x} = \frac{ATC_{IT\rightarrow x}}{\mathrm{ATC}_{\mathrm{IT}\rightarrow(\mathrm{FR,AT,SI})}}$$

"

2. Annex 1: "Justification of usage and methodology for calculation of allocation constraints" shall be amended by adding Section 3 accordingly:
"

3- SEM

Technical and legal justification

EirGrid and SONI intend to implement both allocation constraints on the net position of the SEM bidding zone and ramping constraints on the Celtic interconnector (HVDC) in compliance with Article 7 of CE Day-Ahead Capacity Calculation Methodology (CCM).

i) **Reasons EirGrid and SONI propose using net position constraints**

The primary objective of allocation constraints is to maintain operational security standards while enabling efficient market functioning. The necessity of these constraints for the SEM bidding zone is driven by several factors. As the island of Ireland operates a relatively small power system and electricity market which constitutes a separate synchronous area, dispatching decisions by EirGrid and SONI (SEM TSOs) need to carefully consider system security and real-time balance of supply and demand.

The SEM TSOs are responsible for generation commitment and determining optimal dispatch schedules. In centralized dispatch, balancing reserve procurement and congestion management are performed concurrently, in an integrated process. This differs from self-dispatch systems, where the balance-responsible parties make commitment decisions and determine dispatch positions, based on their own economic criteria, the technical constraints of generating units and the demand elements they are responsible for balancing.

The electricity system of the island of Ireland features a high penetration of renewable energy sources, particularly wind, with the instantaneous System Non-Synchronous Penetration (SNSP) levels reaching up to the safe operational limit of 75%. In the island of Ireland, renewables accounted for 40.0% of the country's electricity generation over the year 2024, with wind energy providing 33% of total electricity demand. Moreover, 41% of the months in the year 2024 had a SNSP of 50% or higher. The large share of wind and solar introduces volatility and unpredictability into the grid, requiring system operators to balance with dispatchable generation and Battery Energy Storage Systems (BESS).

During periods of extremely low wind generation, there can be limited operational flexibility, and managing domestic system reserves becomes crucial to prevent the system from entering an alert, emergency, or blackout state. During these periods of tight system margins, limiting the total export capacity of the SEM bidding zone becomes a key remedial action. This prevents potential market-driven export flows from causing a deficit in reserve margins, thereby ensuring system generation resource adequacy and avoiding potential violations of operational security limits.

In certain situations, conventional generating units identified through system studies are required to operate to support system voltage and provide reactive power in specific parts of the grid, as well as to maintain system inertia above recommended thresholds for frequency stability. These units are treated as priority dispatch (must-run), and system operators may aim to keep them online at or above their minimum generating capability (P_{min}). Additionally, during periods of heavy rainfall, run-of-river hydro units are also prioritized to manage water levels and mitigate the risk of upstream flooding. These operational requirements may reduce the system's flexibility to lower domestic generation. To preserve adequate downward regulation capability and avoid over-supply, it may become necessary to limit the total import capacity into the SEM bidding zone. This remedial action ensures must-run units can operate as required while maintaining system balance and protecting operational security limits.

The island of Ireland operates within a synchronous area that comprises the control areas of both Ireland and Northern Ireland. This synchronous area is connected to other synchronous zones exclusively via HVDC subsea cables. While these HVDC links provide essential cross-zonal trading capacity, they offer limited synchronous support and cannot deliver services such as inertia or electromagnetic coupling. The extent of support services available from HVDC links depends on both the technical capabilities and the commercial agreements between interconnector owners and TSOs. Moreover, the relatively small size of the synchronous area restricts the ability to share reserves and balancing capacity across bidding zone borders, placing it at a disadvantage compared to larger systems like Continental Europe. These limitations may necessitate additional measures to ensure sufficient domestic operating reserves are maintained under all operating conditions.

High HVDC import levels can reduce the dispatch of local synchronous generation, which in turn lowers system inertia and increases susceptibility to frequency deviations during disturbances such as interconnector trips or local faults. The sudden loss of an HVDC interconnector also poses transient stability risks, potentially leading to significant power imbalances and rotor angle instability. Moreover, large HVDC power flows can affect local oscillatory modes, raising small-signal stability concerns in a low-inertia environment where damping is limited. When combined with the variability of intermittent renewable sources, these dynamic stability challenges may require operational management, including measures in the form of allocation constraints to the net position to safeguard system security.

Methodology of calculating allocation constraints on net position

The methodology outlined here shows how the export and import constraints of the net position of the SEM bidding zone are calculated by evaluating the available generation, demand, and reserve requirements. It considers total dispatchable generation, forecasted wind & solar power, and operational limitations such as energy-limited resources like pumped storage, demand side units (DSU), dynamic stability, and battery energy storage. The process also accounts for reductions due to long-notice plants (long lead-time), generation unavailable because of grid constraints, and unusable hydro capacity.

The difference between net generation and the sum of demand and operating reserves for upward regulation defines the net position constraint in the export direction. On the other hand, the system demand subtracted from the sum of technical minima of dispatchable generation (required to run to maintain system inertia), non-dispatchable generation, and operating reserves for downward regulation defines the net position constraint in the import direction. Adopting the equations from Annex 1 for continuity and clarity, the Export and Import constraints are defined as follows:

$$\textbf{Export}_{\ Constraint} = P_{CD} - P_{UG} - P_{DER} + P_{NCD} - (P_L + P_{UPres})$$
$$\textbf{Import}_{\ Constraint} = P_L - P_{DOWNres} - P_{CDmin} - P_{NCD}$$

Where:

P_{CD} : Sum of operating generating capacities of centrally dispatched units as declared on fuel availability by generators

P_{CDmin} : Sum of technical minima of centrally dispatched generating units in operation

P_{UG} : Unavailable generation due to Transmission Constraints, Long-Notice Units, Unusable Hydro

P_{DER} : Derated generation (Demand Response Units, Pumped Storage, Battery Energy Storage Systems)

P_{NCD} : Sum of schedules of generating units that are not centrally dispatched, as provided by generators

P_L : Forecasted Load

P_{UPres} : Minimum reserve for upward regulation

$P_{DOWNres}$: Minimum reserve for downward regulation

Frequency of re-calculation

Allocation constraints on net position are determined through a continuous process for each capacity allocation time frame, based on the most recent information on the technical offer data of dispatchable generating units, forecasted wind and solar generation, forecasted system demand, and operational limitations such as dynamic stability and system constraints.

Time periods for which allocation constraints on net position are applied

In the case of the day-ahead process, allocation constraints on net position are calculated on the morning of D-1, resulting in bi-directional values (import and export) for each MTU of the respective trading day. However, actual capacity restrictions are applied only to those MTUs where the calculation results indicate a potential violation of system security limits.

ii) Reasons EirGrid and SONI propose using ramping constraints on Celtic interconnector

With the commissioning of the Celtic interconnector (700 MW), it will become the largest single infeed and outfeed for the all-island system, increasing the total cross-zonal trading capacity of SEM bidding zone to 2200 MW, which accounts for nearly 30% of peak system demand. To maintain system stability, particularly during imbalances caused by flow changes on HVDC interconnections between market time units (MTUs), ramping restrictions are necessary. These restrictions further mitigate the risk of abrupt shifts between (maximum) import and export limits across two MTUs. Thereby, ramping constraints, as a specific type of allocation constraints, ensure that the maximum flow change on the HVDC interconnector between MTUs remains within secure operational limits.

Methodology of determining ramping constraints

The ramping constraint is required due to the nature of the generation stack in the SEM bidding zone rather than any technical constraints on the Celtic interconnector itself, although the constraint will appear on the interconnector since it is the only one available for cross-border flows in CE CCR. To calculate the ramping constraint, EirGrid and SONI will carry out market and system modelling analysis for all hours of the year 2028 to coincide with forecasted Celtic Interconnector go-live. This analysis will assess the ramping characteristics of the system against a range of possible ramping rates on the Celtic interconnector. These system ramps are constrained by the typical ramp characteristics of renewable generators such as wind and solar PV, and the technically feasible ramping characteristics of the conventional dispatchable generating units in the SEM. The range of acceptable ramp rates is defined by calculating the number of system frequency events that breach system security high and low frequency standards. Based on these study results and overall EirGrid and SONI system frequency control standards, the acceptable Celtic interconnector ramp rates will be defined in due course before Celtic interconnector go-live."

Article 6
Inclusion of Celtic interconnector and SEM-FR Bidding Zone Border

1. Article 2. "Definitions and interpretation" shall be amended by updating paragraph 24 accordingly:
   "'external virtual hub (EVH)' means a virtual bidding zone without any buy and sell orders, used to represent the imports and exports on an AHC border as specified in Article 13 of this Methodology or exchanges on HVDC interconnectors on the bidding zone borders of the CE CCR when either end of a HVDC interconnector is in a different synchronous area as specified in Article 12(5);"

2. Article 2. "Definitions and interpretation" shall be amended by updating paragraph 26 accordingly:
   "'$F_{0,all}$' means the flow per CNEC in a situation without any commercial exchange between bidding zones within Continental Europe and between bidding zones within Continental Europe and bidding zones located in other synchronous areas, and between the island of Ireland and bidding zones located in other synchronous areas;"

3. Article 2. "Definitions and interpretation" shall be amended by updating paragraph 69 accordingly:
   "'slack node' means the reference node used for determination of the PTDF matrix, i.e. shifting the power infeed of generators up results in absorption of the power shift in the slack node. Each synchronous area has one designated slack node, which remains constant for each DA CC TU;"

4. Article 2. Definitions and interpretation shall be amended by adding new paragraph 92 accordingly:
"'SEM' means the Single Electricity Market, the bidding zone consisting of both Ireland and Northern Ireland as a single all-island electricity market."

5. Article 4. "Day-ahead capacity calculation process" shall be amended by updating paragraph 3 first sentence accordingly:

"Each CE TSO and iTCP shall provide the CCC the following capacity calculation inputs by the times established in the process description document, with the reservation that CE TSOs in the SEM bidding zone may delegate their obligation of providing the following inputs to each other subject to prior agreement in accordance with applicable procedures:"

6. Article 12. "Integration of HVDC interconnectors on bidding zone borders within the CE CCR" shall be amended by updating paragraph 1 accordingly:

"The CE TSOs shall apply the evolved flow-based (EFB) methodology, in accordance with paragraph 2 and 4 below, when including HVDC interconnectors on the bidding zone borders of the CE CCR[4], provided that both ends of the HVDC interconnector are within the same synchronous area. In the EFB , a cross-zonal exchange over an HVDC interconnector on the bidding zone borders of the CE CCR is modelled and optimised explicitly as a bilateral exchange in capacity allocation, and is constrained by the physical impact that this exchange has on all CNECs considered in the final flow-based domain used in capacity allocation and constraints modelling the maximum possible exchange of the HVDC interconnector."

7. Article 12. "Integration of HVDC interconnectors on bidding zone borders within the CE CCR" shall be amended by updating paragraph 2 accordingly:

"In order to calculate the impact of the cross-zonal exchange over a HVDC interconnector pursuant to paragraph 1 on the CNECs, the converter stations of the cross-zonal HVDC shall be modelled as two internal virtual hubs, which function equivalently as bidding zones. Then the impact of an exchange between A and B, each being either a bidding zone or an external virtual hub, over such HVDC interconnector shall be expressed as an exchange from the bidding zone or external virtual hub A to the internal virtual hub representing the sending end of the HVDC interconnector plus an exchange from the internal virtual hub representing the receiving end of the interconnector to the bidding zone or external virtual hub B:

$$PTDF_{A \to B,l} = (PTDF_{A,l} - PTDF_{IVH\_1,l}) + (PTDF_{IVH\_2,l} - PTDF_{B,l})$$

Equation 8

with

[4] EFB is different from AHC. AHC imposes the capacity constraints of one CCR on the cross-zonal exchanges of another CCR by considering the impact of exchanges between two capacity calculation regions. E.g. the influence of exchanges of a bidding zone which is part of a CCR applying a coordinated net transmission capacity approach is taken into account in a bidding zone which is part of a CCR applying a flow-based approach. EFB takes into account commercial exchanges over the cross-border HVDC interconnector within a single CCR applying the flow-based method of that CCR.

$PTDF_{A,l}$	zone-to-slack PTDF of a bidding zone or external virtual hub A on a CNEC l
$PTDF_{B,l}$	zone-to-slack PTDF of a bidding zone or external virtual hub B on a CNEC l
$PTDF_{IVH\_1,l}$	zone-to-slack $PTDF$ of internal virtual hub 1 on a CNEC l, with internal virtual hub 1 representing the converter station at the sending end of the internal CE HVDC interconnector
$PTDF_{IVH\_2,l}$	zone-to-slack $PTDF$ of internal virtual hub 2 on a CNEC l, with internal virtual hub 2 representing the converter station at the receiving end of the internal CE HVDC interconnector

"

8. Article 12. "Integration of HVDC interconnectors on bidding zone borders within the CE CCR" shall be amended by adding paragraph 5 accordingly:

   "The CE TSOs shall consider the HVDC interconnectors on the bidding zone borders of the CE CCR when either end of the HVDC interconnector is in different synchronous areas by using at least one external virtual hub (EVH) according to paragraphs (a) and (b) below.

   (a) The CNECs of the Day-ahead capacity calculation in one synchronous area shall not only limit the net positions of bidding zones due to exchanges within this synchronous area but also the exchanges on CE bidding zone borders between the two synchronous areas.

   (b) CE TSOs may impose a limit to the net position of the external virtual hub, that considers the physical limitations of the CE HVDC cables on the border and the converter stations on either endpoint of the CE HVDC cables."

9. Article 17. "Adjustment for minimum RAM" shall be amended by updating paragraph 3 accordingly:

   "Then, the CCC shall calculate $F_{0,all}$, which is the flow on each CNEC in a situation without any commercial exchange between bidding zones within Continental Europe, between bidding zones within Continental Europe and bidding zones located in other synchronous areas, and between the island of Ireland and bidding zones located in other synchronous areas. For this calculation, the CCC shall set to zero all exchanges on DC interconnectors linking Continental Europe and the island of Ireland to each other or to other synchronous areas. The CCC shall then calculate the zonal PTDFs for all bidding zones within the synchronous areas Continental Europe and the island of Ireland for each CNEC. For this calculation, the CCC shall use the GSKs provided by the concerned TSOs to the Common Grid Model platform, and when these are not available, the CCC shall use a GSK where all nodes with positive injections participate to shifting in proportion to their injection. Subsequently the CCC shall calculate $F_{0,\text{all}}$ with the following Equation 11.

$$\vec{F}_{0,all} = \vec{F}_{ref} - \mathbf{PTDF}_{\boldsymbol{all}}\, \overrightarrow{NP}_{ref,all}$$

Equation 11

with

$\vec{F}_{0,all}$	flow per CNEC in a situation without any commercial exchange between bidding zones within Continental Europe, between bidding zones within Continental Europe and bidding zones located in other synchronous areas, and between the island of Ireland and bidding zones located in other synchronous areas
$\mathbf{PTDF}_{\boldsymbol{all}}$	power transfer distribution factor matrix for all bidding zones in Continental Europe and the island of Ireland, and all CE CNECs
$\overrightarrow{NP}_{ref,all}$	total net positions per bidding zone in Continental Europe and the island of Ireland included in the CGM

“

10. Article 27. “Publication of data” shall be amended by updating letter (d)(vii) in paragraph 2 accordingly:
“detailed breakdown of RAM for each CNEC of the final flow-based parameters before pre-solving: I_{max}, U, F_{max}, FRM, $F_{ref,init}$, F_{nrao}, F_{ref}, $F_{0,\text{CE}}$, $F_{0,\text{all}}$, F_{uaf}, AMR, CVA, IVA, F_{LTN};”

11. Article 27. “Publication of data” shall be amended by updating the last bullet point of letter (d)(xiii) in paragraph 2 accordingly:
“reference net positions of all bidding zones in synchronous areas Continental Europe and island of Ireland and reference exchanges for all HVDC interconnectors within synchronous area Continental Europe, between synchronous area Continental Europe and other synchronous areas and between the island of Ireland and other synchronous areas; and”

12. Article 27. “Publication of data” shall be amended by adding letter (j) in paragraph 2 accordingly:
“the intermediate default flow-based parameters.”

13. Article 30. “Timescale for implementation” shall be amended by adding paragraph 5 accordingly:

“The operationalisation of the SEM – France bidding zone border within the CE CCR is dependent on the commercial readiness of the HVDC cable connecting the two bidding zones and the technical conditions allow operations to begin. The integration of the HVDC cable connecting the two bidding zones shall be conducted in compliance with the provisions of Article 12.”

Article 7
Inner-German HVDC lines

1. Article 2. “Definitions and interpretation” shall be amended by adding paragraph 93 accordingly:
   “`bidding zone internal HVDC` means a high voltage direct current network element connected in one bidding zone within the CE CCR;

2. Article 10. “Methodology for remedial actions in day-ahead capacity calculation” shall be amended by updating letter (c) in paragraph 7 accordingly:

   “Changing the set point of an HVDC line within CE CCR.”

Article 8
Operational security limits

1. Whereas (19) shall be replaced and read accordingly:
   “Some operational security limits can be transformed into limitations on active power flows on critical network elements, whereas some other cannot and may be modelled as allocation constraints. Some of the operational security limits (*inter alia* margins, frequency control, voltage dynamic stability, and inter-synchronous area ramping restrictions) may depend on the level of production and consumption in a given bidding zone, and as such cannot be controlled by limitations on active power flows on critical network elements. Thus, specific limitations on production and consumption are needed, and these are expressed as maximum import and export constraints of bidding zones or from/to a set of interconnectors.”

2. Article 6. “Methodology for operational security limits” shall be amended by updating paragraph 2 first sentence accordingly:

   “To take into account the operational security limits of CNEs, the CE TSOs and iTCP shall use as far as possible the maximum admissible current limit (I_{max}), which is the physical limit of a CNE according to the operational security limits in accordance with Article 25 of the SO Regulation.”

3. Article 6. “Methodology for operational security limits” shall be amended by updating letter (a)(iii) in paragraph 2 accordingly:

   “Fixed limits for all DA CC TUs, in case of specific situations where the physical limit reflects the capability of overhead lines, transformers, cables or substation equipment installed in the primary power circuit (such as circuit-breaker, or disconnector) with limits not sensitive to ambient conditions, or where operational security limits are not set by thermal rating.”

4. Article 29. “Monitoring, reporting and information to the CE regulatory authorities” shall be amended by adding letter (e) in paragraph 5 accordingly:
   “according to Article 20(26a), for cases of deviation from Article 20(26) the concerned CE TSOs and iTCP shall provide reports with a justification why the calculation of the final RAM pursuant to Article 20(26)would have led to the inability to maintain operational security and an action plan describing how such

situations will be avoided in the future and the CCC shall annex those to the quarterly report."

5. Annex 2. "List of network elements excluded from Article 6 paragraph 1 and 2" shall be amended by updating the first sentence as follows:

   "The following grid elements are excluded from Article 6 paragraph 1 and 2 as long as the tie lines listed in the technical reasoning section of this annex are not modelled in the common grid model on both sides of the bidding zone borders and are hereafter referred to as 'affected elements':"

Article 9
Consideration of 110kV elements as CNECs after capacity validation

1. Article 15. "Definition of final list of CNECs and MNECs for day-ahead capacity calculation" shall be amended by updating paragraph 2 accordingly:
   "Repealed."

2. Article 20. "Validation of flow-based parameters" shall be amended by updating paragraph 22 accordingly:

   "If all available costly and non-costly RAs are not sufficient to ensure operational security on an internal network element, voltage level 110kV or above, with a specific contingency, which is not defined as CNEC and for which the maximum zone-to-zone PTDF is above the PTDF threshold referred to in Article 15(1), the competent CE TSO and iTCP may exceptionally add such internal network element with associated contingency to the final list of CNECs. The RAM on this exceptional CNEC shall be the highest RAM ensuring operational security considering all available costly and non-costly RAs. $PTDF_{init}$ according to Article 14(3) shall be used to determine if the PTDF of the additional CNEC is above the PTDF threshold. When considering the additional CNEC during the computation of the final flow-based parameters, the $PTDF_f$ value from the NRAO according to Article 16 shall be considered."

Article 10
GCEU Court Ruling on the list of internal CNECs

1. Article 5. "Definition of critical network elements and contingencies" shall be amended by updating paragraph 1 accordingly:
   "Each CE TSO and iTCP shall define a list of CNEs, which are fully or partly located in its own control area, and which can be overhead lines, underground cables, or transformers. At least all cross-zonal network elements shall be defined as CNEs. "

2. Article 5. "Definition of critical network elements and contingencies" shall be amended by deleting paragraphs 6 – 10.

Article 11
Reporting timelines

1. Article 29. “Monitoring, reporting and information to the CE regulatory authorities” shall be amended by adding the following phrase to the start of paragraph 4 accordingly:
   “Within 10 months of the start of each year,”

2. Article 29. “Monitoring, reporting and information to the CE regulatory authorities” shall be amended by adding the following phrase to the start of paragraph 5 accordingly:
   “Within 45 working days of the start of each quarter,”

3. Article 29. “Monitoring, reporting and information to the CE regulatory authorities” shall be amended by adding the following phrase to the start of paragraph 6 accordingly:
   “Within 3 months of the start of each half-year period,”

Article 12
Market time unit clarification

1. Article 2. “Definitions and interpretation” shall be updated by amending paragraph 91 accordingly:
   “‘MTU’ is the day-ahead and intraday market time unit, which means the time unit for capacity allocation during the day-ahead and intraday market;”

2. Article 2. “Definitions and interpretation” shall be amended by adding paragraph 96 accordingly:
   “‘DA CC MTU’ is the day-ahead capacity calculation market time unit, which means the temporal resolution of the day-ahead flow-based parameters used in the day-ahead capacity calculation, in preparation for the capacity allocation process;”

3. Article 4. “Day-ahead capacity calculation process” shall be amended by replacing the term ‘DA CC TU’ in the first sentence of paragraph 1 with ‘DA CC MTU’.

4. Article 21. “Calculation and publication of final flow-based parameters” shall be amended by replacing the term ‘DA CC TU’ in the first sentence of paragraph 2 with ‘DA CC MTU’.

5. Article 24. “Calculation of ATCs for SDAC fallback procedure for CE bidding borders” shall be amended by replacing the term ‘DA CC TU’ in paragraph 1 with ‘DA CC MTU’.

6. Article 27. “Publication of data” shall be amended by replacing the term ‘DA CC TU’ in paragraph 2, letter (a) and letter (c) with ‘DA CC MTU’.

Article 13
General alignment with Core DA CCM 4th amendment

1. Whereas (29) shall be deleted.

2. Article 11. "Calculation of power transfer distribution factors and reference flows" shall be amended by updating paragraph 5 accordingly:

"The maximum zone-to-zone $PTDF$ of a CNEC ($PTDF_{z2zmax,l}$) is the maximum influence that any CE and iTCP exchanges has on the respective CNEC, including the exchanges with the virtual hubs, i.e. the exchanges over HVDC interconnectors which are integrated pursuant to Article 12 and the exchanges on AHC borders which are modelled through EVH pursuant to Article 13:

$$PTDF_{z2zmax,l} = \max_{X \in \{BZ \cup EVH\}}\left(PTDF_{X,l}\right) - \min_{X \in \{BZ \cup EVH\}}\left(PTDF_{X,l}\right) + \sum_{\substack{k \in K \\ H_{1k}, H_{2k} \in IVH}} \left|PTDF_{H_{1k},l} - PTDF_{H_{2k},l}\right|$$

Equation 5

with

k	a given HVDC interconnector within the Core CCR
K	set of all HVDC interconnectors within the Core CCR
$PTDF_{X,l}$	zone-to-slack $PTDF$ of bidding zone or external virtual hub X on a CNEC l
BZ	set of all CE and iTCP bidding zones
EVH	set of all external virtual hubs in the CE CCR
IVH	set of all internal virtual hubs in the CE CCR
$\max_{X \in \{BZ \cup EVH\}}(PTDF_{X,l})$	maximum zone-to-slack PTDF of CE and iTCP bidding zones or EVHs on a CNEC l
$\min_{X \in \{BZ \cup EVH\}}(PTDF_{X,l})$	minimum zone-to-slack PTDF of CE and iTCP bidding zones or EVHs on a CNEC l
$PTDF_{H1k,l}$	zone-to-slack $PTDF$ of internal virtual hub H_1 on a CNEC l, with H_1 representing the

	converter station at the sending end of the HVDC interconnector k
$PTDF_{H2k,l}$	zone-to-slack $PTDF$ of internal virtual hub H_2 on a CNEC l, with H_2 representing the converter station at the receiving end of the HVDC interconnector k

"

Article 14
Removal of provisions related to not-modelled tie-lines

1. Article 2. "Definitions and interpretation" shall be updated by amending paragraph 1 accordingly:
   "Repealed"

2. Article 2. "Definitions and interpretation" shall be updated by amending paragraph 48 accordingly:
   "Repealed"

3. Article 6. "Methodology for operational security limits" shall be updated by amending paragraph 4 accordingly:
   "Repealed"

4. Annex 2. "List of network elements excluded from Article 6 paragraph 1 and 2" shall be retitled:
   "Annex 2: Repealed"