

BIDDING ZONE REVIEW

Public Workshop

15.02.2018

1

Legal background and Time Plan

2

The BZ review report

3

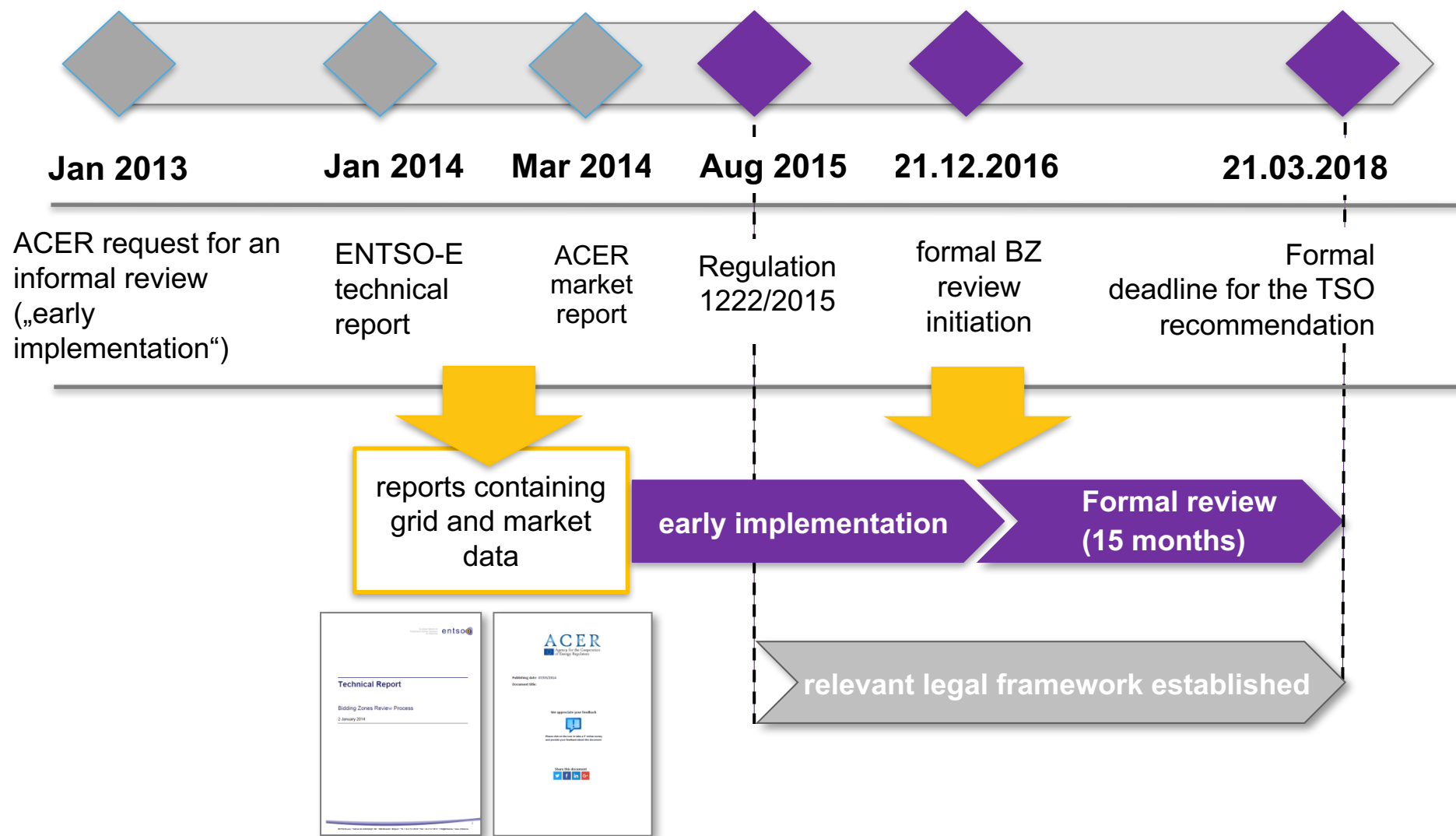
Public consultation and next steps

1. Legal Background – Regulation 1222/2015

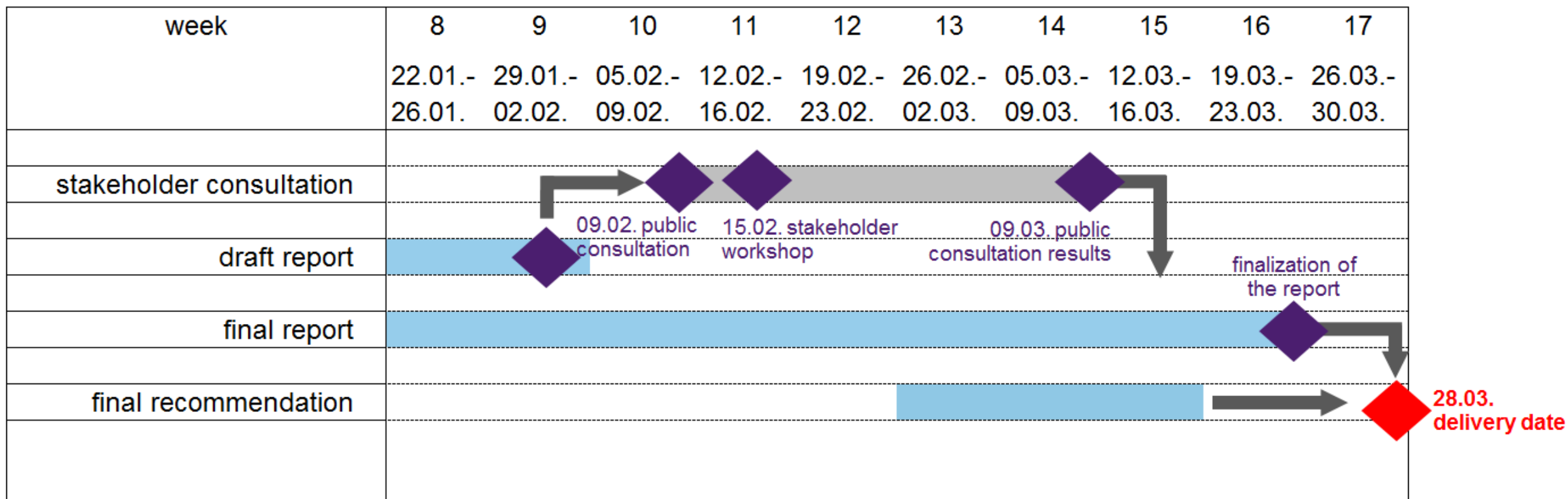
- A formal study under the framework of the CACM Guideline (EU) No. 2015/1222



1. Overview on the current bidding zone review process



1. The next steps until delivery



1

Legal background and Time Plan

2

The BZ review report

3

Public consultation and next steps

2. The BZ review report

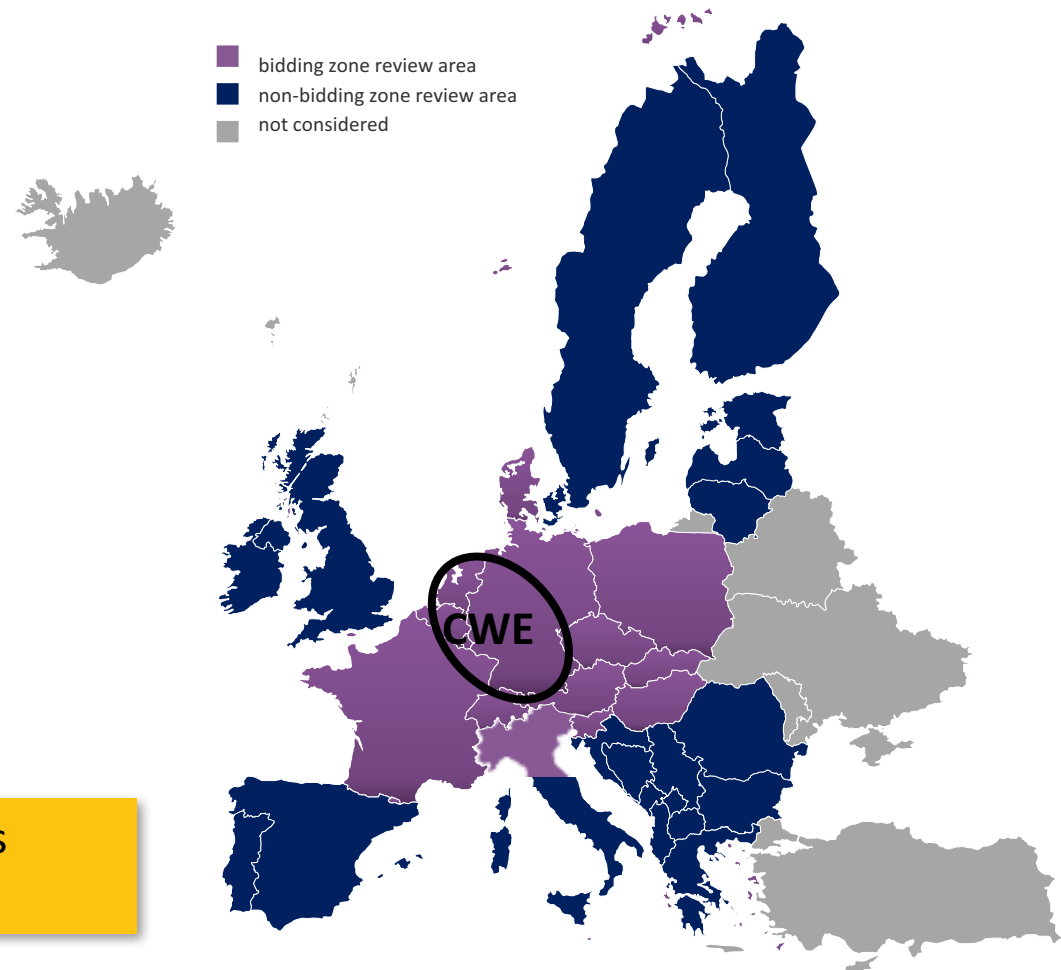


1. Executive Summary
2. Introduction
3. Future scenario assumptions
4. Analyzed bidding zone configurations
5. Evaluation according to the CACM criteria
6. Identification of challenges
7. Stakeholder consultation and involvement

2. The BZ review report: geographical scope

- BZR focuses already on a region which is largely covering the Core Capacity Calculation region
- But in reality, FB MC* is operational only in the CWE region
- FB MC* for Core is still under development

Chapter 6 of the report illustrates the challenges associated with modelling FBMC



*FB MC: Flow Based Market Coupling

2. The BZ review report Chapter 3: market and grid data

	worst case grid	planned grid
	SOAF	SOAF
2020	✓	
2025		✓

3 dimensions of future scenarios:



Time horizon: 2020 & 2025



Load and generation assumptions: SOAF



Grid status: Planned & Worst

The following **2 scenarios** have been selected:

- **2020 SOAF worst**
- **2025 SOAF planned**

Grid scenarios definition

<i>Project Status⁽¹⁾</i>	Until 31/12/2020	Until 31/12/2025
Under Consideration		
Planning		
Designing and permitting		
Under Construction		

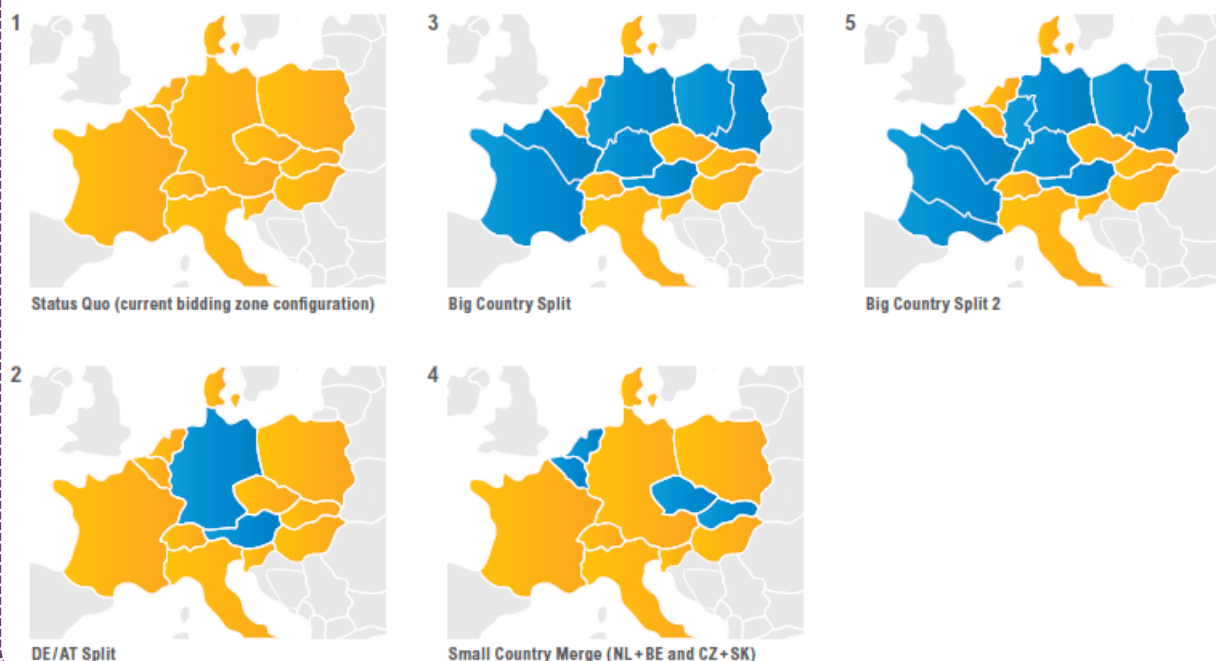
2020 Worst

2025 Planned

Chapter 6 of the report illustrates the challenges associated with modelling FBMC

2. The BZ review report Chapter 4: alternative BZ configurations

Expert-based



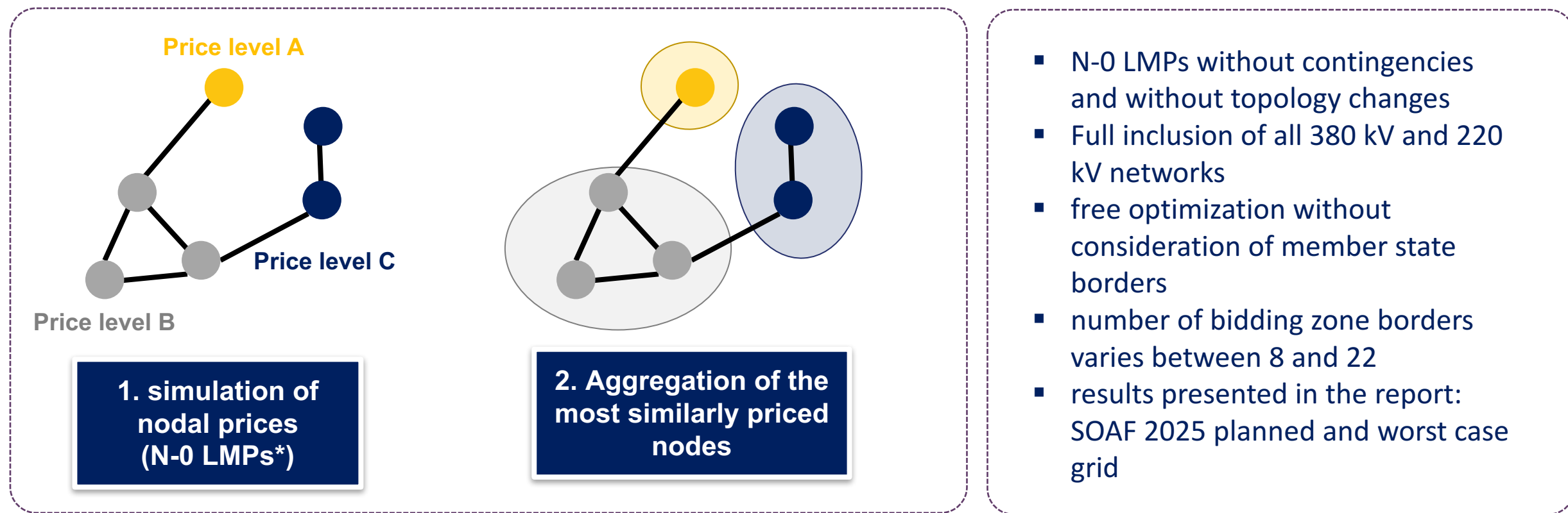
Model-based

the participating TSOs propose not to use the model-based configurations or the nodal pricing for the current Bidding Zone Review but to investigate this approach further for potential use in future Bidding Zone Reviews.

***5 BZ configurations are considered
(status quo + 4 alternatives)***

2. The BZ review report: Model based configurations

basic principle



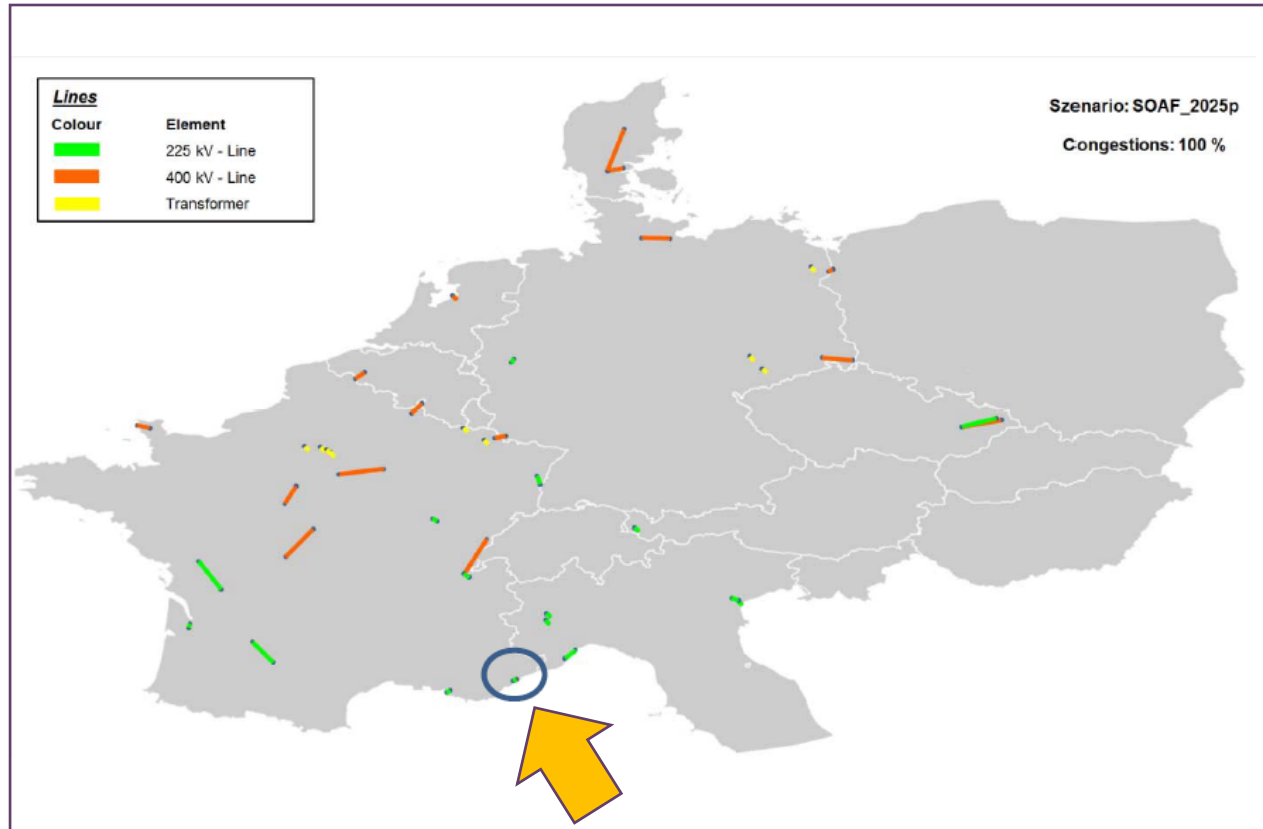
*LMP: locational marginal price

2. Model based configurations

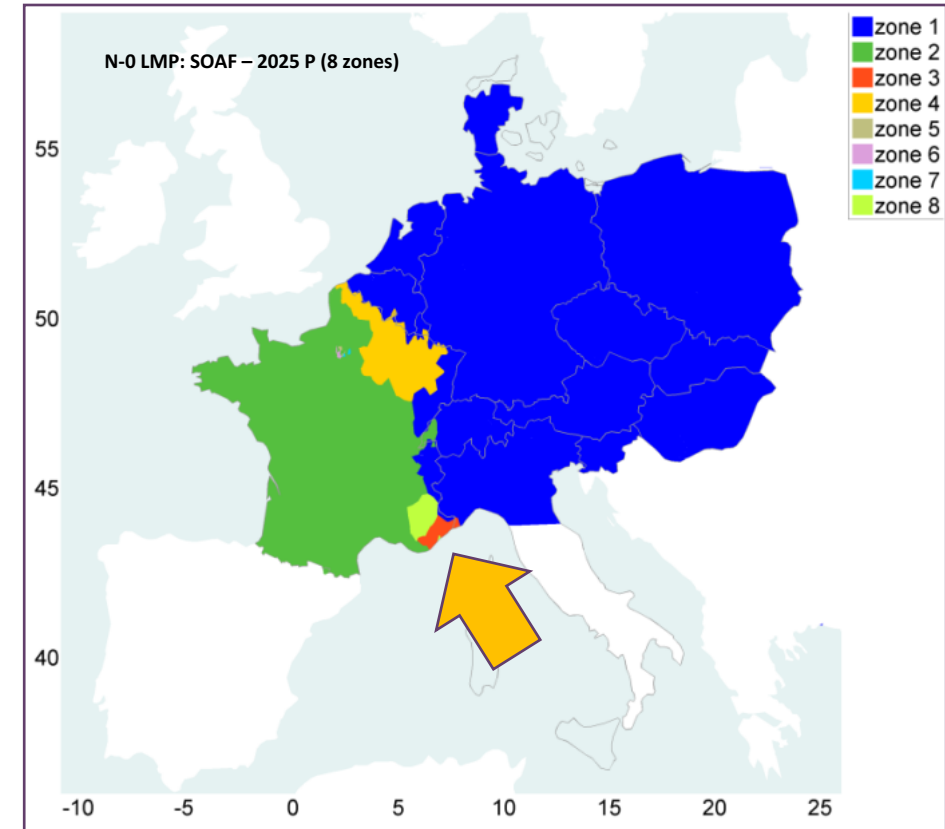
Impact of local 220kV congestions on clustering results

Example 1

N-0 LMP Results for scenario 2025 SOAF planned grid, all grid constraints per voltage level:



Original Clustering Results for scenario 2025 SOAF planned grid, for 8 bz:

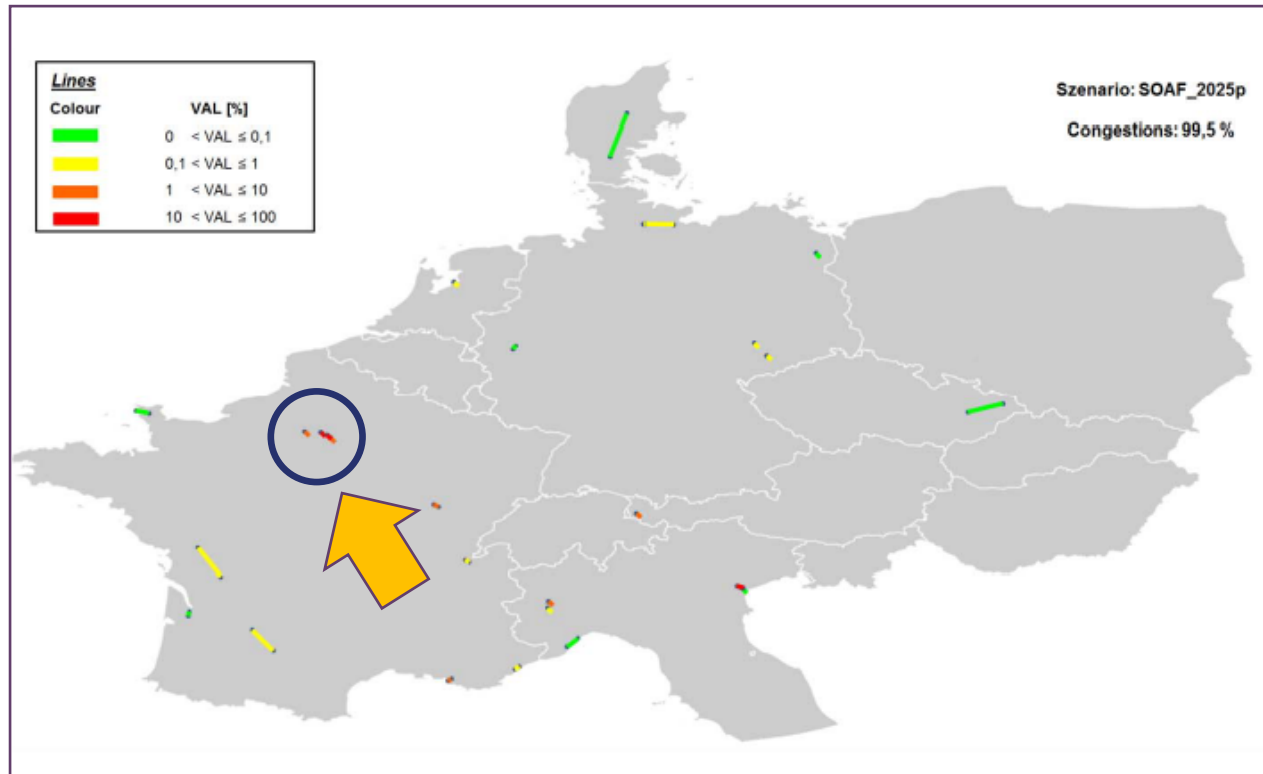


- Example1: the red area (zone 3) in France is created by a 220kV constraint (marked by a blue circle in the figure on the left). However, this line is not foreseen to be congested in the national development plan.

2. Model based configurations: Impact of local 220 kV congestions on clustering results

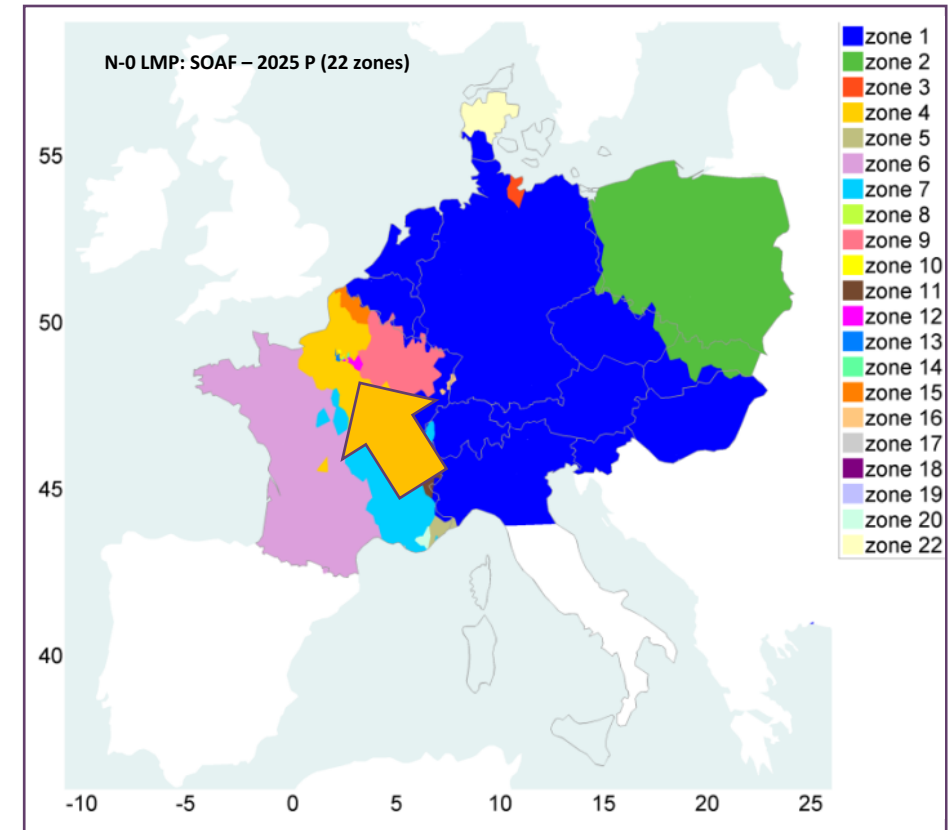
Example 2

N-0 LMP Results for scenario 2025 SOAF planned grid, grid constraints creating 99.5% of the congestion costs (colored by weight of the constraint in the congestion costs):



- four transformers represent 57.9% of the total congestion costs

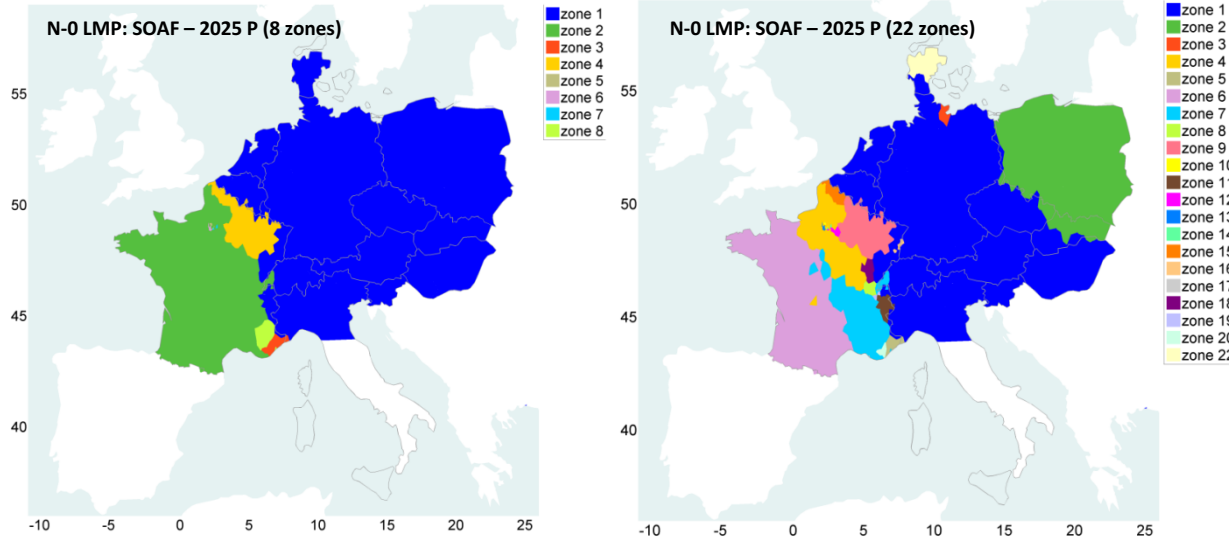
Original Clustering Results for scenario 2025 SOAF planned grid, for 22 bz:



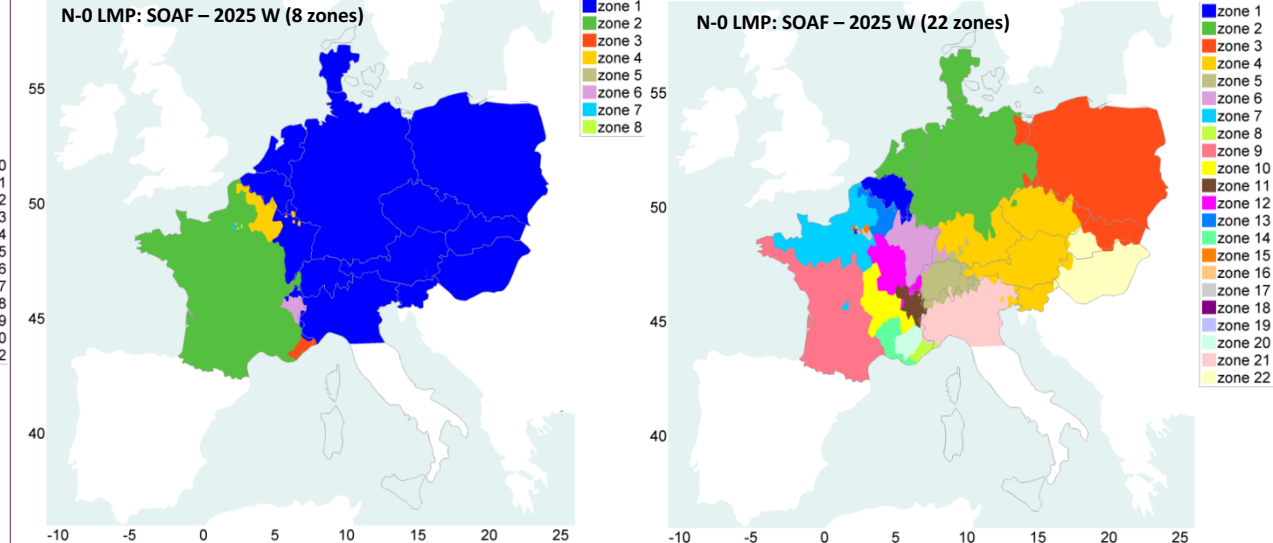
- these unintuitive congestions lead to a split of the Parisian area into four bidding zones

2. Model based configurations: Clustering Results

2025 SOAF planned grid, 8 & 22 bidding zones



2025 SOAF worst case grid, 8 & 22 bidding zones



Clustering outcome demonstrating the limitations of the modelling, overview of model-based bidding zone configurations

- N-0 LMPs have been significantly impacted by local congestions in the 220 kV grid of particular countries.
- The clustering has led to a fragmentation of bidding zones along those congestions.
- The countries most affected by 220 kV congestions have therefore been subdivided into several zones while other areas remained unaffected.
- Beside the harmonized consideration of constraints in the 220kV grid, other simplifications had to be applied that drive the results too, e.g. the consideration of N state only and neglecting of topological remedial actions

2. Model based configurations: Post Processing of Clustering Results

- In order to obtain more realistic results, TSOs have tried to post process the model based bidding zone configurations:

Step 1

If more than 90 % of one country's substations are assigned to a given BZ, the remaining substations also form part of this bidding zone

Step 2

Any shift of less than 10 substations of one country to a new bidding zone is discarded

Step 3

Small Bidding Zones below 30 substations are merged

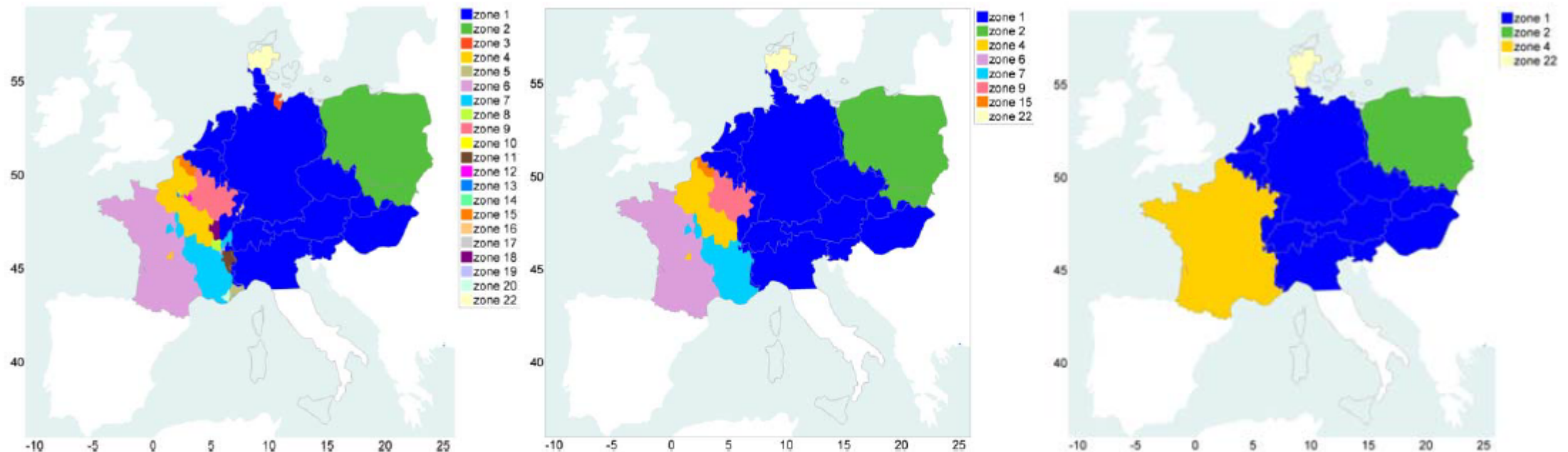
Step 4

Allowance for individual, further alignments (sound explanation had to be provided)

2. Model based configurations: Post-processed Clustering Results

- Clustering outcome demonstrating the limitations of the modelling, overview of model-based bidding zone configurations

SOAF 2025, planned grid



without post-processing, 22 bidding
zones

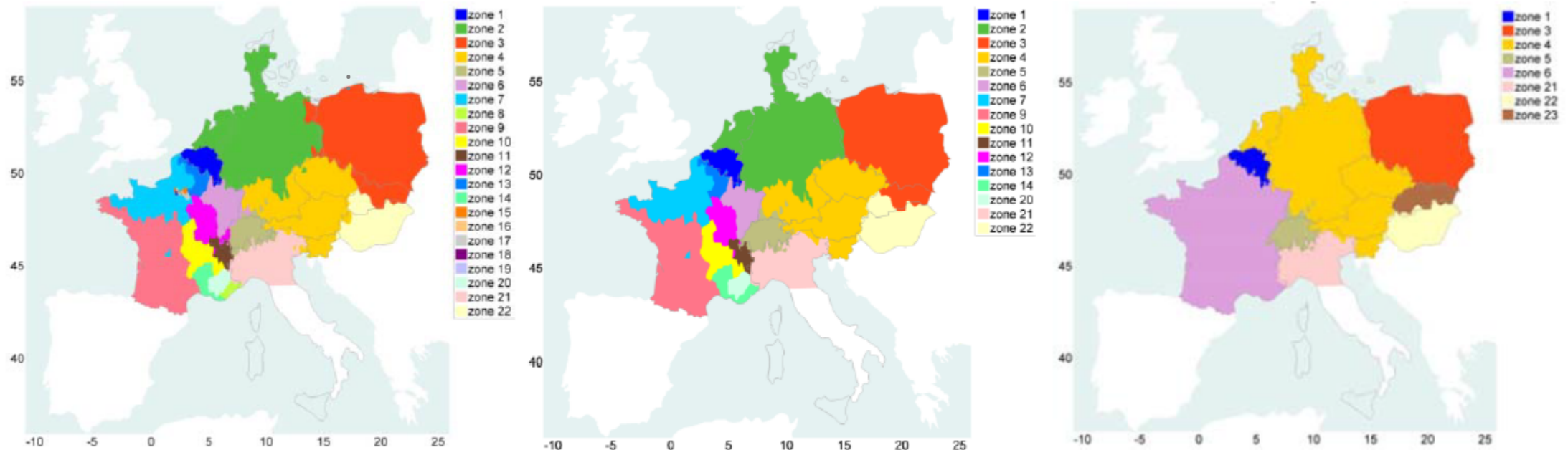
after post processing steps 1-3

after post processing steps 1-4

2. Model based configurations: Post-processed Clustering Results

- Clustering outcome demonstrating the limitations of the modelling, overview of model-based bidding zone configurations

SOAF 2025, worst grid



without post-processing, 22 bidding
zones

after post processing steps 1-3

after post processing steps 1-4

2. Model based bidding configurations: conclusions

The obtained LMP computation and subsequent clustering results provide the following evidence:

- »LMP results are mainly determined by constraints in the 220 kV network
- »This leads to a split of bidding zones mainly along these 220 kV constraints, also if such constraints do not frequently occur.
- »The LMP computations are based on simplifications (e. g. consideration of the n state only; neglecting topological remedial actions and security policies).

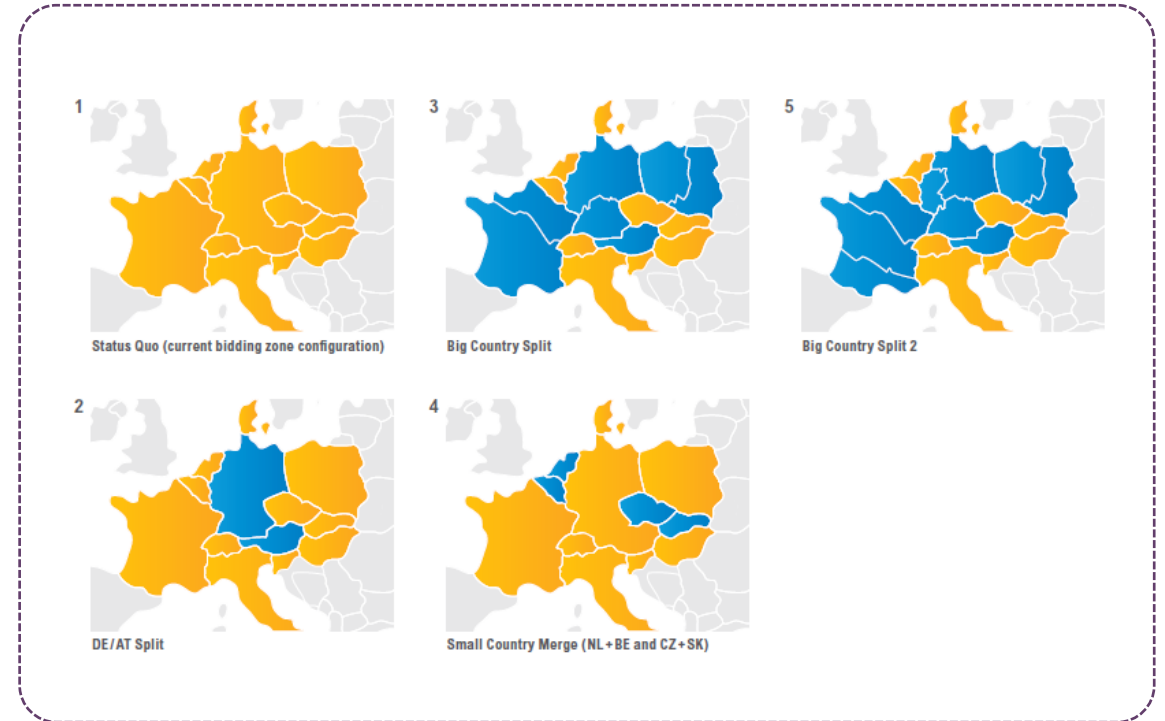
Given these considerations, the participating TSOs propose not to use the model-based configurations or the nodal pricing for the current Bidding Zone Review but to investigate this approach further for potential use in future Bidding Zone Reviews.

2. The BZ review report chapter 5: evaluation according to the CACM criteria

Article 33 of Regulation 1222/2015

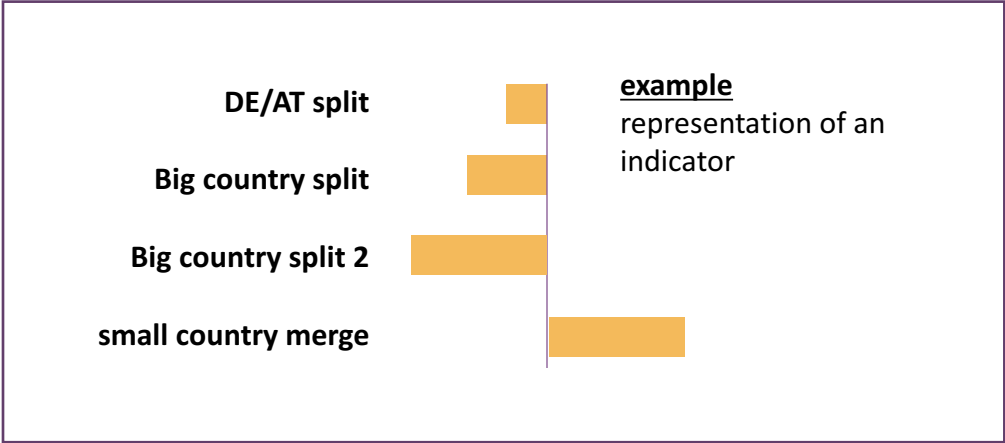
“If a review of bidding zone configuration is carried out in accordance with Article 32, at least the following criteria shall be considered:”

- a) in respect of **network security**:
[...]
- b) in respect of overall **market efficiency**:
[...]
- c) in respect of the **stability and robustness** of bidding zones:
[...]



2. The BZ review report chapter 5: evaluation general approach

quantitative indicator measuring the expected level of a parameter evaluating the criterion



Additional qualitative assessment

BZ Configuration	DE/AT split	Big Country Split	Big Country Split 2	Small country merge
criterion	(+)	(+)	(+)	(+)
	(0)	(0)	(0)	(0)
	(-)	(-)	(-)	(-)

2. The BZ review report chapter 5: evaluation example

Operational Security, actual results

quantitative indicator
not available

- In split scenarios, the market will take constraints into account
- Representation of network constraints both between and within bidding zones is important
- Other factors exist which are independent from bidding zone borders (e.g. RES forecast errors)
- Grid investments alleviate congestions
- Congestions are not the only aspect related to operational security

non-intuitive results

Bidding Zone Configuration	2020W SOAF	2025P SOAF
Status Quo	35,237	143,995
Small Country Merge	113,653	130,086
DE/AT Split	125,439	104,537
Big Country Split	35,993	29,191
Big Country Split 2	112,061	138,464

BZ Configuration	DE/AT split	Big Country Split	Big Country Split 2	Small country merge
Operational Security	(+)	(+)	(+)	(-)

2. The BZ review report chapter 5: evaluation example Market concentration and market power, actual results

quantitative indicator

- Smaller markets tend to be more exposed to market power abuse
- Size of a bidding zone is not the only relevant criterion (e.g. plant structure, DSM development)
- Cross-zonal interconnectivity matters, too
- Interdependency between different market segments matters, too (long term, day ahead, intraday, balancing, redispatching)
- Market concentration does not per se imply market power abuse

change in the HHI index
compared to the current
configuration

BZ Configuration	DE/AT split	Big Country Split	Big Country Split 2	Small country merge
Operational Security	(-)	(-)	(-)	(+)

2. The BZ review report chapter 5: summary of the evaluation

All results, figures and tables shown in this report are no firm basis for drawing conclusions and have to be interpreted against the assumptions explained in this report.

Bidding Zone Configuration (evaluation compared to current bidding zone configuration)	DE/AT Split	Big Country Split	Big Country Split 2	Small Country Merge
Network security				
Operational security	(+)	(+)	(+)	(-)
Security of Supply (for the entire system, short-term)	(0)	(0)	(0)	(0)
Degree of uncertainty in cross-zonal capacity calculation	(0)	(0)	(0)	(0)
Market efficiency				
Economic efficiency	(0)	(0)	(0)	(0)
Firmness costs	(-)	(-)	(-)	(+)
Market liquidity	(-)	(-)	(-)	(+)
Market concentration and market power	(-)	(-)	(-)	(+)
Effective competition	(0)	(0)	(0)	(0)
Price signals for building infrastructure	(0/+) ^a	(0/+) ^a	(0/+) ^a	(0/-) ^a
Accuracy and robustness of price signals	(0)	(0)	(0)	(0)
Long-term hedging	(-) ^b	(-) ^b	(-) ^b	(+) ^b
Transition and transaction costs	(-)	(-)	(-)	(-)
Infrastructure costs	Reference to investment costs as published in the TYNDP 2016			
Market outcome in comparison to corrective measures	(+) ^c	(+) ^c	(+) ^c	(-) ^c
Adverse effects of internal transactions on other bidding zones	(+) ^d	(+) ^d	(+) ^d	(-) ^d
Impact on the operation and efficiency of the balancing mechanisms and imbalance settlement processes	(0/-)	(-)	(-)	(0/-)
Stability and robustness of bidding zones				
Stability and robustness of bidding zones over time	(0)	(-) ^a	(-) ^a	(0)
Consistency across capacity calculation time frames	(0)	(0)	(0)	(0)
Assignment of generation and load units to bidding zones	(0)	(-)	(-)	(0)
Location and frequency of congestion (market and grid)	(+)	(+)	(+)	(-)

^a The importance differs between borders/countries and the effectiveness of the signal is low, given the incompatible lead times between market prices and grid investment decisions which are characterised by long construction periods and approval processes.

^b Alternative long-term hedging instruments (such as system price or trading hubs) that might mitigate the negative impact are to be investigated.

^c There can be no further distinction between the splits without further quantitative analyses.

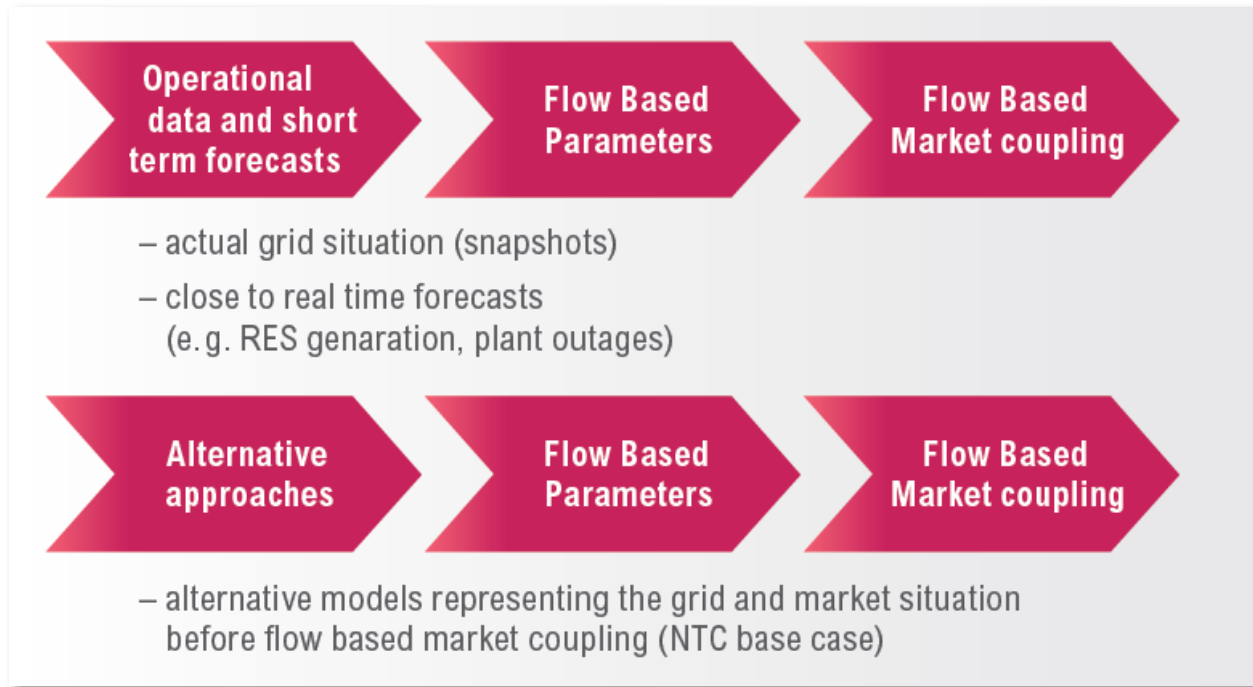
^d This assessment considers loop flows, but does not consider any adverse market effects linked to loop flows.

^e For Germany, grid investment planning foresees the building of high voltage direct current (HVDC) links moving towards a copper plate. The intention of these grid investments is to resolve any relevant congestion that might justify a split of the German bidding zone. This makes the Big Country Split less stable but does not consider any adverse market effects linked to loop flows.

In light of the above considerations and needs for adapting and developing the simulation environment further, the evaluation presented in this First Edition of the Bidding Zone Review does not provide sufficient evidence for a modification of or for maintaining of the current bidding zone configuration. Hence, the participating TSOs recommend that, given the lack of clear evidence, the current bidding zone delimitation be maintained.

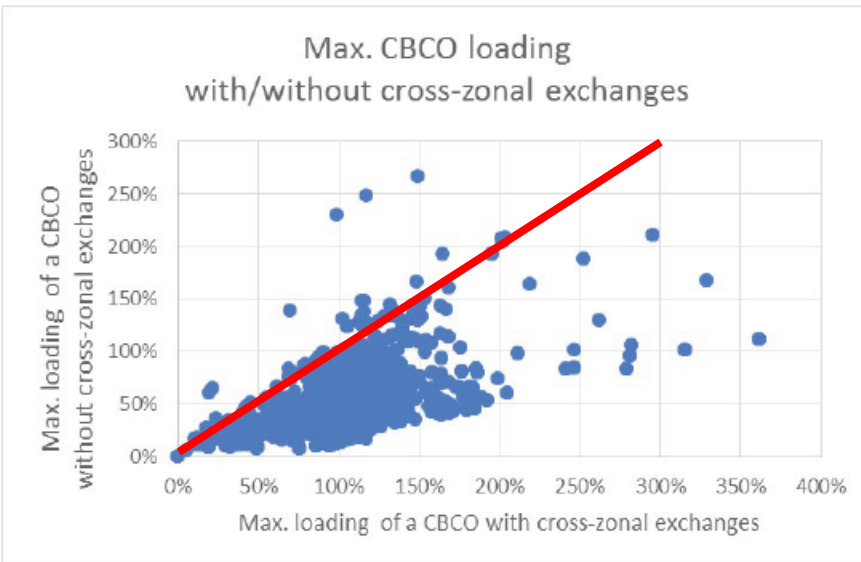
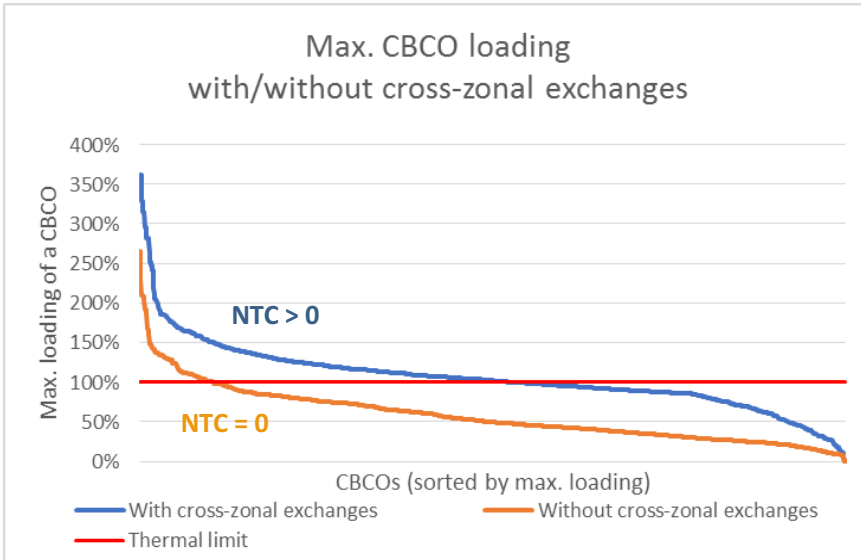
This recommendation should in no way be interpreted as an endorsement of or an objection against the pending split of the German/Luxembourgian and Austrian bidding zones, where TSOs respect all relevant regulatory decisions, e. g. the decision of the Agency for the Cooperation of Energy Regulators no 06/2016 of 17 November 2016 on the electricity transmission system operators' proposal for the determination of capacity calculation regions and the requests of the regulatory authorities of Germany and Austria.

2. The BZ review report chapter 6: challenges associated with modelling markets and grid



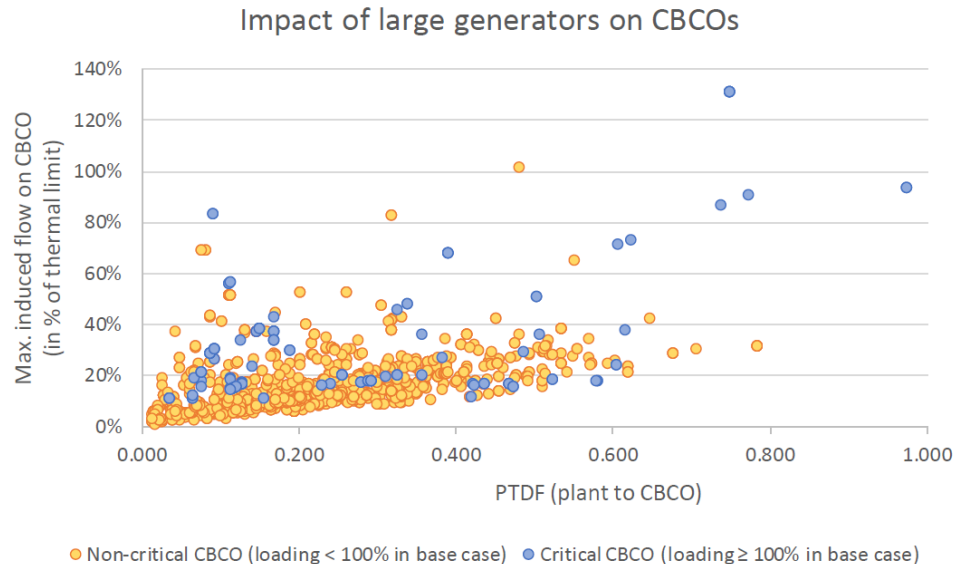
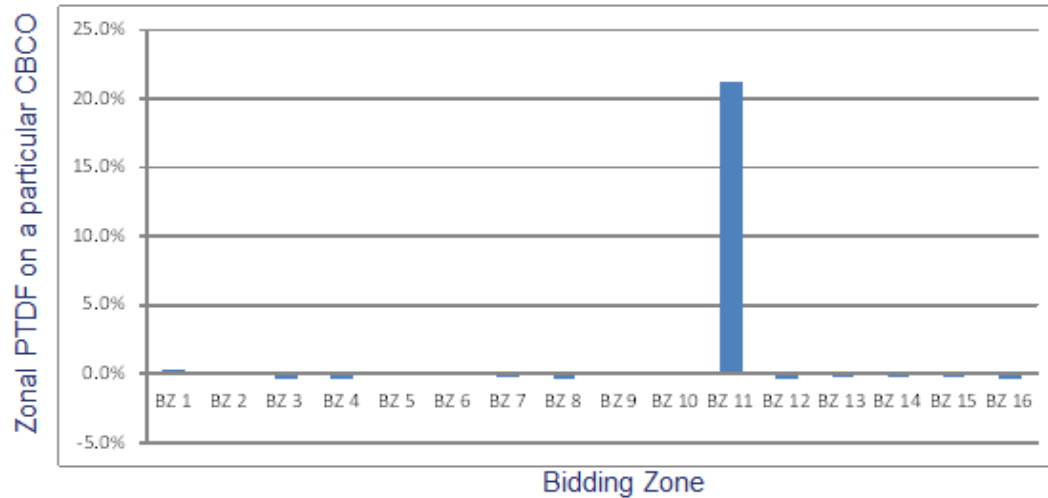
Core internal and external requirement: inclusion of Flow based market coupling in the simulation chain

2. The BZ review report chapter 6: example for challenges: base case determination



In contrast to operational systems, the starting point for the flow based market simulation (base case) needs to be determined artificially

2. The BZ review report chapter 6: example for challenges: CBCO selection



The identification of Critical Branches in Contingency situations (CBCOs) in a future, model based environment depends on assumptions. Distinguishing between elements which are relevant for local and pan-European exchanges is not straightforward

2. The BZ review report chapter 6: summary of key insights and outlook

improvements need to focus in particular on the following aspects:

- » essential market design features (especially regarding the design of the capacity calculation approach, e. g. base case approach, CBCO selection, GSK strategy)
- » representation of local characteristics (e. g. nodal allocation of relevant parameters, inclusion of the 220 kV infrastructure)
- » comprehensive sensitivity analyses

The 15 months allowed for the review process, as specified in EU Regulation 1222/2015, does not provide sufficient time to accommodate such comprehensive analyses.

example for the counter-intuitive OS indicator

Bidding Zone Configuration	2020W SOAF	2025P SOAF
Status Quo	35,237	143,995
Small Country Merge	113,653	130,086
DE/AT Split	125,439	104,537
Big Country Split	35,993	29,191
Big Country Split 2	112,061	138,464

1

Legal background and Time Plan

2

The BZ review report

3

Public consultation and next steps

2. Public consultation – legal requirement

- **Reg. 1222/2015 requirements:**

...hold a consultation in accordance with Article 12 and a workshop regarding the alternative bidding zone configuration proposals compared to the existing bidding zone configuration, including timescales for implementation, ...

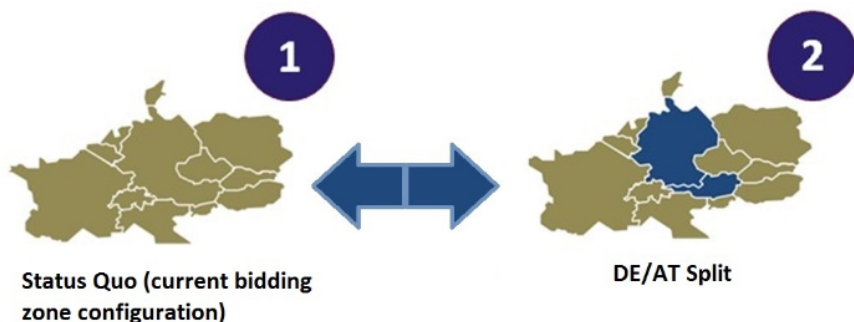
- **General approach: consult on criteria and timelines**

3. BZ review report – section 5: evaluation

1. Comparison of BZ configurations according to CACM criteria:

What would be the impact (if any) in case the Status Quo (current BZ configuration) will be changed to:

1a- the alternative BZ configuration 2 (DE/AT Split) – (explain how it will be impacted and why)



<https://consultations.entsoe.eu/markets/first-edition-bidding-zone-review/consultation>

1. On network security?

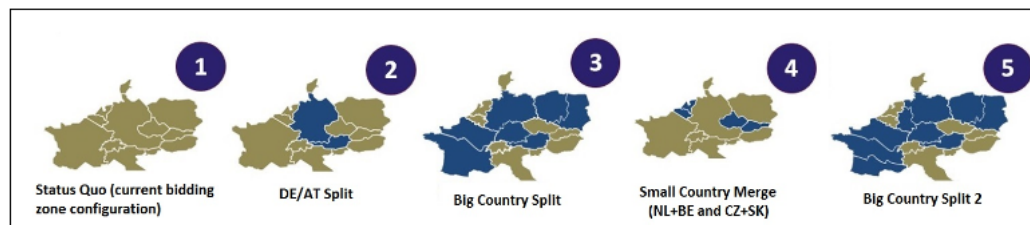
i) On the ability of bidding zone configurations to ensure operational security:

... comments enabled for each CACM evaluation criterion

3. BZ review report – section 5: evaluation

Timescales for implementation

Please fill in when it is the earliest and later time that each of the configurations shall be implemented according to your view. (explain why)



<https://consultations.entsoe.eu/markets/first-edition-bidding-zone-review/consultation>

1. Reference case (The current Bidding Zone delimitation):

Earliest time for implementation

Explain why

... comments enabled for each configuration

3. BZ review report – section 5: evaluation

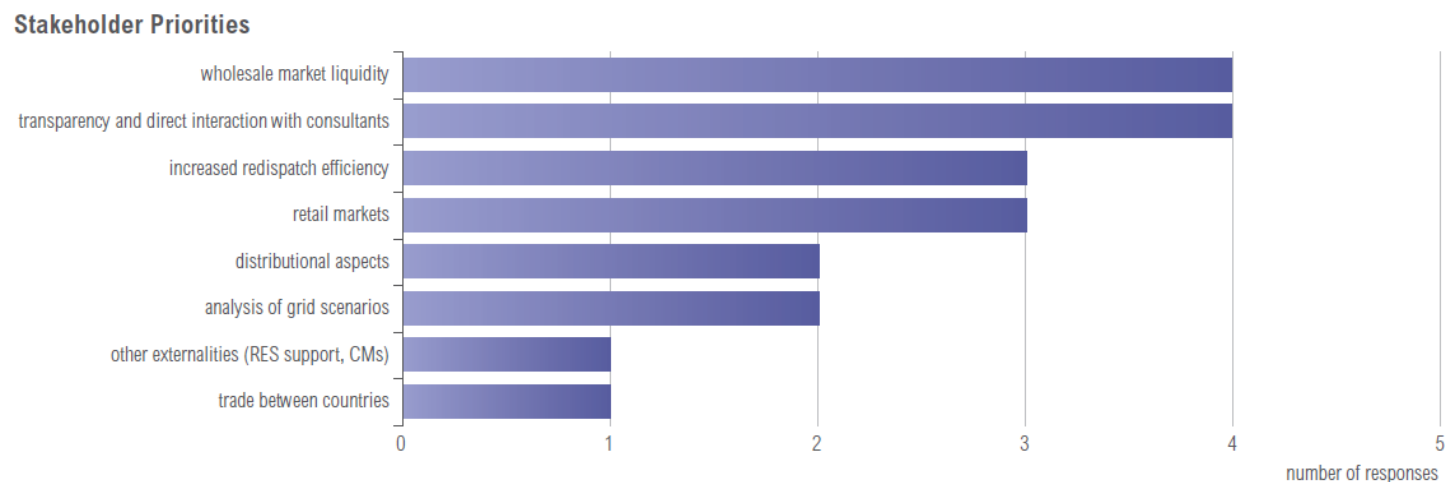
General comments

1. Please, provide your additional comments:

Your comments:

<https://consultations.entsoe.eu/markets/first-edition-bidding-zone-review/consultation>

3. BZ review report – section 5: evaluation



Your response to the survey is highly appreciated !