BZR CG meeting: TSOs' update on on-going BZR study

3 Mar 2023, Brussels, Belgium (online format)

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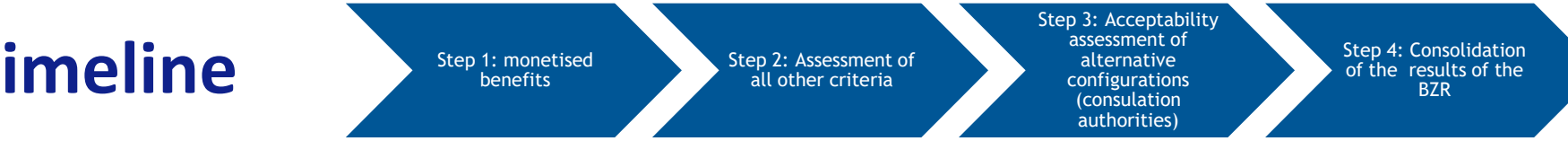
Agenda

- **Updated BZR timeline**
- **Answer to BZR CG members' questions on 22 indicators**
- **Update from BZRRs:**
  - CE BZRR: status update, sensitivity analysis, German configurations
  - Nordic BZRR: general update
- **Pan-EU studies:**
  - 2nd questionnaire on transition costs
  - Liquidity study update
- **Consultative group next meeting (before July MESC)**

Updated BZR general timeline



BZR start

Input data to ACER/NRAs: delivered

Input BZR data publication: done

Start of public consultation (+3 months)

End of calculations for individual splits and modelling per BZRR & pan-EU study report (+ 4 months)

Final assessment by BZRR (+5 months)

Publication of the (+6 months)

Out pub (+6

Jul 22 | Aug 22 | Sep 22 | Oct 22 | Nov 22 | Dec 22 | Jan 23 | Feb 23 | Mar 23 | Apr 23 | May 23 | Jun 23 | Jul 23 | Aug 23 | Sep 23 | Oct 23 | Nov 23 | Dec 23 | Jan 24 | Feb 24

Modelling and Calculations on each BZRR (+5 months)

PAN EU studies on common indicators

1st transition costs questionnaire available for stakeholders input

2nd transition costs questionnaire + interviews

Estimation of transition costs based on stakeholders' answers to 1st and 2nd questionnaire + interview answers

Market liquidity analysis

Step 1 and 2

Step 3

Step 4

Alignment /draft final report

Formatting and final approval

Alternative BZ combinations selected

16 Sep 2022: public webinar

Public webinar

Public webinar

5 Jul 2022: BZR CG

1 Sep 20222: BZR CG

13 Oct 2022: BZR CG

14 Dec 2022: BZR CG

3 March 2023: BZR CG

Mid-June BZR CG

End-Sep BZR CG

Mid-Dec BZR CG

Update from BZRRs

Answer to BZR CG members' questions on 22 indicators

- **See the separate Word document with the questions raised and the answers from the BZR regions.**

Update from BZRRs

Illustration for indicator 4 “Economic efficiency”

- **The market dispatch simulation shall provide the following results for the EU, for each MTU, for all scenarios:**
  - the total socio-economic welfare in €;
  - the consumer surplus in €;
  - the producer surplus in €;
  - the overall congestion revenue in €;
- **The RAO simulation shall provide:**
  - the additional cost from the costly redispatch in €;
- **The overall welfare figure shall consist of:**
  - the total socio-economic welfare from the market dispatch minus the cost from the RAO in €;

Dummy numbers

	Market dispatch				RAO	Overall
Configuration and scenario	total socio-economic welfare in €	consumer surplus in €	producer surplus in €	overall congestion revenue in €	additional cost from the costly redispatch in €	Overall welfare (market dispatch – RAO) in €
Status quo	100M	45M	45M	10M	15M	85M
Alt. config. 1, Climate year1	95M	45M	45M	5M	5M	90M
Alt. config. 2, Climate year1	..	..	..	..	..	..

Update from BZRR Central EU

Topics:

- **Status update**
- **Sensitivity analysis**
- **German configurations**

Update from BZRR Central EU

Status update

- The CE TSOs have set up a toolchain consisting of several dedicated analysis tools to perform the complex bidding zone review computations.
- The tool chain requires a CGM that is based on the CGMES standard. Though the starting point was to use a CGMES model from the LMP analysis, changes had to be made to this grid model, and to enhance the model for the sensitivity analysis.
- This posed many challenges to the CE TSOs, and they were able to finalize the CGMs only shortly before Xmas and to provide them to ACER and NRAs.
- Due to this late availability of the CGMs, CE TSOs are facing an (estimated) one-month of delay in delivering results to the all-TSO liquidity assessment, and the simulations following.
- **Despite the 6 additional months, the CE timeline is still under pressure due to the data issues, and the computational challenges and complexity.**
- The following mitigations have been, or are in the process of being, introduced.
  - Simplifications / improvements to be applied in the modelling approach, e.g. a large computational improvement is being implemented in the RAO module (which is the most computationally-expensive module in the tool chain).
  - Hardware has been enhanced in the meantime to improve the computational performance.

Update from BZRR Central EU

Sensitivity analysis

		Sensitivity for NORDIC	Sensitivity for CE
COMMON PARAMETER	**Fuel prices**	Nordic	CE
LOCAL PARAMETER	**Grid**		CE (based on year 2028)
	RES		CE (based on year 2028)
	Drop of Russian exports	Nordic	

- CE TSOs proposed to have a single sensitivity analysis consisting of three dimensions as indicated in the table above: grid (based on the year 2028), RES (based on the year 2028), and fuel prices

- In the Dec 13, 2022 meeting, NRAs and ACER stated that
  - "*using simplified approaches to scale demand from 2025 to 2028 with the available data is in any case better than considering the demand for 2025 for the sensitivity analysis of 2028*"
  - "*With the current outline, NRAs and ACER consider the sensitivity analysis for 2028 as not fulfilling the minimum methodological requirements*".

- CE TSOs have decided to aim for including the load as a 4th dimension into their sensitivity analysis, in a simplified way as suggested by ACER. Before confirming that the load can be included as an additional dimension into the sensitivity analysis, its feasibility will be tested first.
  - If the addition of the load to the sensitivity analysis poses too many issues, and thereby risks for the stressed CE timeline, the sensitivity analysis will continue with the original three dimensions only (grid, RES, and fuel prices for 2028).

Status of the alternative configurations for Germany

Questions from Eurelectric:

Have you received feedback about German fallback configurations? Could you please update us on the status of this decision? We regret that expert advice has been sought at such short notice as it may have a significant impact at PAN-EU level.

Answers from TSOs:

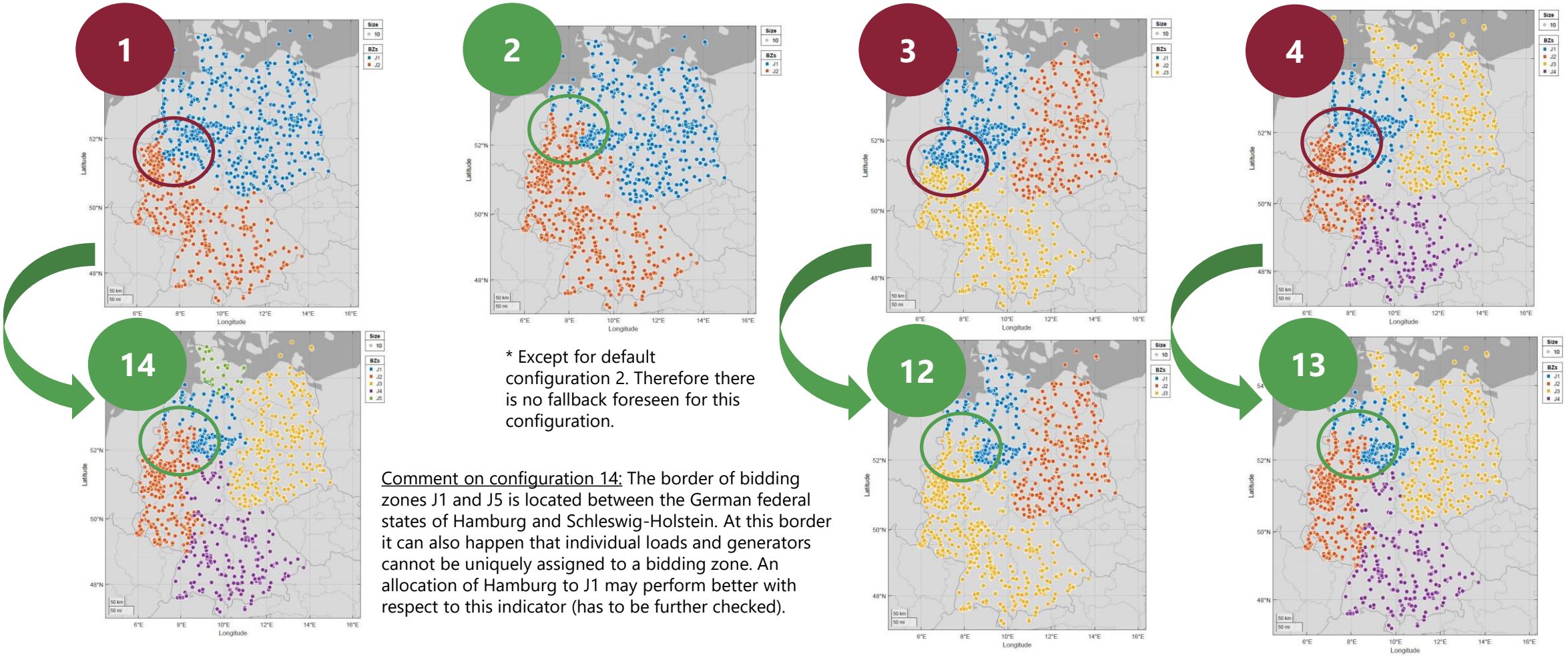
TSOs received feedback on the German fallback configurations from one Dutch stakeholder who expressed concerns and asked for some clarifications by email. TSOs sent a response by email and offered a bilateral call in case the written feedback would not be sufficient. However, no more explanations were requested after the email was sent by the TSOs.

Therefore, following the ACER decision on the alternative configurations, the Steering Committee of the Bidding Zone Review Region Central Europe decided on 23rd January 2023 to evaluate the German fallback configurations. Specifically, this means that configurations 2, 12, 13 and 14 are assessed in the Bidding Zone Review for Germany (please see the next slide for a visual representation of the configurations).

Stakeholders are of course welcome to pose any remaining questions regarding this topic.

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).

Status update Nordic BZRR

- The initial test runs for the base scenario and alternative configurations have been completed without the use of redispatch. These results have been used to gather input data for a Pan-EU liquidity study.
- The implementation of redispatch, a new function in the BID 3 model, is currently being tested by TSOs and may present potential challenges in terms of timely and accurate delivery.
- The current focus is on evaluating the BZR study indicators, as they are crucial for the implementation of the model, simulation output, and evaluation.
- Collaboration with Afry, the modeling service provider, is ongoing to determine which indicator results can be directly provided by BID 3. Additionally, ongoing alignment with CE colleagues on the indicator assessment and the structure of the BZR study report is taking place.
- Nordic TSOs decided to run an additional sensitivity for a dry year.
- Overall, the Nordic BZR work is progressing as planned.

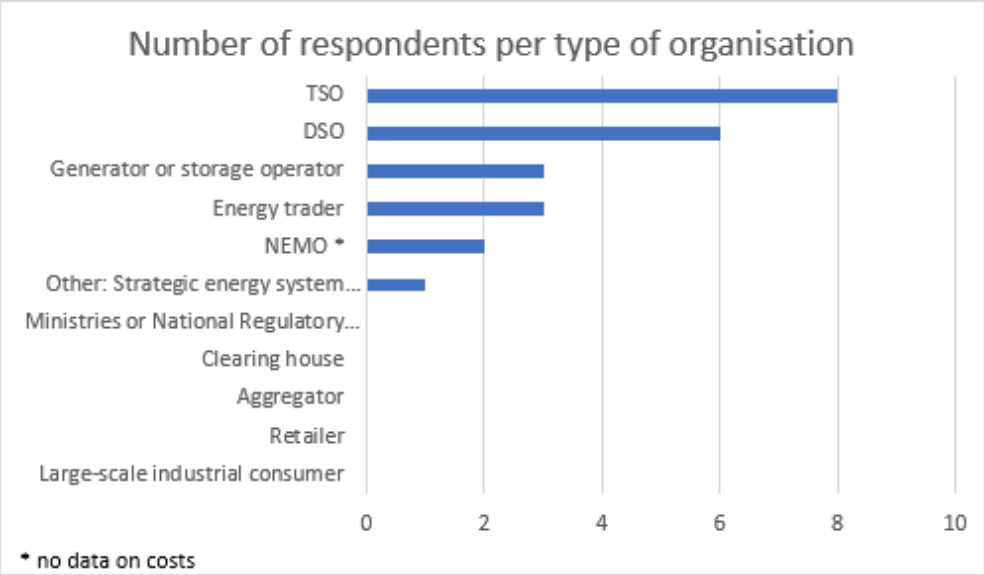
Pan EU Studies

Topics:

- **2nd questionnaire on transition costs**
- **Liquidity study status update**

Transition costs: rational and background for a 2nd questionnaire

General overview of the answers received so far:



BZ reconfiguration	Number of responses per cost category
DE1	20
DE2	19
DE3	38
DE4	38
DE5	19
FR3	18
IT2	17
NL2	18
SE3	34
SE4	34
Total	255

- Very few (mainly DSOs, generators, energy traders) to no (large industrial consumers, retailers, aggregators, clearing houses, NRAs) responses for some categories of stakeholders;
- For these categories, costs estimates will be difficult with the current data → necessity **to complement** the data collection
- Approach chosen: organise a second simplified questionnaire combined with interviews on a sample of around 10 stakeholders from the categories identified (DSO, generator / storage operator, energy trader, NEMO / Clearing houses, aggregator, retailer, large scale industrial consumers);
- Data received on the 1st questionnaire will still be considered;

2nd questionnaire on transition costs: changes compared to the 1st questionnaire

Work in progress

	Questionnaire Element	Rationale
No change	**Introduction** with background, proposed BZ reconfigurations, definition of transition costs, data processing	Relevant information that has not changed
	Overview of **cost categories** with explanations and examples	
	Questionnaire including **general questions** about the respondent, cost estimates, effect of intra-company transactions on liquidity	Relevant information to assess robustness and calculate overall transition costs
Amendments	Optional integration of **Excel file** as questions into the questionnaire when possible	Facilitates answering the questionnaire for respondents
	Costs per BZ configuration: Asking • Which of the proposed BZ configurations are expected to affect the respondent • Whether costs are expected to vary depending on the proposed BZ configuration (granularity per country kept) • For different estimates if respondent indicates that costs depend on BZ reconfiguration (in which case the excel will have to be filled in and uploaded in the consultation tool)	As often same responses were given for different BZ reconfigurations withing the same country in the 1st questionnaire, now asking for estimates in "default case" and explicitly asking for any deviations from the "default case" and corresponding cost estimates
	Drop explicit **cost differentiation per lead time**. Instead, asking whether and, if yes, why lead time is expected to alter transition costs	As often same responses were given for different lead times in the 1st questionnaire, now asking for estimates in "default case" and explicitly asking whether higher (lower) costs are expected with a shorter (longer) lead time
	Aggregating **NEMOs and clearing houses** into one type of organisation	Similar task – so far, no responses from clearing houses
	Drop the request for estimated **market share** of each respondent	So far, no meaningful responses – rather using market data to scale costs
	Drop the request for cost estimates for **flexibilization of systems and processes** (not part of transition costs)	So far, no meaningful responses and not required for transition costs

2nd questionnaire on transition costs: merging responses with those from the 1st questionnaire

Work in progress

Requested Value in Questionnaire 1	Requested Value in Questionnaire 2	Approach to merging
general questions about the respondent, cost estimates, effect of intra-company transactions on liquidity	**general questions** about the respondent, cost estimates, effect of intra-company transactions on liquidity	No change, hence **complete overlap possible**
Costs per BZ configuration, asking for different estimates	**Costs per BZ configuration**: Asking • Exposure to proposed BZ configurations • Variation among costs per BZ configuration • For different estimates if respondent indicates that costs depend on BZ reconfiguration	New questions on the exposure and variation reduces time spent on the questionnaire for respondents. From the answers, the **same cost differentiation** between BZ configurations can be made.
Explicit question on cost estimates for lead times 2,3, and 4	Drop explicit **cost differentiation per lead time**. Instead, asking whether and, if yes, why lead time is expected to alter transition costs	**Decrease of granularity** such that costs estimates from questionnaire 1 for lead times 2 and 4 are translated into the indication if lead times alter transition costs.
Separate treatment of groups	Aggregating **NEMOs and clearing houses** into one type of organisation	**Not an issue** so far
Question about **market share** asked	Drop the request for estimated **market share** of each respondent	Consider answers as informal **background information**
Question about **flexibilization** asked	Drop the request for cost estimates for **flexibilization of systems and processes** (not part of transition costs)	Consider answers as informal **background information**

Tentative timeline

Work in progress

15.03 – 14.04 – 2nd questionnaire online

22.03 – 14.04 – interviews (questionnaire will be provided per mail to the interviewees as soon as finalized)

15.04 – 30.04 – processing information

22.05 – start of the public consultation

Liquidity study - status update

- **Short term markets (DA & ID)**
  Analysis has started regarding the market liquidity in the concerned BZs.
- **Long term markets**
  Final data delivery from the data provider is expected soon. OTC data will also be included in the analysis (data provider: LEBA).

Consultative group meeting

Next meeting: before the public consultation and before next MESC 5 July

Appendix

Nordic: reserve dimensioning for alternative configurations

- In the Nordic BZR, the reserve modelling is only considering FCR and FRR, as RR is not currently in use. The reserves are taken into account in the model by holding constant the generation capacity that is assumed to be contributing to reserves and is thus not available for the day-ahead market dispatch. This is in line with the values reported in the PEMMDB National estimates.
- Parts of the reserve requirement in some Nordic countries is fulfilled with capacity that is not available for the day-ahead market dispatch. The corresponding reserve capacity is not included in the reserve holding requirement in the model; the plants not available for the day-ahead market are also not included in the modelling. This is in line with other Nordic and European TSO modelling projects.
- In the different bidding zone configurations an experience- and visual-based approach was used for estimating the FCR and FRR provision. For example, if a Northern bidding zone spans further north and/or covers a larger area in the North, the estimated FCR provision is increased relative the comparison configuration. The overall provision of FCR and FRR is maintained through all scenarios, and only the distribution between alternative bidding zones is altered.

	Status quo		Config 8		Config 9		Config 10		Config 11	
	FCR	FRR	FCR	FRR	FCR	FRR	FCR	FRR	FCR	FRR
Blue (SE1*)	322	105	763	249	731	230	38	274	32	215
Yellow (SE2*)	403	105	8	51	13	59	3	39	13	59
Orange (SE3*)	64	391	17	301	45	313	322	105	274	89
Violet (SE4*)	0	0	-	-	-	-	425	183	471	238
Total	789	601	789	601	789	601	789	601	789	601

* for status quo

Transition costs: answers to ACER and NRAs‘ questions on the anonymised anwers to the 1st transition costs questionnaire (Jan 27th 2023)

ACER/NRAs‘ questions	TSOs‘ answers
How are you going to scrutinize these numbers?	TSOs do not consider to be in the position to scrutinize the costs. As explained, plausibility checks will be made and outliers will be identified that should allow to assess whether the costs provided are reasonable but beyond this no specific scrutiny of the costs is foreseen. Considering the low number of answers received, it seems difficult to discard any answer if the costs are in a reasonable range.
Some observations: Only a few files have explanations. The rest does not. Some files seem to be filled by the same organizations.	Some organizations have aligned their answers (e.g. some German DSOs) and provided similar answers which seems reasonable.
I see rather big differences, but maybe they can be explained by the difference in size of the companies? Although, is that logical?	Some parties are probably more impacted than others depending on the splits considered as well as the structure of the company.
Why are the costs in Sweden relative so high, while there are already different bidding zones?	We can only offer specifics for the TSOs as we have limited insight into other actors’ costs. Even though there are already bidding zones in Sweden, a reconfiguration requires large changes to IT-systems. As we update our systems, we strive to make them more flexible and to easier accommodate future bidding zone changes but there will always be a cost associated with a reconfiguration.
How to interpret the 2 files with no data?	Parties have not provided costs estimations.
In the presentation was mentioned that maybe a second questionnaire could be organized, or this data is used. Are you going to use this data? Then, how are you planning to use/convert/extrapolate this data for use in the determination of the transition costs? Or are you going to have a second questionnaire? If so, what other information do you expect?	Considering the low number of responses received on the first questionnaire mainly due to its complexity, we foresee to prepare a second more simplified one and reach out to categories of stakeholders that have not answered the first one especially. So we will focus on some categories of stakeholders and combine this second questionnaire with interviews. We are currently discussing how many interviews we can organize considering the rather limited time and how to incentivize stakeholders to answer. The support of the NRAs would be very welcome here. The answers received on the first questionnaire will be used especially for the categories of stakeholders for which we have a rather satisfying answers rate (e.g. TSOs). The aim of the second questionnaire is to complement the data collection in order to be able to have a proper estimation of transition costs. Data will be extrapolated according to the principles presented in the BZR CG on sept. 1st (slide 8).

ENTSO-E Mission Statement

Who we are

ENTSO-E, the European Network of Transmission System Operators for Electricity, is the **association for the cooperation of the European transmission system operators (TSOs)**. The 42 member TSOs, representing 35 countries, are responsible for the secure and coordinated operation of Europe's electricity system, the largest interconnected electrical grid in the world. In addition to its core, historical role in technical cooperation, ENTSO-E is also the common voice of TSOs.

ENTSO-E **brings together the unique expertise of TSOs for the benefit of European citizens** by keeping the lights on, enabling the energy transition, and promoting the completion and optimal functioning of the internal electricity market, including via the fulfilment of the mandates given to ENTSO-E based on EU legislation.

Our mission

ENTSO-E and its members, as the European TSO community, fulfil a common mission: Ensuring the **security of the interconnected power system in all time frames at pan-European level and the optimal functioning and development of the European interconnected electricity markets**, while enabling the integration of electricity generated from renewable energy sources and of emerging technologies.

Our vision

ENTSO-E plays a central role in enabling Europe to become the first **climate-neutral continent by 2050** by creating a system that is secure, sustainable and affordable, and that integrates the expected amount of renewable energy, thereby offering an essential contribution to the European Green Deal. This endeavour requires sector integration and close cooperation among all actors.

Europe is moving towards a sustainable, digitalised, integrated and electrified energy system with a combination of centralised and distributed resources. ENTSO-E acts to ensure that this energy system **keeps consumers at its centre** and is operated and developed with **climate objectives** and **social welfare** in mind.

ENTSO-E is committed to use its unique expertise and system-wide view – supported by a responsibility to maintain the system's security – to deliver a comprehensive roadmap of how a climate-neutral Europe looks.

ENTSO-E Mission Statement

Our values

ENTSO-E acts in solidarity as a community of TSOs united by a shared responsibility.

As the professional association of independent and neutral regulated entities acting under a clear legal mandate, ENTSO-E serves the interests of society by optimising social welfare in its dimensions of safety, economy, environment, and performance.

ENTSO-E is committed to working with the highest technical rigour as well as developing sustainable and innovative responses to prepare for the future and overcoming the challenges of keeping the power system secure in a climate-neutral Europe. In all its activities, ENTSO-E acts with transparency and in a trustworthy dialogue with legislative and regulatory decision makers and stakeholders.

Our contibutions

ENTSO-E **supports the cooperation** among its members at European and regional levels. Over the past decades, TSOs have undertaken initiatives to increase their cooperation in network planning, operation and market integration, thereby successfully contributing to meeting EU climate and energy targets.

To carry out its **legally mandated tasks**, ENTSO-E's key responsibilities include the following:

- Development and implementation of standards, network codes, platforms and tools to ensure secure system and market operation as well as integration of renewable energy;
- Assessment of the adequacy of the system in different timeframes;
- Coordination of the planning and development of infrastructures at the European level (Ten-Year Network Development Plans, TYNDPs);
- Coordination of research, development and innovation activities of TSOs;
- Development of platforms to enable the transparent sharing of data with market participants.

ENTSO-E supports its members in **the implementation and monitoring** of the agreed common rules.

ENTSO-E is the common voice of European TSOs and provides expert contributions and a constructive view to energy debates to support policymakers in making informed decisions.

Our values define who we are, what we stand for and how we behave.
We all play a part in bringing them to life.

EXCELLENCE

We deliver to the highest standardss. We provide an environment in which people can develop to their full potential.

TRUST

We trust each other, we are transparent and we empower people. We respect diversity.

INTEGRITY

We act in the interest of ENTSO-E

TEAM

We care about people. We work transversal and we support each other. We celebrate success.

FUTURE THINKING

We are a learning organisation. We explore new paths and solutions.

We are ENTSO-E