

Request of Elia System Operator SA for
derogation from the minimum level of
capacity to be made available for cross-zonal
trade

in accordance with Article 16(9) of Regulation (EU)
2019/943 of the European Parliament and of the Council of
5 June 2019 on the internal market for electricity (recast)

27 September 2022

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Whereas

- (1) Article 16(8) of Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity (recast), hereinafter “Regulation 2019/943”, prescribes that TSOs shall not limit the volume of interconnection capacity to be made available to market participants as a means of solving congestion inside their own bidding zone, or as a means of managing flows resulting from transactions internal to bidding zones. The same article also defines that this requirement shall be considered to be complied with if a minimum level of available capacity for cross-zonal trade is reached. For borders using a flow-based approach, this level (hereinafter referred to as the “CEP70 requirement”) is generally set to 70% of the capacity of internal and cross-zonal critical network elements taking into account contingencies (hereinafter referred to as “CNECs”). Transitory measures, such as action plans pursuant to Article 15 of Regulation 2019/943 or derogations pursuant to Article 16(9) of the same regulation, allow progressivity in reaching this minimum capacity.
- (2) Article 16(9) of Regulation 2019/943 prescribes that upon request of transmission system operators in a capacity calculation region (hereinafter “CCR”), the relevant regulatory authorities may grant a derogation from the CEP70 requirement on foreseeable grounds where necessary for maintaining operational security. The derogation shall be granted for no more than one year at a time, or, provided that the extent of the derogation decreases significantly after the first year, up to a maximum of two years. The extent of such a derogation shall be strictly limited to what is necessary to maintain operational security and shall avoid undue discrimination between internal and cross-zonal exchanges.
- (3) Article 16(4) of Regulation 2019/943 prescribes that counter-trading and redispatch, including cross-border redispatch, shall be used to reach the CEP70 requirement. This applies without condition to the use of internal redispatch, yet this article stipulates that the application of cross-border measures is subject to the implementation of a redispatching and counter-trading cost sharing methodology. This methodology is not yet implemented in the capacity calculation regions which Elia System Operator SA (hereinafter “Elia”) is a member of.
- (4) The Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on Capacity Allocation and Congestion Management (hereinafter referred to as the “CACM Regulation”) and the Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation (hereinafter referred to as the “SOGL Regulation”) require TSOs to deliver methodologies which are key to managing the flows in the electricity grid via coordinated capacity calculation and coordinated application of remedial actions. These key methodologies are:
 - a. The Day-Ahead Capacity Calculation Methodology for the Core CCR as referred to in Article 21 of the CACM Regulation (hereinafter referred to as “Core DA CCM”).
 - b. The operational security coordination methodology as referred to in Article 76 of the SOGL Regulation (hereinafter referred to as “Core ROSC methodology”).
 - c. The coordinated redispatching and countertrading methodology as referred to in Article 35 of the CACM Regulation (hereinafter referred to as “Core RDCT methodology”).
 - d. The redispatching and countertrading cost sharing methodology as referred to in Article 74 of the CACM Regulation (hereinafter referred to as “Core RDCT cost sharing methodology”).

A timetable summarizing the currently foreseen implementation dates of these key methodologies is depicted below.

Methodology	Status	Currently foreseen implementation date
Core DA CCM	Operational since Jun 8 th 2022	
Core DA CCM: coordinated validation	To be started	A proposal for implementation is due 18 months after go-live thus by Dec 2023. Implementation at the earliest in 2024
Core SOGL 76 + CACM 35	Implementation ongoing	Apr 2024
Core CACM 74	Implementation ongoing	Apr 2024

- (5) Acknowledging that the methodologies Core DA CCM: coordinated validation, Core SOGL 76 + CACM 35 and Core CACM 74 are not implemented yet, Elia cannot rely on them as a structural basis to fulfil the CEP70 requirement as of January 1st 2023. In order to be compliant with Regulation 2019/943, Elia therefore decided, based on a common understanding with CREG, to submit a request for a derogation from the CEP70 requirement on the basis of one foreseeable ground.
- (6) The foreseeable ground to request a derogation is an externality, being that loop flows on Belgian CNECs cannot be contained to an acceptable level, which is creating an operational security risk if the CEP70 requirement would be applied per January 1st 2023:
- a. From Article 16(8) of Regulation 2019/943 it can be understood that the maximum acceptable level of loop flows is defined as the amount of loop flows which, together with the reliability margins and the internal flows, uses 30% of capacity of a CNEC.
 - b. Historical analyses of data from year 2018 have shown that the level of loop flows on Belgian CNECs can amount to 70%, and is structurally superior to a level that would allow meeting Article 16(8) of Regulation 2019/943.
 - c. The go-live of Core DA CCM formalizes the right of each Core TSO to reduce excessive loop flows. Elia exercises this right by adapting the taps on the Belgian PSTs hereby utilizing up to 50% of the operational tap range. An assessment of the reduction of loopflows made upon Core operational data illustrates this approach enables to reduce excessive loopflows by up to 10% of Fmax. This reduction translates into an increase of the minRAM target applied on Belgian CNECs as per the methodological approach incorporated in the derogation. However, the level of reduction is insufficient to fully alleviate the excessive loop flows.
 - d. Loop flows are created in neighbouring bidding zones and cannot be contained by using the redispatching potential available in Belgium. Phase Shifting Transformers (PSTs) located at the North border of Belgium can help partially limiting the loop flows, but even an optimised utilisation of the Belgian PSTs alone is not expected to be sufficient.
 - e. Considering that several Member States implemented an action plan in accordance with Article 15 of Regulation 2019/943, among which the Federal Republic of Germany, Elia expects that identified structural congestions in neighboring bidding zones will not

disappear on short term. Consequently, loop flows are expected to continue to remain above an acceptable level according to Article 16(8) of Regulation 2019/943, at least for the duration of this derogation.

- f. Complementing the full implementation of action plans outside Belgium, the implementation in the Core CCR of the CACM and SOGL methodologies listed in paragraph 4 should allow reducing the level of loop flows to an acceptable level. Indeed:
 - i. Article 10(5) of the Core DA CCM will offer each TSO the possibility to individually define the initial setting of its own non-costly and costly remedial actions, based on the best forecast of their application and with the aim to reduce the loop flows on its cross-zonal CNECs below a loop flow threshold that avoids undue discrimination. The same loop flow threshold is also considered as a constraint in the non-costly remedial action optimiser, as described in Article 16 of the Core CCM. This is important in the Belgian context as the Belgian PSTs contribute to the reduction of loop flows.
 - ii. Article 20 of the Core DA CCM requires to implement a “coordinated validation” process, implying there will be a process that consolidates the prediction and usage of available remedial action on Core level. This creates the necessary visibility on the ability to maintain operational security in a coordinated way when applying the minimum 70% requirement. This is important in the Belgian context. Firstly, the local remedial action potential is insufficient to alleviate the impact of loop flows. Hence, a view on remedial actions available elsewhere to mitigate the loop flows need to be available to allow Elia offering 70% at capacity calculation stage despite possible too high loop flows. Secondly, there is no guarantee that the implementation of the action plan to enable the minimum 70% requirement in the Federal Republic of Germany will in itself reduce loop flows below an acceptable level.
 - iii. If Elia faces congestions as a result of the application of the CEP70 requirement, SOGL 76 and CACM 35 should allow finding solutions in a coordinated way in the Core region to relieve these congestions. The fact that the SOGL 76 methodology and CACM 35 methodology are not yet in place prevents Elia to rely on cross-border remedial actions as existing bilateral redispatching contracts do not enable an efficient use due to the manual procedures involved.
 - iv. In addition to the implementation of SOGL 76 and CACM 35, which alleviate operational security risk, CACM 74 should enable a fair cost sharing, ensuring that the TSOs of the bidding zone(s) at the origin of the loop flows above an acceptable level bear the costs of the remedial actions, in accordance with the polluter-pays principle as described in Article 16(13) of Regulation 2019/943.

(7) This request for derogation is compliant with Regulation 2019/943, more specifically Article 16(9), since:

- a. The grounds to request a derogation are foreseeable, as set out in Recital 4 to 6.
- b. The derogation is required to guarantee operational security as set out in Recital 4 to 6.
- c. The extent of the derogation is strictly limited to what is necessary:

- i. Acknowledging the limitations by the absence of the CACM and SOGL methodologies listed in paragraph 4, the redispatching potential structurally available to Elia will be used to reduce too high Belgian internal flows. Only if the operational security cannot be guaranteed in this situation (due to a lack of redispatching potential), the capacity for cross-zonal trade set in the capacity calculation process is reduced.
 - ii. The methodological approach described in Article 3 allows taking assumptions as late as possible in the capacity calculation process, that is, with the most accurate information related to the grid situation. This approach reduces the extent of the derogation compared to an approach where fixed values would have been defined and included directly in the derogation. The methodological approach avoids under- or overestimating the actual need for a derogation. Indeed, a fixed value approach would lead to unnecessary security margins considering the variety of situations to be covered, the intrinsic uncertainty of grid operation and the lack of visibility on the intentions of neighbouring Member States regarding their approach for implementing Article 16 of Regulation 2109/943, and possibly Article 15 of the same regulation. Given the fact that loop flows follow a variable pattern by nature, the inefficiency of a fixed value approach would be significant and structural. Further, this methodological approach allows naturally to take into account any improvement from a methodological perspective. More concretely, with the implementation of the Core DA CCM the loop flows decrease as described in Recital 6(c), which directly and positively impact the extent of the derogation.
- d. The derogation avoids undue discrimination between internal and cross-zonal exchanges: the sum of reliability margins, loop flows below an acceptable level and internal flows on each CNEC is lower than 30% for as much as operational security can be guaranteed. This ensures that, even in presence of loop flows above an acceptable threshold, the internal flows accounted for in the capacity calculation are reduced in order to avoid undue discrimination between internal and cross-zonal exchanges.

ELIA SUBMITS THE FOLLOWING REQUEST FOR DEROGATION FROM THE IMPLEMENTATION OF THE MINIMUM LEVEL OF CAPACITY TO BE MADE AVAILABLE FOR CROSS-ZONAL TRADE FOR APPROVAL TO THE BELGIAN NRA (CREG)

Article 1. Subject matter and scope

- (1) This request for derogation is a request from Elia to derogate from the implementation of the minimum margin available for cross-zonal trade as established in Article 16(8) and in accordance with Article 16(9) of Regulation 2019/943.
- (2) This request for derogation is based on one foreseeable ground to deviate from the CEP70 requirement, namely loop flows above an acceptable level, as detailed in Article 4 and justified in Recital 6.
- (3) The minimum margin available for cross-zonal trade taking into account this request for derogation will be implemented for as long as operational security can be guaranteed. Deviations will be reported to CREG along with a justification why the deviation was required to guarantee operational security.
- (4) This request for derogation is made to CREG in accordance with Article 16(9) of Regulation 2019/943.
- (5) Ultimately 1 July 2023, Elia shall submit a report to CREG detailing the developments on methodologies that shall provide a long-term solution to the operational security risk that this derogation seeks to address, in accordance with Article 16(9) of Regulation 2019/943. This report will be published for stakeholders.

Article 2. Definitions and interpretation

- (1) For the purpose of this request for derogation, the terms used in this document shall have the meaning of the definitions included in Article 2 of Regulation 2019/943, Article 2 of the CACM Regulation, Article 2 of the Core DA CCM, and Article 2 of the ACER Recommendation No 01/2019.
- (2) In this request for derogation, unless the context requires otherwise:
 - a. The singular indicates the plural and vice versa.
 - b. The table of contents, headings and examples are inserted for convenience only and do not affect the interpretation of this derogation request.
 - c. Any reference to legislation, regulations, directive, order, instrument, code or any other enactment shall include any modification, extension or re-enactment of it then in force.

Article 3. Methodological approach for derogation

- (1) The approach used in this request for derogation defines principles and calculation rules including, where needed, mathematical formulas. These principles and calculation rules are applied to the day ahead capacity calculation process as applied in the Core CCR.

- (2) More specifically, the methodological derogation takes the common grid models (24 in total, 1 for each hour, hereinafter “CGM”) delivered as part of the day ahead capacity calculation process as basis and applies the following principles:
- a. Elia first optimizes its PST taps in the CGM to reduce excessive loopflows. After the initial flow-based calculation, which is performed upon this CGM, the remaining loop flows are calculated and the resulting minimum capacity available for cross-zonal trade is applied on the Belgian CNECs as detailed in Article 4. For the avoidance of doubt, if the loop flows are below the acceptable level defined in paragraph 2 of Article 4, the minimum margin remains equal to 70%.
 - b. During the validation phase, operational security is assessed. This implies the detection of congestion and the possibility to relieve such congestion through the application of remedial actions, non-costly and costly. The capacity domain used during the validation phase shall include the application of the derogation for loop flows pursuant to Article 4.
 - c. As long as operational security can be guaranteed, the minimum capacity resulting from the intermediate flow-based calculation is provided to the day-ahead market. If not, the available capacity for cross-zonal trade is reduced to a level that guarantees operational security.
 - d. The minimum capacity available for cross-zonal trade inside the Core coordination area on each CNEC shall in any case respect commonly coordinated minimum values as defined in paragraph 6 of Article 4.

Article 4. Loop flows

- (1) The application of this derogation for loop flows above an acceptable level entails the following steps:
- a. Step 1: define the acceptable level of loop flows LF_{accept} per CNEC, as further detailed in paragraph 2.
 - b. Step 2: calculate the loop flows LF_{calc} per CNEC, as further detailed in paragraph 3.
 - c. Step 3: define the minimum capacity for cross-zonal trade taking into account the results of the previous steps, as further detailed in paragraphs 4 to 6.
- (2) Article 16(8) of Regulation 2019/943 prescribes that a total amount of 30% of capacity on each CNEC can be used for the reliability margins, loop flows and internal flows. This derogation defines the acceptable level of loop flows (LF_{accept}) for the different type of critical network elements as follows:
- a. Cross-border critical network elements: the acceptable level of loop flows is equal to the difference between 30% and the reliability margins of these elements.
 - b. Internal critical network elements: a choice has to be made on how to divide the capacity between loop flows and internal flows. This request for derogation considers that the acceptable level of loop flows is equal to half of the difference between 30% and the reliability margins of these elements. The second half is used by the internal flows.
- (3) The loop flows LF_{calc} are calculated in the day ahead capacity calculation process as follows:

- a. The CGM used during the initial flow-based calculation shall be used.
- b. Obtain the zero-balanced grid model by shifting the net positions of the CGM to zero:

$$F_{0,all} = F_{ref} - \mathbf{PTDF}_{all} \overline{NP}_{ref,all}$$

With:

- i. $F_{0,all}$: flow derived from a zero-balanced CGM, meaning a situation without any commercial exchange between bidding zones within Continental Europe and between bidding zones within Continental Europe and bidding zones of other synchronous areas.
 - ii. F_{ref} : flow per CNEC in the CGM.
 - iii. $PTDF_{all}$: power transfer distribution factor matrix for all bidding zones in Continental Europe and all critical network elements.
 - iv. $NP_{ref,all}$: total net positions per bidding zone in Continental Europe included in the CGM.
- c. Apply flow decomposition to derive the loop flows and internal flows on each CNEC:
 - i. Cross-border critical network elements: as there is no internal flow the $F_{0,all}$ defines directly the loop flows.
 - ii. Internal critical network elements: a flow decomposition is required since $F_{0,all}$ consists of internal flows and loop flows. To distinguish internal flows and loop flows, the nodal positive and negative injections are considered in the zero-balanced grid model. A perfect-mixer principle¹ is used in order to uniquely allocate the flows to the injections.
 - d. For a given CNEC, LF_{calc} is equal to the loop flows computed following paragraph c, divided by the maximum admissible power flow (F_{max}) of that CNEC according to its operational security limits.
- (4) For a given CNEC, the minimum capacity to be made available for cross-zonal trade $MACZT_{min}$ is then equal to:

$$MACZT_{min} = 70\% - \max(0; LF_{calc} - LF_{accept})$$

- (5) The minimum capacity for cross-zonal trade to be made available for trade inside the Core coordination area (MCCC), results from the minimum capacity $MACZT_{min}$ as defined in previous paragraph and adapted for the cross-zonal flows assumed to result from cross-zonal trade outside the coordination area (MNCC) following the method as defined in Article 17(4) of the Core DA CCM.
- (6) As a result of this derogation, the minimum capacity for cross-zonal trade inside the Core coordination area on each CNEC shall not be below 20% of the maximum admissible power flow (F_{max}) of that CNEC according to its operational security limits.

¹ Firstly introduced in “J. Bialek, D. B. Tam, *Tracing the generators’ output, in International Conference on Opportunities and Advances in International Electric Power Generation (Conf. Publ. No. 419), Durham, UK, March 1996*”

- (7) Elia will publish data on the effects of the application of the formulas in this article as part of the daily publication of the results of the day-ahead capacity calculation process as applied in the Core CCR.
- (8) In accordance with Article 1(3), deviations from the formulas in this article will be reported to CREG on trimestral basis along with a justification why the deviation was required to respect operational security limits.

Article 5. Extent and duration of the derogation

- (1) This request for derogation is applicable to all Belgian CNECs included in the Core day-ahead capacity calculation process, respecting the applicable PTDF threshold.
- (2) This request for derogation is requested for 1 year starting from the 1st of January 2023.

Article 6. Confidentiality

The information provided by Elia to CREG for this request for derogation does not have to be treated as confidential unless stated or agreed otherwise.