

ENTSO-E Market Report 2024 and ENTSO-E Balancing Report 2024



ENTSO-E 03 July 2024

Agenda

10:00 – Introduction & Opening Notes

Marco Hartmann (ENTSO-E Reporting on Market Integration WG Convenor)
Oliver John (ENTSO-E Market Committee Vice Chair)

10:10 – Market Report 2024

- FCA & CACM – Updates of TSOs' projects

Ludivine Marcenac (ENTSO-E Deputy of Market Section and Market Integration Manager, Market Section)

- FCA – Long-Term Markets

Jim Vilsson (ENTSO-E Market Integration Working Group Co-Convenor)

- Market Coupling in Day-Ahead and Intraday Markets
 - CACM – Day-Ahead Markets
 - CACM – Intraday Markets

André Estermann (TSO Chairman of the Market Coupling Steering Committee)

- Further topics

Marco Hartmann (ENTSO-E Reporting on Market Integration WG Convenor)

10:50 – Balancing Report 2024

- Regulatory achievements
- Evolution of energy/reserve platforms

Sarah Maier (ENTSO-E Balancing Reporting PT Co-Lead)

Jose Ignacio de la Fuente (ENTSO-E Balancing Reporting PT Lead)

11:10 – Q&A

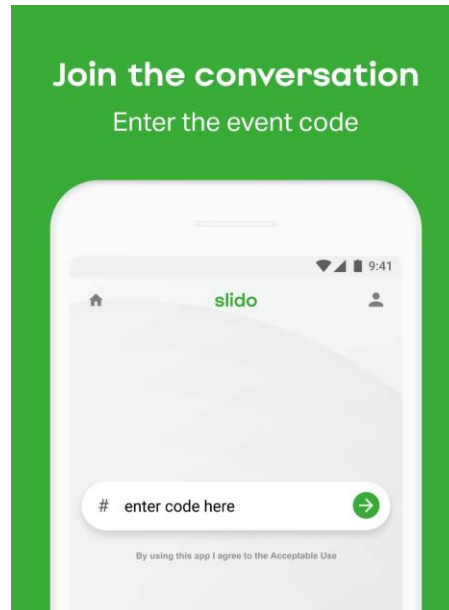
Moderation by *Nicoletta Michael* (ENTSO-E Reporting on Market Integration WG Advisor)

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Introduction

Why to harmonise and integrate electricity markets in Europe?

Market integration is the process of progressively harmonising the rules of markets. In a fully integrated Electricity Market, electricity can flow freely in response to price signals through Europe. This brings **major economic benefits** to the society while **being one of several enabler for the implementation of the European Green Deal**.

Economic Efficiency

- Reduce electricity prices by increasing competition
- Reducing the need for back-up generation

Security

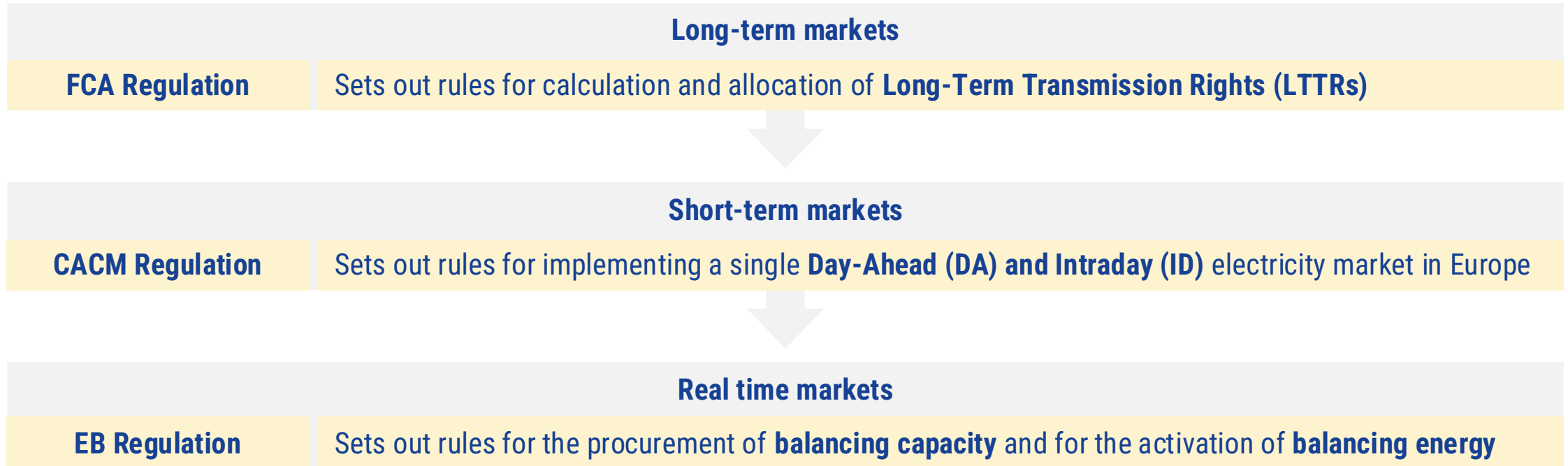
- Increasing market liquidity
- Increasing system security and resilience

Sustainability

- Integrate intermittent renewable energy sources and reducing CO2 emissions
- Increasing Europe's independence from imports of fossil energy fuels

The network codes pave the way for an integrated electricity market. TSOs and their partners are working intensively on the implementation of these regulations for a more harmonised, integrated and efficient single European market for electricity.

How to harmonise and integrate electricity markets in Europe?



ENTSO-E monitors the implementation of these regulations by the present reports:

- The following presentation provides only **an overview** of the extensive annual ENTSO-E Market Report 2024 as well as the biennial ENTSO-E Balancing Report 2024
- To see the full content, browse https://www.entsoe.eu/network_codes/monitoring/

Highlights – some milestones

Intraday

- Intraday Auctions (IDAs) Go live in June

Capacity Allocation to Ukraine

- Capacity between EU countries and Ukraine successfully allocated

Regulatory initiatives

- Amendment of the Core Capacity Calculation Region – inclusion of Italy North
- Compliance of the EU minimum capacity targets (70%)

Envisaged further initiatives 2024 / 25

- Flow-Based Capacity Calculation in the Nordic Region
- 15 Minutes Market Time Unit

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Market Report 2024

Background & Overview – Yearly Market Report is the ‘flagship’ of ENTSO-E’s market monitoring activities covering all timeframes



ENTSO-E has **40 member TSOs** from **36 countries**



ENTSO-E’s Market Report 2024 covers the period from **June 2023 to May 2024**



Every year, **ENTSO-E monitors the progress of the integration of European electricity markets** in accordance with:

- Forward capacity allocation (**FCA**) regulation¹
- Capacity allocation and congestion management (**CACM**) regulation²
- Electricity balancing (**EB**) regulation³

Topics covered:

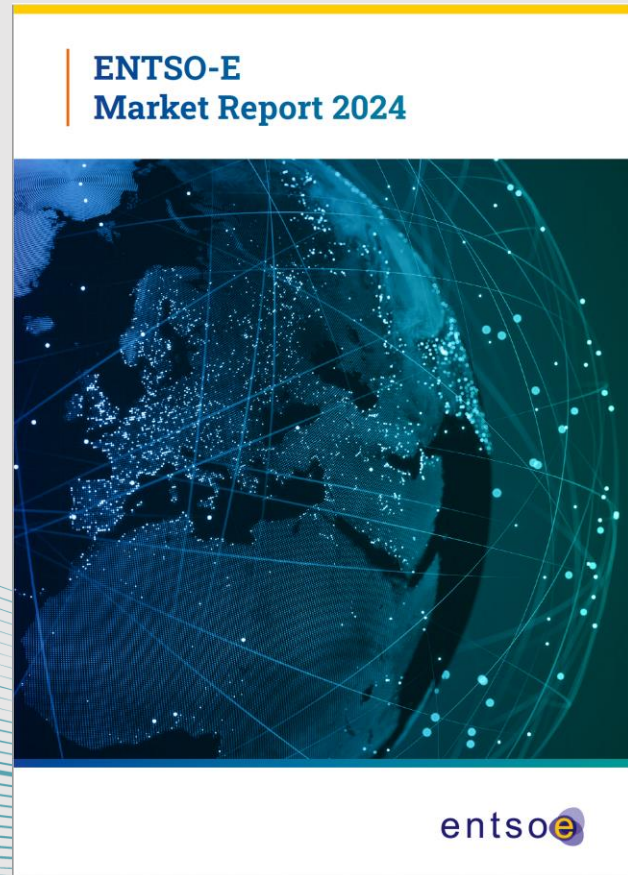


1. Implementation progress across **all time frames**
2. Overview of the **long-term** electricity trading and transmission capacities processes
3. Current status of the single European **day-ahead and intraday** coupling process
4. Harmonisation and integration of European **balancing** markets
5. **Current and future developments** impacting the European electricity market

¹ Commission Regulation (EU) 2016/1719 of 26 September 2016

² Commission Regulation (EU) 2015/1222 of 24 July 2015

³ Commission Regulation (EU) 2017/2195 of 23 November 2017



FCA & CACM – Updates of TSOs’ projects

Updates on further FCA Regulation requirements – Flow-Based allocation of long-term transmission rights

Long-term flow-based allocation assessment (Art. 49, 51, 57, 61)

- ENTSO-E proceeded with the implementation of **the FCA methodologies to enable the long-term flow-based allocation:**
 - Harmonised Allocations Rules
 - Single Allocation Platform requirements
 - Congestion Income Distribution methodology
 - Methodology for ensuring firmness and remuneration of long-term transmission rights
- ENTSO-E and ACER have organised **several workshops with stakeholders**

Updates on TSOs projects according to CACM – Redesign of CCRs, CID, Scheduled Exchanges and regional projects

Determination of the CCRs (Art. 15)

- 17 July 2023, ACER requested that All TSOs develop an amendment of the Determination of CCRs to **merge Core and Italy North for the DA timeframe** by 30 November 2023
- The amendment proposal containing both the inclusion of the **Celtic cable interconnector** in Core CCR and **the merge of Core and Italy North for the DA timeframe** was submitted to ACER for approval on 1 November 2023.
- **ACER approved the proposal on 19 March 2024.**
- ENTSO-E is supporting the TSOs for the Determination of CCRs for the Energy Community countries.

Congestion Income Distribution (CID) (Art. 73)

- According to ACER's decision from December 2021, **TSOs have developed an amendment** including solutions to address the transfer of congestion income among different Capacity Calculation Regions in case of non-intuitive flows. The amendment has been submitted on the 5 July 2023 and approved by ACER on the 22 December 2023.
- TSOs are now implementing the methodology.

Day Ahead Scheduled Exchanges Methodology (Article 43 of the CACM Regulation)

- All TSOs have amended the Day Ahead Scheduled Exchanges Methodology in order to introduce a back-up calculation of the day-ahead Scheduled Exchanges that will be activated if the SDAC algorithm takes too long to find a solution. The amendment proposal containing was submitted to all NRAs for approval on 4 April 2024. The proposal was referred to ACER on the 24 May 2024. The approval is expected by November 2024.

Core and Nordic Flow based projects

- **Successful go-live of the Core Flow Based process on 28 May 2024** for trades on business day 29 May 2024.
- **Nordic FB Go live is planned for Q3 2024**

Updates on NEMOs' and joint NEMO-TSOs' projects according to CACM

Joint NEMO-TSO deliverables	CACM annual report (Annex I to the ACER Decision 04/2020)	<ul style="list-style-type: none">On 20 September 2023, the All NEMO Committee organised their first Annual Conference. Part of this conference was dedicated to the key findings from the 'CACM Annual Report 2022' that was delivered on 14 July 2022. The report focused on demonstrating the robustness of the operating of the market coupling during the energy crisis.
	SDAC and SIDC costs (Art. 80)	<ul style="list-style-type: none">2022 CACM cost report was submitted in September 2023.
NEMO deliverables	Algorithm methodology methodology (Art. 37)	<ul style="list-style-type: none">The amendment proposal was submitted by the NEMOs to ACER on 24 November 2023.This amendment consider the requirements submitted by the TSOs for the co-optimisation of the balancing Energy.Further work will still be needed as the concept is not defined and will require research and development workACER's decision expected by Q3 2024.

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FCA – Long-Term Markets

Long-term markets – JAO acts as a cross-timeframe service provider

The **Joint Allocation Office (JAO)** acts as the single allocation platform (SAP) operator for FCA



In operation as of 1 November 2018



It auctions cross-border transmission capacity rights



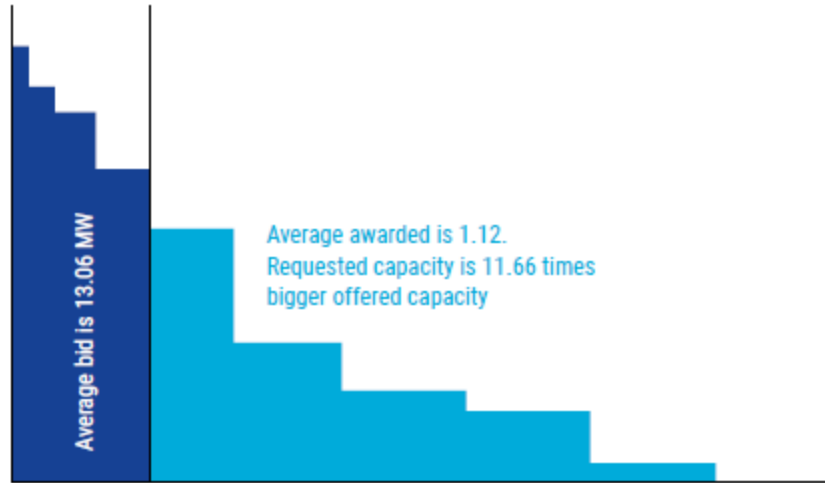
As of 2024 it covers 67 bidding zone directional borders and has 440+ active market participants



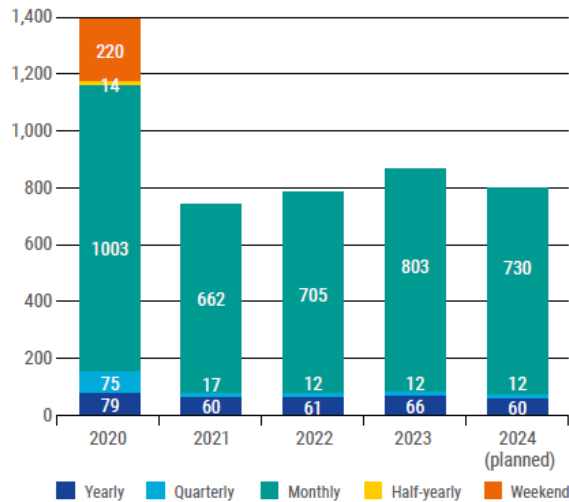
More than 5 200 auctions have taken place since SAP operations began



Facts & figures of the long-term market: On average, demand of LTRs exceeds supply – Increase in auctions for 2023



579 bids per auction on average



In 2023, more than 881 LTR auctions – slight increase compared to 2022



37

participants in every auction

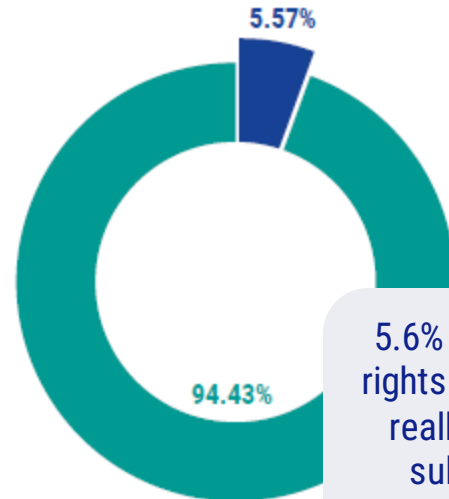


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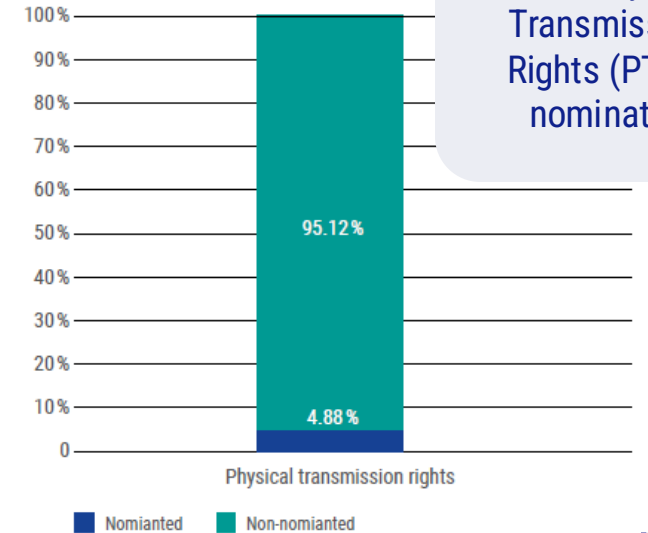
participants win the capacity



A SAP analysis of the valuation of LTRs can be found in the report



5.6% of capacity rights returned for reallocation at subsequent auction



5% of Physical Transmission Rights (PTRs) nominated

Long-term markets – Single Allocation Platform (SAP) is constantly developed further

Operations – Introduction of FTR options and 15-minute products

- A broad transition to FTRs happened with the launch of Flow-based day-ahead coupling in CCR Core.
- SAP tools and processes will be adapted to 15-minute day-ahead market products.

Regulation – Harmonised Allocation Rules (HAR) and European Market Design Reform (EMDR)

- Changes of HAR (LTFBA, 15 Min MTU, Remuneration, Collaterals, Accounts) approved by ACER in December 2023.
- EMDR establishes an impact assessment by the EC to identify the optimal model for the forward markets. This is followed by an amendment of the FCA guideline expected to start end of 2025.

Welfare – Long-Term Flow-Based Allocation (LTFBA)

- Since 2022, TSOs and JAO have been working to implement the LTFBA in Core and Nordic CCRs.
- Yesterday, a decision by all TSOs was taken to assess the relevant methodologies and based on this assessment to request respective amendments aiming to change the LTFBA model on calculation and/or allocation side, to various different degrees and with different urgency.

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CACM – Market Coupling in Short- Term Markets

Short-term markets – Joint Market Coupling Steering Committee

Single day-ahead coupling (SDAC) and single intraday coupling (SIDC)

- The joint Market Coupling Steering Committee (MCSC) was established in January 2022. The joint governance was finalized in September 2022, with the set-up of the Working Groups **mirrored between SDAC and SIDC** to ensure efficiency and synergies.
- A dedicated **Market Coupling Consultative Group (MCCG)** for market participants was established in June 2022.
- To further harmonize the governance structure and to ensure coordinated system provider interactions in the day-ahead cooperation, **SDAC QARM** was established at the start of 2023. In July 2023, the MCSC approved the **addition of the 15 min MTU testing group** to the governance under SDAC QARM.
- **Qualified Majority Voting (QMV)** was introduced at steering committee level as of September 2022.
- A **single project management team** was established in March 2023 to support the integrated governance.
- For the implementation of organizational improvements, the **Governance Task Force** was set up early 2023. MCSC approved putting the Governance Task Force **on hold** due to a persistent delay of CACM 2.0.



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Market Coupling – Day-Ahead Markets

Short-term markets – One common DA allocation for all EU countries

Single day-ahead coupling (SDAC)

- SDAC uses the day-ahead market coupling operator function with the **EUPHEMIA** algorithm. It calculates electricity prices across Europe and implicitly allocates auction-based cross-border capacity.
- The NEMO **BRM** adhered to the Day-Ahead Operational Agreement (DAOA) and **ETPA** became an observer – currently they are non-operational members. **Nasdaq** exited from SDAC. **27 countries with 32 TSOs and 16 NEMOs** are currently involved.
- In August 2023, following amendments to the SEC Methodology, the activation of the **linear Inter-NEMO flow calculation (INFC)** went live.
- In June 2023, the threshold for triggering the second auction was changed from **-150€/Mwh to -500€/Mwh** by several NEMOs. On 24 November 2023, the market results in the Finnish area were set to the minimum of **-500€/MWh** due to the inclusion of a **significantly erroneous sell bid** submitted by one participant. Investigations and potential mitigations are ongoing.
- SDAC continues to operate **successfully - no full decoupling** of markets has occurred since the operation began in February 2014 and all operational incidents are monitored and analysed regularly.



Evolution of short-term markets: SDAC is continuously developed further

Evolution and Changes during 2023/24

- **Technological update of PMB and various new releases of both PMB and the EUPHEMIA algorithm.** The releases entailed EUPHEMIA 11.2 and PMB 12.1 (in November 2023):
 - Fallback procedure updates
 - Functionalities related to IDAs
 - Technology updates for the 15 min MTU project
- **The Multi-NEMO Arrangement (MNA)** on the French side of the FR-ES border went into effect in February 2024. For several regional projects, changes or support (in testing) is needed.
- Several **algorithm improvements** needed for the 15 min MTU implementation were agreed by the MCSC:
 - Removal of PUN product from SDAC
 - Transition from Complex order to Scalable complex order
 - Additional time to the DA MC process algorithm
 - Deployment of distributed computing hardware and software environment

Foreseen future improvements of the algorithm

- **EUPHEMIA Lab programme:** Algorithm improvements are made through the change control procedure and the Algorithm Methodology. Euphemia version E11.3 is planned to go-live in 2024.
- The go-live of the **Nordic CCR DA FB MC** was postponed from November 2023 to October 2024.
- Core CCR Is currently working on implementing **advanced hybrid coupling (AHC)**.
- Nordic CCR FB is expected to go live with **AHC** on the Hansa CCR BZBs and internal borders.
- A plan for the implementation of a **15 min MTU** is being worked upon throughout 2024.
- Work on implementing the **Central Europe CCR** is initiated.

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Market Coupling – Intraday Markets

Short-term markets – SIDC extended in August 2023

Single Intraday Coupling (SIDC)



SIDC enables **continuous cross-border trading across Europe**. It is based on a common IT system (XBID) with a shared order book, a single capacity management module and a shipping module



It covers **27 countries**, 25 of which are operational with at least one border, 30 TSOs and 15 NEMOs



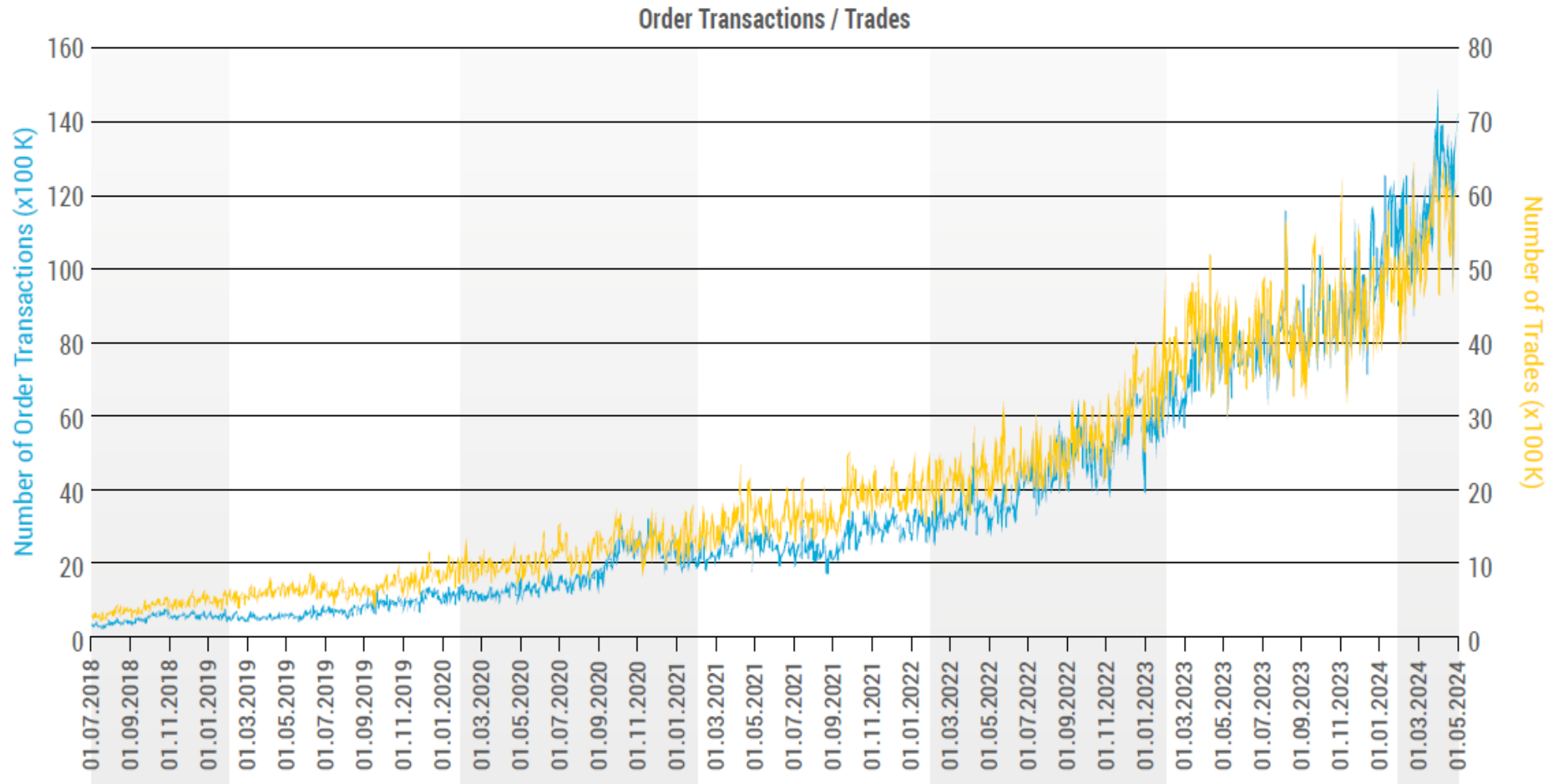
The **fifth go-live wave** in August 2023 added ETPA as intraday NEMO in the Netherlands. **15-minute MTU** capacity allocations went live on the HR-SI and HR-HU borders on 12 January 2024



More than **371 million trades** have been executed within SIDC since its inception in June 2018 (counted until December 2023). The steady growth of trade has continued in 2023/24



Short-term markets: SIDC continues its strong and steady growth – Several updates during the reporting period



Steady growth of number of order transactions and trades since 2018 continued

Short-term markets – SIDC continues to optimize, expand and innovate

- No critical incidents have occurred during the reporting period and minor operational incidents were communicated, monitored and analysed.
- Performance optimisation measures (R4.0 and 4.1) to be deployed into production throughout the course of 2024
- Additional service requests to analyse how to update the XBID platform were agreed upon in 2023 to push the SLA boundaries.

European Intraday Auctions

- The IDAs went live on 13 June 2024.
- XBID release 4.0 supported the introduction of IDAs.
- With the implementation of IDAs, SIDC incorporated three implicit auctions, leading to a more efficient allocation of CZC when congestion occurs.

FB Allocation in Continuous Trading

- Allocation of capacity in IDA could remain in ATC until FB allocation is implemented in the XBID platform for continuous trading.
- This implementation is a priority for SIDC following the IDA go-live.
- Design work has started already in 2023 and will continue in 2024 with the realization of a minimum viable product.

Implicit Intraday Losses

- The continuous trading matching algorithm must consider losses on interconnectors between bidding zones during capacity allocation.
- Losses in continuous trading imply that volumes and prices differ on both sides of the interconnector.
- Due to significant negative performance impacts and necessary complex technical investments, the design of losses and cross product matching are currently on hold.

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Further topics

Further topics: Important developments and discussions

Trade development with Ukraine and Moldova

- Commercial electricity exchange between Ukraine/Moldova and Continental Europe was stabilised and increased again.
- Ukrenergo became a full member of ENTSO-E in January 2024.
- Capacity allocation was successfully extended to the Ukrainian borders with Poland, Hungary and Slovakia at the beginning of 2024.
→ Coordinated capacity allocation now exists on all borders with Ukrenergo.

Further shaping the future of long-term markets

- Discussion on the evolution of the forward market has progressed.
→ TSOs are currently preparing an advocacy note to be published in Q3 2024.

Capacity Calculation Regions

- Any CCR reconfiguration should be based on an economic & technical efficiency analysis.
→ ENTSO-E has published a Framework for Assessing the Configuration of Capacity Calculation Regions end of 2023.

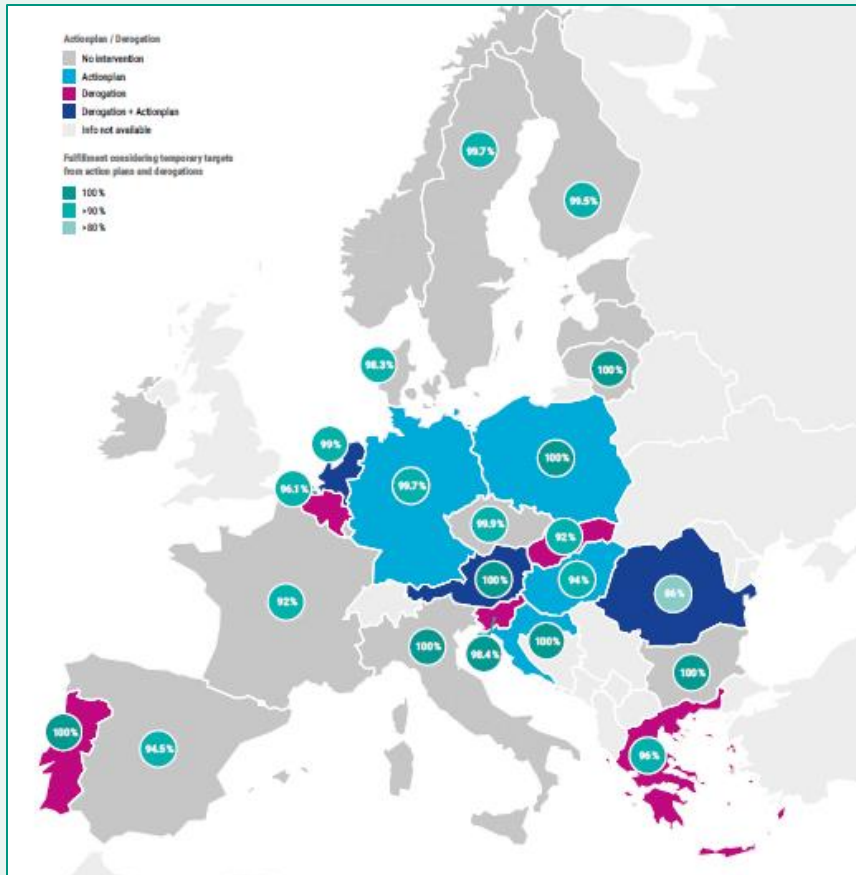
Third countries

- Contribution of 3rd country flows should be considered.
- From a legal perspective, Network Codes or Guidelines cannot exclude 3rd country flows.

Further topics: Implementation of CEP 70 % minimum capacity targets in the year 2023

Overall good compliance in 2023

Throughout the year 2023, Member States were able to comply with the (temporary) minimum capacity requirements applicable on the national level



Improved reporting in new country fact sheets

Improved CEP70 reporting following stakeholders' request: new country fact sheets provide information on differences between NRA's compliance methodology and ACER's monitoring methodology

France

TSO(s)
RTE

Borders/Region
Core region, Italy North region, SWE region

Competent regulatory authority
CRE

Is any transitional regulation in place?

- No, the minimum trade requirement pursuant to Art. 16 of Regulation (EU) 2019/943 is fully applicable
- Yes, the Member state invoked action plan pursuant to Art. 15 of Regulation (EU) 2019/943
- Yes, the TSO requested derogation pursuant to Art. 16(9) of Regulation (EU) 2019/943

Applicable target in 2023
70 %

Summary of national compliance assessment for 2023

- The results of 2023 are fairly satisfying regarding the criterion of compliance agreed with the French regulator CRE.
- A report regarding the application of 70 % on French borders is published each year by CRE to assess the national compliance.

Methodology

Did the competent regulatory authority adopt the non-binding ACER's Recommendation 01/2019 for its compliance assessment?

- Yes
- Partially (see explanation)
- No (see explanation)

Explanation

According to the Smart compliance agreed with CRE, TS where at least one criterion is fulfilled, is deemed as compliant regarding the 70 %:

- Price convergence is reached with BZs inside the corresponding CCR
- All limiting CNECs are in a neighbouring country
- Minimum MACZT is above 70 %

Germany

TSO(s)
50Hertz Transmission GmbH, Amprion GmbH, Baltic Cable AB, TenneT TSO GmbH, TransnetBW GmbH

Borders/Region
CCR Core, CCR Hansa

Competent regulatory authority
Bundesnetzagentur (BNetzA)

Is any transitional regulation in place?

- No, the minimum trade requirement pursuant to Art. 16 of Regulation (EU) 2019/943 is fully applicable
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Applicable target in 2023
CCR Core borders: 40.8 % on all CNECs for each MTU

- DE - DK1: 47 % on all CNECs for each MTU
- DE - DK2: 70 % for Kontek cable/35 % for KF CGS
- DE - SE4: 55.7 % of the NTC of Baltic Cable
- DE - NO2: 35 % on all CNECs for each MTU

Summary of national compliance assessment for 2023

- In the report submitted to the regulatory authority the German TSOs find that the minimum capacity was provided to the market in all relevant hours.
- The report still requires approval by the BNetzA.

Methodology

Did the competent regulatory authority adopt the non-binding ACER's Recommendation 01/2019 for its compliance assessment?

- Yes Partially (see explanation)
- No (see explanation)

Figure 46: Relative MACZT per border/region for France

Figure 47: Relative MACZT per border/region for Germany

Further topics: Important topics to be considered for CACM2.0

70% in ID & structural congestion

- Application of minimum trading capacity of 70% to the ID timeframe - by virtual capacities - is not possible:
 1. min70% in DA often realized by offering virtual capacities to the market
→ requiring redispatch measures to secure the grid
 2. Yet, in ID there is significantly less time to secure virtual capacities by remedial actions as we are close to realtime operation → Physical capacity cannot be increased beyond the security limits
- A broader perspective will help to get a better alignment of markets and physics,
- This debate will take us beyond the update of CACM 2.0 and could be subject to a structural market reform,
- In any case, TSOs are keen to continue a constructive debate.

Transmission Access Guarantee

- CACM 2.0 should include a set of main principles that address the most fundamental elements to provide a firm regulatory framework and legal basis for implementation.
- The more detailed design and implementation considerations may more ideally be included in an implementing methodology to be developed by All TSOs and approved by ACER.

Market Coupling

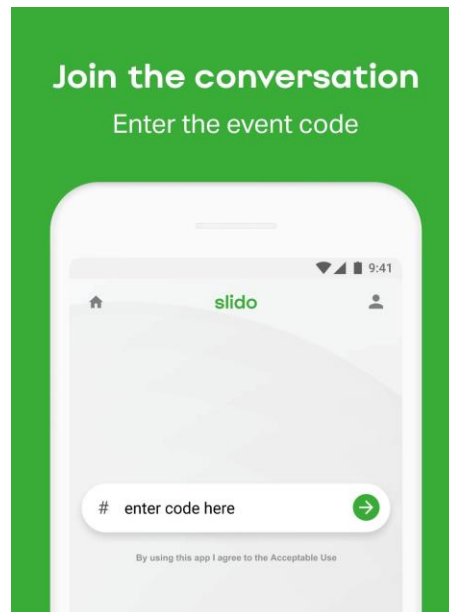
- Transparent & level playing field in data access, use and exchange
- Enhanced and continuous improvement of market coupling
- Ensuring integrity of the price coupling process
- Furthering the implementation of flow-based market coupling

Reminder on the Q&A

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Balancing Report 2024

Background & Overview – Latest developments in European Balancing



Highlight: European Balancing Energy and Reserve Platforms

- *Balancing energy platforms*: meeting each country's upward/downward balancing demand through **netting of needs** and activating the **most efficient bids** in Europe.
- *Balancing reserve platforms*: regional sharing/exchange market driven platforms
- Both types of platforms aim at considering **operational security constraints & increasing the security of supply** in Europe



To comply with the obligations of the Article 59 **EB Regulation**¹, ENTSO-E publishes, on a yearly basis, a **European report on integration of balancing markets**.

In 2024: biennial detailed report on balancing & summary of balancing topics included in European market report



ENTSO-E's Balancing Report 2024 covers the period from **June 2023 to May 2024**, and associated Performance Indicators chapter (PI's covering the calendar year 2023), jointly with respective individual TSO's executive summaries.

The Balancing report describes the **design and implementation of balancing markets** at pan-European, regional and national levels, emphasizing on:

- **development and harmonisation of methodologies** → on-going amendments of cross-zonal capacity allocation methodology, aFRR IF and pricing methodology
- further development of and accessions to **balancing energy platforms**
- **balancing reserve platforms**: implementation of a harmonized market-based CZCAOF (COBRA project)



¹ Commission Regulation (EU) 2017/2195 of 23 November 2017

Latest developments regarding EB methodologies

CZC allocation: implementation of the harmonised methodology (HCZCAM)

- ACER approval of HCZCAM in July 2023
- Currently ongoing amendments of HCZCAM to be submitted to ACER in July 2024 further detailing the governance structure of balancing capacity platforms
- January 2024: start of the implementation project to develop the harmonized market-based CZCAOF including 13 European TSOs (COBRA project)

High balancing energy price mitigation measures

- All TSOs have worked on mitigation measures for high prices observed at the European platforms for the exchange of balancing energy
- Amendments to the aFRR implementation framework and the pricing methodology have been submitted early 2024
- ACER's decision on the proposed measures is expected to be received in early July.

Capacity Management IT solution

The implementation of the Capacity Management IT Solution in 2023 supports the platforms' ability to continuously update and provide the availability of interconnection capacity after intraday market to the balancing energy platforms

Imbalance Settlement Harmonisation

Several derogations are still in place until 1 January 2025, regarding migration towards imbalance settlement period of 15 min.

Imbalance Settlement Harmonisation – Granular trading periods to support the market integration of intermittent and flexible assets

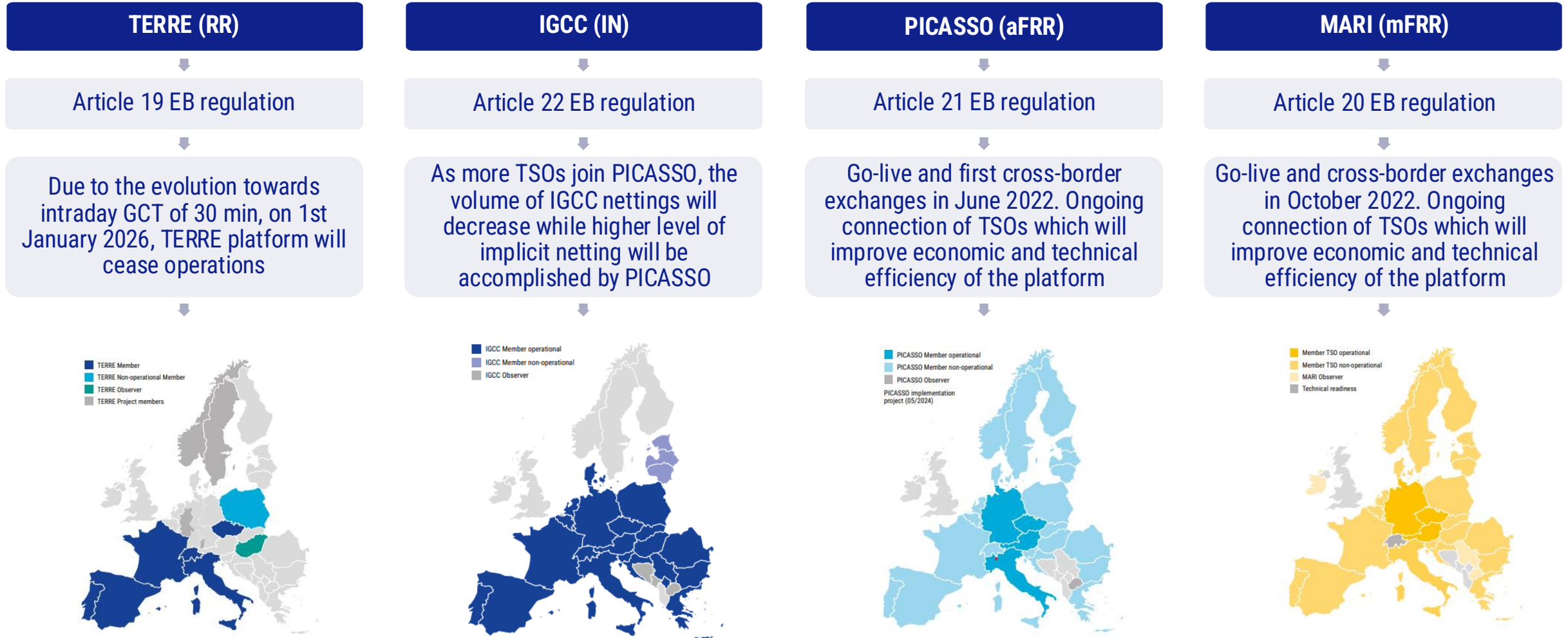
The EB Regulation and recast Electricity Regulation establish a **15-minute Imbalance Settlement Period (ISP)** for which Balancing Responsible Parties' (BRPs) imbalances have to be calculated. It also sets the minimum time interval for NEMOs, by which they shall provide market participants with the **opportunity to trade in energy**, for both day-ahead and intraday markets.

ACER decided on the ISH Methodology in July 2020 to further specify and harmonise imbalance settlement elements, to be implemented nationally at the latest by **January 2022**.

After the implementation of this methodology, each connecting TSO shall calculate, in each imbalance area for each ISP, **one single final position** for each BRP, as equal to the sum of scheduling unit's external and internal commercial trade schedules.

Was the 15-minute ISP implemented by 1 January 2024?	Implemented:	13 TSOs
	Derogated:	8 TSOs
	Exemption:	3 TSOs
Has your TSO made use of additional components following ISH Methodology Art. 9(6) as of 1 January 2024?	Yes:	17 TSOs
	No:	7 TSOs
Has your TSO made use of dual pricing as of 1 January 2024?	Yes:	6 TSOs
	No:	18 TSOs

Balancing Markets – 4 balancing platforms to increase security of supply and economic efficiency of balancing activities in Europe



Balancing cooperations lead to significant economic surplus in 2023

TERRE

Economic surplus : 281 M€

PICASSO

Economic surplus 137 M€

MARI

Economic surplus 9 M€

IGCC

Economic surplus 621 M€

DE-AT

Economic surplus 6 M€

FCR

Economic surplus 120 M€

Nordic
aFRR CM

Economic surplus 29 M€

Q/A session



Any questions?



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Thank you very much for your attention!