ACER

European Union Agency for the Cooperation of Energy Regulators

OPINION No 09/2025

on the transmission system operators' proposal on the alternative bidding zone configurations

17 September 2025

Executive summary

Bidding zones, within which electricity can be traded freely, combined with the allocation of capacity between them to manage network congestions at the lowest cost, are two important cornerstones of the EU electricity market design. Along with remedial actions and targeted grid investments, they represent one of the regulatory options to maximise cross-zonal trading opportunities.

Pursuant to Article 14 of the Electricity Regulation (Regulation (EU) 2019/943), transmission system operators are tasked to assess the relative benefits of different alternative bidding zone configurations in the EU compared to the status quo. The ultimate purpose of a review of the bidding zone configuration is improving the efficiency of electricity market functioning, which in turn leads to lower cost of electricity generation, lower prices for consumers and reduced cost of managing grid congestions by means of remedial actions.

The key objective of this Opinion is to inform Member States on whether the bidding zone review study performed by transmission system operators followed the requirements of the bidding zone review methodology and assess the likely impact of any deviation thereof vis-à-vis the study's findings.

ACER assessment shows that, while the study broadly aligns with the regulatory requirements, an unrealistic assumption on the level of coordination of remedial actions to resolve grid congestions has led to a potential severe underestimation of the expected benefits of the German-Luxembourgish alternative bidding zone configurations and their combinations with a bidding zone reconfiguration in the Netherlands. Whilst transmission system operators have estimated these benefits to be around EUR 250 to 340 million, ACER finds that they are closer to a magnitude of **EUR 450 to 540 million** when reflecting the current operational practises for congestion management.

For the avoidance of doubt, with this Opinion ACER does not intend to provide a recommendation as to what Member States should opt for in terms of the final decisions to be taken with regard to the bidding zone configuration, but rather to inform their assessment with a factual analysis of the work carried out by transmission system operators. In line with the responsibilities entrusted to ACER in the Electricity Regulation, ACER's role in the present bidding zone review process includes approving the bidding zone review methodology and identifying alternative bidding zone configurations for transmission system operators to consider in their review. In addition, as part of its monitoring of potential barriers to cross-border trade in the wholesale electricity market, ACER finds it necessary to monitor the bidding zone configuration given its aim to maximise economic efficiency and cross-zonal trading opportunities.

ACER invites Member States to consider ACER assessment in this Opinion when taking a decision on whether to keep or amend the bidding zone configuration in accordance with Article 14(7) and (8) of the Electricity Regulation.

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1. Background

1 Regulation (EU) 2019/943 of the European Parliament and the Council of 5 June 2019 on the internal market for electricity[1] (the 'Electricity Regulation') laid down a range of requirements to address congestions and, in particular, to ensure an optimal configuration of bidding zones. These requirements include the need to carry out a bidding zone review, following the development of a methodology and assumptions that are to be used in such a bidding zone review and for the alternative bidding zone configurations to be considered in accordance with Article 14(5) of the Electricity Regulation.

2 On 5 October 2019, all European transmission system operators (TSOs) submitted a bidding zone review proposal to regulatory authorities for approval. This proposal lacked alternative bidding zone configurations for a large part of Europe. By 7 April 2020, TSOs submitted an updated version of the proposal to their respective regulatory authorities, which then referred it to ACER for decision.

3 In its Decision No 29/2020 of 24 November 2020[2], ACER:

i. adopted the methodology and assumptions that are to be used in the bidding zone review process[3] in accordance with Article 14(5) of the Electricity Regulation, and

ii. found that it needed additional information to take a decision on alternative bidding zone configurations to be considered, and therefore requested TSOs to submit additional information, mainly results from locational marginal pricing simulations.

4 With its Decision No 11/2022 of 8 August 2022[4], ACER decided on the alternative bidding zone configurations to be considered in the bidding zone review process. These alternative configurations concerned five Member States: Germany (four alternatives), Sweden (four alternatives), France, Italy and the Netherlands (one alternative each). This Decision could however not cover the Baltic region, as the results of the locational marginal pricing simulations were still missing for that area. Once these results were provided, ACER published its Decision No 17/2023 on the alternative bidding zone configurations for the Baltic region on 22 December 2023[5], whereby ACER concluded that no alternative bidding zone configurations needed to be investigated for the Baltics.

5 Pursuant to Article 14(6) of the Electricity Regulation, TSOs must submit a joint proposal to the relevant Member States or their designated competent authorities to amend or maintain the bidding zone configuration no later than 12 months after approval of the methodology and assumptions, i.e. by 8 August 2023. This proposal was published as part of the report 'Bidding Zone Review of the 2025 Target Year'[6] on 28 April 2025.

6 In the following, the specific part of the bidding zone review that TSOs have to carry out pursuant to Article 14(6) of the Electricity Regulation is referred to as 'bidding zone review study' to differentiate it from the overall 'bidding zone review process', which includes further steps such

[1] OJ L158, 14.6.2019, p.54.

[2] https://www.acer.europa.eu/documents/search?search_api_fulltext=29-2020.

[3] https://www.acer.europa.eu/sites/default/files/documents/Individual%20Decisions_annex/ACER%20Decision%2029-2020%20on%20the%20BZR%20-%20Annex%20I%20_%20%20BZR%20methodology_0.pdf.

[4] https://www.acer.europa.eu/documents/search?search_api_fulltext=11-2022.

[5] https://www.acer.europa.eu/documents/search?search_api_fulltext=17-2023.

[6] https://www.entsoe.eu/news/2025/04/28/bidding-zone-study-released. For the Central Europe bidding zone review region, see section 6.7; for the Nordic bidding zone review region, see section 7.4.

as the launch of the bidding zone review, the adoption of the bidding zone review methodology (constituting Annex I of ACER Decision No 29/2020) and the adoption of alternative bidding zone configurations to be considered.

7 According to Article 3(1) of 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 Regulators[7] (the 'ACER Regulation'), ACER may, upon request or on its own initiative, provide an Opinion to the Council on any of the issues relating to the purpose for which it has been established. One of the tasks assigned to ACER under Article 15(1) of the ACER Regulation is to monitor potential barriers to cross-border trade in the wholesale electricity market. Given that, in accordance with Article 14(1) of the Electricity Regulation, the configuration of bidding zones in the European Union must be designed to maximise economic efficiency and cross-zonal trading opportunities, ACER considers that the relevance of a potential bidding zone reconfiguration triggers the need for a dedicated assessment of the bidding zone review study carried out by TSOs.

8 The objective of this Opinion is to inform Member States on whether the bidding zone review study performed by TSOs followed the requirements of the bidding zone review methodology and assess the likely impact of any deviation thereof vis-à-vis the study's findings. Additionally, the Opinion discusses the alignment of the TSOs' proposal to the relevant Member States or their designated competent authorities against the legal framework set out by Article 14 of the Electricity Regulation. Finally, the Opinion expands on the interactions with ENTSO-E and TSOs throughout the process and the lessons learned from it.

9 The assessment conducted by ACER in this Opinion is solely based on the information published by TSOs on ENTSO-E's website[8] as well as the complementary datasets requested by ACER, i.e. anonymised answers to the surveys conducted to estimate transition costs, a non-confidential version of the published network models, and detailed results behind the assessment of criterion 14 ('Adverse effects of internal transactions on other bidding zones') of the bidding zone review methodology. [9] [10]

10 For the avoidance of doubt, with this Opinion ACER does not intend to provide a recommendation as to what Member States should opt for in terms of the final decisions to be taken with regard to the bidding zone configuration, but rather to inform their assessment with a factual analysis of the TSOs' work. In line with the responsibilities entrusted to ACER in the Electricity Regulation, ACER's role in the present bidding zone review process includes approving the bidding zone review methodology and identifying alternative bidding zone configurations for transmission system operators to consider in their review. In addition, as part of its monitoring of potential barriers to cross-border trade in the wholesale electricity market, ACER finds it necessary to monitor the bidding zone configuration given its aim to maximise economic efficiency and cross-zonal trading opportunities.

11 This Opinion is issued in accordance with Article 3(1) and Article 15(1) of the ACER Regulation and addressed to the Council.

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[7] OJ L158, 14.6.2019, p. 22.

[8] https://www.entsoe.eu//network_codes/bzr/.

[9] ACER did not have access to all granular input and output data as well as the modelling tools used by TSOs in the bidding zone review process.

[10] On 31 March 2025, upon ACER's request, TSOs provided ACER with detailed data on the network elements used in capacity calculation, the volume of renewable energy sources curtailed and the total volume of energy redispatched. As per the agreement with the TSOs providing these data items, this information has been used only for the ACER 2025 market monitoring report on transmission capacities for cross-zonal trade of electricity and congestion management in the EU (see chapter 3.3) and not for this Opinion.

2. Procedure

12 During the performance of the bidding zone review study, TSOs held regular meetings with ACER and regulatory authorities to present and discuss the status of the work.

13 In accordance with Article 16(7) of the bidding zone review methodology, TSOs published on ENTSO-E's website[11] all inputs for the bidding zone review study. Complementary to the published data and in line with Article 17(2) of the bidding zone review methodology, TSOs submitted to ACER and regulatory authorities all detailed information including input data, scenario, sensitivity analyses, assumptions and parameters. ACER and regulatory authorities provided feedback on such information in accordance with Article 17(3) of the bidding zone review methodology[12]; TSOs' replies to these comments were published on ENTSO-E's website[13].

14 TSOs held a public consultation[14] covering the elements laid down under Article 17(4) of the bidding zone review methodology. The responses received and, where relevant, their evaluation by TSOs, have been summarised under the respective appendixes of Annex 4 and Annex 5 to the bidding zone review study.

15 The bidding zone review methodology provides for the possibility for a consultation with ACER and regulatory authorities in case TSOs would have considered any of the alternative configurations as 'unacceptable' under Step 3 of the evaluation approach (Article 13 of the bidding zone review methodology). However, this consultation did not occur since all alternative configurations which passed Step 2 were deemed 'acceptable' by TSOs.

16 Finally, in accordance with Article 16(7)(b) of the bidding zone review methodology, the output data of the bidding zone review study was published on ENTSO-E's website[15] on 28 May 2025.

17 The ACER Electricity Working Group provided its advice on 25 August 2025.

18 The ACER Board of Regulators issued a favourable opinion on 17 September 2025 in accordance with Article 22(5)(a) of Regulation (EU) 2019/942.

3. ACER assessment

19 The ACER Regulation entrusts ACER with the monitoring of the wholesale electricity market and bidding zones are one of the cornerstones of its design. Furthermore, Article 14 of the Electricity Regulation defines the bidding zone review as the process to ensure that the bidding zone configuration is designed to maximise economic efficiency and cross-zonal trading opportunities. Hence, given the relevance of the bidding zone review process to fulfil the monitoring obligations laid down under Article 15(1) of the ACER Regulation regarding potential barriers to cross-border trade, a dedicated ACER assessment of the study carried out by TSOs is included in this Opinion.

[11] https://www.entsoe.eu//network_codes/bzr/#bzr-data-publication.

[12] https://www.acer.europa.eu/sites/default/files/documents/en/Electricity/MARKET-CODES/CAPACITY-ALLOCATION-AND-CONGESTION-MANAGEMENT/17%20BZR/Regulators-feedback-note-TSOs-bidding-zone-review-2023.pdf.

[13] https://eepublicdownloads.blob.core.windows.net/public-cdn-container/clean-documents/Network%20codes%20documents/NC%20CACM/BZR/240220_TSOs_formal_answer_to_ACER-NRAs_feedback_vF_CE_file_update.pdf.

[14] https://consultations.entsoe.eu/markets/public-consultation-on-bidding-zone-review/.

[15] https://www.entsoe.eu//network_codes/bzr/#bzr-data-publication.

20 This section is structured as follows. First, ACER assessment of the deviations from the bidding zone review methodology and their likely impact on the outcome of the bidding zone review study is provided. Second, the alignment of the TSOs' proposal against the legal framework set out by Article 14 of the Electricity Regulation is discussed. Finally, the interactions with ENTSO-E and TSOs throughout the process and the lessons learned from it are described.

3.1. Deviations from the bidding zone review methodology

3.1.1. Coordination of remedial actions

21 Remedial actions serve to mitigate forecasted or realised grid congestions, potentially allowing TSOs to safely increase the amount of cross-zonal capacity made available to the market. However, they may carry significant associated costs, their use is currently mostly uncoordinated between the TSOs in the different Member States, and they may face technical limitations closer to real time. The need for remedial actions to solve physical congestions has increased in recent years, alongside the expansion of renewables, and it is expected to grow further in the future. In 2024 alone, over 60 TWh of remedial actions were activated in the EU, at a total cost of EUR 4.3 billion.[16]

22 The Electricity Regulation establishes an improved bidding zone configuration as one of the tools to manage congestions in the grid more efficiently while also increasing the average amount of capacity for cross-zonal trade. Hence, it is of paramount importance to ensure a proper representation of this electricity market segment, in line with the requirements of the bidding zone review methodology, for a technically sound bidding zone review study.

23 The modelling chain to be followed by TSOs in the bidding zone review study provides that a redispatching simulation needs to be carried out to solve all operational security violations determined after the market dispatch. This simulation is referred to as remedial action optimisation and is subject to the requirements laid down in Article 9 of the bidding zone review methodology. Specifically, according to Article 9(10) of the bidding zone review methodology, *'[c]oordination of remedial actions activation shall reflect the expected level of coordination of redispatching among TSOs for the target year[17]'.*

24 In the Central Europe bidding zone review region[18], TSOs assumed that the remedial actions are fully coordinated across the entire region.[19] In practice, this means that congestions in a Member State can be solved by relying on (cheaper) assets located in another Member State within the same bidding zone review region. While this level of coordination is expected to be implemented in the coming years, this is not in line with the operational practices of the target year 2025, where the level of coordination in congestion management processes is still rather limited.

25 Core TSOs communicated in the Core Implementation Group meeting[20] of 14 February 2023 that they would not be able to comply with the regulatory deadline of 4 June 2025 for the full implementation of the Core regional operational security coordination and cost sharing

[16] https://www.acer.europa.eu/sites/default/files/documents/Publications/ACER-Monitoring-Report-2025-crosszonal-electricity-trade-capacities.pdf.

[17] Pursuant to Article 14(5) of the Electricity Regulation, the target year of the bidding zone review study was set to 2025.

[18] The bidding zone review region Central Europe comprises the following bidding zones: Austria, Belgium, Croatia, Czechia, Denmark 1, France, Germany/Luxembourg, Hungary, Italy 1 (Nord), Poland, Romania, Slovakia, Slovenia and The Netherlands.

[19] The same assumption has been considered also in the bidding zone review region Nordic (Denmark 2, Finland and Sweden). In this region, network congestions are addressed via the Nordic balancing energy market, resulting in full coordination across the Nordic bidding zones.

[20] Core Implementation Group is the forum for discussion between Core TSOs and Core NRAs, with ACER as observer.

methodologies[21]. The implementation of the processes to forecast, activate and share the cost of remedial actions across the TSOs of the region are instrumental to contain congestion costs and maximise the amount of cross-zonal capacity made available to the market. According to the updated timeline presented in that meeting, the implementation of these methodologies would take place by the end of Q3 2026. This implies that for most of the time spent performing the bidding zone review study, TSOs were aware that the assumption of full coordination of remedial actions at the level of Central Europe by mid-2025 would not be realistic. This unrealistic assumption became even less applicable when, in October 2024, TSOs communicated an additional significant delay in the implementation of this methodology, currently expected between 2029 and 2031.

26 The impact of this assumption can be inferred by comparing the simulated costs in the bidding zone review study with the most recent actual values, duly accounting for any biases due to different congestion management volumes and/or price levels. Congestion management costs simulated in the bidding zone review study, in Central Europe, for the status quo amount to about EUR 1.2 billion, whereas the operational values for 2024, for the same geographical area, are in the order of EUR 2.4 billion[22]. The total congestion management volumes in the two cases are very similar (20 TWh per direction, i.e. upwards and downwards); however, the weighted average day-ahead price in 2024 across Central Europe was 79 EUR/MWh, whereas it has been simulated as 48 EUR/MWh in the bidding zone review study, i.e. 40% lower[23]. Accordingly, the total congestion management costs simulated in the bidding zone review study for Central Europe, for the status quo, would have rather added up to EUR 1.7 billion with the price levels experienced in 2024.

27 Assuming that the volume of remedial actions in the alternative configurations remains the same as the one simulated in the bidding zone review study, and applying the price correction factor described above, the savings in congestion management costs for the German-Luxembourgish alternative configurations and their combinations with a reconfiguration in the Netherlands would range between EUR 750 to 860 million per year. All in all, this would result in net economic efficiency gains for these alternative configurations in the order of EUR 450 to 540 million per year, about 70% higher than the ones estimated by TSOs in the bidding zone review study.

28 Based on the above, ACER considers that the assumption of full coordination of remedial actions across Central Europe has led to a potential severe underestimation of the expected economic surplus of the German-Luxembourgish alternative bidding zone configurations and their combinations with a bidding zone reconfiguration in the Netherlands. Furthermore, given the relatively limited economic efficiency gains/losses calculated by TSOs for the alternative configurations of the Netherlands, France and Italy (North), it cannot be excluded that the conclusion on the expected (un)profitability of these alternative configurations would have changed under the assumption of less advanced coordination of remedial actions.

29 In the context of significantly high redispatching volumes and costs and with considerable delays in the implementation of key methodologies to mitigate these issues, the assumption of full coordination of remedial actions in the Central Europe bidding zone review region by mid-2025 not only directly impacts the results of criterion 4 of the bidding zone review methodology ('Economic efficiency'), but also the estimation of the minimum lifetime of these alternative configurations, defined as the period needed to pay back the transition costs considering the expected monetised benefits compared to the status quo.

[21] See Article 37(4) of Annex I to ACER Decision No 33/2020 and ACER Decision No 35/2020.

[22] See ACER's dashboard complementing the ACER 2025 market monitoring report on transmission capacities for cross-zonal trade of electricity and congestion management in the EU.

[23] The total electricity demand per bidding zone in 2024 has been used as weighting factor in both cases.

3.1.2. The estimation of transition costs

30 Among the 22 criteria to be assessed by TSOs in the bidding zone review study, criterion 11 concerns the estimation of the so-called transition costs. Article 15(11) of the bidding zone review methodology defines transition costs as '*the one-off costs expected to be incurred in case the bidding zone configuration is amended*' and sets clear requirements on which type of costs may be accounted for under this criterion, among which:

i. Transition costs must relate to adaptations that are inherently and unambiguously related to a specific bidding zone configuration change.

ii. Transition costs must not relate to adaptations that are, in general, necessary to ensure sufficient flexibility of the systems to cope with a variable number of bidding zones due to a potential amendment of the bidding zone configuration in the future.

31 The bidding zone review methodology requires TSOs to perform a joint study for all bidding zone review regions to identify and possibly estimate transition costs. This study was carried out by TSOs in collaboration with an external contractor and was published as Annex 5 to the bidding zone review study on ENTSO-E's website.[24] The transition costs estimates, together with the corresponding minimum lifetime of each alternative configuration, are presented in section 6.3.10 of the bidding zone review study.

32 The transition costs estimates in the study are largely based on the inputs provided by stakeholders in two online surveys launched in 2022 and 2023, respectively. ACER and regulatory authorities, upon their request, were provided with the anonymised answers to both surveys. Overall, 42 stakeholders answered to at least one of the two surveys.

33 ACER appreciates the efforts behind the transition costs study and, more broadly, the work carried out by the external contractor in cooperation with TSOs. Moreover, ACER acknowledges that, at EU level, this study represents the first of its kind, posing significant challenges in retrieving the specific information required for a solid outcome. Nonetheless, ACER considers the range of transition costs estimated under criterion 11 of limited relevance due to the following key shortcomings:

i. The transition cost estimates are based on limited stakeholders' input and do not sufficiently reflect the experience from previous bidding zone reconfigurations. The fact that the reported transition costs are the lowest for Sweden and Italy should be considered as a clear sign that the IT costs provided by stakeholders of the other Member States under analysis are likely the ones to make their IT system flexible and not linked to the specific alternative configurations under investigation.

ii. Several answers provided by stakeholders in the two surveys are not relevant due to lack of explanations and/or disaggregation.

iii. The study fails short in explaining several observed trends and is not complemented by an independent assessment performed by the external contractor.

34 The impact of these shortcomings on the results of the bidding zone review study is not directly quantifiable given the lack of a counterfactual assessment, especially for the case of the German-Luxembourgish alternative configurations. Nonetheless, acknowledging the inherent limitations of a comparison with different jurisdictions, experience from Canada (Ontario), the United Kingdom and the United States consistently shows that the total economic benefits of a transition

[24] https://www.entsoe.eu/network_codes/bzr/#Downloads_of_the_Bidding_Zone_Review_(BZR)_Report_for_the_target_year_2025.

to a more granular locational pricing scheme, leading to considerable economic surplus, significantly outweigh the one-off costs incurred in implementing it.[25]

3.2. Deviations from the legal framework

3.2.1. Timeline for the completion of the bidding zone review study

35 Pursuant to Article 14(6) of the Electricity Regulation, *'[…] the transmission system operators participating in the bidding zone review shall submit a joint proposal to the relevant Member States or their designated competent authorities to amend or maintain the bidding zone configuration no later than 12 months after approval of the methodology and assumptions pursuant to paragraph 5. […]'*.

36 As explained in paragraph 3 and 4, ACER had to follow a two-step approach for the approval of the bidding zone review methodology and the alternative bidding zone configurations, respectively. Hence, the starting point of the 12-month period referred to in Article 14(6) of the Electricity Regulation coincides with the adoption date of ACER Decision on the alternative bidding zone configurations for the Central Europe and Nordic bidding zone review regions, namely 8 August 2022.[26] Accordingly, the legal deadline for TSOs to complete the bidding zone review study was 8 August 2023.

37 The publication of the TSOs' proposal pursuant to Article 14(6) of the Electricity Regulation took place on 28 April 2025. Based on the information at ACER's disposal, the submission of this proposal to the relevant Member States or their designated competent authorities occurred on the same day. This constitutes a delay of more than 20 months compared to the legal deadline.

38 ACER's considerations on the delay incurred by TSOs are discussed in section 3.3.

3.2.2. The submission of the TSOs' (joint) proposal

39 In section 6.7 and 7.4 of the bidding zone review study, the joint proposal pursuant to Article 14(6) of the Electricity Regulation is provided for the Central Europe and Nordic bidding zone review regions, respectively.

40 According to footnote 43 and 54 of the bidding zone review study, the proposal for the Central Europe bidding zone review region was approved by the participating TSOs of the Central Europe bidding zone review region, whereas the proposal for the Nordic bidding zone review region was approved by the participating TSOs of the Nordic bidding zone review region. In other words, the geographic scope of the 'joint proposal' has been set by TSOs as the perimeter of the respective bidding zone review region instead of all TSOs participating in the bidding zone review.

41 Such approach seems not to align with the requirement of Article 14(6) of the Electricity Regulation, according to which the TSOs participating in the bidding zone review – i.e. here all

[25] In the considered jurisdictions, the one-off implementation costs were estimated to be recovered already within the first year of implementation. For Ontario, please refer to https://www.brattle.com/wp-content/uploads/2017/10/7193_benefits-case-assessment-market-renewal-project-clean-20170420.pdf. For the United Kingdom, please refer to https://www.ofgem.gov.uk/sites/default/files/2023-10/FINAL%20FTI%20Assessment%20of%20locational%20wholesale%20electricity%20market%20design%20options%20-%2027%20Oct%202023%205.pdf. For the United States, please refer to https://www.climatepolicyinitiative.org/wp-content/uploads/2011/12/Nodal-Pricing-Implementation-QA-Paper.pdf.

[26] As mentioned in paragraph 4, no alternative bidding zone configurations were proposed for the Baltic bidding zone review region. Accordingly, the adoption of this ACER Decision does not have any impact on the timeline for the bidding zone review study.

TSOs of the Central Europe and Nordic bidding zone review regions – must submit a joint proposal to the relevant[27] Member States or their designated competent authorities.

42 Additionally, regarding the content of the proposal for the Central Europe bidding zone review region, ACER observes that it includes several qualitative considerations, some of which span beyond the scope of the analysis performed by TSOs in accordance with the bidding zone review methodology. ACER invites the relevant TSOs to limit their observations to factual and data-backed insights, duly taking into account the applicable legal and regulatory framework.

3.3. Interactions with TSOs and ENTSO-E and lessons learned

43 ACER appreciates the work done by TSOs, ENTSO-E and the external contractors over the last few years on such a fundamental, yet extremely challenging, deliverable, and congratulates all involved parties for the tremendous efforts behind this achievement.

44 The collaboration with TSOs and ENTSO-E throughout this project was overall very positive. Several meetings were organised and, even at times where the various positions were not reconcilable, the atmosphere always remained highly professional. Furthermore, the frequency of the interactions allowed to alternate discussions on very technical matters with others on more general topics, including planning and organisational developments. Despite the lengthy process, ACER notes that all interactions between TSOs, ENTSO-E, ACER and regulatory authorities took place in an online format. While, especially between 2020 and 2022, this was largely due to external circumstances, ACER finds that at least one or two interactions in the last years could have been organised in a hybrid setup, allowing key stakeholders to interact and get to know each other also on a personal level.

45 The assessment included in this Opinion highlights that not all ACER's and regulatory authorities' key feedback has been reflected in the final deliverable. Nonetheless, ACER recognises that several recommendations have been considered along the way, strengthening the output.

46 ACER acknowledges the complexity of the task that TSOs had to carry out in a relatively short amount of time and appreciates ENTSO-E's and TSOs' frequent updates on the progress of the bidding zone review study. Additionally, ACER takes stock of the fact that this was the first pan-European bidding zone review study performed according to the bidding zone review methodology adopted by ACER in November 2020. On the other hand, ACER considers that part of the delay incurred by TSOs could have been avoided with different choices taken at the outset.

47 First and foremost, ACER recommends TSOs to ensure that the network models used throughout the process are fit for purpose. Already when processing the results of the locational marginal pricing simulations, ACER emphasised that the voltage levels represented in the network models vary significantly across the power grid of Central Europe. This not only risks creating an uneven playing field for the assessment, but also significantly affects the computation time of the various steps of the modelling chain. Consequently, ACER reiterates the importance of having network models representing only the high-voltage transmission network as of 220 kV, keeping the lower voltage levels out of the analysis.[28]

48 Second, ACER finds that an early start into the development of the necessary tools and processes would have been instrumental not only to limit the amount of the delay, but also to enlarge the spectrum of sensitivity analyses to prove the robustness of the final results. In this

[27] The meaning of 'relevant' is clarified in paragraph 4 of the same Article.

[28] ACER recognises that, when defining an alternative bidding zone configuration, all electrical nodes of the power grid need to be allocated to a bidding zone. For the bidding zone review process, however, only the high-voltage network is relevant. A detailed assessment of the lower-voltage grid may be conducted in parallel to the bidding zone review study and finalised in the last phase of the process, if and when a decision to amend the bidding zone configuration is finally taken.

regard, seamless interactions between the different modules of the modelling chain and sufficiently capable computing facilities constitute key prerequisites to allow for the analysis of different scenarios in parallel, hence limiting the burden on the overall process timeline. While it is correct, as mentioned by TSOs in the bidding zone review study, that several key input data and assumptions had to be decided upon back in 2019, this is partly due to the specificities of this first pan-European bidding zone review process carried out in accordance with Article 14 of the Electricity Regulation. Among others, the lack of alternative bidding zone configurations proposed by TSOs for several parts of Europe inevitably led ACER to require locational marginal pricing simulations to be able to define relevant bidding zone configurations to be assessed.

49 Third, ACER appreciates TSOs' ex-post feedback, provided in the bidding zone review study, on the criteria assessed in the bidding zone review methodology. While these criteria are mostly dictated by the overarching legal framework[29], ACER sees the experience with this bidding zone review study as valuable input to reflect on potential future improvements of specific parts of the bidding zone review methodology.

50 Finally, ACER deems that the lessons learned by all involved parties throughout this multiyear process will be duly reflected upon before the start of any upcoming bidding zone review, ultimately resulting in a more effective and efficient process. Regardless, ACER deems it important that all TSOs adhere to the requirements laid down in the bidding zone review methodology when assessing the performance of the alternative bidding zone configurations under the bidding zone review process in accordance with Article 14(6) of the Electricity Regulation.

4. Conclusions

51 This Opinion does not intend to provide a recommendation as to what Member States should opt for in terms of the final decisions to be taken with regard to the bidding zone configuration, but aims to inform their assessment with a factual analysis of the TSOs' work.

52 ACER assessment highlights that the assumption of full coordination of remedial actions in the Central Europe bidding zone review region has led to a potential significant underestimation, assessed to be about 70%, of the expected economic surplus of the German-Luxembourgish alternative bidding zone configurations and their combinations with a reconfiguration in the Netherlands. Based on the current TSOs' operational practises, which are expected to remain applicable at least until 2029, the net economic efficiency gains for these configurations are projected to be in the order of EUR 450 to 540 million per year.

53 ACER considers that the range of transition costs estimated by TSOs is of limited relevance due to the identified key shortcomings in the study carried out with the support of an external contractor. Even though the impact of these shortcomings on the results of the bidding zone review study is not directly quantifiable given the lack of a counterfactual assessment, diverse international experiences show that the total economic benefits of a transition to a more granular locational pricing scheme, leading to considerable economic surplus, significantly outweigh the one-off costs incurred in implementing it.

54 ACER deems it important that all TSOs adhere to the requirements laid down in the bidding zone review methodology when assessing the performance of the alternative bidding zone configurations under the bidding zone review process in accordance with Article 14(6) of the Electricity Regulation. Despite not all ACER's and regulatory authorities' key feedback has been reflected in the final deliverable, ACER recognises that several recommendations have been

[29] In particular, Article 33 of Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management.

considered by TSOs along the way, strengthening the output, and congratulates all involved parties for the tremendous efforts behind this achievement.

55 ACER invites Member States to consider ACER assessment in this Opinion when taking a decision on whether to keep or amend the bidding zone configuration in accordance with Article 14(7) and (8) of the Electricity Regulation.

This Opinion is addressed to the Council.

Done at Ljubljana, on 17 September 2025.

— SIGNED —

C. ZINGLERSEN, *ACER Director*