

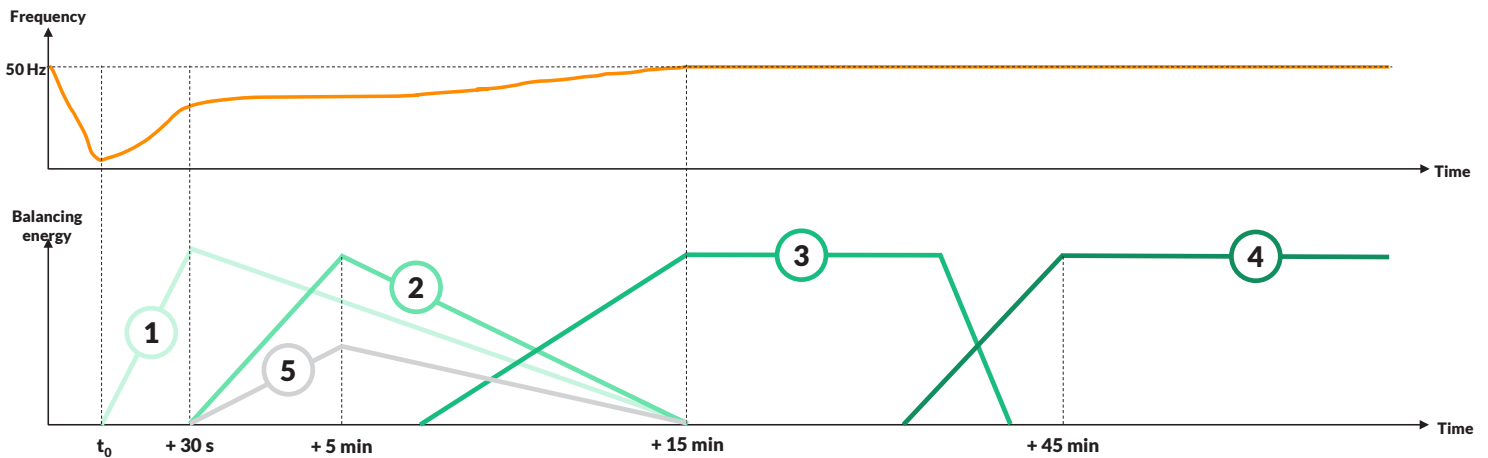
Basics & European Guideline

Balancing

All actions and processes needed for maintaining system frequency within defined range.

Steps

1. TSOs define need for balancing energy
2. TSOs procure required balancing capacity
3. TSOs procure required balancing energy



Balancing Energy Types and Processes

No.	Name	Description
1	FCR	Frequency Containment Reserve: Stabilize frequency after disturbance at steady-state value within maximum steady-state frequency deviation by all TSOs in synchronous area.
2	aFRR	Automatic Frequency Restoration Reserve: Regulates frequency back to desired value, replaces FCR.
3	mFRR	Manual Frequency Restoration Reserve: Regulates frequency back to desired value, replaces aFRR.
4	RR	Replacement Reserves replace/complement FRR and ensure stable frequency despite additional system imbalances.
5	IN	Imbalance Netting: Reduces or prevents simultaneous and counteracting aFRR between TSOs.

European Guideline on Electricity Balancing

Facts

- What?** Detailed Guideline on electricity balancing including common principles for procurement, settlement and common methodologies.
- Who?** Applies to TSOs, DSOs, balancing energy providers/traders, regulatory authorities and ENTSO-E in the EU.
- How?** TSOs obliged to develop terms/conditions/methodologies required and submit for approval to relevant regulatory authorities.
- Who pays?** Reasonable costs of TSOs recovered through network tariffs.

Objectives

- Foster effective competition, non-discrimination and transparency
- Enhance efficiency of balancing and balancing markets
- Integrate balancing markets
- Contribute to efficient long-term operation and development of transmission system
- Ensure that procurement of balancing services is fair, objective and pricing based on demand/supply and increasing liquidity
- Facilitate participation of renewable energy sources and support achievement of EU target for renewable generation

Goal: Harmonization of procurement, gate closure times, standard products and pricing & settlement of balancing energy.

Goal achieved by developing 4 platforms

aFRR:
PICASSO

mFRR:
MARI

RR:
TERRE

Imbalance Netting:
IGCC

