General principles of the internal electricity market

TAIEX – Regional workshop

03/04 April 2023, Vienna

General concept – physical and commercial flows

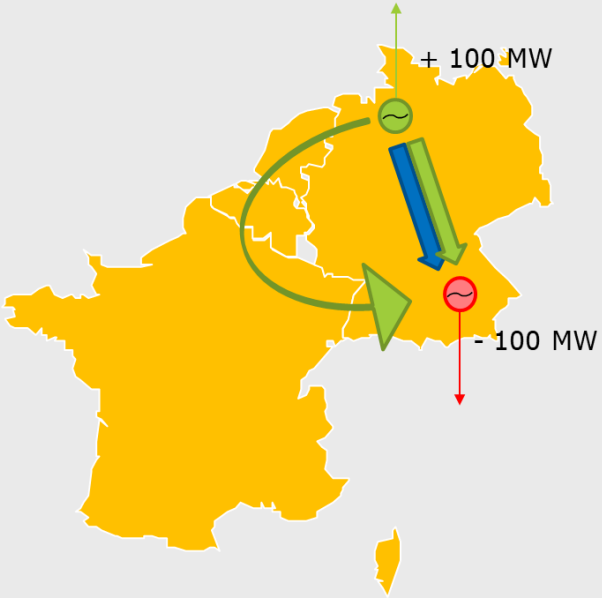
Load

Generation

Market Exchange

Physical flow (2/3)

Physical "loop" flow (1/3)

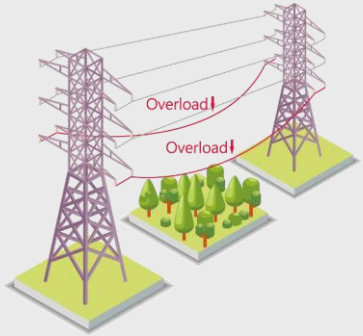


EU electricity markets rely on bidding zones, which are assumed to be « copper plates » in which there are no structural congestions.

Physical limitations

Constraints 1: Max electricity per cable

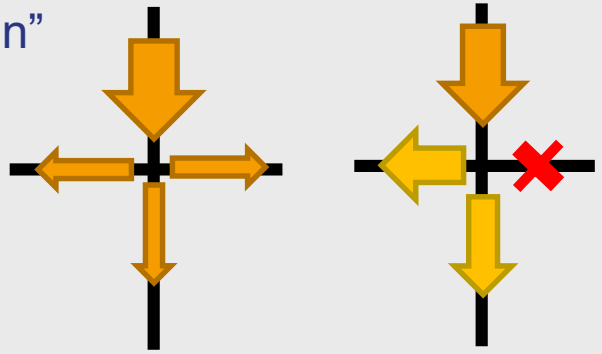
- Electricity is carried by cables, made of copper. Cables can only contain up to a certain amount of electricity.
- Physical capacity of a cable [MW] ≈ amount of copper.



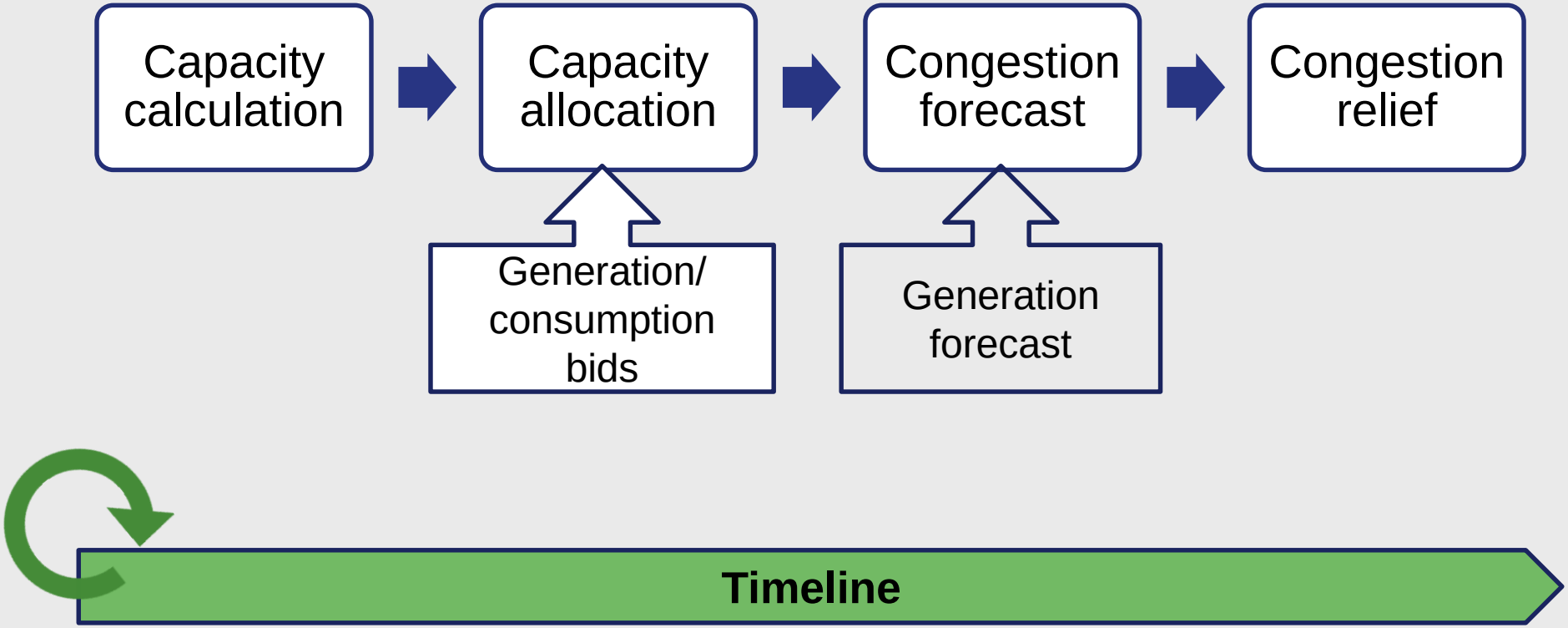
Constraints 2: Ability to withstand an outage

In case a line gets out of service, the electricity that it was carrying will be transfer to the remaining lines.

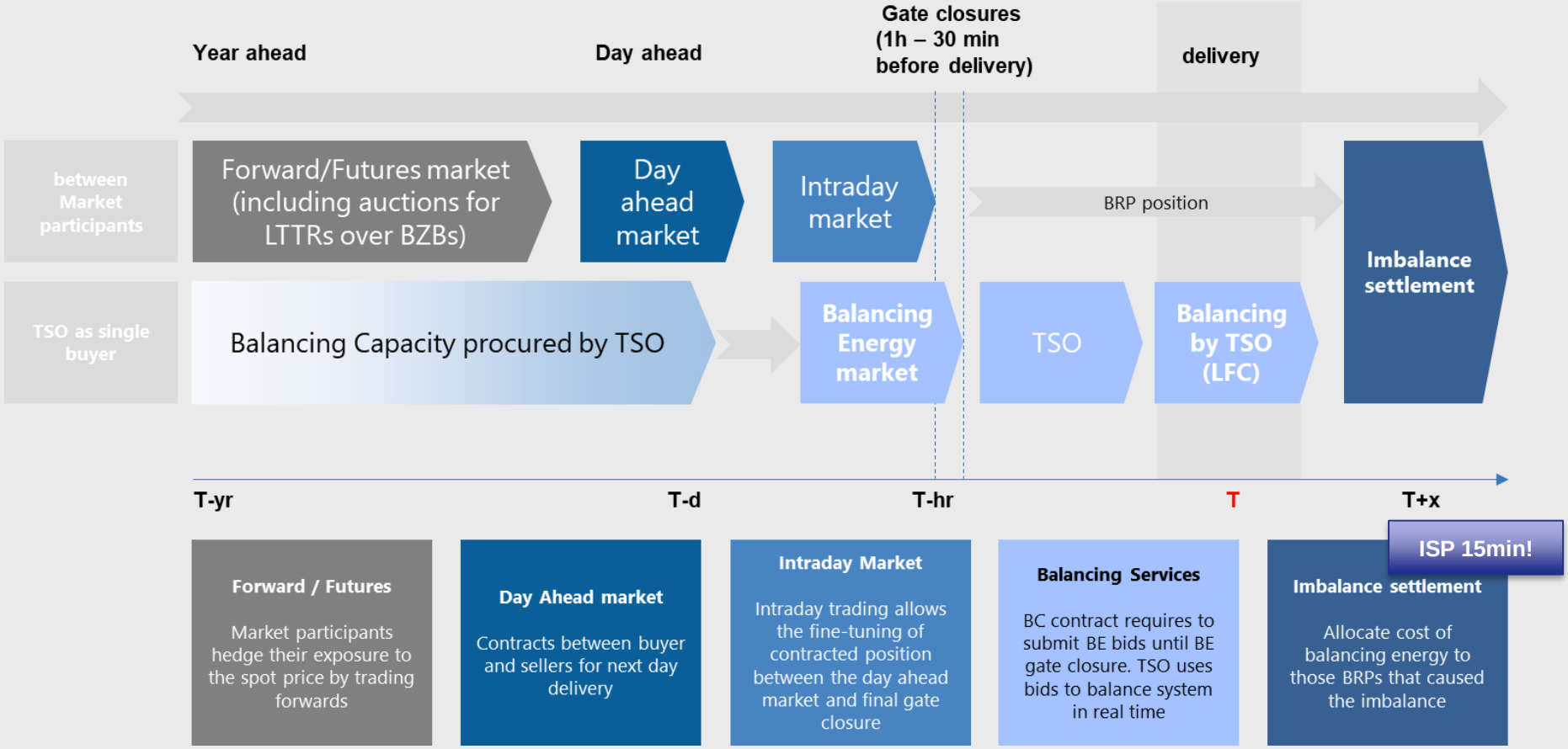
The grid must be able to sustain an outage. TSOs apply the "N-1 criterion"



General concept for cross-zonal capacity



Market segments



Technical bidding limits

Article 10 of Regulation (EU) 2019/943 on the internal market for electricity (Electricity Regulation) defines rules for the technical bidding limits:

- There shall be neither a maximum nor a minimum price to the wholesale electricity price.
- Technical bidding limits can be applied by NEMOs to DA and ID markets. Those limits should not unnecessarily limit trade and shall automatically adjust in due time when they are expected to be reached.
- TSOs shall not take any measure for the purpose of changing wholesale prices
- RAs (or other competent authority) shall identify measures that could indirectly restrict price formation
- A report containing all the identified measures that could restrict price formation is to be sent by Contracting Parties to the Energy Community Secretariat by 5 January 2023.

France, 4th of April

On 4 April 2022, the FR BZ reached prices of 2720€/MWh and 2990€/MWh for hour 7 and 8 respectively. It was estimated by CRE, that those prices would have been halved with a shift in the supply/demand balance between 500 and 1000MW.

This event led to an increase of the SDAC maximum price limit from 3.000€/MWh to 4.000€/MWh

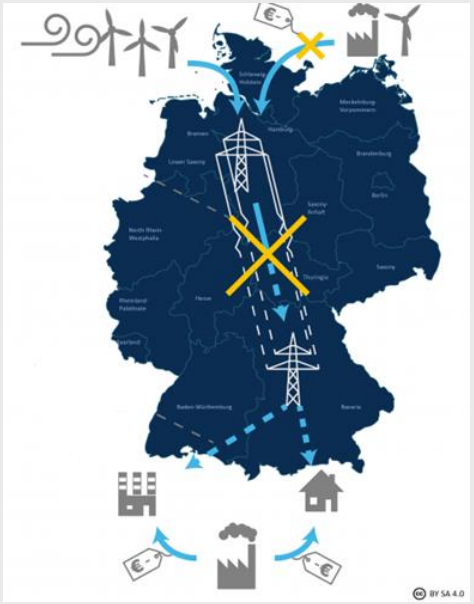
Dispatching of generation and demand response

- General principles: non-discriminatory, transparent, market based
- System operators shall give priority to installations using RES to the extent permitted by the secure operation of the network and where the installations either
  - Power-generating RES with installed capacity less than 400 kW;
  - Demonstration projects for innovative technologies.
- A CP can decide to not apply/alter such priority dispatch if meeting certain criteria such as
  - well-functioning markets (especially ID, balancing) with transparent rules,
  - RES targets are in line with the respective Ministerial Council decision or share of RES in gross final electricity consumption is at least 50%
  - CP has notified derogation to the EnCS and has published this derogation.
- Generation commissioned as from 1 January 2026 only with less than 200 kW.

Redispatch – why?

Example:

- Heavy winds increase the power production in the North German wind farms
- Internal transmission lines from windy North to industrial South are congested
- Industrials that bought power might not receive it due to the congestion
- Grid operators have to reduce production in the North while financially compensating the redispatched producers
- Grid operators have to increase production in the South to compensate the reduced production in the North while financially compensate them



Redispatching

- General principles: non-discriminatory, transparent, objective and open to all generation technologies, energy storage and demand response incl. located in other MSs and CPs
- Non-market based redispatch of generation shall only be used where no market-based alternatives are available (or all market-based was used), the number of participants are too low to ensure effective competition or if the grid situation is too predictable and this could lead to strategic bidding of the units.
- TSOs and DSO shall annually report to NRAs on market-based redispatch mechanisms, reasons and volumes of redispatch and the measures taken to reduce downward redispatch of RES units.
- This report shall also be submitted by NRAs to the ECRB and be published.
- Subject to maintenance, system operators shall guarantee capability of the network to transmit electricity from RES with minimum (limited) amount of redispatch.

Non-market based redispatching

- RES sources shall only be subject to downward redispatch if no other alternative exists or other measures would result in significantly disproportionate costs or severe risks.
- Non-market based redispatch shall be subject to financial compensation by the system operator requesting the redispatch. It shall be at least equal to the higher of the following elements (or a combination if otherwise unjustifiable high/low):
  - additional operating cost caused by the redispatching, such as additional fuel costs in the case of upward redispatching, or backup heat provision in the case of downward redispatching of power-generating facilities using high-efficiency cogeneration;
  - net revenues from the sale of electricity on the day-ahead market that the power-generating, energy storage or demand response facility would have generated without the redispatching request;

Cross-zonal capacity and the 70% target

- General principles unchanged:
  - TSOs shall make available maximum possible capacity to be allocated for cross-border trade.
  - Curtailment procedures shall be used only in emergency situations (TSOs acting in expeditious manner and redispatching or countertrading is not possible) and have to be applied in a non-discriminatory manner. Except in cases of force majeure, market participants shall be compensated for any curtailment of allocated capacity.
- The Electricity Regulation for the first time introduced a minimum level of available cross-zonal capacity to the made available by TSOs in the CPs until the end of 2023 – 70% of transmission capacity taking into account system security and contingencies.
- Consequently, 30% can be used for reliability margins, loop flows and internal flows on each critical network element.

Bidding zone review

- TSOs shall not limit interconnection capacity due to internal congestions and shall take appropriate measures to address congestions.
- Borders between bidding zones should reflect long-term, structural congestions in the EU transmission grid and shall be designed in such a way as to maximize economic efficiency and to maximize trading opportunities.
- ENTSO-E, when reporting on structural congestions, shall extend its report to include Contracting Parties.
- To the extent the report covers bidding zones located outside the Continental Europe synchronous area, the Energy Community Secretariat shall coordinate the contributions by the transmission system operators concerned to the report.

Bidding zone review

- EU TSOs are obliged to conduct a common study assessing alternative bidding zone configurations, in order to assess whether these alternative configurations increase the economic efficiency and cross-border trade opportunities while respecting operational security.
- While originally only CACM GL Art. 32 applied, the CEP introduces a link to the minimum margin (70% or linear trajectory) for cross-zonal trade, as well as an “arbitrating” role for:
  - ACER to decide on methodology, assumptions and configurations; and
  - ECRB to decide on alternative configurations in case of non-agreements

Action plans

- In case of identified structural congestions, a CP, in cooperation with the NRA, can opt for a so-called action plan to address the internal problems and to increase available cross-zonal capacity along a linear trajectory.
- The minimum capacity has finally to be reached by 31 December 2027.
- Such action plan shall include measures to be taken by the CP to address the identified problems.
- Start of the linear trajectory is calculated based on the historic values allocated on the specific network elements.
- During the implementation of the action plan, an annual report has to be prepared by TSOs for the previous 12 months and present this report to NRAs for approval.
- If such report reveals non-compliance, the CP shall decide on the reconfiguration of bidding zones within 6 months of receiving the report.

Congestion income

- The following objectives shall have priority with the respect to the allocation of any revenues resulting from the allocation of cross-zonal capacity:
  - guaranteeing the actual availability of the allocated capacity including firmness compensation; or
  - maintaining or increasing cross-zonal capacities through optimization of usage of existing interconnectors by means of coordinated remedial actions, where applicable, or
  - covering costs resulting from network investments that are relevant to reduce interconnector congestion.
- Points (a) or (b) shall be subject to a methodology adopted by ACER in accordance with Article 19(4) of Regulation (EU) 2019/943.

Congestion income

- Where the priority objectives have been adequately fulfilled, the revenues may be used as income to be taken into account by the regulatory authorities when approving the methodology for calculating network tariffs or fixing network tariffs, or both.
- The residual revenues shall be placed on a separate internal account line until such a time as it can be spent for the purposes as above.
- TSOs shall clearly establish in advance how congestion income will be used and shall report to NRAs on the actual use
- By 1 March every year, NRAs shall inform the ECRB and shall publish a report setting out the amount of revenues, how it was used and the specific projects as well as the amount set aside in a separate account.

Thank you for your attention!

https://www.energy-community.org

Lisa-Marie.Mohr@energy-community.org