BZRR CE: Consultative Group call
Simplified analysis and recommendation for the application of the fallback configurations for Germany

Online meeting

14/12/2022

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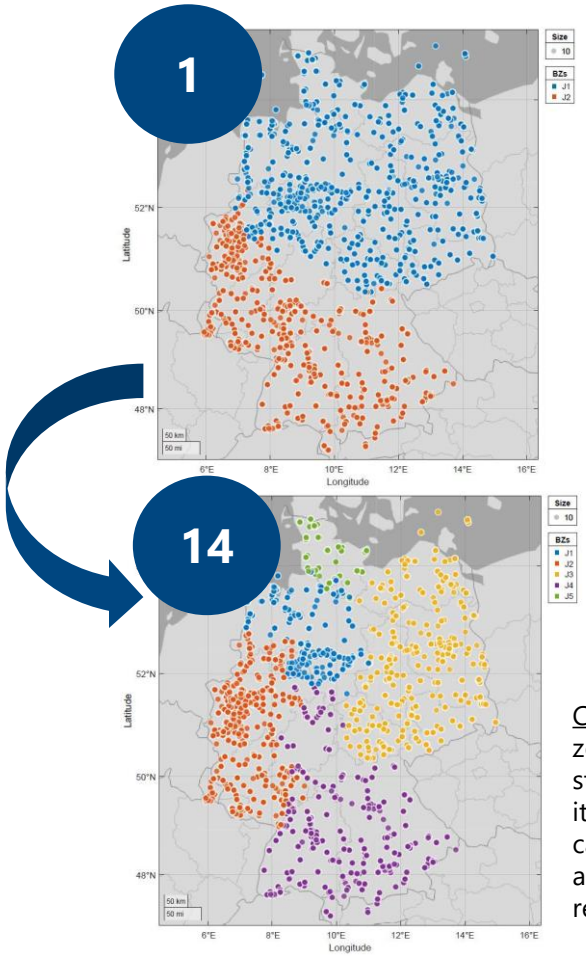
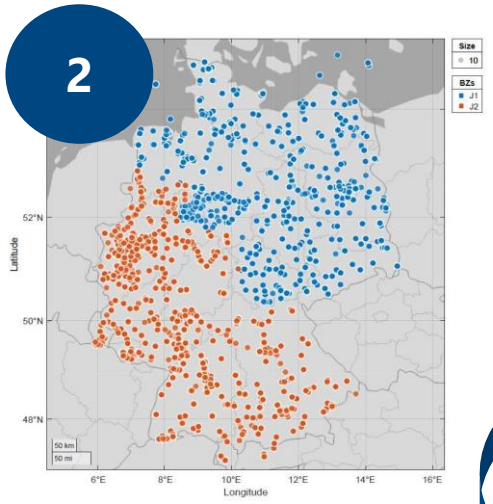
Background information

- The ACER Decision on alternative configurations defines four default configurations and three fallback configurations for Germany (see next slide). This is because German TSOs had already pointed out issues with some of the default configurations during the consultation process regarding the unique and unambiguous assignment of generation and load units to bidding zones.
- The unique and unambiguous assignment of nodes to bidding zones is one of the CACM criteria to assess alternative configurations (CACM Article 33(1)(c)(iii)) and is a prerequisite for the alternative configurations according to Annex I Article 15(18) of the ACER BZR Methodology.
- According to Annex I Article 2 of the ACER Decision on alternative configurations, German TSOs should assess the node-to-zone assignment for the default configurations and if a unique and unambiguous assignment cannot be achieved, then TSOs must replace the concerned configuration(s) with the corresponding fallback configurations.
- The assessment of the node-to-zone assignment is complicated by the fact that the 110 kV grid does not belong to the German TSOs. Instead, there are around 900 DSOs operating the lower voltage levels in Germany. Therefore, not all information needed for the assessment is currently available to the German TSOs.

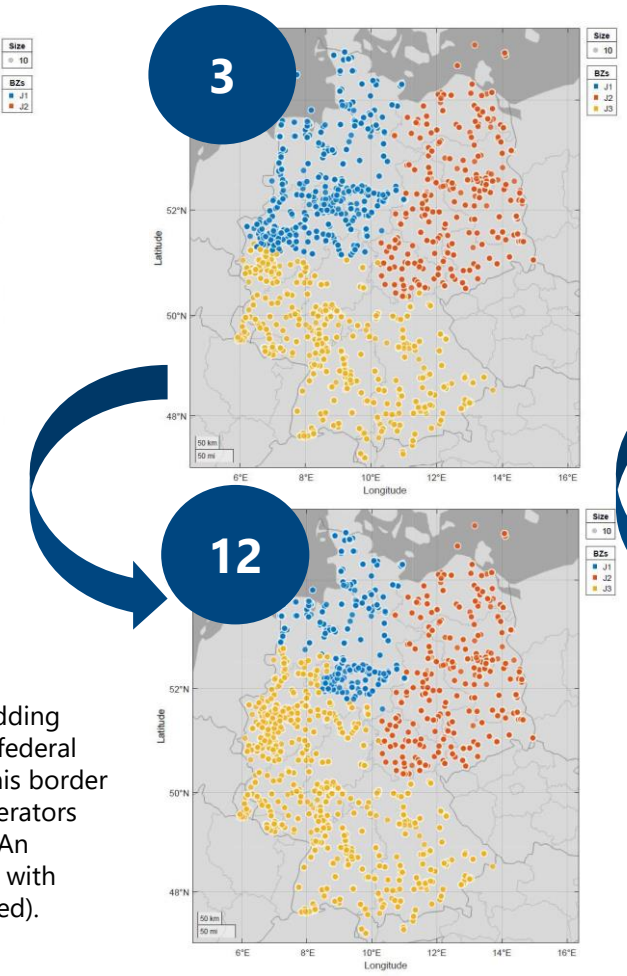
Default and fallback configurations

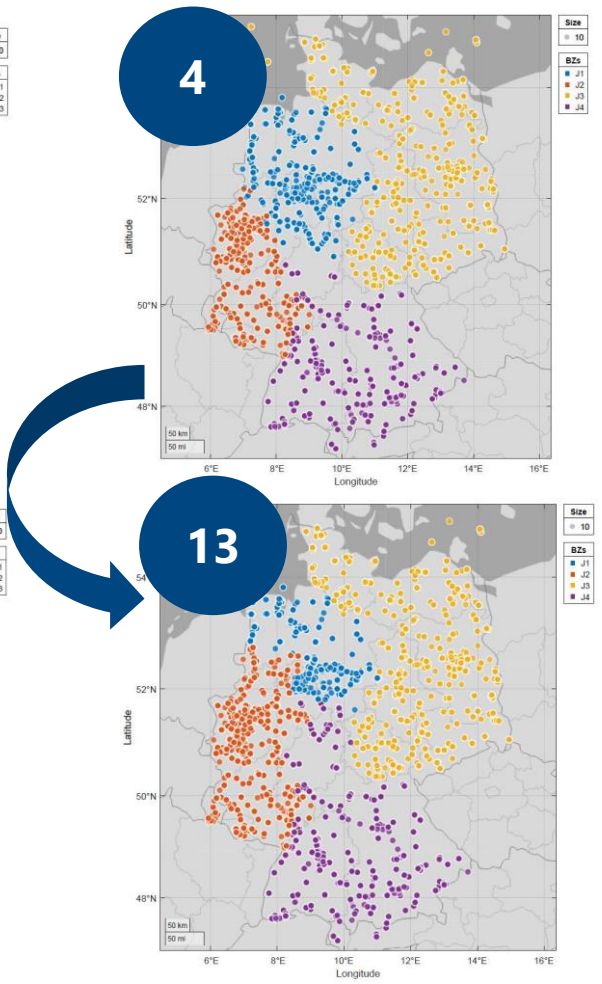
The default configurations* cut through the highly-meshed Ruhr area in the northern Amprion grid → the fallbacks do not





* Except for default configuration 2. Therefore there is no fallback foreseen for this configuration.



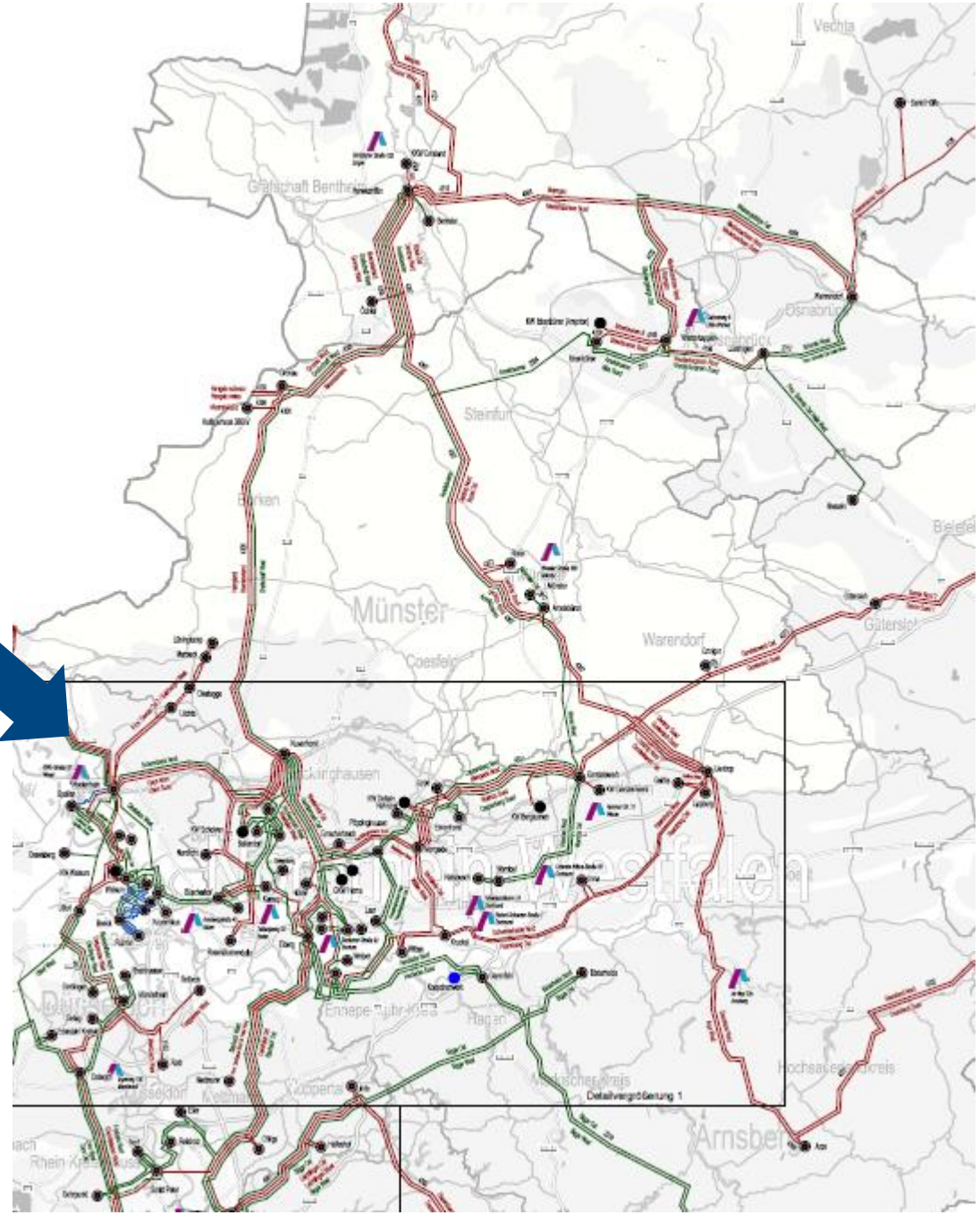


Comment on configuration 14: The border of bidding zones J1 and J5 is located between the German federal states of Hamburg and Schleswig-Holstein. At this border it can also happen that individual loads and generators cannot be uniquely assigned to a bidding zone. An allocation of Hamburg to J1 may perform better with respect to this indicator (has to be further checked).

The Ruhr area

„The Ruhr (/ˈrʊər/ ROOR; German: Ruhrgebiet [ˈʁuːɐ̯gəˌbiːt] (listen), also Ruhrpott [ˈʁuːɐ̯pɔt]), also referred to as the Ruhr area, sometimes Ruhr district, Ruhr region, or Ruhr valley, is a polycentric urban area in North Rhine-Westphalia, Germany.[a] With a population density of 2,800/km2 and a population of over 5 million (2017),[3] it is **the largest urban area in Germany**. It consists of several large cities bordered by the rivers Ruhr to the south, Rhine to the west, and Lippe to the north. In the southwest it borders the Bergisches Land. It is considered **part of the larger Rhine-Ruhr metropolitan region of more than 10 million people, which is the third largest in Europe, behind only London and Paris**."

https://en.wikipedia.org/wiki/Ruhr



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Official communication between German TSOs and ACER on possible options

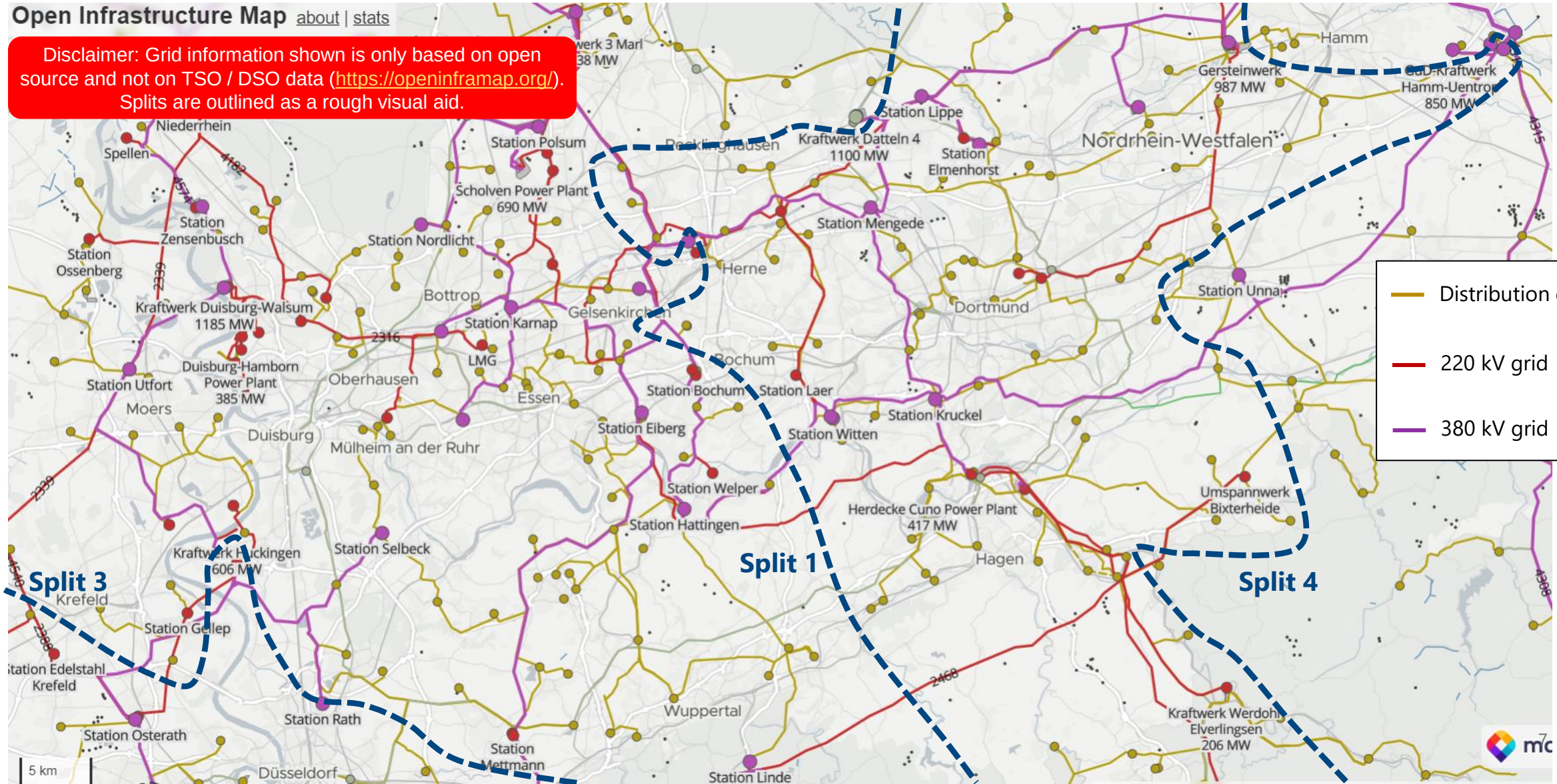
- **German TSOs:** "In case we were now required to carry out the detailed analysis of the unique and unambiguous assignment of such nodes as described in your decision, we would have to:
  - gather the necessary data from 110 kV network operators
  - set up analyses and evaluations such as the ones proposed by you
- Such an analysis would require a significant amount of time. Since this analysis would have to take place before the actual evaluation process can be initiated, the entire review project would be delayed by this time.
- Against this background, we kindly ask you for a formal guidance on:
  - (i) whether the TSOs shall opt for the analysis as described in your decision 11 2022 before concluding which configurations to evaluate in the review with the consequences on the planning mentioned above.
  - (ii) or a more simplified analysis – based on e.g. the examples we have already provided for the original and fallback configurations – may provide sufficient insights (…) to determine which configurations should be evaluated in the bidding zone review process."

- **ACER:** "The fact that you did not yet deem it possible to conclude on the issue of unique assignment at this stage of the BZR, given the 12-month period within which the BZR is to be completed, might constitute a relevant argument for TSOs to conclude that the options have been exhausted. In line with point 2 of Annex I to the ACER Decision on alternative BZ configurations, this might lead the German TSOs to replace the configurations with identifier 1, 3 and 4 with the corresponding fallback configurations included in Annex I to the ACER Decision on alternative BZ configurations."

Outcome of the simplified analysis for the Amprion grid

- In default configurations 1, 3 and 4 the 110 kV network is split in several instances (see next slide).
- From a practical standpoint the unique and unambiguous node-to-zone assignment is not always possible: Even if generation and load units would be assigned to one zone in theory according to a particular arbitrarily chosen criterion (e.g. lowest electrical distance), in practice e.g. generation units would still feed into both zones. This is generally undesired for measurement technological reasons, however **on such a large scale it would pose a real problem for keeping track of flows for balancing and settlement purposes and for integrating them into the market coupling**. Opening breakers could help to mitigate the problem of measuring flows. However not all 110 kV lines have breakers. Furthermore, opening breakers for the sole purpose of assigning generation / load to particular bidding zones is questionable.
- Additional practical concerns:
  - Setting up the necessary meters also in the low-voltage level on such a large scale requires time (first guesstimate: minimum 6 years) and effort. Long delivery times could prolong the implementation time.
  - The question of whether 110 kV lines have to be considered as critical network elements in the market coupling has not been assessed. This could potentially lead to more issues.
- These concerns could be mitigated by not splitting through the Ruhr area but along the northern Amprion LFC area, i.e. choosing to evaluate the fallback configurations in the BZR.
- **Conclusion:** Alternative configurations to be evaluated should be practically implementable. Issues have been detected in the default configurations 1, 3 and 4. Therefore, CE TSOs are preparing for the application of the fallback configurations in the BZR.

The highly-meshed Ruhr area is split in default configurations 1, 3 and 4



Conclusion

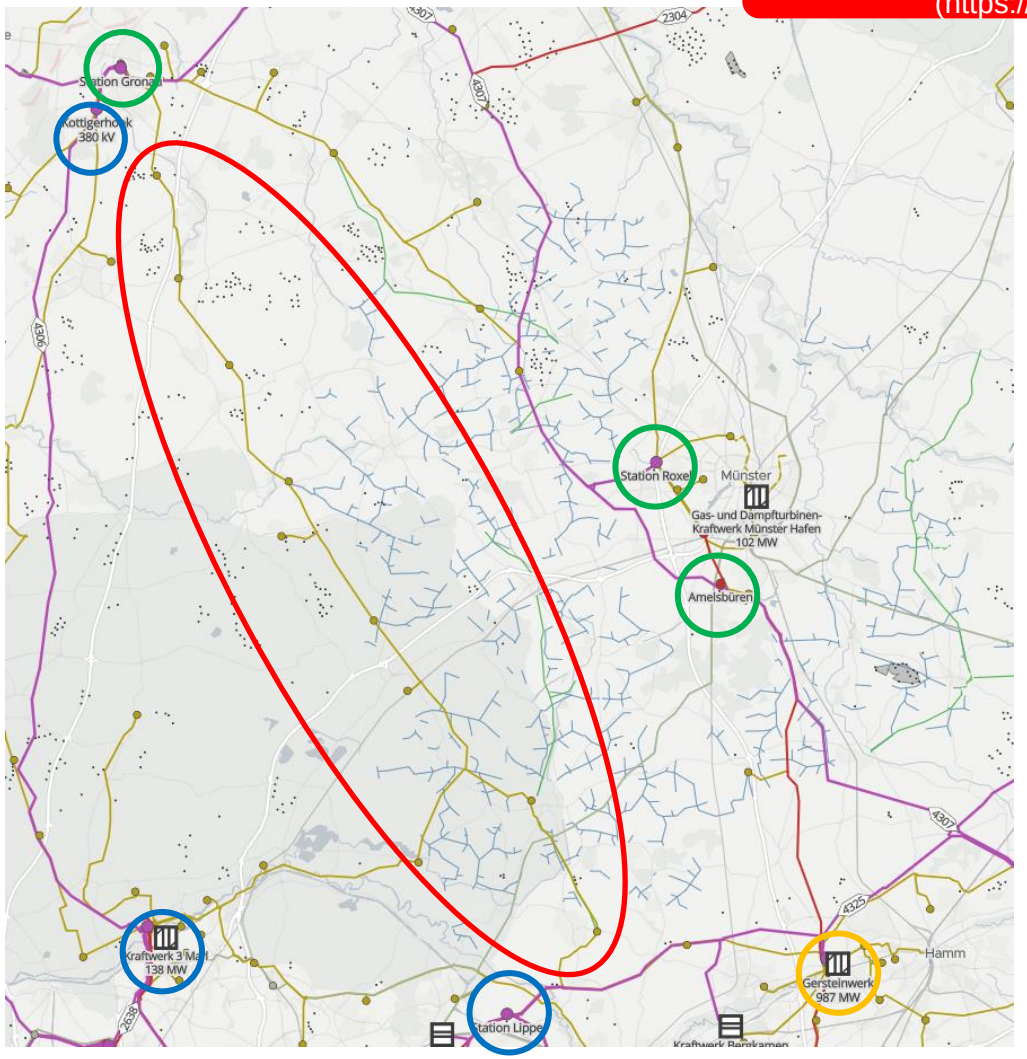
- According to article 2 of Annex I of the ACER Decision on alternative configurations, TSOs shall replace the default with the fallback configurations in case the unique assignment of generation and load units to bidding zones cannot be achieved for the default configurations.
  - The only criterion to consider when determining the alternative configurations to be evaluated in the Bidding Zone Review is the unique assignment of nodes to zones.
- A simplified analysis has revealed issues with the node-to-zone assignment of the default splits 1, 3 and 4 specifically with regard to practical implementability.
  - Major challenges would arise from cutting through the highly-meshed metropolitan Ruhr area.
  - Assigning 110 kV nodes to bidding zones would also require an assignment of the associated injections / withdrawals to zones for balancing and settlement purposes and for integrating them into the market coupling.
  - **Therefore, CE TSOs are preparing for the application of the fallback configurations in the BZR.**
- In order to proceed with the overall review project, the application of the fallback configurations has to be firmly determined by the end of the year 2022. Any feedback to this decision would have to be provided before this deadline.
- Deferrals of this determination or pursuing the alternative approach of initiating a more comprehensive investigation of the 110 kV topology would lead to substantial delays of the bidding zone review project. Currently, the in-depth analysis is not expected to lead to a different outcome than the simplified analysis.

Backup

Assignment of units to BZS – Amprion Grid
Example 4-Zone Split Germany

- As the German 110 kV grid is heavily meshed, specific issues can occur related to the question whether a unique assignment of generation and load units to BZs is possible
- In the example shown on the right, interconnected elements in the 110 kV grid have a connection both to substation „Gronau“ (assigned to BZ 1) and to substations assigned to BZ 2 (for example „Marl“)
- For this reason, it seems as a unique assignment of these nodes to one of the two BZs might not be possible.

Disclaimer: grid information shown in picture are only based on open source and not on TSO / DSO data (https://openinframap.org/).

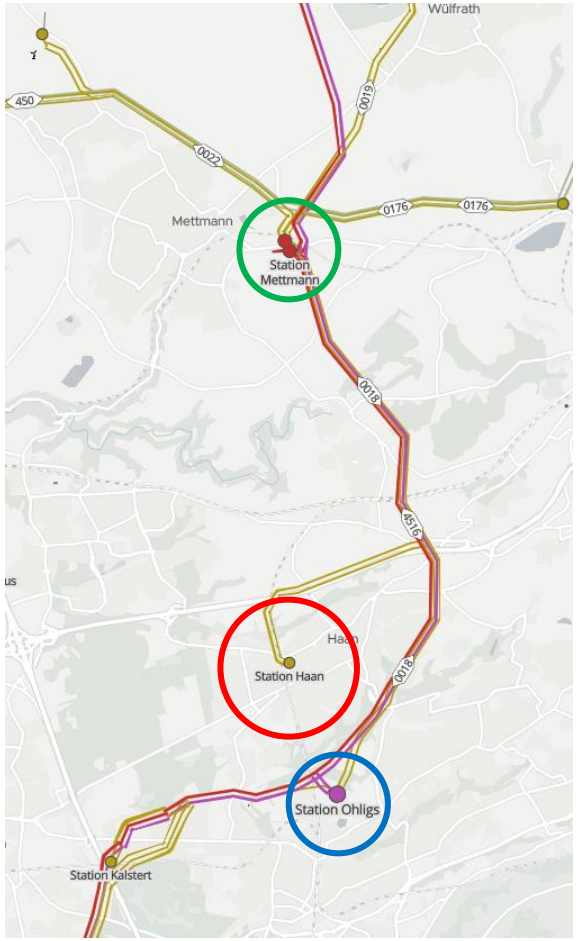


- BZ 1
- BZ 2
- Nodes of substation partly in BZ 1 and partly in BZ 2
- Example of distribution grid nodes where unique assign-ment might not be possible
- Distribution grid
- 220 kV grid
- 380 kV grid

Assignment of units to BZS – Amprion Grid
Example 3-Zone Split Germany

Disclaimer: grid information shown in picture are only based on open source and not on TSO / DSO data (https://openinframap.org/).

- Potential issues can also occur in rather simple cases where a distribution grid node is physically connected to substations that do not belong to the same bidding zone (as shown on the right side)

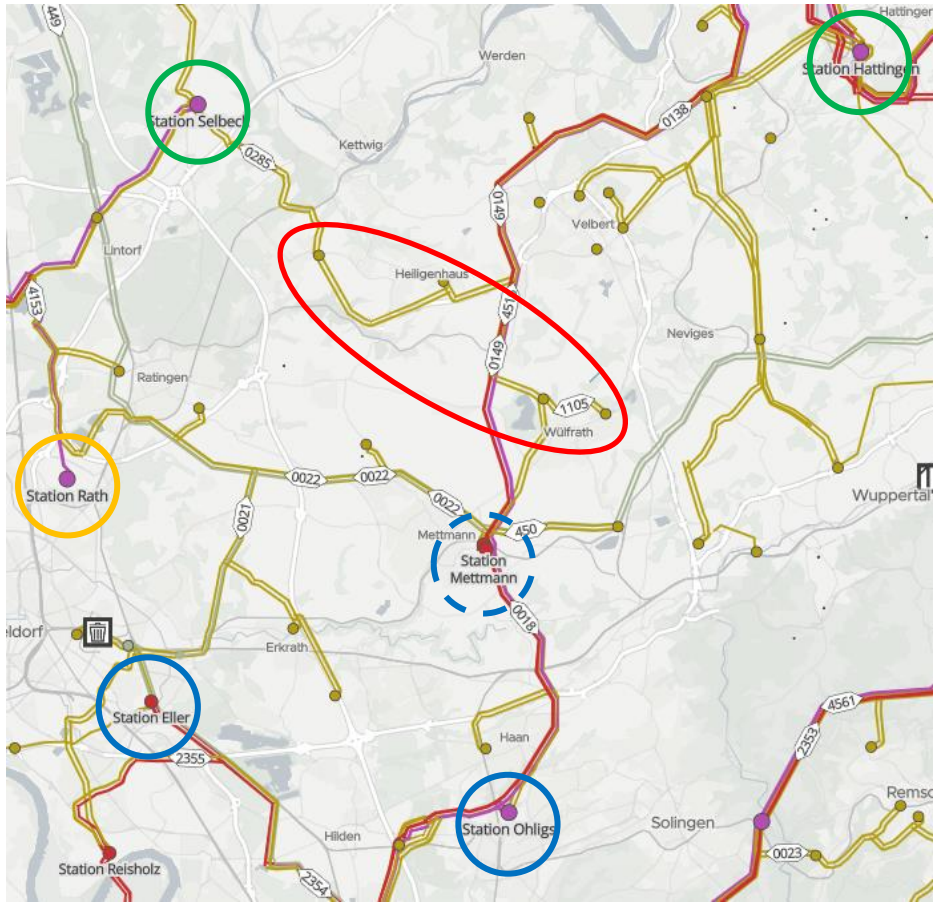


- BZ 1
- BZ 2
- Distribution grid node where unique assignment might not be possible
- Distribution grid
- 220 kV grid
- 380 kV grid

Assignment of units to BZS – Amprion Grid
Example 3-Zone Split Germany

Disclaimer: grid information shown in picture are only based on open source and not on TSO / DSO data (https://openinframap.org/).

- As shown on the right side, it seems that moving the nodes of substation Mettmann to BZ 2 would question whether for example the nodes highlighted in red could be clearly assigned to one BZ. Hence, a reassignment cannot be recommended.
- As the German distribution grid is heaviliy meshed, several examples can be found where a reassignment could potentially cause new issues (in line with this one).



- BZ 1
- BZ 2
- Fictitiously assigned from BZ 1 to BZ 2
- Nodes of substation partly in BZ 1 and partly in BZ 2
- Example of lower voltage nodes where unique assign-ment might not be possible
- Distribution grid
- 220 kV grid
- 380 kV grid

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