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Bidding zone review: process, methodology and ACER's role

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Agenda

- Introduction: The bidding zone review (BZR) process and ACER's role
- The BZR methodology
- The definition of alternative BZ configurations
- Summary
- Q&A

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Introduction

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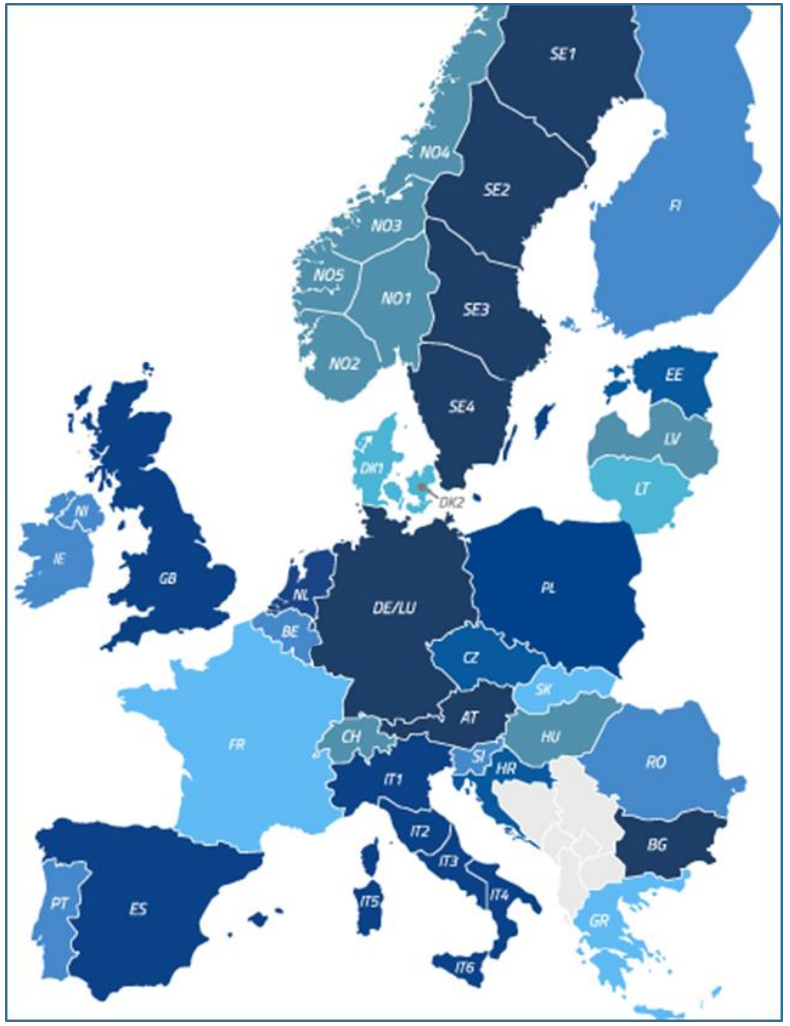
What are bidding zones? And why the need to review them?

- "A **bidding zone** is the largest geographical area within which market participants are able to exchange energy **without capacity allocation**"
- Bidding zones in Europe are currently mostly defined according to **national borders**. Few exceptions apply (DE/LU, DK, IT, NO, SE)
- The European electricity target model poses a challenge to Europe's status quo as it envisages coupled European Markets and bidding zones defined by **network congestion** rather than, for example, national borders
- Pursuant to **Article 14 of the Electricity Regulation**, in order to ensure an optimal configuration of BZs, a **bidding zone review** shall be carried out to ensure that **bidding zone borders are based on long-term, structural congestions** in the transmission network



Bidding zone review: Context and challenges

- An **unbiased, sound, technical and neutral** bidding zone review is key, while fully acknowledging that the final decision of an eventual bidding zone change will lay on Member States (MSs)

Challenges

- Politically sensitive
- Market liquidity concerns
- EU benefits vs impact on individual MSs

EU benefits

- Markets closer to physical reality
- Cost-efficient network investments
- Cost-efficient integration of new technologies

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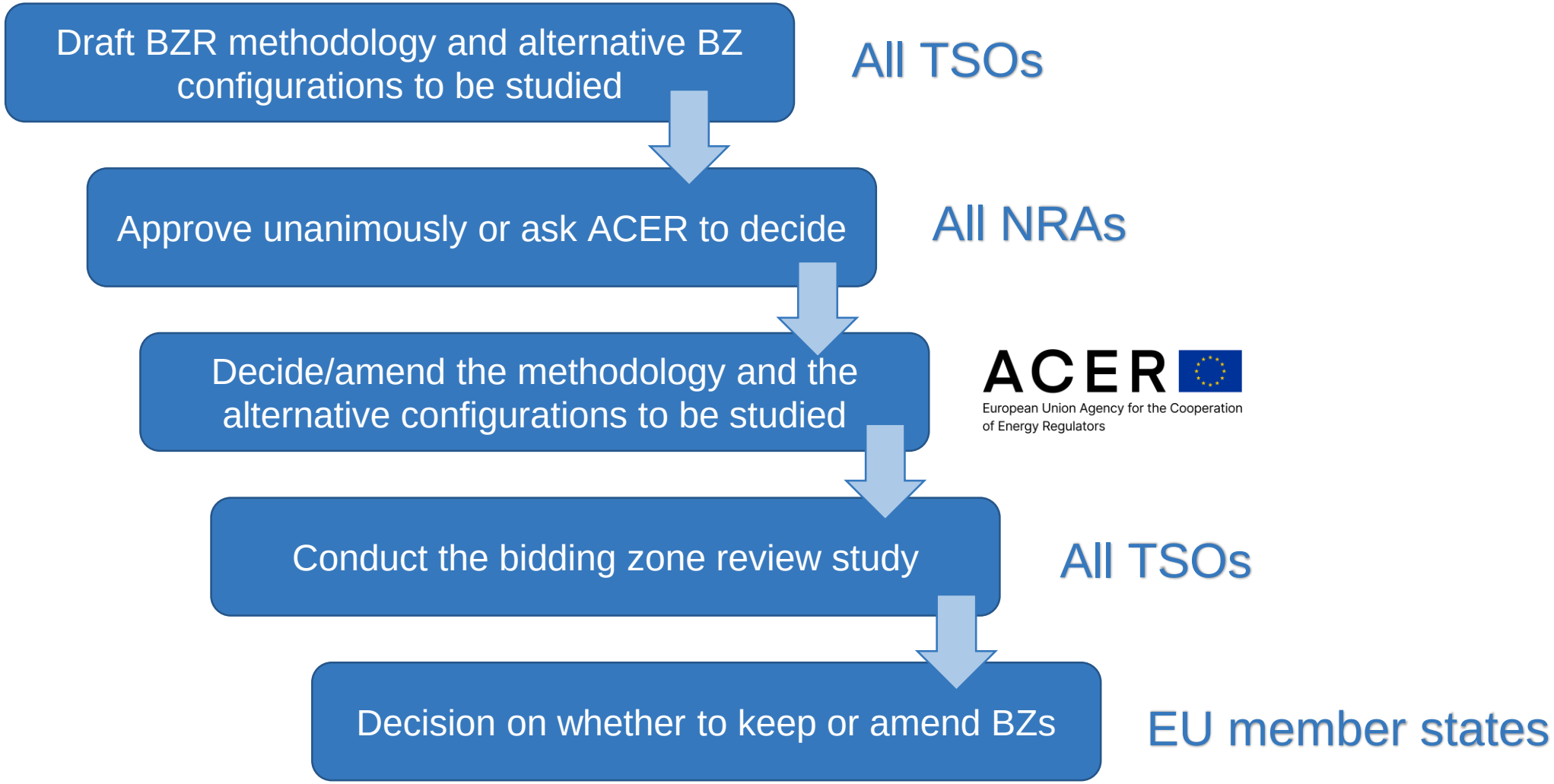
Overview: The BZR process



The BZR process – ACER's role

- In the **absence of proposed alternative bidding zone configurations for most of Europe**, and the need for ACER to take an informed decision, a **two-step approach** was envisaged

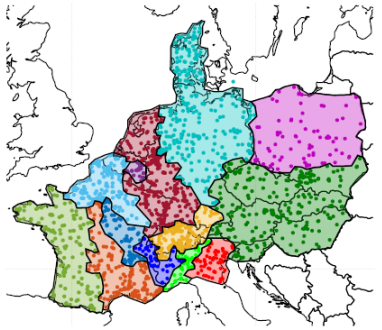
First ACER's decision → Second ACER's decision

24 November 2020

Content of this decision:

a) EU Methodology
b) A data request to TSOs: *Locational marginal pricing (LMP), i.e. nodal pricing, simulations for all Europe*

ACER to identify relevant alternative BZ configurations (clustering of LMP results)



Q2 2022

Content of this decision:
Alternative BZ configurations to be studied *in view of the LMP simulations performed by TSOs*

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The BZR methodology

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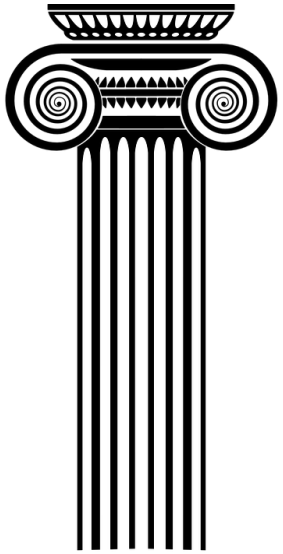
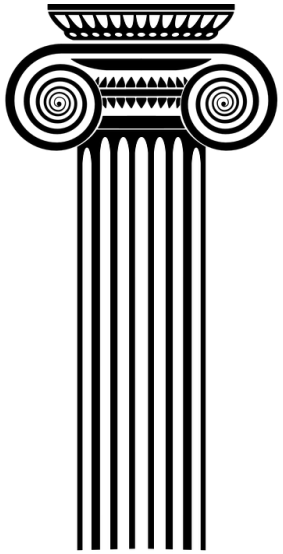
The BZR methodology – Key pillars

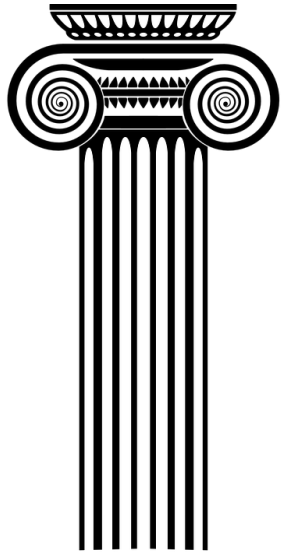
Pan-European consistency and coordination

All evaluation criteria considered, with priority to ‘get the price signals right’ and to address structural congestions

High level of transparency and stakeholders’ involvement







The BZR methodology – Process and modelling chain

1. Definition of scenario and assumptions
2. Execution of the modelling chain
   - Capacity calculation
   - Market dispatch
   - Operational security analysis
   - Remedial actions optimization
   - Flows from internal trades
3. Evaluation of relative performance
4. Publication of results with a proposal to MSs

For practical reasons, Step 2 and 3 are performed at the **Bidding Zone Review Region (BZRR)** level, with a simplified modelling of the network beyond the considered BZRR. List of BZRRs is included in annex

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The definition of alternative BZ configurations

Model-based vs expert-based delineation of BZs

Expert-based delineation of BZs

Model-based delineation of BZs

Expert-based refined with elements of modelling	*Model-based based on predefined boundaries*
i. **Start from expert-based configurations** ii. Use available data or perform certain simulations to confirm, prioritise or refine some expert-based configurations	i. **Start by performing market/network simulations** (e.g. locational marginal pricing simulations in combination with nodes clustering techniques) ii. Prioritise and/or refine configurations subject to certain delineation constraints

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The regulatory framework

- While the BZR study has to consider all the criteria listed in the CACM Regulation, **the following three elements** are explicitly mentioned in the Electricity Regulation (Article 14(1)) as objectives to be pursued when delineating BZs:
  1) Minimisation of **structural congestions** within BZs
  2) Maximisation of **economic efficiency**
  3) Maximisation of **cross-zonal trading opportunities**
- Moreover, the **70% target** is regarded as a binding requirement, which could lead to a BZ change if not met (Article 15(5) of the ER)
- Finally, pursuant to Article 14(5) of the ER, the **target year of the analysis** is set to be three years after the approval of the BZR package (i.e. methodology & alternative BZ configurations), hence **2025**

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Available input data and tools

- The following **input data** are available to ACER to pursue the regulatory objectives:
  - A set of **historical network models** covering the most recent three years (i.e. 2018, 2019 and 2020)
  - The results of the **LMP analysis** conducted by TSOs **for the target year 2025**
- With the available input data, the following **tools** will be used by ACER:
  - **Flow decomposition**, to assess how different BZ configurations contribute to non-allocated flows (loop flows and internal flows) that “consume” cross-zonal capacity on critical network elements.
  - **Clustering techniques**, applied to the results of the LMP analysis, to cluster individual nodes into BZs
- The combination of the two tools allows establishing a **cause-effect** relationship between physical congestions and the network areas that, by exchanging energy, significantly contribute to such congestions, in line with the definition of congestions in the Regulation

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The high-level approach

Input data

- Historical network models
- LMP simulation results (2025)

- BZ identified in step 1
- LMP results (2025)

- Nodes allocated to alternative BZs

Process

Ranking BZs based on:

a) **Maximisation of CZ capacity:** Low amount of LFs+IFs

b) **Economic efficiency** (e.g. minimisation of LMP differentials within a BZ)

Poorest performing BZ*

Running the clustering algorithm.

a) **Clustering technique**

b) **Boundary conditions** (n+1 BZs within a MS)

*n=number of iterations for the MS

The objectives are met:

a) **The 70% target on CNECs**

b) **Proxy for economic efficiency** (e.g. low LMP differentials within all BZs)

Selection of target BZ/MS

Clustering

Stop criterion**

* If a Member State is already split into 2 or more BZs, the whole Member State will be considered when identifying alternative configurations
** An additional fourth step that is not part of the iterations is also required to combine the identified individual alternative BZ configurations to study their joint impact

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Focus on the Nordics

- In the updated BZR proposal (February 2020), the following alternative BZ configurations were proposed in the Nordics:
  - **Sweden**: **New BZ (SE5)** in the Stockholm metropolitan area, **merge of SE4 with the rest of SE3** and **merge of SE1 and SE2**
  - **Norway**: **Split of NO4** leading to a **new BZ (NO6)**
  - Denmark and Finland: No alternative configurations proposed
- ACER will base its decision on the information provided by TSOs on these configurations and on the results of the LMP analysis
- As the Electricity Regulation does not (yet) apply to Norway, **Norwegian BZs cannot be included in ACER's decision**

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Summary

- **Article 14 of the Electricity Regulation** sets the regulatory framework for the bidding zone review
- ACER's decision was split into two due to **lack of alternative configurations proposed by TSOs** (especially for Central Europe)
- The **target year** of the analysis is **2025**
- ACER's decision on the alternative BZ configurations is expected by **Q2 2022**
- Following the BZR study conducted by TSOs, the **final decision** on whether to keep or amend BZs lies on **Member States**

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Annexes

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List of Bidding Zone Review Regions (BZRRs)

- **BZRR Central Europe**, comprising the BZs: France, Belgium, The Netherlands, Germany/Luxembourg, Austria, Czech Republic, Poland, Slovakia, Hungary, Slovenia, Croatia, Romania, Denmark 1 and Italy 1 (Nord)
- **BZRR Nordic**, comprising the BZs: Finland, Sweden 1, Sweden 2, Sweden 3, Sweden 4 and Denmark 2
- **BZRR South-East Europe**, comprising the BZs: Bulgaria and Greece
- **BZRR Central Southern Italy**, comprising the BZs: Italy 2 (Cnor), Italy 3 (Csud), Italy 4 (Sud), Italy 5 (Sici), Italy 6 (Sard) and Italy 7 (Rosn/Cala)
- **BZRR Iberian Peninsula**, comprising the BZs: Spain and Portugal
- **BZRR Baltic**, comprising the BZs: Estonia, Latvia and Lithuania
- **BZRR Ireland**, comprising the BZs: Ireland Single Electricity Market

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Stakeholder involvement and consultation

- Excerpts from Article 17 of the BZR methodology:

TSOs shall involve stakeholders during the BZR. This shall include scheduling regular meetings with stakeholders to inform on the progress of the BZR, including on the difficulties encountered during the process, and collecting feedback from stakeholders. […] No later than six months after the start of the BZR, TSOs of a BZRR shall hold a public consultation regarding at least the following aspects of the BZR:

a) *the impacts of alternative BZ configurations on at least the following criteria: 'Market liquidity and transaction costs' and 'Transition costs'*

b) *possible measures to mitigate negative impacts of specific alternative BZ configurations with regard to at least the criteria listed in point 4(a) of this article; and*

c) *the identification of practical considerations which may need to be considered in case of a possible BZ configuration change as set forth in Article 14(10) of the Electricity Regulation, including possible timescales for implementation of alternative BZ configurations.*

Thank you.
Any questions?

The contents of this document do not necessarily reflect the position or opinion of the Agency.

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