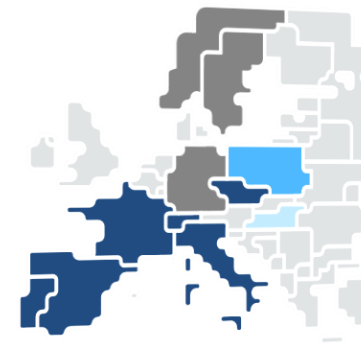
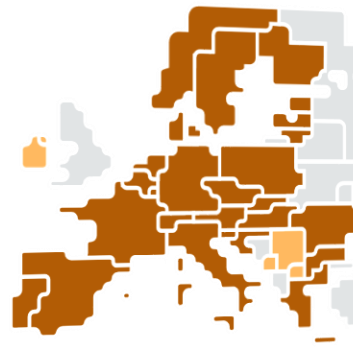




Update on Balancing Platforms

March 9th, 2023
Web Conference



Introduction

Background and Motivation

Regulatory background

- Entry into force of Guideline Electricity Balancing on 2017/12/18
- Entry into force of Clean Energy Package on 2019/06/25

Target model based on Guideline Electricity Balancing

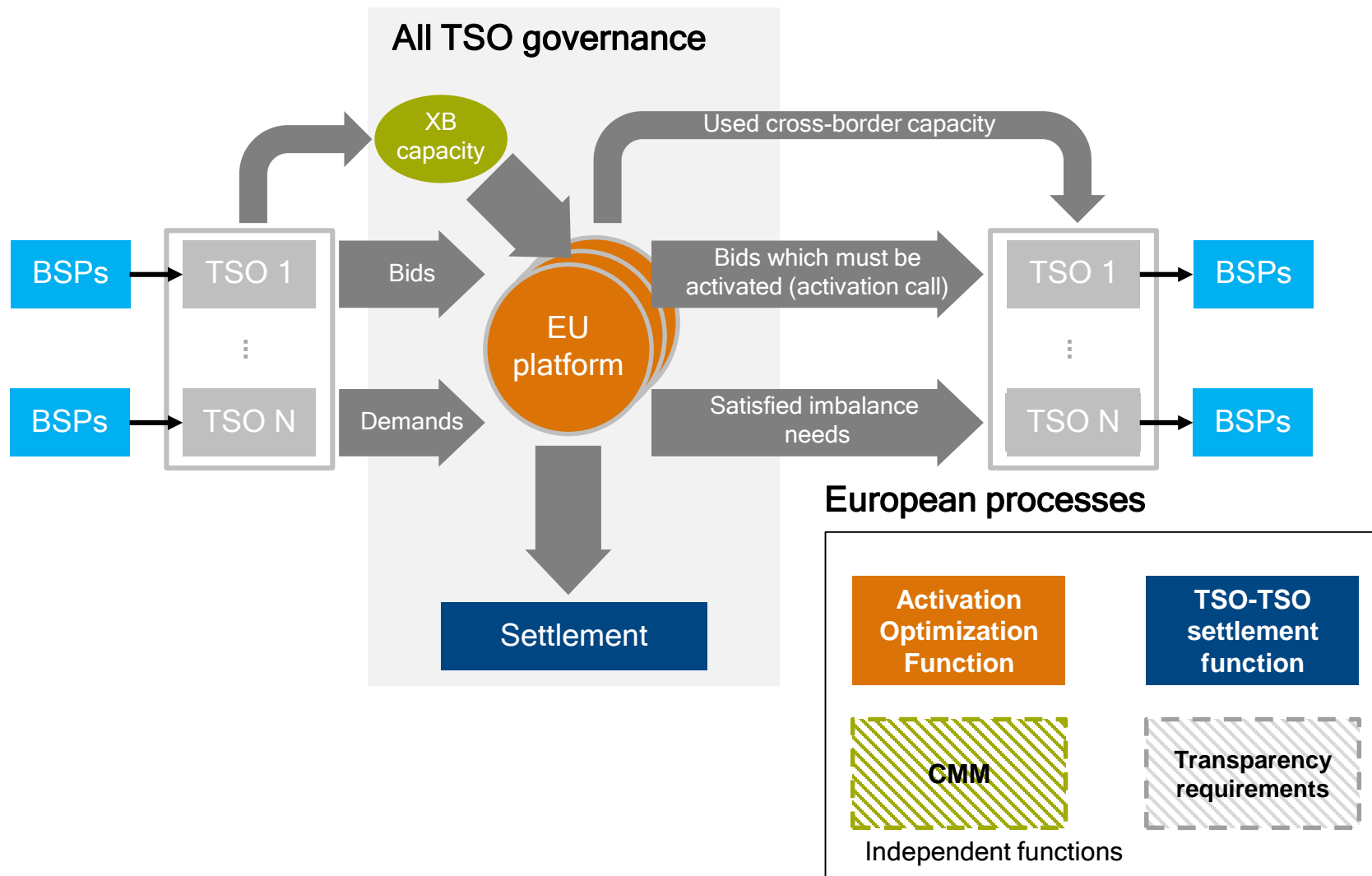
- European domestic market for balancing energy
- Separate procurement of balancing capacity and energy
- Marginal pricing (at least) for balancing energy
- Minimum requirements for balancing capacity cooperations

Additional requirements based on Clean Energy Package

- Regional sizing of reserves
 - Facilitation of balancing capacity procurement
-
- » (Voluntary) regional projects may have facilitated early implementations.
 - » But European projects (balancing platforms) facilitate target model according to GL EB.


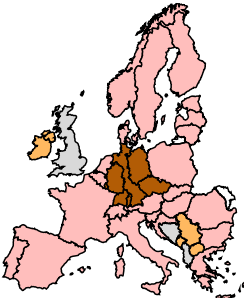


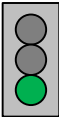
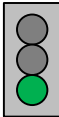
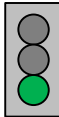
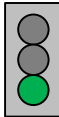
Introduction

Concept of Balancing Platforms (Exemplary Setup)



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	Social welfare gain of around ~790 Mio. € in 2022	Cross-border exchange around 300 MWh between DE and CZ until January 2023	Reached a social welfare of 375 Mio. € (without additional satisfaction of demand) in 2022	Will launch a public consultation in Q1/2023 on additional daily clearings.

* 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.

Conclusions

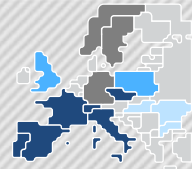
Outlook

- European TSOs have started implementing MARI and PICASSO already in 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.
- PICASSO started operation in June 2022, MARI in October 2022.
 - Road to individual TSOs go-live will also continue in 2023 and 2024, with RTE and TERNA planning to join as next TSOs (PICASSO) and APG (MARI).
 - During the summer, high CBMP were observed (in relation to high day-ahead prices). Occurrence of price peaks (several seconds) up to the price cap.
 - Using a market time unit of 4 seconds, the PICASSO optimizer has performed ~ 4,125,000 market clearings in 2022 with 100 % availability.
- TERRE is in operation since January 2020.
 - Since the go-live, 6 TSO connected to the platform, 24 daily gates
 - Public consultation to be launched end of Q1/2023 to increase the number of daily gates
- First market results already show significant welfare gains by balancing platforms.
 - IGCC gained a social welfare in 2022 of around 790 Mio. €.
 - PICASSO generated a social welfare of 375 Mio. € (without additional satisfaction of demand) in 2022.
 - MARI has facilitated an exchange around 300 MWh between CZ and DE until January 2023. More exchanges are expected when additional TSOs connect.



Backup

- Important change in RR process: Upcoming public consultation
- Market results until end of January 2023 – details
 - IGCC
 - MARI
 - PICASSO



- **RR IF Article 11.5:**

(1) All RR TSOs shall harmonize number of daily clearings:

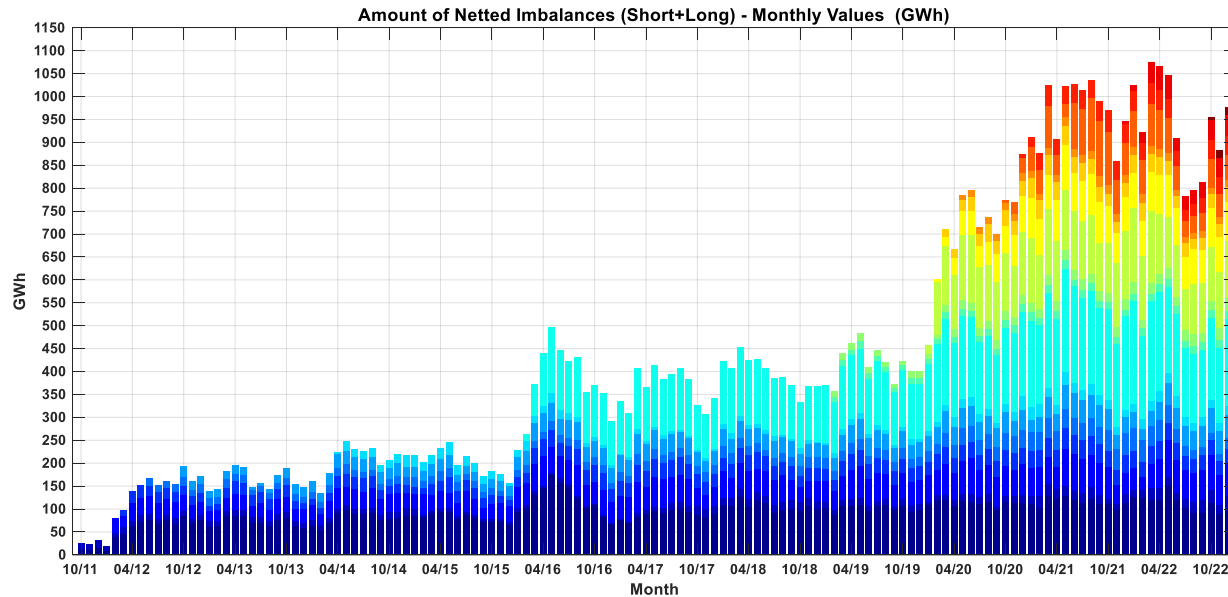
- (a) At the go-live of the RR-Platform, the number of daily gates will be 24. The RR TSOs will reduce the cross-border scheduling steps to less than 60 minutes for the borders included in the Region. The deadline will be the date required by the EBGL for using the European Platform for exchange of mFRR which is still subject for possible derogation and the date required by the CACM regulation for the intraday cross zonal gate closure frequency definition.
- (b) Starting from this deadline, the cross-border scheduling step will be 15 minutes, therefore an increase of the number of daily gates, may be evaluated taking into account the maturity of the European balancing market at that time.

- **Last updates**

- TERRE TSOs studied numerous options to increase the number of daily gates in the RR process.
- First conclusions were presented to RR NRAs during an IG meeting on the 28th November 2022.
- TERRE TSOs and RR NRAs decided to submit 2 main possible options : 48 or 96 gates.
- TERRE TSOs aim at launching the public consultation by the end of Q1 2023.

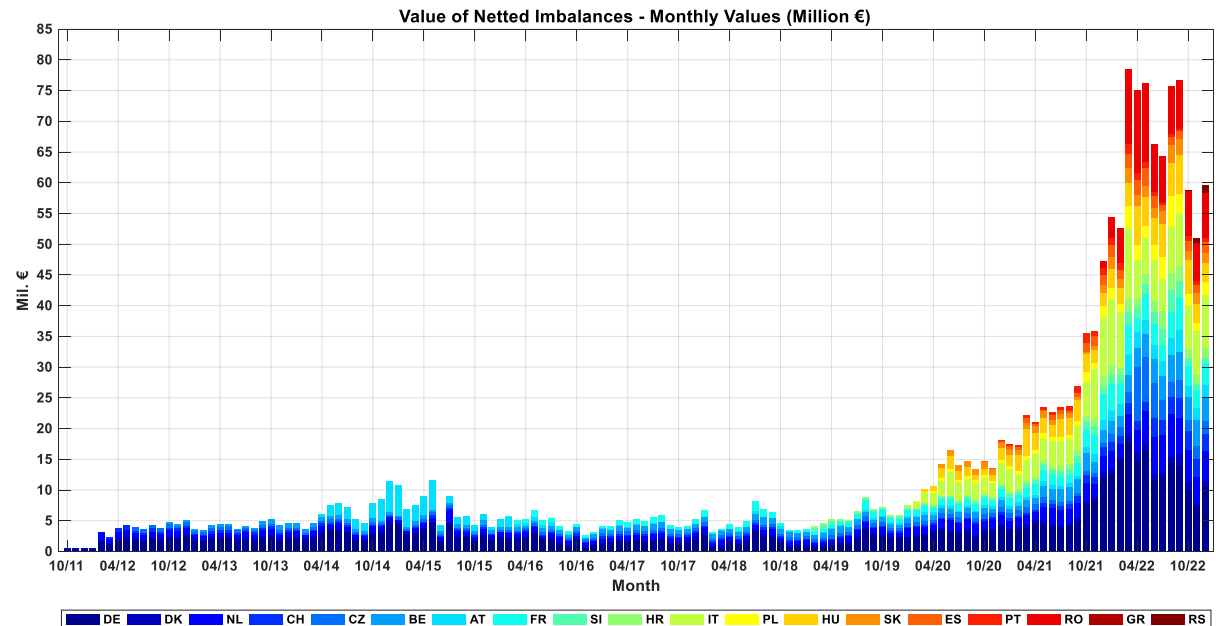
Market Results until End of January 2023

Imbalance Netting Energy Exchanges in IGCC



- The quarterly energy savings have reached around 2813GWh in Q4 2022 and 11,24TWh during all 2022 year .
- New record of monthly value amount of netted imbalances more than 1TWh in March and April 2022
- The impact of PICASSO go-live is visible from June 2022.

- The value of quarterly energy savings have reached around 170 million € in Q4 2022 and 789 million € during all 2022 year.
- The impact of the critical increase of energy price is visible, increasing the value of netted imbalances from end of 2021.
- The impact of PICASSO go-live is visible from June 2022.




Important achievement 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
 - 23 are operational members
 - 1 is non-operational (ESO) and
 - 3 are observers

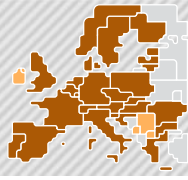
 IGCC operational member
(participating TSO)

 IGCC Observer

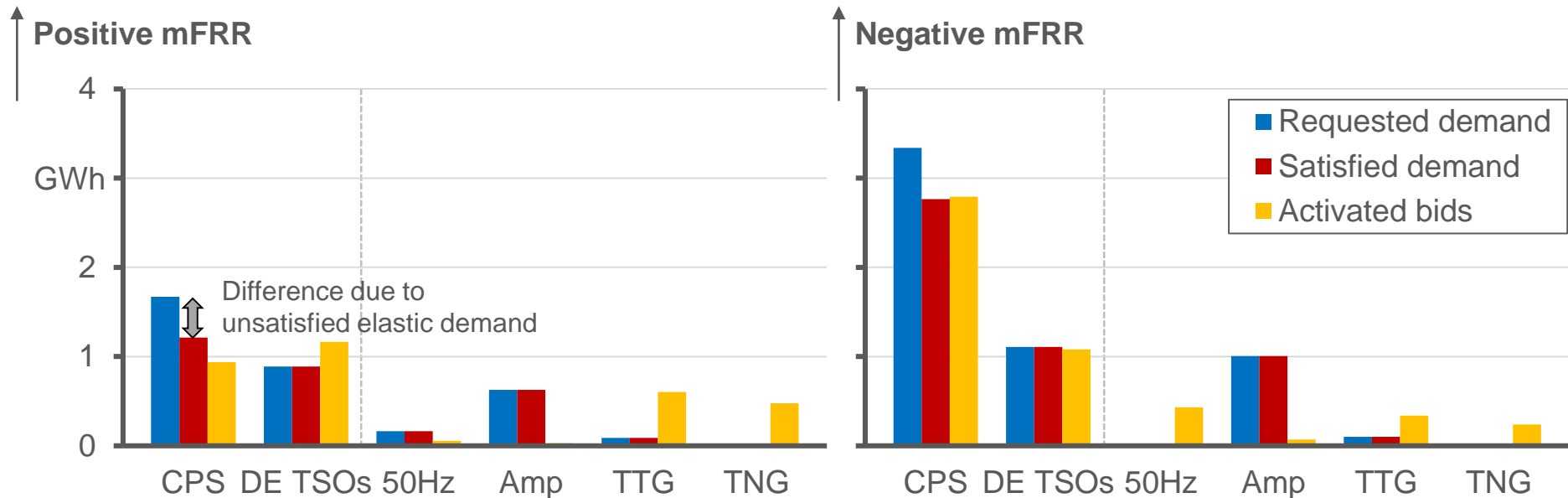
*At this time, ESO is expected to connect~~ion~~ at end of February

Market Results until End of January 2023

mFRR Energy Exchange in MARI



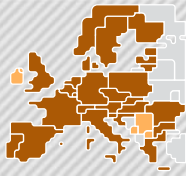
- Overview on requested, satisfied and activated mFRR from 2022/10/05 to 2023/01/31 (4 months) on the mFRR platform
 - Additional differentiation between TSOs (LFC areas) in Germany



- » Price elastic demand is applied by CEPS.
- » Generally, more activation of negative than positive mFRR
- » In sum, net export of 275 MWh of positive mFRR balancing energy from Germany to Czech Republic and 27 MWh of negative mFRR balancing energy from Czech Republic to Germany.

Manually Activated Reserves Initiative (MARI)

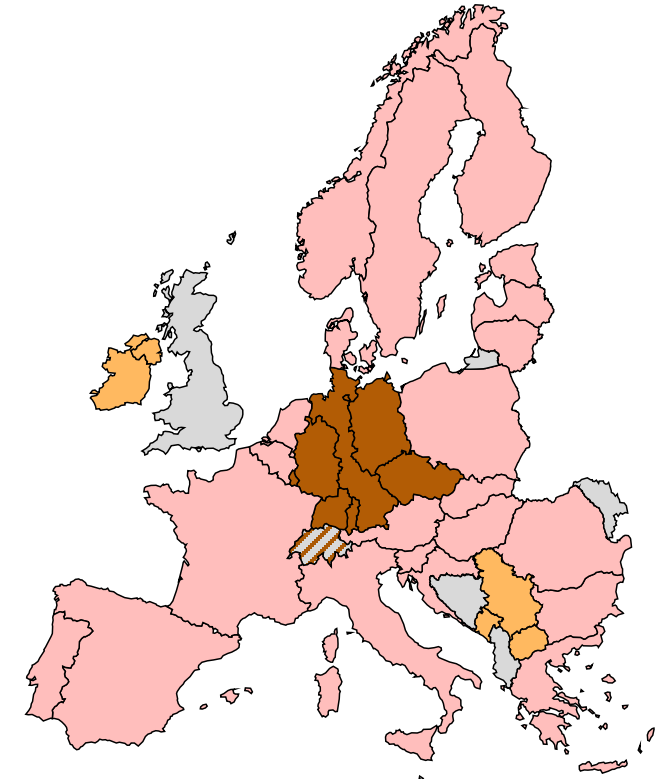
Overview



- 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 18/07/2022
- Technical go-live on 15/09/2022
- First TSOs (CEPS and German TSOs) joined on 05/10/2022.

Relevant Features

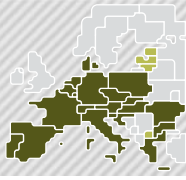
- Counter activation of mFRR balancing energy for economic optimization
- Activation for purposes other than balancing are not prohibited.
- One common standard product in Europe with some national specialties (due to unit-based vs. portfolio-based bidding)
- » Road to individual TSOs go-live will also continue in 2023 ([link to latest version of accession roadmap](#)).



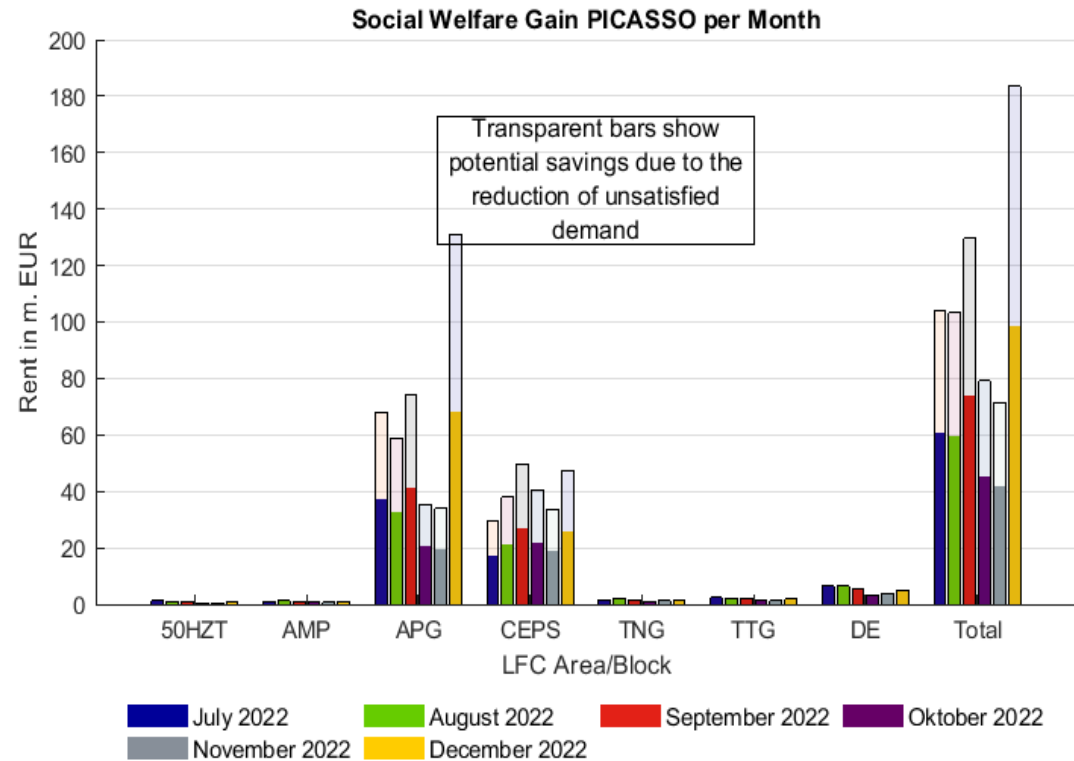
- In operation
- ▨ Technical readiness
- Derogations (2023 and later)
- Observers

Market Results until End of January 2023

aFRR Energy Exchange in PICASSO



- Welfare gain 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.
- Total Welfare Gain in Q3 and 4/2022:
375 Mio. € without additional satisfaction of demand
670 Mio. € with additional satisfaction
- Large welfare gain mainly for small LFC areas, that get access to a much larger market via PICASSO



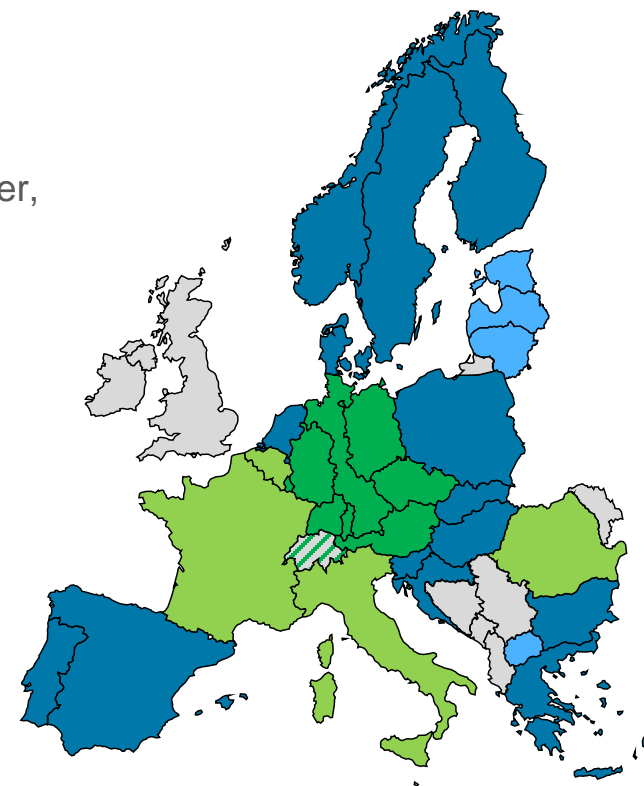
Platform for the International Coordination of automated Frequency Restoration and Stable System Operation (PICASSO)



- 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
- The remaining Member TSOs will gradually join the platform

Relevant Features

- The PICASSO Platform establishes a European domestic energy market for aFRR, based on a common standard product.
- PICASSO fosters operational stability by coordinating the activation of reserves.
- Using a market time unit of 4 seconds, the PICASSO optimizer has performed ~ 4,125,000 market clearings in 2022 with 100 % availability.
- The PICASSO IT system 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.



- In operation
- ▨ Technical readiness
- Plan to join in 2023*
- Derogation 2024

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