

# ELECTRICITY BALANCING – EUROPEAN IMPLEMENTATION PROJECTS



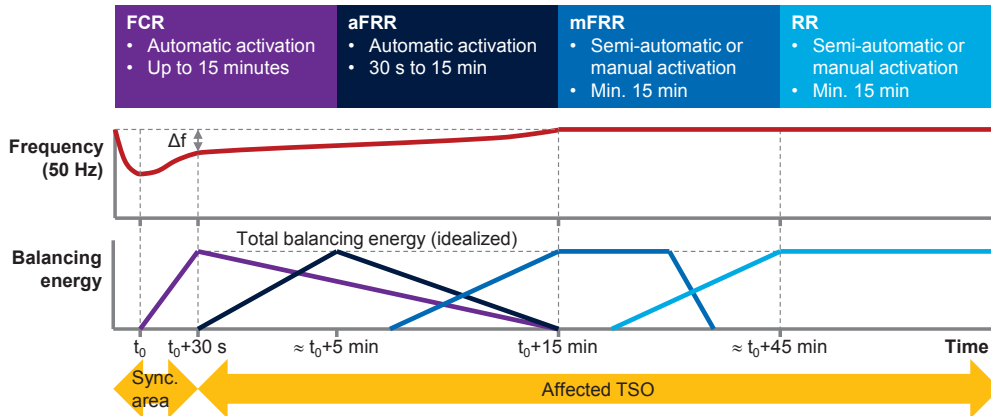
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# Balancing processes in Europe

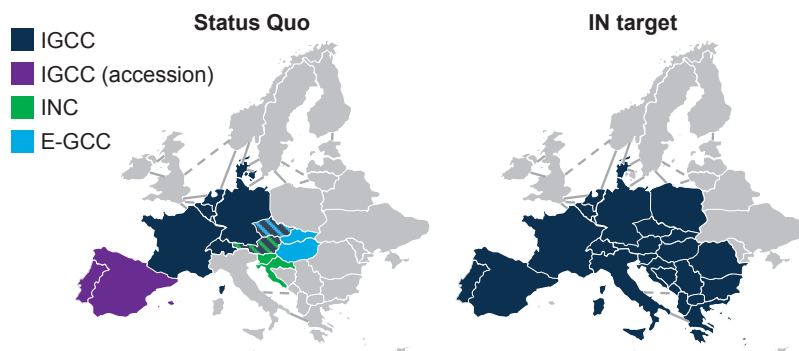
- Balancing qualities according to activation time (without imbalance netting)



- Balancing is organized in up to five steps (FCR, IN, aFRR, mFRR and (optional) RR) in Europe
- Platforms coordinating the (complex) processes of each balancing quality required

# Existing implementation projects: Imbalance Netting

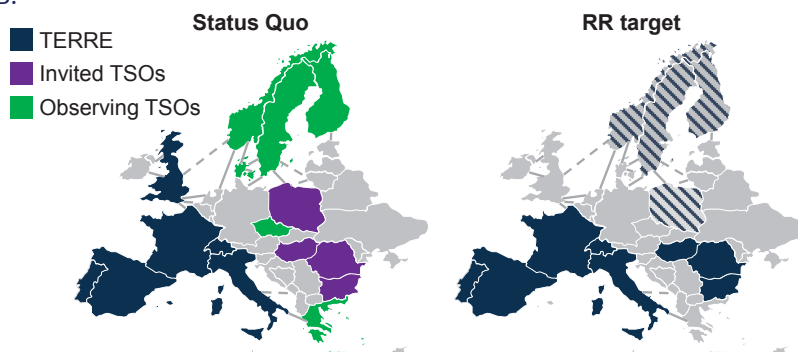
- GL EB requires a single Imbalance Netting (IN) in Central Europe.
- International Grid Control Cooperation (IGCC) has been formally identified as implementation project for IN.



- Different existing cooperations will merge in the future.

## Existing implementation projects: Replacement Reserve

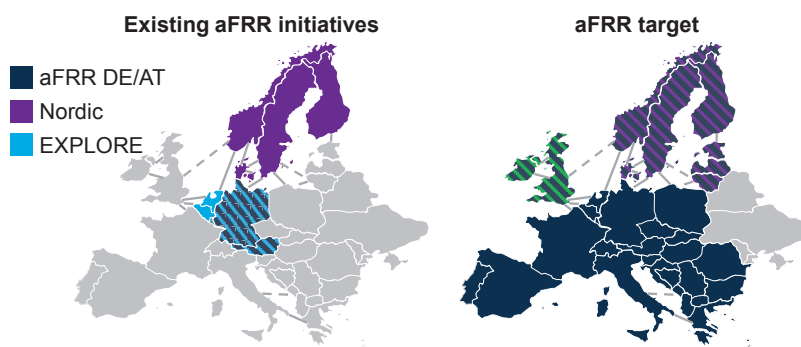
- Usage of Replacement Reserve (RR) is not compulsory for TSOs.
- Several TSOs performing RR started the project Trans-European Replacement Reserve Exchange (TERRE) before entry into force of GL EB.



- European TSOs endorsed TERRE as implementation project for RR.
- Balancing Responsible Parties from countries not performing RR can still offer this balancing quality (via the connecting TSO).

## Potential Implementation Projects: Frequency Restoration Reserve with automatic Activation

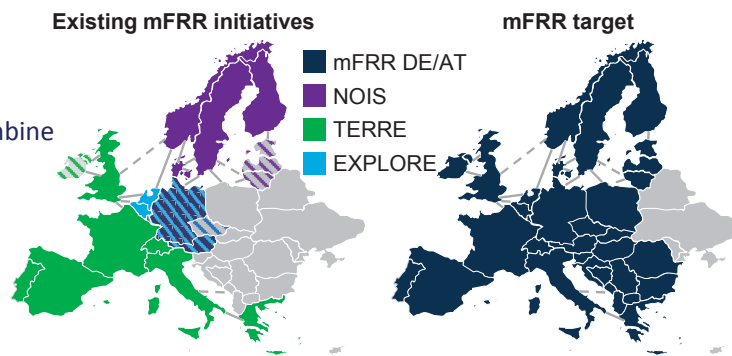
- Currently, different European aFRR initiatives (not all mutual exclusive)
  - aFRR cooperation DE/AT (in operation)
  - Nordic
  - EXPLORE study (report finalized, next steps discussed)



- Exact layout of EU target model depending on applicability of aFRR (UK, Baltics) and/or technical feasibility of cross-synchronous area exchange of aFRR (Nordics)
- Discussions regarding aFRR implementation project ongoing

# Potential Implementation Projects: Frequency Restoration Reserve with manual Activation

- Various existing/discussed initiatives
  - mFRR cooperation DE/AT (under development, go-live in next months)
  - EXPLORE study (report finalized, next steps under development)
  - TERRE
  - NOIS
  - Amprion/RTE study
- Attempt of European TSOs to combine efforts on mFRR



- Discussions regarding mFRR implementation project ongoing

# Further projects and challenges: Frequency Containment Reserve

- Existing FCR initiative started in 2011 as CH/DE project and has been extended continuously.
- Common demand of 855 MW (more than ¼ of entire European FCR demand)

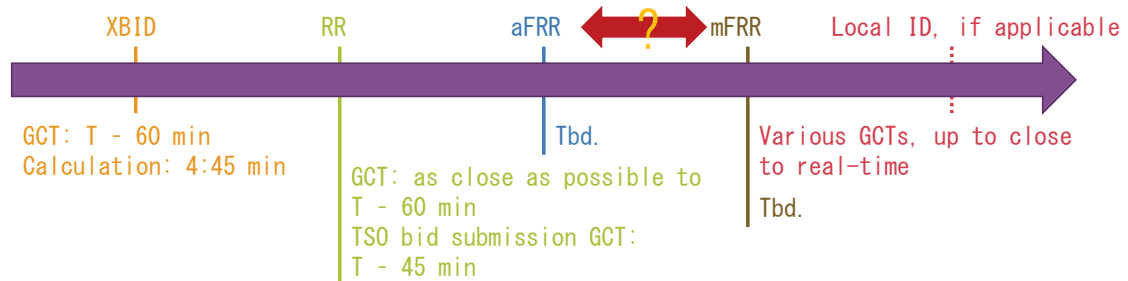
Current FCR initiative



- Further extension within a synchronous area (using TRM) is possible.

## Further projects and challenges: Coordination between different Gate Closure Times

- Gate Closure Times (GCTs) of short-term markets for scheduled energy and balancing energy have to be coordinated.



- » Further technical evaluation is required in order to determine the best timings