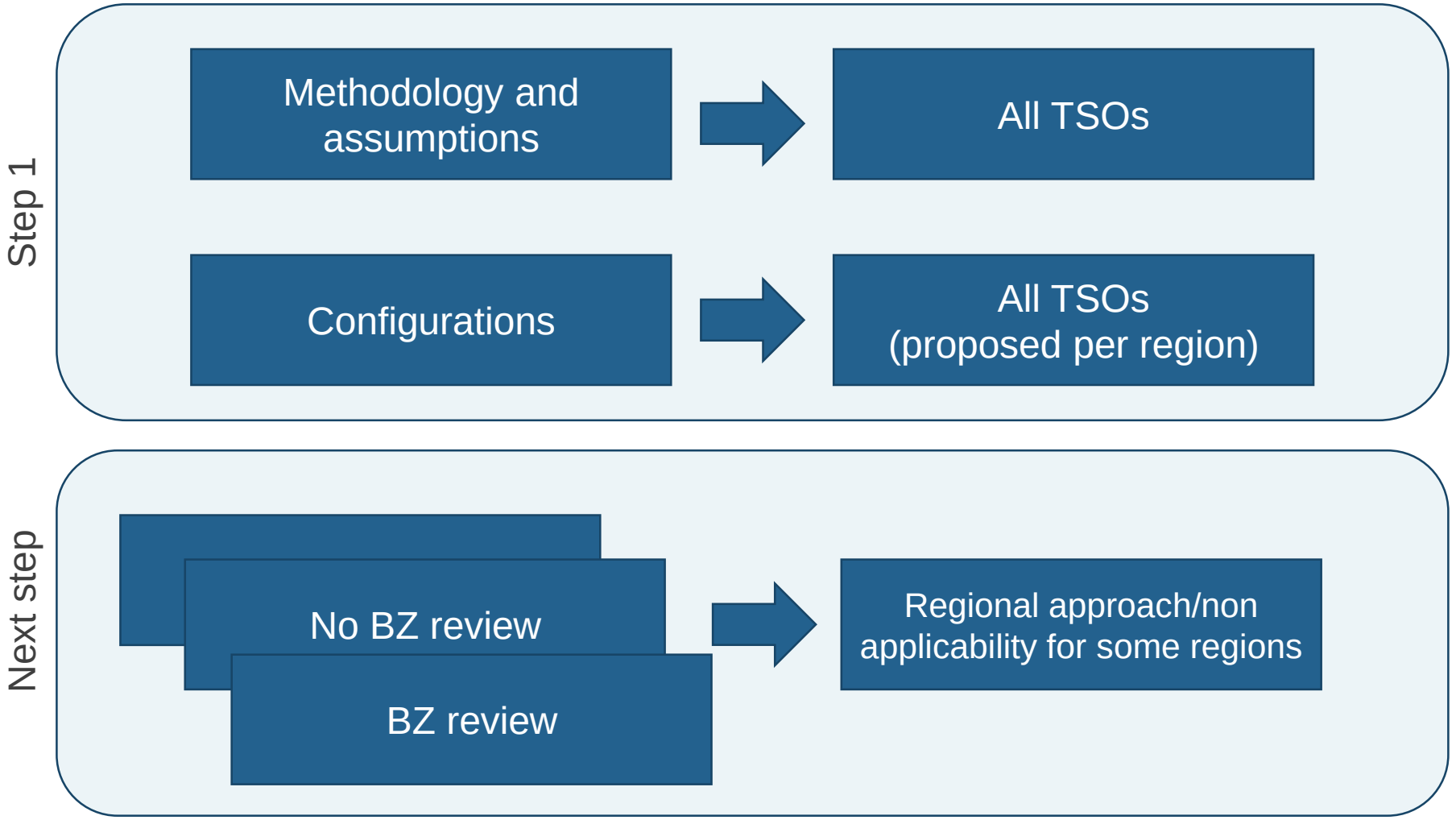
BZ Review stakeholders webinar

21/10/2019

Introduction: The overall concept of the proposal and some background information to understand it

All TSOs for the methodology and regional approach for configurations and reviews.



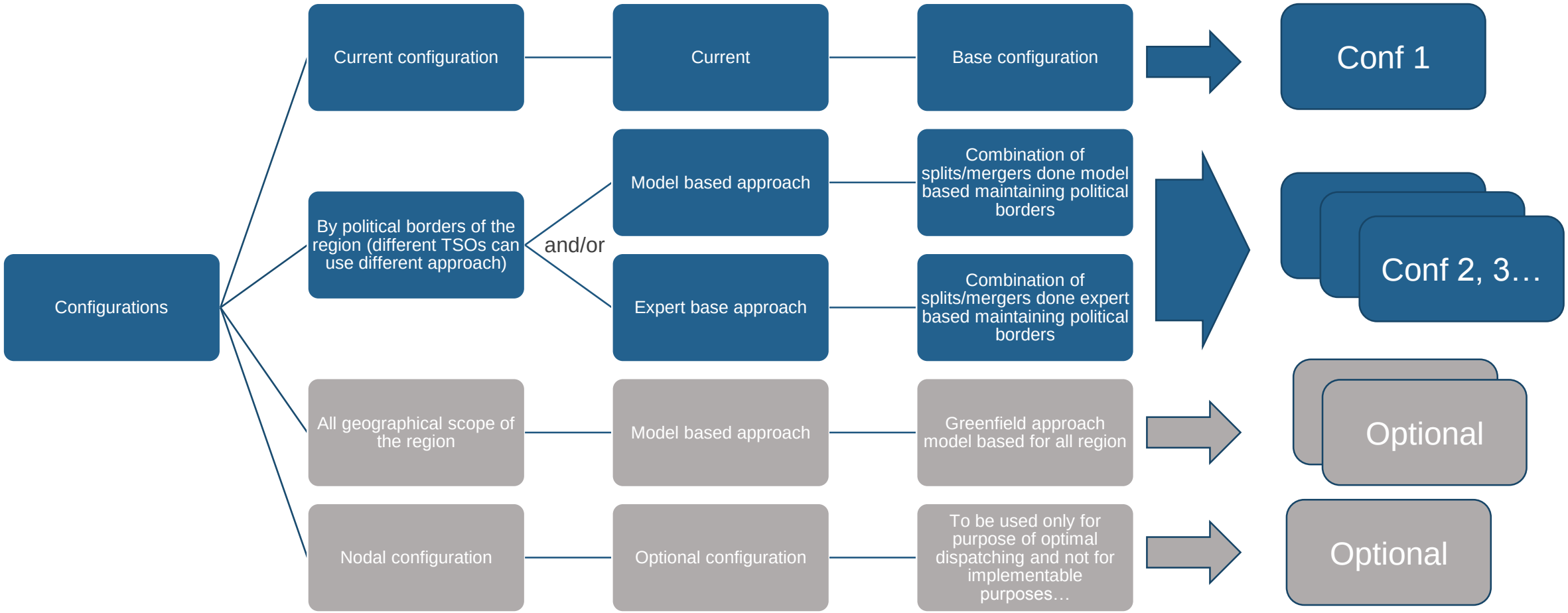
One package to be delivered by 5th October (3M after EIF of CEP)

Why regional approach and common methodology?

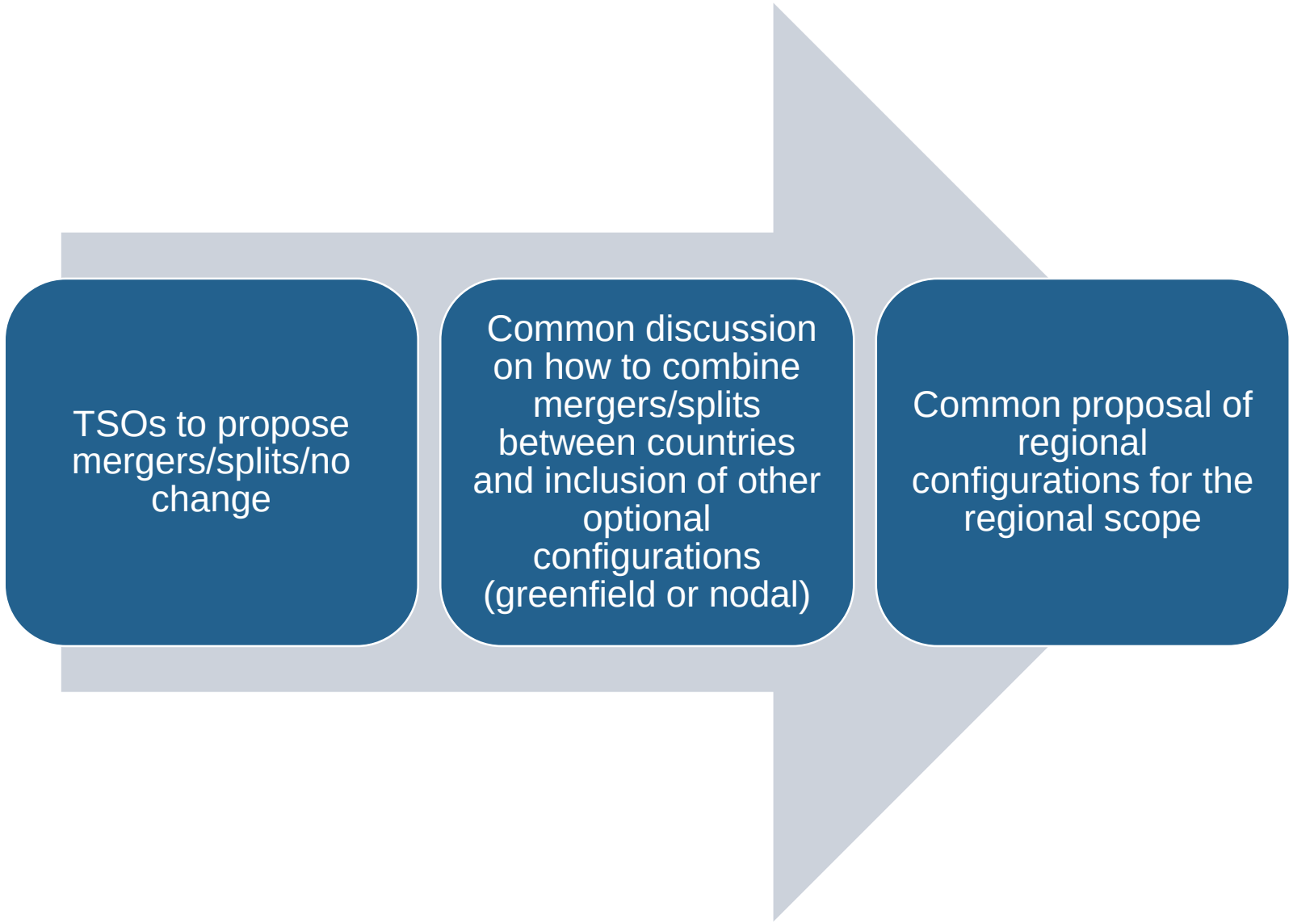
Common methodology with TYNDP data, but focused review

Feasibility of the model	•Regional approach reduces model complexity •pan-EU model is infeasible in the timeframe of the study •Need to ensure feasible simulation environments and short simulation times (providing the possibility to enlarge the set of configurations/scenarios evaluated in the assessment); •In some countries, national regulations regard certain data as confidential and do not allow sharing of this data
Consider technical Regional specificities	•Different capacity calculation and allocation methodologies (FB or NTC for different regions) •Radial or meshed grid: In “radial” structure of the grid, relevant technical constraints shall be properly incorporated and evaluated in the simulation environment. This could endanger the feasibility/timing of a European scale simulation (where, typically, such constraints can be neglected thanks to the highly meshed degree of the network structure).
Reduce governance complexity	•By reducing the number of parties involved

Catalogue of configurations to be proposed per region



The process for proposing configurations in the Regions

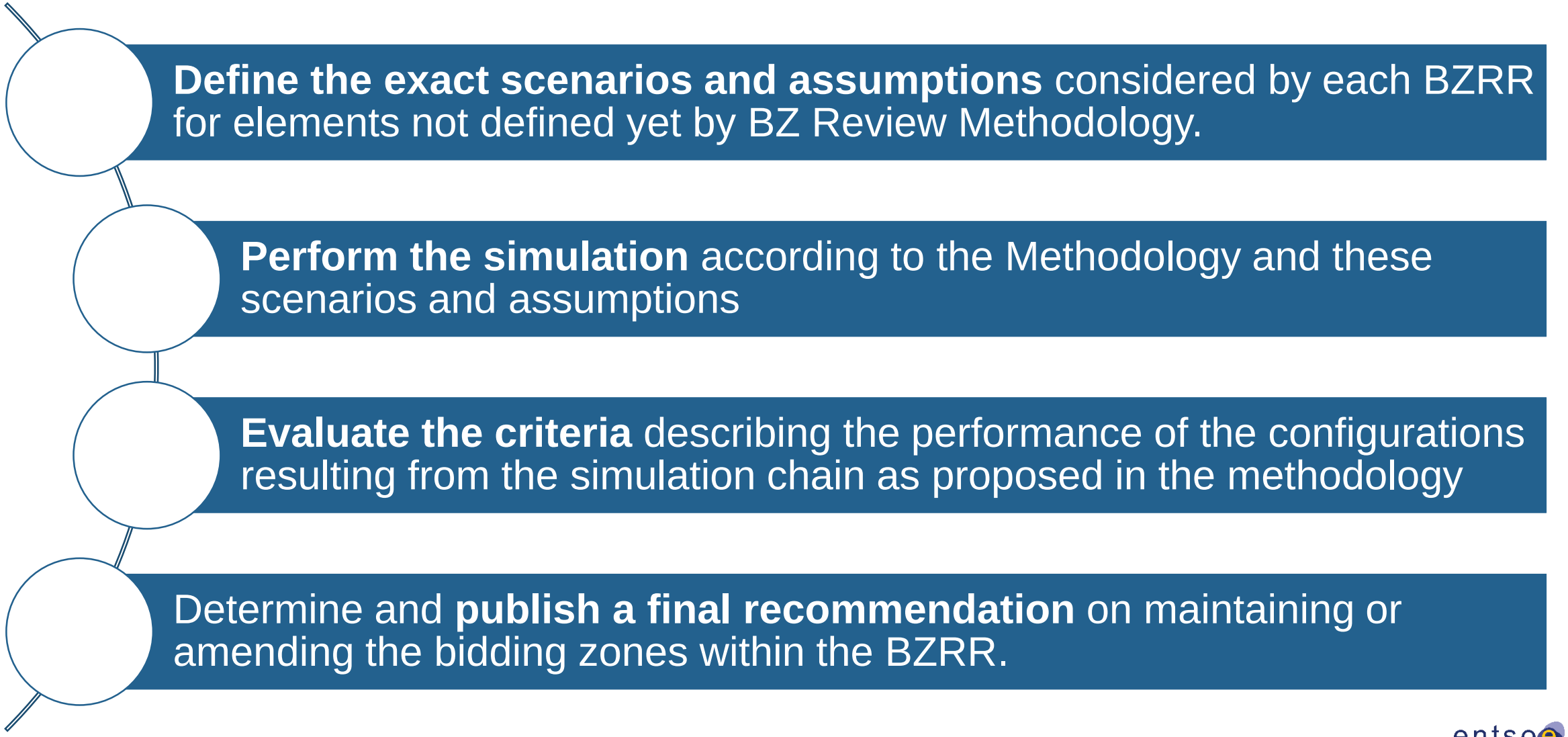


BZR methodology content

Content of BZRR methodology

- A1: Subject Matter and Scope
- A2: Definitions and Interpretation
- **A3: Bidding Zone Review process**
- **A4: Configurations**
- **A5: Scenarios and assumptions**
- **A6: Modelling chain**
- **A7: Capacity calculations**
- **A8: Market coupling**
- **A9: Operational security analysis**
- **A10: Remedial action simulation**
- **A11: Flows not induced by cross-zonal trade analysis**
- **A12: LMP analysis**
- **A13: Evaluation**
- A14: Implementation
- A15: Publication of BZ Review Methodology
- A16: Miscellaneous

A3: The Bidding Zone Review process (4 steps)



A4: Configurations

- The BZ Review shall be carried out on a regional level (by each BZRR).

- The TSOs of a BZRR shall deliver a set of bidding zone configurations for their BZRR which are to be used in the BZR Process. These sets of configurations contain the current BZ configuration as the benchmark configuration and additional alternative configurations.

- If sufficient justification is provided on the absence of structural congestions (following NRAs guidance) or absence of structural congestions that have impact on neighbouring bidding zones under the consideration of applicability of the 70% criterion as intended in Article 16(8) of the IME regulation (CEP text), TSOs of a BZRRs may submit only the status quo configuration, subject to approval of all national regulatory authorities. In this case, no alternative configurations will be investigated by the TSOs of these BZRRs in the BZ Review.

A5: Scenarios and assumptions

Target year	• **Third year from methodology approval** defined as the Base Year. The **data set used for the Base Year shall be based on the year 2025, to align it with the TYNDP scenarios available**, and may incorporate the adjustments or qualitative assessment to show differences between the third year from methodology approval and 2025.
Grid data	• Network model shall be based on the TYNDP 2020 process for the 2025 reference grid taking into account at least relevant network elements operating at voltage levels of at least 220 kV and higher that are likely to be built until the end of the Base Year;
Weather years	• Allow for simulating different climatic conditions. **The model shall be run for at least one representative weather year**, which may derive from the TYNDP clustering process;
Load / Generation Data	• Zonal load/generation data shall be based on the demand/generation data from the Pan-European Market Modelling Database (hereinafter "**PEMMDB** 3.0"). Using the 'National Trends' scenario in PEMMDB for the relevant target year;
Sensitivity analysis	• Additional sensitivity analyses on input data or grid infrastructures may optionally be performed by the TSOs of a BZRR

Scenarios -Time horizon: legal and proposed

CEP: 2022 - 2024

CEP IEM art. 14(5): *The methodology shall be based on structural congestions which are not expected to be overcome within the following **three years**, taking due account of tangible progress on infrastructure development projects that are expected to be realised within the following **three years**.*

CACM: 2030

CACM: *A bidding zone review in accordance with Article 32 shall include scenarios which take into account a range of likely infrastructure developments throughout the period of **10 years** starting from the year following the year in which the decision to launch the review was taken.*

Proposed:

The **data set used for the Base Year shall be based on the year 2025, to align it with the TYNDP scenarios available**, and may incorporate the adjustments or qualitative assessment to show differences between the third year from methodology approval and 2025.

- Aligned with TYNDP, where recent data is available and reliable, transparent and accepted by TSOs;
- New grid model creation specifically for 2022, 2023 or 2024 takes time, effort and extensive discussions;
- In 2025 Action Plans in accordance with CEP IEM art. 15 shall be implemented, therefore most precise information on infrastructure development projects shall be available;
- Decisions based on this bidding zone review likely to be implemented by 2025. 2022 would be too early as it is in the middle of the Action Plan process.
- Major grid changes expected after 2022 which would raise issues on credibility of results

Scenarios -Time horizon: legal and proposed

TYNDP2020 scenario for target year 2025 fulfills all criteria:

- **Single scenario** (National trends) for target year 2025, multiple storylines at 2030
- **Credible,** verified, acceptable by stakeholders as basis for the ENTSOE grid development
- Complete new datasets ready by October 2019, **including all recent developments**

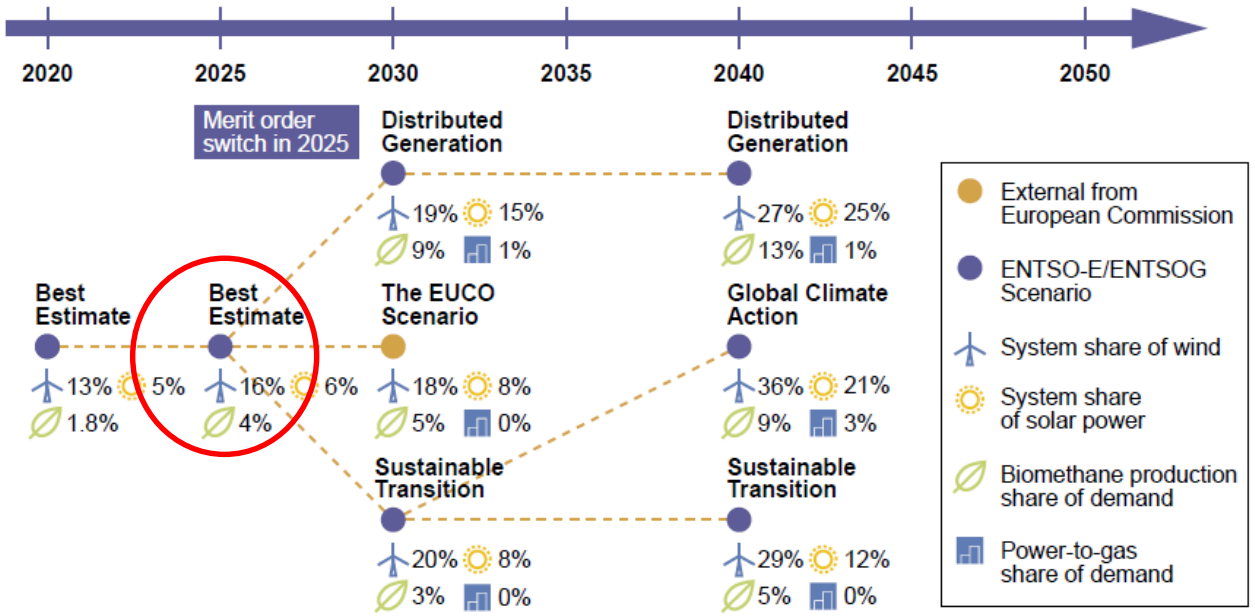


Figure 2: The TYNDP 2018 scenarios for 2030 and 2040 are defined by three storylines

Scenarios -Time horizon: legal and proposed

Modular structure with two main parts: Base + Sensitivities

BASE SCENARIO:
1 mandatory scenario:
1 demand/generation dataset, 1 grid, 1 study year
2025 “National Trends” scenario (TYNDP2020)

SENSITIVITIES:
Additional sensitivities (e.g. key projects, merit order variation) or full scenarios can be proposed and analysed by each region

There are a lot of uncertainties related to assumptions for future years like fuel and CO_2 prices.
Thus, a right balance between simplifications and details for this kind of simulations is needed.

A6: Modelling chain

Capacity Calculation:

- For borders subject to flow based capacity calculation determines the flow based parameters
- Where a NTC approach is used, determines the NTC values

Market Coupling:

- Determines the market dispatch based on the input data, the calculated flow based parameters and/or NTC values. Also determines zonal prices, net positions and active constraints

Operational security analysis:

- Simulates physical flows in the grid according to the load and production as set in the market coupling (load flow calculations) simulation

Remedial action simulation:

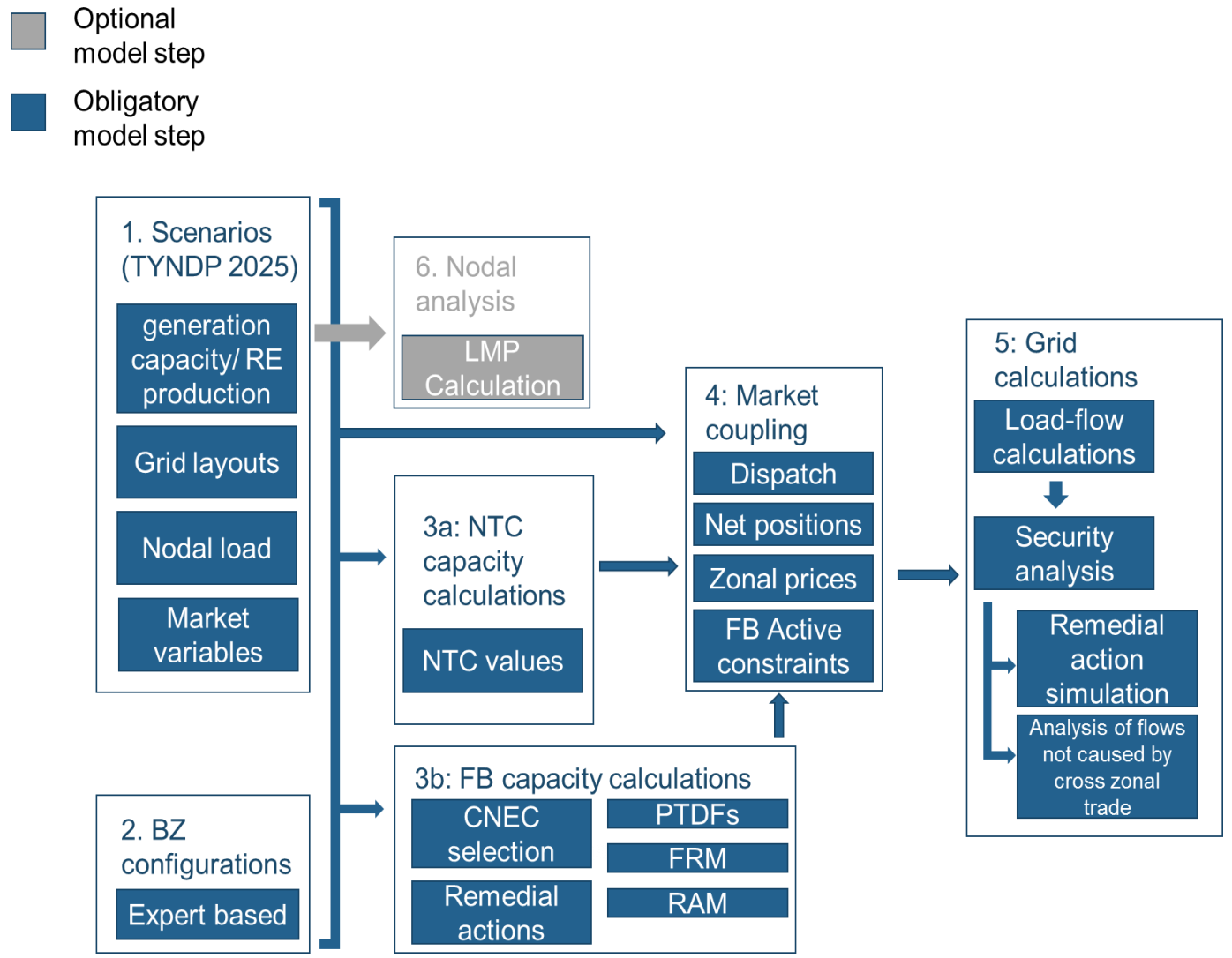
- Determines and implements costly and non-costly remedial actions to solve identified congestions in the grid

Analysis of flows not caused by cross-border trades:

- Determines the flows in the situation that cross-border trades are set to zero (F0, all)

Optional: LMPs (isolated run):

- NOT a benchmark for results, but a potential source of information on the optimal dispatch



A7: Capacity calculations

General approach

- Choice between NTC and FB by BZ border in accordance with foreseen process in the Base Year
- CEP 70% requirement will be applied (in accordance with ACER recommendation or method defined by the relevant NRA)

Implementation

- Methodology offers different possibilities in order to reflect foreseen practices in different regions with the best simplicity/accuracy trade-off
- NTC computation: 4 options
  I. Based on percentage of thermal limits
  II. Based on process-specific computation
  III. Based on PTDF
  IV. Values from TYNDP for existing borders
- FB computation: some flexibility in determination of CNECs and FRMs
- Non-costly remedial actions can be taken into account

A8: Market coupling

Market coupling simulations are based on:

Load and generation data defined for the scenario, 2025 for the base year

Results of the cross-zonal capacity calculation (NTC or flow-based) to represent network constraints

For the minimum of every third hour each year

The models target cost minimization utilizing linear optimization and assuming perfect competition

- Optionally and if technically feasible, mixed integer optimization can be used instead of linear optimization

Power plant dispatch will be simulated based on input data provided, namely

- Thermal power plants: short-run marginal costs, based on scenario's fuel and CO2 prices
- Wind and Solar: weather-dependent parameters, derived from climate time series
- Constraints and technical data, such as must-run constraints, hydro restrictions, availability etc.

Demand side response will be considered

- In case inflexible demand needs to be shed, value of lost load is applied as cost for the shedding
- Demand side response is simulated similarly to generation

A9: Operational security analysis

Based on the optimization results delivered by market simulations, a DC load flow calculation is performed

The aim is to detect at least power flows exceeding operational security limits in the N and (N-1) situation (for a pre-defined contingency list)

Optional

- AC load flow calculations
- Consideration of seasonal line ratings

Main outputs:

List of violations detected in the operational security analyis including the name of the affected network element, its contingencies and a quantitative description of the constraint violation

A10: Remedial action simulation

Non-costly remedial actions: PSTs, HVDC, topological actions

Target: simulate them

Only PST (and HVDC ?) remedial actions are expected to be easily feasible

Topological actions: very difficult

Fall-back options are granted to avoid overestimating redispatching costs in TSOs that make heavy use of them:

- Fully remove 220 kV level from the grid model
- Adapt topology to solve most constraints
- Remove 220 kV level fully or partially from redispatching module
- Perform full optimization of topological actions outside the simulation chain on a limited number of timestamps.

Costly remedial actions: redispatch

Cost-based optimization, irrespective of the bidding zone or control area borders, in line with EU redispatch target model (Article 13 of CEP).

Available units for redispatch based on TSO survey.

Available redispatch capacity respects the market coupling dispatch.

Prices allow mark-ups representing e.g. opportunity costs, the mark up is to be determined

A11: Flows not induced by cross-zonal trade analysis

- The proposed loop flow approach comes from Core methodology
- It consists in determining the flows in a zero exchange situation (all net positions of BZs included in the CGM shifted to zero):

$$\vec{F}_{0,all} = \vec{F}_{ref} - \mathbf{PTDF}_{all}\,\overrightarrow{NP}_{ref,all}$$

- $\vec{F}_{0,all}$ represent Flows not induced by cross-zonal trade on all the cross-border lines.

A12: LMP analysis

General approach

- The LMP analysis is an optional part of the modelling chain and can be used for the model-based assessment of Bidding Zones within the regions (green field approach)
- The decision whether to include a LMP analysis lies with the TSOs of a BZRR
- In case of high LMPs (positive or negative) the reason has to be investigated and, if possible, input data should be corrected, and the simulation repeated

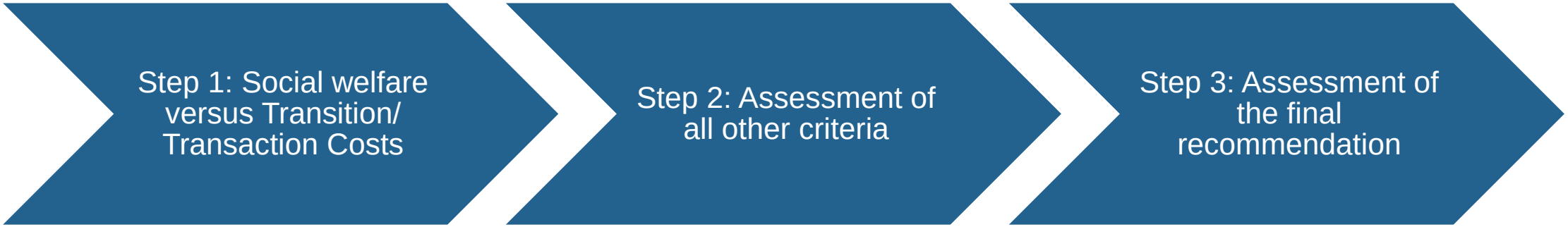
Implementation

- Minimization of total system costs taking into account the capacity of relevant grid elements, the nodal energy balance and the capacity limits of all power plants considered
- Consideration of the (N-1)-criterion, at least with a limited list of critical outages
- Consideration of topological measures, but due to high computational requirements not within the optimization.

A13: Evaluation

- A **three step approach** will be followed for the final assessment in order to arrive at a recommendation to adapt or maintain the current bidding zone configuration

- The methodology specifies on a high level how to assess each criterion while leaving enough flexibility for different Regions to further agree on the details during the Review as the needs from the Regions may be different



- Additionally to the CACM criteria, there will be one more criterion “RES integration” which will show RES infeed of the simulated years but focus on their long-term development

Process on the final assessment

STEP 1: Economic efficiency versus Transition/Transaction Costs

i. TSOs shall assess the monetized benefit of the configuration by calculating the delta between the change in economic efficiency (incl. marginal costs of redispatch and an adequate CO2 price as defined in Article 5) and Transition/Transaction Costs, annualized over a period of 3 years.
The volume of CO2 emissions and the amount of energy produced by RES respectively RES curtailment shall be given per configuration for information purposes.

ii. TSOs shall assess the monetized benefit, considering the following:
- If the monetized benefit is less than 0, then the configuration shall not be recommended.
  However, if the BZRR TSOs can justify that further assessment is needed, they can still proceed to step 2 and assess all other criteria and recommend the configuration in step 3;
- If the monetized benefit is more than 0, then the TSOs shall proceed to step 2 and assess all other criteria and recommend the configuration in step 3.

STEP 2: Assessment of all other criteria

i. Following the step 1 the TSOs shall assess all other criteria considering them as positive, neutral or negative (scale shall be +/0/-) in comparison with the current bidding zones configuration.

ii. TSOs shall provide a justification for the outcome of their assessment.

Process on the final assessment

STEP 3: Assessment of the final recommendation

i. In case all criteria assessed in step 2 of this article are positive and the monetized benefit is more than 0, the alternative configuration can be recommended by the TSOs.

ii. In any other case, the severity of the criteria being assessed as negatively impacted shall be further assessed by the TSOs. To perform this severity assessment, the TSOs shall consider input from the NRAs of the relevant BZRR and other relevant stakeholders. Collection of this input shall be organized at least via an expert workshop. The outcome of the assessment of the criteria shall be either:

   a. The severity of a criterion individually or the severity of the criteria collectively is classified as unacceptably negative and therefore the TSOs cannot recommend the relevant BZ configuration; or

   b. The severity of none of the criteria individually nor the criteria collectively is classified as unacceptably negative and therefore the TSOs can recommend the relevant BZ configuration.

iii. In case after steps 1 to step 3(ii) only one configuration can be recommended, that configuration shall be the final recommendation by the TSOs. In case several configurations can be recommended after steps 1 to step 3(ii), then the configuration with the highest monetized benefit shall be the final recommendation by the TSOs.

iv. Assessment of the uncertainties under which the final recommendation is made shall be provided.

Summary table of indicators

Name of criterion	quantitative/ qualitative	Monetizing Y/N	Evaluation approach
Operational security	Quantitative	no	The assessment shall be based on the security analysis.
Security of supply	Quantitative	no	Calculate at least RCM and ENS. It is optional to additionally calculate LOLE and/or EENS.
Degree of uncertainty in CZC calculation	Qualitative	no	Based on the sources of uncertainty in CZC calculation
Economic efficiency	Quantitative	yes	socio-economic welfare comparison
Firmness costs	Qualitative	no	Expert discussion
Market liquidity	Qualitative / quantitative	no	Study and expert discussion/ if possible – market–depth analysis
Market concentration and market power	Partly quantitative / partly qualitative	no	HHI (Herfindal-Hirschman-Index), RSI/PSI (Residual Supply Index, Pivotal Supplier Indicator) + qualitative evaluation
Effective competition	Qualitative	no	Combination of market liquidity, market power/concentration and robustness of price signals
Price signals for building infrastructure	Quantitative	no	Price spread / Congestion income out of market model
Accuracy and robustness of price signals	Quantitative	no	The accuracy of price signals is based on ability to properly reflect the electricity value through prices at the right location and at any moment and robustness of price signals is based on sensitivity analyses, if applicable.

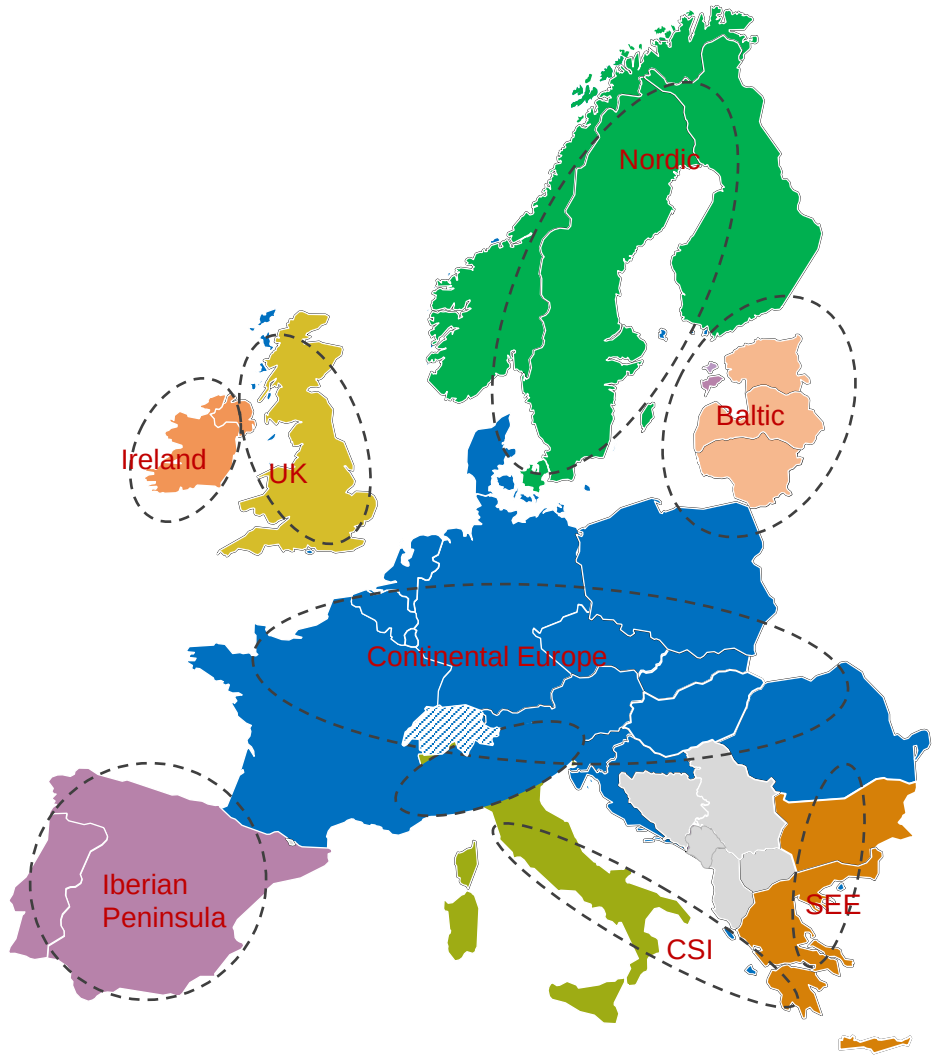
Summary table of indicators

Name of criterion	quantitative/ qualitative	Monetizing Y/N	Evaluation approach
Transition and transaction costs	Quantitative	yes	Expert discussion and stakeholder survey
Infrastructure costs	Infrastructure costs are independent of the BZ configuration.	n.a.	n.a.
Market outcomes in comparison to corrective measures	Quantitative	yes (but only for comparison in order not to double count)	Compare market and redispatch costs and volumes where appropriate on a regional level
Adverse effects of internal transactions on other BZs	Quantitative	no	Based on the analysis of flows not induced by cross-zonal trade
Impact on balancing and imbalance settlement	Quantitative	no	Based on an analysis of the reserve requirements per bidding zone for each configuration.
Stability and robustness of BZs	Quantitative (if sensitivities are calculated), otherwise qualitative	no	Check, if sensitivities deliver more or less same outcomes for the same configuration
Consistency across capacity calculation time frames	This is an assumption for the BZ Review and not an outcome.	n.a.	n.a.
Assignment of generation and load units to BZs	Qualitative	no	Expert discussion
Location and frequency of congestion (market and grid)	Quantitative	no	Active market constraints resulting from market coupling and overloads resulting from grid calculations
RES integration	Partly quantitative and partly qualitative	no	Analysis of integrated amount of energy from RES and qualitative evaluation of long-term effects

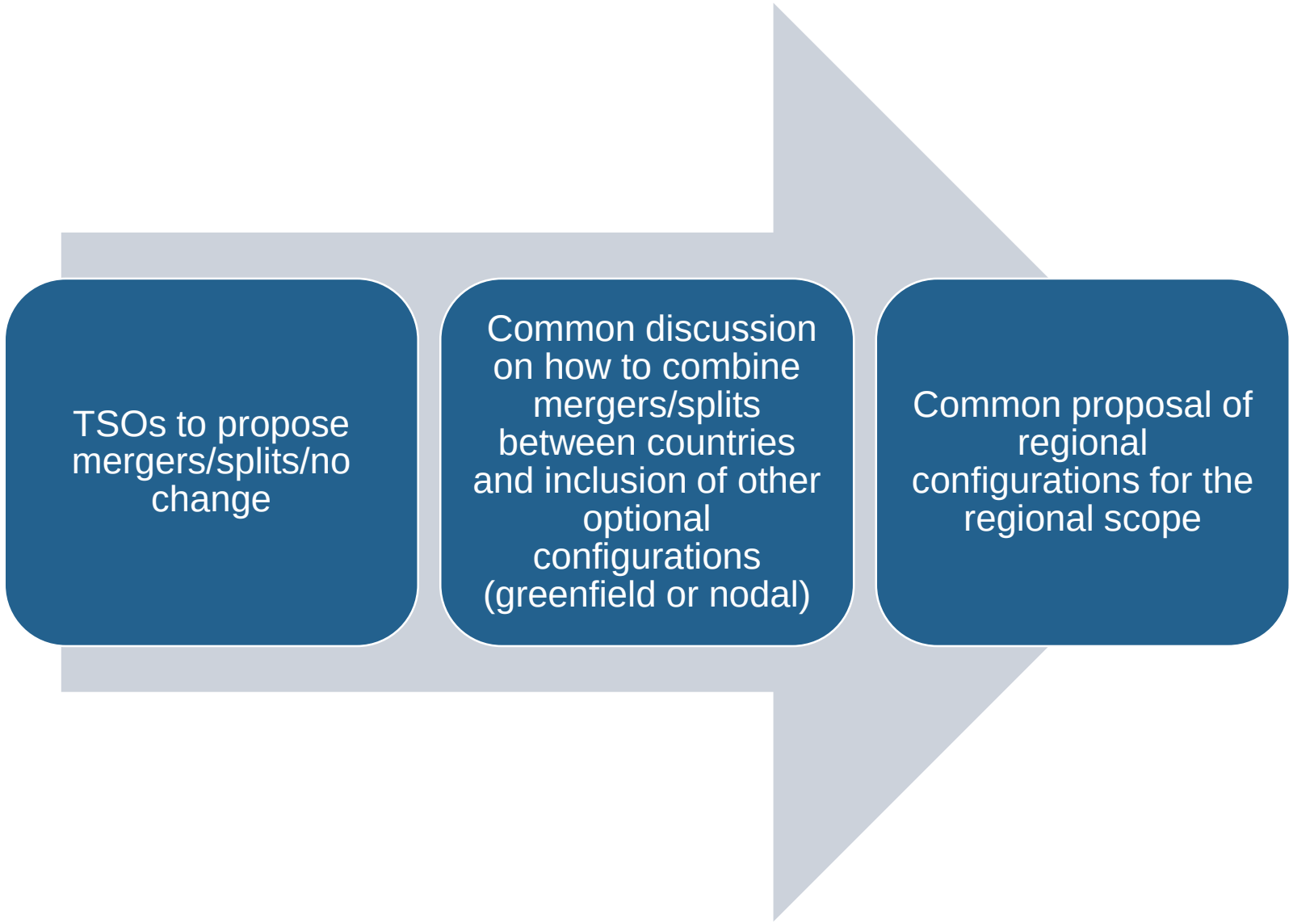
Configurations

Overview BZRRs

BZRR	BZ included	Alternative configurations
Central Europe	FR, BE, NL, DE/LU, AT, CZ, PL, SK, HU, SI, HR, RO, DK1, CH, IT1	No configurations proposed, but individual justifications and proposals sent for information
Nordic	FI, SE1, SE2, SE3, SE4, NO1, NO2, NO3, NO4, NO5, DK2	Yes. **3** alternative configurations proposed
SEE	BG, GR	Yes. **1** alternative configuration proposed
Central Southern Italy	IT2, IT3, IT4, IT5, IT6,	No. A BZ Review pursuant to CACM Regulation has been completed in 2018. New configurations being implemented in 2019 and 2021.
Iberian Peninsula	ES, PT	No. Iberian Peninsula Status Quo is recommended as no internal structural congestions exist
Baltic	EE, LV, LT	No. Baltic Bidding zones are not impacting other bidding zones with unscheduled flows and has no internal structural congestion inside bidding zones.
Ireland	SEM (IE, NI)	No. Cross-border capacity (via HVDC) is only reduced by exception. Time is also required to analyse data from our new market design.
UK	GB	No. Cross border capacity is only reduced by exception, and internal congestion is a transient accepted feature of efficient GB market.



The process for proposing configurations in the Regions



Central Europe BZRR – Provided alternative configurations

1. The following TSOs provided alternative configurations to be investigated in the BZ Review

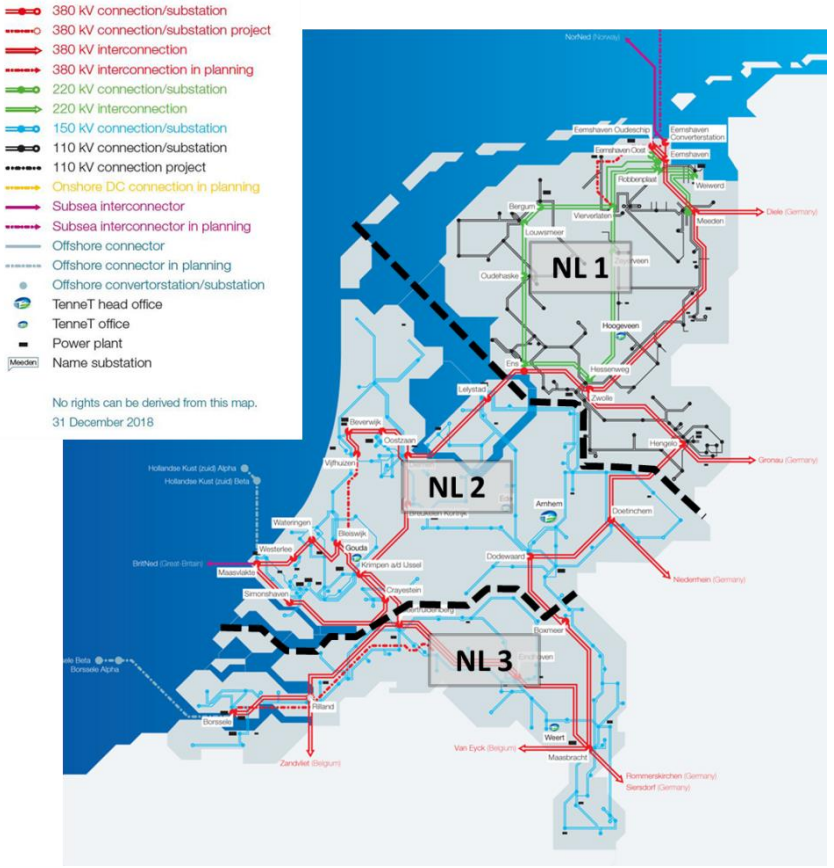
APG

German TSOs

Three alternative configurations:

- Configuration 1 consists of a single split of the German/Luxemburg bidding zone along the borders of the federal states Bavaria and Baden-Württemberg into a northern and a southern bidding zone. (=split investigated in the previous BZ Review)
- Configuration 2 consists of a single split of the German/Luxemburg bidding zone approximately along the borders of the federal states Bavaria, Hesse, North Rhine-Westphalia in the south (following the borders of control areas), into a north-eastern and a south-western bidding zone.
- Configuration 3 extends on configuration 2 with an additional split along the border of Schleswig-Holstein. (thus 3 zones in total)

TenneT TSO B.V.



2. The **other TSOs** provided justifications why no alternative configurations were provided

Central Europe BZRR – Summary

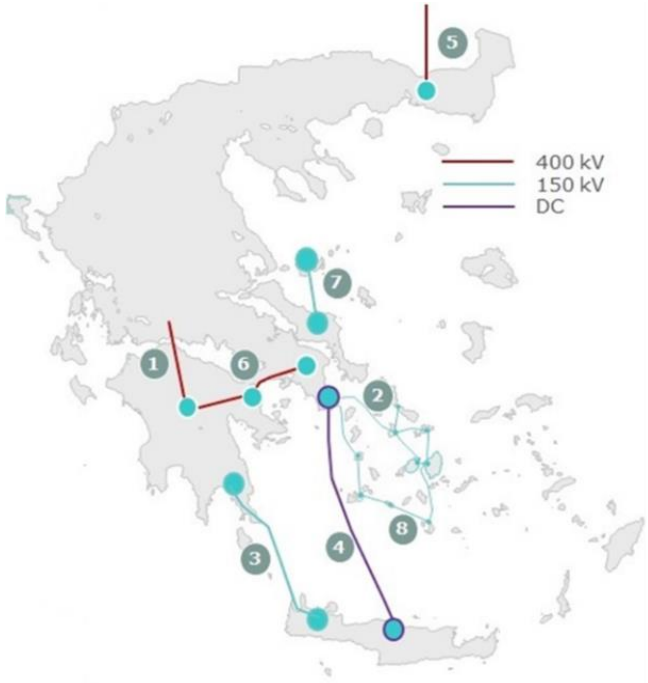
- The process designed by the all-TSOs in order to come up with alternative configurations in the BZRR led to the following outcome in BZRR CE:
  - For 3 Bidding Zones of this BZRR, alternative configurations were provided.
  - For the other 12 bidding zones of this BZRR, the TSOs provided justifications why no alternative configurations were provided
- Unfortunately, due to various reasons the CE BZRR TSOs have not been able to conclude on a set of alternative configurations to be proposed on the basis of these individual proposals.
- In order to provide full transparency to NRAs and ACER, the TSOs provided an overview of the alternative configurations and justifications as provided by the individual TSOs, as well as the reasons that have led to the non provision of alternative configurations for Central Europe. These reasons can be found in the annex of Central Europe (A1) to the explanatory document.
- It is now up to NRAs (and potentially to ACER or the EU commission) to decide on the next steps

Nordic BZRR – Alternative configurations

Nordic	TSO	BZ1	Action Plan	Config 1	Config 2	Config 3	Config 4
				Current Configuration	Split of NO4 (NO4a and NO4b)	Merge of current SE3 and SE4, and new SE4	Config 2 and config 3 combined
Denmark	Energinet	DK2	No	1 BZ	1 BZ	1 BZ	1 BZ
Sweden	Svenska kraftnät	SE1, SE2, SE3, SE4	No	4 BZ	4 BZ	4 BZ (expert based)	4BZ (expert based)
Finland	Fingrid	FI	No	1 BZ	1 BZ	1 BZ	1 BZ
Norway	Statnett	NO1, NO2, NO3, NO4, NO5	No	5 BZ	6 BZ (expert based)	5 BZ	6BZ (expert based)

Alternative configuration to be analysed for Sweden and Norway. In the proposed configuration regarding Sweden, a modified BZ SE3 is introduced in the Stockholm Metropolitan Area. The current BZ SE4 is expanded to include the remaining area of current BZ SE3. In Norway a split of NO4 is proposed, and a new BZ NO6 is introduced. For Denmark and Finland no alternative configuration will be assessed at this stage.

Alternative configuration – SEE BZRR (1)



ID	Project description	Expected commissioning year
1	First 400 kV branch to Peloponnese (OHL Megalopoli – Patras – Acheloos)	2019
2	Cycladic Islands interconnection (Phases A, B and C)	2020 (2018 for Phase A, 2019 for Phase B and 2020 for Phase C)
3	Crete interconnection (Phase I)	2020
4	Crete interconnection (Phase II)	2023
5	New 400 kV interconnector to Bulgaria N. Santa (GR) – Maritsa (BG)	2023
6	Second 400 kV branch to Peloponnese (OHL Megalopoli – Korinthos – Koumoundouros)	2024
7	Skiathos island interconnection	2020
8	Cycladic Islands interconnection (Phase D)	2024

Configuration 2 "Bidding Zones: GR, CR" (New Configuration)									
Cty-CBk	Bidding Zone Border	TSO1	Station 1	TSO2	Station 2	Voltage level [kV]	Type	Network element Name	New/different compared to status quo?
GR	GR - BG	IPTO	a.Thessaloniki b. Nea Santa	ESO-EAD	a. Blageovgrad b. Maritsa East	400 kV 400 kV	AC AC		No
GR	GR-CR	IPTO	a. Molaoi b. Koumoundourou	IPTO	a. Chania b. Damasta	150 kV 500 kV	AC DC		Yes
GR	GR-IT	IPTO	Arachthos	TERNA	Galatina	400 kV	DC		No

Alternative configuration – SEE BZRR (2)

Two configurations will be examined :

1. Status quo: In this configuration it is assumed that no new Bidding Zones are considered in Greece until 2023, therefore the status quo configuration of a single GR BZ is taken into account.

The island of Crete will be interconnected with the Greek mainland in two phases. During Phase I, internal congestion will occur between the Peloponnese and Crete (150 kV line between Molaoi and Chania HVSS). During this period, redispatching will be required and it is estimated that daily redispatch volume will be approximately 3,3 GWh, resulting in redispatching cost of approximately 240 M€ per year. However, this situation will be remediated by 2023, once the Phase II of the project will be completed (with the construction of the DC cable between Koumoundourou HVSS and Damasta HVSS) and no further internal congestion will be evident between the Greek mainland and the Crete system.

Since this phenomenon will occur only for two years and past the completion of Phase II of the interconnection a second BZ will not be required, the first configuration considered is a single Bidding Zone, which consists of the entire interconnected Greek system with all foreseen expansions until 2023 (status quo configuration).

Alternative configuration – SEE BZRR (3)

2. Alternative configuration: It is assumed that starting from the date when the island of Crete is interconnected in year 2020 (Phase I), the Greek system will consist of two bidding zones compared to one zone, as in the status quo configuration.
The first bidding zone will be mainland Greece and small interconnected islands (GR BZ) and the second bidding zone will be the island of Crete (CR BZ). The new bidding zone configuration is proposed due to the extension of the Greek system to the island of Crete, which was previously an autonomous system.

The two 150kV AC lines of Phase I of the interconnection have an estimated transfer capacity of 150MW-180MW and do not suffice to supply the total net load of Crete. Since the conventional generation units in Crete are mostly oil units, with much higher generation cost than the generation units operating in the mainland, it is expected that there will always be congestion in the interconnection in the direction of mainland Greece to Crete (GR towards CR). The annual redispatching costs are estimated around 240 M€.

Therefore, in this configuration Bidding Zone is proposed for the Greek mainland and adjacent small interconnected islands (GR) and an additional Bidding Zone for Crete (CR). It should be noted that this proposed new BZ is internal (within the Greek territory) and it does not affect any cross-border flows between the GR BZ and adjacent Bidding Zones, thus any other TSOs than IPTO.

Baltic BZRR – argumentation for status quo configuration

The guiding principle of the IEM, art.14.1 is that configuration of bidding zones shall maximise economic efficiency and to maximise cross-zonal trading opportunities. Baltic TSOs consider that this principle is fulfilled, due to:

- Baltic States are compliant with IEM art. 16, at least 70% of capacity is provided to the market (according to preliminary calculations carried out by the AST);

- There is no structural congestion inside the BZs (redispatch or counter-trade has never been used for managing congestion inside the Baltic bidding zones);

- Baltic bidding zones are already some of the smallest in European electricity market (average 10 TWh each);

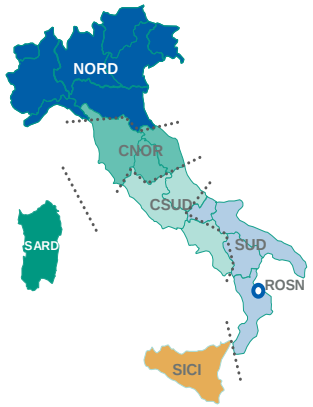
- Baltic bidding zones are (until synchronization with central-Europe) connected to other EU bidding zones by direct current connections, therefore, not impacting other bidding zones with unscheduled flows;

- The ACER's MMR analysis concluded that there is no need to investigate the bidding zone improvement, and costly remedial actions are adequate;

Central Southern Italy – status quo configuration

- A Bidding Zone Review pursuant to CACM Regulation has been successfully completed in 2018.
- According to relevant Italian Regulator Decisions the proposed Bidding Zone configuration changes are going to be applied in 2021 (Bidding Zone Configuration 2021), after a first light improvement adopted starting from the 1st of January 2019 (Bidding Zone Configuration 2019/2020).
- Both of configurations have to be considered as “status quo”.

Bidding Zone Configuration 2019/2020



Bidding Zone Configuration 2021

The main changes are:

- Umbria region moved from “CNord” to “CSud” Bidding Zone;
- All the virtual Bidding Zones merged to the connecting geographical Bidding Zone;
- New geographical Bidding Zone “Calabria”.

Central Southern Italy – argumentation for status quo configuration

- Terna considers the above mentioned CACM Bidding Zone Review and the related ongoing implementation process as fulfilling the Clean Energy Package requirements for the GRIT Bidding Zone Review Region, considering also that the assessed time horizons match with the CEP requirements and no relevant changes occurred in the meantime.

- Starting a new Bidding Zone Review in this moment would threat the improvements linked to the ongoing Bidding Zone Configuration changes approved by the Italian NRA and expected to be completed in 2021. This would lower market efficiency in the near future and prevent to perform a new study when it will be more effective since, according to relevant Stakeholder opinions and CACM Regulation, Bidding Zones Configurations should be “stable over the time”.

- A recent consultation document on the Italian Market Design published by the Regulator confirms that, according to the Italian NRA, no additional reviews are needed for the GRIT BZRR (since, as you know, we completed our study last year).

Iberian Peninsula Status Quo

Following indicators summarize the performance of Iberian Peninsula BZ Status Quo configuration both from Article 32 of Commission Regulation (EU) 2015/1222 and from Article 14 of Regulation (EU) 2019/943:

1) Iberian geographical scope

2018 PTDF Flow Indicators for SWE region are negligible

FR-ES: 3 MW PT-ES: 2 MW

Hence the proposed BZ configuration is Iberian Peninsula Status Quo

2) Absence of internal structural congestions

Remedial Action performance indicator: < 1.0 €/MWh => Iberian Peninsula Status Quo is recommended as no internal structural congestions exist

RA performance Indicator [€/MWh]	2017	2018	2019
Spain	0.25	0.24	0.06
Portugal	0	0	-

3) No internal congestion affecting Cross-zonal trading

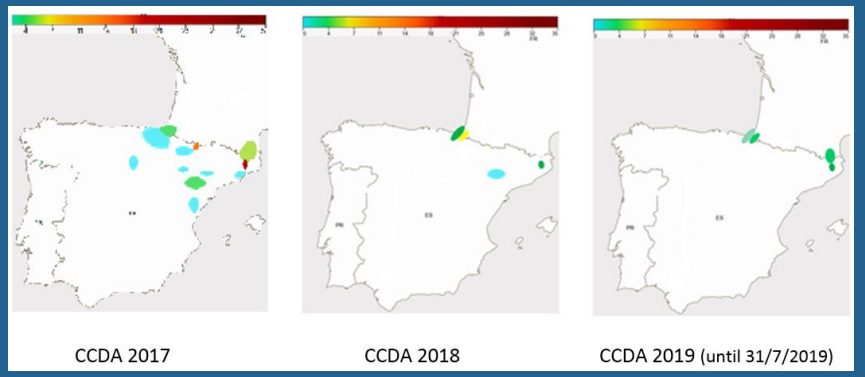
3.1. Level of available transmission capacity with regards to cross-zonal trade

% utilization	2017	2018	2019
Spain-Portugal	39.9	39.8	39.8
Spain-France	84.8	86.9	90.9

Price convergence [% hours]	2017	2018	2019
Spain-Portugal	93.3	94.8	93
Spain-France	24.9	24.5	16.7

- **PT-ES BZ border: > 90% hours with price convergence and < 40% utilization**
- **FR-ES BZ border : 90% level of utilization and < 25% hours with price convergence => Current limited interconnection between France and Spain cross-zonal trade between Iberian Peninsula and rest of Europe**

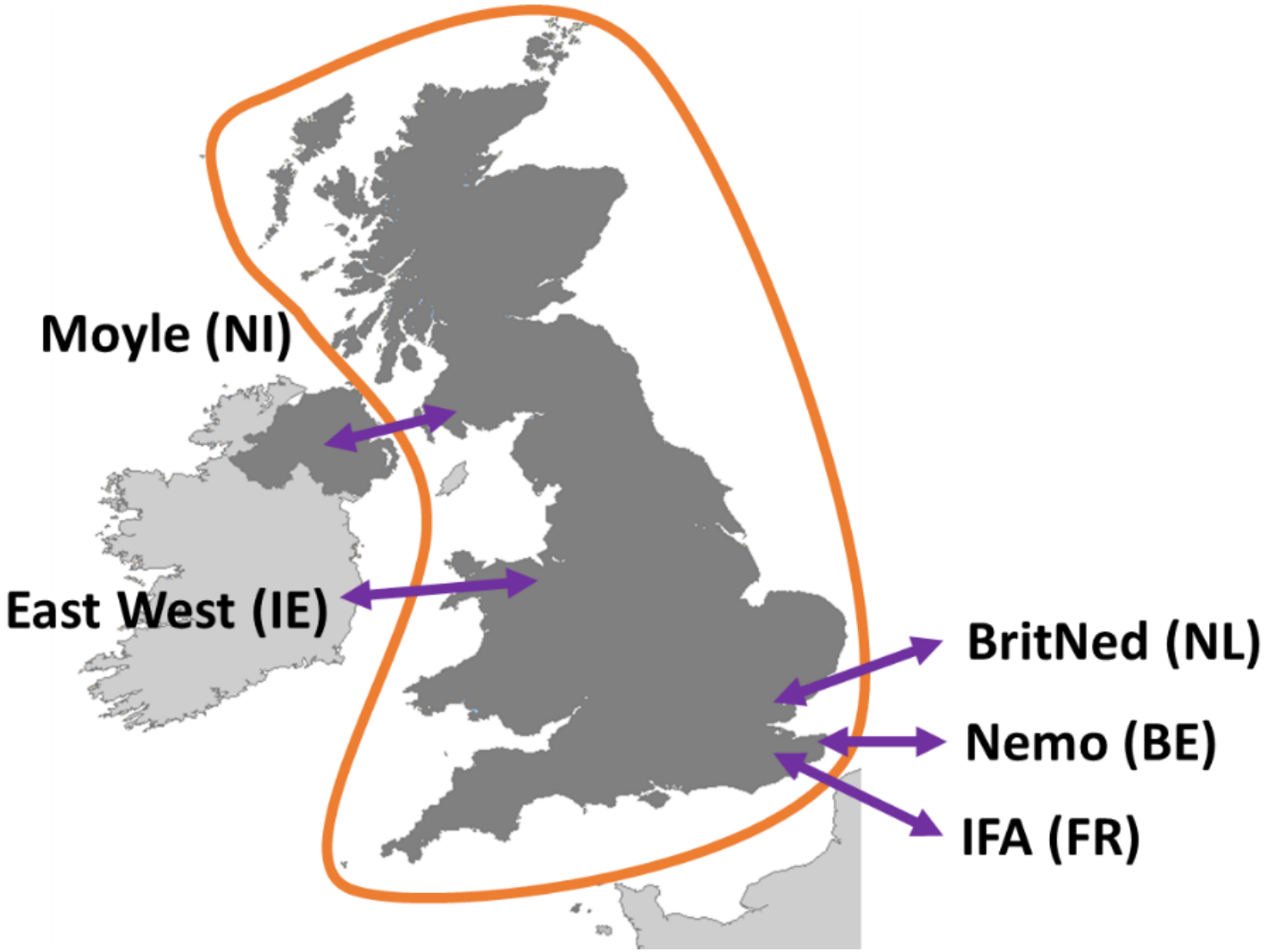
3.2. Only FR-ES interconnection limits cross-zonal trade of Iberian Peninsula



- **FR-ES and by extension Iberian Peninsula-Europe cross-border capacity is very low limiting cross-zonal trade approximately a 90% of hours**
- **Additional FR-ES interconnection strengthening will be needed even after commissioning of Bay of Biscay interconnector**

2019 data calculated for the period 1/1/2019 – 31/7/2019

GB BZR – Status Quo Configuration Only



Today:
The GB Bidding Zone is **one** zone for the whole of GB, connected only via HVDC to IE-SEM, NL, BE and FR.

GB has been one market since ‘BETTA’ which joined England and Wales, with Scotland in 2005.

GB BZR – Status Quo Configuration Rationale

- **In GB, our current bidding zone configuration does not lead to a reduction in cross-zonal trading capacity:**
  - **High-level of cross border zonal trading capacity are offered on all interconnectors.**
    - We only limit interconnectors for operational security reasons close to real-time, and then after exhausting other reasonable options
  - **Transient internal congestion is a known feature of our effective market.** Explicit policy choices in GB lead to short-term congestions and remedial actions, ahead of efficient transmission investment:
    - **Connect and Manage:** Generators (especially wind) is able to connect ahead of wider transmission investment, but if there is network congestions they will be reduced through the balancing mechanism.
    - **Network Options Analysis process:** We only make transmission investment when it is the economic thing to do – that is when the long-run cost of build is greater than the short-run cost of remedial actions.

- **Overall, we develop our system to the benefit of all consumers. We consider a total cost approach (investment + remedial action), allowing renewable generation on earlier than otherwise, and offering maximum capacity for cross-zonal trading. Consumers are well served by the single GB bidding zone.**

Ireland (SEM) BZRR – Status Quo Configuration Only

Today:

The SEM Bidding Zone is **one** zone for the island of Ireland (Ireland and Northern Ireland) only connected via HVDC to GB.

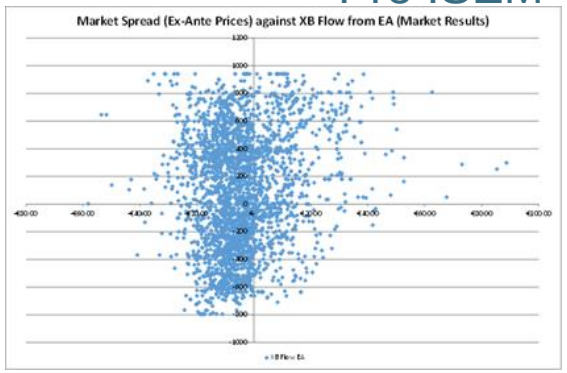
The new single electricity market (SEM) went live on 1 Oct 2018.

SEM – Status Quo Configuration Rationale

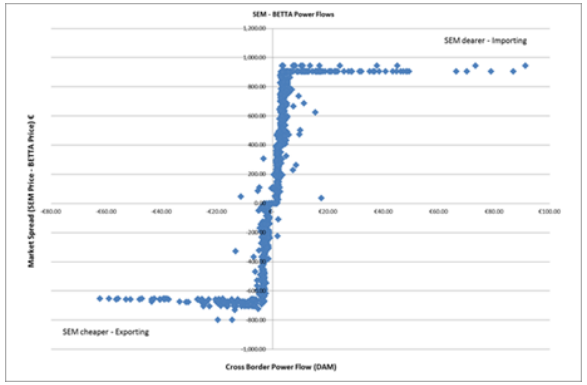
It is proposed to maintain the current bidding zone configuration for SEM for the following reasons:

- Time is required to collect data that may support a potential divergence from the status quo.
- The SEM is currently only connected to GB via 2 HVDC links.
- The Ireland-UK (IU) Capacity Calculation Methodology provides that the maximum available capacity will be offered to the market and also that TSOs will make available non-costly and costly remedial actions.
- The latest figures from the SEM Committee indicate that the interconnectors are working efficiently with flows overwhelmingly in the correct direction.

Pre ISEM



Post ISEM



THANK YOU FOR YOUR ATTENTION

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