

**DECISION No 11/2026
OF THE EUROPEAN UNION AGENCY
FOR THE COOPERATION OF ENERGY REGULATORS**

of 21 July 2026

**on the methodology for cost sharing of redispatching and countertrading of
the Core capacity calculation region**

THE EUROPEAN UNION AGENCY FOR THE COOPERATION OF ENERGY
REGULATORS,

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

Having regard to Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management², and, in particular, Article 9(7)(h) and Article 9(11) thereof,

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

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

Having regard to the favourable opinion of the Board of Regulators ('BoR') of 8 July 2026, delivered pursuant to Article 22(5)(a) of Regulation (EU) 2019/942,

Whereas:

¹ OJ L 158, 14.6.2019, p. 22.

² OJ 197, 25.7.2015, p. 24.

1. INTRODUCTION

- (1) Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management (the ‘CACM Regulation’) laid down a range of requirements for cross-zonal capacity allocation and congestion management in the day-ahead and intraday markets in electricity. These requirements also include the development of a common methodology for redispatching and countertrading cost sharing (hereafter referred to as the ‘cost sharing methodology’) in each capacity calculation region (‘CCR’) in accordance with Article 74 of the CACM Regulation.
- (2) Pursuant to Article 9(1), Article 9(7)(h) and Article 74(1) of the CACM Regulation, transmission system operators (‘TSOs’) of each CCR are required to develop a common proposal for a cost sharing methodology within the respective CCR and submit it to the concerned regulatory authorities for approval. Those regulatory authorities should reach an agreement and take a decision on the proposal for the cost sharing methodology within six months after the receipt of the proposal by the last regulatory authority according to Article 9(10) of the CACM Regulation. Pursuant to the third subparagraph of Article 6(10) of Regulation (EU) 2019/942, the six-month period may be extended. When the regulatory authorities fail to reach an agreement within the six-month (or the extended) period, ACER, pursuant to Article 9(11) of the CACM Regulation and the second subparagraph of Article 5(3) of Regulation (EU) 2019/942, is called upon to adopt a decision concerning the TSOs’ proposal in accordance with point (b) of the second subparagraph of Article 6(10) of Regulation (EU) 2019/942.
- (3) Following the Core TSOs’ submission to the Core regulatory authorities of a common methodology for redispatching and countertrading cost sharing for the Core CCR in accordance with Article 74 of CACM Regulation (the ‘Proposal’), the Core regulatory authorities informed ACER that they were not able to reach a decision on the Proposal, i.e. to approve it or request an amendment, by 27 March 2020.
- (4) On 30 November 2020, ACER issued Decision No 30/2020 adopting in Annex I thereof a common methodology for the cost sharing of redispatching and countertrading for the Core CCR (the ‘RDCTCS Methodology’).
- (5) Decision No 30/2023 was appealed in front of ACER’s Board of Appeal (‘BoA’) by two Core regulatory authorities (Commission de régulation de l’énergie (‘CRE’) and Bundesnetzagentur (‘BNetzA’)) and five Core TSOs (TransnetBW GmbH (‘TransnetBW’), TenneT TSO GmbH, TenneT TSO BV, Polskie sieci elektroenergetyczne (‘PSE’) and Réseau de Transport d'Electricité S.A. (‘RTE’)).
- (6) On 28 May 2021, the BoA adopted Decision A-001-2021 (consolidated), which dismissed the appeals against the Decision No 30/2020 as unfounded.

- (7) BoA Decision A-001-2021 (consolidated) was challenged with annulment actions before the General Court of the European Union by the same appellants, i.e. CRE, BNetzA, TransnetBW, TenneT TSO GmbH, TenneT TSO BV, PSE and RTE.
- (8) On 25 September 2024, the General Court delivered its judgements in cases T-446/21, CRE v ACER, T-472/21, RTE v ACER, T-476/21, TransnetBW v ACER, T-482/21, TenneT TSO GmbH and TenneT TSO BV v ACER, T-484/21, PSE v ACER, and T-485/21, BNetzA v ACER³, annulling BoA Decision A-001-2021 (consolidated).
- (9) In response to the General Court's judgments, on 31 July 2025, the BoA issued its Decisions in cases A-001-2021_R (consolidated), CRE v ACER, RTE v ACER, TransnetBW v ACER, TenneT TSO GmbH and TenneT TSO BV v ACER, PSE v ACER, and BNetzA v ACER, remitting the cases to ACER⁴.
- (10) Due to those remittals, ACER initiated proceedings for the present Decision to revisit its Decision No 30/2020 and the RDCTCS Methodology.
- (11) Accordingly, the purpose of these proceedings was to address the issues for which the judgments in cases T-446/21, T-472/21, T-476/21, T-482/21, T-484/21, and T-485/21 and, in particular, the BoA Decisions in cases A-001-2021_R (consolidated) identified errors of law, namely the reasoning of the chosen flow decomposition method and the determination of the loop flow threshold in accordance with Article 16(13) of the Regulation (EU) 2019/943 (the 'Electricity Regulation').
- (12) The present Decision remedies these errors by providing a detailed analysis and reasoning with regard to the selection choice of the flow decomposition method and by amending Article 7 as well as the related Recital 8 of the RDCTCS Methodology.
- (13) To ensure that those errors are remedied also in a way that ensures clarity and legal certainty with regard to the RDCTCS Methodology in its entirety, ACER considers it appropriate to address the errors in the context of the entire RDCTCS Methodology. To that end, ACER adopted a rectified RDCTCS Methodology, included in the present Decision not only new statements of reasons with regard to the selection of the flow decomposition method (Section 5.3.2) and the determination of the loop flow threshold (Section 5.3.3) but also statements of reasons from Decision No 30/2020 relevant for the other (i.e. unchanged) elements of the rectified RDCTCS Methodology (Sections 5.3.4 and 5.4), and repealed Decision No 30/2020. Notably, the statement of reasons

³ T-446/21, T-472/21, T-476/21, T-482/21, T-484/21, and T-485/21.

⁴ A-001-2021_R - BNetzA v ACER, A-001-2021_R - CRE v ACER, A-001-2021_R - PSE v ACER, A-001-2021_R - RTE v ACER, A-001-2021_R - TenneT v ACER, and A-001-2021_R - TransnetBW v ACER.

from Decision No 30/2020 relating to the unchanged elements of the rectified RDCTCS Methodology were incorporated without substantive changes.

- (14) Potential amendments of elements of the RDCTCS Methodology other than the selection of the flow decomposition method and the determination of the loop flow threshold were not the subject of the proceedings for the present Decision.

2. PROCEDURE

2.1. Proceedings before the Core regulatory authorities and before ACER prior to the remittal by the BoA

- (15) The proceedings leading to Decision No 30/2020 and the RDCTCS Methodology are described in Recitals (4) to (8) of Decision No 30/2020, with related specifications in Recitals (20) to (29). Reference is made here to these provisions.

2.2. Proceedings before ACER after the remittal by the BoA

- (16) ACER closely cooperated with all Core regulatory authorities and TSOs and further consulted on the amendments to the cost sharing methodology during and meetings and through exchanges of amendments. In particular, the following procedural steps were taken:
- (a) 16 October 2025: ACER held an online meeting with all Core regulatory authorities and TSOs;
 - (b) 12 November 2025: TenneT TSO BV and TenneT TSO GmbH provided a joint document ‘Revision of the RDCTC Cost Sharing Decision – Flow Decomposition Method’;
 - (c) 13 November 2025: ACER held an online meeting with all Core regulatory authorities and TSOs focusing on flow decomposition;
 - (d) 11 February 2026: ACER held an online meeting with all Core regulatory authorities and TSOs focusing on flow decomposition;
 - (e) 29 April 2026: ACER shared a preliminary position of the proposed amendments to the cost sharing methodology with all Core regulatory authorities and TSOs;
 - (f) 1 June 2026: ACER, on its own initiative, held a joint oral hearing meeting with all Core regulatory authorities and TSOs discussing ACER’s preliminary position.
 - (g) 10 June 2026: ACER sent the draft Decision to the AEWG for its advice;
 - (h) 22 June 2026: The AEWG broadly endorsed the draft Decision;

- (i) 8 July 2026: The Board of Regulators provided a favourable opinion on the Decision;

3. ACER'S COMPETENCE TO DECIDE

- (17) In a letter from the Chair of the Core Energy Regulators' Regional Forum, on behalf of all Core regulatory authorities of 27 March 2020 on behalf of all Core regulatory authorities, Core regulatory authorities informed ACER that they were not able to approve nor request an amendment to the Proposal by 27 March 2020.
- (18) Therefore, under the provisions of the second subparagraph of Article 5(3) and point (a) of the second subparagraph of Article 6(10) of Regulation (EU) 2019/942 and of Articles 9(7)(h), 9(10) and 9(11) of the CACM Regulation, ACER became responsible to adopt Decision No 30/2020 and the RDCTCS Methodology.
- (19) By Decisions A-001-2021_R (consolidated), CRE v ACER, RTE v ACER, TransnetBW v ACER, TenneT TSO GmbH and TenneT TSO BV v ACER, PSE v ACER, and BNetzA v ACER. concerning Decision No 30/2020 and the RDCTCS Methodology, the BoA remitted the respective cases to ACER in accordance with Article 28(5) of Regulation (EU) 2019/942. According to Article 28(5) of Regulation (EU) 2019/942, ACER is bound by those BoA Decisions.
- (20) Therefore, according to Article 28(5) of Regulation (EU) 2019/942, ACER is competent to revisit the RDCTCS Methodology and take a new decision on it.

4. SUMMARY OF THE OBSERVATIONS RECEIVED BY ACER

4.1. Consultation of the Core regulatory authorities and TSOs

- (21) At the meetings between ACER, all Core regulatory authorities and TSOs, including the joint hearing meeting, ACER:
 - (a) discussed the way forward on the obligation of Core TSOs to jointly analyse and determine the level of loop flows that could be expected without structural congestion, required by the first subparagraph of Article 16(13) of the Electricity Regulation;
 - (b) discussed details of two candidate methods for flow decomposition, namely full line decomposition ('FLD') and power flow colouring ('PFC').

4.2. Hearing phase

- (22) ACER initiated a hearing phase on 29 April 2026 by providing all Core TSOs and regulatory authorities with preliminary position including draft amendments to the RDCTCS Methodology and its analysis and reasoning with regard to the flow decomposition approach. The hearing period ended on 1 June 2026.

- (23) During the hearing phase, the Core TSOs and regulatory authorities provided their individual comments:
- (a) On 13 May 2026, the German regulatory authority BNetzA provided written comments with regard to the loop flow threshold;
 - (b) On 18 May 2026, the Polish TSO PSE provided written comments on the flow decomposition and on the loop flow threshold;
 - (c) On 18 May 2026, the French regulatory authority CRE provided written comments on the flow decomposition;
 - (d) On 18 May 2026, the German and Dutch TSOs TenneT TSO GmbH and TenneT TSO BV provided their comments on the flow decomposition;
 - (e) On 19 May 2026, the Belgian TSO ELIA, on behalf of the TSOs of Poland, Croatia, Czechia, Hungary, Slovenia, Austria and Belgium provided their comments on the flow decomposition;
 - (f) On 26 May 2026, URE provided its comments on the loop flow threshold;
 - (g) On 27 May 2026, Amprion, TenneT TSO B.V, TenneT TSO GmbH, 50Hertz, TransnetBW and RTE provided their comments on the flow decomposition;
 - (h) On 28 May 2026, the Hungarian regulatory authority MEKH, on behalf of Dutch, Belgian, Austrian and Hungarian regulatory authorities, provided their comments to the loop flow threshold;
 - (i) At the joint oral hearing on 1 June 2026, ACER summarized its preliminary position and provided Core regulatory authorities and TSOs with the opportunity to further elaborate on their comments and discuss their views on the preliminary position.
- (24) Details of the inputs by the listed parties and ACER's assessment thereof are provided in sections 5.3.2.11 and 5.3.3.2, for flow decomposition and loop flow threshold topics respectively.

4.3. Consultation of the AEWG

- (25) During the consultation of the AEWG, three regulatory authorities (BNetzA, CRE and URE) provided written comments to the draft Decision. Their main concerns are summarised below and addressed either in this section or, where relevant, in sections 5.3.2 and 5.3.3.
- (26) On the flow decomposition: CRE and BNetzA expressed support for the FLD method over the PFC method; CRE proposed to change the decomposition method, stating also

the reasons for this change, and BNetzA indicated a preference for the FLD method over PFC the method.

- (27) In light of these comments, ACER explained that it is actually necessary that the flow decomposition method follows the same definitions of flow components as applied in preceding processes (capacity calculation and allocation), as the setup of these processes (zonal market model) led to the existence of the loop flows and internal flows. While the PFC method properly encompasses the zonal market model and physics in line with these preceding processes, the FLD method applies an approach inconsistent with these processes. Regarding CRE's comments that the flow decomposition needs to be consistent with the coordinated regional operational security assessment (CROSA), ACER noted that the CROSA is a nodal process and flow decomposition cannot be consistent with it as there is no flow decomposition applied during the CROSA. Further extensive reasoning on the flow decomposition method selection is provided in section 5.3.2 (on the compatibility with other methodologies in sub-section 5.3.2.9 in particular).
- (28) On the flow decomposition: URE expressed support for the draft Decision and referred to Recital 102 of Decision No 30/2020, where the Agency explicitly agreed that the standard GSK for importing zones distorts flow decomposition and invited TSOs to improve the methodology. While URE acknowledged that finding an immediate, region-wide solution is challenging, they proposed that ACER, in its decision, actively encourages TSOs to continue working on this issue.
- (29) In light of this comment, ACER explained that in both the Decision No 30/2020 and the present decision, the same improvements of the GLSK usage were proposed. Namely, the improvements on the GLSK that would avoid distortion of the flow decomposition for importing zones need to be done by providing different GLSK data, tailored to the net position of a bidding zone. ACER proposes to Core TSOs to continue improving GLSK such that it works well for both capacity calculation methodology as well as for the cost sharing methodology. ACER has formulated Recitals (93) and (94) accordingly.
- (30) On the loop flow threshold: BNetzA highlighted that while they may understand the rationale according to which a more stringent methodology is not necessary, they shared severe concerns with accepting the reasons put forward in that regard by the Polish, Dutch, Belgian, Austrian and Hungarian regulatory authorities. To be able to agree with the draft Decision, BNetzA requested to delete the reference to the justification suggested by these five regulatory authorities for rejecting BNetzA's proposal document. In the discussions, CREG and E-Control expressed flexibility regarding the specific reference to their positions and were open for a compromise as long as the text of the methodology stays unchanged.
- (31) After further assessment, ACER adjusted Recital (175) with a compromise text, to reflect BNetzA's, CREG's and E-Control's positions.

- (32) The AEWG provided its advice on 22 June 2026, broadly endorsing the draft Decision, while noting two votes against, by CRE and BNetzA.

5. ASSESSMENT OF THE RDCTCS METHODOLOGY

5.1. Legal framework

- (33) Article 9(1) and (7)(h) of the CACM Regulation requires TSOs of each CCR to provide the proposal for a redispatching or countertrading cost sharing methodology in accordance with Article 74(1) of the CACM Regulation to their regulatory authorities for approval.
- (34) Article 9(9) of the CACM Regulation requires that the proposal for redispatching or countertrading cost sharing methodology includes a proposed timeline for its implementation and a description of its impact on the objectives of the same Regulation.
- (35) Article 74 of the CACM Regulation sets general requirements regarding the development of a proposal for a redispatching or countertrading cost sharing methodology and its implementation.
- (36) Article 74(1) of the CACM Regulation requires TSOs in each capacity calculation region to develop a proposal for a redispatching and countertrading cost sharing methodology no later than 16 months after the decision on the capacity calculation regions is taken in accordance with Article 15(1) of the CACM Regulation.
- (37) Article 74(2) of the CACM Regulation specifies that the redispatching and countertrading cost sharing methodology needs to include cost-sharing solutions for actions of cross-border relevance.
- (38) Article 74(3) of the CACM Regulation specifies that redispatching and countertrading costs eligible for cost sharing between relevant TSOs shall be determined in a transparent and auditable manner.
- (39) Article 74(4) of the CACM Regulation states that the redispatching and countertrading cost sharing methodology must include at least: (i) the determination of costs considered in capacity calculation that are eligible for cost sharing, (ii) the determination of costs eligible for cost sharing that are used to guarantee the firmness of cross-zonal capacities and (iii) the rules for region-wide cost sharing.
- (40) Article 74(5) of the CACM Regulation specifies further elements that need to be included in the cost sharing methodology related to auditing and monitoring of the costs and their sharing.
- (41) Article 74(6) of the CACM Regulation specifies that the cost sharing methodology must:

- (a) provide incentives to manage congestion, including remedial actions and incentives to invest effectively;
 - (b) be consistent with the responsibilities and liabilities of the TSOs involved;
 - (c) ensure a fair distribution of costs and benefits between the TSOs involved;
 - (d) be consistent with other related mechanisms, including at least:
 - the methodology for sharing congestion income set out in Article 73;
 - the inter-TSO compensation mechanism, as set out in Article 13 of Regulation (EC) No 714/2009 and Commission Regulation (EU) No 838/2010;
 - (e) facilitate the efficient long-term development and operation of the pan-European interconnected system and the efficient operation of the pan-European electricity market;
 - (f) facilitate adherence to the general principles of congestion management as set out in Article 16 of Regulation (EC) No 714/2009;
 - (g) allow reasonable financial planning;
 - (h) be compatible across the day-ahead and intraday market time-frames; and
 - (i) comply with the principles of transparency and non-discrimination.
- (42) Recital 31 of the Electricity Regulation specifies that at the end of the implementation of action plans by Member States, such Member States should have a possibility to choose whether to opt for a reconfiguration of the bidding zone(s) or whether to opt for addressing remaining congestion through remedial actions for which they bear the costs. Similarly, Article 15(6) of the Electricity Regulation specifies that six months before the expiry of the action plan, the Member State with identified structural congestion shall decide whether to address remaining congestion by amending its bidding zone or whether to address remaining internal congestion with remedial actions for which it shall cover the costs.
- (43) Article 15(3) of the Electricity Regulation specifies that the cost of remedial actions necessary to achieve the linear trajectory referred to in Article 15(2) of the Electricity Regulation or make available cross-zonal capacity on critical network elements concerned by the action plan shall be borne by the Member State(s) implementing such action plan.
- (44) Finally, Article 16(13) of the Electricity Regulation specifies that when allocating the costs of remedial actions between transmission system operators, regulatory authorities shall analyse to what extent flows resulting from transactions internal to bidding zones

contribute to the congestion between two bidding zones observed, and allocate the costs based on the contribution to the congestion to the transmission system operators of the bidding zones creating such flows, except for costs induced by flows resulting from transactions internal to bidding zones that are below the level that could be expected without structural congestion in a bidding zone. That level shall be jointly analysed and defined by all transmission system operators in a capacity calculation region for each individual bidding zone border, and shall be subject to the approval of all regulatory authorities in the capacity calculation region.

5.2. The requirements for the development and for the content of the Proposal

- (45) The requirements for the development and for the content of the Proposal, meanwhile adopted as the RDCTCS Methodology, have been assessed in Recitals (42) to (54) of Decision No 30/2020. Reference is made here to these provisions.

5.3. The cost sharing solution

5.3.1. The cost sharing solution within the Proposal

- (46) Article 74(2) of the CACM Regulation requires the Proposal to determine cost sharing solutions for actions of cross-border relevance. In accordance with Article 16(13) of the Electricity Regulation the cost sharing solutions for congestions between two bidding zones observed shall be based on the analysis to what extent flows resulting from transactions internal to bidding zones contribute to such congestions. Then the costs of such congestions shall be allocated to transmission system operators of the bidding zones creating such flows, except for costs induced by flows resulting from transactions internal to bidding zones that are below the level that could be expected without structural congestion in a bidding zone.
- (47) The Core TSOs' Proposal included several steps to share the costs of cross-border relevant redispatching and countertrading actions.
- (48) First, the TSOs are to decompose the flows on congested cross-border relevant network elements for which these actions have been activated. Article 7 of the Proposal determines this flow decomposition, by determining the following flow components: loop flows, internal flows, import/export flows, transit flows and PST flows.
- (49) In the second step, Article 8 of the Proposal defined transformation of these flow components into percentage shares for each bidding zone by applying the following steps:
- (a) netting of flow components in opposite direction of the congestion, but the Proposal does not specify how this netting is performed;

- (b) application of thresholds by which some flow components are split into two types (i.e. one below threshold and one above the threshold), but the Proposal does not specify how and to which flow components these thresholds are applied;
 - (c) prioritisation of flow components by which these components are sorted into certain priority list and then only the flow components that exceed the maximum capacity of a network element are penalised. However, the Proposal does not specify such prioritisation and how the final penalisation of flow components is determined;
 - (d) the Proposal mentioned the flow components, which are attributed to the origins of flows outside of the Core CCR and specifies that these shares shall be reallocated to bidding zones in the Core CCR, but without specifying exactly how; and
 - (e) the percentage shares for each bidding zone are then determined, but the Proposal does not specify how. Also, the solution for sharing the costs within a bidding zone consisting of several TSOs is not defined.
- (50) Once the percentage shares are determined for each cross-border relevant network element, the Proposal provided that TSOs determine how the total costs of cross-border relevant redispatching and countertrading actions are split between different network elements, which, according to the Proposal, can be cross-border relevant network elements and network elements which are not cross-border relevant. The mapping process is to determine the share of costs for both types. While the Proposal specified few principles by which the total costs of cross-border relevant redispatching and countertrading actions are mapped to cross-border relevant network elements and non-cross-border relevant network elements, it did not specify the exact sharing key by which these costs are mapped.
- (51) As a final step in the cost sharing solution, the Proposal provided a multiplication by which the costs allocated to cross-border relevant network elements are multiplied with percentage shares identified for each cross-border relevant network element and then these costs are summed up for each cross-border relevant network element per each bidding zone. The costs mapped to non-cross-border relevant network elements are attributed to a bidding zone in which such network elements are located.
- (52) Finally, Article 74(2) of the CACM Regulation and Article 16(13) of the Electricity Regulation require a cost sharing solution to determine the sharing between TSOs, but the Proposal did not specify how the shares of each bidding zone are split between TSOs within each bidding zone.
- (53) The Proposal therefore did not comply with Article 74(2) of the CACM Regulation and Article 16(13) of the Electricity Regulation as it did not specify all the necessary elements to determine the cost sharing solution for sharing the costs of redispatching

and countertrading actions of cross-border relevance among Core TSOs. The Proposal therefore needed to be amended in the following ways:

- (a) In order to determine the exact cost sharing solution for sharing the costs of redispatching and countertrading actions of cross-border relevance, the cost sharing methodology must first determine which network elements are cross-border relevant and which are not;
- (b) The cost sharing methodology must clearly specify how the costs of redispatching and countertrading actions of cross-border relevance are split among different network elements (whether they are cross-border relevant or not);
- (c) The cost sharing methodology must clearly specify which flow components are required for cost sharing and how exactly they are determined for each cross-border relevant network element in order to correctly identify how the flows resulting from transactions internal to bidding zones contribute to congestion;
- (d) The cost sharing methodology must clearly specify why the flow components in the opposite direction of the congestion need to be netted with flows in the direction of the congestion and how this netting is performed;
- (e) The cost sharing methodology must specify how the thresholds for splitting flow components in two parts are determined and to which flow components they are applied;
- (f) The cost sharing methodology must clearly specify the priority of flow components by which the contributions to congestion above the maximum capacity of a network element are identified;
- (g) The cost sharing methodology must clearly specify the shares which determine how much of the costs on cross-border relevant network element are attributed to each bidding zone;
- (h) The cost sharing methodology must clearly specify how the costs attributed to flow components, whose origins lie outside of the Core CCR (i.e. loop flows and allocated flows originating from outside the Core CCR), are attributed to Core bidding zones;
- (i) Finally, the cost sharing methodology must specify how the costs attributed to Core bidding zones are split among the TSOs of each bidding zone.

5.3.2. Flow decomposition

5.3.2.1. *Background*

- (54) In accordance with Article 16(13) of the Electricity Regulation, it is necessary for the sharing of the costs of remedial actions to determine which flows contribute to the congestion between bidding zones, i.e. to define the decomposition of flows for each cross-border relevant network element.
- (55) The Core TSOs' Proposal defined the decomposition of flows for each cross-border relevant network element. It proposed a general identification of five different flow components; however, such general identification was not sufficient for the purpose of defining exact cost sharing solution. In particular, ACER specified the following amendments to the flow components.
- (a) First, ACER merged all the market flows, i.e. import/export flows and transit flows from all bidding zones into one single flow component defined as allocated flow. This allocated flow represents the cumulative flow resulting from all cross-zonal exchanges within and outside the Core CCR and it is therefore the result of cross-zonal capacity allocation. While Core TSOs may further split this component into different import/export flows and transit flows, for the purpose of cost sharing such splitting is not necessary, because all TSOs have agreed that in case the allocated flow is identified as contributing to the congestion, the owner of the congested cross-border relevant network element shall pay for the corresponding costs. For this reason, the cost sharing methodology does not need to identify the specific origins of allocated flow.
 - (b) Second, ACER specified which loop flows need to be calculated. The cost sharing methodology must calculate loop flow resulting from each individual bidding zone in the Core CCR, whereas loop flows from bidding zones outside the Core CCR may be identified as a single flow component, because if they are identified as a contribution to congestion, the corresponding costs are to be borne by the owner of the cross-border relevant network element. Therefore, loop flow originating from bidding zones outside the Core CCR does not need to be split per individual bidding zone.
 - (c) Finally, ACER provided the exact specification of the calculation method, defining how each flow component needs to be calculated. Without such specification TSOs may not be able to agree on how to calculate these components themselves, since different views have been presented by different TSOs with regard to the exact methods of calculating flow components.
- (56) During the development of the RDCTCS Methodology in 2020, as well as in the proceedings for the present Decision, the Core TSOs considered two possible methods

for the flow decomposition: Full Line Decomposition ('FLD')⁵ and Power Flow Colouring ('PFC')⁶, which are explained in Section 5.3.2.3. By its Decision No 30/2020, ACER selected the PFC method for the flow decomposition in Article 6 of the RDCTCS Methodology.

- (57) In its judgment of 25 September 2024 in case T-482/21, TenneT TSO GmbH and TenneT TSO BV v ACER, the General Court held with regard to the plea concerning the flow decomposition method underlying the contested cost-sharing methodology that the statement of reasons in BoA Decision A-001-2021 (consolidated) was insufficient⁷.
- (58) In essence, the General Court stated that the obligation to state reasons requires the institution to disclose its reasoning in a clear and unequivocal manner, enabling the persons concerned to understand the basis of the measure, defend their rights, and allow judicial review. However, the reasoning does not need to address every fact or legal argument, but only the essential considerations underpinning the measure. Its sufficiency must be assessed in light of the context and the applicable legal framework, as well as the addressees' interest in obtaining explanations; in particular, reasons may be considered adequate where the measure is adopted in a context already known to the persons concerned, allowing them to comprehend its scope.⁸
- (59) In its decision of 31 July 2025 in case A-001-2021_R (consolidated), TenneT TSO GmbH and TenneT TSO BV v ACER, the BoA held that ACER's new decision should take into account the requirements of the judgments cited in paragraphs 181 to 184 of the judgment in case T-482/21, in order to enable the addressees of the decision to ascertain the reasons for that decision, and the Court to exercise its power of judicial review of that decision⁹. In particular, the new decision will need to better explain the reasons for the selected flow decomposition method; it will also need to explain related connections with other substantive elements of the decision¹⁰.

⁵ Pavese et al, "The full line decomposition method – a further development for causation-based cost sharing", on CIGRE Science & Engineering, Vol. 9, p.27, October 2017 edition.

⁶ Vlaisavljevic et al, "Power Flow Colouring: A Novel Power Flow Tracing Methodology Tailored for the European Zonal Electricity Market Design", Proceedings of IEEE ISGT Conference (Bucharest, October 2019).

⁷ T-482/21, paras. 166 to 224.

⁸ T-482/21, paras. 181-184.

⁹ A-001-2021_R (consolidated), para. 86.

¹⁰ A-001-2021_R (consolidated); paras. 89-90.

- (60) During the consultation in the decision-making proceedings following the remittal by the BoA, the Core TSOs provided ACER with two divergent position papers on the appropriate flow decomposition method:
- (a) A ‘Non-paper on the flow decomposition method for the future Common Methodology for Redispatching and Countertrading Cost-sharing for the Core CCR’ of 2 February 2026, submitted by TenneT TSO BV (hereafter ‘TenneT Non-paper’). This position supports the use of the FLD method¹¹; and
 - (b) A ‘Position paper on Flow Decomposition methods for RD&CT cost sharing’ of 9 February 2026, submitted by the TSOs of Czech Republic, Slovenia, Belgium, Croatia, Hungary, Poland, Slovakia and Austria (hereinafter ‘8 TSOs’ Non-paper’). This position supports the use of the PFC method.
- (61) In the following subsections, ACER provides a detailed analysis and reasoning with regard to the flow decomposition approach. In order to group specific sub-topics relevant for flow decomposition, ACER has mainly followed the structure of the considerations set out in the TenneT Non-paper, with further reference to related paragraphs of the action for annulment submitted by TenneT TSO GmbH and TenneT TSO BV in case T-482/21 (hereafter ‘TenneT Action for annulment’), as well as the related paragraphs of the judgement in case T-482/21, while also considering the 8 TSOs’ Non-paper.
- (62) The following sub-sections analysing flow decomposition are organised as follows:
- (a) Section 5.3.2.2 ‘Legal background and definitions’ analyses provisions of the Electricity Regulation relevant for defining the notion of electricity transactions, and its consequential flow components;
 - (b) Section 5.3.2.3 ‘Candidate flow decomposition methods’ introduces the two flow decomposition methods proposed by the Core TSOs (FLD and PFC), and their applied principles in defining origins of flow components;
 - (c) Section 5.3.2.4 ‘Consideration of net positions’ analyses the applicability of bidding zone net positions for the flow decomposition process;

¹¹ TenneT TSO BV’s and TenneT TSO GmbH’s joint submission, ‘Revision of the RDCTC Cost Sharing Decision – Flow Decomposition Method’, provided on 12 November 2025, is in essence incorporated in and further elaborated by the TenneT Non-Paper. To avoid duplication, this joint submission has been considered in the context of the assessment of the TenneT Non-Paper. ACER’s respective considerations in section 5.3.2. apply accordingly to this joint submission and, thus, also with regard to TenneT TSO GmbH.

- (d) Section 5.3.2.5 ‘ENTSO-E flow definitions’ matches the definitions of flow components with the FLD and PFC methods;
- (e) Section 5.3.2.6 ‘Usage of GSK (GLSK)’ explains the role and suitability of the application of GSK/GLSK in the flow decomposition;
- (f) Section 5.3.2.7 ‘Zonal market model and physical reality’ analyses the conformity of the candidate flow decomposition methods with the European zonal market model and physical reality;
- (g) Section 5.3.2.8 ‘Consideration of HVDC elements’ analyses the flow decomposition over the HVDC elements and its influence on the surrounding alternating current (AC) networks;
- (h) Section 5.3.2.9 ‘Consistency with other methodologies’ analyses consistency of the flow decomposition methods with the relevant Core and pan-European methodologies: capacity calculation and allocation, 70% target monitoring, congestion income distribution, and coordinated regional operational security assessment (CROSA);
- (i) Section 5.3.2.10 ‘Other relevant elements’ provides feedback to additional relevant elements provided in the TenneT Non-paper;
- (j) Section 5.3.2.11 ‘Hearing: the flow decomposition methods’, provides inputs by Core regulatory authorities and TSOs and ACER feedback provided during the hearing period;
- (k) Section 5.3.2.12 ‘Conclusion on the flow decomposition method’, provides ACER’s conclusion on the selection of the flow decomposition method.

5.3.2.2. Legal background and definitions

- (63) Article 2(65) of the Electricity Regulation defines ‘bidding zone’ as *‘the largest geographical area within which market participants are able to exchange energy without capacity allocation’* (emphasis added).
- (64) Article 2(66) of the Electricity Regulation defines ‘capacity allocation’ as the attribution of cross-zonal capacity.
- (65) Article 16(8) of the Electricity Regulation stipulates that *‘Transmission system operators 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 [...]’* (emphasis added). Moreover, this article requires *‘[...] the minimum levels of available capacity for cross- zonal trade [...]’ of 70 %, while ‘The total amount of 30 %*

can be used for the reliability margins, loop flows and internal flows on each critical network element' (emphasis added).

- (66) Article 16(13) of the Electricity Regulation requires an identification '[...] to what extent flows resulting from transactions internal to bidding zones contribute to the congestion between two bidding zones observed, and allocate the costs based on the contribution to the congestion to the transmission system operators of the bidding zones creating such flows ...' (emphasis added).
- (67) Articles 2(65), 16(8) and 16(13) of the Electricity Regulation refer to 'transactions' and 'trade' as conscious activities of market participants. In the European zonal market model these transactions can be bilateral (e.g. 'over the counter' trade where source and sink pairs are known (at least on the level of portfolio, i.e. not always on nodal level), or more commonly unilateral, where only the source or the sink is known (again, on portfolio level), and trade is performed with a buy or sell order toward (i.e. via) a commonly agreed hub (e.g. at day-ahead and intraday market coupling).
- (68) Further, from the above listed provisions of the Electricity Regulation it is clear that:
- (a) transactions internal to bidding zones:
 - i. are not limited by the capacity allocation; and
 - ii. create loop flows and internal flows, which are considered as primary polluters and for which the resulting congestion management costs are to be borne by the TSOs creating those flows.
 - (b) transactions external to bidding zones (i.e. cross-zonal trade):
 - i. require allocation of cross zonal capacity; and
 - ii. create allocated flows.

5.3.2.3. Candidate flow decomposition methods

- (69) The FLD method pairs source and sink injections/withdrawals among all nodes of the considered network without splitting beforehand each source and sink injection/withdrawal that would cause internal and cross-zonal components of flows. The inter-nodal exchanges are traced by the Bialek method¹². The FLD method involves multiplying nodal PTDF factors with the node-to-node exchanges obtained through the Bialek flow-tracing algorithm. This algorithm relies on the 'perfect mixer'

¹² Bialek, Tracing the flow of electricity, J. Bialek, IEE Proc.-Gener. Transm. Distrib., vol. 143, pp. 313-320, July 1996.

assumption for which at any node the inflows are proportionally distributed among the outflows. Then the bidding zone borders are considered, and the flow types are determined at individual network elements, by appointing and summing up the flow contributions according to the flow type definitions for loop flows, internal flows and allocated flows.

- (70) The PFC method splits injections and withdrawals from the common grid model ('CGM') into the injections/withdrawals reflecting cross-zonal transactions and the injections/withdrawals reflecting electricity transactions internal to bidding zones. This splitting is based on a generation and load shift key ('GLSK') already applied during the capacity calculation, which determines the share of the net position (i.e. total export or import of a bidding zone) that is attributed to each individual node and thereby determines source and sink injections/withdrawals reflecting the cross-zonal exchanges. The difference between total injections/withdrawals and the injections/withdrawals related to cross-zonal exchanges then represents the injections/withdrawals related to internal exchanges. The allocated flow is calculated by multiplying the injections/withdrawals related to cross-zonal transactions with nodal power transfer distribution factors (PTDF) and summing up contributions from all nodes in all bidding zones per relevant network element. Internal flows and loop flows are determined by multiplying the injections/withdrawals related to internal transactions with corresponding nodal PTDFs and summing up contributions from all nodes per each bidding zone per relevant network element.
- (71) The impact of high voltage direct current ('HVDC') network elements is also modelled differently in the two methods.
 - (a) with the FLD method, both internal and cross-zonal HVDC network elements are considered to transport a combination of internal and cross-zonal transactions and thereby can influence all types of flows in surrounding AC networks;
 - (b) with the PFC method, the cross-zonal HVDC network elements are assumed to transport only cross-zonal exchanges and thereby influence only the allocated flows in surrounding AC networks. The internal HVDC network elements are assumed to transport only internal transactions and consequently influence the internal and loop flows in surrounding AC networks.
- (72) The determination of flows caused by phase shifting transformers (i.e. PST flows), which are calculated with the use of the phase shifter distribution factors ('PSDFs') is performed in the same way by both methods. The PSDF expresses the impact of a change of one tap of a PST on a flow of a network element. The PST flow is calculated by multiplying each PST's tap position with the corresponding PSDF and then summing up all contributions from all PSTs into a single PST flow.

5.3.2.4. *Consideration of net positions*

- (73) In its Non-paper, page 3, TenneT TSO BV refers to its appeal before the BoA in 2021 and its concerns regarding net position restrictions: *'The PFC Method applies certain assumptions to bidding zone net positions to restrict the decomposition of flow components, most notably of import/export flow, loop flow, internal flow and transit flow. These assumptions, however, effectively disable the consideration of the electrical distance, the recognized physical principle of least resistance as part of Kirchhoff's law. Instead, depending on the net position of the bidding zones, the PFC Method permits the decomposition of import/export flow, loop flow, internal flow and transit flow in contrast to the physical reality of the transmission grid.'*¹³
- (74) As explained in Section 5.3.2.7, a flow decomposition method suitable for tracing polluter flows in a zonal market model has to consider a simplification inherent to that model, namely allowing unlimited internal transactions to be realised without allocation – which is the very cause of having the polluter flows. These polluter flows cannot be controlled by cross-zonal capacity calculation, and consequential congestions have to be remedied by remedial actions, including redispatching and countertrading. Applying a physical reality approach to the phase of the electricity market operation where this reality is not fully respected (i.e. before recognising causes of legitimate allocated flows and polluter flows) would mask the causes of the pollution (i.e. internal, non-allocated transactions).
- (75) Further, modelling market reality entails recognition of causes of non-polluting, allocated flows, and potentially polluting internal and loop flows (being unlimited due to absence of allocation of internal transactions and thus creating congestions not controllable by the processes of capacity calculation and allocation).
- (76) Finally, such a recognition of causes of allocated flows allows to analyse the influence of allocated transactions through the value of bidding zone net position, because an aggregated effect of all cross-zonal transactions is equivalent to the net position of a bidding zone. Accordingly, ACER considers the usage of net position in flow decomposition by the PFC method as appropriate.
- (77) On the other hand, the FLD method aims at detecting cross-zonal transactions without consideration of bidding zone net positions. The FLD method can be split in three logical phases, where the first phase (detecting pairs of nodes) makes the method unapplicable for the flow decomposition for redispatching and countertrading cost sharing:

¹³ In the same context: TenneT Action for annulment, paras. 103-112; T-482/21, para. 189.

- (a) Phase 1: The FLD method considers each node separately, and thus practically takes each node's net position (injecting/withdrawing electricity) as a decisive input to pairing nodes for flow decomposition, disregarding the fact that the net positions of the nodes are a result of the zonal market outcome (and thus they are largely interdependent);
 - (b) Phase 2: Further on, the FLD method analyses inter-nodal exchanges and consequential inter-nodal flow on the basis of nodes' closeness;
 - (c) Phase 3: Finally, the FLD method considers bidding zone borders only at the end of the process to attribute the flow types to particular flows among node pairs.
- (78) By considering nodes separately as market areas in the zonal market, the FLD method establishes node pairing where each generation node corresponds with each load node. As a consequence, the FLD method ignores the fact that the node's net position is an outcome of complex market activities on zonal level, where one part of that activity (internal transactions) creates polluter flows (loop and internal flows). Consideration of electrical distance (phase 2) and appointment of flow types to flow components once bidding zone borders are considered (phase 3) are not fundamentally flawed ; the flawed selection of pairs of nodes in the first phase of FLD which disregards zonal market reality is the main issue. The FLD method applies tracing of flows by pairing the sources and sinks of non-existing market transactions. Therefore, after the first faulty phase, the later phases also cannot provide correct result.
- (79) A simple test can be made in order to determine the response of both candidate methods towards the existence of allocated transactions and consequential allocated flows: in a situation where net positions of all bidding zones would be zero (when there are no cross-zonal transactions, or when aggregated effect of all cross-zonal transactions would be zero), there should be no allocated flows. In such a case (see Figure 1 below):
 - (a) the PFC method consistently calculates zero allocated flows;
 - (b) the FLD method could also result in non-zero allocated flows.

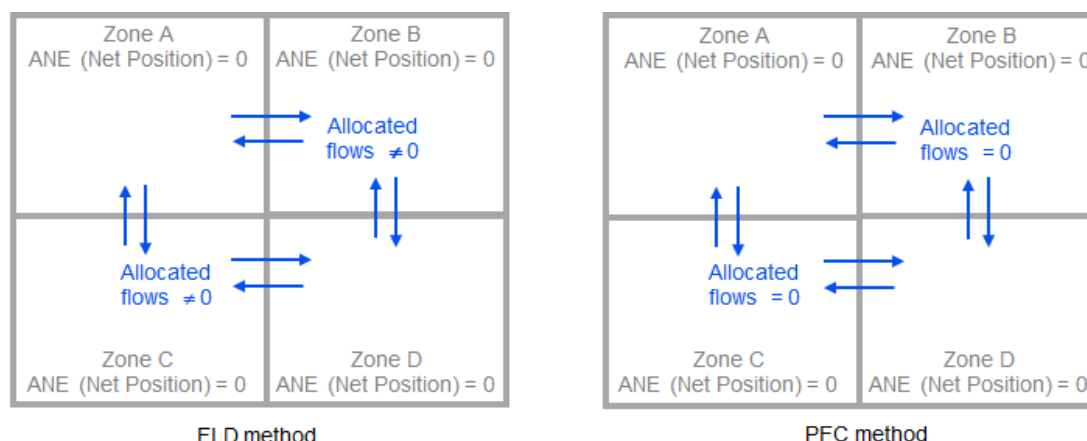


Figure 1: Existence of allocated flows in the situation without allocated transactions (zero Net Positions)

- (80) Therefore, the assumptions made by the PFC method on the usage of net positions correspond to their origin (cross-zonal allocated transactions which are not responsible for loop flows and internal flows) and they fully correspond to the European market model and to physical reality to the extent to which this market model corresponds to physical reality.
- (81) In that regard, TenneT TSO BV also claims that ‘the PFC method tends to identify loop flows that do not actually exist’¹⁴. However, any loop flow calculation is a mathematical construct and there is no possible approach to determining how high the loop flows actually are. Since there is no universal reference to the size of loop flows, TenneT TSO BV’s claim obviously stems from the size of loop flows calculated by the FLD method. On the other hand, the above simple test with zero net positions also demonstrates that an FLD-based reference must be faulty: it creates artificial allocated flows out of a portion of loop flows. Consequently, on such a basis it cannot be claimed that the PFC method creates loop flows that do not exist. It is also not true with regard the treatment of internal HVDC lines (see Recital (113)).
- (82) In Recital (79), it has been shown that the FLD method creates allocated flows that do not exist, thus deflating loop flows. Such an approach conflicts directly with the polluter-pays principle required by Article 16(13) of the Electricity Regulation. Applying the FLD method would ignore the simplifications inherent in the zonal market model (which are the very reason for the existence of loop flows) and lead to an

¹⁴ T-482/21, para. 189.

overestimation of allocated flows at the expense of loop flows. Such an approach disrespects the polluter-pays principle.

5.3.2.5. *ENTSO-E flow definitions*

- (83) In its Non-paper, page 12, TenneT TSO BV claims that the FLD method identifies internal flow, loop flow, import/export flow and transit flow in accordance with the ENTSO-E document on Flow Definitions¹⁵.
- (84) However, this ENTSO-E document, page 2, states:
- (a) *‘Aggregated Netted External (ANE) Schedule means a Schedule representing the netted aggregation of all External TSO Schedules and External Commercial Trade Schedules between two Scheduling Areas or between a Scheduling Area and a group of other Scheduling Areas.’*
 - (b) *‘Aggregated Netted External (ANE) Schedules create Transit Flows and/or export/import flows in a meshed AC interconnection. The sum of these flows on a border are the Allocated flows.’* (emphasis added).
- (85) The ANE Schedule corresponds to the Net Position of a bidding zone, and represents aggregated schedules, i.e. commercial exchanges, not accidental exchanges among groups of nodes determined by their closeness. As, according to ENTSO-E, these schedules create allocated flows (sum of export/import and transit flows, which is not disputable), it is not possible that allocated flows exist where all net positions are zero. This principle is:
- (a) respected with the PFC method, as multiplication of net positions and PTDFs provide zero allocated flows;
 - (b) not ensured with the FLD method, where determining transactions purely on nodal distance can create cross-zonal transactions even when net positions are zero.

5.3.2.6. *Usage of GSK (GLSK)*

- (86) In its Non-paper, page 3, TenneT TSO BV refers to its claims regarding the PFC method’s ‘Use of GSKs’ which it raised in the course of the appeal before the BoA in 2021: *‘It also operates GSKs based on the superposition principle, rather than on implementing electrical distance. The superposition principle implies an "Unbalanced Model" and a "Zero Balanced Model" which artificially forces all exchanges to take*

¹⁵ ENTSO-E (2015), “Joint Task Force Cross Border Redispatch - Flow Definitions”.

*place in the same zone despite the electricity crossing the zonal "borders". This is based on the counterfactual assumption that bidding zones cover their demand solely by internal generation. A direct connection is thereby assumed by ACER for the sale of electricity on the markets, rather than for the physical flows.*¹⁶

- (87) In order to align the flow decomposition with both the European zonal market model and physical reality, it is necessary to determine the effect of a) transactions that create allocated flows and b) the transactions that create loop and internal flows. As in the meshed network with predominant trade towards the hub (within the market coupling process) there are no unanimously known pairs of nodes sources and nodes sinks creating particular transactions. A meaningful way to disentangle these two groups of transactions is provided with the PFC method: When summed up, the cross-zonal allocated transactions provide the net position of a bidding zone. Based on the generation (and load) shift key ('GSK', or 'GLSK') pattern consistently used in flow-based capacity calculation in the Core region, the PFC method determines a portion of injections and withdrawals responsible for cross-zonal trade and consistently calculates related allocated flows. Remaining injections and withdrawals within each bidding zone (which sum up to zero, since the net position-related portion of injections/withdrawals has already been separated), represent sources and sinks of internal transactions (not allocated cross-zonally), which result in loop and internal flows.
- (88) Applying the GLSK within the flow decomposition is consistent with the capacity calculation process since the same GLSK is applied in capacity calculation of the Core CCR. However, ACER considers that the GLSK is not applied in the PFC method with an intention of mimicking the capacity calculation. In the absence of exact information which nodes of a bidding zone participate in cross-zonal exchanges (exporting or importing electricity), the GLSK represents an expected pattern of injections/withdrawals which physical output depends on the day-ahead and intraday cross-zonal market outcome. By customising the nodes and its share key within GLSK, the TSOs can omit the inclusion of those injections/withdrawals whose output is largely independent of the market outcome, i.e. which serve national demand (such as must-run units).
- (89) As already explained in Sections 5.3.2.2 and 5.3.2.4, the situation after the capacity allocation at day-ahead and intraday level results in concrete amounts of electricity traded internally and across the border, however still without the information on distinct source and sink nodes for internal and for cross-zonal transactions. For the capacity calculation the TSOs estimated the response of particular nodes of their bidding zones to the export/import position, through GLSK. Accordingly, the consideration of the

¹⁶ In the same context: TenneT Action for annulment, paras. 111-124 and 130-132; T-482/21, paras. 200, 201 and 215.

GLSK applied at capacity calculation in order to disentangle sources and sinks of internal and cross-zonal transactions (in aggregated form, not per each transaction) is a logical and consistent choice by the PFC method. It is moreover suitable, as the GLSK does not impose a fixed pattern in megawatts but rather a percentage appointed to each considered network node. Hence, the percentual participation of nodes in cross-zonal exchanges applied by the PFC method at the flow decomposition is consistent with the percentages applied during capacity calculation, while absolute megawatt output per nodes results from the day-ahead and intraday market results.

- (90) On the other hand, by ignoring the need to separate the injections/withdrawals originating from internal and external transactions – for which usage of the zonal GLSK used in the capacity calculation is a correct approach – the FLD method implicitly creates another form of a trivial, ‘nodal’ GLSK, where each generation node sends electricity to each load node (in the amount which considers the distance between the nodes). This form of pairing sources and sinks is a design choice of the FLD method. The FLD method’s approach perhaps might be useful for tracing the nodal origins of the total physical flow (which is agnostic to bidding zone borders), but it fails to properly detect the flow components relevant for the zonal electricity market.
- (91) In that context, in its Non-paper, page 3, TenneT TSO BV further claims that the PFC approach ‘is based on the counterfactual assumption that bidding zones cover their demand solely by internal generation’.
- (92) First, ACER disagrees with that claim because bidding zones cover their internal demand only in case a bidding zone has excess generation (injection) that can satisfy internal demand (withdrawal) as well as exports. Second, ACER emphasises that the modelling approach where generation first covers internal demand and only excess generation is exported is not unique to the PFC method as it is applied in all congestion management methods used in zonal electricity markets (capacity calculation, capacity allocation). Thus, the PFC method models the effects of cross-zonal trade by defining the cross-zonal trade between excess generation in exporting bidding zones and excess demand in importing bidding zones. When it comes to assessing which generators are exporting, the GLSK is applied.
- (93) It should also be noted that, in order to fully align the original PFC method (as referenced under Recital (69)) with the Core capacity calculation principles, it was necessary to amend its application of the GLSK, requiring the same GLSK as applied for the Core capacity calculation, instead of applying generation shift for exporting zones and load shift for importing zones. This is because the cost sharing methodology aims to estimate the allocated flow which is a (component of the) physical flow arising from cross-border trade and this component must be the same as the allocated flow used in capacity calculation and capacity allocation. Wherever it would be needed to adjust the calculation to the cross-zonal exchange pattern of a particular bidding zone, such adjustment should be done by altering the GLSK file. The GLSK file allows both generation (injections) and load (withdrawals) to be included. This ensures that the

nodes (and their participation factors) which create allocated flows are the same in capacity calculation and cost sharing. To this end, a different GLSK could be used for hours when significant export or import of a bidding zone is expected (for smaller net positions the influence of GLSK is not essential). In this way, the effect of linearization inherent in the usage of GLSK (equivalent GLSK pattern is applied for both exports and imports to maintain linearity of PTDF calculation), would be mitigated. Even apart from the application of GLSK for the flow decomposition, it is necessary that the TSOs adjust their GLSK data according to the forecasted net position of the concerned bidding zone for the needs of the capacity calculation process. Alignment of the forecasted net position with GLSK data will contribute to the correctness of the PTDF values calculated on the basis of the GLSK during the capacity calculation. The situations where GLSK values shaped for exporting net position are used in the hours with net imports (and vice versa) will be minimised. Therefore, ACER proposes to the Core TSOs to adjust the GLSK application in a way that would mitigate the concerns for importing bidding zones, i.e. to use a different GSK when a net position is expected to be significantly importing and when significantly exporting.

- (94) ACER considers that the data quality improvements of the GLSK methodology or its application proposed in the previous Recital would minimise the possibility of distorted results at both capacity calculation and flow decomposition. The Core TSOs are encouraged to further work on mitigating any potential inconsistency.

5.3.2.7. Zonal market model and physical reality

- (95) In its Non-paper, page 4, TenneT TSO BV further relies on the following objection, which it submitted in the appeal proceedings before the BoA in 2021: *‘No justification of the PFC Method due the zonal market model: In addition, ACER’s and the BoA’s references to the zonal market model do not explain why counter-physical results must be accepted contrary to the requirement to reflect physical reality (TenneT Judgment, para. 204 et seq.). The EGC rightfully considered that it is not “apparent” that discarding electrical distance is inherent in the zonal model, on which the electricity market in the European Union is based, and that a zonal model does not allow electrical distance to be taken into account’*^{17, 18}.
- (96) In order to understand why and how both market and physical reality have to be taken into account at flow decomposition, it is important to understand the following fact:

¹⁷ In the same context: TenneT Action for annulment, paras. 129 and 137-138; T-482/21, paras. 189 and 204-212.

¹⁸ TenneT TSO BV uses ‘EGC’ as an acronym for the General Court of the European Union.

During the capacity allocation phase, the European zonal market model¹⁹ partially ignores physical reality as it allows infinite internal trade within each bidding zone (see Recital (63)). Thus, internal trade may compromise the outcome of capacity allocation based on previous capacity calculation and may create congestions as the internal trade is not controllable by cross-zonal capacity allocation. Consequently, the above simplification is the very origin of the polluter flows in the context of redispatching and countertrading cost sharing, and the main reason why the corrective actions are necessary (application of the CROSA process with nodal resolution, further explained in Section 5.3.2.9.4).

- (97) The total active physical flow through each network element is the only quantity that directly reflects the physical reality of the power system²⁰. Its best-known simulation for symmetrical power systems is the AC load flow, while linearised, direct current ('DC') load flow is an approximation used when linearity is needed (as is the case with flow decomposition). Any decomposition of the total physical flow is a mathematical construct. Its result depends on the selection, i.e. pairing of source (injection) and sink (withdrawal) nodes. Further, source and sink nodes must be paired according to the purpose of the flow decomposition, for instance mapping remedial actions to congested network elements, inter-TSO compensation for losses, or decomposing flows in zonal markets for sharing the redispatching and countertrading costs (which is the case in this process).
- (98) Both the FLD and the PFC method impose particular assumptions in pairing source and sink nodes for flow decomposition. The fact that the FLD method pairs all generation nodes with all load nodes independently might appear as suitable for tracing the origins of total physical flow, without observing nodal outputs as a result of zonal market activities. Theoretically, if its approach of pairing sources and sinks makes the FLD method suitable for tracing the nodes originating the total physical flow, it also makes it not suitable for tracing the allocated, internal and loop flows within and by the zonal market. Rather, the opposite.
- (99) By first disentangling the origins of external (allocated) and internal (non-allocated, unlimited) transactions of bidding zones, the PFC method fully respects the zonal nature of the European market model as applied in the capacity allocation phase, including its deviation from physical reality. Once this disentangling has been ensured, and from that

¹⁹ See Estermann/Schrade/Anderson, European Electricity Market Coupling – A Practitioner's Guide (2025), available at: <https://library.oapen.org/bitstream/handle/20.500.12657/103554/1/9783031863158.pdf>, in particular pages 13-15.

^T The reactive power flow, voltage, voltage angle, frequency and power quality are not relevant in the context of flow decomposition.

point onwards, the physical reality and electrical distance are taken into account, as it is done with the PFC method.

- (100) Kirchhoff's laws apply fully for the total physical flows per elements, as well as for the flows within the separated 'balanced model' and 'exchange model' of the PFC method. However, Kirchhoff's laws are not mirrored in the European market model during capacity allocation (electricity transactions within the bidding zones are treated as they have no electrical distance, ignoring network reality). Therefore, before applying these laws, it is necessary to model the reality of the European market model. This requirement is achieved by the PFC method and completely ignored by the FLD method, by insisting solely on alleged physical reality.
- (101) The market model without the above simplification would be nodal market (as the one applied in the United States). In such a market each node represents a bidding 'zone', and it is possible to fully align market transactions with physical reality as all transactions are allocated and cause allocated flows. Any potential transactions internal to a bidding zone (i.e. node) are immediately netted and their consequential flow does not leave the node. However, for the same reason the nodal market has no loop or internal flows – so there would be no need to trace these flows as contributors to congestions.
- (102) Another theoretical case would be a zonal market with the network of only controllable elements such as HVDCs. In such a case there would also be no polluting flows²¹ as all electricity transactions (external or internal) would be exactly matched with physical flows by adjusting the setting of the controllable elements. Logically, in a system without free-riding AC flows, there would be no need for remedial actions to fix the outcome of capacity calculation and allocation, nor related costs of these remedial actions, and thus no need for cost sharing.
- (103) After the separation of the injections/withdrawals responsible for allocated flows and those for internal and loop flows, the PFC method applies the calculation of flow components by multiplying corresponding nodal injections/withdrawals with PTDF factors – the solution fully corresponding to linearised, DC load flow. The load flow calculation is a standard and maximally accurate applicable representation of physical reality (including electrical distance) in quasi-stable transmission networks. It relies on electrical parameters, i.e. admittances of modelled network elements, fully respecting Kirchhoff's laws. The DC load flow is a linear approximation of the AC load flow,

²¹ There would be only allocated flows at cross-zonal HVDCs and internal flows at internal HVDCs; however, the latter ones would not be polluters as they are controlled and there is no AC network to be polluted.

suitable for the implementation for flow decomposition due to its linearity, which ensures the additivity of PTDF factors ($PTDF_{a \rightarrow b} = PTDF_{a \rightarrow c} + PTDF_{c \rightarrow b}$).

- (104) By contrast, the FLD method applies the Bialek method for pairing sources and sinks and for further flow decomposition. ACER explained the non-compatibility of such an approach for pairing sources and sinks with the European market model in section 5.3.2.4 Further, the FLD approach, as specified in Recital (69), does not properly reflect physical reality, in particular electrical distance²², as the attribution of flow components is based on a tracing algorithm that does not take into account network impedances. Instead, it relies on the convention of the perfect mixer principle, whereby inflows at each node are assumed to be proportionally distributed across all outgoing network elements, and on nodal distance (i.e. the number of nodes between an assumed source and sink), without considering the physical parameters of network elements²³.
- (105) Once the sources and sinks of allocated flows as well as loop and internal flows are determined according to the PFC method, the Bialek approach could be one of the options for further decomposition of allocated flows to their origins (to export/import flows and transit flows, or even further, towards the TSOs which are sources and sinks of a particular portion of allocated flow). However, the Core cost sharing methodology does not require such further decomposition of allocated flows, because potential costs from all allocated flows are attributed to the XNE-owning TSO. In other words, the proportion between import/export flows, on the one hand, and transit flows, on the other hand, will have no impact on the cost distribution as it will always be the owner of the congested network element which will bear the costs of the remedial actions implemented to solve the congestion caused by these two types of allocated flows. Finally, if such a decomposition of allocated flows becomes necessary for some other methodology (e.g. Inter-TSO compensation for losses originated by allocated flows), it could be possible to consider the Bialek method as a candidate approach, once improved with consideration of electrical distance (as explained in the footnote of Recital (104)). This improvement could be achieved through a better representation of physical reality,

²² See Cijssouw et al., Computing a Nodal Power Exchange Matrix based on a Nodal Reactance Matrix, 21st Power Systems Computation Conference(Porto, June 2020), Figure 5.

²³ According to information available to ACER, a later version of the FLD method - described in Cijssouw et al. "Computing a Nodal Power Exchange Matrix based on a Nodal Reactance Matrix", 21st Power Systems Computation Conference (Porto, June 2020) - introduces an improved consideration of network parameters through the so-called Proximity approach, which constructs a PEX matrix in which exchanges between generators and loads are determined by their electrical proximity (i.e. inverse equivalent reactance) and adjusted by scaling factors to ensure consistency with total generation and load. However, this improvement does not remedy the fact that the application of flow decomposition has to mirror market reality, besides network reality, as explained in Recitals (95) - (100).

namely by considering the actual physical parameters of the transmission network instead of nodal distance.

- (106) In accordance with the above, the 8 TSOs' Non-paper, page 10, explains: 'The application of the PFC method is fully consistent with the European regulatory framework, the key regulatory principles outlined above, and other established methodologies. It explicitly considers the European zonal market design while ensuring that flows resulting from internal transactions are calculated through DC load-flow analysis, rather than derived from purely mathematical constructs. As a result, the PFC method ensures a coherent and transparent treatment of flows across all relevant processes, delivering methodologically consistent and regulation-compliant outcomes throughout.'
- (107) To conclude, taking into account electrical distance before disentangling the transactions that are the origin of flows, would yield results incompatible with the EU market design. Such results do not properly respect the polluter-pays principle as required by the Electricity Regulation. Furthermore, the FLD method based on the Bialek approach does not take electrical distance into account, whereas PFC does, given that after disentangling the transactions the load-flow results are based on DC load-flow calculation, which represent an exact physical calculation of flows rather than a tracing approximation.

5.3.2.8. *Consideration of HVDC elements*

- (108) In its Non-paper, page 4, TenneT TSO BV refers to the following objection, which it submitted in the appeal proceedings before the BoA in 2021: *'Assumptions and restrictions related to HVDC network elements: ACER introduced restrictive assumptions to HVDC lines which upfront define what types of flow are exchanged. The types of flow exchange via HVDC lines are not based on any calculation and treated as such in a different way as AC lines. However, the HVDC lines are controllable in the direction and magnitude of the exchange, the origin and destination of the electricity is not controllable. Next to that exchanges via HVDC lines are not determined based on electrical distance, these principles are discriminatory.'*²⁴
- (109) The PFC method considers that cross-zonal HVDCs carry allocated flows and internal HVDCs carry internal flows. On the contrary, the FLD method considers that both cross-zonal and internal HVDCs can transport any type of flow.
- (110) ACER considers that the treatment of flows at HVDCs applied by the PFC method fully corresponds to the nature of HVDCs (as controlled network elements) and their usage

²⁴ In the same context: TenneT Action for annulment, paras. 151-157.

within the European zonal market model. The PFC method focuses on the effect of internal and cross-zonal HVDCs to the polluter flows, in line with both the European market model, and physics – respecting Kirchhoff's laws.

- (a) Internal HVDCs do not operate based on capacity allocation. The flows on these network elements are independent of capacity allocation and TSOs usually use these elements in a way that minimise congestions in the surrounding AC network within such bidding zones. It would be non-realistic for internal HVDCs to carry or cause allocated flows since they are never allocated (there is no allocation within a bidding zone). It needs to be noted that, although internal HVDCs carry internal flows, such an internal flow is not 'polluting' the HVDC carrying it, as the HVDC elements can never be overloaded (as their flow is controlled by the TSO). Therefore, the internal flow on a HVDC is not an issue for the cost sharing.
 - (b) On the other hand, cross-zonal HVDCs operate completely in line with capacity allocation, which means that the flow they transmit is exactly equal to the volume of the allocated capacity. There can be no loop flows (uncontrolled by its nature) at cross-zonal HVDCs, as the HVDC flow is fully controlled by the operating TSOs. Each megawatt allocated over the cross-zonal HVDC is realised in exactly the same amount due to the controllability of the HVDC.
- (111) In its Non-paper, page 11, TenneT TSO BV also claims: *'...Assuming that internal HVDC lines are only for national produced electricity (internal flows) is restrictive and discriminatory. HVDC lines are controllable in the direction and magnitude of the exchange, the origin and destination of the electricity is however not controllable. It is impossible to distinguish between the origin of electrons/electricity and this limitation ignores the physical properties (electrical distance) of the network which at the end determines the path of the physical flows. It is further not compliant with Article 31 EU Regulation 2019/943, where market participants shall have a right to obtain access to the transmission networks and distribution networks on objective, transparent and non-discriminatory terms.'*
- (112) This claim of TenneT TSO BV is incorrect as the PFC method does not focus on the origins of electrons/electricity in assigning the flows on internal HVDC, but on the sources and sinks of electricity transactions realised over internal HVDCs, which can only be internal transactions. Finally, while it is correct that market participants should have a right to obtain access, the market participants who obtained access to only cross-zonal exchanges at a certain allocation round do not have a part in creating internal flows, neither on AC nor on HVDC links. Accordingly, they are not discriminated.
- (113) By considering the flows flowing to and from the HVDCs as internal flows in the surrounding AC network, the PFC method correctly recognises the effect that HVDCs have on the AC network. The internal HVDCs represent a bridge over the internal AC network, carrying the flows to another part of that network. Such an internal flow decreases internal flows in the surrounding internal network (and loop flows in the

neighbouring network), which is the main purpose of an internal HVDC. The FLD method fails to recognise the effect of internal HVDC lines in decreasing internal and loop flows in the surrounding AC network. Therefore, and contrary to TenneT TSO BV's claim that '*the PFC method tends to identify loop flows that do not actually exist*'²⁵, the fact is that, with its treatment of HVDC lines, the FLD method inflates internal and loop flows in the surrounding AC network.

- (114) As explained before, the treatment of the HVDC elements by the PFC method is a design with full awareness of the purpose and the operation principles of the HVDCs within the meshed AC network, as well as with the correct understanding of the effects of HVDCs in (mitigation of the) polluter flows in the AC network. The effect of the cross-zonal HVDCs is having controlled flows across the border in line with the allocation outcome, thereby not contributing to the pollution with loop flows. The effect of internal HVDCs is bypassing the AC network within a bidding zone which, by taking over the internal flows, reduces the pollution by the internal flows in the internal AC network and the loop flows in the neighbouring networks.

5.3.2.9. Consistency with other methodologies

5.3.2.9.1. Consistency with the Electricity Regulation and Core capacity calculation methodology

- (115) Core flow-based capacity calculation applies the so-called zero balance principle, where 'zero exchange' (or "zero balance") flows are calculated as:

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

$\vec{F}_{ref}$ flow per CNEC in the common grid model (CGM)

$\vec{F}_{0,all}$ 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 of other synchronous areas

$\mathbf{PTDF}_{all}$ power transfer distribution factor matrix for all bidding zones in Continental Europe and all Core CNECs

$\overrightarrow{NP}_{ref,all}$ total net positions per bidding zone in Continental Europe included in the CGM

- (116) Further, Core capacity calculation defines the approach to reach the 70% requirement pursuant to Article 16(8) of the Electricity Regulation. Accordingly, the value of the

²⁵ T-482/21, paras. 189.

capacity available for cross zonal trade has to be at least 70% of the maximum flow of a CNEC. The equations from the Core capacity calculation for calculating Remaining Available Margin (RAM) and unscheduled allocated flow (F_{uaf}) are:

$$RAM + F_{uaf} \geq R_{amr} \cdot F_{max}$$

$$RAM = F_{max} - FRM - F_{0,Core}$$

$$\vec{F}_{uaf} = \vec{F}_{0,Core} - \vec{F}_{0,all}$$

FRM Flow Reliability Margin

$\vec{F}_{0,Core}$ flow per CNEC in the situation without commercial exchanges within the Core CCR and without commercial exchanges on advanced hybrid coupling borders

R_{amr} minimum RAM factor (equal to 70% unless the derogation is approved)

(117) From the above equations it can further be deduced:

$$RAM + F_{uaf} = F_{max} - FRM - F_{0,Core} + F_{uaf} = F_{max} - FRM - F_{0,all} \geq R_{amr} \cdot F_{max}.$$

(118) The equation $F_{max} - FRM - F_{0,all} \geq 70\% F_{max}$ corresponds to the requirement of Article 16(8) of the Electricity Regulation, as:

- ‘The margin shall be 70 % of the capacity respecting operational security limits of internal and cross-zonal critical network elements, taking into account contingencies’, and
- ‘The total amount of 30 % can be used for the reliability margins, loop flows and internal flows on each critical network element.’

(119) As can be seen from point (b) of the previous Recital, the value of $F_{0,all}$ corresponds to the sum of loop flow and internal flow; together with the reliability margin (FRM) its total amount can be a maximum of 30 % at each CNEC.

(120) Article 16(3)(d)(vii) of the Core day-ahead capacity calculation methodology²⁶ specifies: ‘the loop flow on each cross-zonal CNEC, which is equal to $F_{0,all}$ calculated pursuant to Article 17(3)...’. This sentence confirms that, as there is no internal flow at

²⁶ Annex I of ACER Decision No. 02/2019

a cross-zonal CNEC, the $F_{0,all}$ is identical to the loop flow on such a CNEC. It is in particular relevant for the example provided under Recital (123).

- (121) It is essential to underline that the value of $F_{0,all}$ (loop flows and internal flows as considered in Core capacity calculation) is equivalent to the loop flows and internal flows as calculated with the PFC method, under the assumption that the same GLSK principles are applied. Therefore, the PFC method is fully consistent with the definition and consideration of loop flows and internal flows in both the Core capacity calculation methodology and the 70% requirement stemming from Article 16(8) of the Electricity Regulation.
- (122) On the other hand, if loop flows and internal flows are calculated according to the FLD method, these loop and internal flows are different and inconsistent with the ones calculated within the Core capacity calculation methodology – unanimously applied by all Core TSOs, including those supporting the FLD method for flow decomposition. The 8 TSOs' Non-paper confirms this inconsistency (see Section 5.3.2.9.5).
- (123) The results of the Core capacity calculation and TenneT TSO BV's request for a derogation from the 70% target provides an illustration of inconsistency when mixing zero balance principles applied in Core capacity calculation (equivalent to the PFC method), and applying the FLD method for the assessment of loop and internal flows:
- (a) TenneT TSO BV accepts and applies the zero balance principles applied for $F_{0,All}$ calculation by the central capacity calculation tool to calculate its initial position with regard the fulfilment of the 70%. For the interconnections (listed in the example below) there are no internal flows, so $F_{0,all}$ corresponds to loop flows;
 - (b) On the other hand, TenneT TSO BV applies the FLD method to calculate loop flows ('LFcalc'), in order to determine its level acceptable as per their derogation request; significantly lower loop flow figures have been obtained (for the analysed timestamp, 12% lower on average).

TimeUTC: 16/02/2026 09:00:00; Tso: TENNETBV

CNE	From	To	Contingency	Ram	LFcalc	F0all	F0all%	Difference
Rilland - Zandvliet 380 Grey/29	NL	BE		1952	3.96%	559	20.17%	-16.21%
Rilland - Zandvliet 380 Grey/29	NL	BE	Avelgem - Avelin 380.80	1976	3.17%	520	18.77%	-15.60%
Rilland - Zandvliet 380 Grey/29	NL	BE	Avelgem - Horta 380.101	1964	3.61%	538	19.42%	-15.81%
...								
Rilland - Zandvliet 380 White/30	NL	BE		1952	3.96%	559	20.17%	-16.21%
Rilland - Zandvliet 380 White/30	NL	BE	Avelgem - Avelin 380.80	1976	3.17%	520	18.77%	-15.60%
Rilland - Zandvliet 380 White/30	NL	BE	Avelgem - Horta 380.101	1964	3.61%	538	19.42%	-15.81%
...								
Maasbracht - Van Eyck 380 Black/27	NL	BE		1380	9.11%	381	22.00%	-12.89%
Maasbracht - Van Eyck 380 Black/27	NL	BE	Achene - Lonny 380.19	1366	8.90%	375	21.65%	-12.75%
Maasbracht - Van Eyck 380 Black/27	NL	BE	Aubange - Mont St Martin 2	1380	9.11%	381	22.00%	-12.89%
...								
Maasbracht - Van Eyck 380 White/28	NL	BE		1066	-9.14%	320	18.48%	-27.62%
Maasbracht - Van Eyck 380 White/28	NL	BE	Achene - Lonny 380.19	1073	-8.92%	326	18.82%	-27.74%
Maasbracht - Van Eyck 380 White/28	NL	BE	Aubange - Mont St Martin 2	1066	-9.14%	320	18.48%	-27.62%
...								
Diele - Meeden 380 Black	DE	NL		1457	12.91%	333	15.81%	-2.90%
Diele - Meeden 380 Black	DE	NL	Conneforde - Diele ROT	1483	12.22%	308	14.62%	-2.40%
Diele - Meeden 380 Black	DE	NL	Conneforde - Diele WEISS	1483	12.22%	308	14.62%	-2.40%
...								

Figure 2: Loop flows calculated by FLD ("LFcalc") and loop flows calculated at Core capacity calculation ("F0all%");
<https://publicationtool.jao.eu/core/finalComputation>

5.3.2.9.2. Consistency with capacity allocation

- (124) Flow-based market coupling, i.e. allocation of cross-zonal capacity via single day-ahead coupling in the flow-based regions, operates on the same principles as flow-based capacity calculation, respecting zonal nature of the European market model. Capacities are effectively allocated based on the effects of allocated flows on the critical network elements, which are obtained by multiplying bidding zones' net positions with PTDFs. Therefore, the PFC method is also consistent with the capacity allocation applied for the Core region, which is not the case with the FLD method.

5.3.2.9.3. Consistency with Congestion income distribution methodology

- (125) The European Congestion Income Distribution (CID) methodology for flow based CCRs achieves the determination of allocated flows (due to market coupling and exchange of balancing capacity) by multiplying net positions with PTDFs, which is consistent with capacity calculation in flow-based CCRs.
- (126) Article 74(6)(d)(i) of the CACM Regulation requires consistency of the cost sharing methodology and the CID methodology. The PFC method applies the same principles for the calculation of allocated flows as the CID methodology; hence it is compatible with the consistency requirement of Article 74(6)(d)(i) of the CACM Regulation. Unlike PFC, the FLD method does not apply the zero-balance principle which makes it incompatible with the CID methodology.

5.3.2.9.4. *Consistency with Coordinated Regional Operational Security Assessment ('CROSA') process*

- (127) In its Non-paper, page 1, TenneT TSO BV properly describes the role of the CROSA process: *'Cost sharing encompasses costs triggered by redispatch and countertrading actions from the CROSA (Coordinated Regional Operational Security Assessment) process, as established by the Regional Operational Security Coordination (ROSC) methodology, in accordance with Article 76(1)(b) of Regulation (EU) 2017/1485 (System Operations Guideline), where physical congestions and measures to solve physical congestions are identified.'*
- (128) Furthermore, in its Non-paper, TenneT TSO BV mentions multiple times the need for consistency of the flow decomposition with the CROSA process, for instance, at page 8: *'To identify types of physical flows, it is a regulatory requirement that both the identification of physical flows (CROSA process) and the identification of the types of physical flows (Cost-sharing) giving rise to physical congestion take place in a consistent way. Consistency between CROSA process and RDCT CS is required as we are dealing with related activities. It is necessary to use the same or similar methods for:*
- *Identifying congestions and solving congestions with remedial measures;*
 - *Sharing the costs of remedial measures only in respect of flows that actually contribute to congestion.'*
- (129) Capacity calculation and allocation processes rely on the zonal market model with the inherent simplification explained under Section 5.3.2.7, i.e. allowing unlimited trade within a bidding zone, without capacity allocation. One of the main reasons to establish the CROSA process under the ROSC was to remedy this simplification, by applying remedial actions and observing the network reality in nodal resolution (unlike capacity calculation and allocation). Therefore, for instance, the mapping process under the cost sharing (as another form of flow decomposition) pairs the remedial actions ordered under the CROSA process (and their costs) with decongested network elements, relying solely on nodal resolution.
- (130) However, the process of flow decomposition is about to determine the polluters (those who created excessive flows by internal transactions), which exist due to the aforementioned simplification of the zonal market model applied at capacity allocation. Moreover, the level of the pollution is dependent on the shape of bidding zones. Therefore, the zonal market model has to be fully considered in the flow decomposition process. This is ensured with the PFC method and ignored by the FLD method.
- (131) TenneT TSO BV's view that the advantage of the FLD method is full consideration of physical reality (like the one applied in the CROSA process) although market reality (which is actually relevant to determine polluters inherent to zonal market model) is

ignored, is based on a clear misconception. The CROSA process does not define flow components but deals only with total physical flow per congested network element, so there is no reason nor way to apply the same principles in flow decomposition. On the other hand, capacity calculation directly involves flow components due to the zonal market model (such as $F_{0,all}$, encompassing loop and internal flows), however TenneT TSO BV sees no reason to apply flow decomposition with the consistent definition of these flow components (which the PFC method is). The flow decomposition for RDCT cost sharing has to determine polluters (due to the zonal model) and not to mimic CROSA principles (which applies nodal principles).

5.3.2.9.5. Consistency: comments from the 8 TSOs' Non-paper

(132) Referring to the inconsistency of the FLD method with the relevant European and Core methodologies, the 8 TSOs' Non-paper correctly states:

- (a) At page 2: *'Methodological Consistency: All major European methodologies (Core DACCm, IDDCm, ACER Recommendation 01/2019, the Market Coupling Algorithm, CID), covering pre-coupling, coupling and post-coupling processes, consistently use a "balanced model" approach and define flows induced by cross-zonal exchanges as the product of net positions and PTDFs and flows induced by internal exchanges as those originating from bidding zones with zero net positions, in line with the described regulatory key principles for flow decomposition.'*
- (b) At page 11: *'Furthermore, applying the FLD method only for RD&CT cost sharing would introduce legal and methodological asymmetries across all related methodologies. Alternatively, making it fully consistent would require – if technically feasible at all – a complete paradigm shift across the entire process chain: from pre-coupling (capacity calculation), through coupling (capacity allocation), to post-coupling (congestion-income distribution). Such a shift would be incompatible with the European zonal market design and would require major amendments to the regulatory framework, which is not in line with the current EU energy policy nor with ongoing market-integration projects.'* (emphasis added)

(133) Specifically, the 8 TSOs' Non-paper, page 2, evaluate the PFC and the FLD method and concludes on them as follow:

- *'Evaluation of Methods:*
 - iii. *PFC Method: Compliant with EU regulation, distinguishes between internal/loop flows and cross-zonal flows, applies the "balanced model" approach, keeps correlation between NP and cross-zonal flows and aligns with established processes.*

iv. FLD Method: Inconsistent with regulatory principles and market design, applies mathematical approximation as a tracing algorithm, decouples the NP of bidding zones and cross zonal flows, which leads to identification of cross zonal flows (e.g. exports/import and transits) caused by a bidding zones that have NP=0 or cross zonal flows created by a bidding zone higher than the NP of that bidding zone (e.g. DE with a net position of -300 MW creates export flows of 650 MW), which are implausible and unrealistic under the European zonal market design. The outcome would be non-compliant with regulations. Applying FLD in Cost Sharing would introduce legal and methodological asymmetries, with potentially far-reaching consequences for the EU's energy legal framework and market design.'

- *'Conclusion: The PFC method remains the most appropriate and regulation-compliant approach for the Core Cost Sharing methodology, as foreseen with the originally approved methodology. It ensures transparency, fairness, and methodological consistency across the European electricity market.'*

(134) Accordingly, the TSOs of the Czech Republic, Slovenia, Belgium, Croatia, Hungary, Poland, Slovakia and Austria agree with ACER's view that PFC method is consistent with the applicable regulatory principles, other relevant methodologies and the existing market design, while the FLD method is not.

5.3.2.10. Other relevant elements

(135) In the following, further particular concerns raised by the TenneT Non-paper are addressed.

(136) In its Non-paper, pages 7-8, TenneT TSO BV claims that the PFC method obtains 'Import/Export and Transit Flows (introduced as allocated flows by ACER within RDCTCS) combined. Bidding zones with an exporting net position are only allowed to exchange with biding zones with an importing net position.'

(137) As already explained in Sections 5.3.2.2 - 5.3.2.7, in the zonal market model external transactions result in bidding zone net positions different from zero. The non-zero export and import net positions of the bidding zones trigger the allocated flows. Internal transactions trigger internal and loop flows. Such differentiation by the PFC method is necessary to properly simulate the reality of the European market model with regard to the allocated and non-allocated (polluter) flows.

(138) Furthermore, once the origins of loop and internal flows ('balanced model' under the PFC method) and allocated flows ('exchange model' under the PFC method) are disentangled, pairing nodal exchanges within the exchange model can also be performed while respecting electrical distance, for instance by applying a proximity approach which is improved by considering network parameters, as explained under Recitals (104) and (105)). However, such a decomposition of allocated flows, on

export/import and transit flows, and further per origin, is not relevant for the Core cost sharing, as allocated flows bear no costs.

- (139) In its Non-paper, page 10, TenneT TSO BV claims: *‘Aggregate invariant is a consistency rule for calculations. Generation and load patterns depend on the market outcome, which on itself is influenced by the European bidding zone configuration. This means that differences in the market outcome (reflected by variations in output of generators and volume of loads) will result in different electrical power flows through a grid and on network elements. However, bidding zone borders do not determine the nodal exchanges when respecting physical reality. For flow decomposition it means that when respecting physical reality, the nodal exchanges and the sum of the total flow on a network element does not change when only bidding zone borders are changed. This will be illustrated by an example. We have two different bidding zone configurations M1 and M2. In M2 is bidding zone B split up into two bidding zones. When the network characteristics and load & generation patterns stay the same, the bidding zone split should not influence the nodal exchanges when respecting physical reality: ...’*
- (140) Claiming that flow decomposition should be agnostic to the shape of bidding zones is incorrect. Generation and load pattern are heavily dependent on the shape of the bidding zones and for different bidding zone resolutions there would be different market outcome. For instance, in a bigger bidding zone there would be more opportunities for (unlimited) internal transactions. This influences the amounts of resulting loop and internal flows.
- (141) In its Non-paper, page 6, TenneT TSO BV states: *‘The applicable regulatory framework in first instance consists of Article 16(13) Regulation 2019/943 and Article 74 Regulation 2015/1222. However, definitions used in both regulations specify the precise meaning of key terms used throughout those articles, ensuring consistent interpretation of their definitions for clarity and efficient legal understanding. This can also be seen in the interpretation of the EGC in the TenneT Judgment:’*
- *‘Article 16(13) Regulation 2019/943 provides the relevant legal standard for flow decomposition;’ ‘Physical reality by means of electrical distance need to be respected to identify physical flows;’*
 - ACER agrees that physical reality needs to be respected to identify physical flows for the needs of the flow decomposition for cost sharing. However, as already explained in section 5.3.2.7, the physical reality is encompassed by the total physical flow, while each pairing of sources and sinks to obtain flow components is a mathematical construct. By pairing each net producing node with each net consuming node without considering their belonging to a bidding zone, the FLD method could potentially identify the sources and sinks of total flows in CROSA process, but it cannot properly determine loop and internal flows existing as a consequence of the zonal market.

- In Section 5.3.2.7 it has thoroughly been explained to which extent the nodal physical reality, including electrical distance, can in fact be applied in the European market model, and confirmed that the PFC method does apply electrical distance and physical reality accordingly. Conversely, it has been explained that the FLD method incorrectly pairs sources and sinks to determine in that section that flow components and that the FLD method with the Bialek approach referred to by TenneT TSO BV, incorrectly considers electrical distance.
- For these reasons, ‘the PFC method takes due account of electrical distance’ and does so ‘in order to achieve a correct flow decomposition’, as specified by the judgement in case T-482/21, para. 208, while the FLD fails to achieve this.
- *‘Only a physical flow can give rise to physical congestion and loop flows are a type of cross-border flow being a physical flow’*
 - ACER agrees with the first part of this statement, claiming that only a physical flow could give rise to physical congestion. Loop flow is a component of a physical flow calculated by the flow decomposition. Loop flows can flow across the bidding zone borders but also internally, depending on the type and position of an observed network element.
 - However, it is also to note that any flow decomposition method constitutes an approximation, as there is no physical mechanism to uniquely trace specific portions of electrical energy from individual sources to sinks. In AC power systems, energy is transmitted through superposed electromagnetic fields²⁷. While total physical flows on network elements are uniquely defined, they cannot be decomposed into physically distinct source–sink contributions, and any such allocation is inherently method-dependent. Therefore, the loop flows, as a calculation component of physical flow, are also a result of the method applied. The chosen method cannot follow the physical reality of a nodal market model and directly apply such an approach to zonal market model, as there are aspects in which physical reality is not reflected within the zonal market model. The zonal market model itself is a simplification of physical reality. Conversely, looking purely at physical

²⁷ It is a well-established result of electromagnetic theory that electrical energy in AC networks is transported by electromagnetic fields rather than by the kinetic motion of electrons. Power flow is described by the Poynting vector ($S=E \times H$) meaning that energy is contained in and propagates through the electric and magnetic fields in and around the conductors. The role of electrons is to enable current and establish these fields, but their drift (kinetic) energy does not carry the transmitted power. See [2000_Macien_Poynting_vector.pdf](#) or [David Griffiths Electrodynamics_text.pdf](#)

reality without considering market design would not properly identify polluters, as they are effectively hidden within ‘copper plate’ the assumption for bidding zones (infinite trade allowed within a bidding zone).

- *‘Costs sharing happens on costs following from redispatch and countertrading actions from the CROSA process, where physical congestions and measures to solve physical congestions are identified’; ‘No remedial action is activated when calculating cross-zonal capacity and no cost will incur.’; ‘Article 74(4) Regulation 2015/1222 provides the option to consider costs from both capacity calculation and CROSA process (ensuring firmness of capacity). As correctly pointed out by the EGC, there are no remedial actions with costs as a result of capacity calculation, remedial actions with costs are only a result from CROSA process to solve physical congestions. Therefore, there are no valid reasons to mimic parts of the capacity calculation process.’*
 - ACER agrees with these statements and underlines that the reasoning behind the application of the PFC method for flow decomposition is not to mimic or replicate capacity calculation, but to identify polluters inherent in the zonal market model applied during both capacity calculation and capacity allocation. This implies and requires consistency of principles across capacity calculation, allocation, post-allocation remedial actions and flow decomposition for related cost sharing, as each step must reflect the market design, which itself is a simplification of the physical reality of the grid. The PFC method therefore consistently applies the same principles applied in capacity calculation (such as GLSK) and capacity allocation (such as obtaining allocated flow by multiplying net positions with PTDFs), whenever the zonal nature of the European market model is to be considered.
 - The CROSA process is on the other hand a nodal process, defined in a way to remedy the simplifications inherent in the zonal model, but as such cannot determine the polluter flows originated by the zonal model, nor does it ever determine flow components. Therefore, as explained under Section 5.3.2.9.4, the alleged mimicking of the CROSA process by the FLD method, while ignoring market reality, is a misconception.

5.3.2.11. Hearing: the flow decomposition methods

- (142) In its preliminary position of 29 April 2026, ACER explained that, and why, it intends to maintain the PFC method as the approach for flow decomposition in the RDCTCS Methodology.
- (143) On 18 May 2026, the Polish TSO PSE provided written comments on the flow decomposition and explained them further at the oral hearing on 1 June 2026. PSE support the application of the PFC method. However, PSE disagree with applying the

exact GLSK as used in the Core capacity calculation on the ground that such application of GLSK would be discriminative for bidding zones in the periods of their net imports. Instead, PSE proposes to consider the proportion to load in cases of imports. In that regard, PSE refers also point 16 of their observations of 20 December 2024 concerning the annulment of BoA Decision No A-001-2021 (consolidated) of 28 May 2021 from, stating in particular: *‘decoupling the GSK from the Capacity Calculation process and the scaling factors used to determine loop flows and internal flows. The erroneous association of these groups of factors, assumed in the CS Methodology, leads to the establishment of a hypothetical self-balanced operating point such that for importing zones, an overestimation of loop flows and internal flows becomes inevitable’*.

- (144) In response to PSE’s concerns, ACER explained at the oral hearing on 1 June 2026 that the determination of the allocated flows component for cost sharing cannot be different to the determination of the allocated flows component in other congestion management procedures such as capacity calculation, capacity allocation, congestion income distribution etc. To estimate the origins of allocated flows, the GLSK is used as in the capacity calculation process. In ACER’s view, there is no justification for using a different methodology in cost sharing, because in all cases allocated flows represent a component of the total physical flow resulting from cross-zonal trade. This topic is further explained under Recitals (93) and (94).
- (145) On 18 May 2026, the French regulatory authority CRE provided written comments on the flow decomposition, which they further explained at the oral hearing on 1 June 2026. CRE favours the FLD method over the PFC method, arguing that the FLD method would more accurately consider the physical reality of the grid, particularly due to the use of the electrical distance, and would allow a better consideration of the characteristics and topology of the network. According to CRE, the PFC method would create an artificial distance between production and consumption assets on the two sides of a bidding zone border even though they were physically close.
- (146) On 18 May 2026, the German and Dutch TSOs TenneT TSO GmbH and TenneT TSO BV provided written comments on the flow decomposition. TenneT TSO BV further explained their position at the oral hearing on 1 June 2026. Specifically, they referred to the judgement in case T-482/21 (‘TenneT Judgment’), especially its paras. 60 et seqq., 130, 166, 167, 169, 170, and 189, and the underlying conditions for a lawful flow decomposition method as part of the overall cost-sharing process for cross-border redispatching and countertrading measures and concluded as follows:

‘In our view, ACER’s preliminary position fails to remedy the substantive deficiencies of the PFC method. It does not meet the legal requirements formulated by the EGC for the following reasons:

- 1) The PFC method remains unable to determine which flows “contribute to the congestion between bidding zones”. It therefore also contradicts the very purpose of flow decomposition as such,*

stipulated in Art. 16 (13) Electricity Regulation (see p. 6 of TenneT's Non-Paper on Flow Decomposition of 2 February 2026).

2) The PFC approach does not reflect the physical reality of the network and stands in clear contradiction to recognized physical principles by means of electrical distance between nodes. (see p. 8 of TenneT's Non-Paper on Flow Decomposition of 2 February 2026).

Moreover, must point out that ACER is incorrect in assuming that physical flows are only established based on capacity allocation, as in the first place, even flow-based market coupling outcomes may create unscheduled or undesirable flows. Also, TSO/RCC intervention as well as unforeseen events (e.g. loss of load or generation) may lead to unscheduled or undesirable flows. ACER's argumentation seems to assume that physical flows were fully intuitive, which (also for flow-based capacity allocation) is not the case.

Also, ACER's assumptions on the differences between the zonal market model and nodal resolutions are flawed. Both flow decomposition approaches (FLD and PFC) respect the zonal market structure of the European electricity market and require nodal resolutions within a bidding zone to determine individual flow types.'

- (147) On 27 May 2026, the French TSO RTE, on behalf of the German TSOs Amprion, TenneT TSO GmbH, 50Hertz and TransnetBW, Dutch TSO TenneT TSO B.V and RTE, expressed their disappointment regarding ACER's preliminary position of selecting the PFC method for the flow decomposition. According to them, ACER's preliminary position did not fully address the flaws of the PFC method and failed to provide the necessary evidence showing its superiority on the FLD approach.
- (148) The claims of CRE, TenneT TSO GmbH and TenneT TSO B.V., RTE, Amprion, 50Hertz and Transnet, in particular to the ones of TenneT TSO GmbH and TenneT TSO BV that *'The PFC method remains unable to determine which flows "contribute to the congestion between bidding zones"'* and that *'The PFC approach does not reflect the physical reality of the network and stands in clear contradiction to recognized physical principles by means of electrical distance between nodes.'*, rely on a major misconception of physical reality: The total physical flow on a network element is the only physical reality in the given context, and indeed only a physical flow of electricity can give rise to congestion and the cost sharing methodology could, accordingly, share the costs incurred through remedial actions only in respect of flows that actually contributed to congestion. However, it is also clear that every flow decomposition is a mathematical construct. The pairing of sources and sinks for flow decomposition directly determines its result, and this pairing must follow the purpose of the flow decomposition method. In the case of flow decomposition for cost sharing, the pairing

of sources and sinks performed by the PFC method properly follows the preceding processes of zonal capacity calculation and allocation, which are the sources of polluter flows (excessive loop flows and internal flows). By contrast, the FLD method applies pairing of sources, sinks with initial disregarding the zonal market resolution and alters the definition of flow components from the one in behind of capacity calculation and allocation processes. In that regard, reference is made to the detailed explanations in sections 5.3.2.4 - 5.3.2.10.

- (149) It is also to note that the application of the FLD method for flow decomposition would require an adjustment of the definitions of allocated, loop and internal flows inherent in the Core capacity calculation and allocation, and a paradigm change in the relevant Core and European methodologies. Such a change would result in altering the solid and correct concept of the zero-balance approach applied in Europe for more than a decade, with consensus of all involved regulatory authorities and TSOs, including TenneT TSO GmbH and Tennet TSO BV.
- (150) ACER disagrees with TenneT TSO GmbH's and Tennet TSO BV's claim that *'even flow-based market coupling outcomes may create unscheduled or undesirable flows'* because while unintuitive flow-based market coupling results may exist, the resulting allocated flows are always obtained by multiplying PTDFs with net positions of the bidding zones, and there are no unscheduled or undesirable flows in this context.
- (151) Regarding TenneT TSO GmbH's and Tennet TSO BV's claim that *'Also, TSO/RCC intervention as well as unforeseen events (e.g. loss of load or generation) may lead to unscheduled or undesirable flows.'*, ACER understands that such an intervention may happen for the reasons of balancing. However, balancing happens after the ROSC/CROSA process and is therefore not to be considered within the RDCT cost sharing. Furthermore, where the intervention is due to loss of load or generation, it occurs within the real time and, as such, again after the ROSC/CROSA process. Thus, also this scenario is irrelevant for the cost sharing of the remedial actions triggered through the ROSC/CROSA process.
- (152) Regarding TenneT TSO GmbH's and Tennet TSO BV's claim that *'Also, ACER's assumptions on the differences between the zonal market model and nodal resolutions are flawed. Both flow decomposition approaches (FLD and PFC) respect the zonal market structure of the European electricity market and require nodal resolutions within a bidding zone to determine individual flow types.'*, it is to recall that the FLD method considers bidding zones late in the process of flow decomposition, namely to assign flow types to particular internal-nodal flows. However, as explained, the FLD method fails to respect zonal market structure, by combining pairs of source and sink nodes without respecting the fact that their power output is dependent on the zonal market outcome. On the contrary, in pairing nodes the FLD considers all nodes separately, solely on the basis of their net output.

- (153) On 19 May 2026, the Belgian TSO ELIA, on behalf of the TSOs of Poland (PSE), Croatia (HOPS), Czechia (CEPS), Hungary (MAVIR), Slovenia (ELES), Austria (APG) and Belgium (ELIA), provided their written comments on the flow decomposition. They agree with ACER's assessment regarding the flow decomposition methodology and support ACER's preliminary position to maintain the PFC method, being fully aligned with their position paper (referenced under Recital (60)(b)). APG further explained these TSOs' position at the hearing meeting on 1 June 2026.
- (154) ACER agrees with those comments of PSE, HOPS, CEPS, MAVIR, ELES, APG, and ELIA.

5.3.2.12. Conclusion on the flow decomposition method

- (155) In line with the above analysis of both candidate methods for flow decomposition, ACER considers the PFC method as a valid method for flow decomposition for the cost sharing of redispatch and countertrading and the FLD method as an inappropriate approach for that purpose. ACER therefore decided to maintain the PFC method for the flow decomposition, in the form already included in the RDCTCS Methodology.

5.3.3. The loop flow threshold

5.3.3.1. Background

- (156) In accordance with Article 16(13) of the Electricity Regulation, the cost sharing methodology must exclude from cost sharing the flows resulting from transactions internal to bidding zones that are below the level that could be expected without structural congestion in a bidding zone (i.e. the loop flow threshold). This means that loop flows must be split into two components, one below the threshold and one above the threshold.
- (157) The threshold for loop flows is an indispensable part of the cost sharing methodology, because Article 16(13) of the Electricity Regulation establishes a principle by which costs induced by flows resulting from transactions internal to bidding zones that are below the level that could be expected without structural congestion in a bidding zone should not be considered as contributing to congestion. This principle reflects the fundamental nature of a zonal electricity market model according to which even in an optimal bidding zone configuration, some levels of loop flows would still persist and are therefore inherent in any zonal market model. Article 16(13) of the Electricity Regulation therefore establishes a rule by which this normal level of loop flows is legitimate and should not be penalised.
- (158) In order to define the loop flow threshold, Article 16(13) of the Electricity Regulation requires this threshold to be jointly analysed and defined by all TSOs in a capacity calculation region for each individual bidding zone border and be subject to the approval of all regulatory authorities in the capacity calculation region.

- (159) By its Decision No. 30/2020, ACER adopted a common loop flow threshold equal to 10% of the maximum capacity of a network element in Article 7 of the RDCTCS Methodology, thereby amending the TSOs' Proposal, given that the Core TSOs had not analysed and defined this threshold, nor had the Core regulatory authorities approved such threshold.
- (160) In its judgements in cases T-446/21, T-472/21, T-476/21, T-482/21, T-484/21, and T-485/21, the General Court held that ACER's determination of the threshold in the RDCTCS Methodology infringed Article 16(13) of the Electricity Regulation, in that this threshold did not meet the criterion that the threshold must correspond to the *'level that could be expected without structural congestion'* or the criterion that the threshold must be defined *'for each individual bidding zone border'* (e.g. T-482/21, para. 331). According to the General Court, it was common ground that the TSOs did not carry out the required analysis and that ACER did not carry out that analysis either (e.g. T-482/21, paras. 242 and 243). The General Court found that the setting of a 10%-threshold by ACER of the maximum capacity of the network element as the first stage in the determination of the threshold takes no account of *'the specific characteristics of those zones or of the borders between them'* (e.g. T-482/21, para. 262) and that the analysis carried out in the second stage *'does not take account of the characteristics of the different bidding zones'* (e.g. T-482/21, para. 263). The General Court further noted that, in the absence of the analysis required by the first subparagraph of Article 16(13) of the Electricity Regulation, *'the threshold set by ACER cannot comply with the requirement for that threshold to correspond to the level of loop flows that could be expected without structural congestion'* (e.g. T-482/21, para. 266). The General Court concluded that *'the threshold set by ACER does not comply with the requirements laid down in Article 16(13) of Regulation 2019/943, according to which the threshold must correspond to the "level that could be expected without structural congestion" and must be defined "for each individual bidding zone border"'* (e.g. T-482/21, paras. 272 to 273). Moreover, the General Court held that in accordance with Article 6(11) of Regulation 2019/942, which reflects the principle of sincere cooperation enshrined in Article 4(3) TEU, ACER is required to consult regulatory authorities and TSOs when preparing a decision on the basis of Article 6(10) of that regulation (e.g. T-482/21, para. 308). According to the General Court, *'[i]n accordance with the principle of sincere cooperation and taking into account the clear intention of the EU legislature to make decision-making on difficult but necessary cross-border issues more efficient and faster (judgment of 7 September 2022, BNetzA v ACER, T-631/19, EU:T:2022:509, paragraph 46), ACER was to facilitate the development, by the TSOs and NRAs, of the analysis required by Article 16(13) of Regulation 2019/943'* (see T-482/21, para. 309). Finally, the General Court found that ACER did not have an implicit competence to set the level of the threshold itself and in any event not in a different way than that established in Article 16(13) of the Electricity Regulation (e.g. T-482/21, paras. 330 and 331).
- (161) Accordingly, in its decisions A-001-2021_R (consolidated), the BoA held that, in the new decision, ACER would need to set the threshold following an analysis carried out

by the TSOs and approved by the relevant regulatory authorities (e.g. A-001-2021_R (consolidated) – TenneT TSO GmbH and Tennet TSO BV v ACER, para. 111). The BoA further stated that *‘[i]n the process of adoption of the new decision, Core TSOs will need to undertake the analysis underpinning the determination of the loop flow threshold(s), in order to make RDCTCS implementable, while ACER will need to observe the limits to its actions, as set by the GCEU in its Judgment, to fully respect Article 16(13) of the Electricity Regulation, as interpreted by the GCEU’* (e.g. A-001-2021_R (consolidated) – TenneT TSO GmbH and Tennet TSO BV v ACER, para. 113).

- (162) At the kick-off meeting on 16 October 2025, ACER discussed with the Core TSOs their potential readiness to provide values for the loop flow threshold within the timeline of ACER’s current decision process. The Core TSOs indicated that they would not be in a position to provide such values within the envisaged general timeframe for the present decision-making proceedings, i.e. by April 2026.
- (163) On 12 January 2026, ACER asked the Core TSOs to provide, in writing, their readiness to submit the loop flow threshold values within the envisaged timeline of these decision-making proceedings.
- (164) On 20 January 2026, the Core TSOs stated that they will not provide values for the loop flow threshold within envisaged timeline of the present decision-making process.
- (165) Even after April 2026, the Core TSOs have still not provided the loop flow threshold analysis, nor did they indicate by the closure of the written and oral procedure for the present Decision on 1 June 2026 that the required analysis and the resulting loop flow threshold values would be available anytime soon.

5.3.3.2. Hearing: the loop flow threshold

- (166) In its preliminary position of 29 April 2026, ACER explained that, and why, it intends to remove paragraphs 3 to 5 of Article 7 of the RDCTCS Methodology, which define the common loop flow threshold and to add a new paragraph 3 which requires the Core TSOs to provide the individual threshold for burdening loop flows in accordance with Article 16(13) of the Electricity Regulation, according to which the threshold must correspond to the *‘level that could be expected without structural congestion’* and must be defined *‘for each individual bidding zone border’*, along with corresponding clarifications in Recital 8 of the RDCTCS Methodology.
- (167) On 18 May 2026, the Polish TSO PSE provided written comments on the loop flow threshold. PSE considered the loop flow threshold previously introduced into the RDCTCS Methodology as significantly overestimated and disregarding the polluter pays principle. PSE also proposed a solution, in which the individual threshold on a given overloaded XNEC for a given bidding zone generating loop flow should be based on the sensitivity of existing or hypothetical phase shifting transformers on a border of given bidding zone.

- (168) ACER acknowledges in principle the relevance of PSE's proposal, however also deems it critical, due to the complexity of the present methodology, that this proposal is thoroughly discussed and jointly considered by the Core TSOs who, according to the General Court's rulings in cases T-446/21, T-472/21, T-476/21, T-482/21, T-484/21, and T-485/21, are primarily responsible for studying and calculating the loop flow threshold. Therefore, ACER did not include PSE's proposed solution in the RDCTCS Methodology.
- (169) On 13 May 2026, the German regulatory authority BNetzA provided written comments on the loop flow threshold. BNetzA proposed to amend Recital 8 and Article 7(3) of the RDCTCS Methodology beyond the text envisaged by ACER's preliminary position, in order to further align the methodology with the findings of the General Court in its judgements in cases T-446/21, T-472/21, T-476/21, T-482/21, T-484/21, and T-485/21.
- (a) For Recital 8 of the RDCTCS Methodology, the following addition (in bold) was proposed: *'(...) Accordingly, and as the Core TSOs have not analysed nor provided the threshold values during the amendment of the methodology, the new Article 7(3) of the methodology only refers to Article 16(13) of the Electricity Regulation and the obligation of the relevant TSOs to determine the individual thresholds, **taking into account the characteristics of each bidding zone concerned, as established by the General Court in para. 209 of its judgement T-446/21, para. 175 of its judgement T-472/21, para. 229 of its judgement T-476/21, para. 261 of its judgement T-482/21, para. 57 of its judgement T-484/21, and para. 206 of its judgement T-485/21.**'*
- (b) For Article 7(3) of the RDCTCS Methodology, the following addition (in bold) was proposed: *'The individual thresholds for burdening loop flows shall be determined in accordance with Article 16(13) of the Electricity Regulation, **i.e. by taking into account the characteristics of the bidding zones, such as the size, the degree of meshing, the proportion of electricity injected that comes from renewable energies, the number of borders of the bidding zone concerned, its topological characteristics and its tendency to import or export electricity. By taking these characteristics into account, the level of loop flows may vary from one bidding zone to another, on a 'border' within the meaning of Article 16(13) of Regulation 2019/943, or on the elements of relevance to congestion between two zones.**'*
- (170) By email of 18 May 2026, ACER explained to BNetzA that in principle ACER could be comfortable with including quotations from the general Court's judgements, however that it prefers to have consensus among the regulatory authorities on the quotations to be included in the methodology. ACER therefore invited the other regulatory authorities to provide their views on BNetzA's proposal.
- (171) On 26 May 2026, the Polish regulatory authority URE provided written comments on the BNetzA's proposal, arguing that references to specific paragraphs are redundant

and that a reference to the judgments as a whole, rather than selected paragraphs, is sufficient. URE proposed:

- (a) for Recital 8 of the RDCTCS Methodology, to add the following text: '...taking into account the characteristics of each bidding zone concerned, as established by the General Court in its judgements T-446/21, T-472/21, T-476/21, T-482/21, T-484/21, T-485/21.';
 - (b) for Article 7 of the RDCTCS Methodology, to reject the amendments proposed by BNetzA and to keep the text proposed by ACER in its preliminary position. According to URE, *'The clarifying article, which references the requirements of Article 16(13) of Regulation 2019/943, establishes a closed (exhaustive) set of bidding zone characteristics ('i.e.') to be considered when determining loop flow thresholds. This rigid approach fails to account for other relevant elements. Additionally, undefined and ambiguous terms such as 'degree of meshing' and 'renewable energies' have been introduced, which are highly susceptible to divergent interpretations, further complicating the process of reaching a common approach. Furthermore, the criteria seem to be arbitrary, and it is difficult to find any objective justification.'*
- (172) On 28 May 2026, the Hungarian regulatory authority MEKH, on behalf of the Dutch, Belgian, Austrian and Hungarian regulatory authorities, provided written comments on BNetzA's proposal, expressing concerns about this proposal. In their view, the change suggested by BNetzA expands on the definition of loop flows by adding interpretations that are not present in Article 16(13) of the Electricity Regulation.
- (173) At the oral hearing on 1 June 2026, BNetzA, URE and MEKH further explained their positions.
- (174) At the same oral hearing, ACER reconfirmed that the General Court's judgements in cases T-446/21, T-472/21, T-476/21, T-482/21, T-484/21, and T-485/21 are applicable in their entirety to the RDCTCS Methodology, which in turn has to be applied in accordance with those judgements.
- (175) To that end, ACER included a further clarification in Recital 8 of the RDCTCS Methodology, highlighting that the determination of the individual thresholds in accordance with Article 16(13) of the Electricity Regulation needs to fully take into account the General Court's judgements in cases T-446/21, T-472/21, T-476/21, T-482/21, T-484/21 and T-485/21. Conversely, ACER considered the additional wording proposed by BNetzA for Article 7(3) of the RDCTCS Methodology as neither necessary nor appropriate: first, because the General Court's findings in cases T-446/21, T-472/21, T-476/21, T-482/21, T-484/21 and T-485/21 with regard to the determination of the loop flow threshold under Article 16(13) of the Electricity Regulation are authoritative for the application of that provision; and second, because the non-inclusion of references to the General Court's judgements ensures a simpler and clearer

regulatory rule. Therefore, ACER refrained from referring to the judgements in cases T-446/21, T-472/21, T-476/21, T-482/21, T-484/21 and T-485/21 in the operative part of the RDCTCS Methodology.

5.3.3.3. Conclusion on the loop flow threshold

- (176) Since the adoption of Decision No 30/2020 on 30 November 2020, including in the process of adoption of the present decision, the Core TSOs did not undertake an analysis underpinning the determination of the loop flow threshold(s) in accordance with Article 16(13) of the Electricity Regulation. ACER was therefore not in a position to set a loop flow threshold in the RDCTCS Methodology on the basis of an analysis carried out by the TSOs and approved by the relevant regulatory authorities.
- (177) By the closure of the written and oral procedure for the present Decision on 1 June 2026, the Core TSOs did not even indicate when in the future they would complete the required analysis, define low loop flow thresholds or submit them for approval to the relevant regulatory authorities. Due to this fact, ACER's ability to facilitate the development, by the TSOs and the regulatory authorities, of the analysis required by Article 16(13) of the Electricity Regulation, is indeed limited. Considering the limits to ACER's actions set by the General Court in cases T-446/21, T-472/21, T-476/21, T-482/21, T-484/21 and T-485/21 and the need to adopt the RDCTCS Methodology at all and within due time, it is indeed not feasible for ACER to effectively facilitate the development of the required analysis in the process of adoption of the present decision. Under those circumstances, it is rather appropriate to ensure that the RDCTCS Methodology can be adopted in its entirety and to enable an implementation of the loop flow threshold that is still in accordance with Article 16(13) of the Electricity Regulation.
- (178) For these reasons, ACER amended Article 7(3) of the RDCTCS Methodology to the effect that it does no longer specify a common loop flow threshold and instead refers to Article 16(13) of the Electricity Regulation, entailing an obligation of the relevant TSOs to determine the individual thresholds for burdening loop flows in accordance with Article 16(13) of the Electricity Regulation. Corresponding to this change, ACER deleted paragraphs 4 and 5 of Article 7 of the RDCTCS Methodology and revised Recital 8 of the RDCTCS Methodology accordingly, mentioning the judgements in cases T-446/21, T-472/21, T-476/21, T-482/21, T-484/21 and T-485/21.

5.3.4. Further elements of the cost sharing solution

- (179) This section incorporates, without substantive changes, statements of reasons from Decision No 30/2020 with regard to elements of the RDCTCS Methodology other than the selection of the flow decomposition method and the determination of the loop flow threshold.

5.3.4.1. Determination of cross-border relevant network elements eligible for cost sharing

- (180) Articles 9 and 10 of the Proposal provided that the coordination process for the activation of redispatching and countertrading actions of cross-border relevance will activate these actions to solve congestions on two types of network elements, one type would be cross-border relevant and the other type non-cross-border relevant.
- (181) However, ACER understood that this assumption is not correct, since the methodology for coordinated security assessment, adopted pursuant to Article 75(1) of the SO Regulation, determines that regional operational security coordination, which is used as the basis for the activation of redispatching and countertrading actions of cross-border relevance, shall solve congestions only on cross-border relevant network elements. The regional operational security coordination process that is set out in the above-mentioned methodology will not aim to resolve congestions on network elements which are not cross-border relevant network elements and therefore no redispatching and countertrading actions of cross-border relevance will be activated for such elements. This understanding was confirmed by Article 8 of the proposal for the Core methodology for regional operational security coordination²⁸ pursuant to Article 76 of the SO Regulation, which specifies that cross-border relevant network elements are secured network elements and these in turn are the only elements on which the congestions are being resolved by the regional operational security coordination²⁹.
- (182) ACER therefore understood that redispatching and countertrading actions of cross-border relevance can only be used for resolving congestions on cross-border relevant network elements.
- (183) Some Core TSOs and regulatory authorities expressed concerns that the cost sharing solution should not apply to all cross-border relevant network elements on the ground that Article 16(13) of the Electricity Regulation refers to cost sharing with regard to congestions between two bidding zones observed. More specifically, some of them interpreted this reference to imply that only network elements located on the border between two bidding zones should be eligible for cost sharing, while some other were of the opinion that all network elements which are concerned by the congestion as defined in Article 2(4) of the Electricity Regulation (i.e. all network elements

²⁸ https://www.acer.europa.eu/en/Electricity/OPERATION-CODES/SYSTEM-OPERATION/Documents/20191219_Core%20CCR%20TSOs_Core%20ROSC%20Methodology.pdf

²⁹ ACER notes that this proposal also mentions scanned network elements which are not cross-border relevant network elements, but these elements will only be monitored within the regional operational security coordination and any congestions on them will not be actively resolved.

significantly impacted by electricity trades between two bidding zones observed) are subject to cost sharing.

- (184) Article 16(13) of the Electricity Regulation specifies a clear cost sharing solution (i.e. based on contributions from flows resulting from internal transactions) for congestion between two bidding zones observed. However, Article 16(13) of the Electricity Regulation does not specify that cost sharing should be applied **only** for congestion between two bidding zones observed (regardless of the exact interpretation of what the congestion between two bidding zones observed means). Therefore, Article 16(13) of the Electricity Regulation does not prevent, *per se*, that for network elements which would not be covered by the interpretation of the ‘congestion between two bidding zones observed’, the same cost sharing solution as for congestion between two bidding zones observed (or another cost sharing solution) can be applied.

- (185) Article 74(2) of the CACM Regulation requires the cost sharing methodology to determine cost sharing solutions for redispatching and countertrading actions of cross-border relevance. Since these actions are used to solve congestions on all cross-border relevant network elements and not just on a subset of them (see Recital 65 above), it follows that omitting some cross-border relevant network elements from cost sharing would not comply with Article 74(2) of the CACM Regulation as it would not determine a cost sharing solution for some or part of redispatching and countertrading actions of cross-border relevance.

- (186) Furthermore, Article 74(6)(i) and Article 3(e) of the CACM Regulation require that the cost sharing methodology should not discriminate between TSOs. In that regard it is to note that the cost sharing methodology must apply certain principles for cost sharing, most notably the polluter pays principle by which flows resulting from internal transactions should primarily pay for congestion costs. If the same amount of flows resulting from internal transactions would be identified on two different congested network elements, for which redispatching and countertrading actions of cross-border relevance have been applied to resolve such congestion, and only one of these two cross-border relevant network elements would be subject to cost sharing, this would lead to a discriminatory application of the polluter-pays principle, directly discriminating against the TSO owning the network element, which is excluded from the cost sharing. In such case there would be no justification why polluting flows of the same type are considered as polluters on one cross-border relevant network element, but not on the other cross-border relevant network element. Thus, the exclusion of cross-border relevant network elements from cost sharing would not be justified and would lead to a discrimination between TSOs.

- (187) Excluding some cross-border relevant network elements from cost sharing would also contradict the general principles of congestion management in accordance with Article 16(1) of the Electricity Regulation by which network congestion problems should be addressed with non-discriminatory market-based solutions which give efficient economic signals to the market participants and transmission system operators

involved. This general principle was applied in ACER Decision 02/2019 of 21 February 2019 on the Core CCR TSOs' proposals for the regional design of the day-ahead and intraday common capacity calculation methodologies³⁰. Articles 5 of Annexes I and II of this Decision set out the requirements for Core TSOs to continuously monitor and identify the most efficient congestion management method for congestions on internal network elements, among which are capacity calculation, remedial actions, reconfiguration of bidding zones and network investments. The solution by which congestion problems can be addressed with remedial actions crucially depends on the coordination of remedial actions and related cost-sharing. Thus, in the absence of cost-sharing for specific congested network elements, remedial actions could no longer be considered as an alternative congestion management method for these elements. As a consequence, this would prevent efficient congestion management as required by Article 16(1) of the Electricity Regulation.

- (188) In view of this context, Article 16(13) of the Electricity Regulation should be interpreted as not excluding a cost sharing solution that applies to all cross-border relevant network elements.
- (189) During the proceedings on the RDCTCS Methodology, ACER explored whether regulatory authorities could support the interpretation that only network elements concerned by the congestion as defined in Article 2(4) of the Electricity Regulation are eligible for cost sharing (as outlined in Recital 67 above). The responses from the majority of regulatory authorities showed that a decision adopted based on this interpretation could not receive the required favourable opinion of the ACER's Board of Regulators. Thus, only a decision where all cross-border relevant network elements are eligible for cost sharing was able to gather the required favourable opinion of the ACER's Board of Regulators.
- (190) Based on the above, ACER defined in Article 3 of the RDCTCS Methodology that all cross-border relevant network elements shall be subject to cost sharing.

5.3.4.2. Cross-border relevant network elements concerned by the action plans³¹

- (191) In their non-paper a majority of Core regulatory authorities expressed the view that network elements concerned by action plans should not be eligible for cost sharing. They referred to Article 15(3) of the Electricity Regulation which stipulates that the

³⁰ https://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Individual%20decisions/ACER%20Decision%2002-2019%20on%20CORE%20CCM.pdf

³¹ The considerations in this section are no longer relevant in practice, as the existing action plans are completed as of 31 December 2025.

cost of the remedial actions necessary to achieve the linear trajectory referred to in Article 15(2) of the same Regulation or make available cross-zonal capacity at the borders or on critical network elements concerned by the action plan shall be borne by the Member State or Member States implementing the action plan. These regulatory authorities therefore claim that this Article *per se* excludes all such network elements from cost sharing. While these regulatory authorities recognise that the costs referred to in this Article are limited only to making available cross-zonal capacities, they consider that internal network elements concerned by the action plan cannot be considered as cross-border relevant, whereas for cross-zonal network elements concerned by the action plan, the costs attached to the concerned Member State should also not be shared.

- (192) Few other Core regulatory authorities have the opposite view that Article 15(3) of the Electricity Regulation excludes from cost sharing only the costs incurred to reach the required level of minimum capacities, but it does not exclude *per se* such network elements from cost sharing. According to these regulatory authorities, the costs incurred by TSOs in order to go beyond the required minimum capacity would be eligible to cost sharing.
- (193) ACER carefully evaluated these positions and the specific situation of the network elements concerned by the action plan. First, ACER observed that the claim that internal network elements concerned by the action plan cannot be considered as cross-border relevant is not supported by Article 15(3) of the Electricity Regulation nor by any other relevant legal provision. Second, ACER notes that indeed Article 15(3) of the Electricity Regulation limits the exclusion of such network elements from cost sharing only to the extent where such costs have occurred for the purpose of achieving the linear trajectory referred to in Article 15(2) of the same Regulation or make available the required level of cross-zonal capacity in accordance with Article 16(8) of the same Regulation.
- (194) ACER considers that the costs of remedial actions which are not stemming from making available the required level of cross-zonal capacities should still be subject to cost sharing in accordance with the cost sharing methodology. With this regard ACER notes that the adopted cost sharing methodology by default allocates all the costs attributed to a specific network element to the TSO which owns such network element (i.e. the TSO in whose control area such network element is connected or located), except for the costs which are caused by congestions created by loop flows originating from other bidding zones. These costs are then borne by the TSOs of these other bidding zones that create such loop flows.
- (195) ACER understands that the remedial actions, which are required to address congestions caused by loop flows from other bidding zones cannot be considered as remedial actions necessary to achieve the linear trajectory as stipulated by Article 15(3) of the Electricity Regulation. This is because the action plan and the related linear trajectory are designed

to address the congestion³². identified within the bidding zone(s) of the concerned Member State in accordance with Article 15(1) and (2) of the Electricity Regulation. The action plan and linear trajectory therefore reflect the (high level of) loop flows and internal flow caused by the bidding zone of such Member State and they are not designed to solve the physical congestion problems that are caused by loop flows from other bidding zones. The action plan should gradually reduce the level of loop flows and internal flow resulting from the bidding zone of a Member State applying the action plan, which should allow for a gradual increase of cross-zonal capacities. However, this may not be possible if during this period the loop flows from other bidding zones would increase and no cost sharing with polluter-pays principle would be applied for these loop flows. Excluding all network elements concerned by the action plan from the cost sharing would not allow the Member State applying the action plan to increase cross-zonal capacities, because there would be no cost sharing for congestions caused by loop flows originating from neighbouring bidding zones. Such a solution would, on the other hand, provide perverse incentives to neighbouring Member States. With this respect, Article 15(3) of the Electricity Regulation does not aim at contradicting the polluter-pays principle in case of action plans, but rather to safeguard and reinforce it.

- (196) In conclusion, the adopted cost sharing methodology, which effectively shares the costs of remedial actions, which are related only to congestions caused by loop flows, ensures that all remedial actions necessary to achieve the linear trajectory as stipulated by Article 15(3) of the Electricity Regulation are always borne by the TSOs of Member States where such network elements are located. Therefore, the adopted cost sharing methodology ensures that the remedial actions necessary to achieve the linear trajectory on network elements concerned by the action plan as stipulated by Article 15(3) of the Electricity Regulation are always borne by the Member States implementing such action plans.
- (197) For the reasons above, the adopted cost sharing methodology does not need any specific rules regarding the network elements concerned by the action plans.

5.3.4.3. Splitting of total costs to individual cross-border relevant network elements (mapping)

- (198) The cost sharing methodology must clearly specify how the costs of redispatching and countertrading actions of cross-border relevance are mapped, i.e. split among cross-border relevant network elements.

³² The congestion referred here is defined in Article 2(4) of the Electricity Regulation and indicates inability of the bidding zone to accommodate all trade requests within such bidding zone. It should not be confused with the term congestion used elsewhere in this Decision which refers to physical congestion caused by physical flows on network elements.

- (199) Article 9 of the Proposal provided the high-level description of the process of mapping the costs of cross-border relevant remedial actions to both cross-border relevant and non-cross-border network elements. It defined the need to perform mapping on an hourly basis, the need to use the final costs resulting from remedial actions and the need to use the common grid model ('CGM') used in the relevant coordinated security analysis. The Explanatory document and the Experimentation report provided the description of potential mapping methods, however none of them was proposed to be used in the Proposal. These methods were: volume-based mapping ('VBM'), improved volume-based mapping ('iVBM'), individual optimisation-based mapping ('IOBM') and shadow price-based mapping ('SBM').
- (200) ACER discussed these options with Core TSOs and regulatory authorities. Volume based mapping solution was criticised by most of the Core TSOs and regulatory authorities due to its failure to include properly the influence of non-costly remedial actions. During the common proceedings, ACER proposed the adjustment of volume-based mapping (so called advanced volume-based mapping), which partially addressed the concerns regarding the consideration of non-costly remedial actions.
- (201) Improved volume-based mapping option was the only option that was tested during the experimentation, but its results were judged as non-satisfactory by all Core TSOs and regulatory authorities. During the proceedings, some Core TSOs proposed a simplified and more robust version of the improved volume-based mapping, which significantly improved the performance of this solution as shown by simulations performed by ACER.
- (202) Individual optimisation-based mapping and shadow price mapping were considered by Core TSOs only at a theoretical level and they could not be tested by Core TSOs due to unavailability of proper IT tools.
- (203) During the proceedings with Core TSOs and regulatory authorities, ACER proposed another alternative method called the least-cost-based mapping ('LCBM'). This method identifies those cross-border relevant remedial actions (that were applied by coordination optimisation), which are sufficient to address congestion on an individual cross-border relevant network element with the least costs. Subsequently the total costs of all cross-border relevant remedial actions are split in proportion to the least costs identified for each individual network element.
- (204) Based on the above discussions, ACER performed the testing of improved volume-based mapping, advanced volume-based mapping and least-cost-based mapping and presented the testing results of these three options to Core TSOs and regulatory authorities.
- (205) The least-cost based mapping method received the support of a majority of TSOs and regulatory authorities and for this reason ACER included it in the RDCTCS Methodology. The reason for this high support was that the least-cost-based mapping

properly takes into account the proximity of remedial actions and only their required volume such that less costs are attributed to network elements on which the congestions can be relieved with less remedial actions and with less costs. This method therefore adequately addressed the main concern of TSOs and regulatory authorities that the mapping solution needs to take into account the impact of non-costly remedial actions on cross-border relevant network elements. The test results for this method showed that the method is feasible and sufficiently robust to be implemented.

- (206) Given the complexity of the mapping solution, some Core TSOs and regulatory authorities proposed that the mapping solution is reviewed during the implementation of the cost sharing methodology and the methodology amended subject to this review. However, since the adopted mapping solution was judged by ACER and most Core TSOs and regulatory authorities as sufficiently robust, ACER deemed that an amendment of the methodology to improve this mapping solution during the implementation was not required and should preferably be avoided in order not to delay the implementation. Nevertheless, if TSOs identified implementation problems related to this method, they would have the right to propose amendment to the RDCTCS Methodology in accordance with Article 9(13) of the CACM Regulation.
- (207) Some Core TSOs and regulatory authorities also expressed concerns that the final mapping solution can only be adopted once more testing on real data is performed. To address this concern, ACER introduced in Article 12 of the RDCTCS Methodology a general obligation to review all aspects of the methodology and propose amendments where required 12 months after the implementation of the cost sharing methodology. With this regard, some TSOs and regulatory authorities pointed out the need that the mapping solution should be improved to take into account the specific effects of remedial action optimisation where congestions on network elements are not resolved directly, but rather redirected to other network elements where they can be resolved with cheaper remedial actions. The proposed current mapping solution failed to properly take into account such shifting of congestions. As it was not possible to adequately and robustly address this problem during the adoption of this cost sharing methodology, ACER invited TSOs to analyse it during and after implementation and to propose amendments to address this problem to the degree possible.

5.3.4.4. Netting of flow components in the opposite direction to the congestion

- (208) Article 8(4) of the Proposal specified that a cost sharing solution must apply the netting of flow components that are opposite to the direction of congestion (i.e. relieving flows), but it did not specify how exactly this netting is applied. In the Experimentation report and Non-paper of Core TSOs, Core TSOs have analysed several solutions that fall into two categories. The first category determines which relieving flows are netted with which burdening flows, and here TSOs presented that first the relieving flows of the same category are netted (e.g. relieving loop flows reduce burdening loop flows) and then the remaining relieving flows, if still present, reduce all burdening flows. The second category determines how flows are netted and here the TSOs presented three

solutions: (i) all relieving flows reduce all burdening flows proportionally to the size of burdening flows, (ii) all relieving flows reduce all burdening flows equally, such that each burdening flow component is reduced by the same amount and (iii) vertical shift by which the relieving flows reduce burdening flows at the bottom of the order stack, which is determined by the priorities of flows as determined in Section 4.5 of the TSOs' Explanatory document.

- (209) After careful analysis of all options presented by the TSOs and the fact that the TSOs could not agree on any of the presented options, ACER concluded that the cost sharing methodology does not require the netting of relieving flows. While netting could technically be applied, the cost sharing methodology can also work without any netting of relieving flows.
- (210) The reason for such decision was twofold. First, neither the CACM Regulation nor the Electricity Regulation explicitly requires the netting of relieving flows for establishing a cost sharing solution. Second, Article 16(13) of the Electricity Regulation only requires the identification of flows which contribute to congestion as only such flows shall be considered for cost sharing. The flows which contribute to congestion are only burdening flows whereas the relieving flows do not contribute to congestion. Furthermore, reducing burdening flows by the relieving flows would artificially reduce the contribution of burdening flows to congestion and thereby would not comply with the requirements of Article 16(13) of the Electricity Regulation, which require the identification of flows which contribute to congestion without any reductions. For this reason, ACER removed from the cost sharing methodology the requirement to net the relieving flows as it is not required for cost sharing.
- (211) During the proceedings on the RDCTCS Methodology, ACER explored whether regulatory authorities could support the netting of relieving flows in the form of equal netting where the equal share of relieving flows reduce all burdening flow components. The responses from the majority of regulatory authorities showed that a decision adopted based on such proposal for netting could not receive the required favourable opinion of the ACER's Board of Regulators. Thus, only a decision where no netting of relieving flows is applied was able to gather the required favourable opinion of the ACER's Board of Regulators.

5.3.4.5. Priority of flow components

- (212) The cost sharing methodology must specify which flow components contribute to congestion, which is in this sense defined as a portion of physical flow exceeding the maximum flow on a network element.
- (213) Article 7 of the Proposal provided a principle by which a priority list is applied to flow components and then only the flow components (sorted with such priority) that exceed the maximum flow on network elements are identified as contributions to congestion.

However, the Proposal did not include the proposal for prioritisation of flow components.

- (214) In order to identify which flow components contribute to congestion and to which degree, ACER first clearly defined what congestion means in this regard, and for this purpose defined the volume of overload. This volume of overload is equal to the total flow on the cross border relevant network element before the congestion (i.e. overload) is relieved, reduced by the maximum flow on that network element.
- (215) In the Experimentation report, Core TSOs analysed three prioritisation sequences:
- (a) Option 1: First: loop flows above threshold; second: internal flow; third: loop flow below threshold; fourth: allocated flow and PST flow;
 - (b) Option 2: First: loop flows and internal flow above threshold; second: loop flows and internal flow below threshold; third: allocated flow and PST flow; and
 - (c) Option 3: First: loop flows above threshold; second: internal flow above threshold; third: allocated flow and PST flow; fourth: loop flows below threshold; fifth: internal flow below threshold.
- (216) A majority of Core TSOs and regulatory authorities supported a version of Option 1, where the loop flows above the threshold have the first priority, internal flows have the second priority, while all the rest of the flow components are treated equally in the third priority. These TSOs and regulatory authorities supported this option, because they considered that the users which cause internal flow should be treated differently than users causing the loop flows. This is because the former are paying for the investment and maintenance of the network they are using, whereas the latter are not. They also claimed that treating loop flows and internal flows equally would not provide sufficient incentives for TSOs causing loop flows to manage congestions efficiently and to reduce the loop flows by e.g. investing in the network or reconfiguring the bidding zones which cause loop flows.
- (217) Few Core TSOs and regulatory authorities, on the other hand, supported Option 2 where the loop flows and internal flows should be equally considered within first priority. They supported their argumentation by noting that Article 16(13) of the Electricity Regulation does not distinguish between the loop flows and internal flows when identifying the contribution to the congestion. Further, these TSOs and regulatory authorities argued that not treating loop flows and internal flows with equal priorities would not provide correct incentive to TSOs to invest in their network in case of congestions within a bidding zone.
- (218) Option 1 and 2 are presented in the figure below, which shows the stacking of different flow components in relation to the maximum capacity of the network element (denoted with 100%). In Option 1 of this example all loop flows are identified as contributors to congestion, whereas only the internal flow which is needed to cover the remaining

congestion is identified as contributor to congestion. In Option 2, all loop flows and the whole internal flow are identified as contributors to congestion, however, since their sum is larger than the volume of congestion they are scaled down afterwards to become equal to the volume of congestion (i.e. volume of overload). This scaling does not change the relative shares of loop flows and the internal flow.

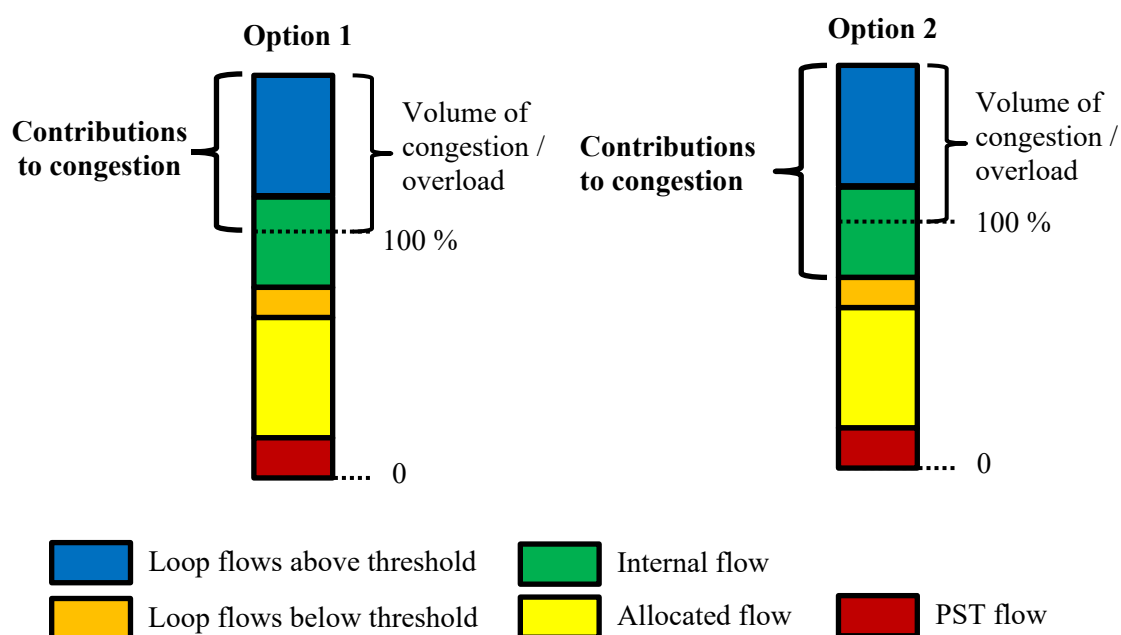


Figure 1: The difference between two considered options for priorities of flows

- (219) ACER carefully evaluated different arguments from Core TSOs and regulatory authorities, analysed possible options and performed the simulations of investigated options based on the data used in the Experimentation report. While ACER recognised some validity of arguments of both groups of Core TSOs and regulatory authorities, it considered that the arguments of the majority of TSOs and regulatory authorities were stronger in this specific case.
- (220) In accordance with Article 16(13) of the Electricity Regulation, the physical flows resulting from electricity exchanges (i.e. transactions) internal to bidding zones (i.e. internal flows and loop flows) should indeed be identified as the main contributors to the congestion and the TSOs of bidding zones in which those exchanges are settled should therefore bear the proportional part of the costs attributed to the congested network elements. In case of cross-zonal network elements these flows are loop flows, whereas in case of internal network elements, these flows are the internal flow and the loop flows, the former being caused by electricity exchanges within a bidding zone where such network element is located and the latter being caused by electricity exchanges within other bidding zones.

- (221) ACER recognised that Article 16(13) of the Electricity Regulation does not make a specific distinction between loop flows and internal flows when referring to flows resulting from electricity exchanges (i.e. transactions) internal to bidding zones. However, this Article requires regulatory authorities to analyse to what extent loop flows and internal flows contribute to congestion, but it does not prescribe the extent to which they contribute to congestion. Article 16(13) of the Electricity Regulation therefore provides regulatory authorities the freedom to analyse and conclude to what extent the loop flows and internal flows contribute to congestion. ACER considered that a conclusion by regulatory authorities that loop flows contribute to congestion more than internal flows is therefore not contradicting Article 16(13) of the Electricity Regulation.
- (222) On the other hand, ACER agreed with the majority of Core TSOs and regulatory authorities that loop flows and internal flows cannot be treated equally when identifying their contribution to congestion. This is because the network users which are causing internal flows on internal network elements are actually financing the investment and maintenance of such internal network element via network fees or tariffs. These are users trading within a Member State and are using the domestic network, whose construction and operation has been financed by these users. On the other hand, users causing loop flows on internal network elements have not financed the investment and maintenance of such internal network elements via network tariffs, because these are users trading within one Member State, but the loop flows they create are flowing through the network of another Member State, where they do not pay the network fees or tariffs.
- (223) Furthermore, the electricity networks within Member States have been primarily dimensioned and built to accommodate internal trading within Member States and cross-zonal trading, but it has not been dimensioned to accommodate significant loop flows from internal trading in other Member States. Thus, in most cases, the internal network elements are sufficient to accommodate domestic internal trade and cross-zonal trade, but when significant loop flows from internal trading within other Member State are added on top, these elements become congested.
- (224) Article 74(6)(a) of the CACM Regulation requires that the cost sharing methodology needs to provide incentives to manage congestion, including remedial actions and incentives to invest effectively. For the reasons described above, ACER considered that, in case of internal network elements, the main incentives should be put on the TSOs which cause loop flows (e.g. due to their internal congestion problems) and not on the TSOs which host loop flows and face congestions because of these loop flows. Option 1 therefore provides correct incentive to TSOs which cause loop flows to manage their congestion problems and reduce loop flows, whereas for TSOs which host loop flows, the incentives to invest are needed only in case their internal flows are causing congestion and Option 1 described above is adequate to provide such incentive. Option 2, on the other hand, would define completely wrong incentives, i.e. insufficient

incentives to reduce loop flows and unfair incentives to TSOs which host loop flows to invest, despite the true reason for congestion being outside of their responsibility.

- (225) For the above reasons, ACER adopted a decision where the loop flows beyond a 'legitimate' level (i.e. the level that could be expected without structural congestion in a bidding zone) should be identified as the primary contributor to the congestion on internal network elements, whereas internal flows should be penalised only for the remaining volume of congestion.
- (226) During the proceedings on the RDCTCS Methodology Decision, ACER explored whether regulatory authorities could support a compromise solution between Option 1 and Option 2 (as described above) where part (percentage) of internal flows would be treated with equal priority as loop flows and the remaining part with a second priority. The responses from the majority of regulatory authorities showed that a decision adopted based on such proposal for priority of flow components could not receive the required favourable opinion of the ACER's Board of Regulators. Thus, only a decision adopting Option 1 (as described above) was able to gather the required favourable opinion of the ACER's Board of Regulators.

5.3.4.6. Treatment of flows originating outside of the Core CCR

- (227) The cost sharing methodology must clearly specify how the costs attributed to flow components, which are attributed to the origins of flows outside of the Core CCR are allocated to the Core bidding zones.
- (228) Article 8 of the Proposal mentioned the flow components which are attributed to the origins of flows outside of the Core CCR and specified that these shares shall be reallocated to bidding zones in the Core CCR, but without specifying exactly how. In the Experimentation report, Core TSOs explored the options: no socialisation of loop flows from outside the Core CCR and the socialisation of these flows on equal sharing principle.
- (229) A majority of Core TSOs and regulatory authorities were of the opinion that there should be no socialisation of loop flows from outside the Core CCR, which implies that the related costs would be borne by the owners of cross border relevant network elements carrying such flows. The TSOs and regulatory authorities close to the perimeter of the Core CCR opposed to such a solution, claiming that applying no socialisation is not fair towards the TSOs located at the perimeter of the Core CCR and it would not provide an incentive to foster cross-regional coordination or merging of CCRs.
- (230) After careful assessment of possible options, ACER adopted the RDCTCS Methodology without socialisation of loop flows from outside the Core CCR. This decision reflected the majority position of Core regulatory authorities and the TSOs. ACER also disagreed that equal socialisation of loop flows from outside the Core CCR

would provide better incentives to foster cross-regional coordination or merging of CCRs. On the contrary, TSOs at the perimeter of the Core CCR should have higher incentive for cross-regional coordination or merging of CCRs since they are also members of neighbouring CCRs and they therefore have more leverage to apply these efficient solutions than other Core TSOs, which are not members of these CCRs. Socialisation, on the other hand, would soften these incentives for all Core TSOs.

- (231) During the hearing regarding the RDCTCS Methodology, some Core TSOs expressed concerns that the loop flows from outside the Core CCR should be treated equally as loop flows within the Core CCR. ACER responded that different treatment is justified by the fact that cost sharing can only be applied to Core TSOs and no costs can be assigned to the TSOs outside the Core CCR. Treating all loop flows equally would lead to costs assigned to the TSOs outside the Core CCR, which would render the methodology not legally compliant as the TSOs outside the Core CCR are not within the scope of this methodology, are not being consulted and have no legal obligation to implement the Core cost sharing methodology.

5.3.4.7. Distribution of cost shares to each bidding zone

- (232) The cost sharing methodology must clearly specify the solution, which determines how much of the costs on a particular cross-border relevant network element are attributed to each bidding zone.
- (233) Article 8(7) of the Proposal defined how the shares for each bidding zone are determined, but it did not specify how this is done exactly.
- (234) ACER amended this part of the Proposal and provided further clarification on how the shares per bidding zones are determined. Article 7(7) of the RDCTCS Methodology defined that the total costs attributed to cross-border relevant network element are split proportionally to the calculated contributions to congestion, where the loop flow contributions are attributed to the concerned bidding zones where these loop flows originate from and the remaining contributions to the TSO(s) owning the concerned network element (i.e. XNE connecting TSO).

5.3.4.8. Splitting of costs among the TSOs within a bidding zone

- (235) The cost sharing methodology must specify how the costs attributed to Core bidding zones are further split among the TSOs of each bidding zone.
- (236) The Proposal did not mention the sharing of costs among the TSOs of a bidding zone and therefore did not comply with Article 74(2) of the CACM Regulation, which requires the costs to be shared among TSOs, not the bidding zones.
- (237) ACER consulted this issue with TSOs and regulatory authorities of Germany and Luxembourg, which currently constitute the only bidding zone where several TSOs are involved. While these concerned parties suggested this cost sharing issue to remain

open for discussion and agreement among the involved parties, ACER considered that this would represent a legal gap that could result in a dispute that could hamper the implementation or operation of the cost sharing. For this reason, ACER insisted that a default solution is defined in case no agreement is reached on cost sharing among the involved parties. Accordingly, ACER defined that the costs for such bidding zone shall be split among the TSOs in proportion to the annual consumption. However, TSOs may also agree on a different sharing key (in which case they will inform the settlement entity of the agreed sharing key) or appoint a single TSO as a settlement counterparty.

5.4. Other issues

- (238) This section incorporates, without substantive changes, statements of reasons from Decision No 30/2020 with regard to elements of the RDCTCS Methodology other than the selection of the flow decomposition method and the determination of the loop flow threshold.

5.4.1. Monitoring by TSOs and reporting to regulatory authorities

- (239) Article 74(5) of the CACM Regulation requires that methodology for cost sharing of redispatching and countertrading includes (a) a mechanism to verify the actual need for redispatching or countertrading between the TSOs involved; (b) an ex post mechanism to monitor the use of remedial actions with costs; (c) a mechanism to assess the impact of the remedial actions, based on operational security and economic criteria; (d) a process allowing improvement of the remedial actions, and (e) a process allowing monitoring of each capacity calculation region by the competent regulatory authorities.
- (240) The Proposal did not contain any provisions which would address the requirements of Article 74(5)(a)-(d) of the CACM Regulation. However, after consulting with Core TSOs and regulatory authorities, ACER understood that these requirements cannot be met within the cost sharing methodology since they essentially require monitoring of the efficiency of coordination and optimisation of remedial actions and have no relevance for cost sharing. Thus, ACER was not in a position to amend the methodology to be compliant with Article 74(5)(a)-(d) of the CACM Regulation, without having an information and understanding about the coordination and optimisation of remedial actions. ACER also invited Core TSOs and regulatory authorities to draft and propose amendments that would address these requirements, but no proposal has been received. Since the coordination and optimisation of remedial actions is within the scope of the methodology pursuant to Article 35 of the CACM Regulation and the methodology pursuant to Article 76 of the SO Regulation, and both methodologies had not yet been adopted, ACER suggested that these requirements need to be met in these two methodologies rather than in the cost sharing methodology. This suggestion was generally accepted by Core TSOs and regulatory authorities.
- (241) ACER therefore deemed that only point (e) of Article 74(5) of the CACM Regulation is relevant for this cost sharing methodology. This requirement was addressed within

Articles 11 and 12 of the Proposal, which contained provisions on database used for monitoring by Core TSOs and reporting to Core regulatory authorities and ACER.

- (242) In Article 11 of the Proposal (Article 10 of the cost sharing methodology) ACER removed all provisions on data, which are not used within the cost sharing methodology but rather within the coordination optimisation subject to the methodology pursuant to Article 35 of the CACM Regulation and the methodology pursuant to Article 76 of the SO Regulation. ACER clarified provisions on data regarding mapping and the final splitting of costs per each bidding zone and TSO. ACER also added provisions regarding the input data used for cost sharing methodology, the flow decomposition results, the results of the application of the loop flow threshold and the data on identified contributions to congestion.
- (243) With regard to specific monitoring tasks, ACER added, based on request by Core regulatory authorities, the requirement for Core TSOs to monitor the forecasting accuracy of network topology, generation and load in the individual grid models that are used for cost sharing. ACER understood that the forecasting of these elements might have a significant impact on the cost sharing and it is for this reason important that Core TSOs monitor such forecasting to prevent any abusive behaviour, which would bring specific financial gain to any TSO in the application of the cost sharing methodology.
- (244) Finally, ACER removed the second paragraph of Article 11 of the Proposal, since it was not relevant for the monitoring of cost sharing, but rather for the monitoring of the total costs incurred by the coordination optimisation. Such monitoring should therefore be included in the methodology pursuant to Article 35 of the CACM Regulation and the methodology pursuant to Article 76 of the SO Regulation.
- (245) Article 12 of the Proposal included provisions on reporting to Core regulatory authorities by regular quarterly reports. ACER again removed from this report all the requirements related to coordination optimisation as these need to be included in the methodology pursuant to Article 35 of the CACM Regulation and the methodology pursuant to Article 76 of the SO Regulation. ACER also further clarified the reporting provisions on the overview of the total costs and cost shares attributed to Core TSOs as well as the possible correction of results of cost sharing from the previous quarterly reports. ACER added the reporting on the monitoring of forecasting accuracy of individual grid models and monitoring of specific cases of cost sharing, which are considered to result in an unexpected outcome. Finally, ACER softened the frequency of monitoring and changed the monitoring reports to biannual frequency.

5.4.2. Review of the cost sharing methodology

- (246) Article 13 of the Proposal defined an annual review of the cost sharing methodology for the purpose of identifying possible improvements regarding the effectiveness of applied remedial actions as well as appropriateness, fairness and effectiveness of the applied cost sharing solution.

- (247) ACER amended this Article (Article 12 of the RDCTCS Methodology) by reviewing the principles for possible improvements such that they are consistent with the most important principles and objectives established in Article 74(6) of the CACM Regulation.
- (248) Based on request from Core TSOs and regulatory authorities, ACER also added the obligation for a general review of the methodology twelve months after its implementation. This allowed the TSOs to gain sufficient understanding and information about the appropriateness of all the aspects of the cost sharing solution based on real data. The review should be followed by the development of a proposal for an amendment of the cost sharing methodology submitted to Core regulatory authorities for approval.

5.4.3. Implementation of cost sharing methodology

- (249) In its Article 14, the Proposal defined the deadline for publication of the cost sharing methodology according to the Articles 9(10), 9(11) and 9(12) of the CACM Regulation. This Article also contained a proposal for the amendment of the cost sharing methodology twelve months after its approval, which would also include a detailed implementation timeline, which would be subject to approval by Core regulatory authorities. Further, this Article contained a number of conditions for the implementation of the cost sharing methodology, which serve as an indication or information on what is needed to implement this methodology.
- (250) The Proposal therefore contained the obligation for publication of the methodology. However, the Proposal did not contain the timescale for implementation as required by Article 9(9) of the CACM Regulation. For this reason, ACER specified clearly the timescale for the implementation of the cost sharing methodology. After consultation with Core TSOs and regulatory authorities, ACER was informed that the cost sharing methodology is conditional on the implementation of the methodology pursuant to Article 35 of the CACM Regulation and the methodology pursuant to Article 76 of the SO Regulation. ACER therefore clarified that the implementation of the cost sharing methodology shall be done by the same deadline as the implementation of these two methodologies.
- (251) In Article 13 of the adopted cost sharing methodology, ACER also introduced, at the request of some Core regulatory authorities, additional requirements that TSOs need to meet during the implementation of the cost sharing methodology. These include the requirements on the provision of regular information and reports to Core regulatory authorities regarding development, implementation and testing of the cost sharing methodology. This was required to provide Core regulatory authorities with sufficient perspective on the impact of cost sharing methodology on the national transmission tariffs, which they are competent to set or fix.

- (252) Article 15 of the Proposal included a paragraph on the agreement among Core TSOs regarding the settlement of costs arising from the cost sharing methodology. ACER amended this Article (Article 8 of the RDCTCS Methodology), by further providing an obligation to appoint a settlement entity, which shall be responsible to settle the costs among Core TSOs.

5.4.4. Establishment of operation committee

- (253) During the proceedings for the RDCTCS Methodology, ACER, Core TSOs and Core regulatory authorities agreed that the cost sharing methodology describes a very complex process, which has not been developed and tested yet. For this reason, it was and is very difficult to ensure that the adopted methodology fills all possible gaps that could emerge during its implementation. ACER therefore identified a significant risk for implementation and operation problems, such as interpretation of the methodology, design choices on details that are not governed by the cost sharing methodology and problems related to day-to-day operation.
- (254) In order to prevent any possible delays or interruptions in the implementation or operation of this methodology, ACER considered that TSOs should have certain degree of freedom to solve those problems themselves, until the methodology can be further amended or clarified. For this reason, ACER added a new Article 9 in the RDCTCS Methodology, which establishes an operation committee. This committee should serve as a body for settlement of disputes among TSOs regarding the implementation and operation of the cost sharing methodology. This committee should be able to make effective decisions regarding the possible disputes, which should be binding for the implementation and operation of this cost sharing methodology,

HAS ADOPTED THIS DECISION:

Article 1

The common methodology for cost sharing of redispatching and countertrading for the Core capacity calculation region, developed pursuant to Article 74 of Regulation (EU) 2015/1222, is approved as set out in Annex I to this Decision.

Article 2

Decision No 30/2020 of the European Union Agency for the Cooperation of Energy Regulators of 30 November 2020 on the Core CCR TSO's Proposal for the methodology for cost sharing of redispatching and countertrading is repealed.

Article 3

This Decision is addressed to all TSOs of the Core CCR:

1. 50Hertz - 50Hertz Transmission GmbH
2. Amprion - Amprion GmbH
3. APG - Austrian Power Grid AG
4. ČEPS - ČEPS a.s.
5. CREOS Luxembourg - CREOS Luxembourg S.A.
6. ELES, d.o.o. sistemski operater prenosnega elektroenergetskega omrežja
7. Elia - Elia Transmission Belgium S.A.
8. HOPS d.d. - Croatian Transmission System Operator Plc
9. MAVIR ZRt. - MAVIR Magyar Villamosenergia-ipari Átviteli Rendszerirányító Zártkörűen Működő Részvénytársaság ZRt.
10. PSE - Polskie Sieci Elektroenergetyczne S.A.
11. RTE - Réseau de Transport d'Electricité S.A.
12. SEPS - Slovenská elektrizačná prenosová sústava, a.s.
13. TenneT Germany - TenneT TSO GmbH
14. TenneT Netherlands - TenneT TSO B.V.
15. Transelectrica - Compania Nationala de Transport al Energiei Electrice S.A.
16. TransnetBW - TransnetBW GmbH

Done at Ljubljana, on 21 July 2026.

- SIGNED -

*For the Agency
The Director ad interim*

V. ZULEGER

Annexes:

Annex I – Common methodology for redispatching and countertrading cost sharing for the Core CCR in accordance with Article 74 of Commission Regulation (EU) 2015/1222 of 24 July 2015

Annex Ia (for information only) – Common methodology for redispatching and countertrading cost sharing for the Core CCR in accordance with Article 74 of Commission Regulation (EU) 2015/1222 of 24 July 2015 with tracked changes

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

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