



GUIDELINE ON ELECTRICITY TRANSMISSION SYSTEM OPERATION AND GUIDELINE ON ELECTRICITY BALANCING

Neum, March 2022



WHAT ARE NETWORK CODES / GUIDELINES



1

Set of rules that apply to cross-border cooperation and electricity market

2

Developed by the European Commission, ACER, ENTSO-E, market participants in accordance with article 8 of Regulation 714/ 2009

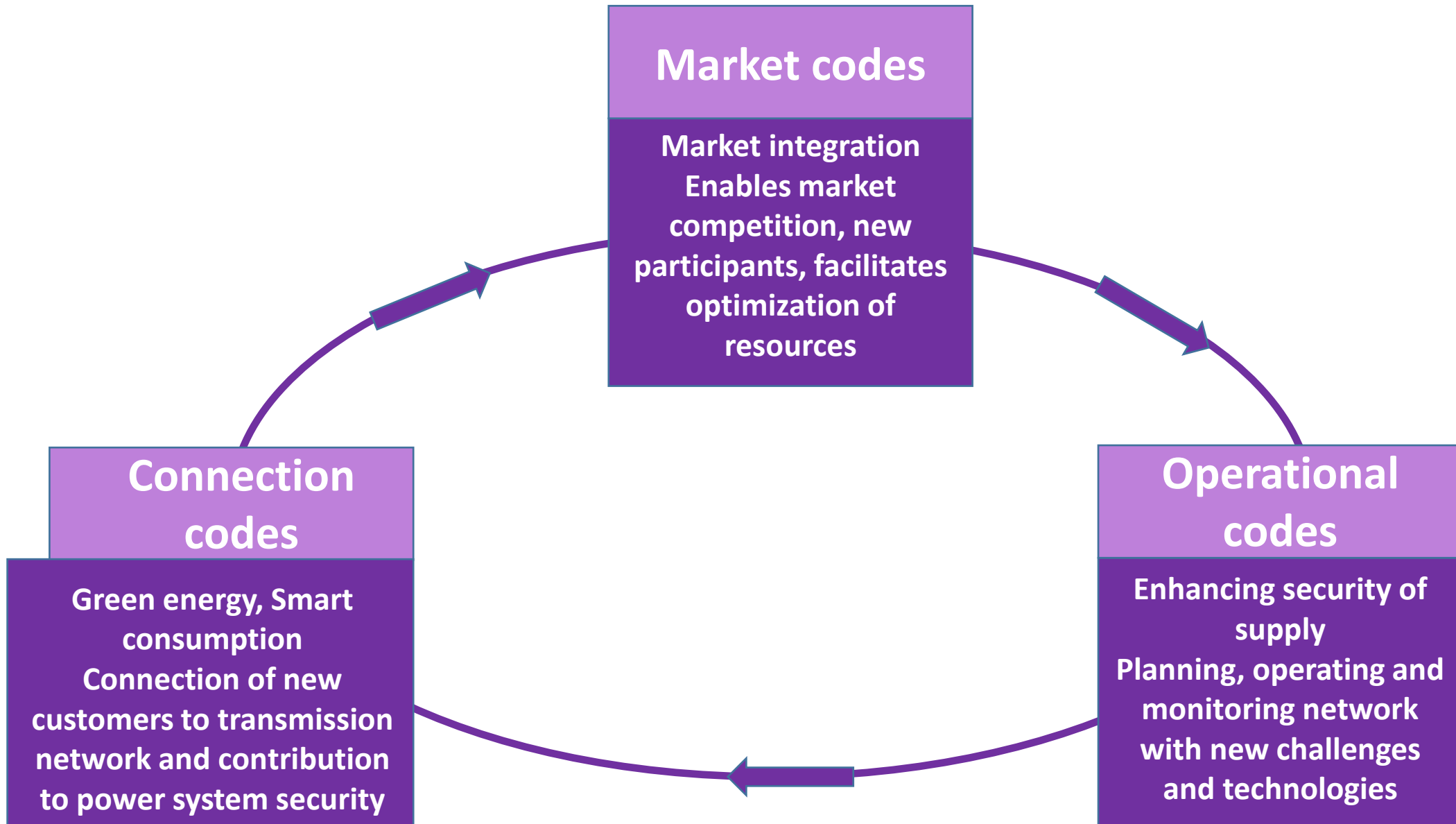
3

EU process of drafting laws called “comitology”

4

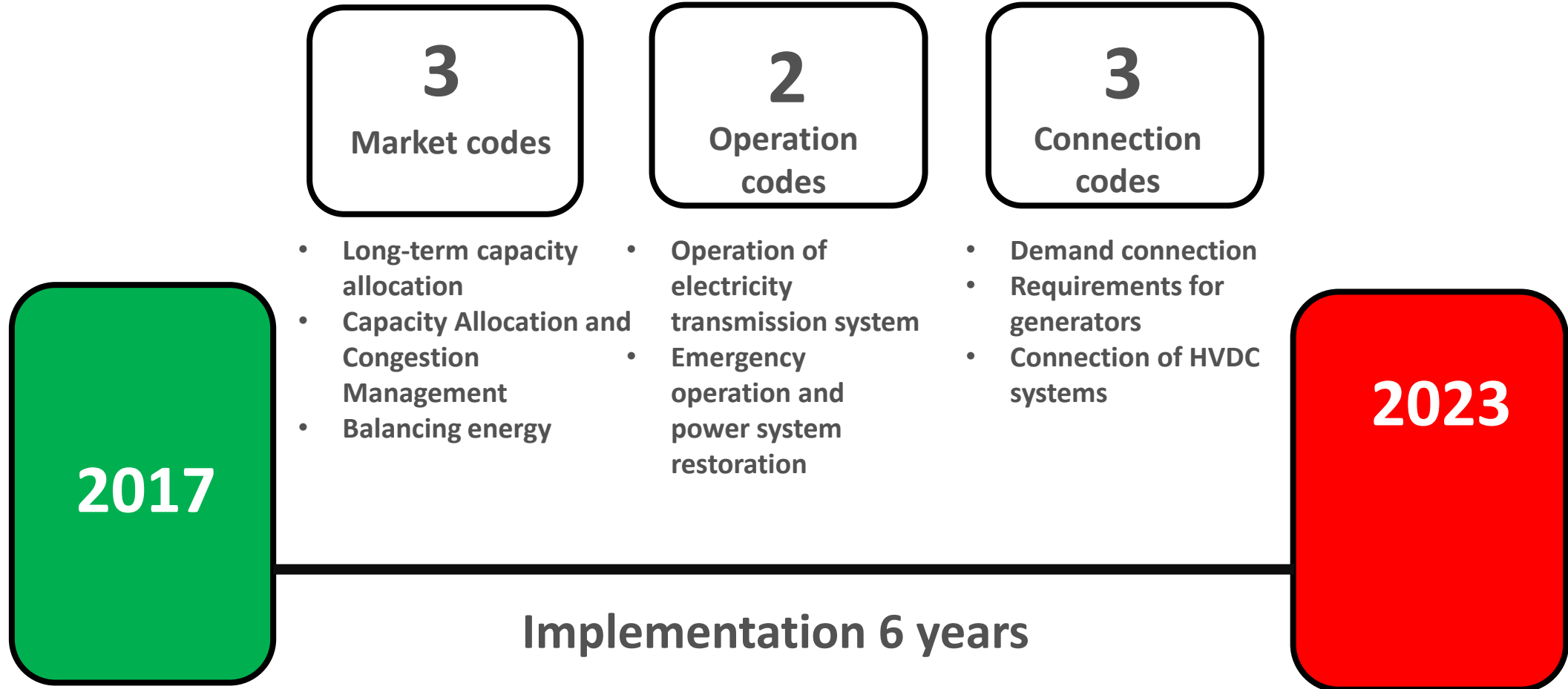
Process that ends with the network codes and guidelines that become obligatory legislation to be implemented in all EU Member States.

NETWORK CODES / GUIDELINES



NETWORK CODES / GUIDELINES

DIVISION





GUIDELINE ON ELECTRICITY TRANSMISSION SYSTEM OPERATION - SO GL

OPERATIONAL GUIDELINES EPS - SO GL



STRUCTURE

General provisions

- Scope, definitions and objectives
- Regulatory aspects
- Monitoring and reporting

Operational security

- Classification and monitoring of system condition
- Corrective actions
- Operational requirements
- Data exchange
- Training

Operational planning

- Common network model and OPDE
- Operational security analysis
- Regional security centers
- Outage planning
- Adequacy analysis
- Scheduling

Power/frequency regulation and reserves

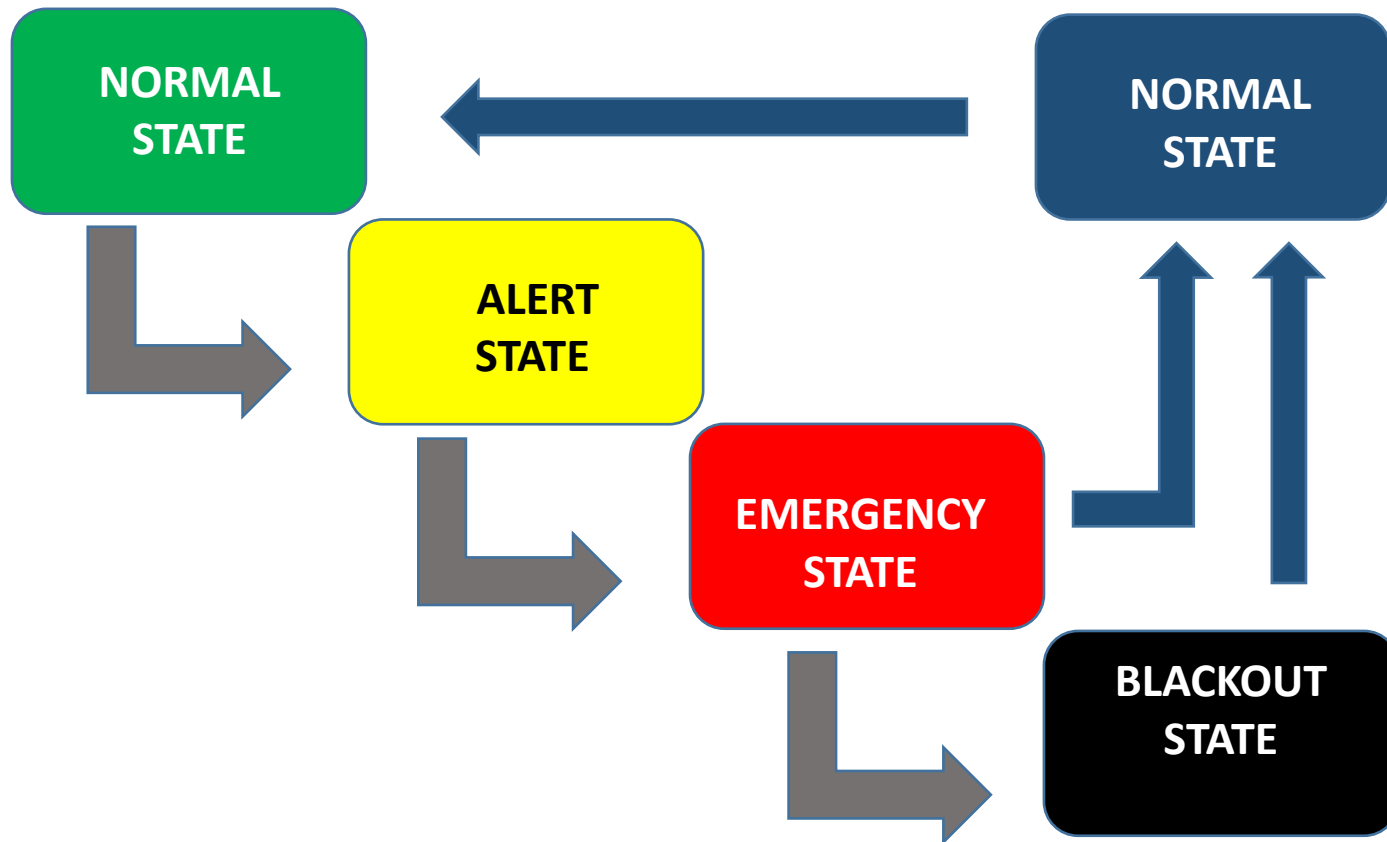
- Operational agreements
- Procurement, exchange and sharing the reserves
- Frequency quality parameters

Final provisions

- Voltage ranges
- Values of the frequency quality parameters
- Technical requirements for FCR

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OPERATIONAL SECURITY

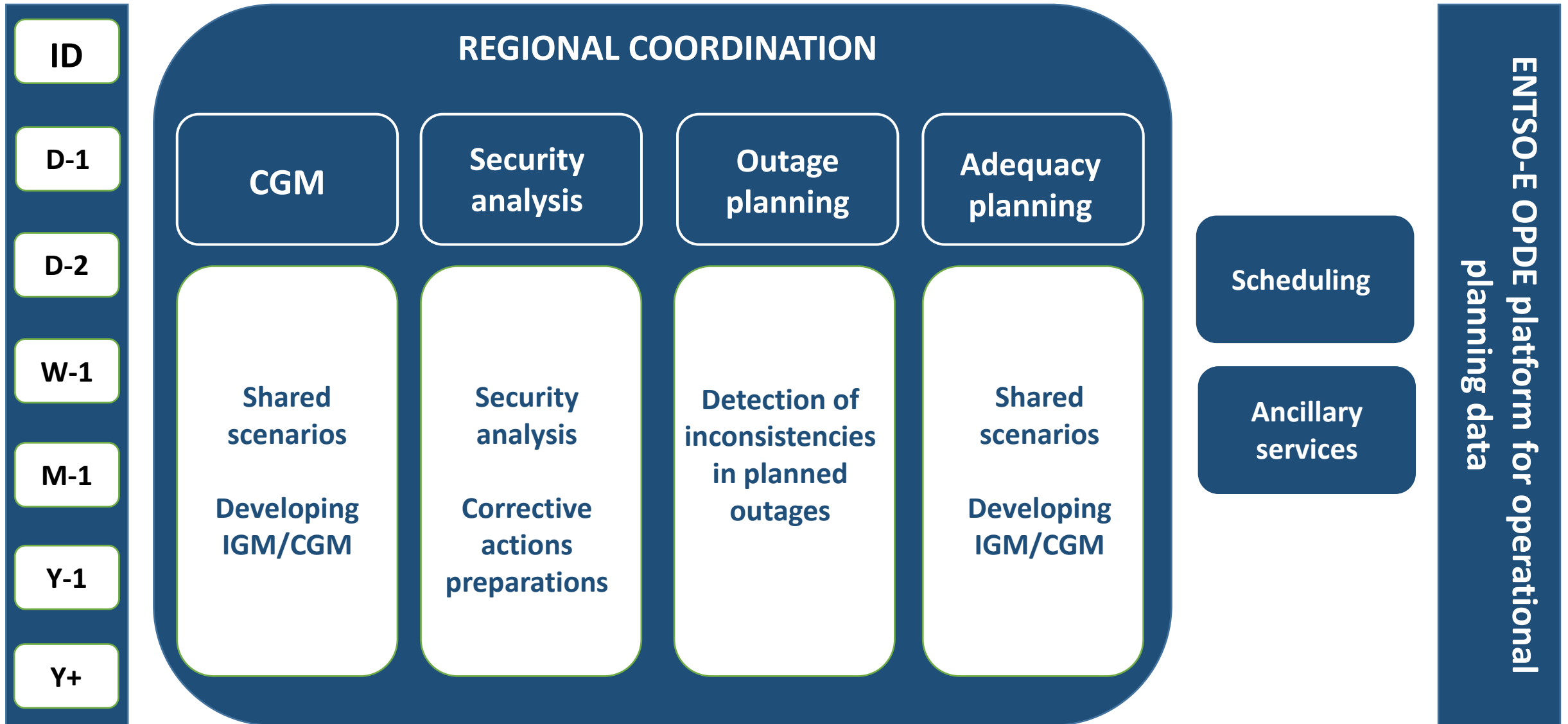


Real time monitoring of the system state:

- security analyses every 15 minutes
- monitoring the power system parameters and comparison with the operational limits
- monitoring the level of available reserves
- System state on the emergency alert system platform - EAS

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OPERATIONAL PLANNING



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ACTIVE POWER/FREQUENCY REGULATION AND RESERVES



SO GL: LFCR

EB GL

LFC

Frequency Quality

Regulation reserve

Activation of reserves

Market design

Product definition

Real-time coordination

Imbalance sharing

XB Activation of reserves

Market design

CMOL

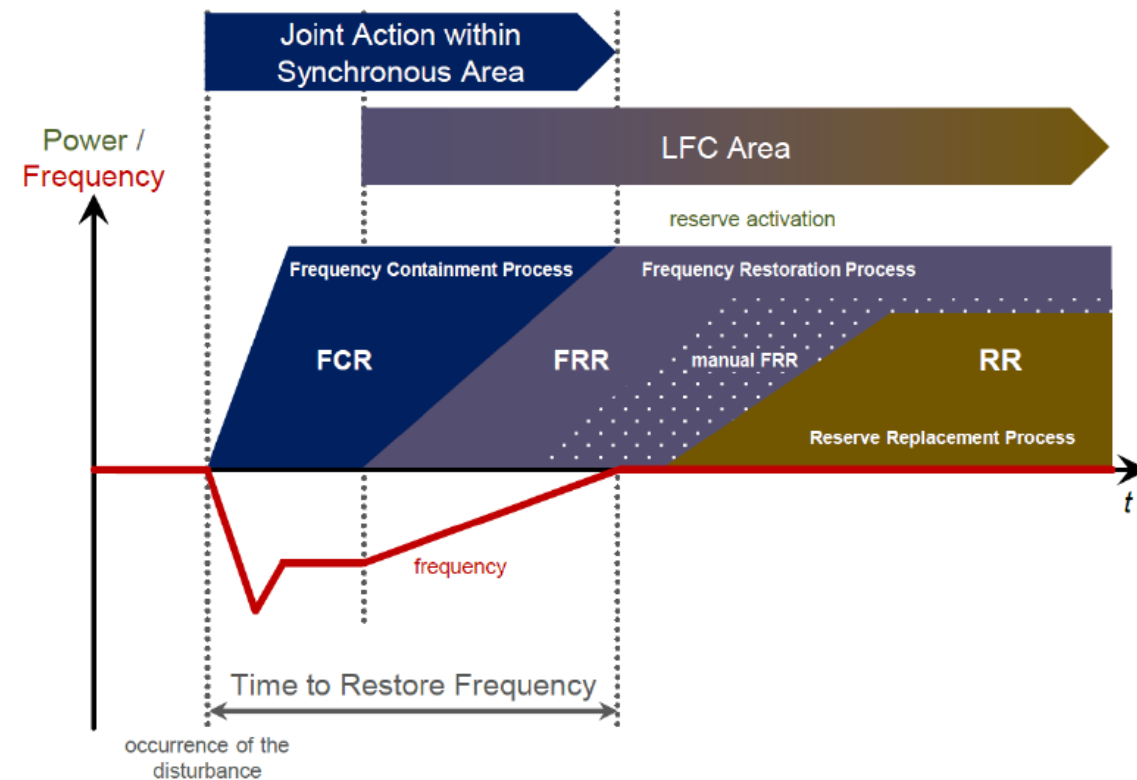
Location and volume of reserves

Reserves sharing

Reserves exchange

Cross-border coordination

Coordination in procurement of reserves

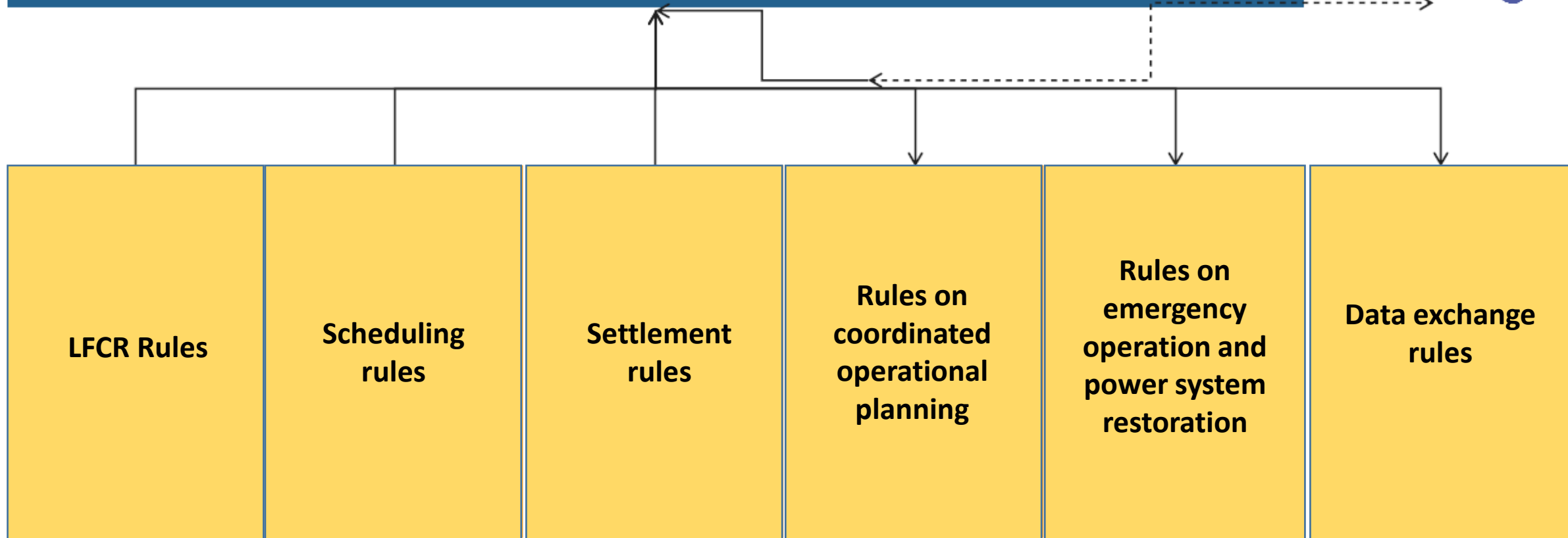


SYSTEM OPERATION GUIDELINES - SOGL

SAFA AGREEMENT



**Synchronous Area Framework Agreement for continental Europe;
Entered in force on 14 April 2019**





GUIDELINE ON ELECTRICITY BALANCING - EB GL

GUIDELINE FOR ELECTRICITY BALANCING - EB GL



Regulation of the Commission (EU) 2017/2195 of 23 November 2017, providing guidelines for electricity balancing (EB GL) stipulates detailed rules on integration of balancing markets in Europe with the aim of encouraging effective competition, non-discrimination, transparency and integration in balancing markets, thus improving the efficiency of European balancing system as well as security of supply.

Balancing means all actions and processes continuously performed by the transmission system operators to maintain power system frequency within the defined limits, as well as ensuring the quantities of the required regulation reserves against the required quality. The balancing process comprises three major steps: 1) dimensioning of the required reserves; 2) procurement of the required reserve capacities; and 3) procurement of balancing energy.

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STRUCTURE



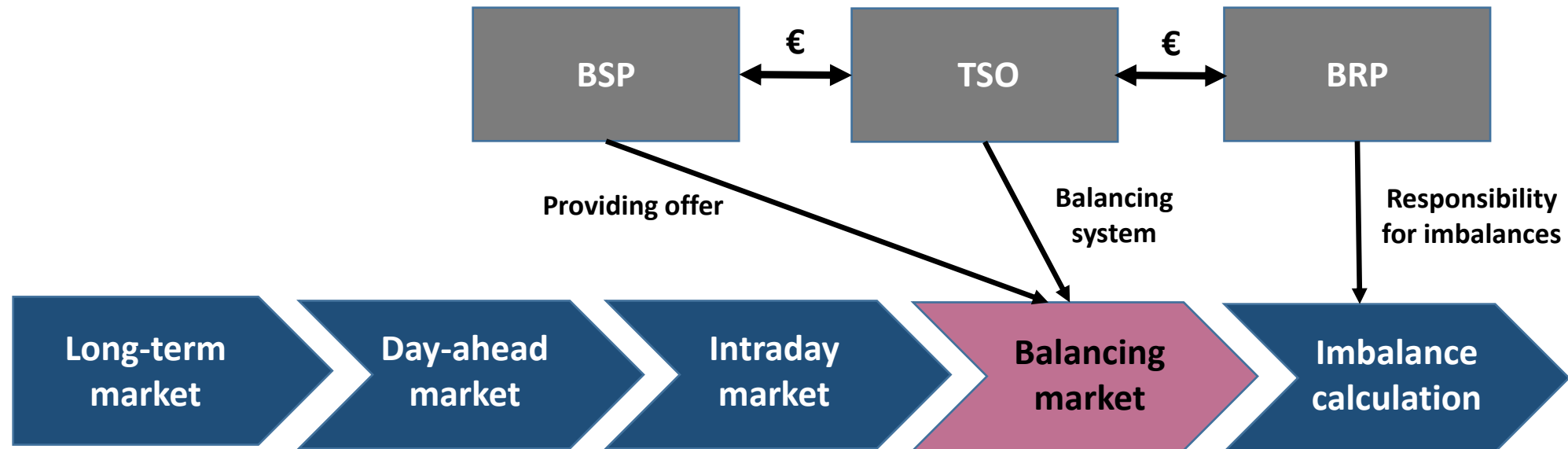
General provisions	Scope, objectives, regulatory aspects, definitions
Balancing market	Roles and responsibilities, balancing platforms, cost allocation, requirements for standard and specific balancing products
Procurement of balancing services	Activation of balancing energy, function of optimization, CMOL, balancing capacity
Cross-zonal capacities for balancing services	Cross-zonal exchange of balancing energy, calculation of cross-zonal capacity, market based allocation of cross-zonal capacity, allocation on the basis of economic efficiency analysis
Settlement	Balancing energy settlement, TSO-TSO, TSO-BSP, TSO-BRP, harmonization of imbalance settlement period
Other provisions	Coupling algorithms, reporting, cost-benefit analysis

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BALANCING MARKET, ROLES



- TSO is responsible for ensuring power system balance near to real-time, taking into consideration other electricity markets
- Balancing service providers (generators, DSR, energy storage systems) offer balancing services (capacity, energy) used by TSO to keep the power system balance
- BRP is financially responsible for imbalances and thus tries to keep their positions (generation, consumption, exchange) in balance



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BALANCING SERVICES AND PROCESSES



FCR

Operational reserve to prevent frequency deviations from nominal value in order to continuously maintain the active power balance in the whole synchronous area

FRR

Operational reserve that is activated to restore the frequency up to the nominal value and to restore to the planned value the active power balance of synchronous area that consists of several control areas

RR

Reserve of active power for restoration or support to the required level of FRR, with the aim of balancing additional system imbalances

IN

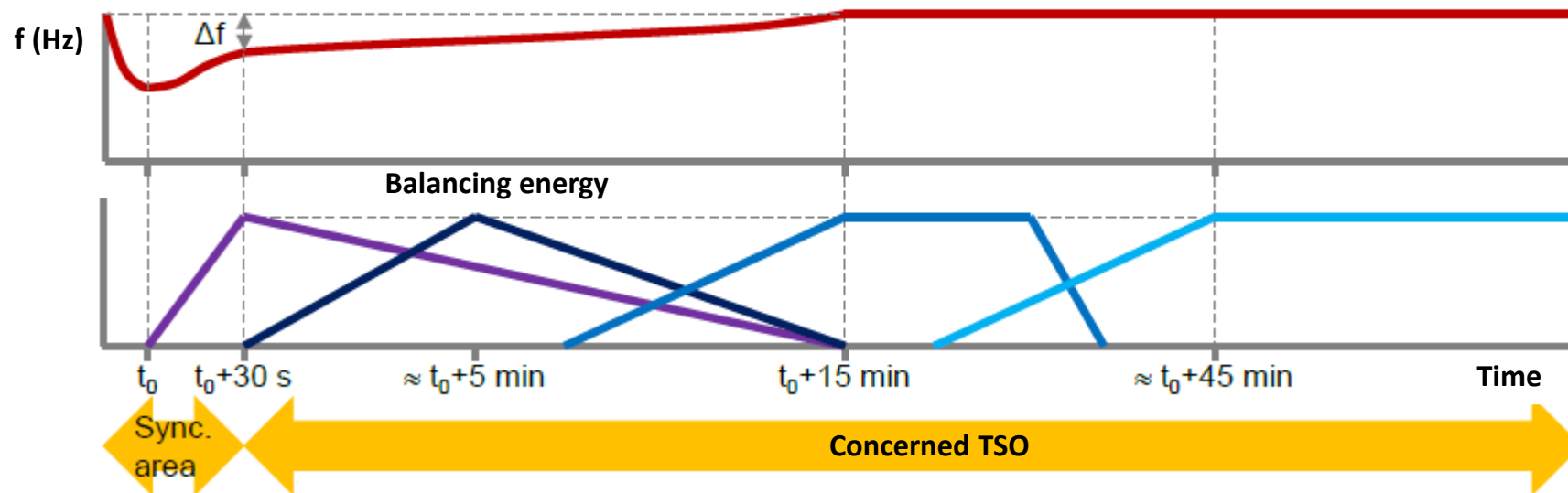
Process agreed among TSOs that allows avoidance of simultaneous activation of aFRR in opposite directions, taking into consideration relevant control area errors, as well as the activated aFRR

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STANDARD AND SPECIFIC PRODUCTS



FCR	aFRR	mFRR	RR
<ul style="list-style-type: none">▪ automatic activation▪ Max 30s	<ul style="list-style-type: none">▪ automatic activation▪ 30s - 15min	<ul style="list-style-type: none">▪ semi-automatic and manual activation▪ 12.5min	<ul style="list-style-type: none">▪ semi-automatic and manual activation▪ 30min



- Requirements for standard product for mFRR and RR defined
- Full activation time (FAT) for aFRR shall be specified

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STANDARD AND SPECIFIC PRODUCTS



	mFRR	RR
Activation method	Manual	Manual
Activation type	Direct or contracted	Direct or contracted
Activation time	12.5min	30min
Min quantity	1MW	1MW
Resolution	1MW	
Max quantity	9999MW	In accordance with national rules
Minimal delivery time	5min	15min
Maximum delivery time	Defined in conditions for BSPs	60min
Price resolution	0.01EUR/MWh	In accordance with national rules

Other requirements

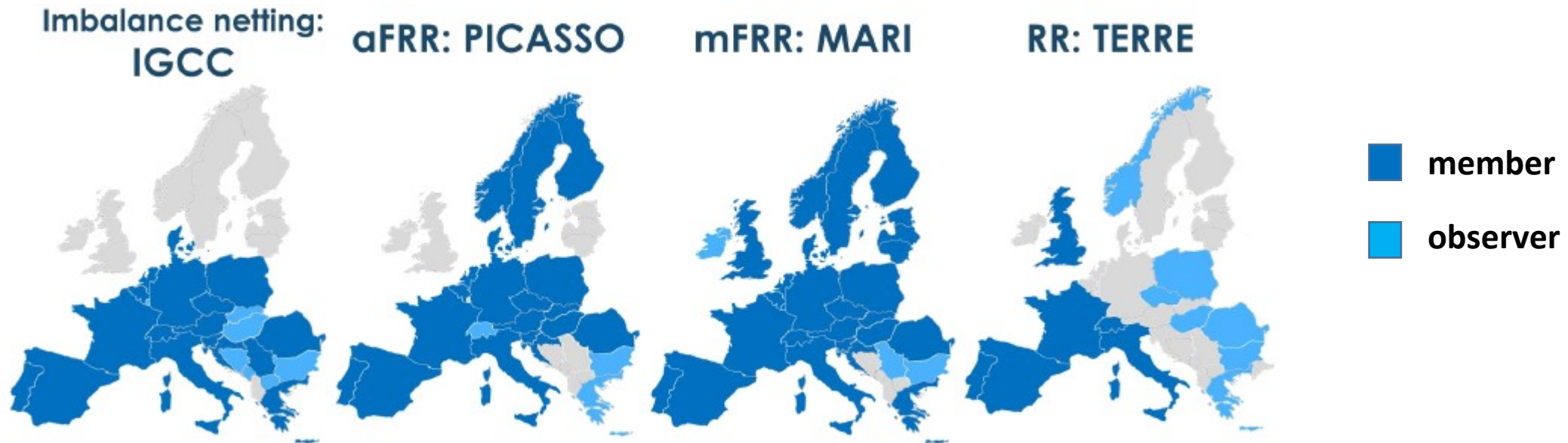
- BSPs are allowed to submit divisible and non-divisible bids
- Direction of bids upwards/downwards
- Preparation period, ramping period and deactivation time are defined in conditions for BSPs in accordance with conditions given in the table
- Minimum time between two activations are defined in conditions for BSPs

Specific products:

- In order to meet the requirements for the reserves dimensioning, TSO may request from NRA approval for defining the specific products
- Specific products may be converted into standard products if they are to be used at balancing platforms, in accordance with the rules defined in the table

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BALANCING PLATFORMS



- IGCC cooperation in work since 2010
- TERRE platform started operation on 9 January 2020
- Planned go-live for MARI foreseen in 2021

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BALANCING RESERVE ACTIVATION



Activation of balancing services



- **Activation of balancing bids**
 - *Activation for purposes other than balancing*

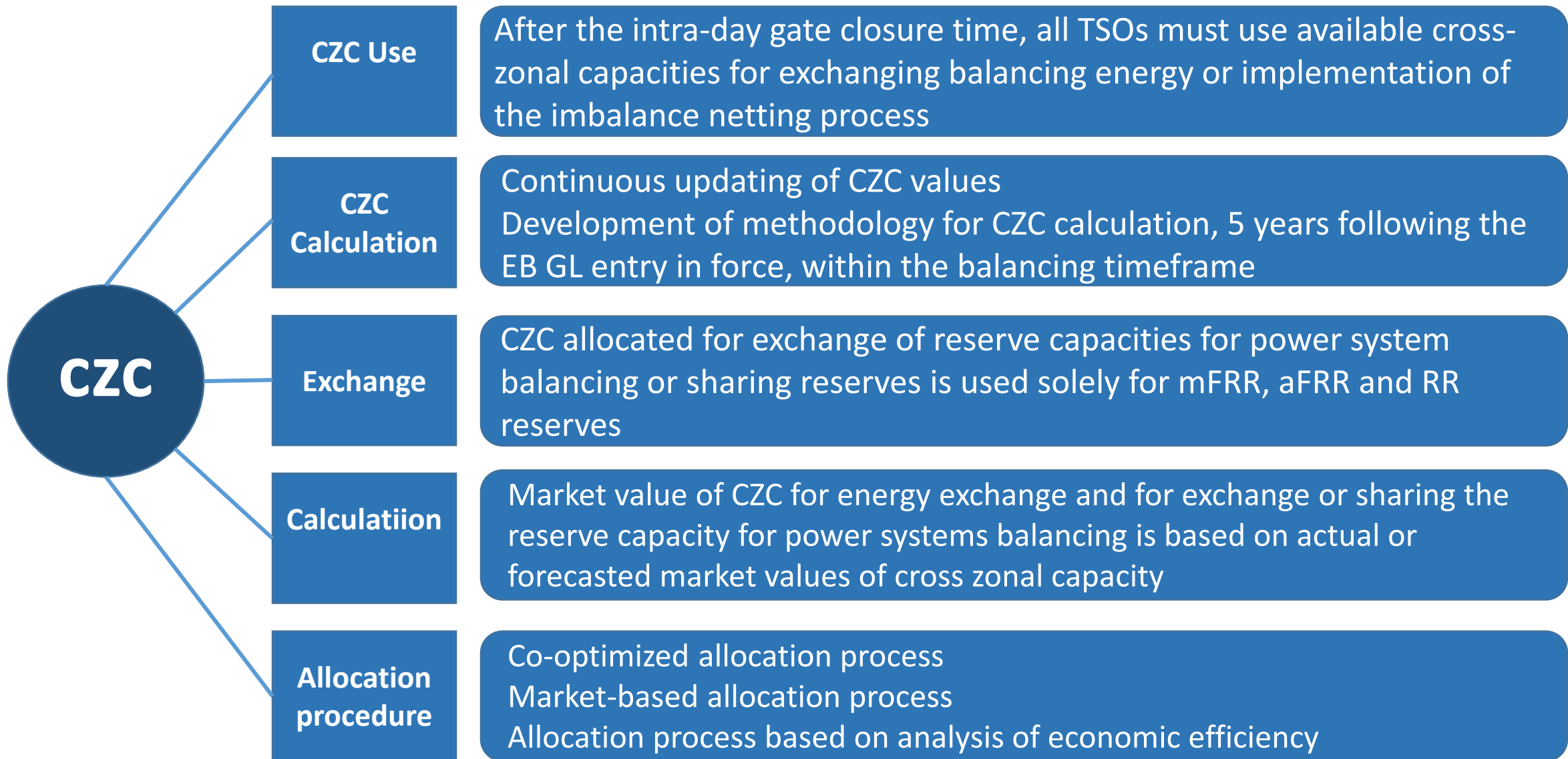
- **Unavailable bids**
 - *Requirements for divisible bids*
 - *Bid restrictions due to internal congestion*

- **Optimization of activation function**
 - *Common merit order lists - CMOL*

- **Balancing capacity**
 - *Market-oriented procurement of capacities*
 - *Capacity exchange - TSO-TSO model*
 - *Transfer of capacity among BSPs*
 - *TSO-BSP model*

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CZC, CALCULATION, ALLOCATION PROCEDURE



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IMBALANCE SETTLEMENT



General principles of settlement:

- Enable the imbalance settlement at the price that reflects the actual costs of energy
- Encourage the balance responsible parties to be in balance and help the power system to restore balance
- Encourage competition among market participants
- Encourage balancing services providers to offer and provide balancing services
- Ensure financial neutrality of all TSOs

When calculating the balancing energy, each TSO must establish a procedure for:

- Calculation of activated volume of balancing energy on the basis of requested or metered activation
- Claims for recalculation of the activated volume of balancing energy.

Each TSO calculates the activated volume of balancing energy for:

- Each imbalance settlement period
- Its imbalance areas
- Each direction, where the negative sign indicates relative withdrawal by the balancing services provider, and positive sign indicates relative injection by the balancing service provider

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IMBALANCE SETTLEMENT



- Within three years from entry into force of the EB GL, all TSOs must use the Imbalance Settlement Period (ISP) of 15 minutes in all scheduling areas while ensuring that all boundaries of *market time unit* - MTU coincide with ISP boundaries.
- TSO shall set up rules for: calculation of final positions, determination of the allocated volumes, determination of the imbalance adjustments, calculation of imbalances, and method of claiming the recalculation of imbalances
- Along with the imbalance, the volume and direction of settlement transaction among parties responsible for imbalance and TSO shall be stated, where the imbalance may have positive or negative sign
- Each TSO shall set up rules to calculate the imbalance price that may be positive, zero or negative.
- TSO shall specify the imbalance price for each imbalance settlement period and each imbalance direction



THANK YOU FOR YOUR ATTENTION!

