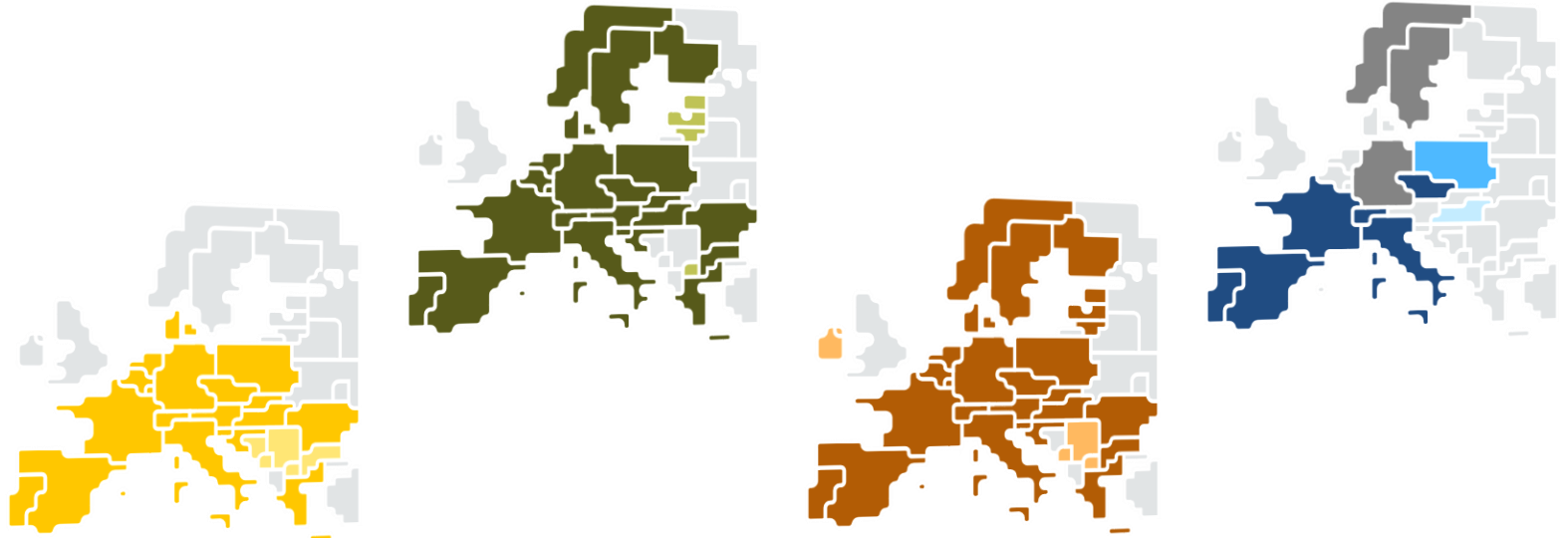





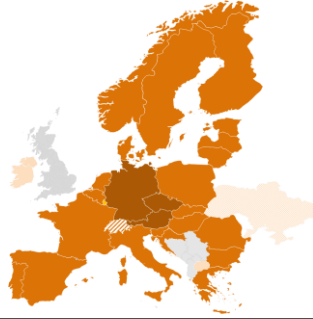
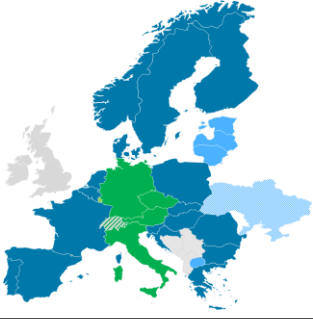
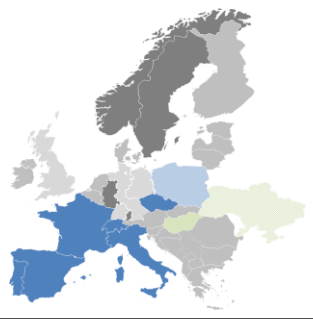
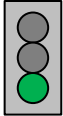
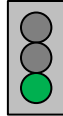
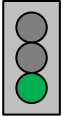
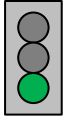
Update on Balancing Platforms

February 28th, 2024
MESC meeting



Introduction

Overview on current status of European Balancing Platforms

	IGCC	MARI	PICASSO	TERRE
Balancing service	IN	mFRR	aFRR	RR
Participants				
Target area	Continental Europe	Europe	≥ Continental Europe	≥ RR TSOs
Go-live	24/06/2021 & operational since 01/10/2011	05/10/2022*	22/06/2022*	29/09/2020*
Status				
Highlights	Economic surplus of around ~620 Mio. € in 2023	Economic surplus of 8.5 Mio. € in 2023	Economic surplus of more than 134 Mio. € in 2023	Economic surplus of more than 280 Mio. € in 2023

* Date as of when cross-border exchanges were possible due to neighboring TSO joining. Technical go-live of platform was earlier.

- » European domestic market (at least) for balancing energy has been established in 2022.
- » European market design has significantly changed the local procurement rules.

Introduction

Ongoing activities

- TSOs are preparing for their connection to the MARI and PICASSO platforms. Based on the most recent planning an adaptation of the accession roadmap from October is necessary.
 - This updated accession roadmap will be published end of February / beginning of March (instead of the “usual” update in April).
 - If there are no major changes after this publication until July 2024, the next update will be following in October 2024
- TSOs submitted the aFRR IF and Pricing Methodology proposals to ACER on 2nd February 2024
 - First discussion regarding the detailed planning took place at the EBCG-meeting

Market Results

Important achievements in IGCC

- All TSOs with the obligation to connect as a result of the EB Regulation are connected to IGCC*.
- IGCC is the first Balancing Platform to achieve this objective.



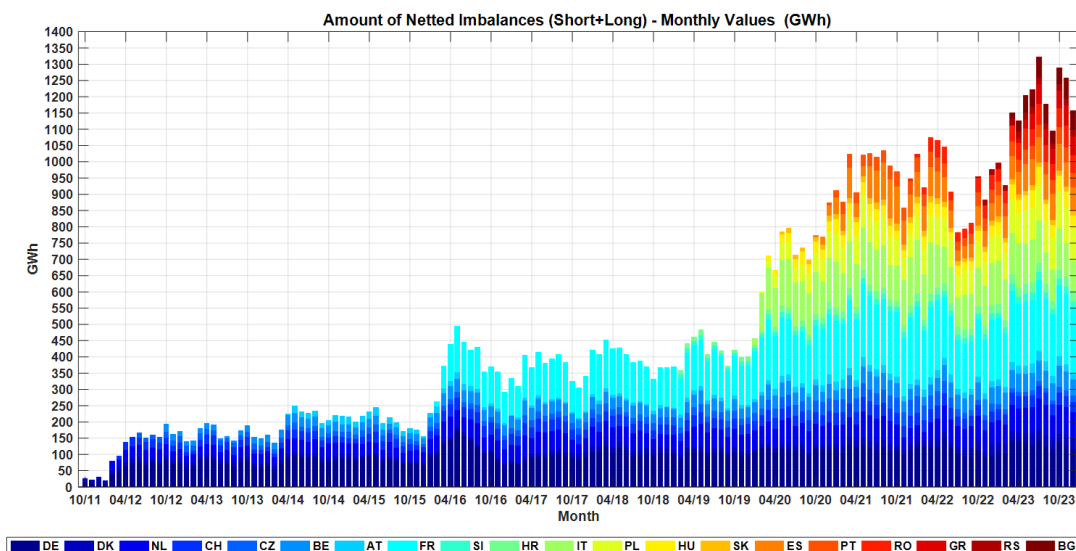
- IGCC has 27 members in total, out of which
 - 24 are operational members and
 - 3 are observers.
- With the go-live of ESO in March, all EU-TSOs are connected and can net their imbalances.
- Historical evolution (starting in 2010):



- Outlook 2024: planning of the accession of the Baltic TSOs to IGCC ongoing (Baltic TSOs submitted request to become member)

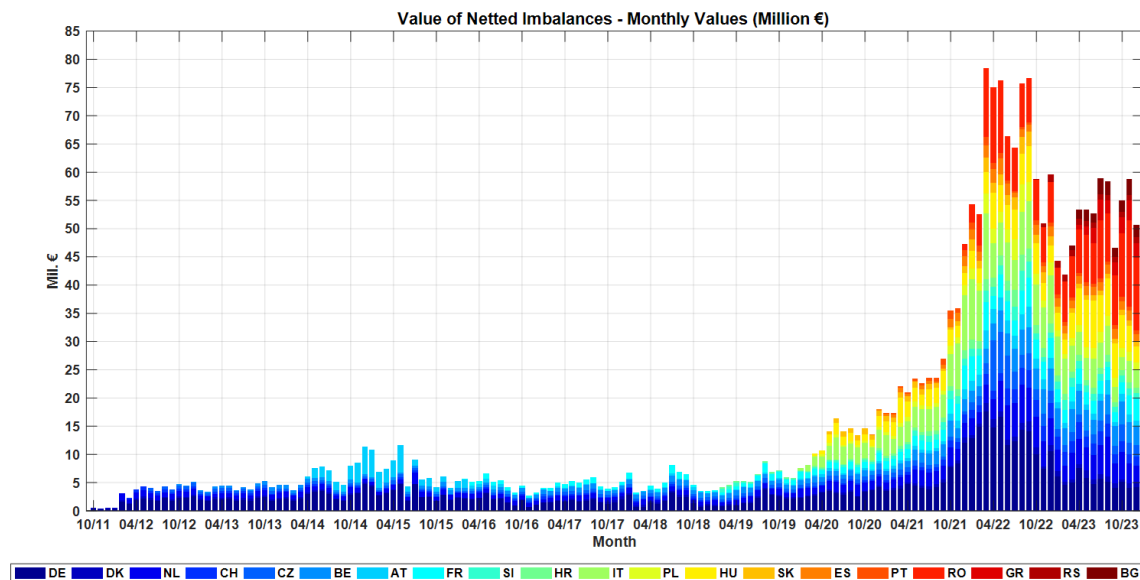
Market Results including Q4/2023

Imbalance Netting Energy Exchanges in IGCC



- The quarterly energy savings have reached around 3707 GWh in Q4/2023.
- After a temporary drop due to the PICASSO go-live, the netted imbalances reached a new all time high in Q3 (with a maximum of 1,324 GWh in July). This increase has been caused by the further increase of the available transmission capacity.

- The value of quarterly energy savings have reached around 164 million € in Q4/2023 and around 621 million € in the first 2023.
- In May 2023, the total aggregated savings of the IGCC passed the mark of 2 billion Euros. This is less than 1 ½ years after the 1 billion Euro mark has been passed, underlining the recent massive increase in energy savings.

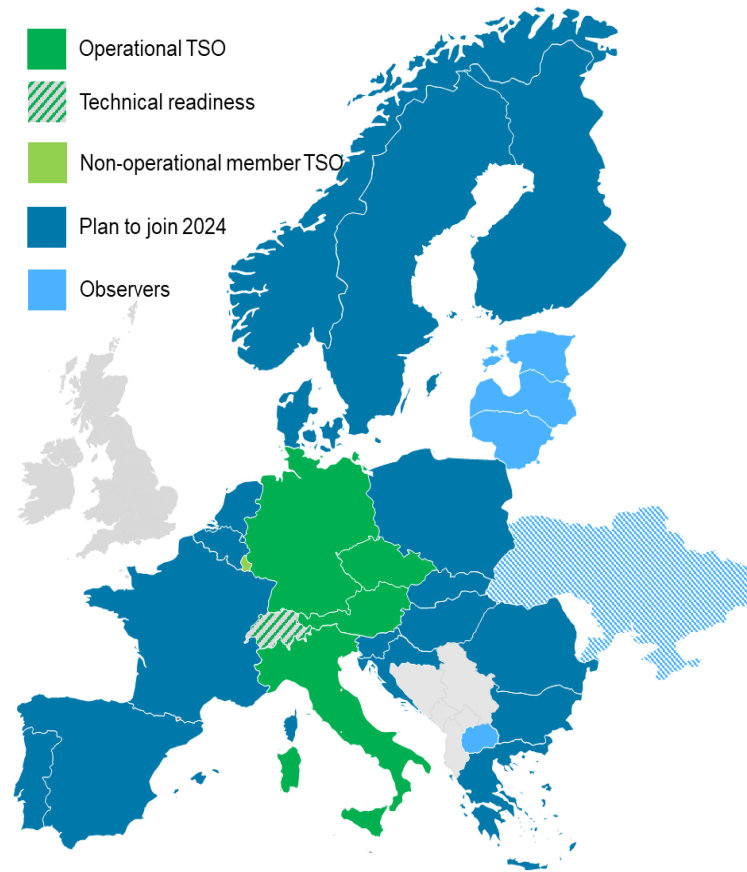


Platform for the International Coordination of automated Frequency Restoration and Stable System Operation (PICASSO)

- The “Platform for the International Coordination of Automated Frequency Restoration and Stable System Operation” (PICASSO) has been endorsed by all TSOs in 2017 as implementation project for the European aFRR platform pursuant to GL EB.
- Currently, 26 TSOs from 23 countries have joined the project. 4 TSOs and ENTSO-E are observers.
- Successful go-live on June 1st, 2022 with CEPS as first operational member, earlier than required by the regulation
- First exchange of energy on June 22nd, 2022, after APG and the 4 German TSOs joined the platform, on 19th July TERNA joined
- The remaining Member TSOs will gradually join the platform

Relevant Features

- The PICASSO Platform establishes a European domestic energy market for aFRR energy, based on a common standard product.
- PICASSO fosters operational stability by coordinating the activation of aFRR.
- Using a market time unit of 4 seconds. The PICASSO optimizer has performed more than 7.8 Mio. market clearings per month 100 % availability.
- The PICASSO IT solution is also used for the International Grid Control Cooperation (IGCC), which is closely interacting with the PICASSO Optimization to maximize the economic surplus while ensuring that the netting potential of all IGCC TSOs is used.

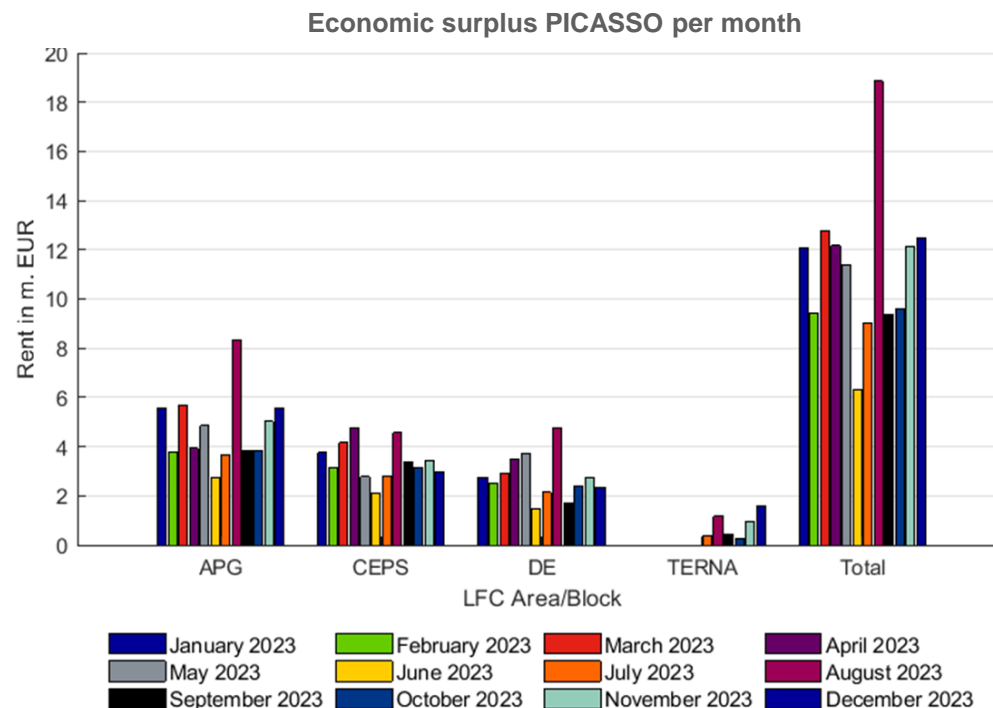


* based on the current accession roadmap which includes additional information and risks on the planning

Market Results until End of December 2023

Economic surplus PICASSO

- Economic surplus is calculated by comparing the actual activation of aFRR to a reference scenario with the same bids, demands and market design, but without international interchange.
- Economic surplus from October 2023 until December 2023 was around 34 Mio. € (without additional satisfaction of demand). See next slide for details regarding the additional demand satisfaction
- Economic surplus higher for small LFC areas, that get access to a much larger market via PICASSO



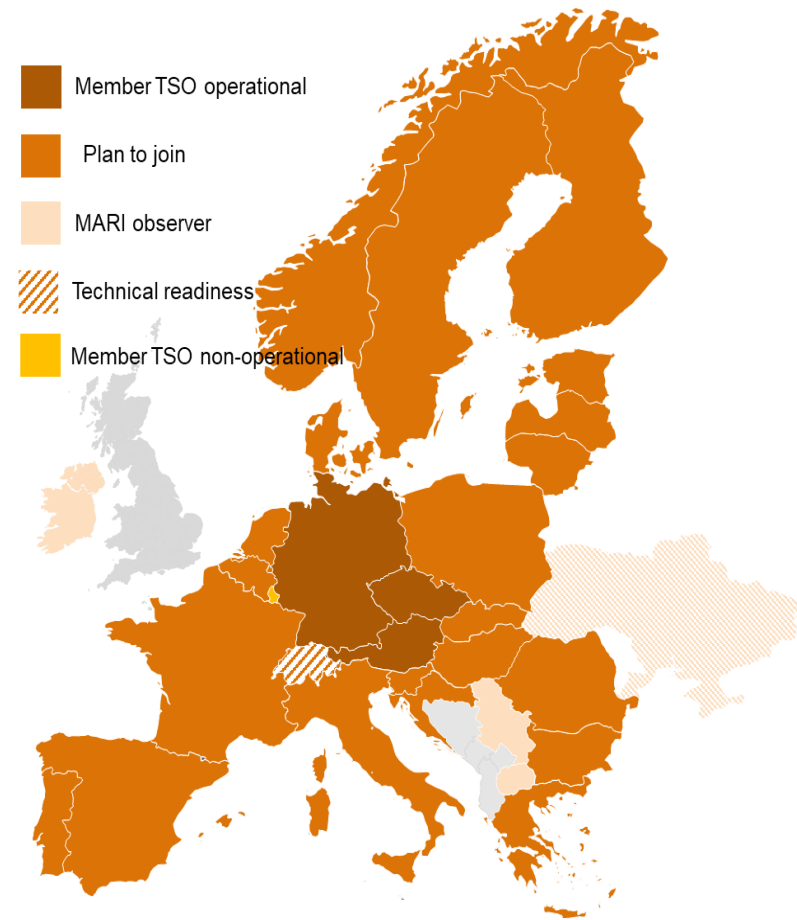
Manually Activated Reserves Initiative (MARI)

Overview

- Project “Manually Activated Reserves Initiative” (MARI) has been set up already in 2017 to provide the basis for a European mFRR platform.
 - Currently, 29 TSOs from 26 countries have joined the project (Creos as non-operational member only).
- Start of dry-run (CEPS) on 2022/07/18
- Technical go-live on 2022/09/15
- First TSOs (CEPS and German TSOs) joined on 2022/10/05.

Relevant Features

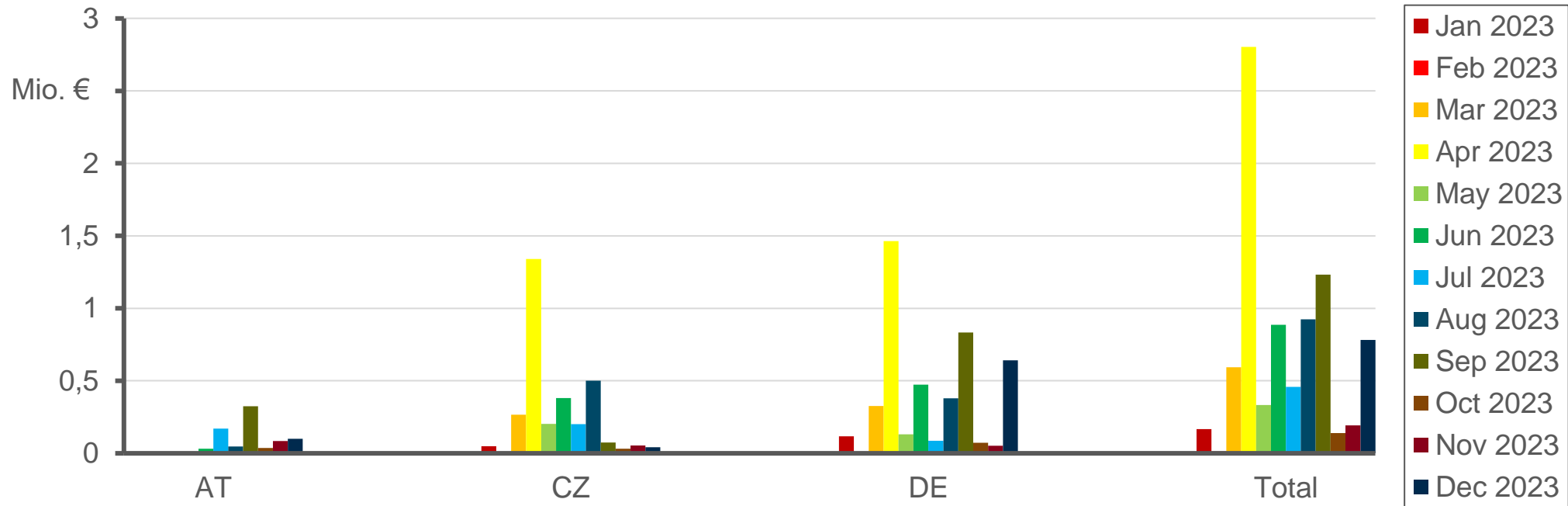
- Counter activation of mFRR balancing energy for economic optimization
 - mFRR balancing energy bids can be activated either for balancing or (locally) for system constraints purposes
 - Direct and scheduled activation
 - 100 % availability since go-live
- » Road to individual TSOs go-live will also continue in 2024.



* based on the current accession roadmap which includes additional information and risks on the planning

- 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 generated by MARI per month



- » Economic surplus (without pricing unsatisfied demand) sums up to 8.5 Mio. € for 2023.
- » Including unsatisfied demand economic surplus is 9.6 Mio. € for the same period in time.

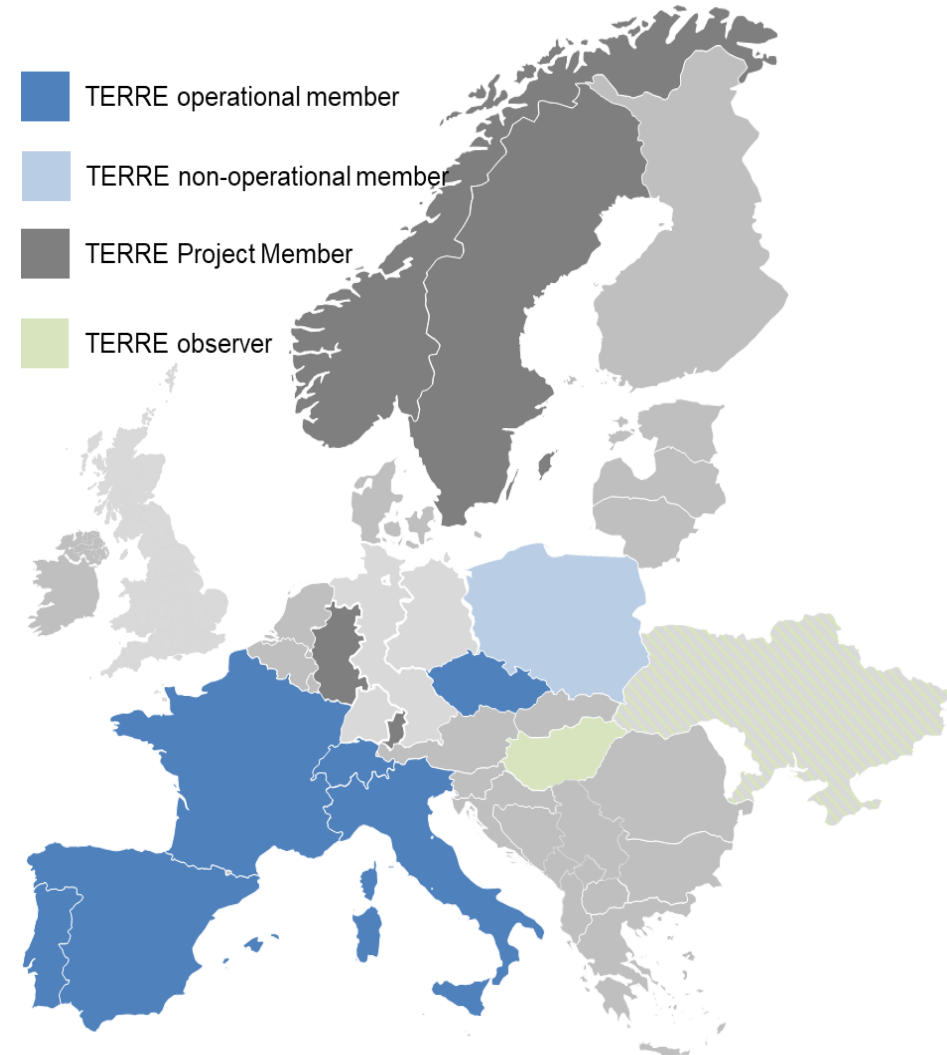
Trans European Replacement Reserves Exchanges (TERRE)

Last main milestones

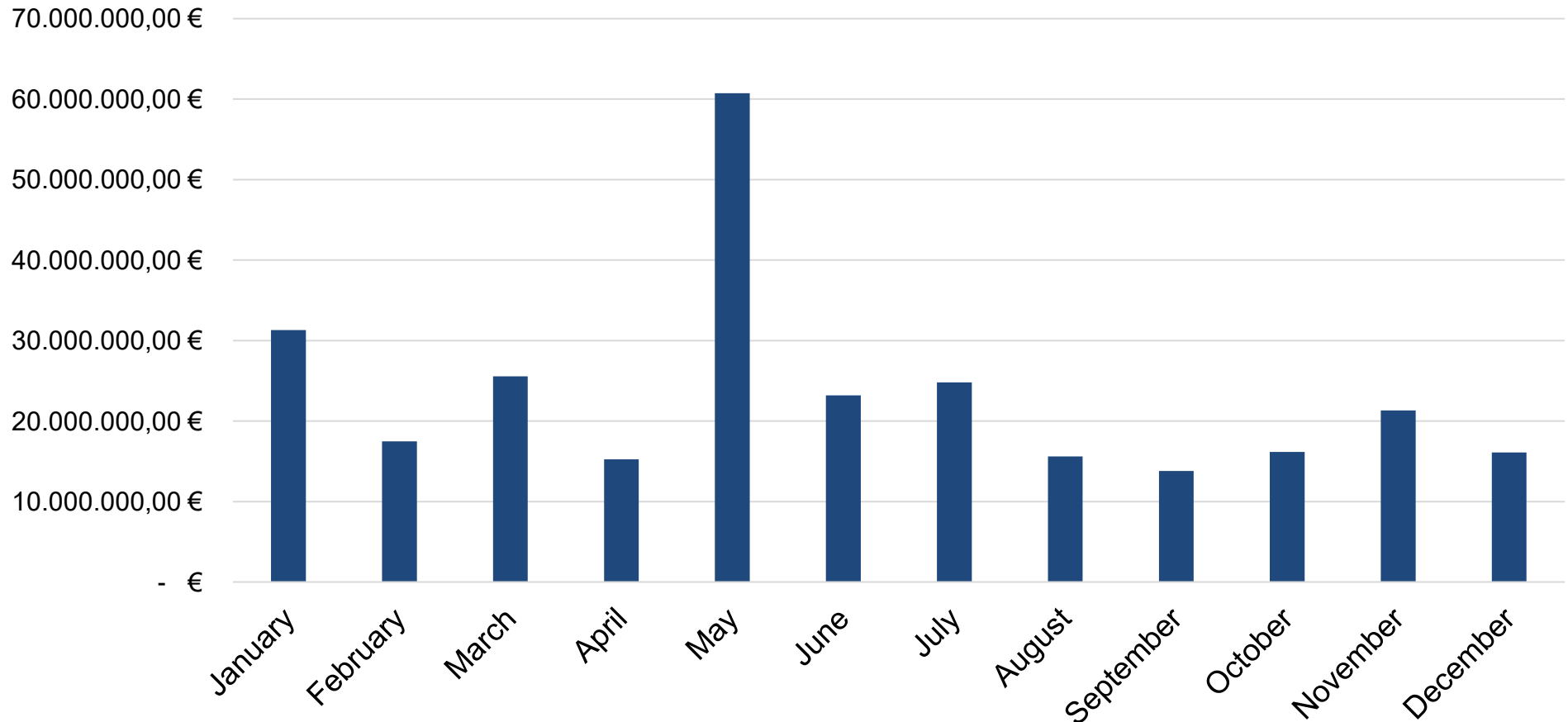
- The “Trans European Replacement Reserves Exchanges” platform include:
 - 6 operational members: REN (Portugal), Red Electrica (Spain), RTE (France), Terna (Italy), Swissgrid (Switzerland), CEPS (Czech Republic)
 - One non-operational member: PSE (Poland) which is expected to connect in 2024.
 - Two observers: Mavir (Hungary) and ENTSO-E

Relevant update

- TERRE TSOs met RR NRAs twice in October to share the main results of the public survey and possible way forward with the number of clearings. Another meeting will be organized in January. Some updates shall be communicated during the next Balancing Platform Stakeholder Workshop (30/11).
- TERRE TSOs officially approved two new TSOs to become observers:
 - Ukrenergo (27/01)
 - Eirgrid (07/09)



Economic surplus (€)



- TERRE platform provides important financial benefits for all countries involved in the project, around 24 million € per month on average. In total, for the year 2023, the global economic surplus reaches more than 280 million €.

Conclusions

Outlook

- European TSOs have implemented MARI and PICASSO since 2017 (i. e. before entry into force of Guideline Electricity Balancing).
 - Several hundred experts from TSOs have contributed to MARI and PICASSO in the last years.
 - Also, cross-platform related topics are addressed under the framework of MARI.
 - During 2022, high CBMP were observed in both platforms (in relation to high day-ahead prices). Some TSOs that are technical ready to connect before their end of the derogation have delayed their go-live also based on these high CBMP. All TSOs and the platforms have investigated several mitigation measures that are at the moment under public consultation.
- PICASSO started operation in June 2022
 - Road to individual TSOs go-live will also continue in 2024
 - Using a market time unit of 4 seconds, the PICASSO optimizer has performed more than 10 Mio. market clearings since go-live with 100 % availability.
- MARI in in operation since October 2022
 - APG joined MARI on 2023/06/20.
 - The platform represents the hinge between TERRE and PICASSO.
- TERRE is in operation since January 2020.
 - Since the go-live 6 TSO connected to the platform (24 daily gates)
 - Ongoing exchanges with RR NRAs to agree on a way forward for the future RR process.
- First market results already show significant economic surplus generated by balancing platforms.
 - IGCC generated an economic surplus in 2023 of around 620 Mio. €.
 - TERRE generated an economic surplus of more than 280 Mio. € in 2023
 - PICASSO generated an economic surplus of more than 134 Mio. € in 2023.
 - MARI generated an economic surplus of more than 8.5 Mio. € in 2023.