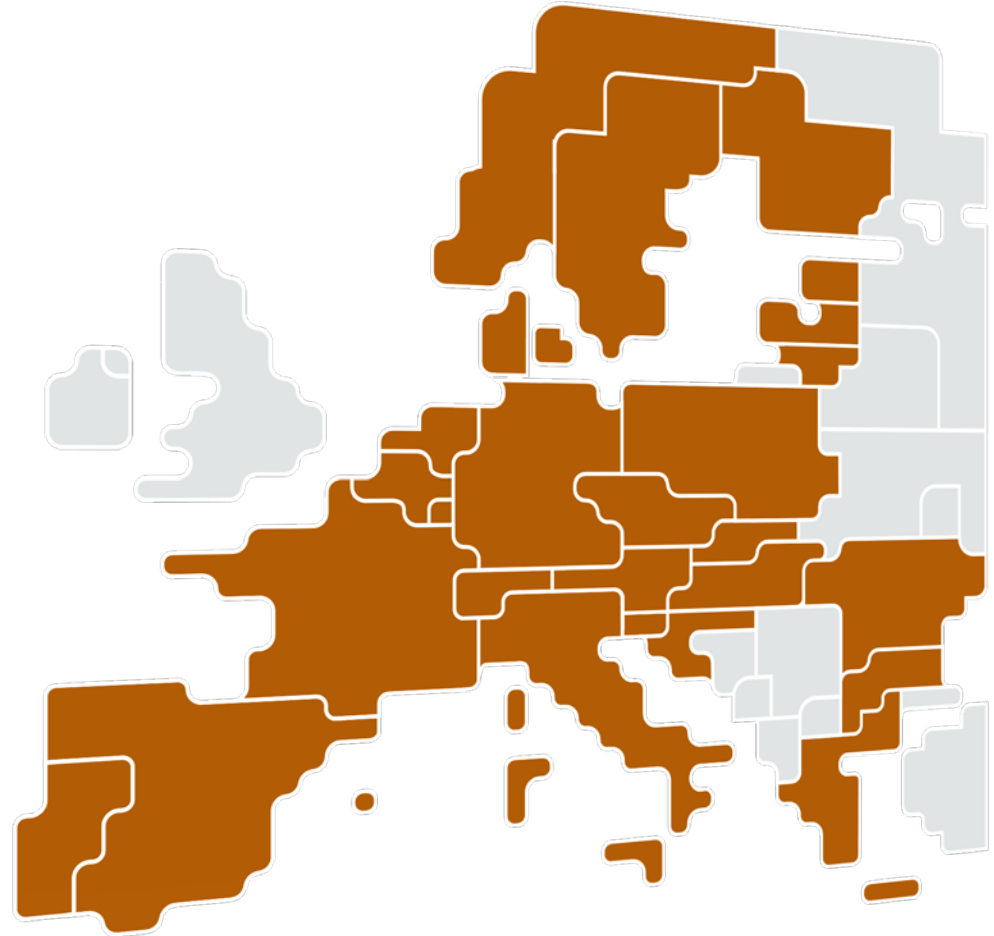




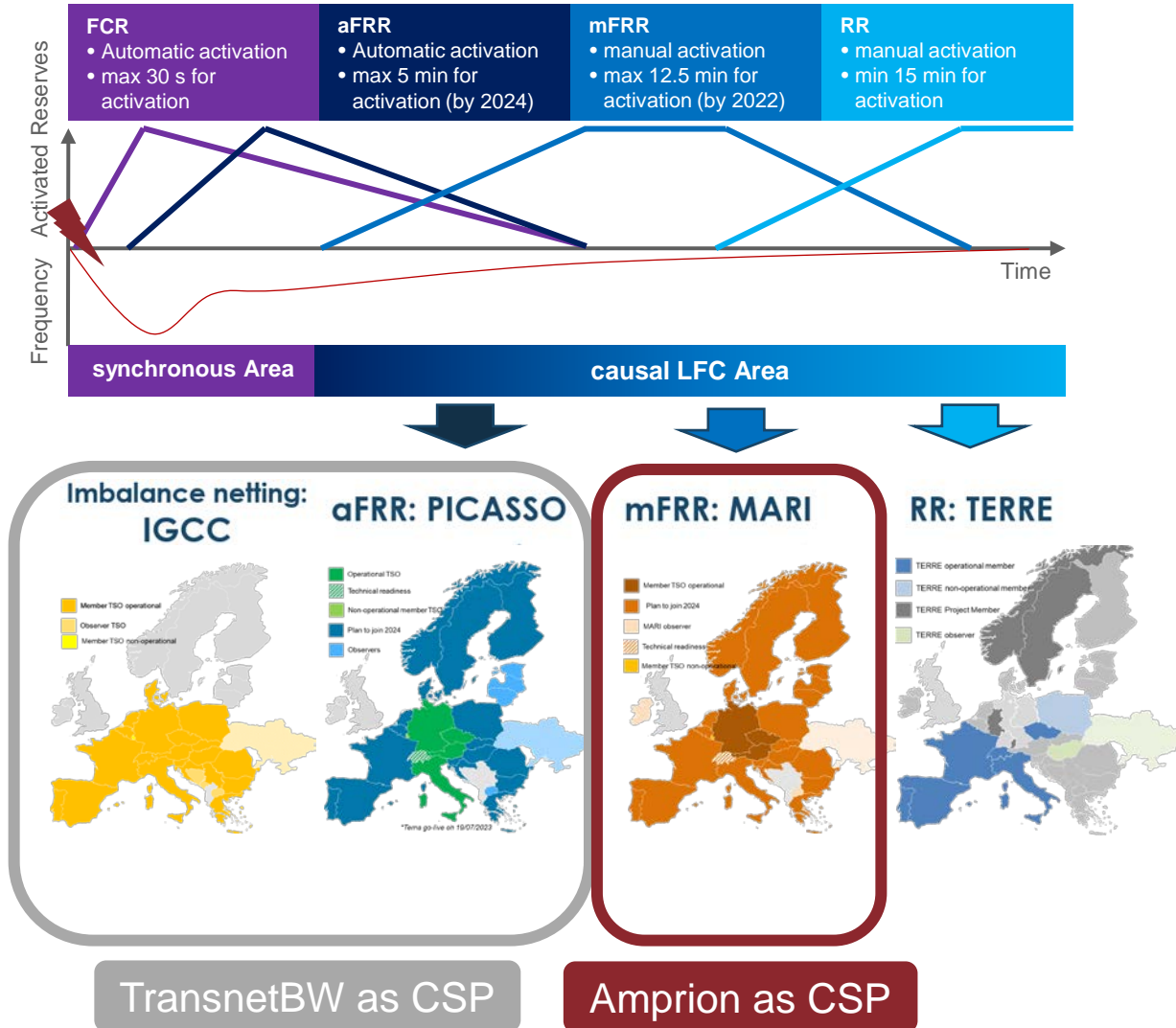
Balancing Platforms Stakeholder Workshop

11th December 2024



1	Introduction	14:00 – 14:10
2	Operational Platform Reporting	14:10 – 14:30
3	Accession Roadmap	14:30 – 14:40
4	Summary and Outlook	14:40 – 14:45
5	Q&A	14:45 – 14:55

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- Different balancing processes and products to contain and restore system frequency in case of imbalances
- Distributed activation of FCR by the whole synchronous area
- Each LFC area is responsible for the restoration of its system balance by activation of aFRR, mFRR and RR.
- EBGL requires implementation of platforms for cross-border activation of these balancing products.
- Operation of balancing platforms allows the cost-optimal restoration of imbalances.

Introduction (ii)

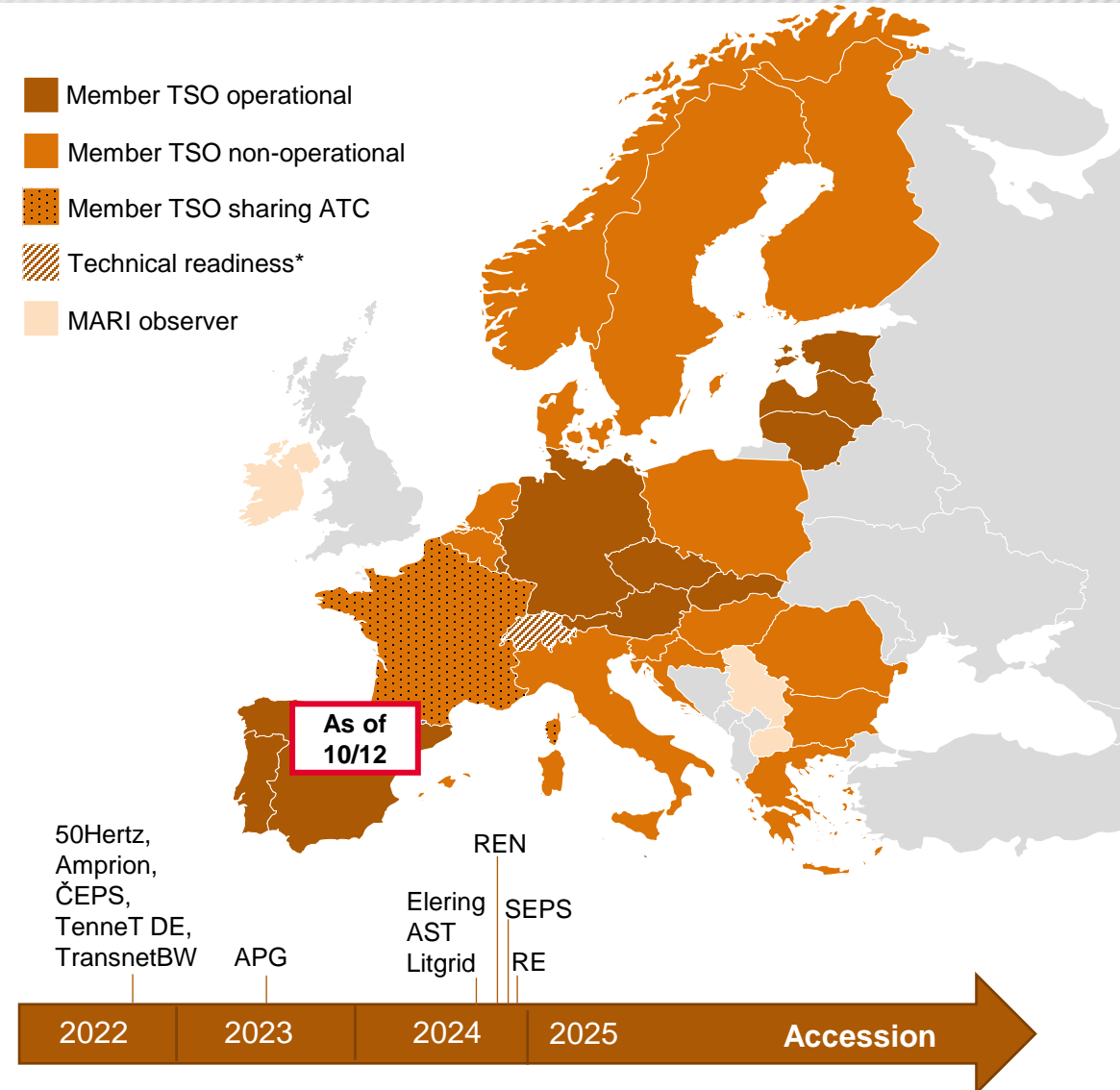
Manually Activated Reserves Initiative (MARI)



- MARI has been set up already in 2017 to provide the basis for a European mFRR platform.
- Start of dry-run (ČEPS) on 18/07/2022.
- Technical go-live on 15/09/2022.
- First TSOs (ČEPS and German TSOs) joined on 05/10/2022. In summer 2023, APG joined.
- During Q4/2024 several TSOs joined: Elering, AST, Litgrid, REN and SEPS.
- RE plans to connect to MARI on 10/12/2024.

Relevant features MARI platform

- Counter activation of mFRR balancing energy for economic optimization
- mFRR balancing energy bids can be activated either for balancing or (locally) for system constraints purposes.
- Direct and scheduled activation

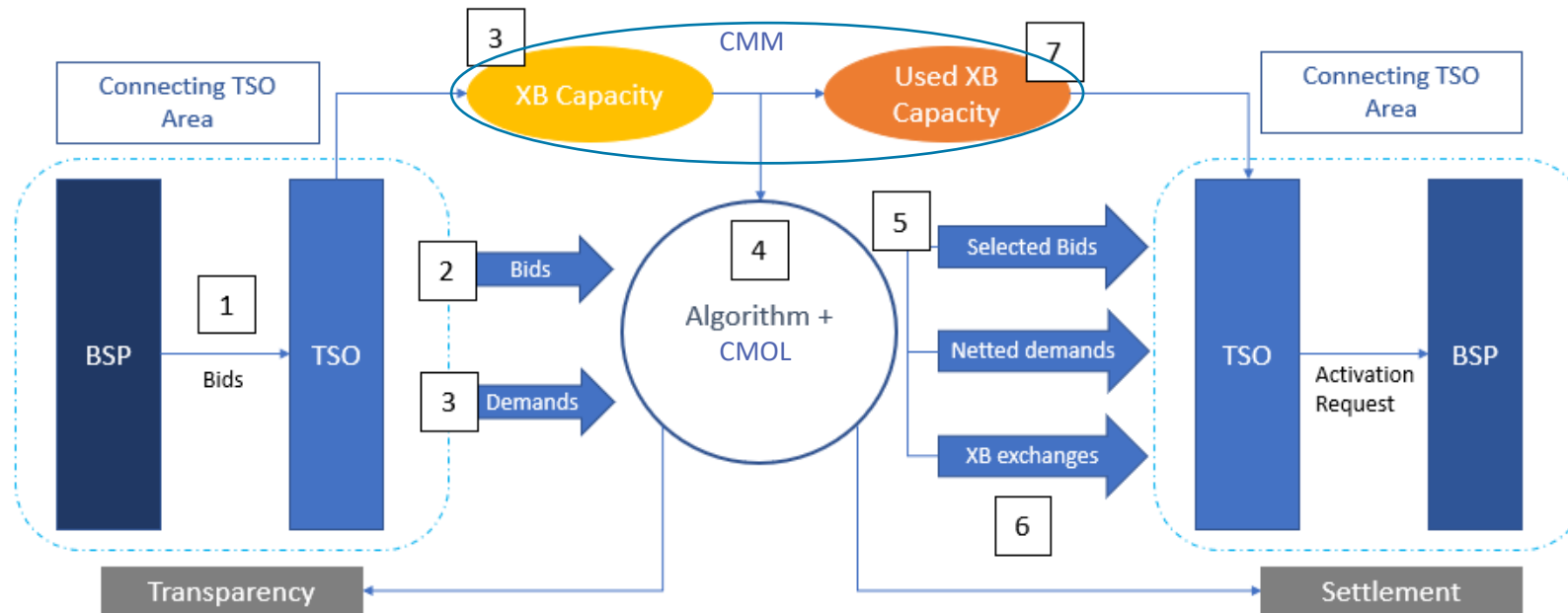


*The technical readiness of Swissgrid has been acknowledged. The participation of Switzerland in the mFRR-Platform is regulated based on article 1.6 and 1.7 of the EB Regulation and is currently the subject of litigation by Swissgrid at the Court of Justice of the European Union.

Introduction (iii)

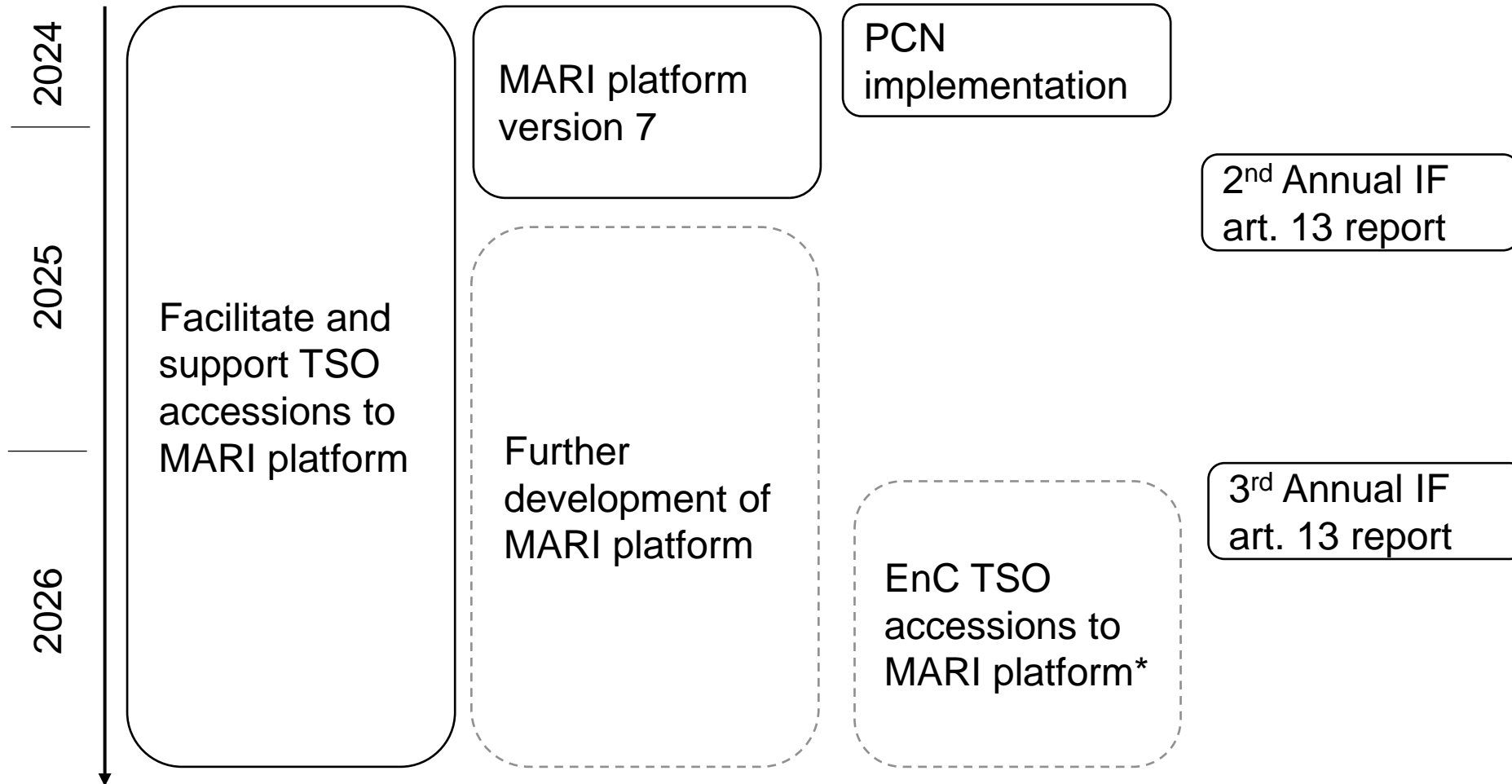
Description of how the MARI platform is working

The MARI platform is based on the LIBRA platform that has been implemented for Replacement Reserves (RR) in the TERRE project. The MARI platform consists in (i) a data management platform (Libra Data Management), handling communications and data exchanges with TSOs and ENTSO-E, pre-processing, postprocessing and archiving, and (ii) an optimization module (AOF) optimizing the activations and computing Cross Border Marginal Prices (CBMP).



1. TSO receive bids from BSPs in local market balance area
2. Forward of coherent mFRR balancing products to mFRR platform
3. TSOs communicate their balancing demands via the balancing platform and the available XB transmission capacities (ATC) either directly or via CMM*.
4. Optimization of the clearing of balancing demands against BSPs bids
5. Communication of the accepted bids, satisfied demands and prices
6. Calculation of the commercial flow between market balancing areas and settlement of the expenditure and revenues between TSOs
7. The resulting XB schedules and remaining ATC are sent to the TSOs directly and to CMM (if configured).

* CMM is designed as a Single Point of Information when it comes to balancing capacities, which improves transparency among the TSOs. In future, the primary source of ATCs shall be CMM. Direct provisions of ATCs by TSOs to balancing platforms will be a backup option. It is foreseen that TSOs will connect to the balancing platforms first and then to CMM in order to test that the backup of sending ATCs is functioning properly.



Legend

Expected

Confirmed

* The accession date of EnC TSOs by end of 2024 is based on publicly available information, balancing platforms are aware of the possible derogation times and consider a later accession as likely.

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Reporting period

- 01/01/2024 – 15/11/2024

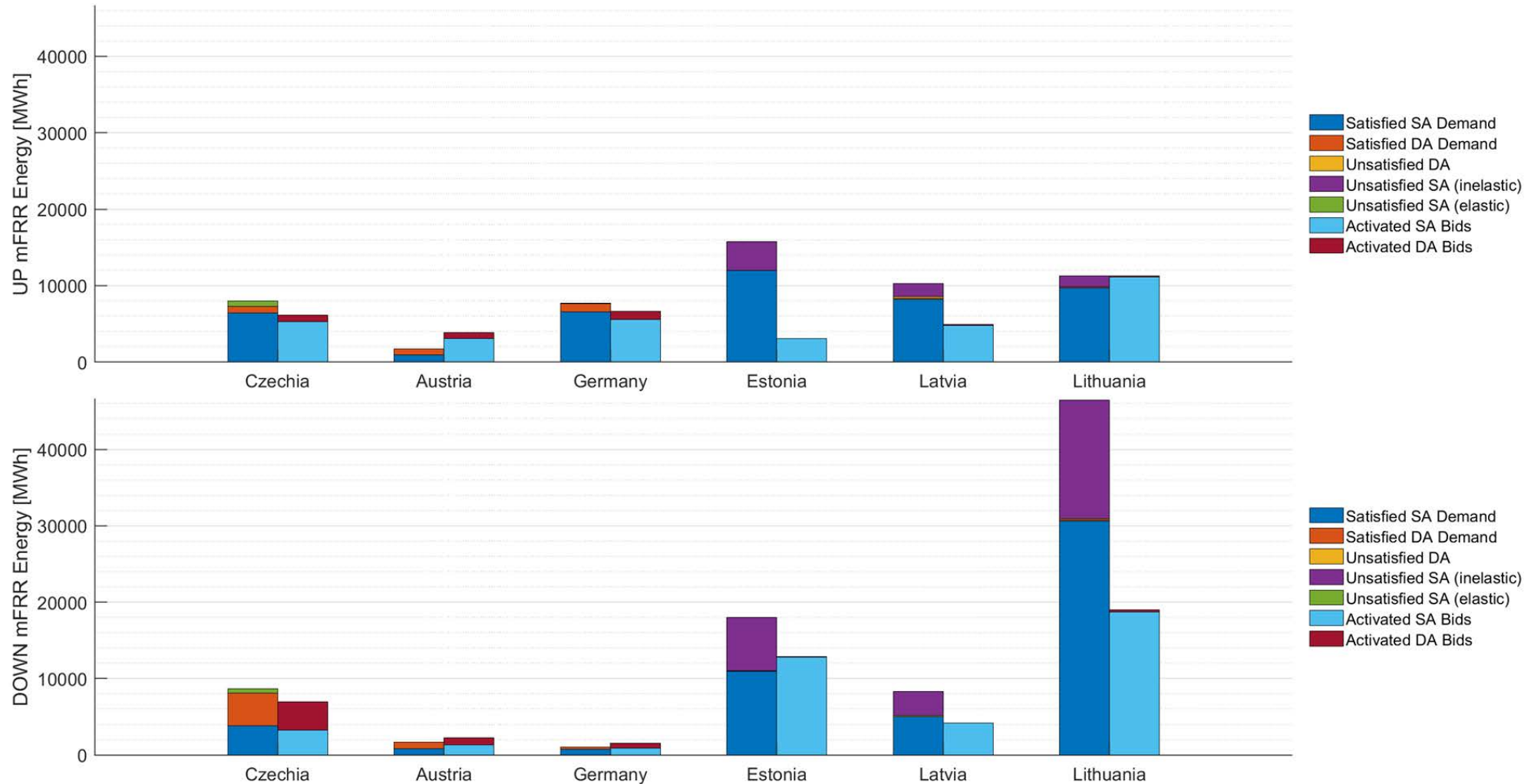
Featured analysis

- mFRR requested and activated via MARI → Which country requests and which country activated mFRR?
- mFRR demand per country → To which extent are direct and scheduled activations used?
- mFRR prices → What prices result from the activation?
- MARI economic surplus → Economic benefits resulting from MARI

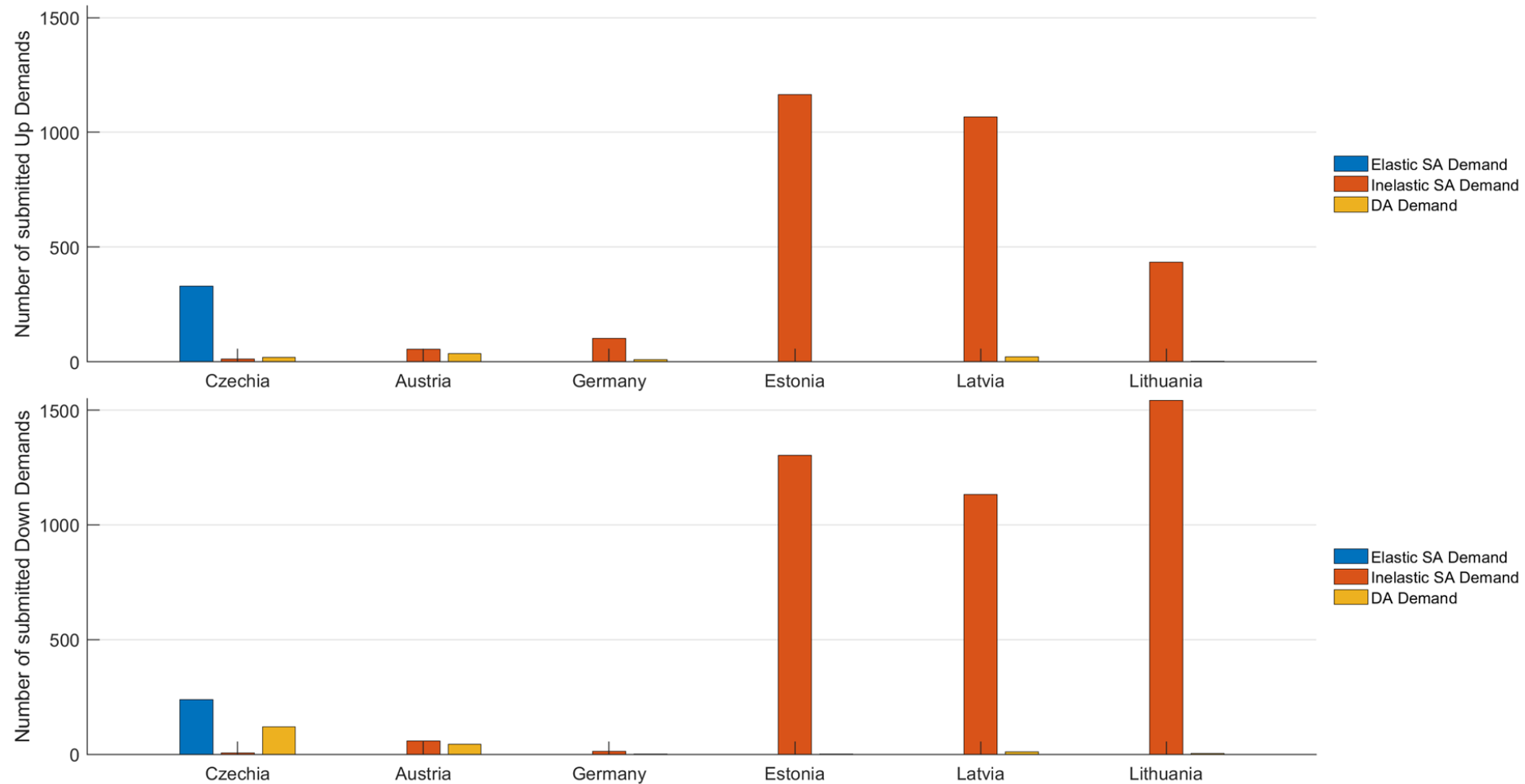
Operational Platform Reporting (ii)

mFRR requested and activated via MARI

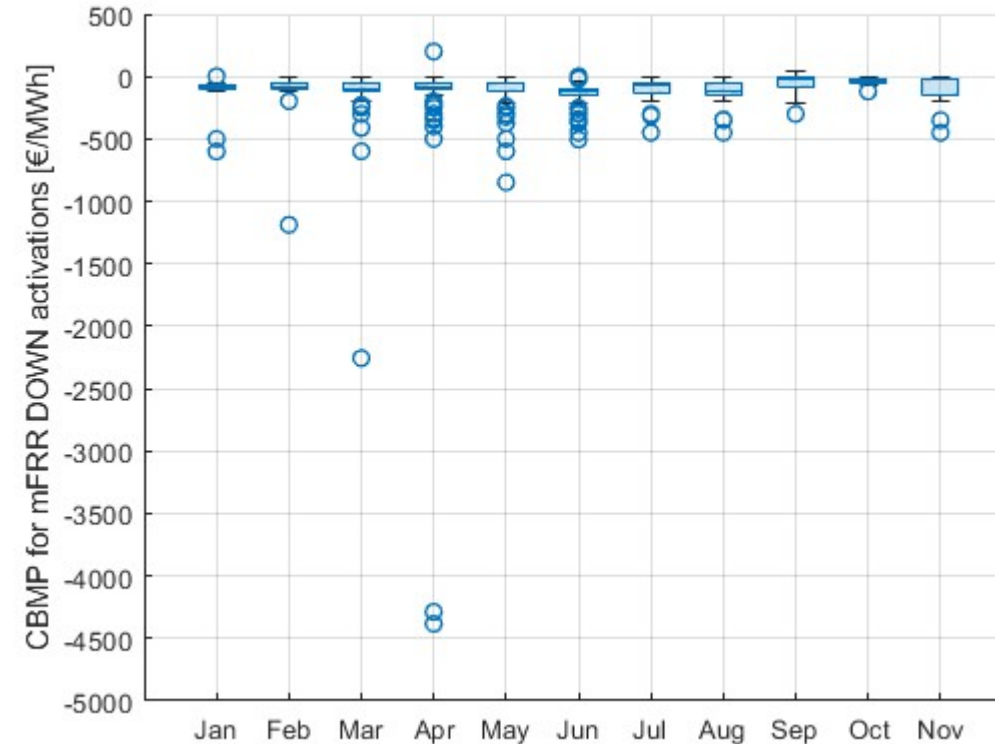
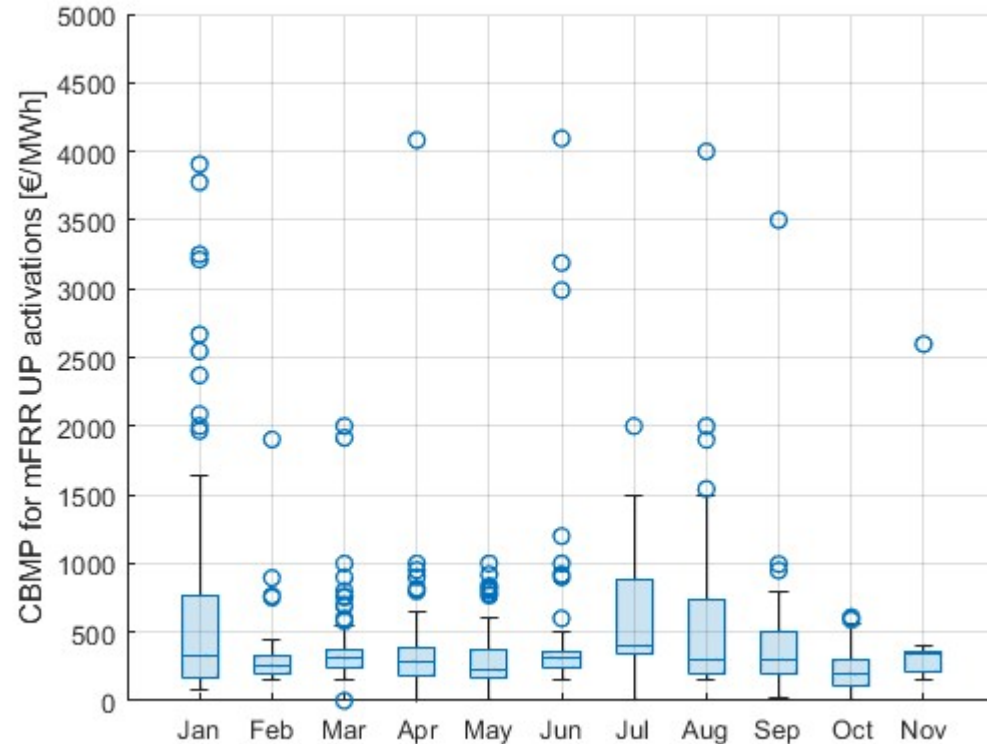
Based on operational data from
01/01/2024 – 15/11/2024



- » Baltic TSOs have activated more mFRR down and up since their accession in early October than CZ, AT and DE combined in all of 2024.
- » Baltic TSOs have significant amounts of unsatisfied demands, as no balancing capacity procurement is in place yet.

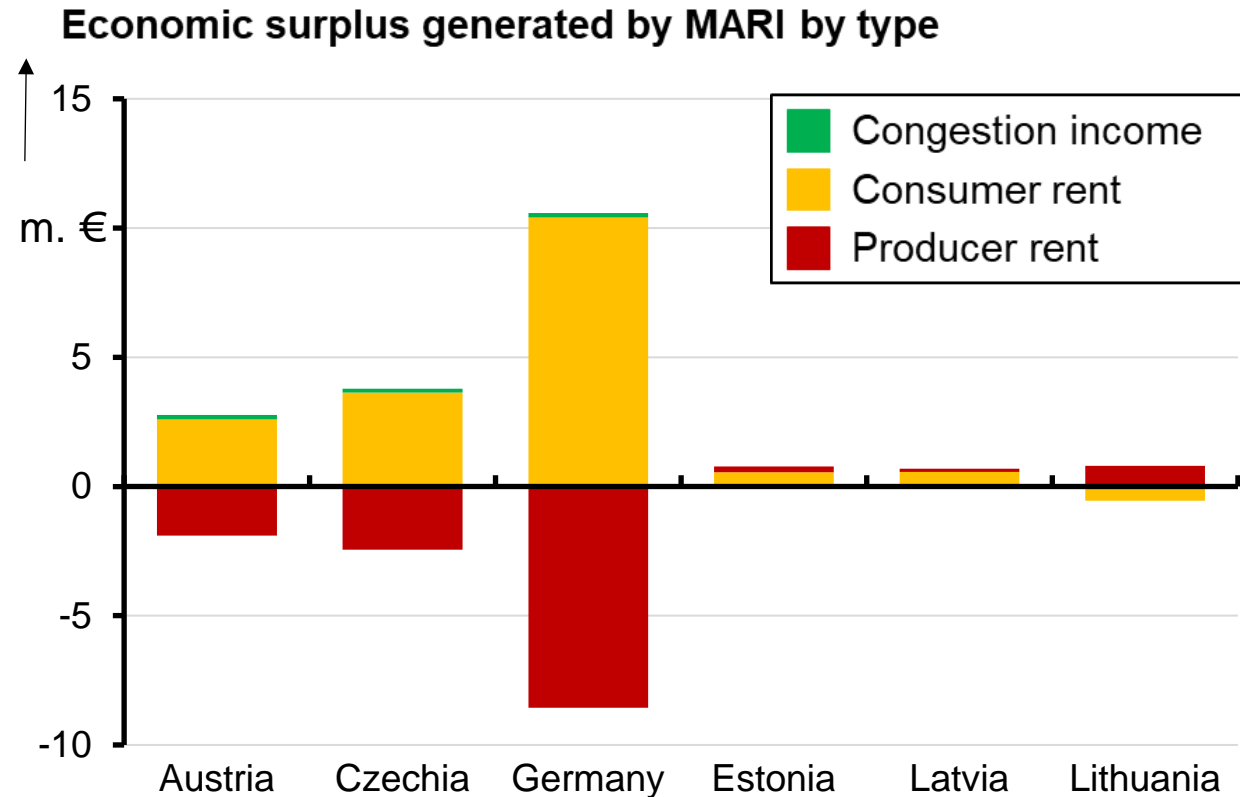


- » Less frequent activations with higher volumes from CZ, AT and DE compared to Baltic TSOs
- » Baltic TSOs use predominantly inelastic SA.
- » Only CEPS uses elastic demands.



- » For a better visibility of the majority of the prices, the y-axis is limited to $\pm 5,000$ €/MWh.
- » Majority of the activations are small volumes resulting in low prices on average.
- » Higher average prices as well as more outliers for positive mFRR
- » Accession of the Baltic TSOs had no significant impact on the distribution of the prices

- Calculation of economic surplus as comparison between actual mFRR activation with a reference scenario (same bids, demands and market design) but without exchange of balancing energy



- » Economic surplus (without pricing unsatisfied demand) sums up to 6 Mio. € from January to mid November 2024.
- » Including economic surplus from additionally satisfied demand, surplus increases to **468 Mio. €** for the same period in time due to large exchange volumes between Baltic TSOs.

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- The accession of member TSOs to the mFRR-Platform is planned in accordance with the following accession roadmap.
- MARI member TSOs share this accession roadmap for informative purposes only and it does not, in any case, represent a firm, binding or definitive position of MARI on the content.
- The content is subject to change as the implementation progresses and new information becomes available.
- In particular, the feasibility of the present accession roadmap may depend on final detailed accession planning and possible operational and/or technical constraints that would result in the maximum number of parallel accessions.
- Since last Accession Roadmap publication, RE anticipated its go-live to December 10th.

[Link](#) to latest published version (October 2024)

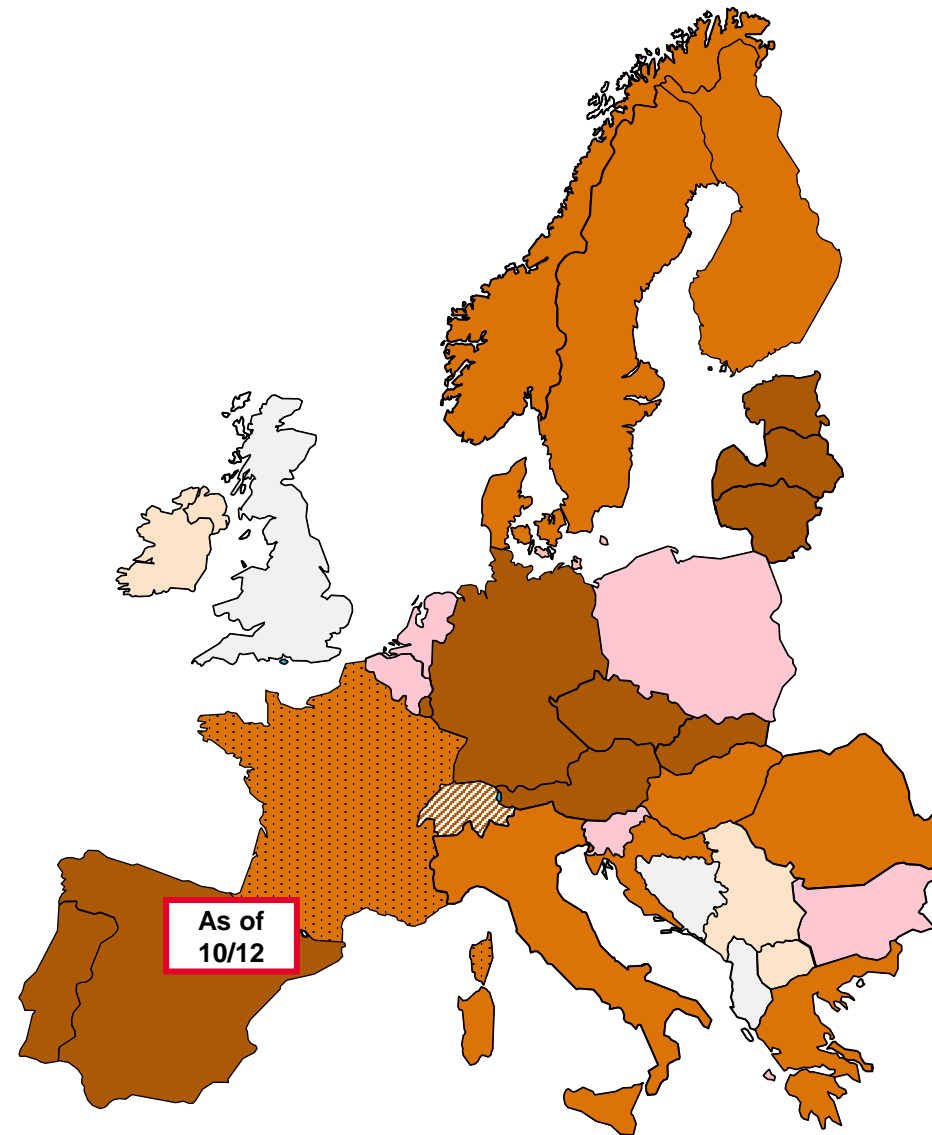
Legend	mFRR IF	
■	5.4.(b)(i)	National terms and conditions development
■	5.4.(b)(i)	National terms and conditions entry into force
■	5.4.(b)(iii)	Interoperability tests between TSO and mFRR-Platform
■	5.4.(b)(v)	TSO connection to mFRR-platform / Go-live
■	5.4.(b)(vii)	EBGL Article 62 Derogation considered / requested / granted

mFRR-Platform Accession Roadmap

Last updated on 10th October 2024 based on latest information available.

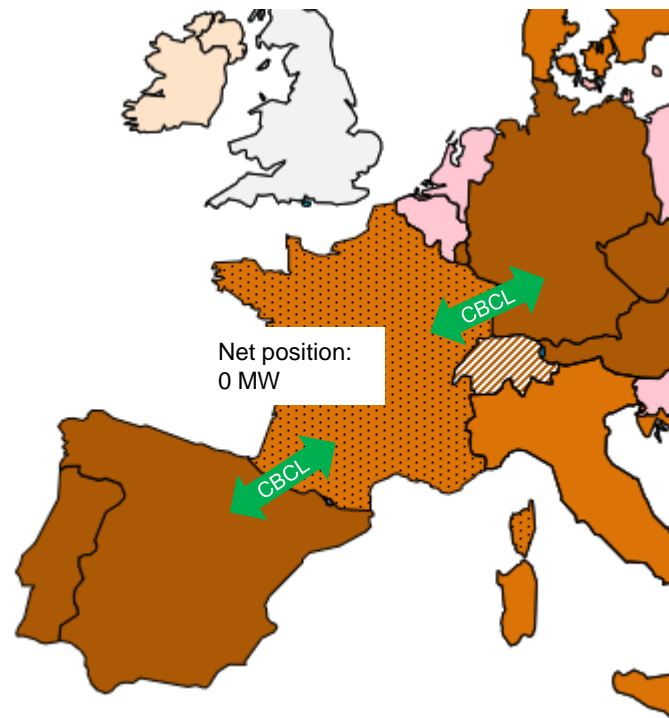
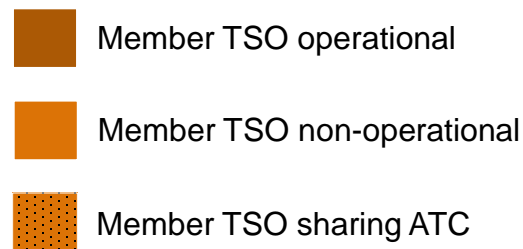
Country	Derogation deadline	Last published accession date	New accession date	TSO	2024												2025											
					7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12						
Germany				50Hz/AMP/ TTG/TNG	■																							
Czech Republic				CEPS	■																							
Austria				APG	■																							
Latvia ²	24/07/2024	Oct-24		AST	■																							
Lithuania ²	24/07/2024	Oct-24		LITGRID	■																							
Estonia ²	24/07/2024	Oct-24		ELERING	■																							
Portugal	24/07/2024	Sep-24	Nov-24	REN	■																							
Slovakia	24/07/2024	Dec-24		SEPS	■																							
Spain ¹²	24/07/2024	Q1 2025	Feb-25	RE	■																							
Belgium ¹¹	24/07/2024	Q1 2025	Mar-25	Elia	■																							
Bulgaria	30/06/2024	Q3 2025	Q2 2025	ESO	■																							
Slovenia ¹⁰	24/07/2024	Not available	Oct-25	ELES	■																							
Netherlands ⁷	24/07/2024	Q4 2025		TenneT BV	■																							
Poland ⁵	24/07/2024	Q4 2025		PSE	■																							
Hungary ⁴	24/07/2024	Q1 2026		MAVIR	■																							
Italy	24/07/2024	Not available		Terna	■																							
France ⁶	24/07/2024	Not available		RTE	■																							
Greece ¹	24/07/2024	Not available		IPTO	■																							
Romania ⁹	24/07/2024	Oct-24	Apr-26	Transelectrica	■																							
Denmark ³	24/07/2024	Not available		Energinet	■																							
Finland ³	24/07/2024	Not available		Fingrid	■																							
Sweden ³	24/07/2024	Not available		SVK	■																							
Croatia ¹³	24/07/2024	Not available		HOPS	■																							
EEA					■																							
Norway ³	24/07/2024	Not available		Statnett	■																							
Non-EU Member st																												
Switzerland ⁸		Not available		Swissgrid	■																							

- Member TSO operational
- Member TSO non-operational
- Member TSO sharing ATC
- Technical readiness*
- Go-live foreseen in 2025
- MARI observer



*The technical readiness of Swissgrid has been acknowledged. The participation of Switzerland in the mFRR-Platform is regulated based on article 1.6 and 1.7 of the EB Regulation and is currently the subject of litigation by Swissgrid at the Court of Justice of the European Union.

- The objective of the Available Transmission Capacity (ATC) sharing concept is to voluntarily enable Member TSOs who are not yet operational to increase the balancing energy exchange possibilities for operational TSOs.
- As a side-effect, the ATC sharing TSO participates in the distribution of possible congestion income generated on its borders.
- RTE/France are applying ATC sharing on voluntary basis to facilitate mFRR SA exchanges between otherwise not directly connected areas as indicated in the picture below.



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Summary

- In 2024, Elering (2024/10/02), AST (2024/10/04), Litgrid (2024/10/08), REN (2024/11/27), SEPS (2024/12/03) and RE (2024/12/10) have successfully joined MARI.
 - The voluntary ATC sharing of RTE now enables mFRR exchange between the Iberian peninsula and the Central European region of MARI.
- Economic surplus of MARI sums up to 6 Mio. € from January 2024 to mid-November 2024
 - Most economic surplus is generated in Germany (2 Mio. €).
 - Considering unsatisfied demand significantly increases the economic surplus (468 Mio. €).
 - More reliable calculation of economic surplus to be expected after exchange between Baltic TSOs and MARI core region can be enabled.
- Moderate mFRR prices: Only six price incidents in 2024 (2024/04/05, 2024/04/07, 2024/05/12, 2024/06/03, 2024/08/29 and 2024/09/05)
- In first week of operation, Baltic TSOs have activated more mFRR than APG, ČEPS and German TSOs in 2023 due to different constraints in system operation.

Outlook

- Also in 2025, MARI will continuously grow by further accessions.

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ANY QUESTIONS?

Acronym	Meaning	Acronym	Meaning
aFRR	Frequency Restoration Reserves with automatic activation	EnC	Energy Community
AOF	Activation Optimization Function	IF	Implementation Framework
ATC	Available Transmission Capacity	LFC	Local Frequency Controller
BSP	Balancing Service Provider	LIBRA	Name of the software
CBMP	Cross-Border Marginal Price	MARI	Manually Activated Reserves Initiative
CMM	Capacity Management Module	mFRR	Frequency Restoration Reserves with manual activation
CMOL	Common Merit Order List	PCN	Physical Communication Network
CSP	Common Service Provider	RR	Replacement Reserves
DA	Direct Activation	SA	Scheduled Activation
EBGL	Electricity Balancing Guideline	TSO	Transmission System Operator
FCR	Frequency Containment Reserves	XB	Cross-border