

CACM Annual Report 2025



ALL
NEMO 
COMMITTEE

CACM Annual Report 2025

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Letter to stakeholders

Dear Stakeholders, NRAs, Commission and ACER,

For more than two decades, NEMOs have been successfully running market coupling operations, maintaining high standards in securing systems' reliability, operational robustness and efficiency in the context of a constantly evolving energy landscape. Following the complete integration of Europe's day-ahead and intraday markets, efforts in recent years have been focused, on the one hand, on maintaining the stability of market coupling operations and, on the other hand, on further development in response to market participants' needs and European society as a whole .

The evolution of the day-ahead and intraday markets in the past years is a living proof of complex – and challenging at times – regulatory requirements being implemented, thanks to the spirit of cooperation among NEMOs. At a time when cooperation and coordination play a pivotal role in overcoming challenges and driving forward future projects, NEMOs have optimised their contractual and governance framework aiming at improving decision-making processes and streamlining the organisation of workstreams.

Against the background of dynamic market conditions, it is paramount that we preserve the ability to seamlessly accommodate the steady growth of traded volumes, increasing complexity of tradable products, requirements like advanced hybrid coupling along with any other further developments needed for the green transition, market coupling of the Energy Community countries, integration of renewable energy sources and flexibility.

The year 2025, a decade after entry into force of the CACM Regulation and ahead of coming closer to its revision (CACM 2.0), witnessed the completion of yet another major milestone – the successful implementation of 15-minute MTU in SDAC which came as a result of the collaborative efforts of all stakeholders –NEMOs, TSOs, regulatory bodies and market participants.

This significant transition was also complemented by the complete rollout of 15-min. MTU in intraday thus further contributing to enhancing the precision of supply and demand matching.

The previous edition of the CACM Annual Report featured data on IDAs for the first time. This edition will provide a comprehensive overview of IDA-related data for one full year of operations. It is complemented with the first insights into the operation of markets after the full transition to smaller granularity MTUs and the respective share of usage for 15-min and 60-min products across bidding zones.

Starting from slightly below 98 % success rate, IDAs now boast a success rate close to 99 % which is solid evidence that systems are fit for purpose. System stability is also evidenced by the efficient performance of the day-ahead coupling following the extra calculation time allocated for Euphemia. Despite the extra calculation time, time to first solution has exceeded 10 minutes only in rare cases. A positive trend to be noted is the steadily increasing share of 15-min products reaching above 80 % in January 2026. The data released in the CACM Annual Report 2025 shows the improvements achieved in the Day-Ahead algorithm and the ability of the intraday continuous market to cope with an increasing number of trades and volumes of energy. This is largely thanks to the investments made in the relevant algorithms and systems with a view to extending their functionalities, improving performance, in order to level up with the higher utilisation of the trading platforms.

Market Coupling has become significantly more complex while maintaining the solid levels of reliability and availability that market participants expect from NEMOs. At the same time, NEMOs strive to respond to the needs of market participants while also respecting regulatory requirements.

Looking at the further developments ahead, among the proposals on the table, is the potential introduction of co-optimisation, meaning a simultaneous clearing of Day-Ahead energy and balancing capacity on the coupled Day-Ahead markets. In order to fully take on board the views of market participants, the NEMO Committee has launched an informal survey followed by a workshop in order to engage with stakeholders. Furthermore, the NEMO Committee, in cooperation with the TSOs, has initiated a fully fledged R&D effort around this topic, and will continue to publicly share the outcomes of the work. On the SIDC side, significant efforts have been made to increase the capacity of the SIDC continuous trading solution. As regards the introduction of flow-based in IDAs, the design has also been developed.

Last but not least, another example of bringing adjustments to the power market design in close cooperation with market participants: The Harmonised Maximum and Minimum Clearing Price methodologies for SDAC and SIDC were subject to a regular update to reflect necessary adaptation with regard to the introduction of the 15-min products and the 15-min MTUs in SDAC and SIDC. The NEMO Committee conducted a public consultation on this and subsequently implemented the new rules. The overall objective of this process was to make sure to refine the balance between necessary adjustment of maximum and minimum clearing prices while avoiding a too frequent adjustment.

The NEMO Committee maintains its commitment to advancing well-designed, market-ready solutions through close coordination and open exchange. This year's achievements reflect the strength of our joint efforts and the value of working together toward outcomes that genuinely meet market requirements. We remain fully accountable and transparent- this very report is proof for it.

As we move forward, we welcome continued engagement with all stakeholders and look forward to further strengthening our collaboration in support of an efficient, resilient, and integrated market.

These initiatives illustrate that the work of the All NEMO Committee spans the full spectrum of our shared responsibilities. It ranges from the highly detailed operational topics that keep the coupled markets running reliably every day, to the broader strategic and political questions that shape the future of European market integration—such as the prospective inclusion of Energy Community countries into SDAC and SIDC.

We remain committed to advancing both dimensions with the same rigor, transparency, and collaborative spirit, and we thank all stakeholders for their continued engagement and trust.



Rafael Gómez-Elvira González
Chairman of the All NEMO Committee

Regulatory framework

Annex I to the ACER Decision 04/2020 on the Algorithm Methodology of 30 January 2020 (hereinafter referred to as Algorithm Methodology), amended by ACER Decision 11/2024, provides the regulatory framework obligations for this CACM Annual Report. It includes the methodology for the price coupling algorithm, the continuous trading matching and the intraday auction algorithm also incorporating a common set of requirements in accordance with Article 37(5) of the Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management (CACM).

The reporting obligations to comply with CACM Annual Report are listed in the Algorithm Methodology. In addition, article 20(3) of the Algorithm Methodology sets the obligation to publish all the below listed reports.

This report is elaborated in cooperation with TSOs and is structured in the following manner, for both SDAC and SIDC:

1. Operations report, consisting of:

a) Report on incidents

According to article 4(19) and 5(17) of the Algorithm Methodology, it provides a list of incidents in the operation of the relevant algorithm and the application of back-up and fall-back procedures. It includes an explanation for their occurrence, as well as remedies applied or anticipated to prevent their recurrence;

b) Report on the decisions on requests for change

According to article 19(11) of the Algorithm Methodology, it indicates the decision for each request for change, the criteria and the principles behind such decision as well as the assessment report as required under article 17(12) of the Algorithm Methodology; and

c) Report on the application of corrective measures

According to article 12(13) of the Algorithm Methodology, it indicates the corrective measure applied, the reasons for applying it and provides additional information on plans for future measures to address these problems.

2. Report on the outcome of the monitoring of the algorithm performance:

According to article 8(3) of the Algorithm Methodology, it contains the items listed in Annex 3 and Annex 4 to the Algorithm Methodology, all cases of performance deterioration or non-compliance with an implemented functionality, an analysis on the usage of each product and its impact on algorithm performance (for SDAC only), a description of the reasons for these occurrences and remedies or future improvements (as referred to in article 5 of Annex 3 and article 5 of Annex 4 to the Algorithm Methodology) and a presentation of the conclusions made in cooperation with the relevant stakeholder fora.

3. Scalability report

According to article 9(4) of the Algorithm Methodology, it provides the outcome of the assessment of the estimated level of scalability for the coming years and an explanation as to whether this level meets adequate scalability requirements. This section also includes the assessment of the effective usage, anticipated usage and usage range. Finally, it provides the prospective projects scoped as part of research and development with estimated workloads. Starting from 2025 (relevant to CACM Annual Report 2024) the scalability Report will be published separately from the CACM Annual Report by the end of September each year.

4. Report on research and development activities

According to article 11(8) of the Algorithm Methodology, it provides the status of the research and development activity and the planning of the future research and development activity, including an estimation of the identified workload and the associated budget.

NEMOs & NEMO Committee

NEMOs are the Nominated Electricity Market Operators designated by the competent national authorities to run the Day Ahead and Intraday markets according to CACM. Currently there are 17 NEMOs designated for both DA and ID, with the exception of ETPA and EXAA (designated only for the Day Ahead market).

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The All NEMO Committee is the body established by NEMOs to facilitate their cooperation in the delivery of common European tasks. It manages the delivery of the Terms, Conditions and Methodologies expected under CACM (the so called MCO Plan, and relevant Methodologies), the contractual framework among NEMOs and with TSOs and ensures NEMO representation, stakeholder's involvement and legal compliance.

NEMO Committee Activities

Reporting

Publication of CACM Cost Report 2024, CACM Annual Report 2024, Scalability Report 2024 and CACM Annual Report 2024 Infographic

Communication

On 24th September 2025, the NEMO Committee held its 3rd Annual Conference in Brussels, scheduled to present insights from the CACM Annual Report 2024, including the expanded Intraday Auctions (IDAs) section.

Nemo representation

preparation and representation of NEMO positions in public and institutional fora (including among others the Florence Forum, MESC, the Market Coupling Consultative Group (MCCG), the Pentilateral Coordination Group, Electricity Market Integration Forum (EMIF), together with European Commission, ACER and NRAs.

Methodologies

In 2025, the All NEMO Committee organised a public consultation on proposed amendments to the methodologies for Harmonised Maximum and Minimum Clearing Prices (HMMCP) in the Single Day Ahead Coupling (SDAC) and Single Intraday Coupling (SIDC) electricity markets, in line with Article 12 of the CACM Regulation.

The consultation, open from 24 February to 24 March 2025, invited feedback from market participants, transmission system operators (TSOs) and national regulatory authorities (NRAs) adapting trigger conditions – including for liquidity criteria and multiple product durations – and improving alignment with evolving market structures such as 15-min products. An online workshop on 12 March supported stakeholder engagement in the consultation process.

In August 2025, ACER received a proposal from Nominated Electricity Market Operators (NEMOs) to amend the HMMCPs methodologies for the SDAC and SIDC electricity markets. In February 2026, ACER issued its approval of amendments clarifying how the automatic price adjustment mechanism applies in exceptional market situations.



Further info about NEMOs and the NEMO Committee can be found at www.nemo-committee.eu.

Figure 01

Published

- Information package about 15min MTU
- Updated EUPHEMIA Public Description
- Co-optimisation R1 report: phase 1 R&D R1 report on bidding products, bid design, and pricing
- NEMOs Annual Work Program 2026
- SDAC Fallback Manual, the second version
- NEMO Committee position on the revised CACM
- Description of the SDAC Corrective Measures
- HMMCP methodologies online workshop and material

Public consultation

NEMOs launched a public consultation on Harmonised Maximum and Minimum clearing prices for SDAC and SIDC. The amendments mainly focused on clarifying and rephrasing existing provisions to improve understanding. They also adjust rules for triggering events, considering the number of market time units and the coexistence of products with different durations. New conditions related to market liquidity were proposed to determine when price limit updates should occur. Additionally, the proposal suggested reverting price level changes if no triggering events happen within a year and updated the list of NEMOs covered by the methodology.

Further tasks

The SDAC 15-min MTU project successfully went live on 30 September 2025.

Newsletter

With close to 1000 subscribers, All NEMO Committee newsletter has been a reflection of the latest developments of the NEMOs activities in SDAC and SIDC on a quarterly basis since September 2021.

You can subscribe to the newsletter on All NEMO Committee website [here](#).

NEMO Committee ANNUAL WORK PROGRAMME 2026

In 2025 the [NEMO Committee Annual Work Programme](#) was published setting out the tasks and objectives to be fulfilled by the Committee and its taskforces for 2026.

LinkedIn account

Since its launch in April 2023, the NEMO Committee [LinkedIn](#) Professional network has been constantly growing, highlighting NEMO Committee activities and important topics.

NEMO Committee 3rd Annual Conference

On 24 September 2025 the NEMO Committee held its third Annual Conference. This high-level forum explored the challenges and future opportunities of the European internal electricity market, including its expansion beyond the EU. The event highlighted the strong collaboration and dedication of NEMOs in implementing EU regulations.

More details about the event can be found [here](#)

Market Coupling Consultative Group (MCCG)

MCCG serves as a key platform for engaging market participants in discussions on the design, development, implementation, and operation of the Single Day-Ahead and Intraday Coupling. It fosters open dialogue and collaboration between NEMOs, TSOs, and market participants, ensuring continuous progress in market integration.

Since its establishment in 2022, MCCG has held regular meetings to address various market developments. In 2025, three meetings took place: on February 14 – this meeting was exclusively dedicated to the launch of 15-minute products in SDAC, June 2, and October 23.

Given the interactive nature of MCCG meetings, participants' questions and insights are captured in real-time and subsequently reflected in the published meeting minutes. Meeting agendas, presentation materials, and minutes are available on the [NEMO Committee](#) and [ENTSO-E](#) websites.

Each MCCG meeting follows a structured format, with dedicated sessions focused on MCSC, SDAC, and SIDC topics. The follow-up of agreed action points is closely monitored to ensure alignment with market developments.

Key topics discussed in 2025 included:

- The introduction of 15-minute Market Time Unit (MTU) in SDAC; from planning and implementation status to end-to-end member testing
- SDAC fallback improvements
- Change of Intraday Cross Zonal Gate Closure Times (reduction to 30 minutes)
- SIDC product- and HMMCP methodologies





Figure 02

ENTSO-E

40 TSOs operating one of the world's largest interconnected grids

- ENTSO-E is the association for the **cooperation** of the European Transmission System Operators (TSOs).
- 40 member TSOs, representing 36 countries with 500.000km of transmission lines and serving 520 million citizens, responsible for the **secure and coordinated operation** of Europe's electricity system.
- ENTSO-E **serves the interests of society by optimizing social welfare** in its dimensions of safety, economy, environment, and performance.

For more Information, please check [Member Companies](#).

ENTSO-E's Responsibilities:

- Security of power system
- Optimal functioning and development of electricity markets

ENTSO-E's Purpose: to Power Society and Enhance Cooperation



Executive summary

Single Day-Ahead Coupling

High level market data

The SDAC covered a large proportion of the EU, including 27 Countries. The average economic surplus remained stable with respect to 2024 and was, on average, around 11.8B€ per session. The traded volumes were around 1 900 TWh slightly increased but close to the 2024 figure (1 840 TWh). Clearing prices slightly increased with respect to the previous year, resulting in average between 60 €/MWh and 120 €/MWh for most of the countries, with the exception of a few bidding zones in Nordic Countries, which show annual average prices ranging between 15 and 50 €/MWh.

Operations report

In 2025, the SDAC operations continued to show great reliability. No incident of partial or full decoupling was observed. The number of incidents slightly increased in line with the ones registered in the previous years, mainly concentrated on cases of low severity, related to technical issues belonging to local NEMO or TSO systems. The most critical incidents in SDAC were two cases where the message of risk of decoupling was sent, however the issue was resolved. Four incidents under the category "MCO" were mainly related to post 15-min go-live adjustments but were quickly resolved with an updated EUPHEMIA algorithm version. Many RfCs went live: among the others, the 15-min implementation, the removal of the Second Auction and several network topology changes. There has been no need to trigger corrective measures.

Performance Monitoring report

Despite the increased complexity introduced with the 15-min products the SDAC algorithm continued to perform well. The usage of products shows a considerable increase with respect to 2024 (in overall around +45%). While the Time To First Solution (TTFS) increased by +14%, it remained, on average, on a yearly level at 2.57 mins, well below the 17 minutes (before the introduction of 15-min MTU) and below the 30min (after the introduction of 15-min MTU, 5.93 min in average). Optimality and Repeatability continued to perform well. The individual impact of products study indicates that after the introduction of the Scalable Complex Orders the Complex Block Orders seem to impact more the algorithmic performance.

R&D report

Throughout 2025, key areas of focus included fine-tuning the go-live of the 15-minute Market Time Unit (MTU), scalability improvements, and exploratory research on future algorithmic adaptations and new order types like storage orders. R&D for co-optimisation, in cooperation with the TSOs, reached its first milestone the R1-Report. These efforts are crucial for ensuring the readiness and robustness of EUPHEMIA to meet evolving market requirements and regulatory standards.



Single Intraday Coupling

High level market data

Trading in the SIDC continuous market continues to show steady growth and 2025 is yet another record year. The SIDC currently couples the intraday markets of 25 countries. The coupled SIDC volume continuously grew to 286.85 TWh traded – representing 515 million trades, boosted considerably by the introduction of 15-min products/MTU. Annual mean price per bidding-zone ranged from 13.15 €/MWh to 118.58 €/MWh. The SIDC handles orders and transmission capacity from 34 bidding zones and 57 borders where market participants trade on platforms of 15 NEMOs.

Intraday Auctions (IDAs), complementing the continuous trading in SIDC with the three daily auctions, amounted to a total of 100 TWh traded yearly in 2025, averaging daily of 151 GWh in IDA1, 103 GWh in IDA2 and 34 in IDA3. IDA1 still holds the highest traded volume of 201 GWh per session. The SIDC/IDAs are available in all the same market areas as for the SIDC/CT.

Operations report

For SIDC continuous, 19 RfCs were implemented in 2025 (10 of them affecting also the SIDC/IDAs), including extension of 15-min products Hungary, Poland, Baltic Countries and the Italian and Greek BZs. Through 2025, despite the increase in the number of incidents, also related to the increase in orders and trades, the operation of the systems remained reliable. SIDC/CT experienced 27 incidents in total, of which 15 incidents of severity 4 were not visible to market participants. There were five incidents of Severity 1, on 24 January, 6 September, 26 November, 29 November and 2 December which led to Market Halt ranging from 10 minutes to 8 hours and 20 minutes.

For SIDC/IDA, 5 RfCs were implemented in 2025. SIDC/IDA experienced 78 incidents in total, of which 21 incidents were not visible to market participants. Eight incidents were related to the MCO function. 30 incidents was under Severity 1, which included 9 IDA Cancellations and 13 Automatic Partial Decoupling. Despite the slight increase of incidents, IDA success rate during 2025 was 99.18 %.

Performance Monitoring report

For SIDC continuous, the analysis of monthly values regarding executed orders and matched trades illustrates substantial increase for 2025. The daily values, in terms of processing time for orders/trades and order book update, show some challenges mainly due to the introduction of the 15-min products/MTU. The “Total matched – hours to delivery” indicator shows that increased percentage of the matched volume is taking place in the last hours before gate closure, one hour before delivery in comparison to the previous years.

A complete year of SIDC/IDAs now allows for a better understanding of IDAs performance. TTFS now spans from 0.76 min up to 1.37 min well below the algorithm execution time limit. Measuring optimality through optimality gap also provides good results where the optimality gap as a percentage of economic surplus ranges from 0.0002 % (IDA1) to 0.06 % (IDA3). The economic surplus for the three IDAs are 167 M€, 19M€ and 5M€ respectively, per session.

R&D report

The R&D focus in 2025 was on implementation of Flow-based allocation in SIDC/IDAs (1st track, leading to finalisation of specifications for development) and further analysis for the Flow-based incorporation in SIDC/CT (2nd track, for better understanding the options available). Several R&D tasks were also dedicated to short-term and middle-term performance developments for dealing with the exponential growth of Orders and Trade Transactions, including an initial impact assessment of SIDC/CT extension to EnC countries. In 2025, several improvements and adaptations also considered for the central platform implementing requirements for data exchange and reporting.



coupling



SDAC main features

NEMO requirements

- Aggregated MTUs orders (curves, MTU and Period Orders)
- Block Orders (simple, linked, exclusive)
- Complex Orders and Scalable Complex Orders

TSO requirements

- ATC and Flow based (PTDF constraints)
- Network constraints: Ramping, losses

CACM requirements

- Adequate optimality
- Adequate scalability
- Adequate repeatability
- MNA
- MTU: 15 min

Systems release(s)

- PMB 13.1 and Euphemia 11.4 implemented on 2nd of September 2025

Geographical scope

PT, ES, FR, IT, DE, BE, NL, LUX, IE*, NI*, AT, SI, HR, BG, GR, PL, LT, LV, EE, FI, SE, DK, NO, HU, CZ, SK, RO

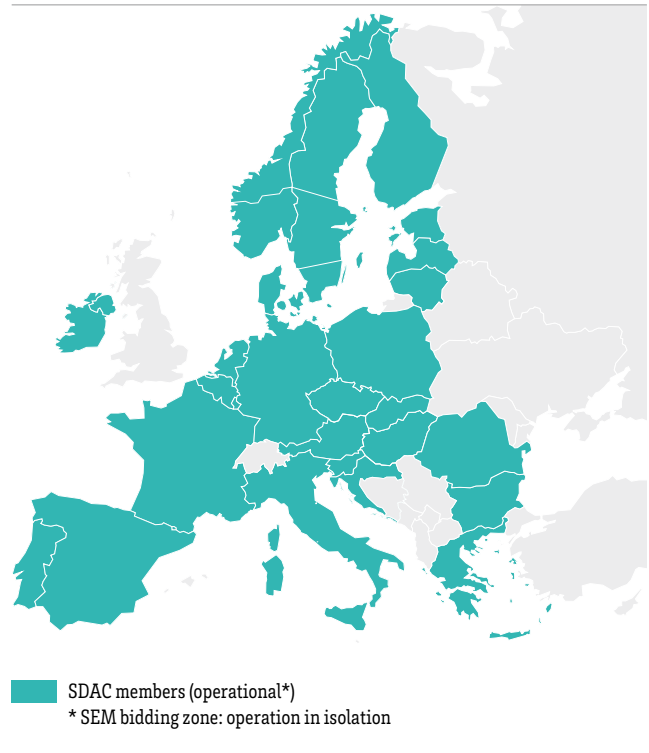


Figure 03

High level market data

In 2025, the SDAC covered most of the EU, in a fully integrated Pan-European day-ahead power market.

The coupling topology included 27 Countries, 77 bidding zones (including virtual Bidding Zones), 30 TSOs and 16 operational NEMOs.

- The economic surplus managed by the algorithm was stable with respect to 2024 and was, on average, around 11.8B€ per session. The traded volumes of the coupling were around 1 900 TWh (in line with 2024).
- The clearing prices slightly increased compared to the previous year, with average prices between 60 €/MWh and 120 €/MWh for the majority of the countries, with the exception of a few bidding zones in Nordic Countries, with an annual average price between 15 and 50 €/MWh.

Price indexes are computed excluding hourly prices in bidding zones with no traded volume on a daily basis. Yearly prices are computed as simple averages of hourly prices.

Traded volumes are computed based on selling and purchase volumes in each bidding zone.

Traded volumes (TWh)

Table 01

Annual	Daily average	Daily minimum	Daily maximum
1 900.88	5.21	4.21	6.10

Clearing prices – annual mean (€/MWh)

Table 02

Hourly minimum	Hourly maximum
-500	1 750

2025 Monthly traded volumes (TWh)

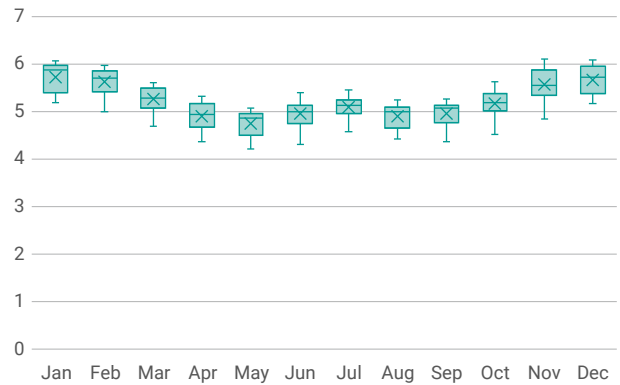


Figure 04

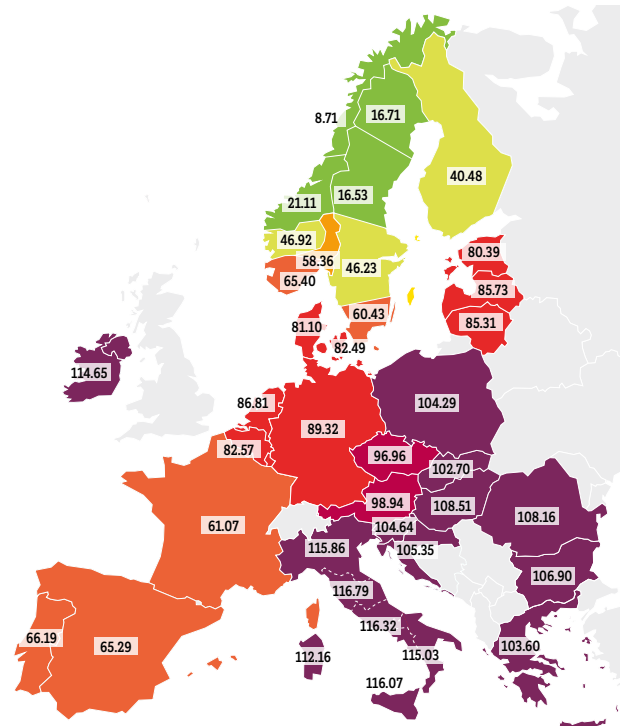


Figure 05

Operations report

In this section, 2025 SDAC operational events are reported, including: the incidents, requests for changes and corrective measures.

“During 2025:

- Increased number of RfCs went live*
- No partial decoupling was registered.”*

Incidents

As for the past year reports, incidents in SDAC are classified according to severity and causes, which is similar but not identical to the relevant classification applied for SIDC, given the differences in the two technical solutions.

The number of incidents in 2025 increased with respect to the previous years, mainly concentrated on cases of low severity.

- No incident which led to partial or full decoupling was registered in 2025.
- The majority of the incidents were visible to market participants but only in two cases the message of risk of decoupling was sent, with no actual decoupling taking place due to the issues being solved.
- A share of 30% of incidents were of low-severity and not even visible to market participants.
- Four incidents fell in the category “MCO”, mainly related to one-time issue with database (resolved by database cleanup) and the post-15 MTU go-live adjustments in the system (no such incidents were detected after the update of EUPHEMIA 11.4 algorithm version).

Requests for change (RfC)

RfCs for SDAC are classified per type of requirement. The same classification is used in SDAC and SIDC, despite the differences of the two technical solutions.

- Many important RfCs went live in 2025, in particular:
 - › The implementation of 15' MTU in SDAC on 30/09
 - › Removal of second auction process on 29/01 and on 30/09
 - › Several network topology changes
- Product extensions:
 - › Introduction of Scalable complex Orders and Blocks and discontinuation of Complex Orders in OMIE Trading Hub on 18/03
 - › Introduction of 30' Period Orders in CROPEX Trading Hub.
- Additionally, two system releases for PMB and for EUPHEMIA went live.

Corrective measure (CM)

In 2025, no corrective measures were triggered.

NEMOs took advantage of the go-live of 15' MTU in SDAC to inform Market Participants on the process in place in case activation of CM is needed, more information can be found on the NEMO Committee website.

Detailed operation report

[More information can be found in the detailed Excel-file Operations Report published at the NEMO Committee website at the publications section.](#)

Incidents

Severity

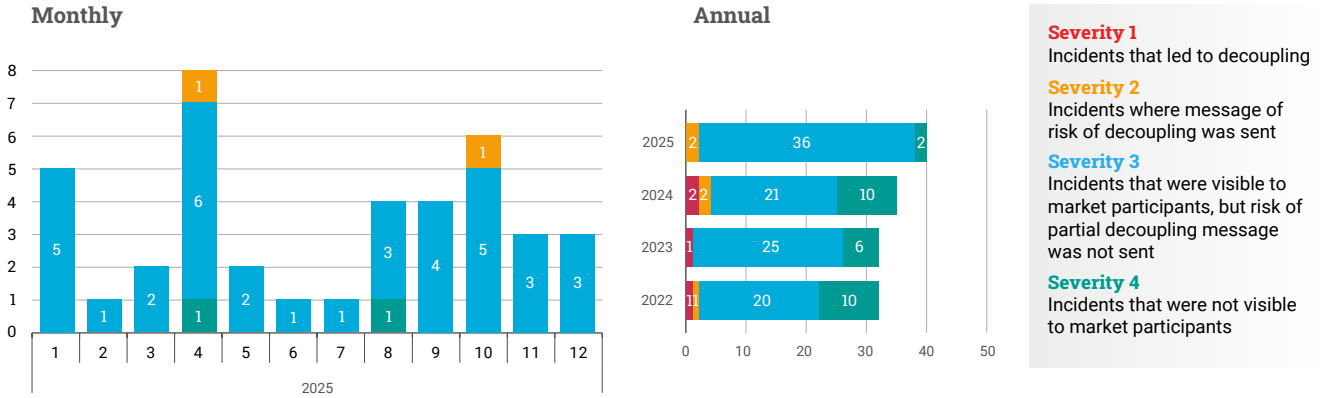


Figure 06

Causes^[1]

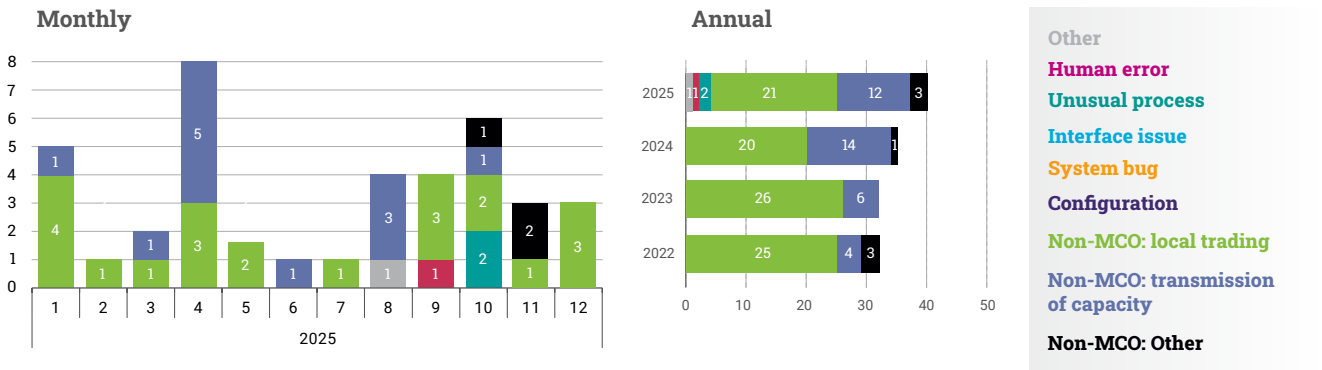


Figure 07

Request for change (RfCs)^[2]



Figure 08

Table 03

Requirement	Name	Go-live Date*	Reason according to AM article 14.1	Initiator/ Owner Details
Network topology	Lowering of ramping limit to 300 MW Estlink	22/01/2025	g	TSOs
Other	Procedural improvements in OTH_02 template messages for external parties	29/01/2025	N/A	NEMOs/TSOs
Other	Removal of Second Auction process except for Baltic bidding zones and Greece (wave 1 of the Second Auction decommissioning)	29/01/2025	N/A	NEMOs
Other	Removal of third countries in the Baltics due to CESA synchronisation	29/01/2025	N/A	TSOs
Network topology	Ramping changes to Nordbalt and Estlink due to synchronisation and isolation test period.	07/02/2025	g	TSOs
Network topology	Changes to LitPol Link due to CESA synchronisation	09/02/2025	g	TSOs
Network topology	Change in ramping Limit for Nordic internal HVDCs (SE3-DK1, NO2-DK1 and DK1-DK2)	18/02/2025	g	TSOs
Other	Temporary change of fallback solution for DK1_DE-DE, DK1_CO-NL (COBRA cable) and DK2_KO-DE (Kontek)	25/02/2025	N/A	TSOs
Network topology	Change of ramping limit on Lineset NO2A in SDAC	05/03/2025	g	TSOs
Network topology	Change of ramping limit on NorNed (NO2_ND-NL) in SDAC (2 weeks prior to 15 -min MTU SIDC go-live)	05/03/2025	g	TSOs
Network topology	Change in ramping Limit for the two HVDCs "Kontek" and "Kriegers Flak CGS" (DK2-DE)	18/03/2025	g	TSOs
Network topology	Lowering of the SE4 - LT (Nordbalt) ramping limit to 300 MW	18/03/2025	g	TSOs
Product Extension	Discontinuation of COs and introduction of new products in OMIE	18/03/2025	d	NEMOs
System release	Euphemia 11.4 & PMB13.1	02/04/2025	e, f	NEMOs/TSOs
Other	Core PL AC decoupling solution	02/04/2025	N/A	NEMOs/TSOs
System release	E11.4 fix 3	20/05/2025	e, f	NEMOs/TSOs
Network topology	SE3-DK1 (Kontiskan) change of loss factor from 0,0% to 2,5%	11/06/2025	g	TSOs
Other	Procedural update regarding JAO messages	24/06/2025	N/A	NEMOs/TSOs
Network topology	Procedural update regarding SwePol	08/07/2025	b	TSOs
Other	Removal of second auctions wave 2 (Baltics)	30/09/2025	N/A	NEMO
Product Extension	CROPEX implementation of 30' Period orders	30/09/2025	d	NEMO
Other	Change of rounded prices in Bidding Area – Greece Mainland with EIC 10YGR-HTSO – Y in SCF	30/09/2025	e	NEMO
Network topology	Lowering of the SE4 – DE (Baltic Cable) ramping limit to 300 MW	30/09/2025	e	TSO
Network topology	Quarterly Polar Reversal Elimination (QPRE) solution for KontiSkan (SE3-DK1) and SwePol Link (SE4- PL)	30/09/2025	e	TSOs
Other	15 -min MTU implementation in SDAC	30/09/2025	a	NEMO/TSOs
MNA extension	EXAA access to PMB	18/11/2025	g	NEMO
System release	PMB_13.1_Fix_Patch	24/11/2025	e, f	NEMO

Performance monitoring report

During 2025 the performance of the SDAC continued to be positive, in which the performance has been better than previous years despite that the usage of products has increased in average, and most significantly since the 15' MTU go-live.

- The usage of products, on average, shows an increase with respect to 2024 (+45%).
- The Time To First Solution (TTFS) has increased since previous year (+14%) – thus amounting to 2.57 minutes in yearly average. The TTFS has increased significantly since the 15' MTU go-live (5.93 minutes in average since 15' MTU go-live).
- Optimality continued to show good performance, as shown in previous years. Since phase-out of Complex Orders in March 2025, the optimality gap is being reported.
- Repeatability indicators keep showing good performance.

“The performance of the SDAC algorithm continued to be highly reliable, ensuring yearly average TTFS of 2.57 mins. The introduction of 15' MTU go-live has had a significant impact on TTFS increasing it to 5.93 mins on average since then, but well below the 30 allowed for calculation.”

For performance monitoring, the indicators considered are listed in the draft annex 3 of the AM approved by ACER with decision 4/2020. The chapter addresses the past four years spanning from 2022 to 2025 in order to allow for a better appreciation of trends and seasonality.

The daily values for these indicators were considered as well as the maximum, minimum and average values observed throughout the year 2025. These are reported in tables in the following pages and compared with the average values of the past three years.

In this comparison, for 2025, it should be borne in mind the huge change that was introduced in the market with the go-live of 15' MTU. When relevant, monthly values are also reported in separate graphs, with evidence of the main events which took place within the timeline of the graphs.

Notes on the calculation of these indicators are included at the end of the report as Annex 2 and further details are provided in the Monitoring Procedure published on the NC website.

Usage Indicators

- In 2025, we observe an increase in the average values for **product usage** for most of the products with respect to the previous years, such an increase is linked partially to the go-live of 15' MTU, but also to the discontinuation of some products : for instance, the removal of PUN and Merit Orders at the very beginning of 2025 was compensated by the replacement with Curves and Simple Blocks. In addition, the discontinuation of Complex Orders starting from March 2025, was compensated by the replacement with Scalable Complex Orders and Simple Blocks. In detail, the increase in 2025 with respect to 2024 is concentrated in the increase of the “total number of steps at bidding zone level” (+90%), “total number of block orders” (+24%), “total number of block order exclusive groups” (+25%), and “total number of linked families” (+8%).
- Among the indicators related to **network constraints** usage, the increase in the number of Flow Based-Power Transfer Distribution Factors (FB-PTDF) constraints is linked to the go-live of 15' MTU and the average level of the usage shows **approximately a fourfold increase compared to the pre-15' MTU value**.
- The analysis of time series shows a seasonal effect in the usage of different kind of orders, with an increase during the winter period. This is particularly evident when observing the trend of the total number of block orders.

Performance data

The analysis of TTFS (Time To First Solution) shows an increase w.r.t. the previous year (+14 %) and the performance of the SDAC algorithm continued to show high reliability, with a yearly average of 2.57 mins for the TTFS. The TTFS has increased significantly since the 15' MTU go-live (5.93 minutes since that date). Also, in the most challenging sessions, the TTFS never exceeded 16.9 min, well below the 30 mins allowed for calculation.

The economic surplus indicators show good quality of solutions, negligible changes in the overall economic surplus for either first to final solution found in the standard calculation time and for final solution to the one after extended calculation time. Increment of economic surplus with respect to the first OK solution in the algorithm calculation is slightly decreasing compared to previous years. The similar behaviour is found in the economic surplus gain when comparing the production results with the calculation after increasing allowed calculation time by 10 minutes.

Without using deterministic time in the calculation, the level of repeatability in 2025, measured by the frequency indicator per delivery day, is always higher than 98.81%,

and the impact of differences over the relevant values, whenever present, proved to be very small with an average annual value around 0.40 %.

The level or repeatability with the deterministic time activated is the expected 100 %. On average the impact of differences is the expected 0 %.

Output indicators

The average economic surplus results stable with respect to 2024, amounting to an average economic surplus equal to 11.8 B€ per session.

Curve orders are responsible for the majority of the traded volumes, followed by block orders and complex orders. The most significant increase in the energy matched is coming from the scalable complex orders (+73 %), followed by block orders (+40 %) and curve orders (+24 %).

The time spent on the different phases of the algorithm calculation process increased with respect to the values from the previous years, as a consequence of the go-live of 15' MTU in the October 2025.

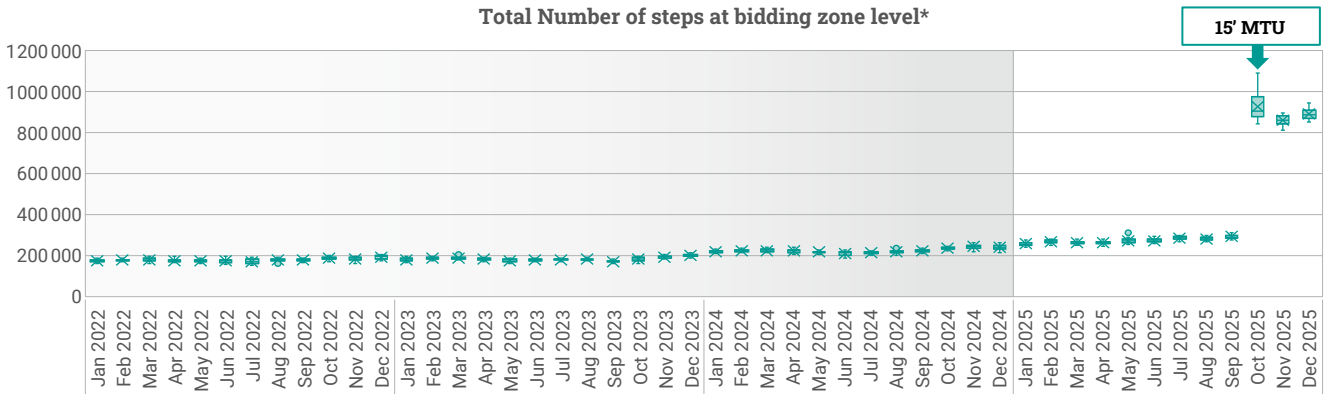
Usage indicators MRC/SDAC

Table 04

Usage indicators	2022**	2023**	2024**	2025		
	SDAC	SDAC	SDAC	SDAC		
Indicators to describe the Usage of SDAC products (Annex 3 of AM Article 10)	Avg	Avg	Avg	Avg	Min	Max
Total number of steps at bidding zone level*	182 216	186 818	226 854	430 778	239 374	1 086 514
Total number of block orders	4 076	4 401	4 828	6 002	4 354	9 314
Total number of block order exclusive groups	135	158	171	213	159	310
Total number of linked families	43	57	52	56	35	115
Total number of complex orders	81	57	53	11	0	57
Total number of scalable complex orders	0	19	21	50	20	68
Total number of demand merit orders	687	832	1 692	0	0	0
Total number of supply merit orders	43 341	40 744	42 342	0	0	0
Total number of PUN orders	13 823	21 279	24 485	0	0	0

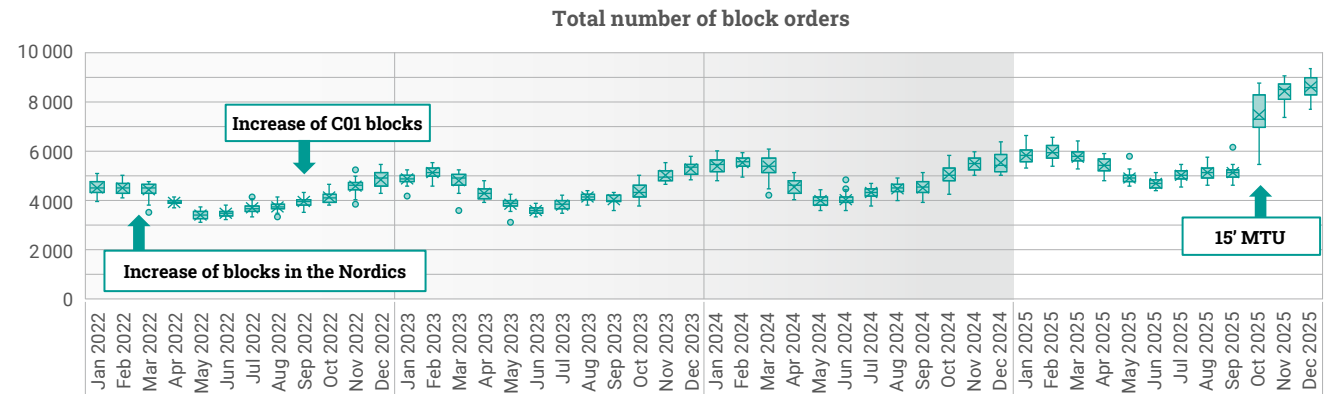
* This figure is the sum of number of points or steps of the aggregated bid curves or stepwise curves in all bidding zones in all 24 hours of the day respectively.

** The reported values are calculated excluding the days of Decoupling – one occurrence in each of the years 2021, 2022, 2023 and 2024.



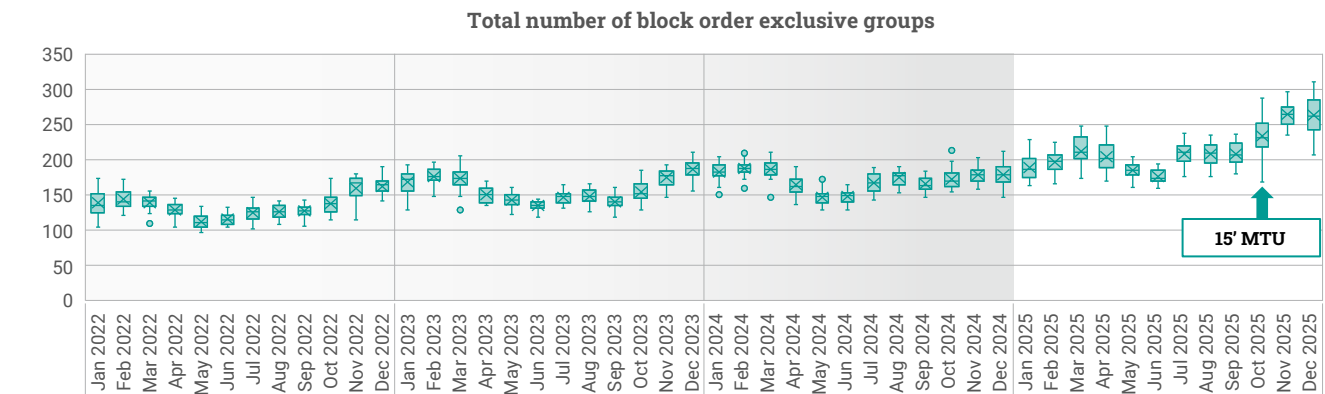
Around fourfold increase in the usage of steps in the curves after the introduction of 15' MTU.

Figure 09



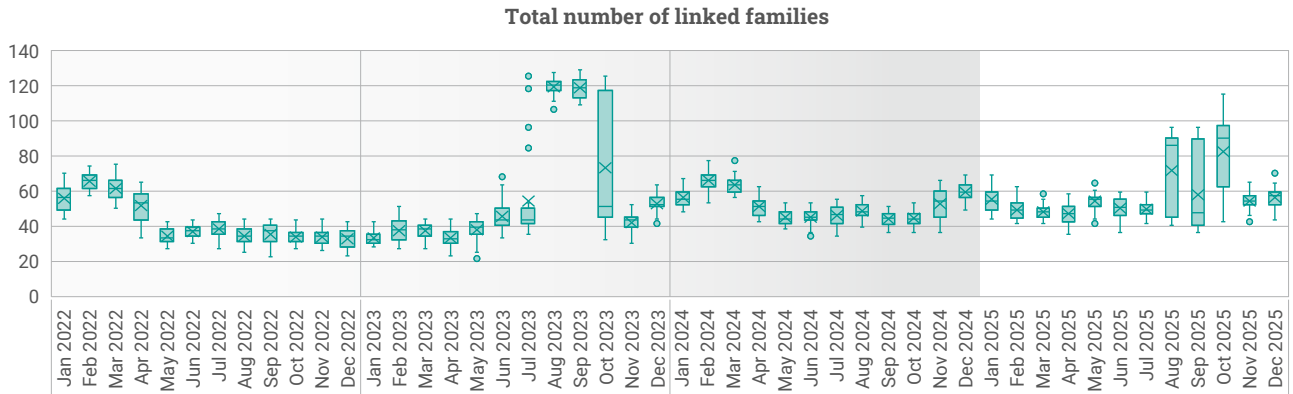
Introduction of 15' MTU almost doubled the number of block orders.

Figure 10



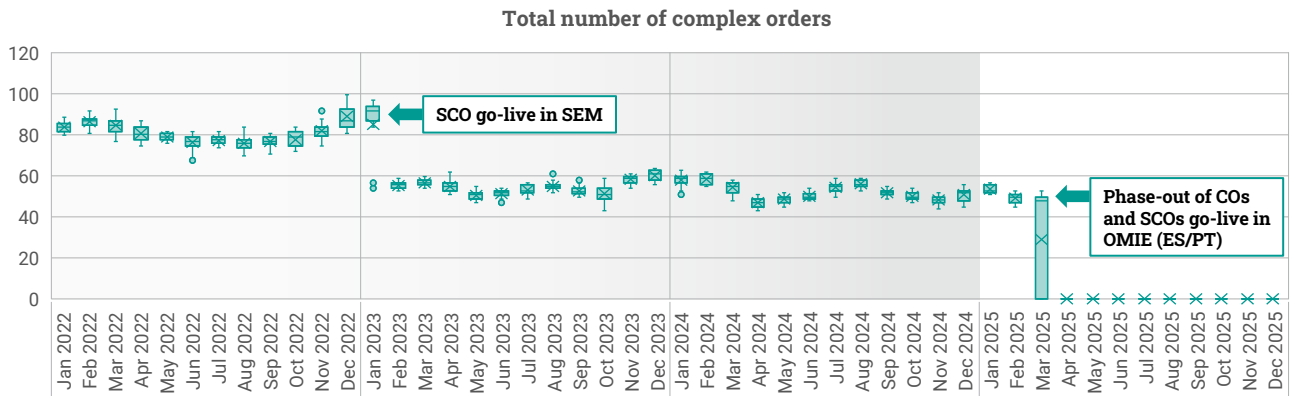
The introduction of 15' MTU seems not to have a significant impact, at least in the 3 first months after the go-live. Nevertheless, the growing trend seems to be maintained and from 2024 to 2025 a significant increase of +24% is observed.

Figure 11



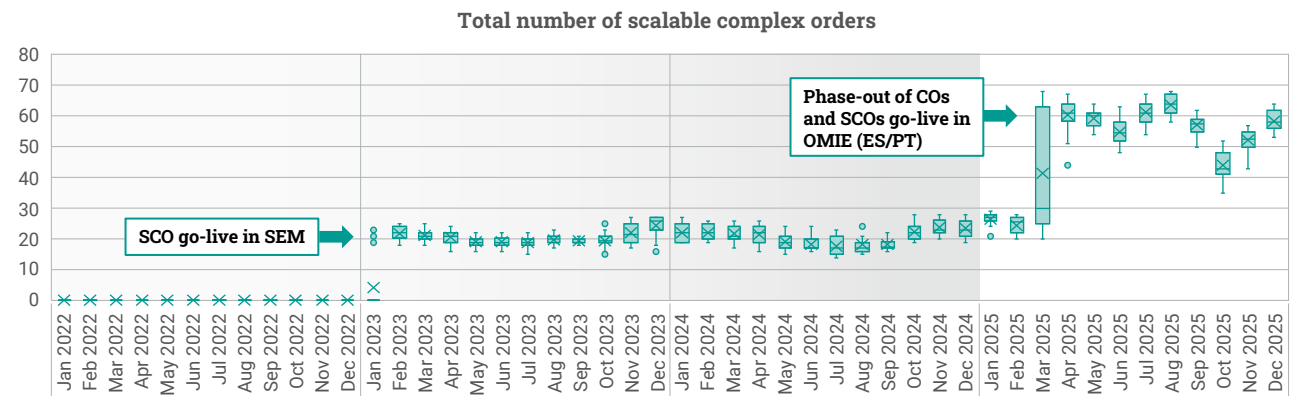
In 2025, a significant increase is observed during the summer, a pattern previously observed in 2023, but in 2025 the variability is bigger and greater values are observed in August and October. In 2025 the average number of linked families was increased w.r.t. 2024 (+8 %).

Figure 12



Usage of complex orders was abandoned in March 2025.

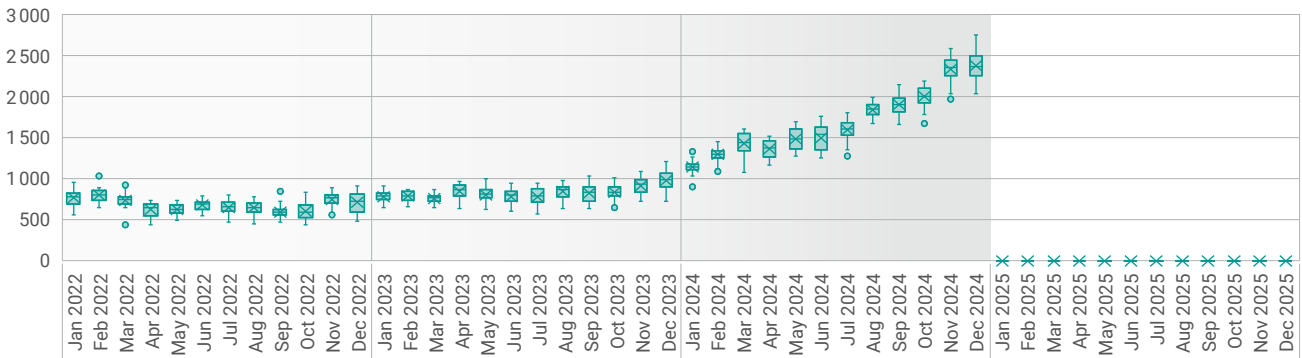
Figure 13



The introduction of 15' MTU in October 2025 seems to have an initial impact regarding the usage of SCOs but in the later months of 2025 their usage seems to have been recovered. After the transition from COs to SCOs has been completed, it is observed that the number of SCOs is smaller than the number of COs at the beginning of this process.

Figure 14

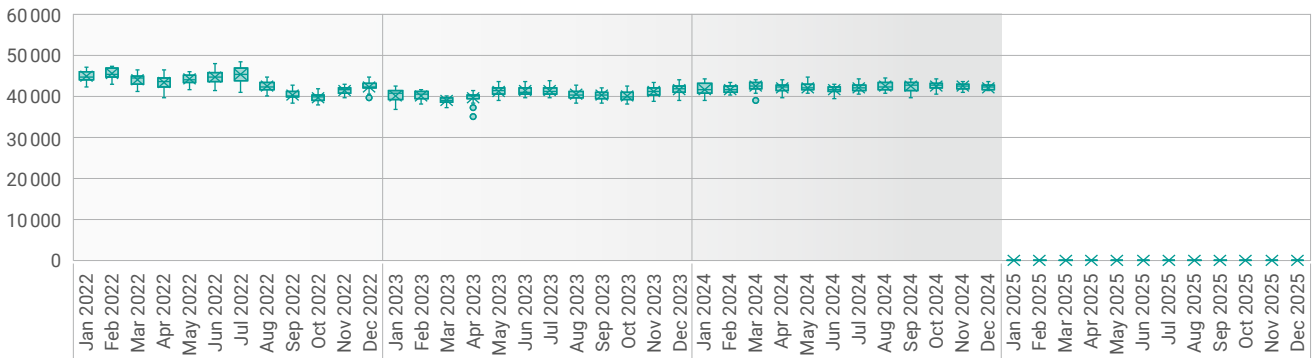
Total number of demand merit orders



The usage of demand merit orders was phased out in January 2025

Figure 15

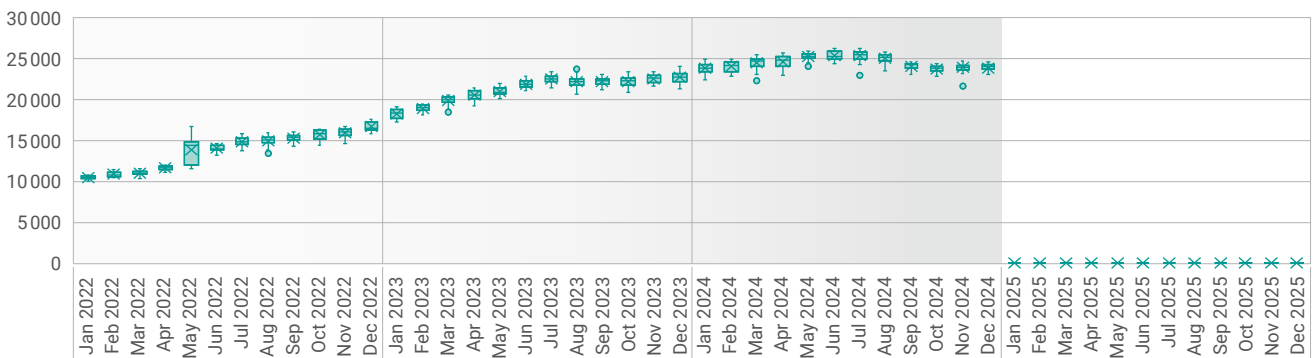
Total number of supply merit orders



The usage of supply merit orders was phased out in January 2025

Figure 16

Total number of PUN orders



The usage of PUN orders was phased out in January 2025

Figure 17

Usage indicators per time resolution, since 15' MTU go-live	Year 2025			
	Time Resolution	Avg	Min	Max
Indicators to describe the Usage of SDAC products (Annex 3 of AM Article 10)				
Total number of steps at bidding zone level*	15	757 023	680 252	951 435
	30	25 626	19 957	33 326
	60	108 481	86 615	125 541
Total number of block orders	15	5 853	3 584	7 001
	30	0.1	0	6
	60	2 277	1 723	2 821
Total number of block order exclusive groups	15	254	168	310
	30	0	0	0
	60	0	0	0
Total number of linked families	15	43	18	59
	30	0	0	0
	60	22	2	64
Total number of scalable complex orders	15	35	21	41
	30	17	8	23
	60	0	0	0

* This figure is the sum of number of points or steps of the aggregated bid curves or stepwise curves in all bidding zones in all 24 hours of the day respectively.

Table 06

Usage indicators	2022 *	2023*	2024*	2025		
	SDAC Avg	SDAC Avg	SDAC Avg	Avg	SDAC Min	Max
2) Indicators to describe geographical extension of the SDAC (Annex 3 of AM Article 11)						
Number of bidding zones	61.6	61	63.8	72.4	72	77
Total number of flow-based bidding zones	11	14	19.4	45	45	45
Number of scheduling areas	64.6	64	66.8	75.4	75	80
Number of NEMO Trading Hubs	99.4	97	102.7	125.4	125	130
3) Indicators to describe the network constraints (Annex 3 of AM Article 12)						
Total number of bidding zone lines	88.2	88	90.9	100.4	100	105
Total number of flow-based PTFD constraints	1896.0	2 785.2	3 410.8	10 110.1	3 969	26 072
Total number of scheduling area lines	98.8	99	101.9	111.4	111	116
Total number of NEMO Trading Hub lines	224.8	222	233.3	273.4	273	278

*The reported values are calculated excluding the days of Decoupling.

Total number of flow-based PTFD constraints

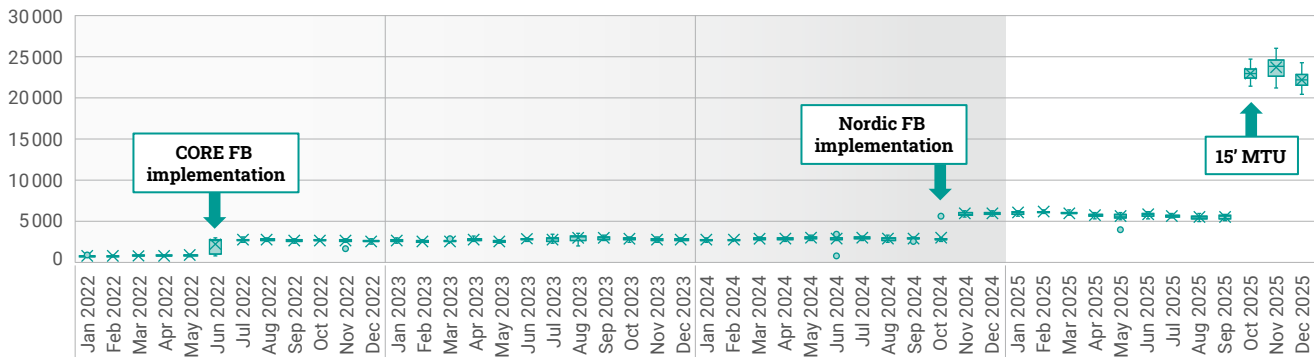


Figure 18

Number of NEMO Trading Hubs

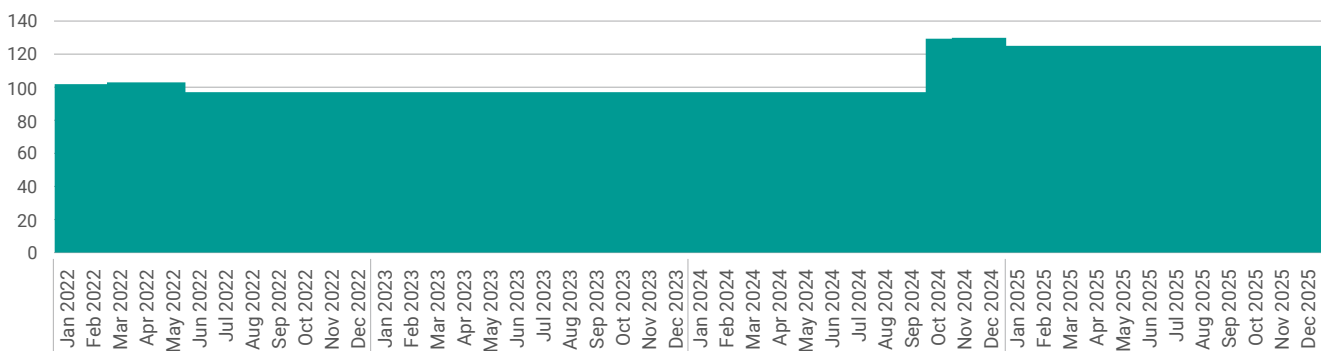


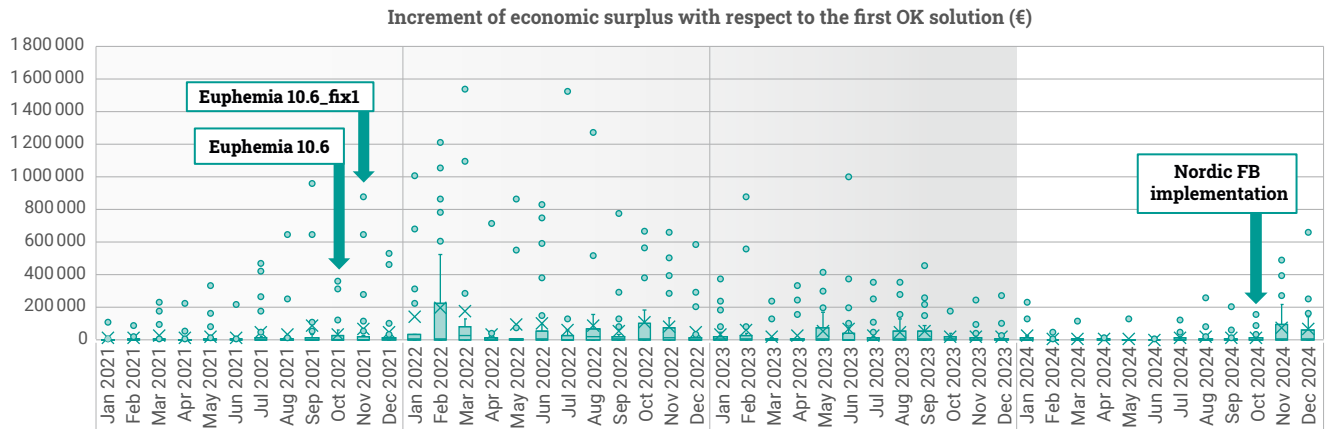
Figure 19

Performance indicators^[4]

Table 07

Performance	2022	2023	2024	2025		
	SDAC	SDAC	SDAC	SDAC		
	Avg	Avg		Avg	Min	Max
1) Ability to maximise economic surplus (Annex 3 of AM Art. 7)						
(a) Increment of economic surplus with respect to the first OK solution (%)	0.001021 %	0.000351 %	0.000177 %	0.000113 %	-0.00126 %	0.005308 %
(b) Economic surplus gain after increasing allowed calculation time by 10 minutes (%)	0.000011 %	0.000007 %	0.000002 %	-0.000001 %	-0.00138 %	0.001683 %
Final gap (€) [available since 19/3/2025]	Not available	Not available	Not available	25 246.6	736.3	244 874.5
Final gap expressed as percentage of the value of the economic surplus of the final solution (%) [available since 19/3/2025]	Not available	Not available	Not available	0.000215 %	0.000007 %	0.0021 %
2) Algorithm repeatability without deterministic time						
(a) Repeatability frequency indicator, measured as number of equal values over total values for the relevant results (%) [bigger is better]	99.88 %	99.89 %	99.82 %	98.81 %	93.16 %	100 %
(b) Repeatability impact of differences indicator, measured as average of the contributions of the sums of absolute values of differences over the sum of the absolute values, for all the relevant results (%) [lower is better]	0.17 %	0.19 %	0.25 %	0.40 %	0 %	6.78 %
(b) Repeatability frequency indicator, measured as number of equal values over total values for the relevant results (%) [bigger is better]	100 %	100 %	100 %	100 %	100 %	100 %
(b) Repeatability impact of differences indicator measured as average of the contributions of the sums of absolute values of differences over the sum of the absolute values, for all the relevant results (%) [lower is better]	0 %	0 %	0 %	0 %	0 %	0 %
3) Algorithm scalability (Annex 3 of AM Art. 9) TTFS (min)						
	2.56	2.47	2.26	2.57	0.60	16.9

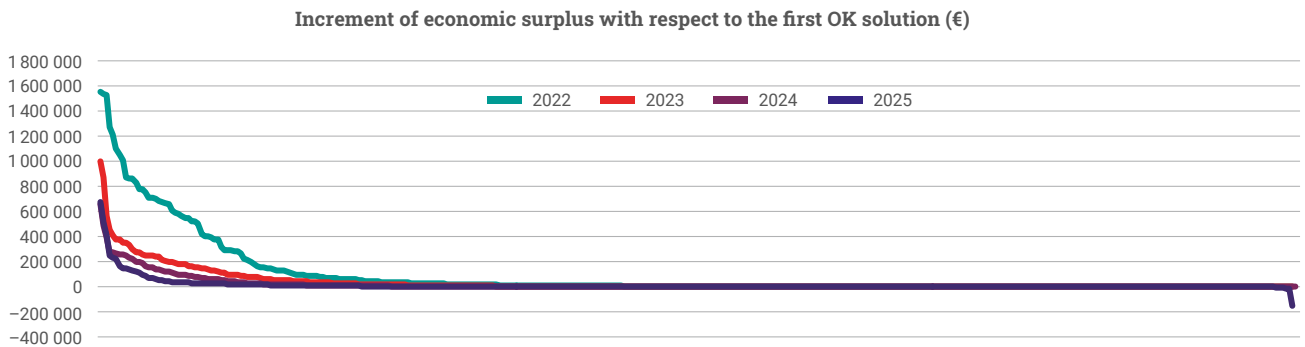
Ability to maximise the economic surplus [3,5]



Increment of economic surplus with respect to the first solution: maximum increase around 0.68 M€ over 11 819 M€ average daily economic surplus in 2025.

Negative values are caused by the cases in which the first solution found was of worse quality in terms of tolerances used and later a solution with better quality was found. This normally happens when the first solution has Technical quality and later a solution with OK quality is found.

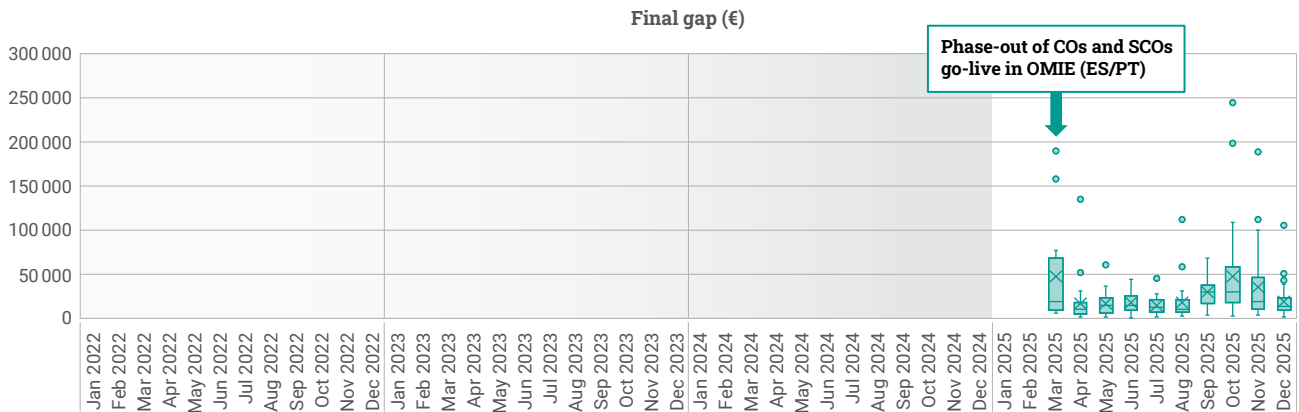
Figure 20



Duration curve shows the Increment of economic surplus with respect to the first solution, ordered in descending order of magnitude, rather than chronologically.

Figure 21

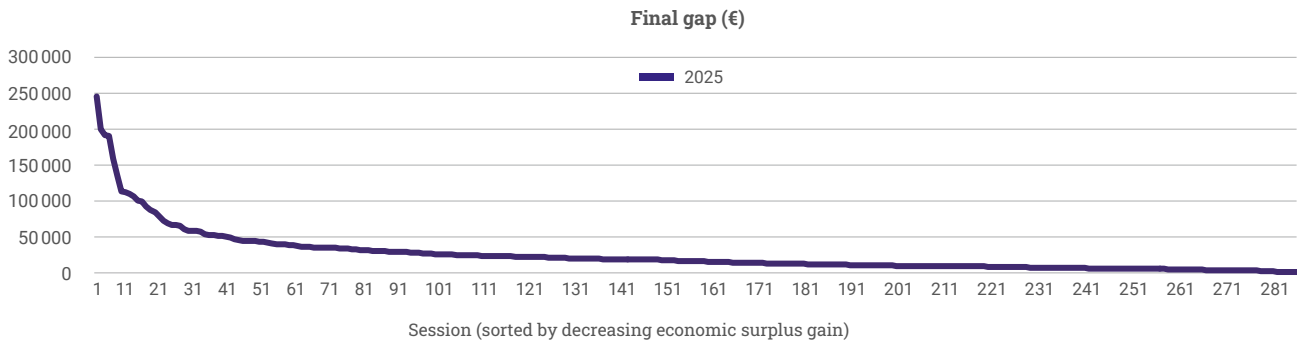
Ability to maximise the economic surplus. Final gap, since phase-out of COs^[3,5]



In 2025, final gap is always below 245 k€ (over 11 819 M€ average daily economic surplus).

In 2025, the final gap expressed as percentage of the value of the economic surplus of the final solution is always below 0.0021%.

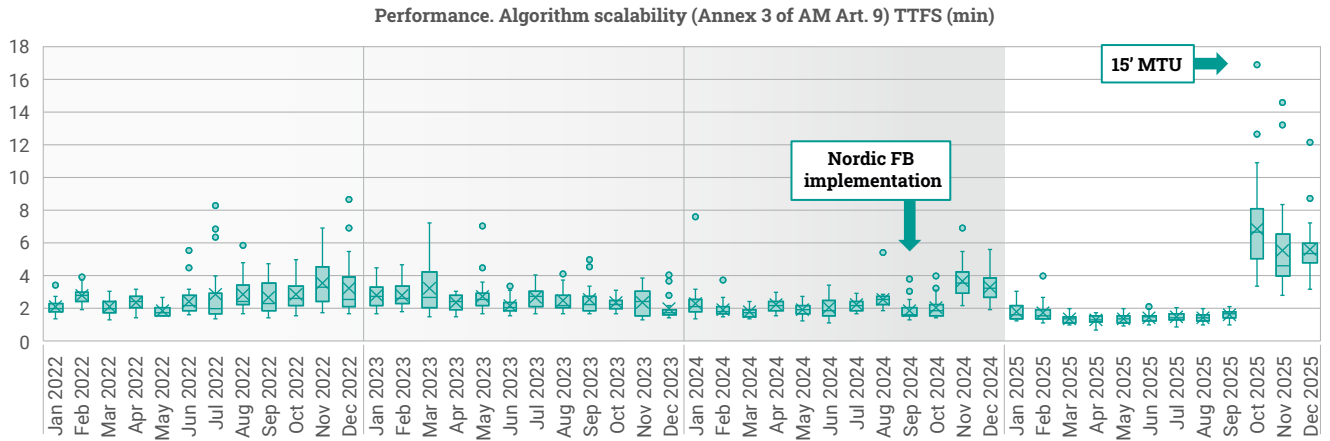
Figure 22



Duration curve shows the Economic surplus gain after increasing the calculation time by 10 minutes ordered in descending order of magnitude, rather than chronologically.

Figure 23

Algorithm scalability (min) [3,5]



Since October 2025 we observed an increase in the TTFS due to 15' MTU go-live.

For the sessions from 2025 that are before the 15' go-live it is observed that, in general, the TTFS is lower than for previous years.

Figure 24

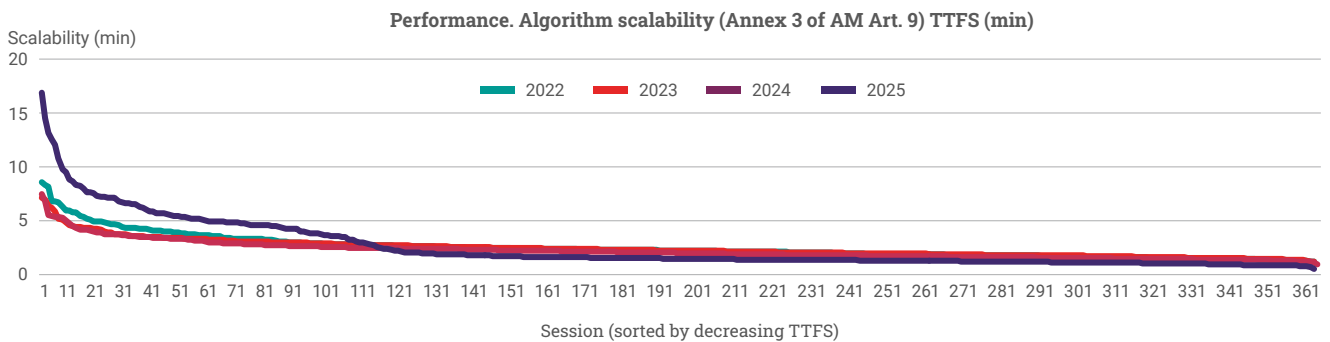
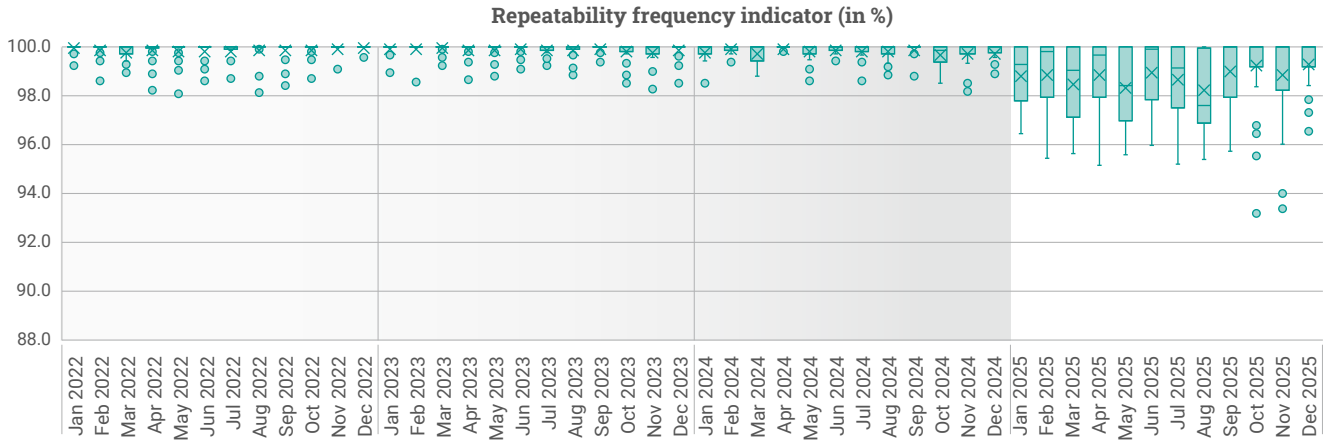


Figure 25

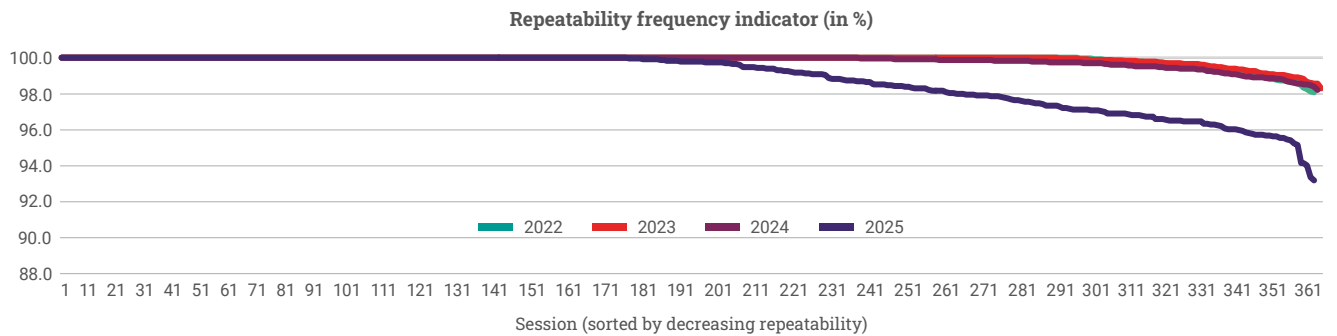
Algorithm repeatability without deterministic time [3,4]



Repeatability frequency indicator without deterministic time shows high levels of repeatability, which, in 2025, is always higher than 92.89%. The repeatability frequency indicator is significantly lower in 2025 than previous years due to the disappearance of PUN and merit orders at the beginning of 2025 and a slight and widespread increase of differences in the results in the rest of bidding zones.

Since 15' MTU, the outliers are bigger, but the averages seem to be aligned with the data from previous years.

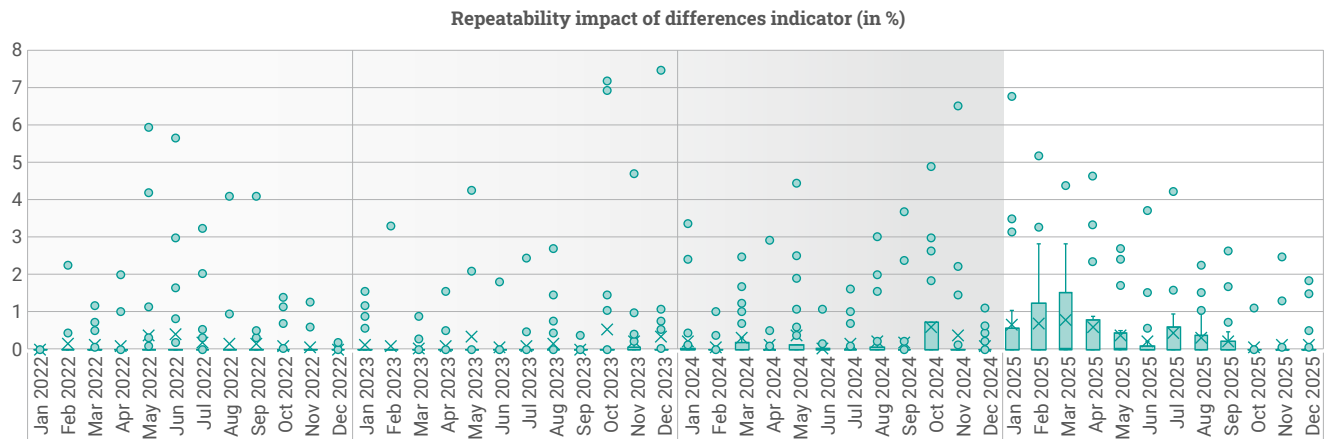
Figure 26



Duration curve shows the Repeatability frequency indicator ordered in descending order of magnitude, rather than chronologically. The number of sessions reaching 100% value for repeatability frequency in 2024 is lower than the value obtained in 2023, caused by the strictness of tolerances used for the calculation of this indicator. See details in the Annexes.

Figure 27

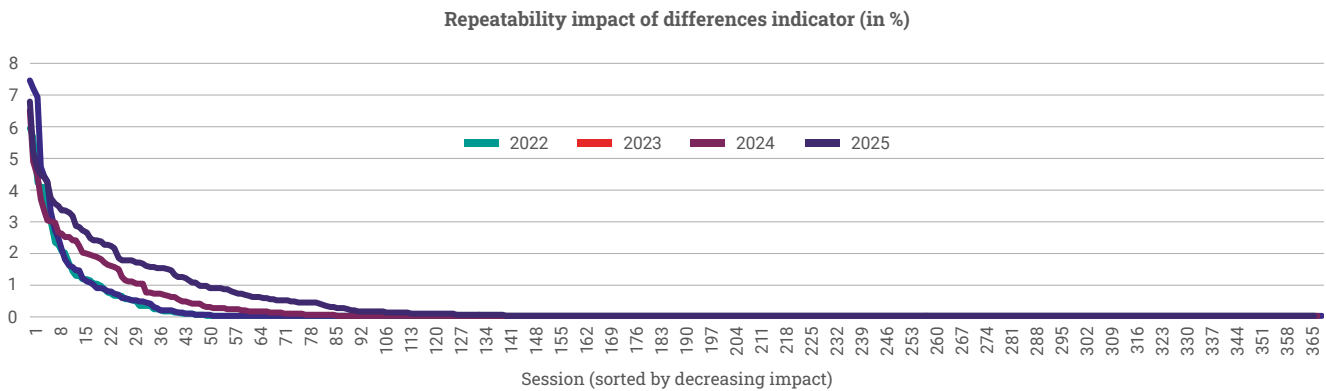
Algorithm repeatability without deterministic time [3,4]



Repeatability impact of differences indicator: the impact of differences over the relevant values, whenever present, proved to be negligible.

In 2025 the differences are greater in average than 2024, but the 2025 maximum is below the maximum of 2024.

Figure 28



Duration curve shows the Repeatability impact of differences indicator ordered in descending order of magnitude, rather than chronologically.

Figure 29

Output indicators

MRC/SDAC

Table 08

Output indicators	2022*	2023*	2024*	2025		
	MRC/SDAC	SDAC	SDAC	SDAC		
	Avg	Avg	Avg	Avg	Min	Max
1) Indicators on the maximisation of economic surplus (Annex 3 of AM Article 13)						
Maximisation of the first economic surplus						
Economic surplus of first OK solution (M€)	9 904.509	10 908.781	11 755.454	11 819.400	0	14 706.680
Economic surplus of the final solution (M€)	9 904.607	10 908.819	11 755.476	11 885.830	1 248.231	14 706.680
2) Indicators to describe the status of orders (Annex 3 of AM Article 14)						
Evolution of number of matched orders						
Total number of matched blocks	808	875	1 098.3	1 497.7	840	3 039
Total number of matched complex orders	42	13	6.8	1.5	0	25
Total number of matched scalable complex orders	0	6	6.6	9.7	0	28
Total number of matched non-PUN merit orders	32 883	32 542	35 224	0	0	0
Total number of matched PUN orders	11 354	16 936	19 635	0	0	0
Total matched volume from curves (MWh)	5 707 128	6 001 375	6 728 770	8 363 403	6 975 971	10 004 245
Total matched volume from blocks (MWh)	398 544	363 438	349 632	491 036.7	198 592.7	10 29 284
Total matched volume from complex orders (MWh)	210 601	62 762	45 661	15 033.8	0	201 817.6
Total matched volume from scalable complex orders (MWh)	0	36 600	41 008	71 108.8	0	161 955.6
Total matched volume from (non-PUN) merit orders (MWh)	730 972	691 978	701 125	0	0	0
Total matched volume from PUN orders (MWh)	776 821	751 039	758 490	0	0	0
Paradoxically rejected orders						
Number of PRBs in the final solution	13.0	7.5	8.3	13.4	1	43
Number of PRMICs in the final solution	2.1	1.5	1.4	1.3	0	9
Maximum Delta P in the final solution	41.7	14.9	13.1	19.8	0.3	292.6
Maximum Delta MIC in the final solution	6.1	3.3	3.6	3.2	0	33.3
PRB utility loss in the final solution (k€)	129.859	46.123	45.1	60.7	0.05	1374.05
PRMIC utility loss in the final solution (k€)	50.669	23.610	24.0	21.5	0	312.6
Volume of PRBs in the final solution (MWh)	12 704	10 127	10 299.9	18 877.5	433.5	67 953
Volume of PRMICs in the final solution (MWh)	10 955	6 897.64	4 826.8	4 275.3	0	43 459.4

Table 08

Output indicators	2022*	2023*	2024*	2025		
	MRC/SDAC	SDAC	SDAC	SDAC		
	Avg	Avg	Avg	Avg	Min	Max
Indicators on the evolution of the use of network constraints along the time						
Number of periods for ATC/DC lines with flows at full capacity	1 059	1 127	1 265.2	2 553.9	1 551	6 956
3) IT calculation process (Annex 3 of AM Article 15)						
Time spent in every phase of the algorithm calculation process						
TTFS (s)	153.6	148.3	135.8	154.2	35.9	1 014.1
Input data reading time (s)*	10.4	9.3	13.4	12.9	2.4	118.1
Input data delivery day creation (s)*	23.1	30.0	14.1	25.5	8.6	122.3
Time to solve the root node for the master computer (s)*	15.0	17.2	9.5	29.0	4.5	264.5
Time to solve the root node for the job that found first solution (s)*	3.49	5.6	6.5	19.5	3.7	124.3
Number of successive improvements of the solution in the given timeframe <i>This indicator measures the number of OK solutions that improve a previously found solution during the optimisation process limited by the amount of time available for running the SDAC algorithm***</i>	2.4	3.1	3.2	3.6	0	21
Total number of nodes in the master branch and bound tree**	405	565.2	579.6	535.9	9	11 029

* The reported values are calculated excluding the days of Decoupling

** Some time measurements in the calculation are overlapping (parallel processes).

*** Zero nodes in the master branch can happen when the root node directly resolves to an optimal solution.

**** This number includes the first solution

Table 09

Output indicators per time resolution, since 15' MTU go-live	Time Resolution	2025 SDAC		
		Avg	Min	Max
Evolution of number of matched orders				
4) Indicators to describe the status of orders (Annex 3 of AM art 14)				
Total number of matched blocks	15	1 397	702	2 181
	30	0.02	0	2
	60	820	485	1 069
Total number of matched scalable complex orders	15	4	0	18
	30	7	1	19
	60	0	0	0
Total matched volume from curves (MWh)	15	7 292 885.2	5 978 667.8	8 344 995.5
	30	201 866.8	152 564.3	259 870.8
	60	1 082 763.2	837 746.0	1 430 027.8
Total matched volume from blocks (MWh)	15	463 947.0	201 919.0	834 806.4
	30	0.04	0	3.5
	60	162 793.0	72 027.2	215 148.8
Total matched volume from scalable complex orders (MWh)	15	49 900.1	0	107 184.5
	30	39 168.2	984.0	75 219.5
	60	0	0	0

Performance monitoring report: analysis on the usage of each product and its impact on algorithm performance

In this section, the individual impact on performance of each product is assessed, as stated in article 8.3.a) of the Algorithm methodology approved by ACER in January 2020.

Methodology

The analysis is performed for all the products included in the DA product methodology, apart from Stepwise Curves and Simple Blocks (which are deemed being the least impacting way to implement requirement explicitly mentioned in CACM) and merit orders (which are considered basically equivalent to stepwise curves in terms of performance impact). The analysis is performed against a historical dataset from Q4 2025.

Conversion of products

In order to assess the individual impact on performance, the remaining products have been replaced by the most similar alternative product, following specific conversion rules.

- **Piecewise curves:** converted into stepwise curves. For each non-vertical piecewise curve segment, one stepwise curve segment is created with price at the middle of min and max price of the given source piecewise segment. In case source segment is stepwise (e.g. having STEPWISE or HYBRID source curve) it is kept as it is. Vertical segments needed for the construction of the stepwise curve may be added or amended.
- **Smart Blocks:** converted into simple blocks.
 - › Linked families where all members have the same sign (all buy or sell) are converted into a single block that aggregates all their energy at the price of the family parent block. Linked families with mixed members (buy and sell) are discarded.
 - › Exclusive groups are converted by picking the most promising block of the blocks forming the exclusive group, maintaining its MAR and price.
 - › Flexible blocks are replaced by a simple block in the period in which they would provide the greatest welfare according to the published results.
- **Scalable Complex orders** Scalable Complex Orders are replaced by BO and curves:
 - › Power for the block order is the greatest of the first step power or the minimum acceptance power from the Scalable Complex Order. Price of the block is calculated using the contribution of price of the SCOs steps weighted by its power and the contribution of the FT distributed among all power that is assigned to the block.
 - › Remaining steps shall be integrated into the single curve.
- **As several products were phased out during 2025, there will not be any scenarios that aim to replace the PUN orders, merit orders and Complex Orders (formerly referred as MIC/MP and load gradient orders).**

Conversion of products drawbacks

Due to the nature of the requirements these conversion rules are not able to convert all the requirements from the original product into requirements from remaining products.

The conversions carried out in this study may not reflect a realistic behaviour of market participants in case one product is replaced by another one. For instance, one stepwise order may be split in several stepwise orders by market participants in order to reflect their needs.

Results

First, the gains of a product replacement measured in seconds are in the order of few tens of seconds. Furthermore, repeated runs of the same input data may return small differences in values for the time to first solution (TTFS), in the order of a few seconds, even when the same machine and configuration is used.

Second, the impact on individual sessions is not evenly distributed. It has been observed that although the average behaviour may be negative, there may exist a few sessions that are not single outliers and its value has a different sign.

Third, it has been observed that the impact on TTFS may depend on the internal parameters of the simulation. The selection of values for internal parameters of CPLEX and heuristics in EUPHEMIA is done pursuing a good behaviour in a wide variety of cases, covering adequate performance in average and being able to deal with problematic cases, too. If one kind of product is removed, then the values of parameters should be reassessed against the full set of data scenarios used for the acceptance of new EUPHEMIA releases.

Fourth, Q4 2025 has been selected, which contains many of the most challenging sessions of the year. In 2025, they also match all the sessions that followed the 15' MTU go-live. Although the size of the sample used for input data has been extended from the initial 1 month selected for 2019 study to 3 months from 2020 study, data still show counter intuitive behaviours in some scenarios when using normal configuration. We observed counter-intuitive behaviours such as in piecewise curves conversion into stepwise curves when using normal configuration (+97.9% in TTFS,).

It should be noted that such an approach is overestimating the impact on performance, as the conversion eliminates not only the individual impact of each product but also the combined effect linked to the interaction with the remaining products. For such a reason, it should also be noted that the estimated impact of the different scenarios cannot be accumulated.

Fifth, as indicated in results from previous years, the comparison of impact from this study with the outcome from R&D activities was indicating that the size of the input data for the sessions used in an impact of products on algorithm performance study is more relevant than the size of the sample (in number of sessions) used for the study. In 2025 the data includes post-15' MTU go-live data, the size in number of orders has increased significantly. For instance, for curves it is 3.7 times bigger than in previous year. The results show a heavy increase in TTFS compared to results from previous year and the TTFS of the reference scenario is almost 4 times bigger.

Sixth, it should be also reminded about the drawbacks due to the conversions of products applied that have been already explained in a previous slide. In conclusion, the main findings of the study indicate:

- The outcome is heavily dependent on the methodology used [replacement of products, length in number of sessions of the batch, selection of internal parameters of the algorithm, size of the input data for each one of the sessions contained in the batch, ...]
- Given the chosen methodology, Complex Block Orders seem to impact more than other optional products the algorithmic performance .

As a **final remark**, all these observations suggest reconsidering the approach to be followed to assess the impact of each product on algorithm performance. It should be noted that in the scope of this study only products were taken into account, while other requirements, such as flow-based requirements also have a significant impact, as shall be reflected in the scalability report. NEMOs defend that in case corrective measures need to be applied, the decision should be accompanied with a study analysing the impact on prices.

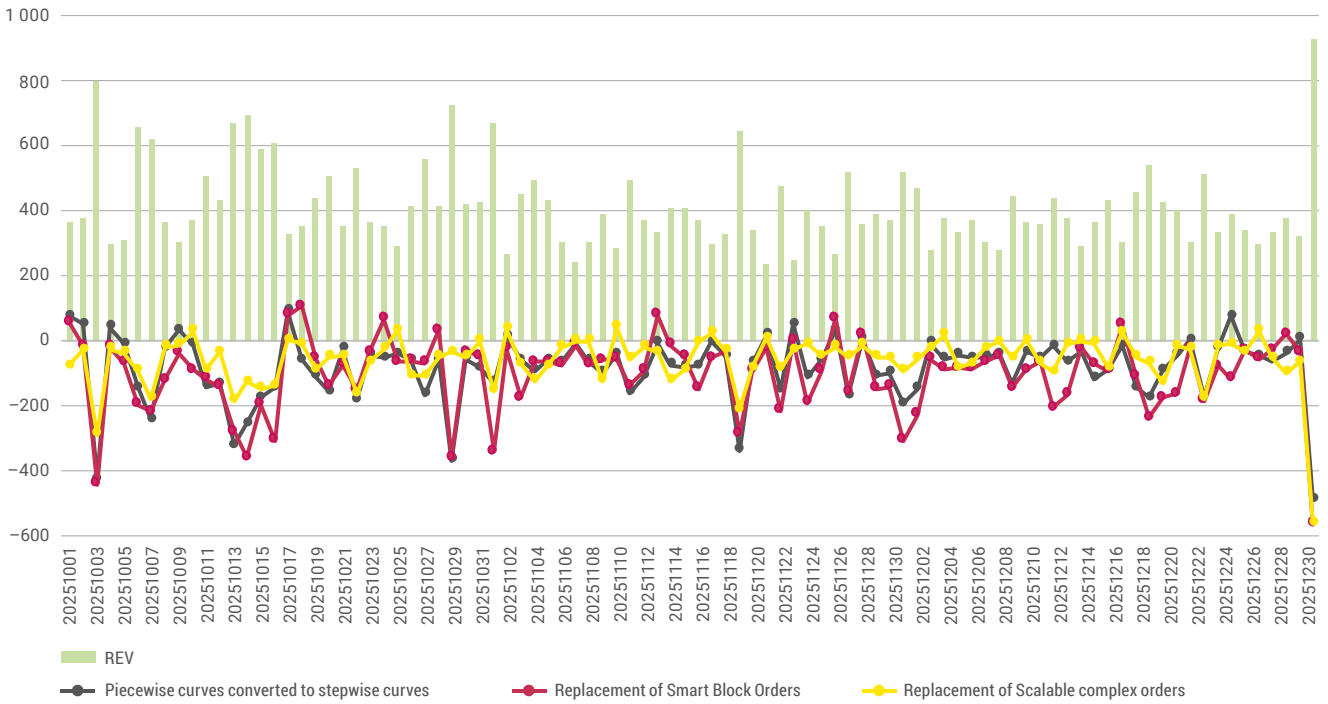
		Reference Scenario										
		Actual values		Impact on performance [*]			Assumptions for the simulation					
Products	Orders submitted (#)	Traded volumes (GWh)	AVG TTFS(s) E11.3	Δ TTFS (s) E11.3	Δ TTFS (%) E11.3	# of steps at BZ level	# of Block orders	# of Smart Block Orders	# of MIC/MP and load gradient orders	# of Scalable MIC/MP and load gradient orders	# PUN and Merit Orders	# of PUN Orders
Reference scenario			417.4	-	-	891 130	8 131	3 570	0	51	0	0
Scenarios in which products are replaced	Stepwise Curves	891 130	8 654	Not estimated			-	-	-	-	-	-
	Piecewise Curves			334.2	-83.2	-19.9%	805 087	5 317	3 570	0	51	0
	Merit orders	0	0	Not estimated			-	-	-	-	-	-
	Block Orders	8 131	626	Not estimated			-	-	-	-	-	-
	Complex Block Orders (exclusive groups + linked blocks)	3 570	Not available	314.2	-103.2	-24.7%	891 130	4 848	0	0	51	0
	Scalable Complex Orders (that are converted into BO and curves)	51	89	357.7	-59.6	-14.3%	904 461	8 182	3 570	0	0	0

^{*} Calculated with respect the reference scenario. The values of the impact (Δ TTFS) report AVG(TTFS from scenario replacing the product X) compared against AVG (TTFS from REF scenario). A negative value means that when the product is replaced, the TTFS is shorter than in the reference scenario. All the scenarios, except for the one in which piecewise curves are converted in stepwise curves, are calculated using default configuration (the one used in production). For the scenario in which piecewise curves are converted to stepwise curves, different internal parameters have been used, as suggested by the algorithm provider (these are different from the default configuration).

Figure 30

Euphemia 11.4*

TTFS Absolute differences (s) and TTFS REF values (s)



* Calculated with respect the reference scenario. The values of the impact (Δ TTFS) report AVG (TTFS from scenario replacing the product X) compared against AVG (TTFS from REF scenario). A negative value means that when the product is replaced, the TTFS is shorter than in the reference scenario. All the scenarios, except for the one in which piecewise curves are converted in stepwise curves, are calculated using default configuration (the one used in production). For the scenario in which piecewise curves are converted in stepwise curves, different internal parameters have been used, as suggested by the algorithm provider (these are different than the default configuration).

Figure 31



R&D report

The SDAC R&D program has been the driving force of significant advancement in market coupling algorithm development as a part of Euphemia Lab since its beginning in 2019. The program has been vital for continuous introduction of new methods and features into Euphemia releases, making sure the algorithm remains compliant with regulations and keeps up with the evolution of the market. The two newest iterations in the year 2025 were mostly focused on performance and welfare improvements, increasing scalability and effectiveness of the algorithm, and performing exploratory research, with the goal of keeping Euphemia robust enough to excel in the increasingly dynamic market conditions.

Key Developments and Achievements in 2025

With the 15-minute MTU environment successfully going live on the 30th of September, focus of the research tracks has shifted significantly towards general improvements of Euphemia algorithm, mainly regarding performance and welfare. Along with improvements of already existing functions and mechanisms of the algorithm as well as follow-ups from the previous iterations, various novel topics have been investigated as well. In particular, quite a bit of focus has shifted onto the market coupling network, making a new R&D topic Future of the Network. The aim of the new topic is to ensure Euphemia algorithm can adapt to major expansions of the market coupling topology. It also takes over the spot of Future of the Algorithm topic in the previous iterations, while ongoing tracks from the topic in question have been moved to Generic Improvements topic.

Generic Improvements topic itself covers 30% and 35% of iteration 13 and 14 respectively. Tracks covered by this topic contain a variety of reliability and performance upgrades, as well as a new order type called Storage Orders. This new type of order enables efficient representation of energy storage capacities in Single Day Ahead Coupling market. Besides the new way of bidding, Generic Improvements topic also encompasses follow-ups for new heuristics that potentially bring improvements in the process of complex order reinsertion, which ultimately enhances algorithm performance. Next is also the ongoing track consisting of Adequacy Patch module, addressing rare curtailment events, ensuring robust CACM operation under 15' MTU. Last but not least, is Negative Remaining Available Margin (RAM). Handling of Negative RAM is necessary for the introduction of flow-based in SIDC/IDA, meeting CACM requirements.

“Successful integration of 15-minute products allowed the R&D to shift focus towards improving scalability of Euphemia algorithm.”

About 16,7 percent of the iteration 13 scope consisted of topic Core Software Improvements. This part of iteration 13 was mainly focused on improvement of branching mechanisms and local search improvements, both of which are already existing core parts of Euphemia algorithm. Enhancing these features allows for better scalability, as well as maintaining or reducing time necessary for algorithm to find a valid solution, meeting CACM performance expectations. In iteration 14 the Core Software Improvements covered 26,7 percent of the total budget. Explored tracks during this time were various performance and welfare improvements as well as solver repeatability. Performance improvements consisted of refactoring various parts of the code for better performance. For example, pre-solving, bidirectional flow cuts or curve violation checks. The welfare improvement track mainly focuses on potential ways to make final economic surplus bigger at the end of the algorithm calculation. Track comprised of various new heuristics like Top-down reverse local search or Large Neighborhood Search. Concurrently, solver repeatability was improved to comply with the CACM repeatability requirement under increasing complexity of the algorithm.

Next crucial part of the R&D efforts was Future of the Network topic, which included roughly 20 percent of the budget for both iteration 13 and iteration 14. All the tracks included inside this topic concern the current network structure of the market coupling endeavour. Tracks like CE Merger and Celtic Interconnector ensure that Euphemia algorithm can adapt to major expansions of the current topology, while continual refinement of HVDC reversal avoidance mechanism modelling continues to minimize current reversal instances, lessening the wear the cables in question endure. The track Core advanced hybrid coupling continued in 2025 with a goal of improving the capacity allocation mechanism. In addition, as a completely new addition to R&D during iteration 14, the testing of oriented flow-based domain was conducted, potentially bringing improvements to the performance of the Euphemia algorithm. These steps ensure that Euphemia remains well-positioned to integrate new technologies without compromising its established performance benchmarks, a necessity for evolving regulatory and market landscapes. From iteration 12 onwards, the co-optimisation was considered as its own separate topic with unique budget to cover the increasingly bigger workload required.

For both Iterations 13 and 14, the largest share of the budget was dedicated to Generic improvements containing multiple topics as detailed in the following tables. Comparing the share of 'Prospective and preparation costs' between the two iterations, it is important to note that in Iteration 13 the training of personnel in inner workings of Euphemia algorithm was part of 'Prospective and preparation costs'. The total cost for both iterations is 1 063 800 €, plus added costs for cloud testing of 90 051 €.

The R&D on Co-optimisation throughout the year 2025 was made completely separate due to extensively increased work-load compared to other tracks and made its own topic. The total cost for both iterations was 1 063 800 €, plus added costs for cloud testing of 90 051 €, the cost for R&D on Co-optimisation separated during 2025 was 166 200 €.

**R&D programme for the price coupling algorithm:
budget share per topic**

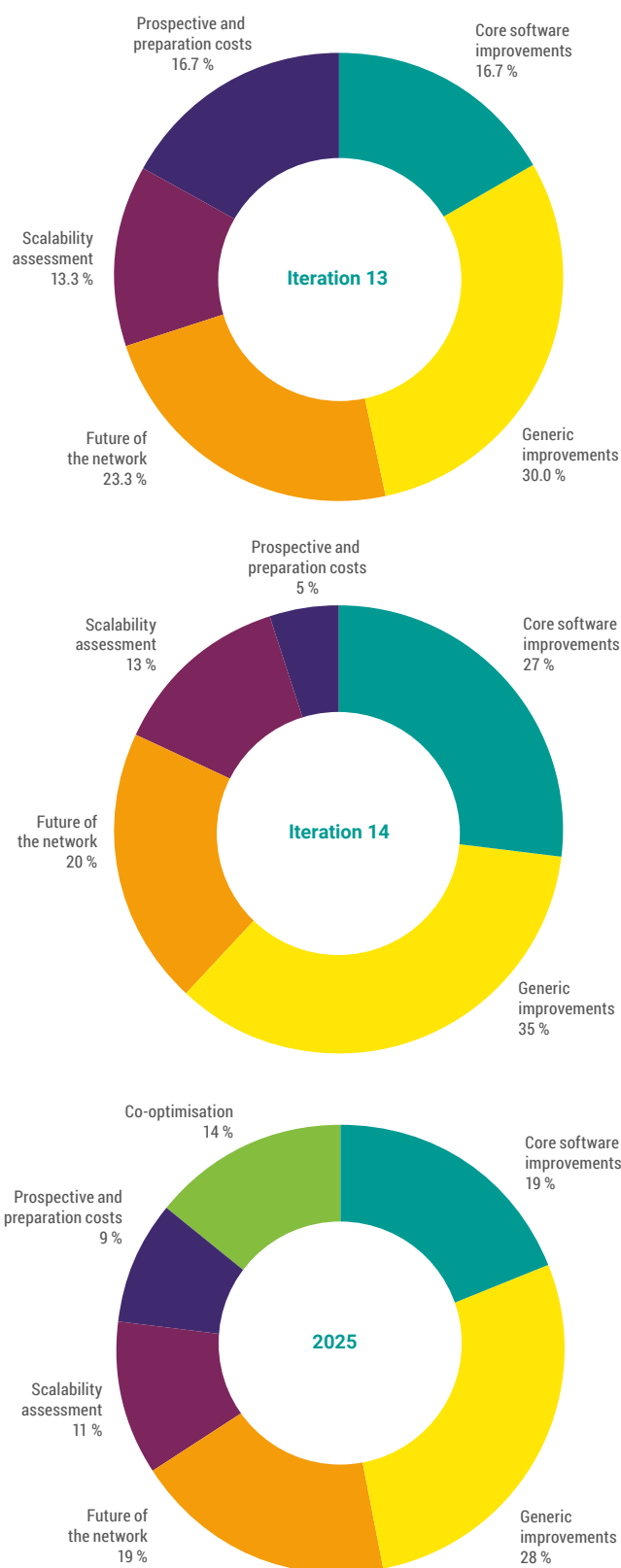


Figure 32

R&D programme for the price coupling algorithm – ITERATION 13

R&D topic	Description	Iteration # [*]	Share of iteration workload and budget	Share of both iterations workload and budget
Core software improvements	Branching mechanisms	13	8,33 %	4,17 %
	Local search improvements	13	8,33 %	4,17 %
Core software improvements	New heuristics follow-ups (reverse local search, large neighbourhood search)	13	8,33 %	4,17 %
	Adequacy patch revision	13	8,33 %	4,17 %
	Negative RAM	13	5,00 %	2,50 %
	Storage orders	13	8,33 %	4,17 %
Future of the Network	CE Merger	13	11,67 %	5,83 %
	HVDC reversal avoidance mechanism	13	5,00 %	2,50 %
	Core Advanced Hybrid Coupling	13	6,67 %	3,33 %
Scalability assessment	<ul style="list-style-type: none"> • Large-scale batch analyses • Creation of new solver and algorithm configurations when required 	13	13,33 %	6,67 %
Prospective and preparation costs	Wrap up prototype iteration 13, personnel training, iteration 14 preparation	13	16,67 %	8,33 %

* Iteration 12 is presented in the 2024 CACM Annual report; Iteration 13 and 14 took place from April 2025 until March 2026.

Table 10

CACM compliance	Outcome and impact on CACM compliance	Implementation in production (forecast)
Scalability improvement	Helps maintain or reduce TTFS under increasing complexity (e.g. advanced hybrid coupling) meeting CACM requirements.	E 11.4 and following releases
Scalability improvement/ Flow-based SIDC(IDA)	Raises performance headroom by implementing new heuristics and improving existing ones. Updated Adequacy Patch addresses rare curtailment events, ensuring robust CACM operation under 15 MTU. Handling of negative RAM is needed for the introduction of flow-based in SIDC/IDA meeting CACM requirements. New order type enabling efficient representation of energy storage capacities in SDAC (Storage orders).	<ul style="list-style-type: none"> • E 12.1 for Reverse Local Search • E 12.2 (TBC) for Negative RAM • E 12.2 or E12.3 for Storage orders To be further determined for other tracks
Scalability improvement	Ensures Euphemia can adapt to major expansions of the market coupling topology. Refines HVDC modeling (fallback & reversal logic). Simplifies capacity allocation mechanism (Core AHC).	<ul style="list-style-type: none"> • E 12.0 and following releases (Core AHC) • E 12.2 and following releases (HVDC, CE Merger)
NA	Ensures new and existing features are tested against latest test batches. Analyse performance gains achieved due to improved algorithms, modelling, or configurations.	NA
NA	Integrated successful adaptations from the iteration into the Euphemia prototype, ensuring readiness for future tests and implementations.	NA

R&D programme for the price coupling algorithm – ITERATION 14

R&D topic	Description	Iteration #*	Share of iteration workload and budget	Share of both iterations workload and budget
Core software improvements	Solver repeatability	14	6,67%	3,33%
	Performance Improvements	14	10,00%	5,00%
	Welfare improvements	14	10,00%	5,00%
Generic improvements	Adequacy patch	14	15,00%	7,50%
	Negative RAM	14	10,00%	5,00%
	Storage Orders	14	10,00%	5,00%
Future of the Network	Core Advanced Hybrid Coupling	14	20,00%	10,00%
	CE Merger	14		
	Celtic Interconnector	14		
	HVDC reversal avoidance mechanism	14		
	Oriented flow-based domain	14		
Scalability assessment	Large-scale batch analyses, creation of new solver and algorithm configurations when required	14	13,33%	6,67%
Prospective and preparation costs	Wrap up prototype iteration 14	14	5,00%	2,50%

*Iteration 12 is presented in the 2024 CACM Annual report; Iteration 13 and 14 took place from April 2025 until March 2026.

R&D programme for the price coupling algorithm – Co-optimisation 2025

R&D topic	Description	Year	Share of 2025 budget	CACM compliance
Co-optimisation	Bid cost types	2025	14,29%	Scalability Improvement
	Bid design			
	Cross-zonal Capacity Allocation			
	Pricing with non-convexities			
	Future analysis			

Table 11

CACM compliance	Outcome and impact on CACM compliance	Implementation in production (forecast)
Scalability improvement/ Repeatability	Helps maintain or reduce TTFS under increasing complexity (e.g. advanced hybrid coupling) as well as increasing welfare meeting CACM scalability expectations.	<ul style="list-style-type: none"> E 12.1 (Performance improvements) To be investigated (others)
Scalability improvement/ Flow-based in SIDC IDA	Updated Adequacy Patch addresses rare curtailment events, ensuring robust CACM operation under 15 MTU. Handling of negative RAM is needed for the introduction of flow-based in SIDC/IDA meeting CACM requirements. New order type enabling efficient representation of energy storage capacities in SDAC (Storage orders)	<ul style="list-style-type: none"> E 12.2 (TBC) for Negative RAM E 12.2/E12.3 for Storage orders To be further determined for other tracks
Scalability improvement	Ensures Euphemia can adapt to major expansions of the market coupling topology. Refines HVDC modeling (fallback & reversal logic). Simplifies capacity allocation mechanism (Core AHC). Testing of oriented flow-based domain for potential performance improvements.	<ul style="list-style-type: none"> E 12.0 and following releases (Core AHC) E 12.2 and following releases (HVDC, CE Merger) <p>To be further investigated (other tracks)</p>
NA	Ensures new and existing features are tested against latest test batches. Analyse performance gains achieved due to improved algorithms or modelling.	
NA	Integrated successful adaptations from the iteration into the Euphemia prototype, ensuring readiness for future tests and implementations.	

Table 12

Outcome and impact on CACM compliance	Implementation in production (forecast)
Proper identification of potential endogenous costs incurred within auction due to linkages between products in a given offer.	To be further investigated
Exploration of various methods bids can be designed in a way that enables market participants to offer both energy and balancing capacity, while accounting for intrinsic linkages between these products to effectively represent their economic preferences and technical constraints.	
The co-optimisation of energy and balancing capacity in the day-ahead electricity wholesale market allocates both generation (or consumption) assets and cross-zonal capacity.	
Non-convex optimisation caused by non-standard features in bid structures like start-up costs, minimum generation levels, minimum up and down times, and block bids pose a major challenge when it comes to price formation.	
Further topics of interest for the future development. For example Flow based cross product CZC allocation, combined thermal bids and combined storage bids.	

Future Plans

For 2026, the plan is to continually improve Euphemia algorithm through clever innovation and adaptability by enhancing scalability, increasing efficiency of algorithm performance, and integrating new ideas and concepts, thus building more robust system for the sake of the market. Core advanced hybrid coupling track has been finished in the iteration 14, meaning more room for potential new topics concerning topology of the market coupling network such as network pre-solving, dynamically changing flow-based domain and possible removal of virtual bidding zones. The polarity reversal avoidance mechanism continues to be a significant objective for the future of the algorithm because of the considerable impact it has had on the algorithm performance due to HVDC cables being more resistant to degradation as a result.

Focus on storage order products track will continue within the Euphemia Lab to allow the market to benefit from storage assets while also support the renewable energy-based electricity system. Another persisting track for the 2026 will be the Adequacy Patch, which addresses rare curtailment events, meeting the CACM requirements. Furthermore, various performance and solution quality improvements as well as simplifications or new technologies will be investigated for the sake of algorithm scalability and effectiveness.

Part of the extended roadmap for the “2030 Future of the Algorithm” involves follow-up studies on co-optimisation frameworks, which will continue as a separate topic with separately allocated budget outside the iterations with extensive efforts dedicated to this topic.

With continued research and development of the specific tracks (key of them outlined above) and thorough consideration put toward risk management, the SDAC market coupling systems are adequately equipped to manage any potential challenges and opportunities. The combined budget for the efforts in iterations 13 and 14 was 1 063 800 €, together with the co-optimisation topic separated during 2025 it was in total 1 230 000 € and including also cloud testing, the overall budget reaches 1 320 051 €, reflecting the commitment of Euphemia Lab to deliver robust and scalable market coupling solutions.

The perpetually underway development of the R&D program of Euphemia Lab proves its commitment towards innovation and excellence. In the future, Euphemia Lab will continue seeking advancements, to make sure the algorithm will remain at the forefront of market coupling systems. Through continuous research and development, the program seeks to sustain high performance levels, adapt to new market demands, and support the transition to a high-renewables energy system, ensuring robust and efficient market operations for the future.

The R&D plan in a nutshell: How it works

With the approval of CACM and the related methodologies, further challenging requirements have been introduced in terms of dimension (a wider geographical scope, going together with a higher usage of products, more complex network topology), market design (MNA, new demanding network constraints, 15-minute MTU, ...) and algorithm performance (optimality, scalability and repeatability).

To be ahead of the change and keep on ensuring the best level of performance even in the new demanding environments, NEMOs and TSOs launched in 2019 a forward-looking R&D program "Euphemia Lab", aimed at increasing both the scalability of Euphemia and the quality of the solutions in terms of economic surplus as well as ensuring the repeatability of the solutions, meeting CACM requirements.

Euphemia Lab conducts its research in systematically defined iterations that address three areas: hardware, software and market design. While some changes are incremental – refinements that smoothly integrate into existing code, others – like storage orders or advanced HVDC expansions – can be disruptive enough to require broader re-engineering and prolonged pilot testing.

From the overall timeline perspective, a period of six to twelve months is usually required to integrate, test, and validate newly proven concepts. This timeframe ensures that time-to-first-solution, optimality gap, and solution repeatability remain within operationally acceptable ranges.

Changes that may significantly impact market participant behavior or require methodology updates undergo additional scrutiny and stakeholder engagement. By organizing development in this structured manner, Euphemia Lab remains poised to manage immediate enhancements—such as 15-minute MTU expansions—while also planning for next-generation features that the European electricity markets will likely need in the coming years. This iterative approach has effectively balanced short-term operational stability with the ongoing innovations required to keep Euphemia at the leading edge of market coupling solutions.

Single Intraday Coupling

SIDC CT main features

NEMO requirements

- MTU: 15, 30, 60 mins without cross-matching
- Regular orders
- Linked orders
- Iceberg Orders
- User Defined Blocks

TSO requirements

- ATC (including possibility to set a global constraint for set of cross-zonal interconnectors)
- Ramping constraints
- Explicit capacity requests

CACM requirements

- Adequate scalability
- MNA
- MTU: 15–60 mins, completion of 15' MTU implementation in all BZ

Systems release(s)

- Deployment of XBID version 4.1.50, 12 December 2025.

Geographical scope

- Introduction of Multi-Nemo Arrangements in Baltic region



Figure 33



SIDC IDAs features

NEMO requirements

- Aggregated MTUs orders (curves, MTU and Period Orders)
- Block Orders (simple, linked, exclusive)
- Merit Orders

TSO requirements

- ATC
- Network constraints: Ramping

CACM requirements

- Adequate optimality
- Adequate scalability
- Adequate repeatability
- MNA
- MTU: 60 min, 30 min, 15 min
 - › completion of 15-minute product implementation

Systems release(s) IDA

- PMB 13.1 and Euphemia 11.4 implemented from 6 May 2025

Geographical scope

- Introduction of Multi-Nemo Arrangements in Romania in August 2025

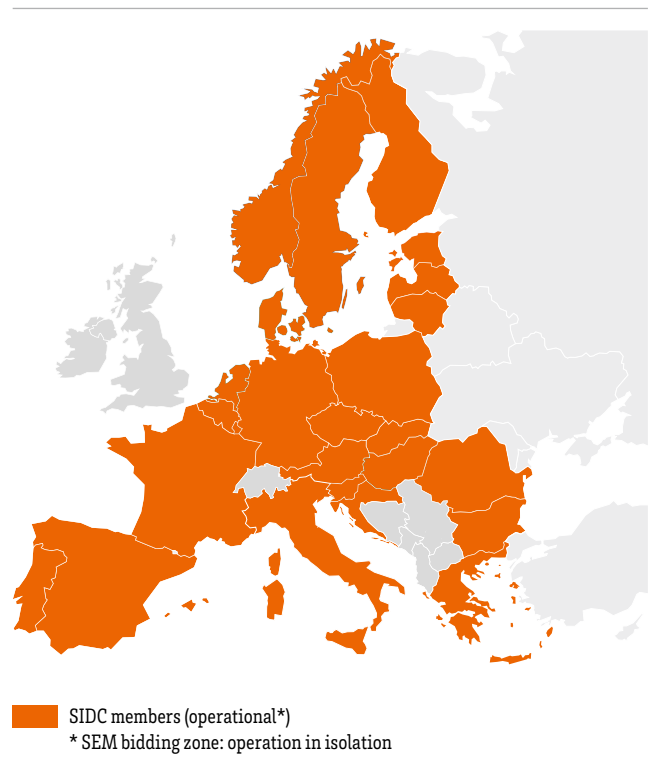


Figure 34

High level market data

SIDC Continuous

Through more than seven years, since the go-live in 2018, the trading in the SIDC continuous market has shown steady growth. 2025 shows increasing growth and another record year with more than 10 582 million orders handled by the market coupling.

The coupled SIDC continuous-trading grew to 286.85 TWh traded - representing more than 515 million trades. In 2024 the relevant traded volume was 207.49 TWh.

The SIDC couples the continuous intraday markets of 25 countries. The SIDC/CT systems handle orders and transmission capacity from 34 bidding zones and 57 borders. Market participants are now trading on platforms of 15 NEMOs. Multi-NEMO arrangements went live in Baltic region in the year 2025.

The introduction of 15-minute MTU has substantially contributed to the growth in both order transactions and trades leading to performance challenges. The performance challenges were mitigated by introduction of a new XBID release focused on performance improvements and by introduction of the hybrid load management applied on individual NEMOs. Number of incidents that were visible to the market remains low and the amount of unexpected downtime at a minimum though there were also limited situations with high latencies.

The annual average clearing price was about 86 €/MWh for hourly contracts and 80 €/MWh and 87 €/MWh for half- and quarter-hourly contracts, respectively. Block contracts were traded at a higher average price of 93 €/MWh. Average price on hourly traded products in the last hour before delivery is slightly lower while for half-hourly and quarter-hourly and blocks the average price is higher than the average price overall.

Annual mean price per bidding-zone in the SIDC/CT ranged from 13.15 €/MWh to 118.58 €/MWh. Price range across the market area converged compared to the 2024 mean price levels per bidding zone.

TRADED VOLUMES – SIDC CT (GWh)

Table 13

Annual	Daily average	Daily minimum	Daily maximum
286 824	785.8	345.1	1 050.2

Yearly prices are computed as volume-weighted average prices of all trades per contract per bidding zone.

“The coupled SIDC continuous trading grew to 286.85 TWh traded – representing more than 515 million matched trades.”

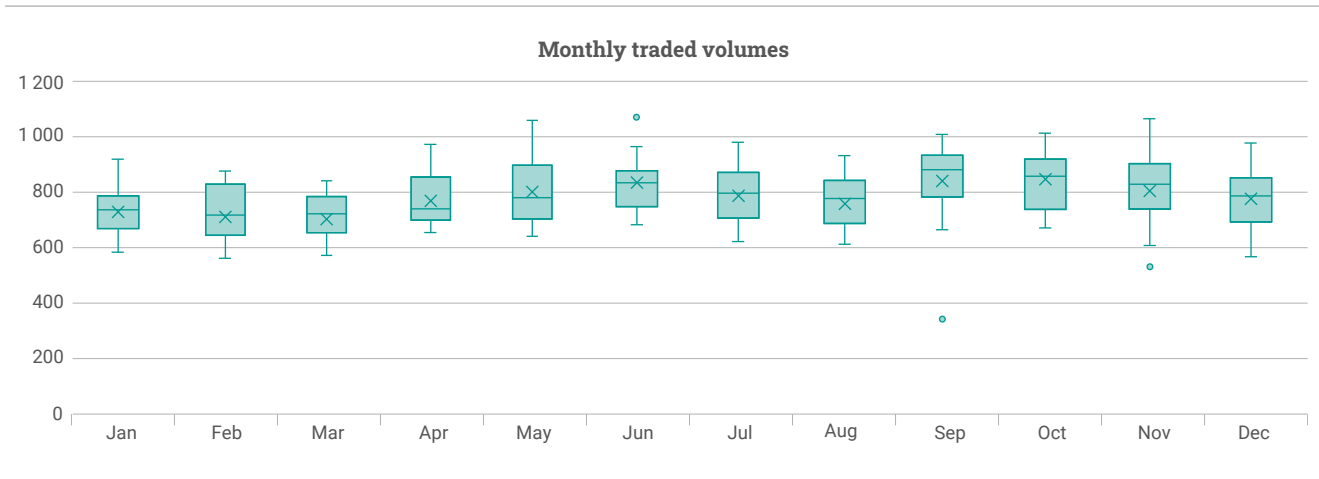


Figure 35

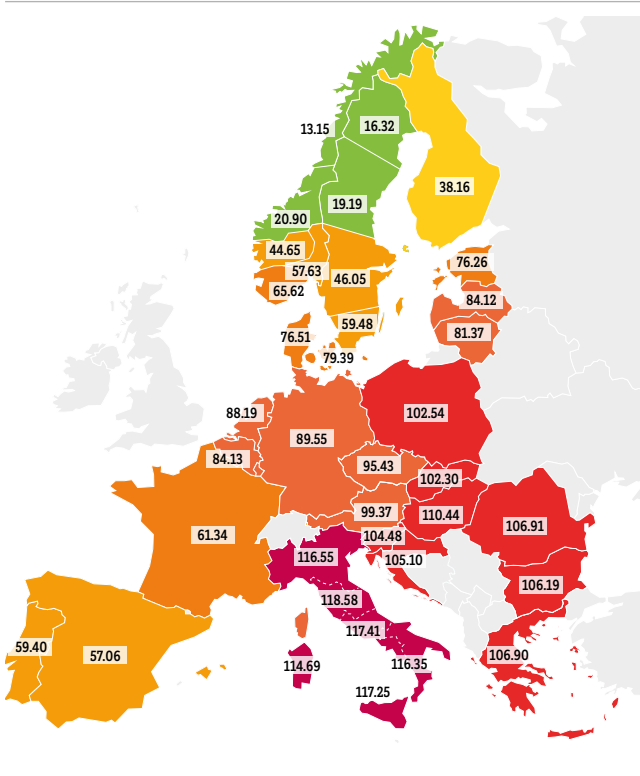


Figure 36

SIDC IDAs

Intraday Auctions (IDAs) were implemented across Europe on 13 June 2024, complementing the continuous trading in SIDC. IDAs take place as three European-wide auctions at 15:00 (D-1), 22:00 (D-1), and 10:00 (D).

The SIDC/IDAs are available in all the same market areas as for the SIDC/CT, coupling 25 countries - 34 bidding zones and 57 borders. Multi-NEMO arrangements in Romania were introduced in the year 2025.

In the three daily auctions, a total of 100 TWh was traded in 2025. A daily average of 151 GWh was traded in IDA 1, 103 GWh in IDA 2 and 34 in IDA 3. The highest daily volume traded has been 201 GWh in IDA 1.

The annual average prices in the three IDA auctions were mostly aligned, with higher prices in the continental/southeast Europe, ranging between 60.8 and 131 €/MWh, east Europe between 41 and 101 €/MWh and lowest prices in the Nordic countries around -26 €/MWh and 85 €/MWh.

TRADED VOLUMES – SIDC IDAs (GWh)

Table 14

IDA	Annual	Daily average	Daily minimum	Daily maximum
IDA 1	51 420.48	150.79	96.92	201.42
IDA 2	36 429.88	102.91	70.44	183.85
IDA 3	12 147.24	34.31	21.36	73.80

Yearly prices are computed as volume-weighted average prices of all trades per contract per bidding zone.

“A total of 100 TWh was traded in 2025 in the three Intraday Auctions.”

IDA 1 Monthly traded volumes

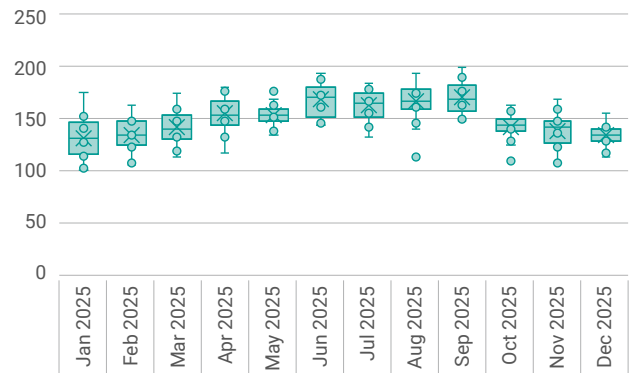


Figure 37

IDA 1*

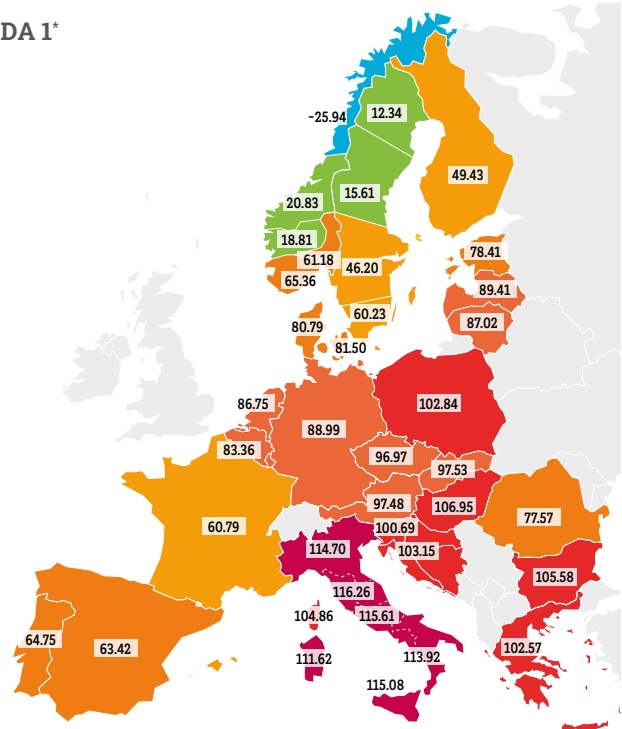


Figure 38

IDA 2 Monthly traded volumes

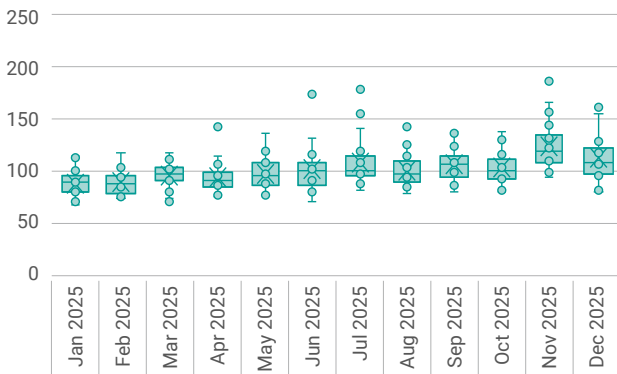


Figure 39

IDA 3 Monthly traded volumes



Figure 40

IDA 2*

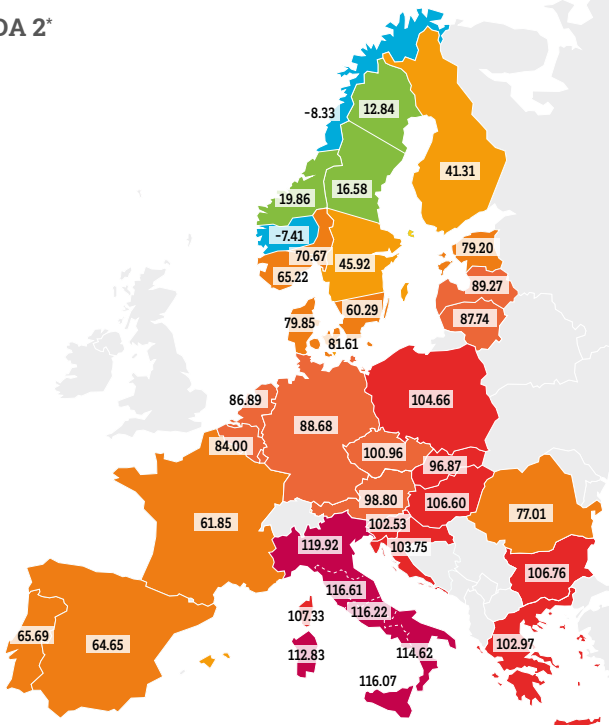


Figure 41

IDA 3*

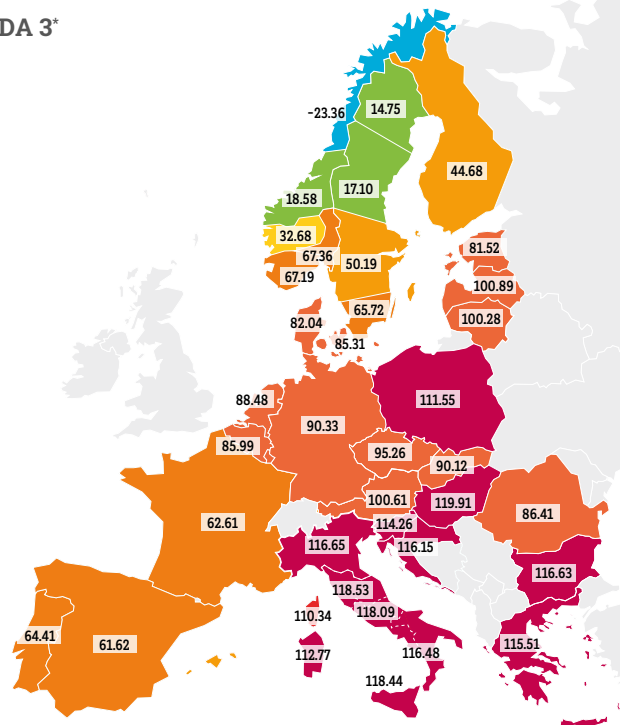


Figure 42

* RO BZ run in isolated mode up to Q1 2025, the almost zero average prices is due to the technical price computed by the coupling algorithm in most of the sessions, due to the very poor liquidity in the area.

Operations report

This section reports on operational events that occurred in SIDC during 2025, including: the incidents, requests for changes decided upon and corrective measures applied both in SIDC Continuous Trading (CT) and SIDC/IDA.

Incidents (SIDC CT)

They are classified according to severity and causes, with a classification in SIDC which is similar but not identical to the one applied in SDAC due to the specificities of the two technical solutions.

- Throughout 2025, SIDC/CT experienced 27 incidents in total, of which 15 incidents of severity 4 were not visible to market participants. 19 incidents were caused by issues not related to the MCO function.
- In SIDC/CT there were 5 incidents of Severity 1 in 2025, all of which are depicted in the table below.

Table 15

Date 2025	Real duration	Comments and observations
24/01	10 min	Manual halt by one of the NEMO Central Admin parties caused a 10-minute downtime in XBID cross-border continuous trading.
06/09	8 hours, 20 min	After the maintenance window, parties experienced connectivity issues with several XBID components, leading to an extended market outage. The issue was resolved by the service provider and normal operations resumed.
26/11	3 hours, 55 min	The service provider began network activities earlier than scheduled, which unexpectedly disconnected all LTS from the central platform despite no intended impact on the IDCT market.
29/11	1 hour, 29 min	On Saturday 29/11/2025 the service provider executed their Disaster Recovery Site testing activities. During the tests they found out a major defect on their side which caused the IDCT market interruption.
02/12	1 hour, 10 min	XBID outage caused by a system running out of storage space, with no automatic alert triggered.

"2025 was another year of reliable operations of SIDC Continuous Trading"

Incident on 24/01/2025

Manual halt by one of the NEMO Central Admin parties caused a 10-minute downtime in XBID cross-border continuous trading. The issue was resolved by the NEMO Central Admin on-duty, by setting the market back to trading, and normal operations resumed.

Scope of the impact (Severity 1):

Severity 1 incidents have impact on all market areas & all borders, and therefore XBID solution is halted. Incidents with severity 2, 3 or 4 have less significant impact and are considered as regular operational states. Lower severity incidents are thoroughly treated by SIDC/CT procedures.

Description of the incident on 24 January:

On January 24, XBID experienced a 10-minute downtime between 10:56 and 11:06 due to an erroneous manual halt by one of the NEMO Central Admin parties.

At 10:50 CET, an Incident Call was triggered.

At 10:54 CET, the NEMO Central Admin initiated the call and shared the incident report on screen.

At 10:55 CET, the NEMO that initiated the call outlined the reason for raising the Incident Call, namely an incorrect trading schedule related to the recently introduced 15-minute Market Time Unit (MTU) resolution for a Delivery Area. At that time, a resolution to the issue was being actively investigated by all market coupling parties and system providers; however, it had not yet been finalised.

At 10:58 CET, several parties reported during the Incident Call that the XBID market had been halted. It was further indicated that the halt had been performed by a NEMO Central Admin user. This was followed by a cross-check carried out by the on-duty NEMO Central Admin.

At 11:04 CET, the parties agreed that the market could be reopened.

At 11:06 CET, the on-duty NEMO Central Admin manually reopened the market.

Long term measures:

Long-term mitigation measures were assessed and deemed not applicable to this specific incident.

Incident on 06/09/2025

Following scheduled maintenance on the XBID system, market participants experienced connectivity issues with certain XBID components, resulting in a disruption of the continuous intraday electricity market lasting 8 hours and 20 minutes. Combined with the planned maintenance window of 2 hours and 30 minutes, the total interruption to XBID cross-border continuous trading amounted to 10 hours and 50 minutes. The root cause was identified as a network infrastructure issue under the responsibility of the XBID Service Provider. Normal market operations resumed upon resolution of the issue.

Scope of the impact (Severity 1):

Severity 1 incidents have impact on all market areas & all borders, and therefore the XBID solution is halted. Incidents with severity 2, 3 or 4 have less significant impact and are considered as regular operational states. Lower severity incidents are thoroughly treated by SIDC/CT procedures.

Description of the incident on 6 September:

At 07:00 CEST scheduled maintenance began on the XBID system.

At 09:27 CEST the XBID Service Provider gave the green light for parties to reconnect, but issues were encountered with the Shipping Module, CMM connectivity, and later with the Shared Order Book (SOB). Parties were present in a Maintenance call with the software provider and addressing the issue before raising an Incident Committee Call.

At 10:46 CEST the incident was formalised by triggering an Incident Call according to procedures.

At 10:59 CEST the Service Provider attempted resolution by restarting affected components.

Public incident report:

Market participants are informed about category 1 incidents on [\[ENTSO-E\]](#) and [\[Nemo Committee\]](#) websites.

At 13:07 CEST the XBID Service provider indicated the root cause was still unknown and continued troubleshooting.

At 15:25 CEST the XBID Service provider considered involving additional support and the incident was escalated to the Market Coupling Steering Committee (MCSC).

At 16:46 CEST Core failover was initiated by the XBID Service provider.

At 17:23 CEST multiple parties confirmed system components were available.

At 17:37 CEST it was agreed to set the market reopening time at 17:50.

At 17:50 CEST the market was set to trading and operations resumed.

Some parties reported residual connectivity issues, which were addressed in follow-up actions.

Long-term measures:

Preventative Actions: To reduce the likelihood and impact of similar incidents in the future, the following measures will be implemented:

1. Update the maintenance runbook to address scenarios involving disruptive infrastructure changes.
2. Strengthen pre-maintenance coordination through:
 - › Joint planning and impact assessments across relevant teams to ensure alignment and readiness.
 - › Clearly defined escalation paths and fallback procedures for high-impact changes.

3. Establish a formal rollback strategy as part of impact assessment and change planning. For similar future infrastructure changes, contingency measures will be explicitly documented and reviewed in advance, including technical feasibility, risk thresholds, and fallback procedures to safeguard service continuity.
4. Enhance endpoint monitoring and connectivity visibility across critical services to enable faster detection of disruptions and support proactive issue resolution during infrastructure changes.

Public incident report:

Market participants are informed about category 1 incidents on [\[ENTSO-E\]](#) and [\[Nemo Committee\]](#) websites.

Incident on 26/11/2025

As part of a series of incidents affecting the Single Intra-Day Coupling (SIDC) market between 25 and 29 November 2025, the XBID service provider performed maintenance and testing activities that adversely impacted the Intra-Day Continuous Trading (IDCT) market, resulting in outages and market interruptions on 25, 26, and 29 November 2025. On 26 November 2025, network activities were initiated ahead of the agreed maintenance schedule. Although not expected to impact the IDCT market, they led to the unexpected disconnection of all LTS from the different NEMOs to the central platform. The issue was identified and resolved during the operational coordination call between NEMOs, TSOs, and the service provider, allowing the maintenance to commence with a 30-minute delay. The root cause was an internal pre-maintenance network change, unrelated to external grid or infrastructure factors, which nevertheless affected all LTS connections.

Scope of the impact (Severity 1):

Severity 1 incidents have impact on all market areas & all borders, and therefore the XBID solution is halted. Incidents with severity 2, 3 or 4 have less significant impact and are considered as regular operational states. Lower severity incidents are thoroughly treated by SIDC/CT procedures.

Description of the incident on 26 November:

At 10:45 CET, a system disruption occurred following the disconnection of all LTS from the different NEMOs to the central platform due to pre-maintenance network activity initiated by the service provider.

At 11:24 CET, the issue was identified and resolved during the operational coordination call between NEMOs, TSOs, and the service provider, and the system was declared recovered.

At 11:24 CET, the service provider issued a green light confirming system stability.

At 14:30 CET, all parties provided clearance to resume trading.

At 14:40 CET, trading was restarted.

Long-term measures:

The XBID service provider has stated that all operations related to maintenances will be performed during a market halt regardless of a seamless label.

The XBID service provider has adapted their future playbooks to cover the issues appeared during the Disaster Recover Test.

Public incident report:

Market participants are informed about category 1 incidents on [\[ENTSO-E\]](#) and [\[Nemo Committee\]](#) websites.

Incident on 29/11/2025

As part of a series of incidents affecting the Single Intra-Day Coupling (SIDC) market between 25 and 29 November 2025, the XBID service provider performed maintenance and testing activities that adversely impacted the Intra-Day Continuous Trading (IDCT) market, resulting in outages and market interruptions on 25, 26, and 29 November 2025.

On Saturday 29/11/2025, the service provider executed their Disaster Recovery Site testing activities. During the tests, they found out a major defect on their side which caused the IDCT market interruption from 13:26 to 14:55.

The root cause was identified as the decision by the service provider not to shut down the primary physical hosts during the Disaster Recovery testing in order to maintain flexibility in case of incidents. This configuration led to an unexpected disconnection of both the primary and secondary data centres at the start of the tests. Upon detection of the issue, the service provider immediately shut down the primary physical hosts and performed additional corrective actions, after which the issue was resolved and system operations were restored.

Scope of the impact (Severity 1):

Severity 1 incidents have impact on all market areas & all borders, and therefore the XBID solution is halted. Incidents with severity 2, 3 or 4 have less significant impact and are considered as regular operational states. Lower severity incidents are thoroughly treated by SIDC/CT procedures.

Description of the incident on 29 November:

At 13:26 CET, a system failure occurred, resulting in a disruption of trading activity.

At 14:36 CET, the system was recovered following restoration of normal operations.

At 14:36 CET, the service provider issued a green light confirming system stability.

At 14:40 CET, all parties provided clearance to resume trading. At 14:55 CET, trading was restarted.

Long-term measures:

The XBID service provider has stated that all operations related to maintenances will be performed during a market halt regardless of a seamless label.

The XBID service provider has adapted their future playbooks to cover the issues appeared during the Disaster Recover Test.

Public incident report:

Market participants are informed about category 1 incidents on [\[ENTSO-E\]](#) and [\[Nemo Committee\]](#) websites.

Incident on 2/12/2025

On 02/12/2025 there was an outage from 00:50 to 02:00 CET. According to the Root Cause Analysis provided by the XBID Service Provider, the incident was caused by a system running out of storage space without triggering an automatic alert. As a result, writing operations could no longer be performed and the XBID core system halted.

The issue was not detected in time due to an incorrect monitoring configuration, which prevented the relevant alerts from being generated. This monitoring setup has since been corrected and appropriate alerts have been implemented. The identified issues have been remediated, and similar occurrences are not expected to recur.

Scope of the impact (Severity 1):

Severity 1 incidents have impact on all market areas & all borders, and therefore the XBID solution is halted. Incidents with severity 2, 3 or 4 have less significant impact and are considered as regular operational states. Lower severity incidents are thoroughly treated by SIDC/CT procedures.

Description of the incident on 2 December:

At 00:50, NEMO IC SPOC observed that the XBID modules were not functioning correctly and promptly raised a critical incident ticket with the XBID Service Provider.

At 01:06, the XBID Service Provider joined the Incident Committee call.

At 01:10, the XBID Service Provider informed participants that an internal call would be held to investigate and resolve the issue.

At 01:13, all parties confirmed that the XBID modules were not operational.

At 01:17, the XBID Service Provider stated that it would communicate an estimated resolution time to the NEMOs by approximately 01:25.

At 01:28, NEMO IC SPOC reported that some NEMOs were unable to access certain modules.

At 01:47, the XBID Service Provider indicated that the applications were functioning again.

At 01:50, all parties agreed to set the market reopening time at 02:00:00.

At 01:54, NEMO IC SPOC sent the IDCT_NEMO_02 message, informing stakeholders of the planned market reopening time.

At 02:00, NEMO IC SPOC reopened the market and requested confirmation from NEMOs that all applications were operational.

At 02:05, all NEMOs confirmed successful access to all modules and visibility of the market open status.

At 02:06, the Incident Committee was formally closed.

Long-term measures:

The XBID service provider has stated that monitoring and alerts have been fixed to avoid the incident happening again in the future.

Public incident report:

Market participants are informed about category 1 incidents on [\[ENTSO-E\]](#) and [\[Nemo Committee\]](#) websites.

Incidents (SIDC IDAs)

Throughout 2025, SIDC/IDA experienced 78 incidents in total, of which 21 incidents were not visible to market participants. Eight incidents were related to the MCO function. Despite the number of incidents, IDA success rate during 2025 was 99.18%.

IDA incidents are classified according to severity and causes, similar but not identical to the ones applied in SDAC due to the different visibility of the MPs implied by strict timings. There were 25 incidents of Severity 1 in 2025, which included 9 IDA Cancellations and 13 Automatic Partial Decoupling.

- Analysing all incidents occurring during 2025, it can be observed that the majority of reported cases were related to local causes, particularly local trading activities, local procedures, and other non-MCO topics. Meanwhile, only a small portion of incidents were attributed to system-related causes such as bugs, configuration issues, interface problems, or unusual processes. Overall, this suggests that the IDA joint system

"In 2025 the IDA success rate was 99.18 %, in comparison to 97.69 % in 2024."

remained robust and stable throughout 2025, with most incidents driven by local operational matters rather than deficiencies in the central system itself.

- Each of the incidents was analysed immediately after the completion of the related IDA by the affected party to ensure the correct functioning of the next auction. In all cases, mitigating measures and solutions were applied, being previously tested with satisfactory results. The SIDC OPSCOM group is in charge of monitoring it on a weekly basis to ensure the proper functioning of the markets.
- Market participants are informed about category 1 incidents (Automatic Partial Decoupling/IDA Cancellation) on [\[ENTSO-E\]](#) and [\[NEMO Committee\]](#) websites.

Table 16

Date	Type of incident	Affected IDA	Comments and observations
17-01-25	Automatic PD	IDA3	Automatic Partial Decoupling due to Order Book not gathered in time
22-01-25	IDA cancellation	IDA3	IDA cancellation due to technical reasons or market issues
01-02-25	Automatic PD	IDA1	Automatic Partial Decoupling due to Order Book not gathered in time
04-02-25	IDA cancellation	IDA2	IDA Cancellation due to technical reasons or market issues
03-05-25	Automatic PD	IDA2	Automatic Partial Decoupling due to Order Book not gathered in time
17-05-25	IDA cancellation	IDA2	IDA Cancellation due to technical reasons or market issues
03-06-25	IDA cancellation	IDA1	IDA Cancellation due to technical reasons or market issues
04-07-25	Automatic PD	IDA1	Automatic Partial Decoupling due to Order Book not gathered in time
13-07-25	Automatic PD	IDA1	Automatic Partial Decoupling due to Order Book not gathered in time
16-07-25	Automatic PD	IDA1	Automatic Partial Decoupling due to Order Book not gathered in time
24-07-25	Automatic PD	IDA1	Automatic Partial Decoupling due to Order Book not gathered in time
25-07-25	Automatic PD	IDA1	Automatic Partial Decoupling due to Order Book not gathered in time
19-08-25	Automatic PD	IDA1	Automatic Partial Decoupling due to Order Book not gathered in time
09-09-25	Automatic PD	IDA3	Automatic Partial Decoupling due to Order Book not gathered in time
18-09-25	Automatic PD	IDA3	Automatic Partial Decoupling due to Order Book not gathered in time
15-10-25	Automatic PD	IDA1	Automatic Partial Decoupling due to Order Book not gathered in time
01-11-25	IDA cancellation	IDA1	IDA Cancellation due to technical reasons or market issues
14-11-25	Automatic PD	IDA1	Automatic Partial Decoupling due to Order Book not gathered in time
10-12-25	Automatic PD	IDA2	Automatic Partial Decoupling due to Order Book not gathered in time
10-12-25	IDA cancellation	IDA1	IDA Cancellation due to technical reasons or market issues
31-12-25	Automatic PD	IDA1	Automatic Partial Decoupling due to Order Book not gathered in time

Requests For Change (RfC)

RfCs are classified per type of requirement, with the same classification being applied in SDAC and SIDC despite the specificities of the two technical solutions.

- Altogether 39 RfCs and 6 system releases were implemented in 2025.
- 5 RfCs were related to IDAs only, while 19 were related to continuous trading and 10 affected both markets.
- Several RfCs related to 15-min resolution and products went live throughout the year, including in Hungary, Poland, Baltic Countries and Italian Bidding Zones.
- Two geographical extensions took place with ETPA

extension to Germany and BRM activation in the Romanian delivery area.

- Most RfCs had various aims, like fulfilling flow-based prerequisites and improving usability.
- This report includes a complete list of the RfCs that were implemented.

Corrective Measures

- No Corrective Measures were applied in SIDC during 2025, as no relevant performance deteriorations have been recorded during the year.

SIDC CT Incidents – severity and causes

Table 17

IDAs	Severity 1	Severity 2	Severity 3	Severity 4
IDA 1	19	10	8	10
IDA 2	6	5	5	8
IDA 3	5	5	5	7

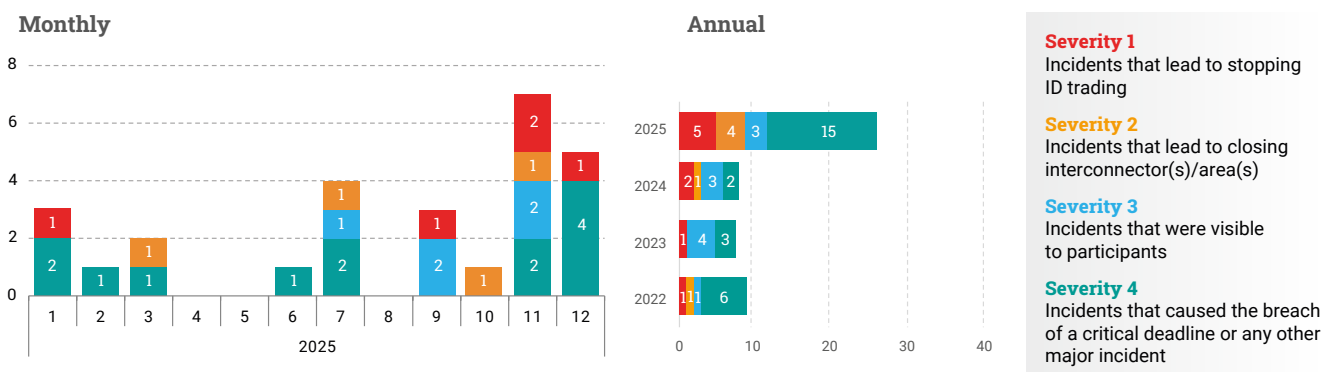


Figure 43

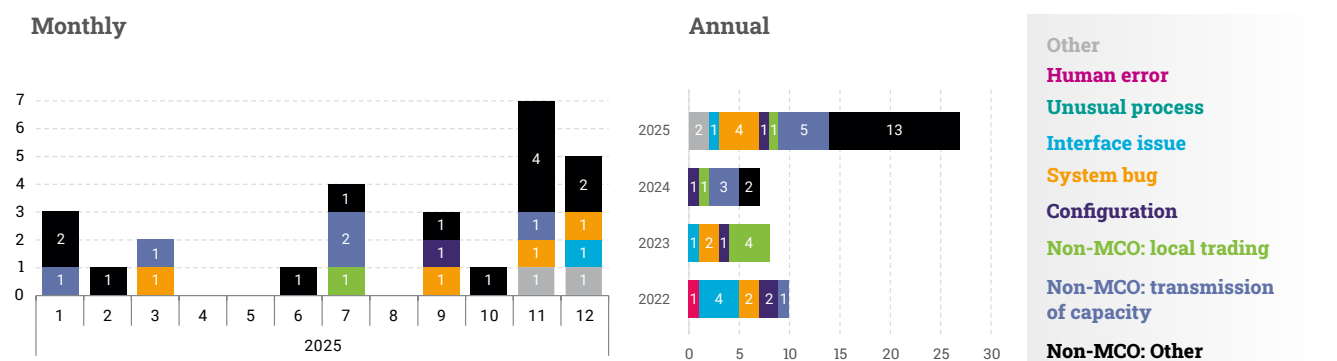


Figure 44

SIDC IDAs Incidents – severity and causes

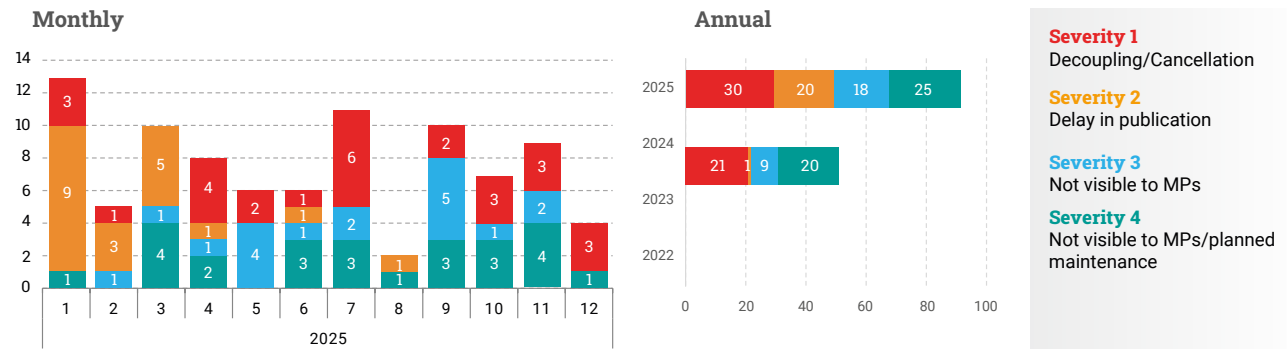


Figure 46

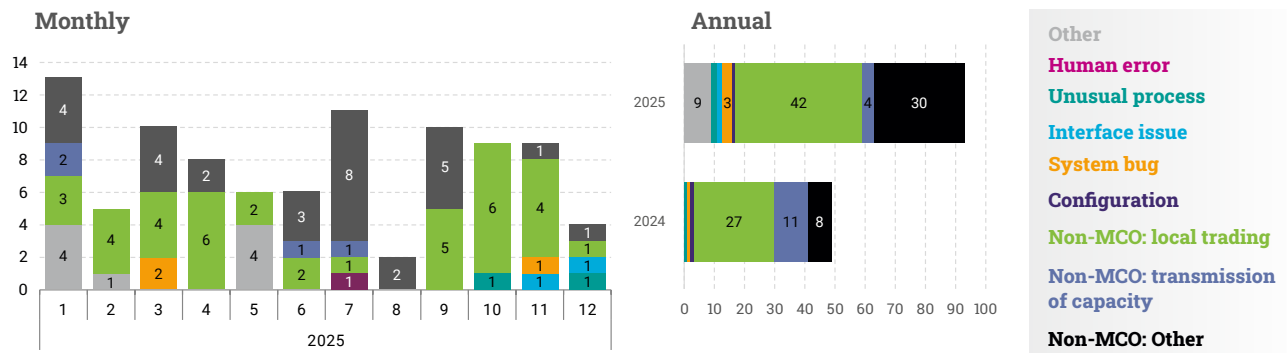


Figure 45

Table 18

IDAs	Non-MCO: Other	Non MCO: transmission of capacity	NON MCO: local trading	Configu-ration	System bug	Interface Issue	Unusual process	Human error	Other
IDA 1	16	1	23	2	5	1	13	1	25
IDA 2	8	2	10	1	1	1	2	1	18
IDA 3	6	1	9	1	0	1	4	0	16

Request for change (RfCs)^[2]

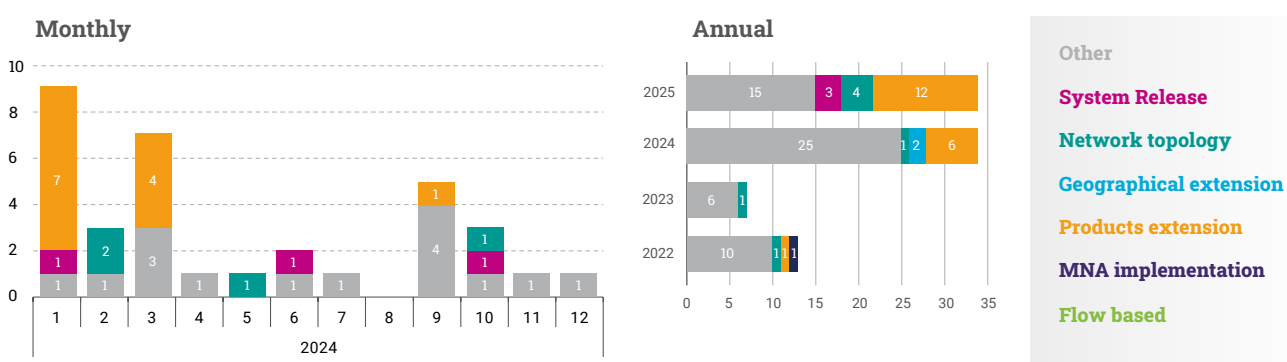


Figure 47

Request for change (RfCs)^[2]

Requirement	Name	Go-live Date
Other	ANIDOA_CROPEX_change of block parameter settings in Croatia	08.01.2025
System release	XBID Release 4.1	14.01.2025
Products extension	15 minutes products XBID and IDAs FR-BE border	22.01.2025
Products extension	15 minutes products XBID and IDAs FR-DE border	22.01.2025
Products extension	15 minutes products XBID and IDAs FR-IT border	22.01.2025
Products extension	15 minutes products XBID and IDAs in FR BZ	22.01.2025
Products extension	15 minutes products in XBID and IDAs on the IT-AT border	22.01.2025
Products extension	15 minutes products in XBID and IDAs on the IT-SI border	22.01.2025
Products extension	15 minutes resolution for Estlink IC in the intraday timeframe and lowering the ramping limit to 300 MW/MTU	22.01.2025
Network topology	Changes to the interconnector between Lithuania and Sweden (Nordbalt) and Estonia and Finland (Estlink) due to synchronisation and isolation test period	08.02.2025
Network topology	Changes to LitPol Link due to CESA synchronisation	09.02.2025
Other	Change of ramping limits in SE3A-DK1A, DK1A-NO2 and DK1-DK2	18.02.2025
Other	NorNed ramping limit change for 15' MTU	05.03.2025
Other	Virtual Interconnector NO2- NO2A ramping limit change for 15-minute MTU	05.03.2025
Products extension	15 minutes resolution and products for internal and external Nordic ICs and BZs	18.03.2025
Products extension	15 minutes resolution and products in IDCT & IDAs for Iberia (ES and PT BZs; FR-ES and ES-PT borders)	18.03.2025
Products extension	15 minutes products in XBID and IDAs on Polish borders and PLC-PSE	18.03.2025
Products extension	IDA_Inclusion of Romanian borders	18.03.2025
Other	15-minute MTU for NorNed and NordLink	18.03.2025
Other	EPEX SPOT Maximum volume for big blocks update	22.04.2025
Network topology	Introduction of Bidding curve aggregation in Slovakia in IDAs	07.05.2025

Table 19

Reason	Reason (AM article 14.1)	Initiator/Owner (Annex I to AM article 15.2.c)	Details, Aim of the CR (Annex I to AM article 15.2.a)	IDA related	CT related
Other	a	NEMOs	Local change/NRA		x
Other	e	NEMOs/TSOs	Improve usability	x	
CACM	a	TSOs	IDCZGOT prerequisite		x
CACM	a	TSOs	IDCZGOT prerequisite		x
CACM	a	TSOs	IDCZGOT prerequisite		x
CACM	a	TSOs	IDCZGOT prerequisite		x
CACM	a	TSOs	IDCZGOT prerequisite	x	
CACM	a	TSOs	IDCZGOT prerequisite		x
CACM	a	TSOs	IDCZGOT prerequisite		x
Other	h	TSOs	Ensuring optimal use of the transmission infrastructure, Ensuring operational security	x	
Other	h	TSOs/NEMOs	Ensuring optimal use of the transmission infrastructure, Ensuring operational security		x
Other	h	TSOs	Configuration change		x
Other	h	TSOs	Configuration change		x
Other	h	TSOs	Configuration change	x	
CACM	a	TSOs	IDCZGOT prerequisite	x	x
CACM	a	NEMOs/TSOs	IDCZGOT prerequisite	x	
CACM	a	NEMOs/TSOs	IDCZGOT prerequisite	IDA3	
Other	g	NEMOs/TSOs	Creating a level playing field for NEMOs	x	
Other	h	TSOs	Configuration change	x	
CACM	h	NEMOs	Promoting effective competition in the generation, trading and supply of electricity	x	
Other	h	NEMOs	Creating a level playing field for NEMOs	x	

Requirement	Name	Go-live Date
System release	PMB13.1 release	05.06.2025
Other	Final CORE IDCC(c) Go-Live Preparations – Additional AAC deliveries	17.06.2025
System release	XBID Release 4.1.5	23.06.2025
Other	Removal of Nord Pool Data Intermediary from CMM	23.07.2025
Products extension	BRM activation in SIDC IDA in the Romanian delivery area (IDA 2 nd wave)	05.08.2025
Other	EPEX SPOT change in trading system	28.08.2025
Other	Removal of Morocco delivery & market areas and Spain-Morocco interconnector & border	15.09.2025
Other	Replacing single border NSF to TenneT Data Intermediary by Bulk file NSF	15.09.2025
Other	Change of Automatic Publication offset for Terna Interconnectors	23.09.2025
Products extension	15 minutes resolution and products in IDCT & IDAs for the Greek Market Area and GR-BG border	30.09.2025
Other	Change of rounded prices in Bidding Area - Greece Mainland with EIC 10YGR-HTSO-----Y in SCF	30.09.2025
Other	Additional cluster for Bulgaria in SIDC IDA	30.09.2025
Other	Enabling of Default Capacity and High default ATC and Ramping on some Terna internal interconnectors	28.10.2025
Other	Reducing waiting time to have an earlier utilisation of the backup channel (in case no ACK is sent by a party to the XBID system).	04.11.2025
Network topology	Change of max/min capacity, maximum quantity and BG allocation limit for interconnector FI-SE1 between Finland and Sweden.	12.11.2025
Other	EPEX sFTP migration for provision of Euphemia dump	18.11.2025
System release	XBID Release 4.1.5.11	25.11.2025
Other	EPEX activation in the Baltic region for SIDC continuous	25.11.2025
Other	Disabling of High Default ATC and Ramping on some Terna internal interconnectors	18.12.2025

Table 19

Reason	Reason (AM article 14.1)	Initiator/Owner (Annex I to AM article 15.2.c)	Details, Aim of the CR (Annex I to AM article 15.2.a)	IDA related	CT related
Other	e	NEMOs/TSOs	Improve usability	x	
Other	h	TSOs	N/A	x	
Other	e	NEMOs/TSOs	Improve usability	x	
Other	h	NEMOs	Read-only change		x
CACM	h	NEMOs	Configuration change	x	
Other	h	NEMOs	Ensuring operational security	x	
Other	g	NEMOs/TSOs	Interconnection Update		x
Other	c	TSOs	Configuration change		x
CACM	a	TSOs	Configuration change	x	x
CACM	a	NEMOs/TSOs	IDCZGOT prerequisite	x	x
Other	h	NEMOs	Change of rounding prices	x	x
Other	g	NEMOs	Configuration change	x	
Other	e	TSOs	Configuration change	x	x
CACM	a	TSOs	IDCZGCT prerequisite		x
Other	g	TSOs	Configuration change		x
Other	i	NEMOs	Infrastructure change	x	
Other	e	NEMOs/TSOs	Improve usability		x
Other	h	NEMOs	Improve usability	x	x
Other	h	TSOs	Configuration change	x	x

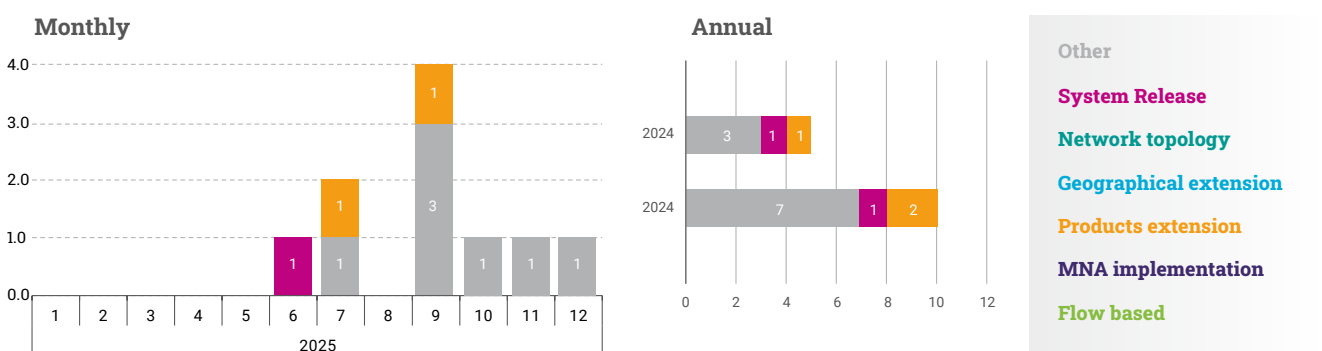


Figure 48

Performance monitoring report

SIDC CT

For performance monitoring, the indicators listed in the annex 4 of the AM have been considered for all the days of 2025. The maximum, minimum and average values observed throughout the year are reported in the following slides. Where relevant, monthly values are also reported. Notes and explanations on the calculation of these indicators are included as asterisks below the diagrams in the slides where relevant.

Usage Indicators

- The majority of the available data reflects the network topology with 34 bidding zones, 71 interconnectors, 15 NEMOs and the product types available; hourly, half-hourly, quarter-hourly and blocks.

- The analysis of monthly values regarding executed orders and matched trades in the Continuous shows substantial increase through 2025.

Performance Indicators*

The analysis of daily values, in terms of processing time for orders/trades and order book update shows some challenges through 2025 which is mainly due to introduction of 15' MTU.

Output Indicators

The "total matched – hours to delivery" indicator shows that increased percentage of the matched volume is taking place in the last hours before gate closure one hour before delivery in comparison to the previous years.

"Substantial increase in number of orders in continuous trading and trades through 2025, also due to implementation of 15' MTU in all BZ. This leads to the performance challenges. Good performance recorded also for IDAs, for the first whole year in operation."

***Ability to maximise the economic surplus indicator:** As set out in the Title 3, Article 7 of the Annex 4 of the Methodology for monitoring the performance and usage of the continuous trading matching algorithm, the indicators on the continuous trading matching algorithm's ability to maximize economic surplus are not relevant for the continuous trading matching algorithm.

Repeatability indicator: As set out in the Title 1, Article 2, Paragraph 1c of the Annex 4 of the Methodology for monitoring the performance and usage of the continuous trading matching algorithm, the continuous trading matching algorithm is by design optimal and repeatable. For this reason, the monitoring of the continuous trading matching algorithm's optimality and repeatability is not necessary.

SIDC IDAs

According to the annex 4 of the AM, the performance monitoring report for IDAs takes into account the same indicators adopted for SDAC, following a "mutatis-mutandis" approach. The indicators monitoring the performance of the intraday auctions shall be those used in the DA, in accordance with Annex 3 to the AM.

Usage Indicators

- The majority of the products in use in the three IDAs are the curve orders, followed by merit orders and block orders, with a higher number of usage in IDA 1 compared to IDA 2 and 3.
- Due to the specificities of intraday with respect to the day-ahead auction, scalable complex orders have not been activated in IDAs.

Performance Indicators*

- Time to first solution average values span from 0.76 min up to 1.37 min, corresponding with IDA 3 and IDA 1, well below the time allowed to the algorithm to run.
- Optimality gap average value is between 8 737.2 € and 3 048.4 €, corresponding to IDA 2 and IDA 3. The average value of final gap expressed as percentage of the value of the economic surplus of the final solution is significantly higher in IDA 2 and IDA 3 (0.06 %) than in DA (0.0002 %).

Output Indicators

- The average economic surplus was around 167 M€ for IDA1, 19 M€ for IDA 2, and 5 M€ for IDA3.
- The higher values of traded volumes can be traced back to the products most in use, namely curves, block and merit orders.

Performance SIDC CT

Table 20

Performance		2022 Avg	2023 Avg	2024 Avg	Avg	2025 Min	Max
Algorithm scalability (Annex 4 of AM Art. 7)							
a) Time for the execution of an order (milliseconds)*	Lower percentile 93 %	28	21	17	20	13	154
	Upper percentile 96.5 %	41	30	26	33	16	289
b) Rate of executed orders (number per day)		4 214 466	7 892 767	14 428 800	28 993 086	17 162 810	39 626 992
c) Time for the execution of a trade*		Equal to (a)	Equal to (a)	Equal to (a)	Equal to (a)	Equal to (a)	Equal to (a)
d) Rate of executed trade (number per hour)		243 753	411 947	569 506	1 155 959	595 702	1 631 761
e) Time for generation of post coupling files (milliseconds)		12 137	16 719	21 035	50 511	16 579	64 885
f) Time for processing an order book update (milliseconds)**	Lower percentile 93 %	34	20	20	31	19	54
	Upper percentile 96.5 %	56	30	27	42	24	85

* This indicator measures the time between the moment that an order receives a timestamp from the system and the moment that it is reported by the system as executed. As of today, there is no separate value for the execution of a trade and for execution of an order. The parameter includes together order and trade execution (trades executions are a subset of order executions in the existing reporting.)

** For each orderbook update, this indicator measures the longest time lapse between the moment that an order enters the system and the moment that the system sends the order book update comprising that order.

Usage indicators SIDC CT^[9]

Table 21

Usage indicators		2022	2023	2024	2025		
					Avg	Min	Max
1) Indicators to describe the Usage of products (Annex 4 of AM Article 8)							
Total number of products (per end of year)		4	4	4			4
Total number of daily submitted orders per product and per bidding zone	Hour	41 214	80 069	157 916	226 982	1	4 055 140
	½-hour	9 826	56 048	73 417	129 534	1	589 343
	¼-hour	272 364	384 603	549 880	414 683	1	9 631 831
	Blocks	4 940	602	10	24	1	3 429
Total daily submitted order volume per bidding zone (MWh – avg, min, max)		305 700	460 828	868 595	1 361 936	0.2	60 226 138
Total number of explicit capacity allocation request (avg, min, max – per day)		602	700	501	547	302	1 691
2) Indicators to describe the geographical extension (Annex 4 of AM Article 9) ^[10]							
Total number of NEMO (per end of year)		13	14	15			15
Total number of delivery areas* (per end of year)		35	37	44			56
Total number of bidding zones* (per end of year)		32	34	34			49
Total number of interconnectors* (per end of year)**		67	71	71			89
Total number of borders* (per end of year)		54	56	57			74
3) Indicators to describe Network constraints (Annex 4 of AM Article 10)							
Total number of occurrences of ramping constraints on interconnector level***		715	882	911	2 233	2	5 599
Total number of occurrence of Biding Zone net position ramping constraints****		-	-	-	-	-	-
Total number of occurrence of Biding Zone net position volume constraints****		-	-	-	-	-	-

* Delivery areas, bidding zones, interconnectors and borders required for system setup are excluded (with Morocco and Russia, Italian virtual areas)

** Interconnectors that represent the connections with the VDAs to their PDA were removed. (TN_IC = 71)

*** This count started in May 2021. There are 12 interconnectors with Ramping limit;

EE-FI, DE-DK2, DE-NO2, DK1-SE3, DK1-DK2, DK1-NL, DK1-NO2, LT-SE4, LT-PL, NO2-NL, PL-SE4,

**** The net position ramping constraint and the net position volume constraint are not in use in SIDC today, i.e. no values to be reported for these two indicators.

Time for the execution of an order/trade (millisec)^[3]

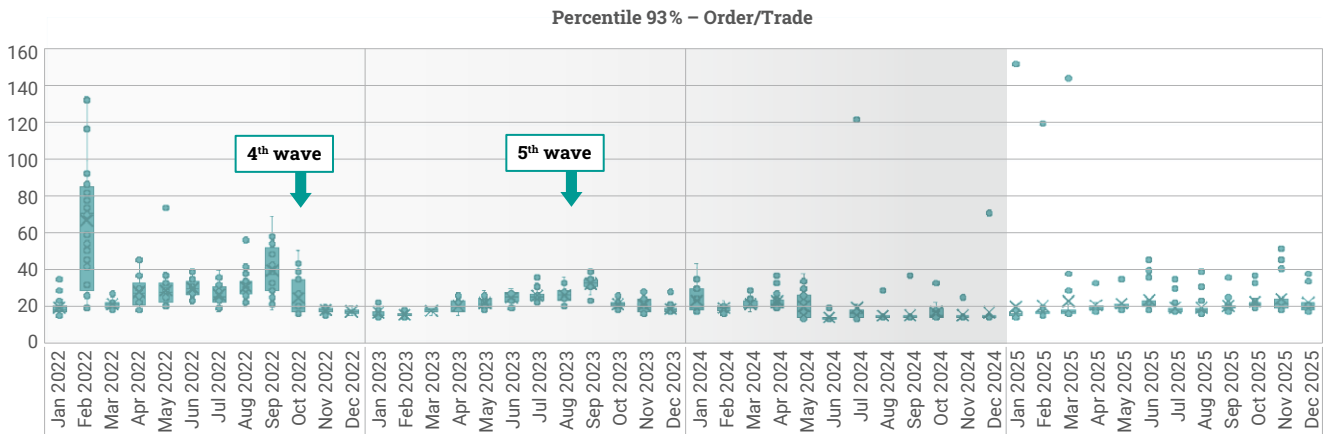


Figure 49

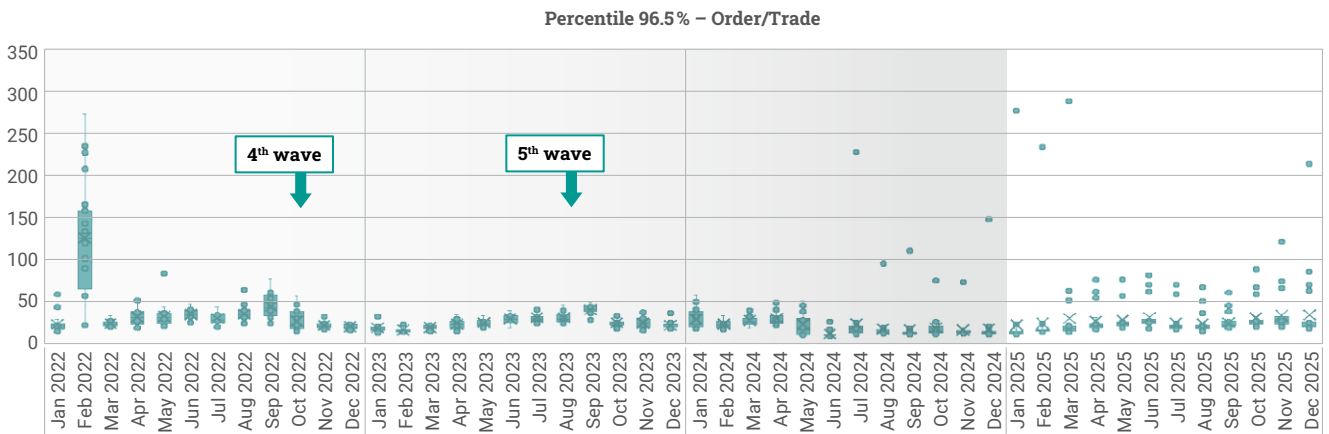


Figure 50

Time for execution of an order/trade in 2025 is stable as long as the featured percentiles are concerned (the performance optimisation was delivered). However, with the higher percentiles used for internal monitoring, the time for execution has increased especially in peak situation.

Time for processing an order book update (millisec)^[3]

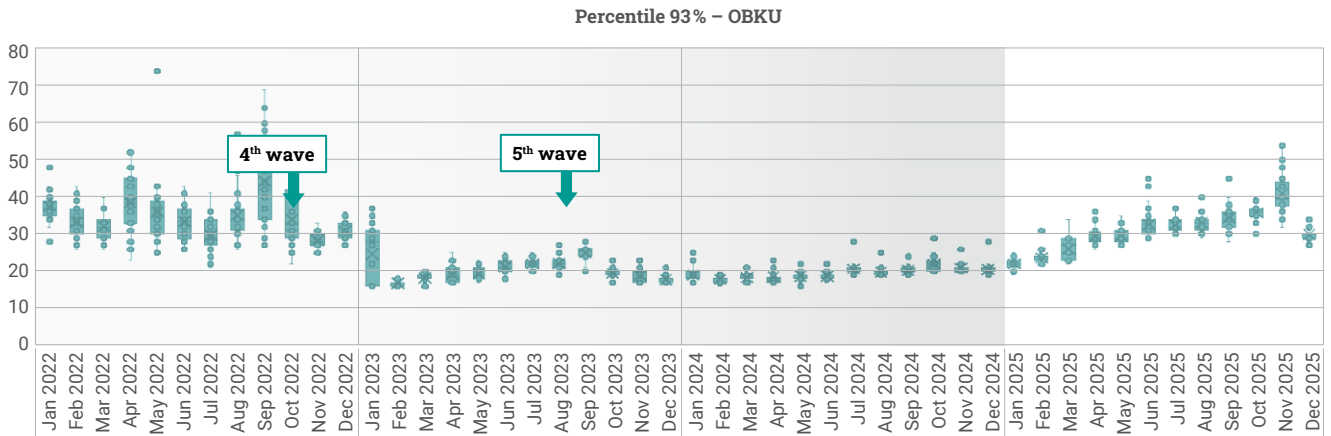


Figure 51

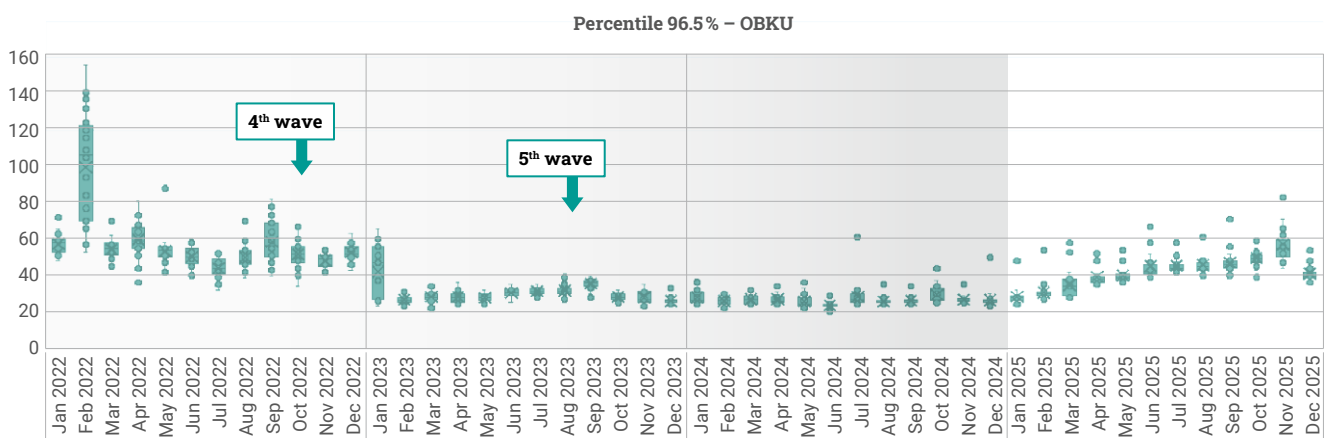


Figure 52

The times for processing an orderbook update has increased since introduction of 15' MTU.

Rate of executed orders (number per day)^[3]

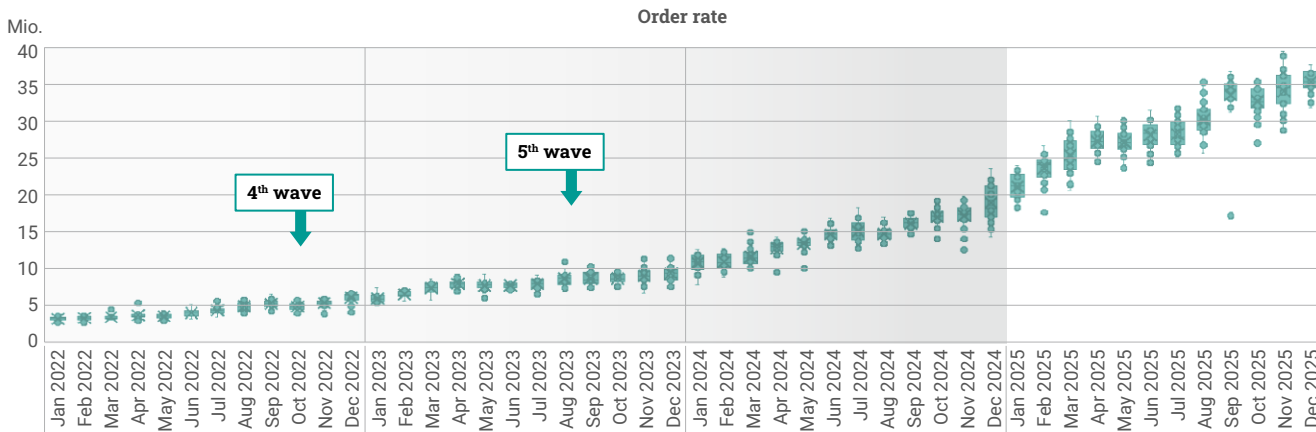


Figure 53

Rate of executed trades (number per day)^[3]

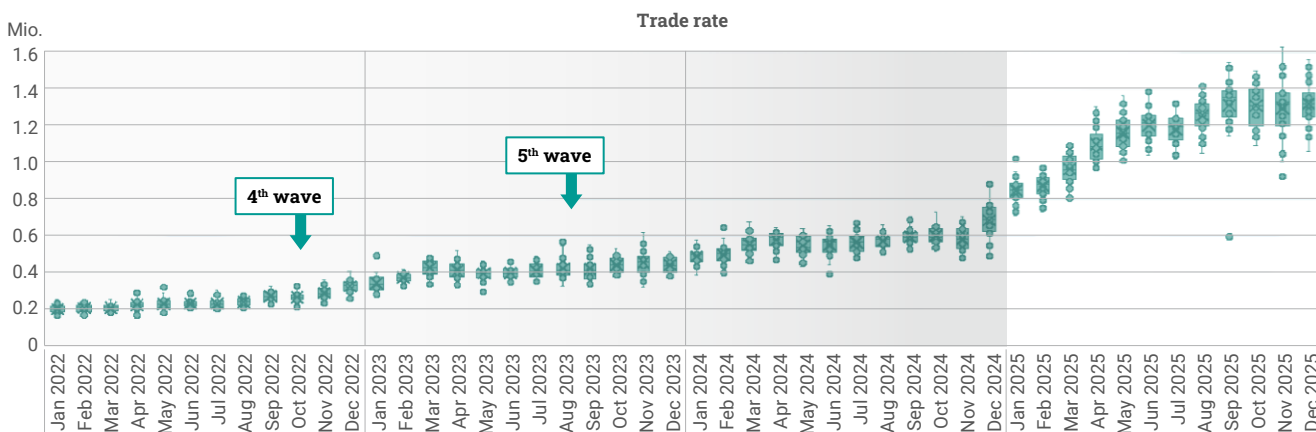


Figure 54

Introduction of 15' MTU at the end of 2024 and in early 2025 led to the substantial increase in the rate of executed orders and trades which required application of the order management to keep level of trading within the technical limits of the system.

Time for generation of Shipping Module post-coupling files (millisec)

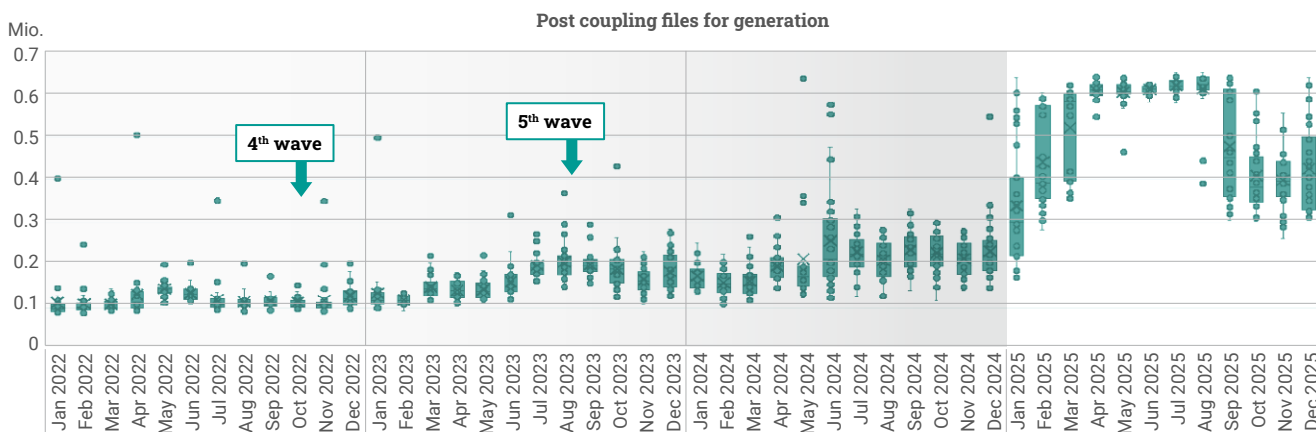


Figure 55

Introduction of 15' MTU at the end of 2024 and in early 2025 led to the substantial increase in the rate of executed orders and trades. This resulted in the direct impact on the time for generation of post-coupling files. With introduction of order management, the time for generation of post coupling files has been kept to the acceptable level.

Output indicators SIDC CT

Table 22

Output indicators		2022 Avg	2023 Avg	2024 Avg	Avg	2025 Min	Max	
Indicators on the maximisation of economic surplus (Annex 4 of AM Article 11)								
Number of matched orders of each contract	Total matched volume (MWh) – daily value (MWh)*	302 681	456 028	566 901	785 819	345 063	1 050 172	
	Total matched volumes – hours to delivery (MWh)	See separate graph						
	Total number of trades per contracts**	1 834	2 808	2 808	8 503	1	43 844	
	Total number of trades per contract – hours to delivery***	3 640 941	6 173 413	6 173 413	13 210 139	403	153 508 336	
Number of explicit capacity allocation	Total number of daily explicit capacity allocations	6 762	6 145	7 108	19 670	10 817	26 030	
Prices	Volume-Weighted Average Intraday Prices (€/MWh)	Hour	218.19	94.58	79.01	86.14	-1 680.80	913.17
		½-hour	274.24	96.69	69.95	80.46	-857.63	1 620.85
		¼-hour	253.77	102.16	91.03	86.54	-1 714.10	6 326.67
		Blocks	138.13	78.10	69.81	92.97	-150.00	445.48
	Volume-Weighted Average Intraday Prices – last trading hour (€/MWh)	Hour	213.70	94.08	80.82	85.62	-1 565.43	2 971.53
		½-hour	263.28	98.56	73.57	86.53	-1 249.90	6 598.40
		¼-hour	251.92	100.72	89.61	88.02	-6 500.00	8 999.00
		Blocks	141.36	71.19	91.47	96.49	-30.00	441.41
	Bid-Ask Spread (€/MWh)	Hour	124.16	49.18	30.77	84.74	0.19	11 000.58
		½-hour	174.58	65.71	90.86	292.88	1.38	10 189.92
		¼-hour	272.19	115.69	154.92	77.94	0.01	19 998.00
		Blocks	243.10	607.96	102.52	398.10	-0.01	600.00

* Total matched volume is in the table shown as a daily value – average traded volume in MWh per day and the min and max volume in MWh traded in oneday.

** Data available since 1 May 2021. Shows how many times each contract has been traded on average, min and max.

*** Data available since 1 May 2021. Shows total number of trades 0-33 hours before delivery. Avg is average number of contract traded per hour to delivery. Max is number of trades in the hour one hour before delivery. Min value in the hour 33 before delivery.

Total volume matched hours before delivery

Total matched volumes – hours to delivery. This indicator counts the annual traded volumes in all BZ, grouped per contract with the same "delivery time start-end" and grouped according to the hours left to delivery.

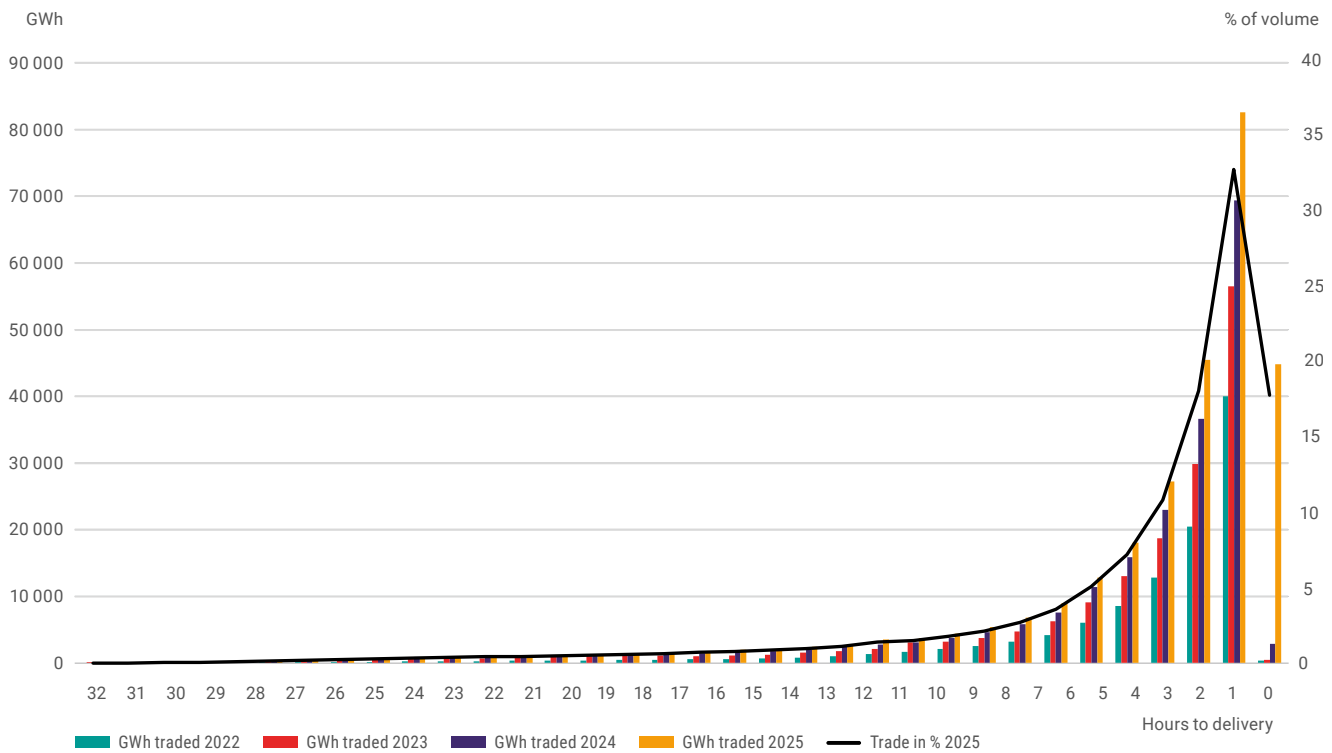


Figure 56

ATC utilisation rate per border – both directions

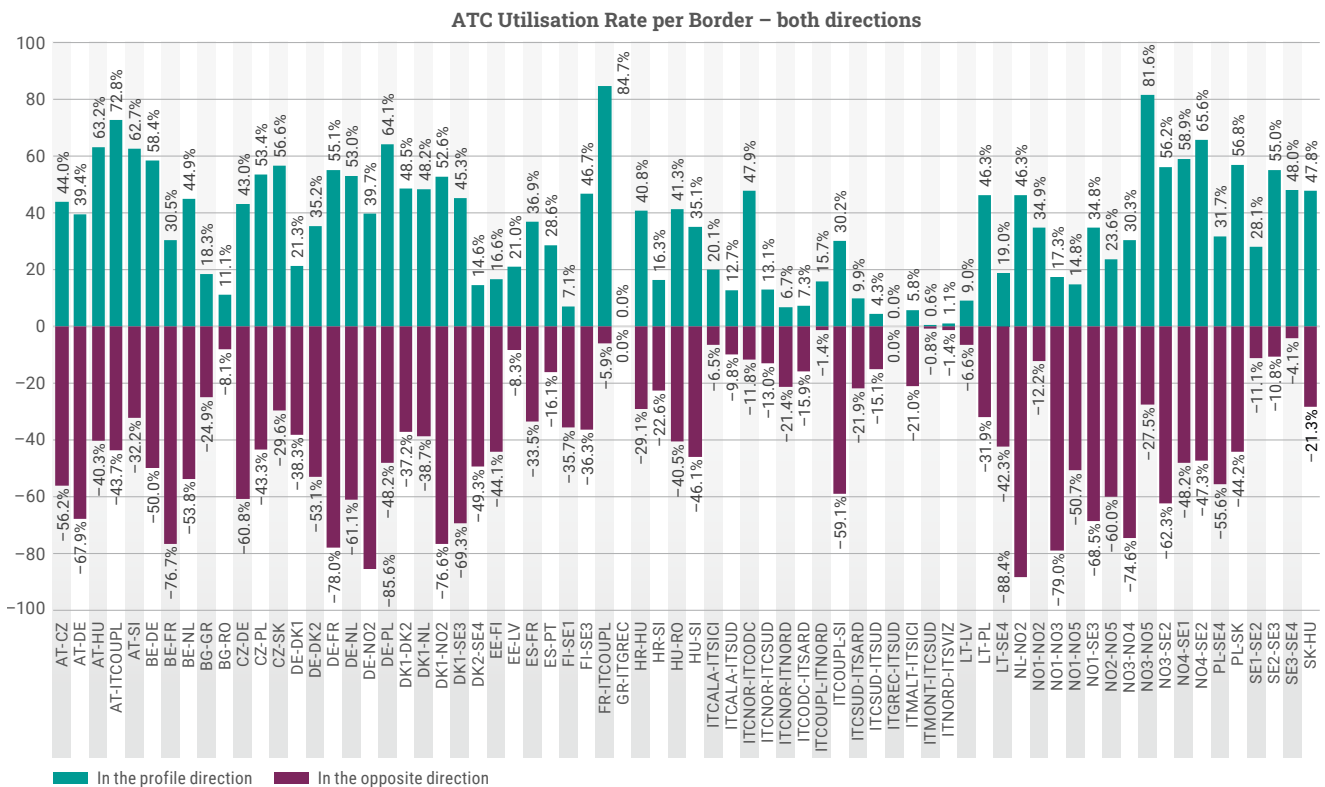


Figure 57

Net position in GWh per bidding zone

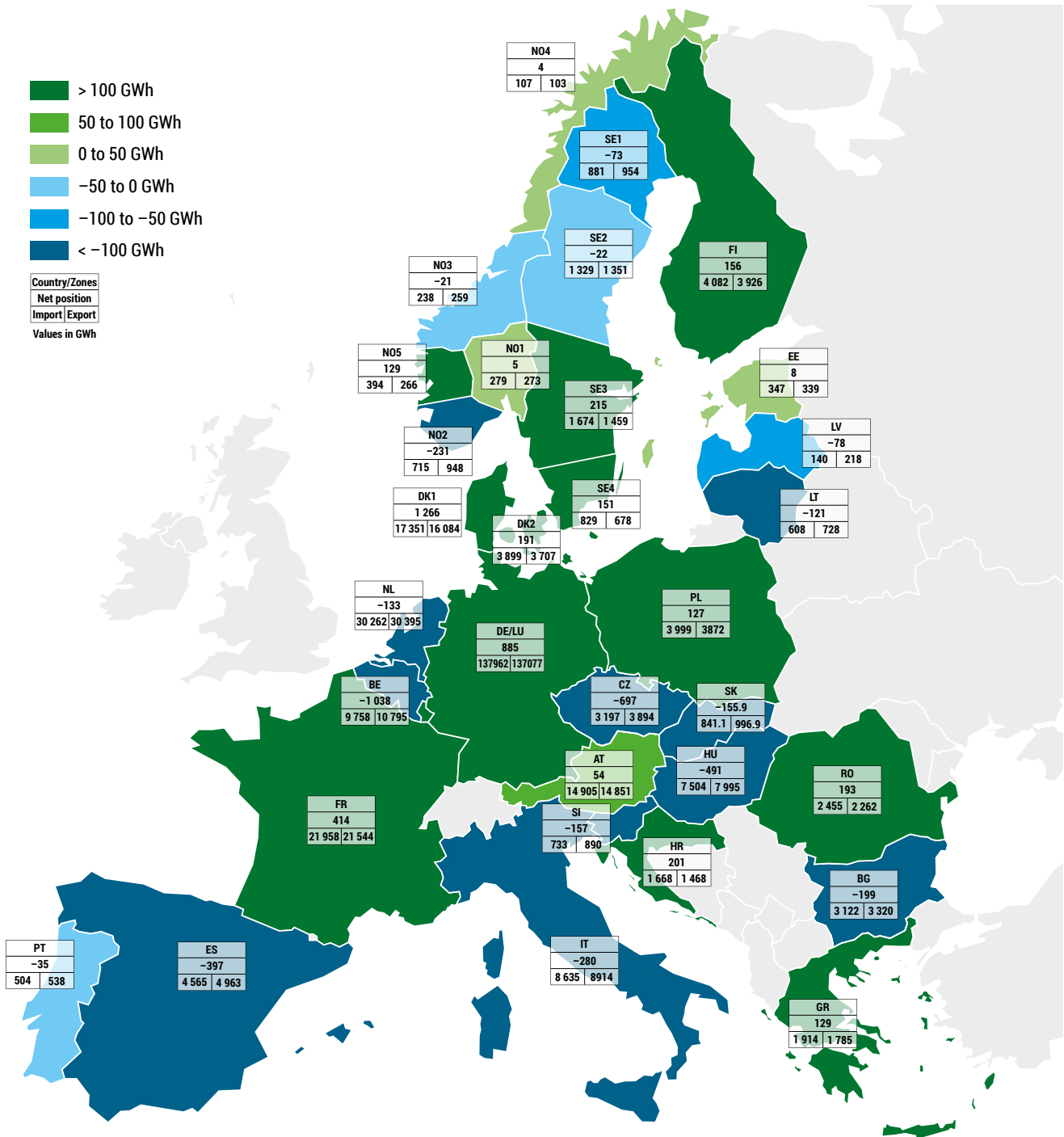


Figure 58

Performance monitoring report

Usage indicators SIDC IDAs

Table 23

Usage indicators Indicators to describe the Usage of SIDC IDAs	2024** SIDC IDAs			2025** SIDC IDAs		
	Avg	Min	Max	Avg	Min	Max
IDA 1						
Total number of steps at bidding zone level*	142 876.0	105966	178544	313 595.7	176 124	431 572
Total number of block orders	5 476.1	2 200	7 531	8 373.5	4 481	11 071
Total number of block order exclusive groups	16	4	67	14.4	1	60
Total number of linked families	0.4	0	5	22.1	0	78
Total number of scalable complex orders	0	0	0	0	0	0
Total number of demand merit orders	16 909.4	12 032	20 363	0	0	0
Total number of supply merit orders	13 054.4	9 314	17 073	0	0	0
IDA 2						
Total number of steps at bidding zone level*	69 894.4	54 586	114 205	204 845	93 293	354 899
Total number of block orders	5 016.7	2 678	7 596	9 173.4	4 015	12 977
Total number of block order exclusive groups	10.8	0	29	66.7	0	153
Total number of linked families	0.1	0	4	21.6	0	79
Total number of scalable complex orders	0	0	0	0	0	0
Total number of demand merit orders	15 083.3	9278	21 523	0	0	0
Total number of supply merit orders	13 264.0	9238	17 581	0	0	0
IDA 3						
Total number of steps at bidding zone level*	27 853.2	21434	48 962	86 263.9	38 923	153 727
Total number of block orders	2 608.5	767	4 136	5 486.7	2 233	7 632
Total number of block order exclusive groups	8.1	0	25	33.2	0	91
Total number of linked families	0.2	0	5	11.85593	0	52
Total number of scalable complex orders	0	0	0	0	0	0
Total number of demand merit orders	6 734.8	0	9 349	0	0	0
Total number of supply merit orders	6 098.8	0	9 566	0	0	0

* This figure is the sum of number of points or steps of the aggregated bid curves or stepwise curves in all bidding zones in all 24 hours of the day respectively.

** The reported values are calculated excluding the days of Decoupling and Auction Cancellation

Different order of magnitude between the orders submitted in the first two IDAs and in the third one. After steady usage in 2024, multi-fold increase from 2024 to 2025 is observed in all IDAs.

Different order of magnitude between the orders submitted in the first two IDAs and in the third one. Increase in the usage of block orders in 2025 follows the growing trend observed in 2024.

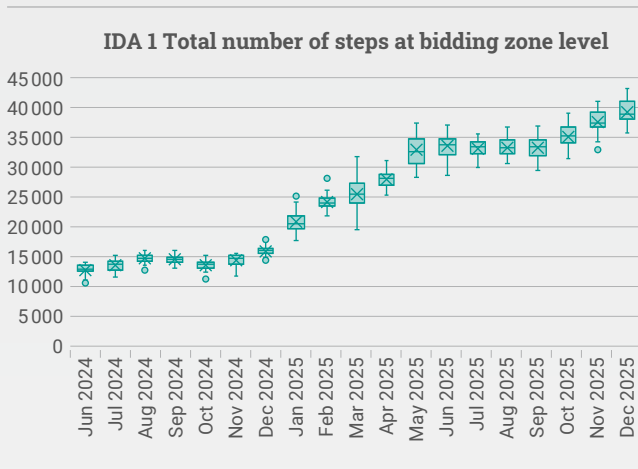


Figure 59

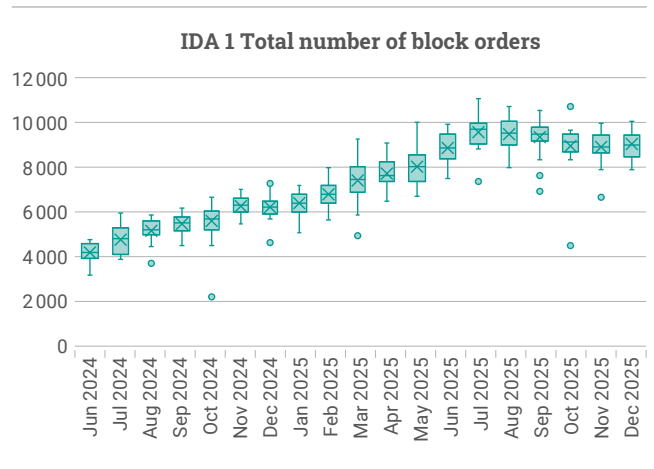


Figure 62

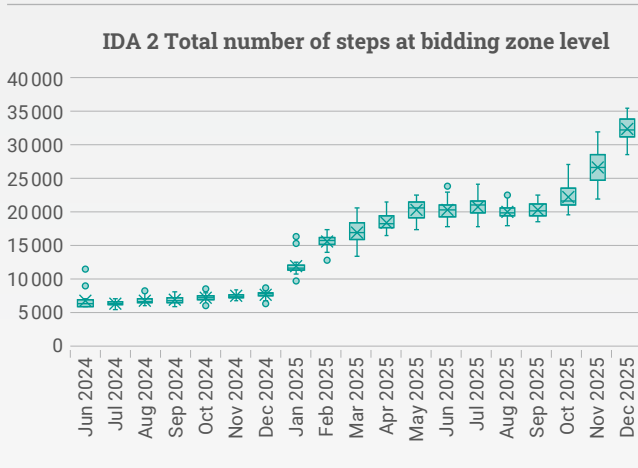


Figure 60

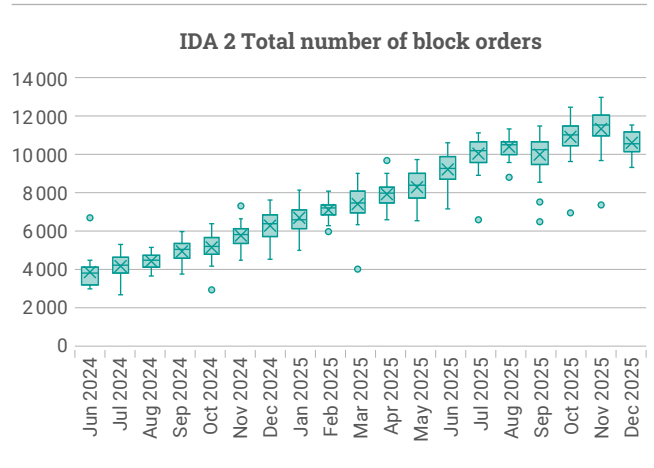


Figure 63

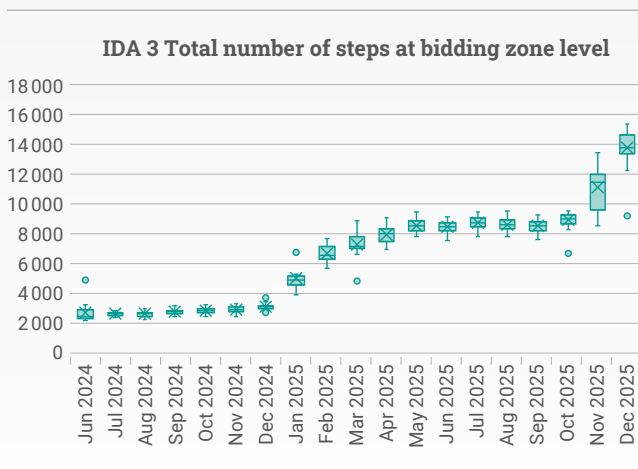


Figure 61

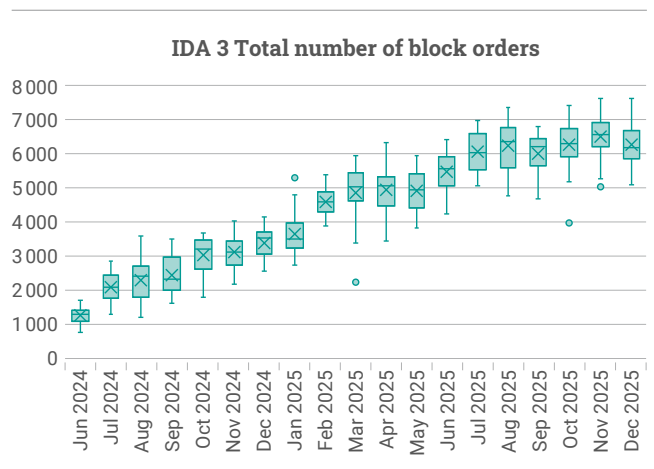


Figure 64

Despite IDA 1 followed the steady pattern from 2024 in 2025, IDAs 2 and 3 have increased multi-fold the usage of the block order exclusive groups.

Usage of Linked Families for the IDAs is in general low, but there are a few months in 2025 in which their usage increased significantly. When values are 0 for the whole month, the boxes in the boxplot are displayed as a horizontal line instead of a rectangle.

IDA 1 Total number of block order exclusive groups

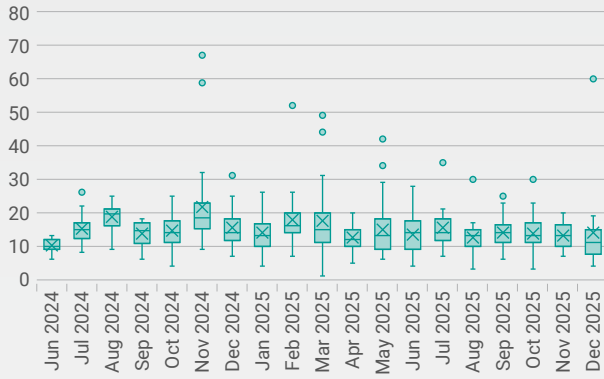


Figure 65

IDA 1 Total number of linked families

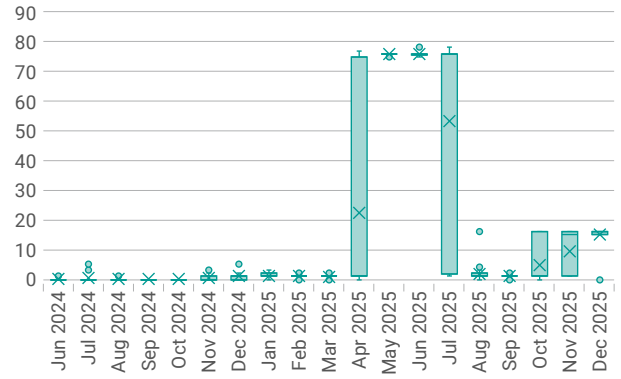


Figure 68

IDA 2 Total number of block order exclusive groups

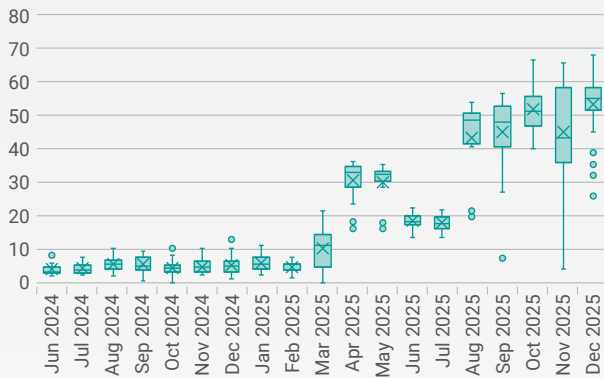


Figure 66

IDA 2 Total number of linked families

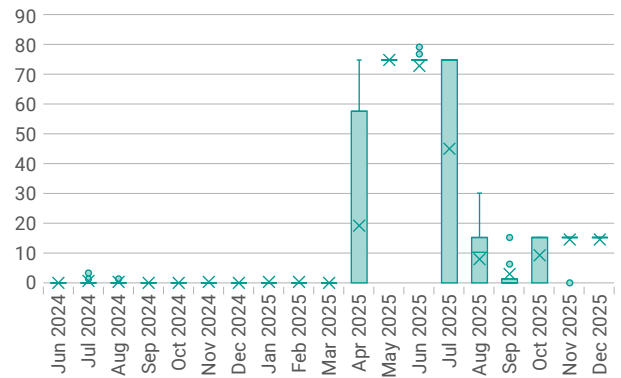


Figure 69

IDA 3 Total number of block order exclusive groups

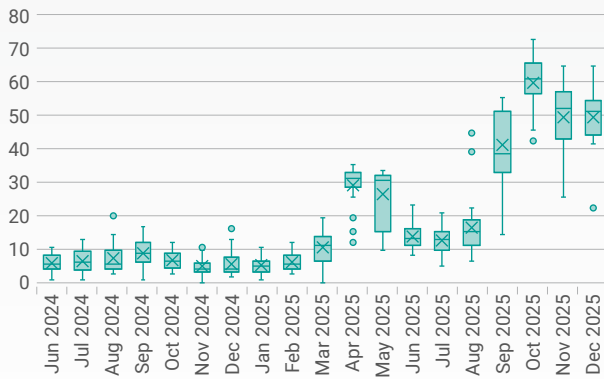


Figure 67

IDA 3 Total number of linked families

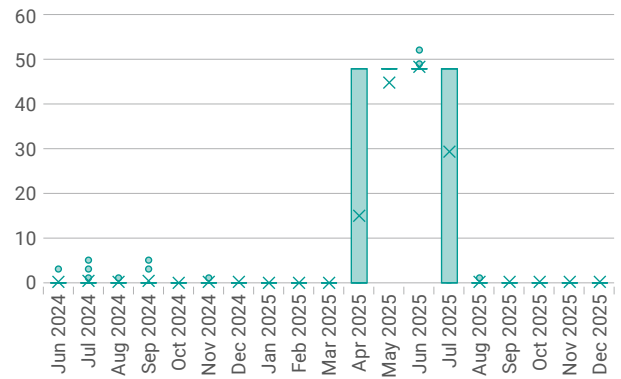


Figure 70

Since January 2025, the usage of demand merit orders has been discontinued.

Since January 2025, the usage of supply merit orders has been discontinued.

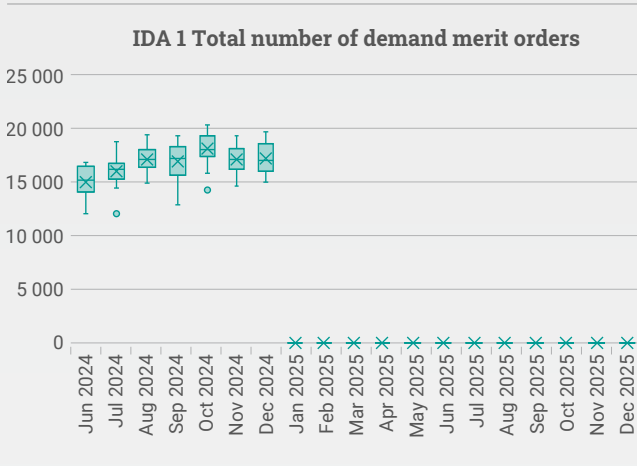


Figure 71

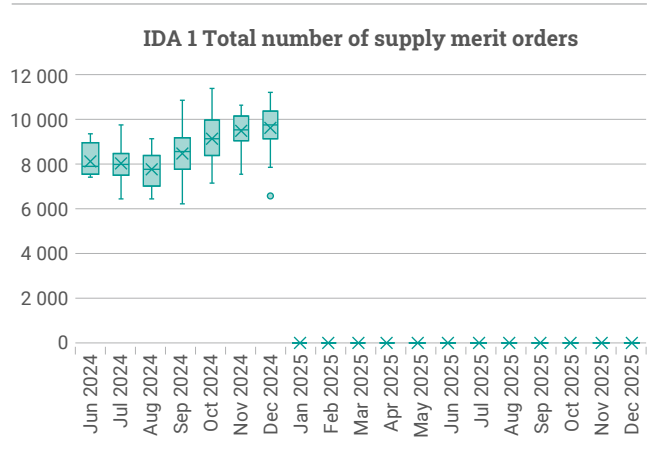


Figure 74

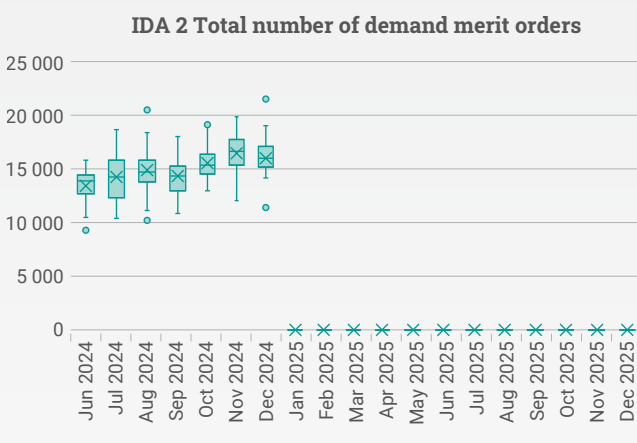


Figure 72

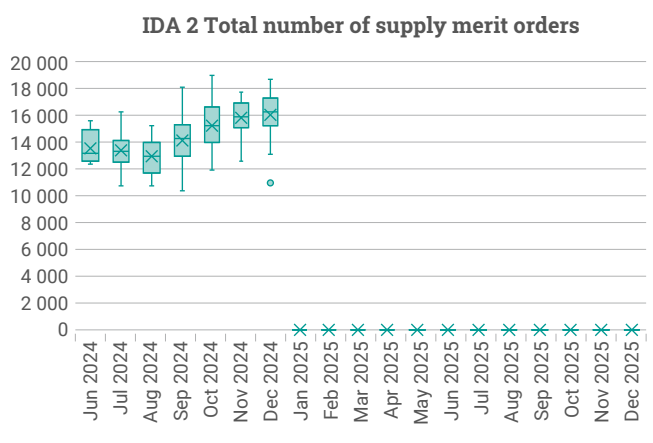


Figure 75

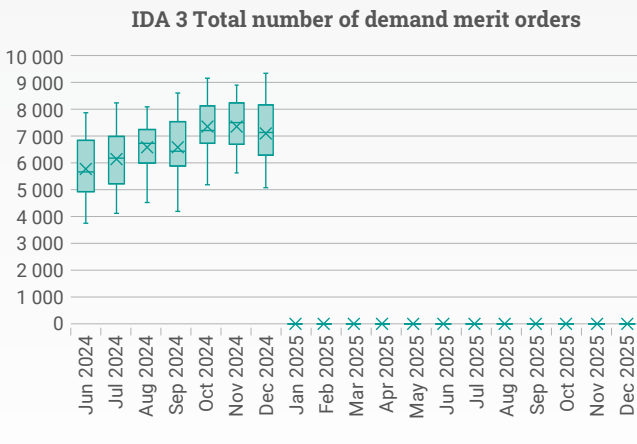


Figure 73

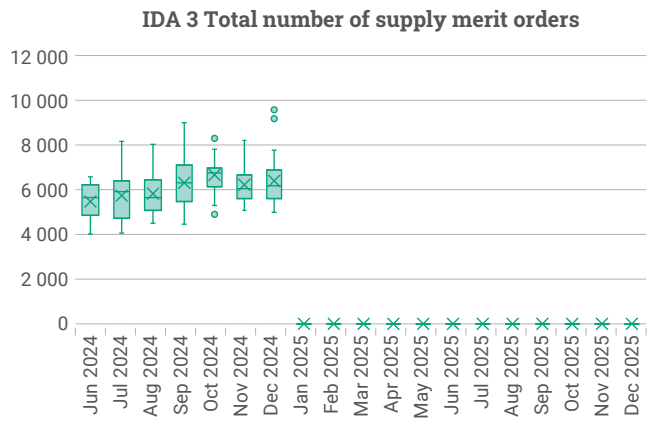


Figure 76

Table 24

Usage indicators	2024* SIDC IDAs			2025* SIDC IDAs		
	Avg	Min	Max	Avg	Min	Max
IDA 1						
2) Indicators to describe geographical extension of the IDAs (Annex 3 of AM Article 11)						
Number of bidding zones	50.7	50	51	50.0	50	50
Total number of flow-based bidding zones	0.0	0	0	0.0	0	0
Number of scheduling areas	53.7	53	54	53.0	53	53
Number of NEMO Trading Hubs	78.4	77	79	77.4	77	78
3) Indicators to describe the network constraints (Annex 3 of AM Article 12)						
Total number of bidding zone lines	74.7	74	75	75.6	74	76
Total number of flow-based PTDF constraints	0.0	0	0	0.0	0	0
Total number of scheduling area lines	80.7	80	81	81.6	80	82
Total number of NEMO Trading Hub lines	156.1	154	157	156.8	154	159
IDA 2						
2) Indicators to describe geographical extension of the IDAs (Annex 3 of AM Article 11)						
Number of bidding zones	50.7	50	51	50.0	50	50
Total number of flow-based bidding zones	0.0	0	0	0.0	0	0
Number of scheduling areas	53.7	53	54	53.0	53	53
Number of NEMO Trading Hubs	78.4	77	79	77.4	77	78
3) Indicators to describe the network constraints (Annex 3 of AM Article 12)						
Total number of bidding zone lines	74.7	74	75	75.6	74	76
Total number of flow-based PTDF constraints	0.0	0	0	0.0	0	0
Total number of scheduling area lines	80.7	80	81	81.6	80	82
Total number of NEMO Trading Hub lines	156.0	154	157	156.8	154	159
IDA 3						
2) Indicators to describe geographical extension of the IDAs (Annex 3 of AM Article 11)						
Number of bidding zones	50.7	50	51	50.0	50	50
Total number of flow-based bidding zones	0.0	0	0	0.0	0	0
Number of scheduling areas	53.7	53	54	53.0	53	53
Number of NEMO Trading Hubs	78.4	77	79	77.4	77	78
3) Indicators to describe the network constraints (Annex 3 of AM Article 12)						
Total number of bidding zone lines	74.7	74	75	75.6	74	76
Total number of flow-based PTDF constraints	0.0	0	0	0.0	0	0
Total number of scheduling area lines	80.7	80	81	81.6	80	82
Total number of NEMO Trading Hub lines	156.1	154	157	156.8	154	159

* The reported values are calculated excluding the days of Decoupling and Auction Cancellation

Number of NEMO Trading Hubs



Figure 77

Performance indicators SIDC IDAs [4], [5]

Table 25

Performance	2024 SIDC IDAs			2025 SIDC IDAs		
	Avg	Min	Max	Avg	Min	Max
IDA 1						
1) Ability to maximise economic surplus (Annex 3 of AM Art. 7)						
(a) Increment of economic surplus with respect to the first solution (%)	0.000282 %	0 %	0.00505 %	0.000277 %	0 %	0.007382 %
Final gap (€)	4 750.7	7.3	223 600.0	6 727.6	75.0	133 503.4
Final gap expressed as percentage of the value of the economic surplus of the final solution (%)	0.002768 %	0.000005 %	0.116046 %	0.004811 %	0.000047 %	0.146773 %
3) Algorithm scalability (Annex 3 of AM Art. 9) TTFS (min)	0.91	0.61	1.31	1.37	0.81	3.00
IDA 2						
1) Ability to maximise economic surplus (Annex 3 of AM Art. 7)						
(a) Increment of economic surplus with respect to the first solution (%)	0.049767 %	0	7.453848 %	0.009681 %	0	0.23158 %
Final gap (€)	4 323.5	0	40 226.8	8 737.2	2.9	236 279.6
Final gap expressed as percentage of the value of the economic surplus of the final solution (%)	0.033228 %	0 %	0.245367 %	0.061501 %	0.000017 %	1.830933 %
3) Algorithm scalability (Annex 3 of AM Art. 9) TTFS (min)	0.77	0.53	1.21	1.25	0.75	2.14
IDA 3						
1) Ability to maximise economic surplus (Annex 3 of AM Art. 7)						
(a) Increment of economic surplus with respect to the first solution (%)	0.016823 %	0 %	0.645705 %	0.015711 %	0 %	0.441629 %
Final gap (€)	1 970.5	-0.1	16 711.3	3 048.4	0.3	23 921.4
Final gap expressed as percentage of the value of the economic surplus of the final solution (%)	0.038737 %	-0.000002 %	0.234615 %	0.062229 %	0.000005 %	0.72482 %
3) Algorithm scalability (Annex 3 of AM Art. 9) TTFS (min)	0.43	0.28	0.76	0.76	0.38	1.58

Ability to maximise the economic surplus

Increment of economic surplus with respect to the first OK solution: maximum final gap value around 0.23 M€ in IDA 2.

Negative axis is not shown due to the absence of negative values.

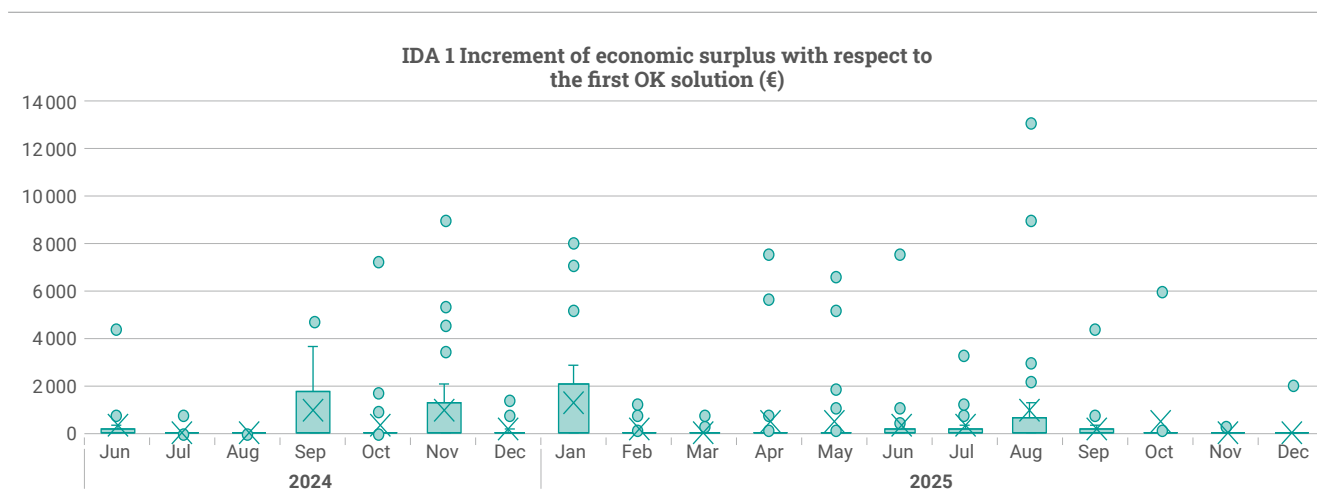


Figure 78

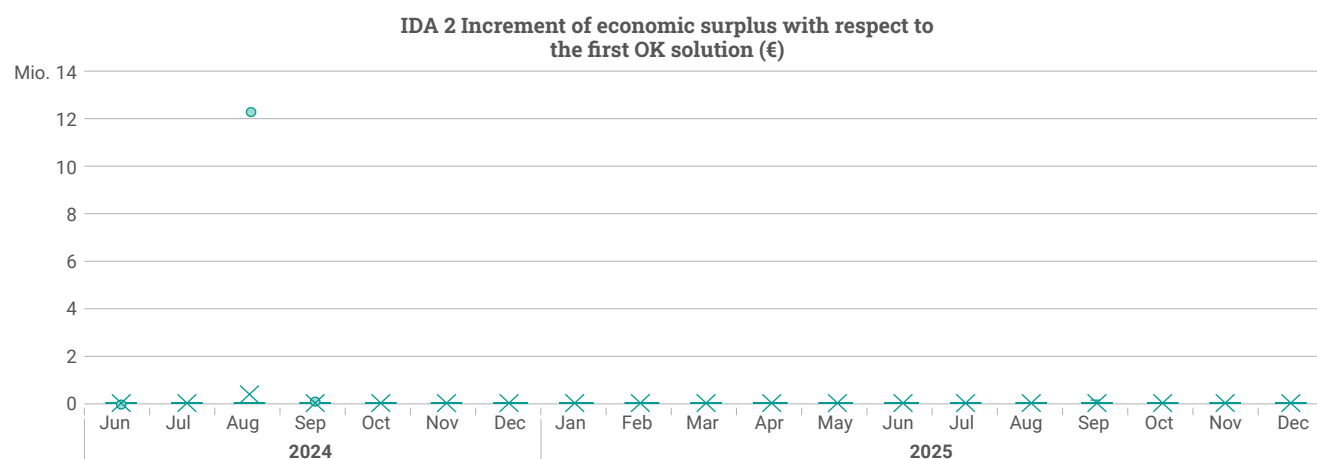


Figure 79

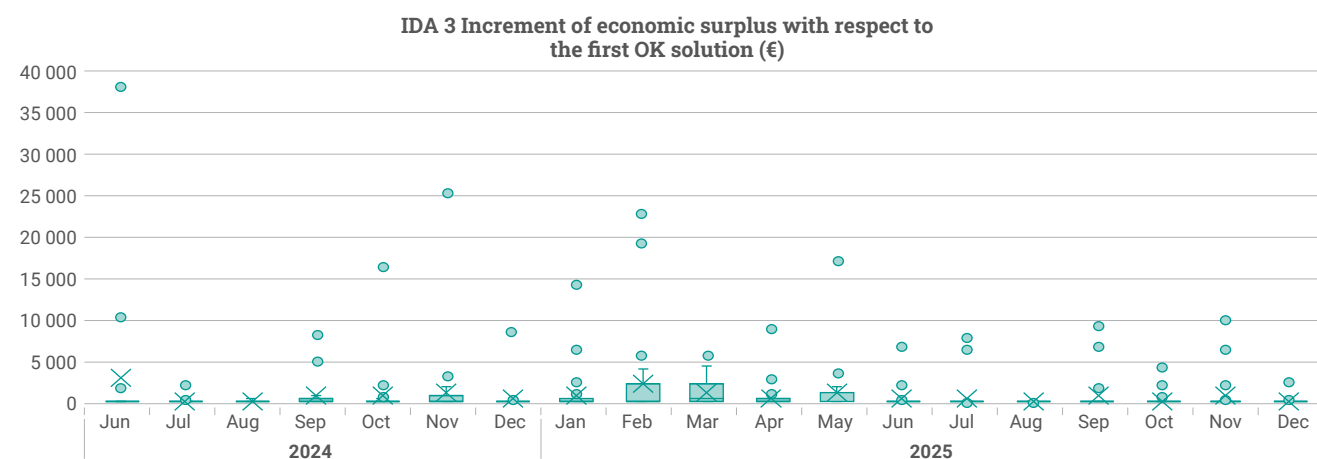


Figure 80

Duration curve shows the final gap in descending order of magnitude, rather than chronologically.

Note that most of the values have a value of 0 or very close to 0.

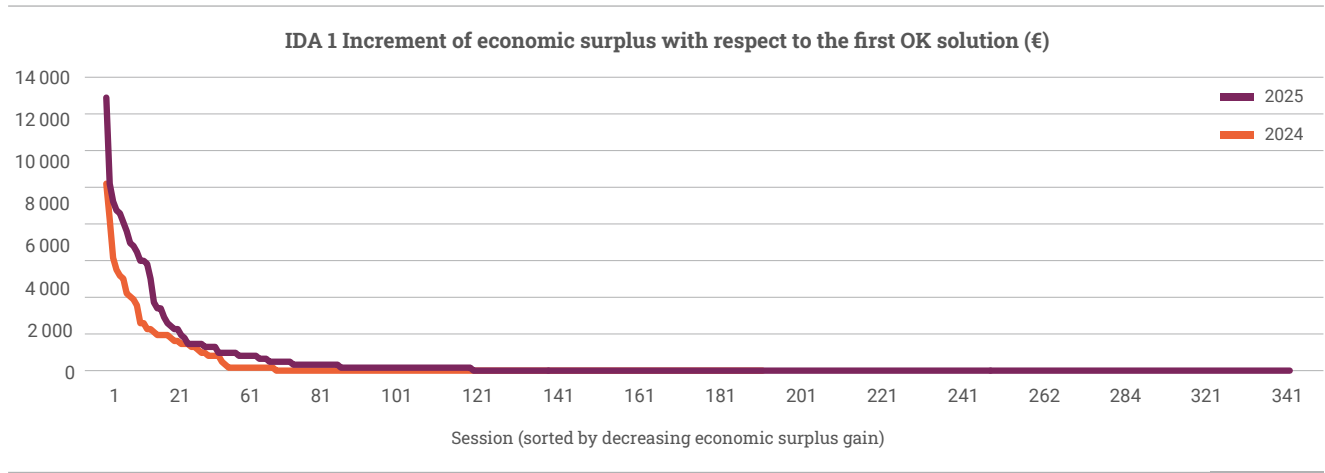


Figure 81

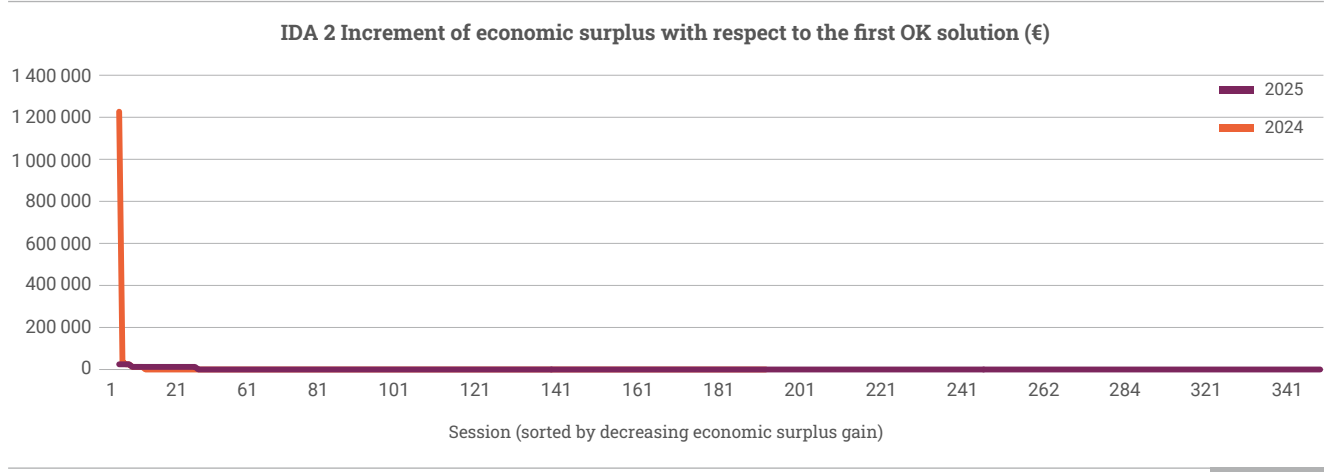


Figure 82

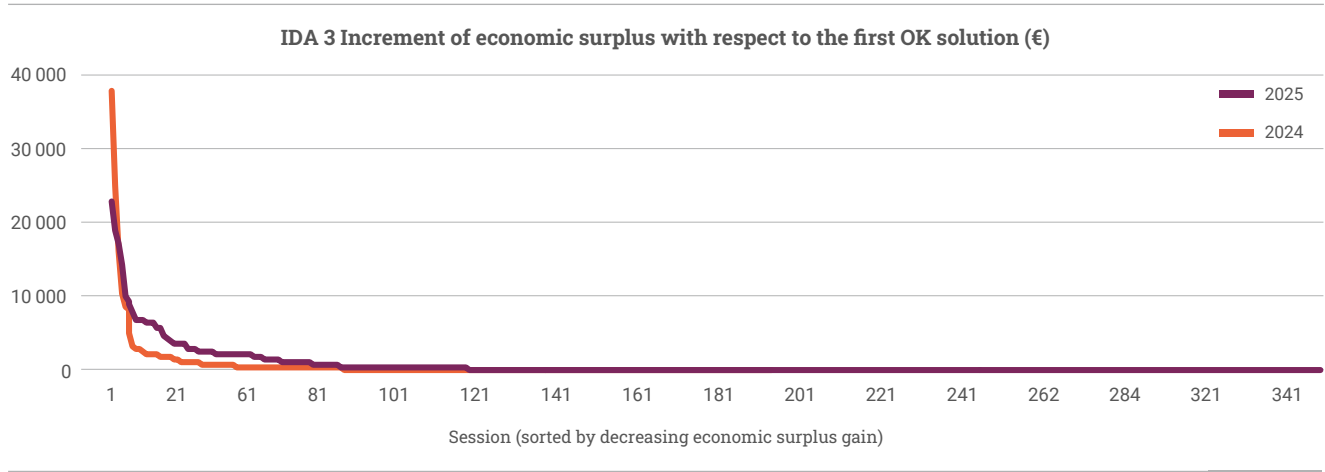


Figure 83

Increment of economic surplus with respect to the first OK solution: maximum final gap value around 0.23 M€ in IDA 2.

Negative axis is not shown due to the absence of negative values.

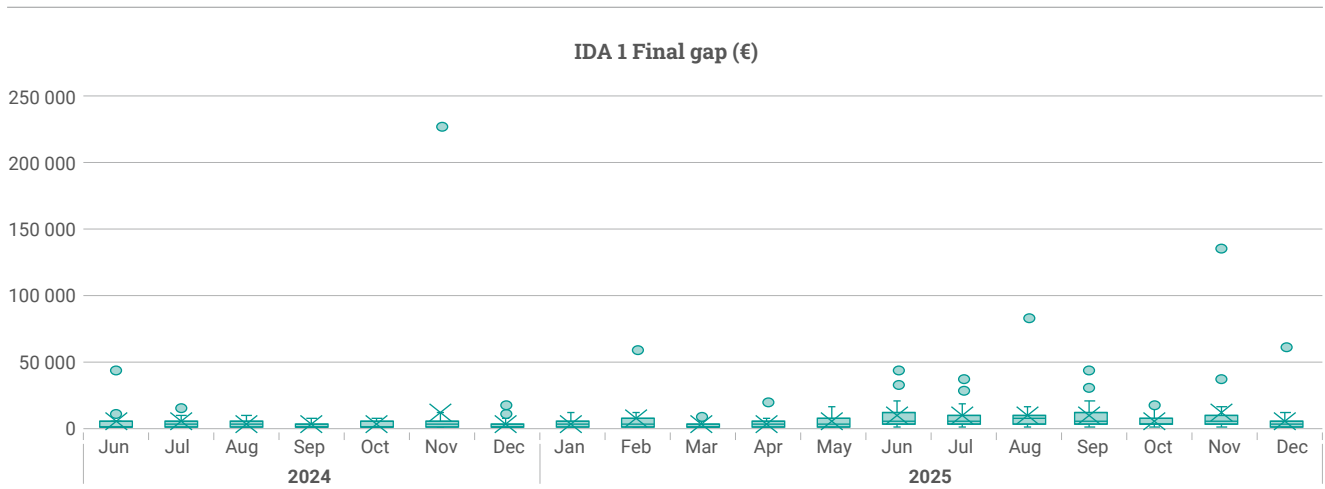


Figure 84

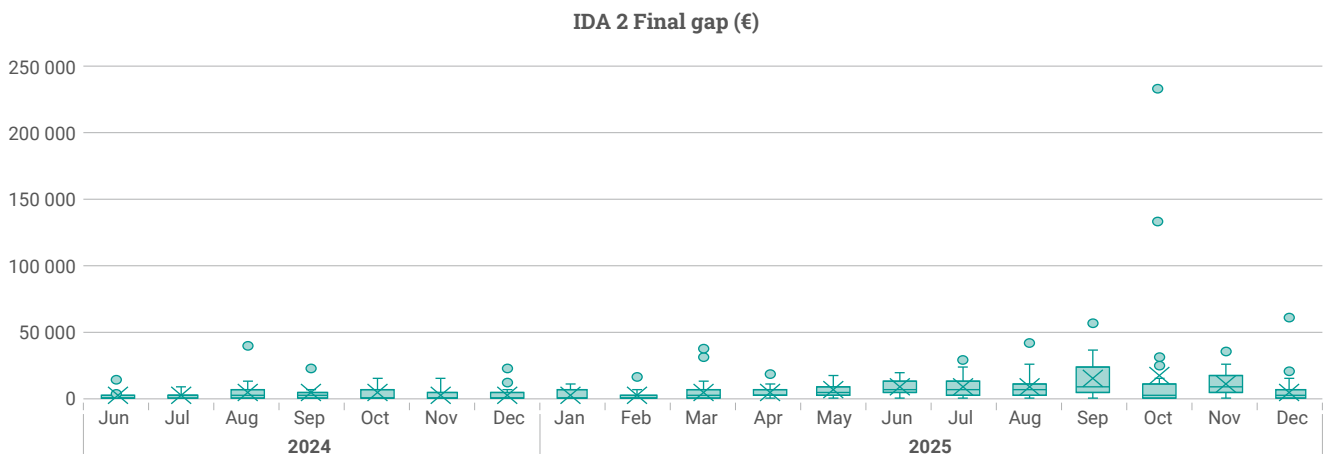


Figure 85

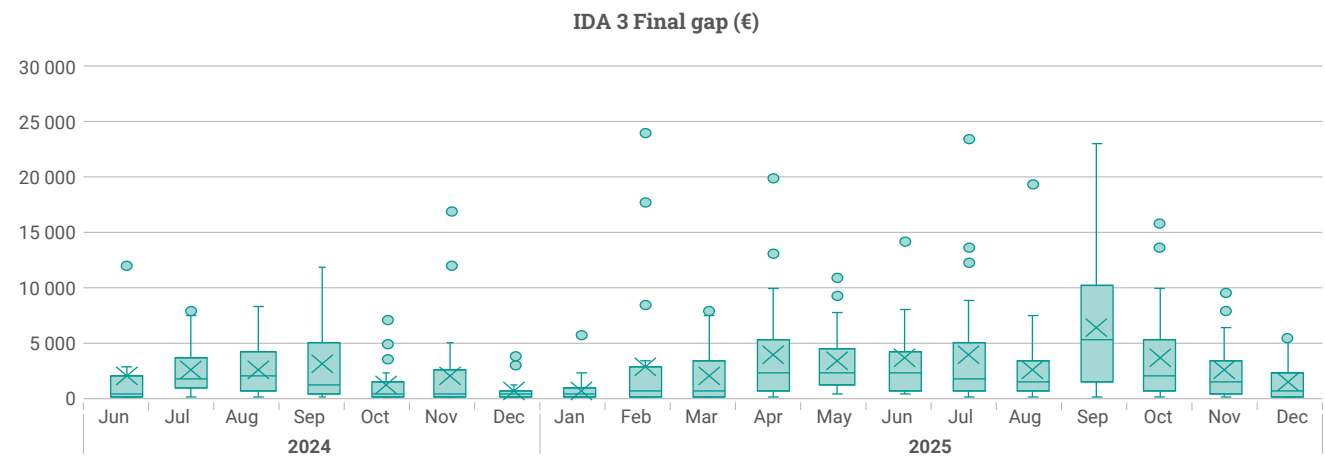


Figure 86

Duration curve shows the final gap in descending order of magnitude, rather than chronologically.

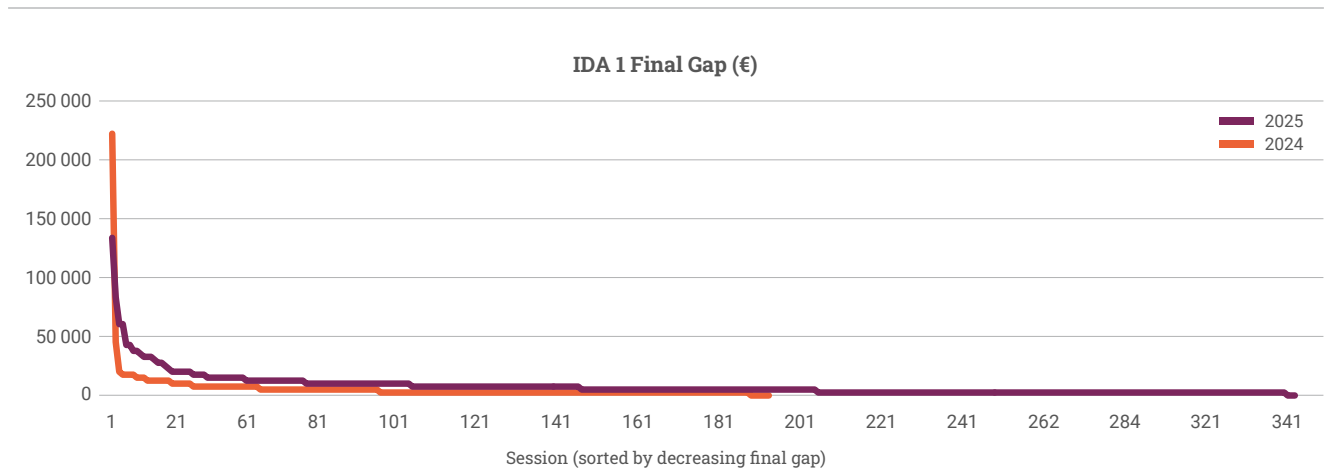


Figure 87

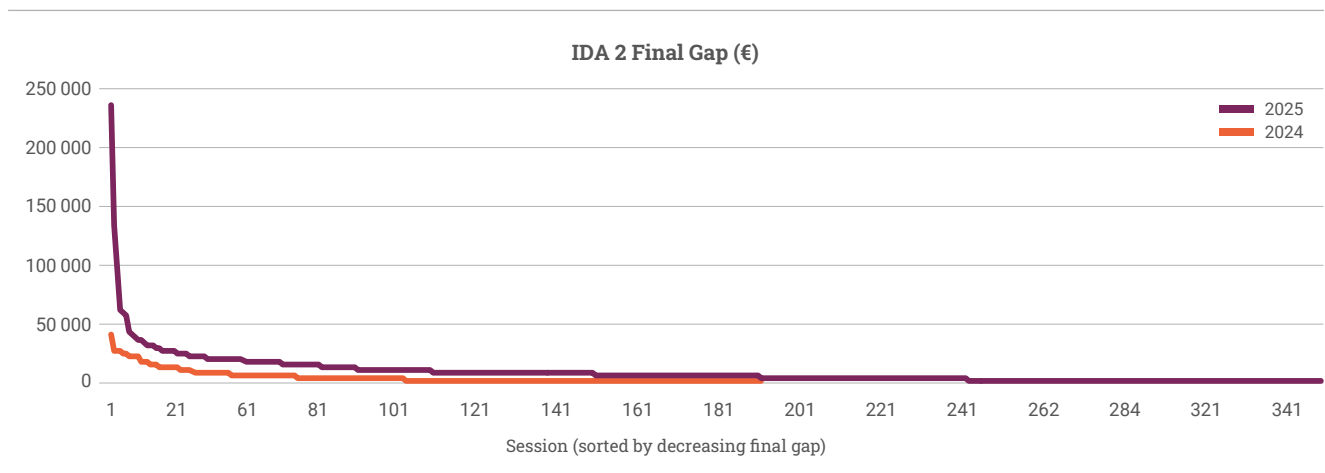


Figure 88

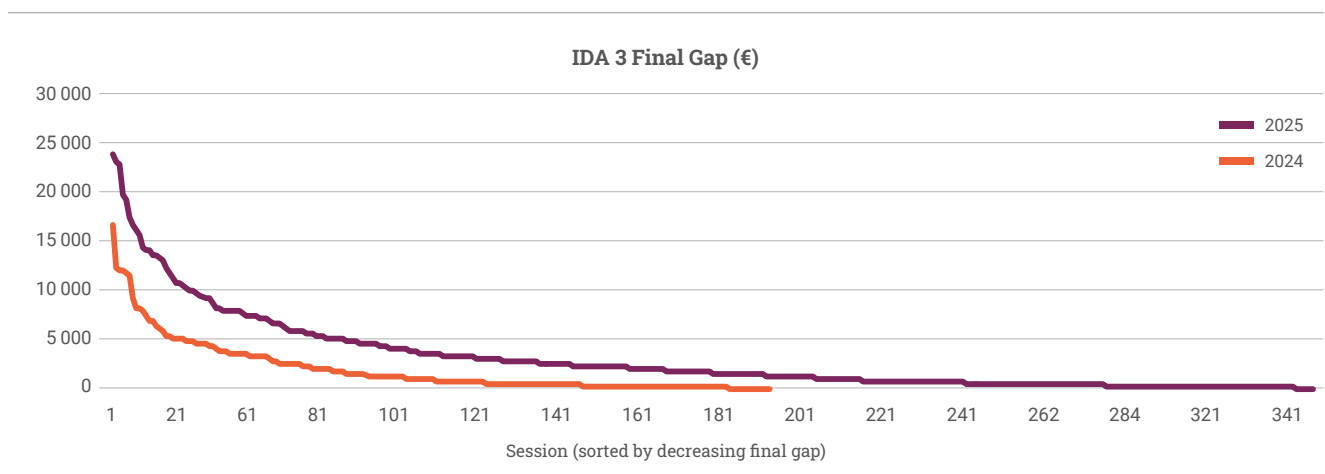


Figure 89



Algorithm scalability (min) SIDC IDAs

TTFS in most cases is below 2 min, but in 2025 average time almost doubled with respect to 2024.

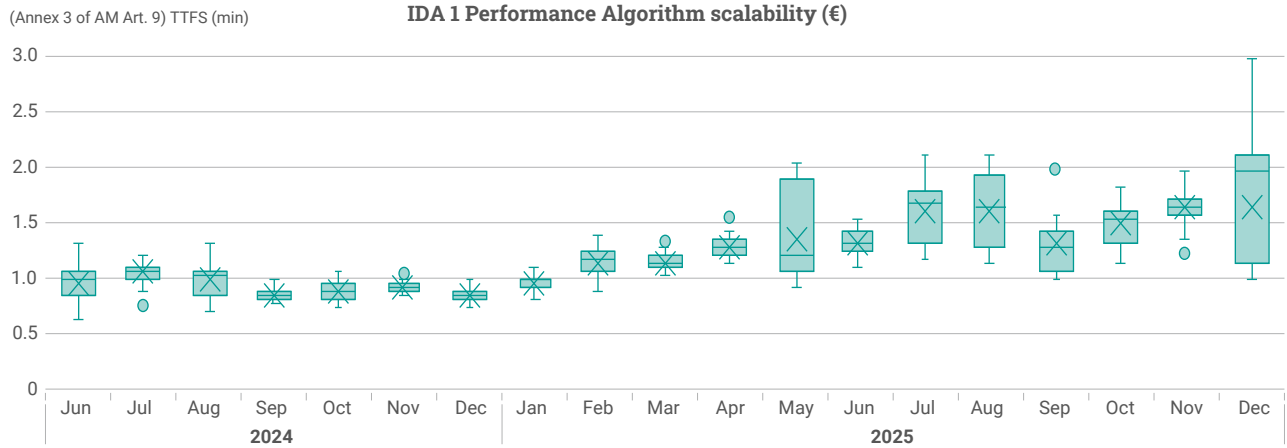


Figure 90

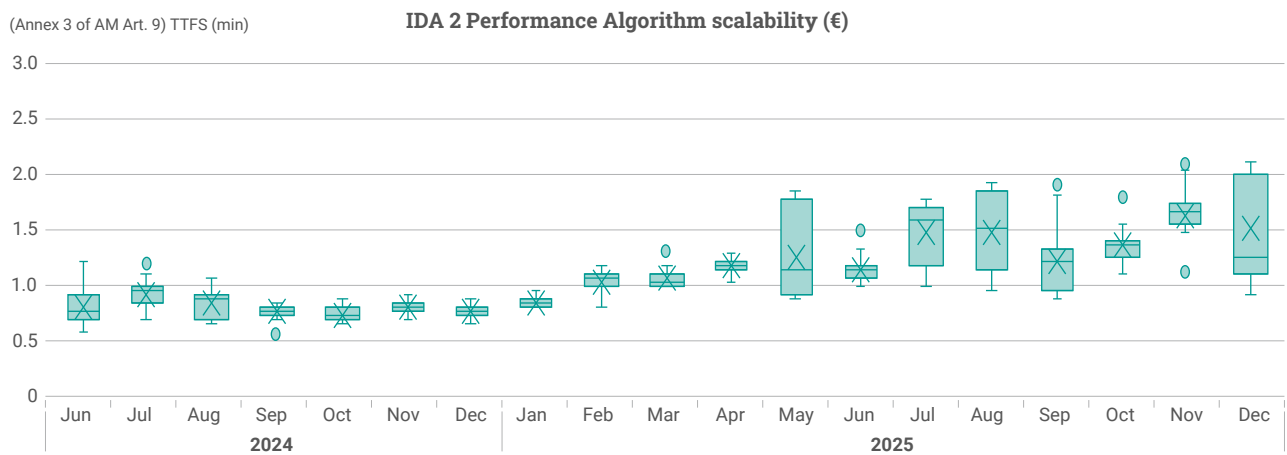


Figure 91

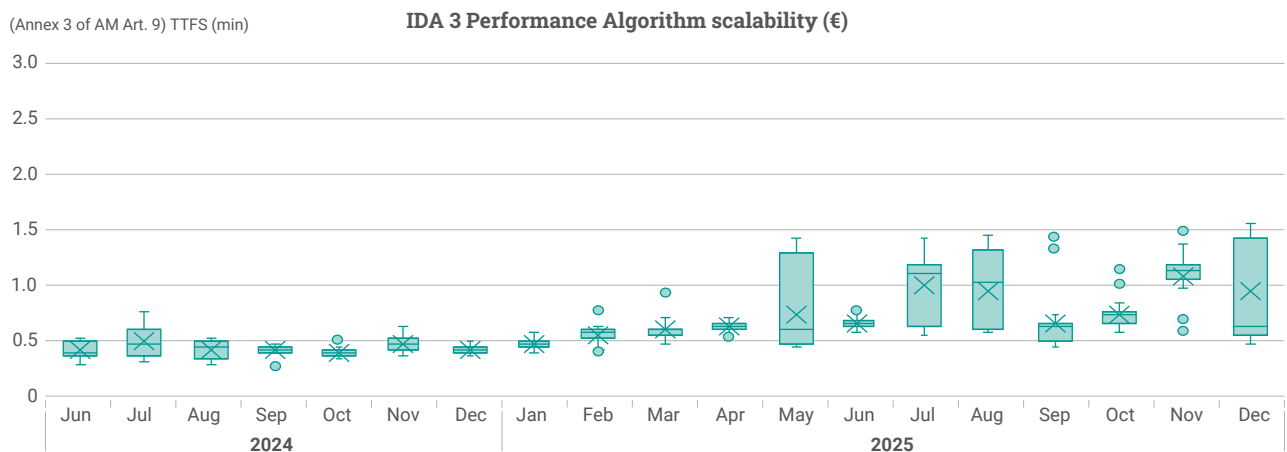


Figure 92

Duration curve shows the TTFS in descending order of magnitude, rather than chronologically.

IDA 1 Performance Algorithm scalability (€)

(Annex 3 of AM Art. 9) TTFS (min)

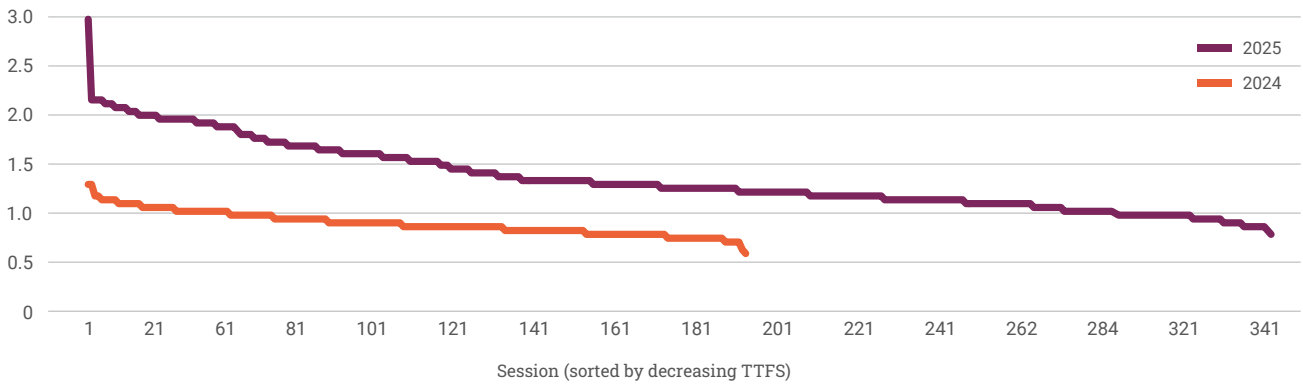


Figure 93

IDA 2 Performance Algorithm scalability (€)

(Annex 3 of AM Art. 9) TTFS (min)

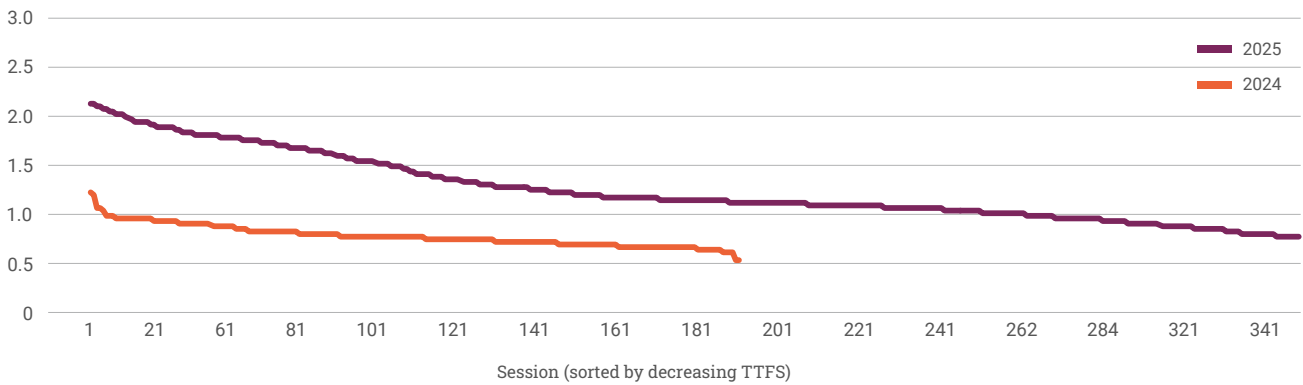


Figure 94

IDA 3 Performance Algorithm scalability (€)

(Annex 3 of AM Art. 9) TTFS (min)

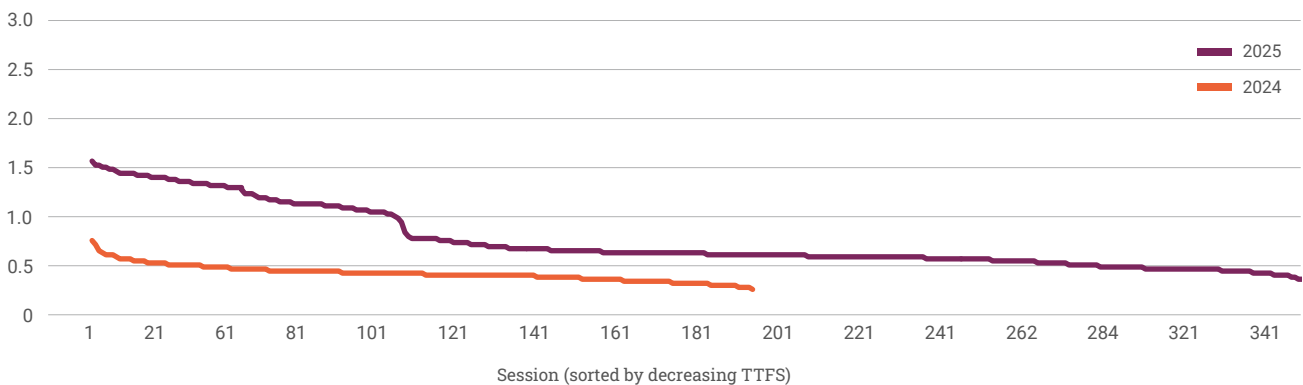


Figure 95

Table 26

Performance	2024**** SIDC IDAs			2025**** SIDC IDAs		
	Avg	Min	Max	Avg	Min	Max
IDA 1						
1) Indicators on the maximisation of economic surplus (Annex 3 of AM art 13)						
Maximisation of the first economic surplus						
Economic surplus of first OK solution (M€)	167.469	111.497	254.569	163.838	40.950	295.685
Economic surplus of the final solution (M€)	167.469	111.498	254.569	163.838	40.950	295.685
Evolution of number of matched orders						
Total number of matched blocks	479	208	832	884.7	306	1446
Total number of matched complex orders	0	0	0	0	0	0
Total number of matched scalable complex orders	0	0	0	0	0	0
Total number of matched non-PUN merit orders	16 078	12 858	18 772	0	0	0
Total number of matched PUN orders	0	0	0	0	0	0
Total matched volume from curves (MWh)	120 785	98 282	206 811	222 809	152 433	297 163
Total matched volume from blocks (MWh)	18 733	6 981	61 745	29 707	12 170	60 692
Total matched volume from scalable complex orders (MWh)	0	0	0	0	0	0
Total matched volume from (non-PUN) merit orders (MWh)	71 749	43 777	102 025	0	0	0
2) Indicators to describe the status of orders (Annex 3 of AM art 14)						
Paradoxically rejected orders						
Number of PRBs in the final solution	77.8	11	250	76.6	17	321
Number of PRMICs in the final solution	0	0	0	0	0	0
Maximum Delta P in the final solution	147.8	0.7	4 990.0	241.0	1.8	5007.1
Maximum Delta MIC in the final solution	0	0	0	0	0	0
PRB utility loss in the final solution (k€)	70.057	0.331	1 904.208	85.157	1.407	2 791.665
PRMIC utility loss in the final solution (k€)	0	0	0	0	0	0
Volume of PRBs in the final solution (MWh)	5 872	290	28 088	8 807	620	30 546
Volume of PRMICs in the final solution (MWh)	0	0	0	0	0	0
Indicators on the evolution of the use of network constraints along the time						
Number of periods for ATC/DC lines with flows at full capacity	1 448.5	785	1 840	3337.4	1 190	5 367

* Some time measurements in the calculation are overlapping (parallel processes).

** Zero nodes in the master branch can happen when the root node directly resolves to an optimal solution.

*** This number includes the first solution.

**** The reported values are calculated excluding the days of Decoupling and Auction Cancellation

Table 26

Performance	2024**** SIDC IDAs			2025**** SIDC IDAs		
	Avg	Min	Max	Avg	Min	Max
3) IT calculation process (Annex 3 of AM Article 15)						
Time spent in every phase of the algorithm calculation process						
TTFS (s)	54.5	36.8	78.9	82.1	48.4	179.8
Input data reading time (s)*	11.1	2.0	35.6	8.1	2.0	33.3
Input data delivery day creation (s)*	10.3	6.6	18	19.9	8.3	47.9
Time to solve the root node for the master computer (s)*	2.0	1.2	4.5	6.7	2.1	12.3
Time to solve the root node for the job that found first solution (s)*	2.1	1.4	3.5	4.9	2.4	115.3
Number of successive improvements of the solution in the given timeframe <small>This indicator measures the number of OK solutions that improve a previously found solution during the optimisation process limited by the amount of time available for running the SDAC algorithm***</small>	1.7	1	4	1.8	1	8
Total number of nodes in the master branch and bound tree**	145.3	42	331	186.3	17	1119

IDA 2**1) Indicators on the maximisation of economic surplus (Annex 3 of AM art 13)**

Maximisation of the first economic surplus						
Economic surplus of first OK solution (M€)	18.67	6.491	142.623	17.845	8.417	172.863
Economic surplus of the final solution (M€)	18.678	6.492	142.623	17.846	8.417	172.864

2) Indicators to describe the status of orders (Annex 3 of AM art 14)

Evolution of number of matched orders						
Total number of matched blocks	417	115	1 031	952	293	2523
Total number of matched complex orders	0	0	0	0	0	0
Total number of matched scalable complex orders	0	0	0	0	0	0
Total number of matched non-PUN merit orders	15 443	11 893	20 162	0	0	0
Total number of matched PUN orders	0	0	0	0	0	0
Total matched volume from curves (MWh)	95 150	65 289	171 787	135 198	97 062	257 794
Total matched volume from blocks (MWh)	13 617	3 357	69 360	24 777	6 574	77 070
Total matched volume from scalable complex orders (MWh)	0	0	0	0	0	0
Total matched volume from (non-PUN) merit orders (MWh)	31 462	18 318	73 536	0	0	0

* Some time measurements in the calculation are overlapping (parallel processes).

** Zero nodes in the master branch can happen when the root node directly resolves to an optimal solution.

*** This number includes the first solution.

**** The reported values are calculated excluding the days of Decoupling and Auction Cancellation

Table 26

Performance	2024**** SIDC IDAs			2025**** SIDC IDAs		
	Avg	Min	Max	Avg	Min	Max
Paradoxically rejected orders						
Number of PRBs in the final solution	42.4	3	211	48.3	6	170
Number of PRMICs in the final solution	0	0	0	0	0	0
Maximum Delta P in the final solution	202.1	2.2	4 954.6	200.0	0.8	4989.6
Maximum Delta MIC in the final solution	0	0	0	0	0	0
PRB utility loss in the final solution (k€)	65.034	0.133	806.228	51.023	0.223	657.137
PRMIC utility loss in the final solution (k€)	0	0	0	0	0	0
Volume of PRBs in the final solution (MWh)	6 096	195	60 930	9 910	187	54 988
Volume of PRMICs in the final solution (MWh)	0	0	0	0	0	0
Indicators on the evolution of the use of network constraints along the time						
Number of periods for ATC/DC lines with flows at full capacity	1 204.5	669	1 810	2 830.2	942	4 155
3) IT calculation process (Annex 3 of AM Article 15)						
Time spent in every phase of the algorithm calculation process						
TTFS (s)	46.3	31.8	72.7	75.2	45.1	128.5
Input data reading time (s)*	9.6	2.5	33.6	8.4	2.1	42.8
Input data delivery day creation (s)*	7.7	5.1	18.9	16.4	6.6	52.5
Time to solve the root node for the master computer (s)*	1.2	0.7	2.0	5.0	1.4	13.6
Time to solve the root node for the job that found first solution (s)*	1.5	1	2.4	3.6	1.7	6.8
Number of successive improvements of the solution in the given timeframe <small>This indicator measures the number of OK solutions that improve a previously found solution during the optimisation process limited by the amount of time available for running the SDAC algorithm***</small>	2.3	1	10	2.0	1	6
Total number of nodes in the master branch and bound tree**	231	28	1 819	198.1	11	1846

* Some time measurements in the calculation are overlapping (parallel processes).

** Zero nodes in the master branch can happen when the root node directly resolves to an optimal solution.

*** This number includes the first solution.

**** The reported values are calculated excluding the days of Decoupling and Auction Cancellation

Performance	2024**** SIDC IDAs			2025**** SIDC IDAs		
	Avg	Min	Max	Avg	Min	Max
IDA 3						
1) Indicators on the maximisation of economic surplus (Annex 3 of AM art 13)						
Maximisation of the first economic surplus						
Economic surplus of first OK solution (M€)	5.157	1.776	20.852	5.246	2.122	25.641
Economic surplus of the final solution (M€)	5.158	1.776	20.852	5.247	2.122	25.641
Evolution of number of matched orders						
Total number of matched blocks	115	20	324	250	67	560
Total number of matched complex orders	0	0	0	0	0	0
Total number of matched scalable complex orders	0	0	0	0	0	0
Total number of matched non-PUN merit orders	6 635	0	8 663	0	0	0
Total number of matched PUN orders	0	0	0	0	0	0
Total matched volume from curves (MWh)	28 252	17 492	53 577	47 361	31 979	109 216
Total matched volume from blocks (MWh)	3 149	407	10 647	6 482	822	16 202
Total matched volume from scalable complex orders (MWh)	0	0	0	0	0	0
Total matched volume from (non-PUN) merit orders (MWh)	15 802	0	36 534	0	0	0
Paradoxically rejected orders						
Number of PRBs in the final solution	42.2	3	190	43.0	6	193
Number of PRMICs in the final solution	0	0	0	0	0	0
Maximum Delta P in the final solution	186.1	1	5 099.6	147.5	0.7	5 082.0
Maximum Delta MIC in the final solution	0	0	0	0	0	0
PRB utility loss in the final solution (k€)	41.774	0.157	856.398	37.402	0.085	2 044.708
PRMIC utility loss in the final solution (k€)	0	0	0	0	0	0
Volume of PRBs in the final solution (MWh)	2 949	90	11 273	4 360	165	29 095
Volume of PRMICs in the final solution (MWh)	0	0	0	0	0	0
Indicators on the evolution of the use of network constraints along the time						
Number of periods for ATC/DC lines with flows at full capacity	674.4	320	1 112	1 469.6	491	2 111

* Some time measurements in the calculation are overlapping (parallel processes).

** Zero nodes in the master branch can happen when the root node directly resolves to an optimal solution.

*** This number includes the first solution.

**** The reported values are calculated excluding the days of Decoupling and Auction Cancellation

Table 26

Performance	2024****			2025****		
	Avg	Min	Max	Avg	Min	Max
3) IT calculation process (Annex 3 of AM Article 15)						
Time spent in every phase of the algorithm calculation process						
TTFS (s)	25.8	16.5	45.6	45.8	22.7	95.0
Input data reading time (s)*	4.8	1.3	10.5	5.5	1.3	23.3
Input data delivery day creation (s)*	4.6	3	11.7	10.5	3.7	46.5
Time to solve the root node for the master computer (s)*	0.5	0.3	0.8	2.5	0.6	6.8
Time to solve the root node for the job that found first solution (s)*	0.7	0.4	1.7	1.7	0.8	4.5
Number of successive improvements of the solution in the given timeframe <small>This indicator measures the number of OK solutions that improve a previously found solution during the optimisation process limited by the amount of time available for running the SDAC algorithm**</small>	1.9	1	11	1.8	1	7
Total number of nodes in the master branch and bound tree**	318.5	13	7 328	253.2	6	5691

* Some time measurements in the calculation are overlapping (parallel processes).

** Zero nodes in the master branch can happen when the root node directly resolves to an optimal solution.

*** This number includes the first solution.

**** The reported values are calculated excluding the days of Decoupling and Auction Cancellation

R&D report

2025 Outcomes

The R&D focus in 2025 was mainly on implementation of regulatory changes such as the initial steps of implementation of Flow-Based Allocation in IDAs, further analysis of Flow-Based Allocation in the continuous trading as well as on improvement of performance to level up with the high utilisation of the trading platform in the continuous trading.

Flow-Based Allocation (FB)

There were two tracks of R&D in 2025. The 1st track focused on the so-called interim solution, implementation of FB for IDAs, where the performance impact is not posing a principal issue. For FB in IDAs the technical specification was finalised and approved, including all commercial arrangements leading to the start of development in the 2nd half of 2025. The 2nd track focused on the final solution which is intended to cover also Continuous Trading. In this respect further analysis were executed leading to the better understanding of the viable options.

Performance improvements

The growth in trading resulted in R&D focused on two main tracks. Short term solution for improvement of the trading performance so that the Continuous Trad-

ing (CT) could deal with the situation after introduction of 15-minute MTU (in combination with the natural exponential growth) and middle-term solution introducing performance improvements with the longer delivery timeline. Moreover, an additional track focused on more strategic performance improvements with the outlook of several years was worked on in parallel which also considered initial impact assessment of EnC countries which will have important impact on the changes in the topology and therefore a direct performance impact.

Functional improvements

Several functional improvements and adaptations were developed in 2025 mainly with the focus to improve usability of the central platform and to implement requirements to improve data exchange and reporting.

Major items in SIDC R&D programme

Budget/cost share per topic

The biggest investment of R&D is in Flow-Based Allocation (in both Continuous Trading and IDAs) and execution of the Performance Improvements. The investment in Flow-Based allocation in 2025 was substantial with the main focus on development of the solution in IDAs and with additional analytical activities for continuous trading. The second substantial part of SIDC R&D investment was focused on performance improvement addressing short- term improvements with the delivery of the optimisation in spring 2025 and middle- term improvements which are expected to be delivered in 2026.

The R&D costs mainly consist of 3 elements:

- Central cost of chairs and team leaders.
- Cost for drafting and testing activities – this is usually done evenly by the team members and therefore it is not reflected as a central cost.
- Cost provided by 3rd parties (usually solution providers). This may cover implementation cost for final deliverables, analyses and cost for the prototypes usually focused on the limited functionalities with high impact on the performance.

Major items in SIDC R&D programme:
budget/cost share per topic

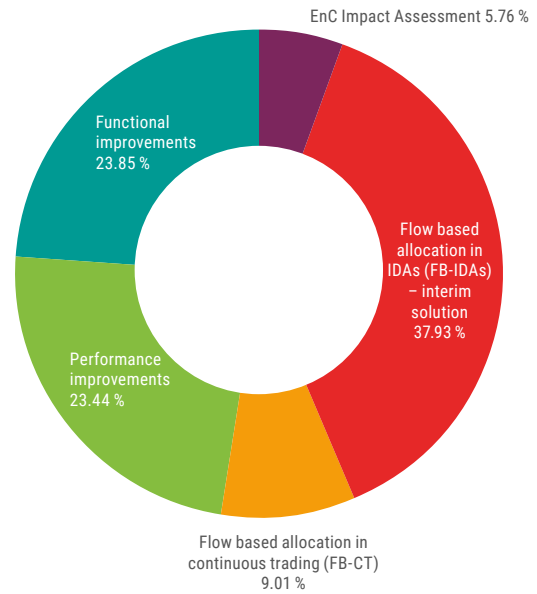


Figure 96

Description	Share of Cost	CACM compliance	Outcome and impact on CACM compliance	Future steps/Implementation in production (forecast)
Flow-Based allocation in IDAs (FB-IDAs) – Interim solution				
The development of the market, geographical extensions and implementation of new functionalities contribute to the growth of the system performance needs. The performance is constantly monitored and improved if needed.	37.93 %	Regulatory requirements implementation	Implementation of the interim solution for IDAs	Foreseen steps: <ul style="list-style-type: none"> Finalisation of the development of FB interim solution (IDA) Planning, preparation and initiation of the testing of FB interim solution (IDAs)
Flow-Based allocation in continuous trading (FB-CT)				
In line with Algorithm Methodology requirements, the continuous trading matching algorithm shall allow for Flow-Based allocation in order to introduce a method in which energy exchanges between bidding zones are limited by power transfer distribution factors and available margins on critical network elements.	9.01 %	Regulatory requirements implementation	Analysis of the results of initial FB prototype and evaluation of performance impact on continuous trading including discussion on the mitigation measures (the impact on continuous trading is adverse, sufficient mitigation measures not available for the time being), design of FB interim solution (FB	Foreseen steps: <ul style="list-style-type: none"> Assessment on implementation feasibility of FB for Continuous Market Development of functional specification and prototype for continuous market
Functional improvements				
Minor improvements which increase stability and operability of the IDAs and continuous trading	23.85 %	Usability improvements	Usability improvement of the central platform and to implement requirements to improve data exchange and reporting	Foreseen steps: <ul style="list-style-type: none"> All scoped improvements were delivered New improvements are subject of future releases
Performance improvements				
The development of the market, geographical extensions and implementation of new functionalities contribute to the growth of the system performance needs. The performance is constantly monitored and improved if needed.	23,44 %	Increase performance	Implementation of the agreed performance improvement measures, execution of the tests in order to establish technical XBID limits, specification of the performance improvements having a direct impact on LTS API.	Foreseen steps: <ul style="list-style-type: none"> Finalisation of the testing of R5.0 Finalisation of development of the performance optimisation measures having an impact on LTSs (R5.1) Testing of the performance optimisation measures having an impact on LTSs (R5.1)
EnC Impact Assessment				
In line with the request for Description of the expected impact of the integration of NEMOs from Contracting Parties on the performance of the MCO functions in Article 7 (2) of Regulation (EU) 2015/1222	5,76 %	Regulatory requirements implementation	Impact assessment completed and provided to ACER	Foreseen steps: <ul style="list-style-type: none"> Next steps will be focused on the clarification questions raised by ACER



Annexes



Annex 1: Parameters

SDAC parameters

Table 28

Indicator	Parameter	Description	Value	Purpose	Annex 3 of AM
	K	Number of months which define the recent historical set	3	Definition of recent historical set	Art. 2(a)
Scalability	X%	Minimum percentage of cases which have to comply with the scalability indicator threshold	<ol style="list-style-type: none"> 97 % of cases should be below Running time; 100 % of cases should be below 180 % of running time. 	<ul style="list-style-type: none"> Monitoring purpose RfC assessment for the past scenario RfC assessment for the future scenario Scalability assessment for the near future scenario Scalability assessment for distant future scenario Research and development 	Art. 3(4) Art. 4(2)(a) Art. 4(2)(b) Art. 5(2)(a) Art. 5(2)(b) Art. 6(2)(a)
	y	Threshold for scalability indicator on the indicator values distribution	1. TBD accordingly for the SDAC Scalability Report	<ul style="list-style-type: none"> Monitoring purpose RfC assessment for the past scenario RfC assessment for the future scenario Scalability assessment for the near future scenario Scalability assessment for distant future scenario Research and development 	Art. 3(4) Art. 4(2)(a) Art. 4(2)(b) Art. 5(2)(a) Art. 5(2)(b) Art. 6(2)(a)
	Z	Threshold for scalability indicator on the average value	∞	<ul style="list-style-type: none"> Monitoring purpose RfC assessment for the past scenario Scalability assessment for the near future scenario Scalability assessment for distant future scenario Research and development 	Art. 3(4) Art. 4(2)(a) Art. 5(2)(a) Art. 5(2)(b) Art. 6(2)(a)
Ability to maximise economic surplus	T	Time extension for first OK-solution calculation	10 min		Art. 7(2)
Repeatability	pi	Weight for the different component of the repeatability indicator	1	<ul style="list-style-type: none"> Clearing prices Products output 	Art. 8

SIDC parameters

Table 29

Parameter	Value	Scope	Proposed Annex 4 of AM
K	12	Number of months which define the recent historical set	Art. 2(a)
t	NA ⁸⁾	Scalability threshold as defined in the service agreement with the service provider	
X %	NA ⁸⁾	Minimum percentage of cases which have to comply with the scalability indicator threshold	

Annex 2: Notes

[1] Incidents causes

"Unusual process" category involves any unattended procedures that may cause delays; "Interface issues" is related with mistakes in the format of offers/results; "System bug" involves problems with common systems; "Configuration" is related with topological configuration; "Human error" is related with incidents caused by an external party (e.g. market participant); "Other" involves any other cause. Incidents not related to MCO assets are classified in three different categories: "Non-MCO: local trading", "Non-MCO: transmission of capacity" and "Non-MCO: Other".

[2] Requests for change

"Geographical extension" category involves any RfC, including in the SDAC new MSs; "Network topology" category involves any RfC modifying the topology of the existing MSs (for example by splitting existing BZs, removing BZs, adding or eliminating cables, ...); "Flow based" category involves any RfC introducing or modifying the flow based methodology in one or more BZs; "MNA implementation" category involves any RfC introducing MNA in one or more BZs; "product extension" category involves any RfC extending the usage of existing products in further BZs; "System release" category involves any RfC introducing the usage of a new version of one or more MCO system; "other" category involves any RfC not included in the previous categories, among which especially related to procedural changes. When a single RfC impacts more than one category among those reported in the graphs, they are conventionally counted for the number of categories impacted. Typical is the example of the "Geographical extension" RfCs, which, by definition, are impacting also product extension to different BZs. Note that the Non-notifiable changes are not included in the list provided. These changes are not directly affecting the MCO function assets, and not causing a detriment to the performance of the relevant algorithm and not relevant to market participants.

[3] Box plot

The monthly trend of the indicators is reported through "box and whisker" chart (or box blot). The chart shows the distribution of data into quartiles, highlighting the median, mean and outliers. The boxes have lines extending vertically called "whiskers" which indicate variability outside the upper and lower quartiles, and any point outside those lines or whiskers is considered an outlier. The reported charts show the mean markers (X symbol) and the quartile calculation uses the exclusive median method (i.e. The median is excluded from the calculation if the number of values in the data is odd).

[4] Performance indicators

1) Ability to maximise the economic surplus indicator:

The first indicator illustrates the economic improvements realised in production, from the first valid solution find (corresponding to the TTFS solution) and the finally chosen solution. This year we observe a few negative values in the indicator "Increment of economic surplus with respect to the first OK solution (%)", caused by the improvement of the quality of the solution in terms of tolerances used, from first solution found which had "Technical" quality to the accepted solution that had "Ok" quality, behavior that has been observed mainly in the following weeks after the 15' MTU go-live. The second indicator shows foregone economic surplus improvements, identifying the incremental welfare which would have derived from prolonging calculation time by 10 minutes after the maximum allowed time (17 minutes until 15' MTU go-live and 30 minutes after that date). These latter results were obtained re-running the sessions on a simulation environment. For individual sessions the economic surplus gain after increasing allowed calculation time by 10 minutes can be negative, i.e. a decrease. This is evidenced by the reported minimum values -0.00138% , as well as the plot with differences, which has a tail with some negative values. Such effects may stem from differences between the production and simulation machine, lack of reproducibility or different paths followed when exploring the branch & bound tree.

2) Repeatability indicator:

A session is repeatable if Euphemia returns, for each iteration, the same value for all the relevant variables in both runs when comparing solutions with the same solution id. Potential differences are calculated using the same inputs, configuration of hardware and software and at the end comparing the last common solutions in both runs. Comparison is made on the latest common solution over two consecutive runs of production input data in a production like machine. The machine used for the study fulfils the minimum requirements set for machines used in production. Comparisons are done considering 6 decimal places precision (1e-6 tolerance).

One indicator measures what is the proportion of the values equal with respect the total number of indicators, the other indicator measures the average impact on the relevant results when differences exist. Since Euphemia 10.4, there exist the possibility of activating a parameter named "deterministic time" that allows to use an internal clock that can be used to assure that the decisions are taken in the same time sequence in two consecutive runs on the same input data on the same machine. For 2025 repeatability study, it was run using E12.0fix3 and time limit as stopping criterion. The same input data has been run with and without the "deterministic time" parameter activated, but only the case without the parameter activated has been plotted because when using "deterministic time" activated the results were able to obtain the same relevant results in all cases.

[5] Ability to maximise the welfare indicator

The indicator on foregone welfare due to limiting calculation shows that for some sessions the economic surplus decreases with the time extensions. This effect reflects, among others, the non full repeatability of the SDAC Algorithm when the parameter "deterministic time" is not activated, the usage of newer machines in production that outperform the testing production-like machine used in the ex-post calculations and the differences that might exist in the algorithm versions used for the extended time calculation (the newest version of the algorithm used in the historical data is used for the extended time calculation). For IDAs, a new approach is followed: instead of comparing the increment of economic surplus when using additional 10' calculation time, the final gap and the final gap expressed as percentage of the value of the economic surplus of the final solution in (%) are reported. These indicators add transparency providing a value about the theoretical maximum that the accepted solution could be improved. Note that the gap is a hypothetical value that measures the distance to the best potential economic surplus of all the unexplored nodes. It can happen that the optimal solution could have already been found but, as not all nodes have been explored yet, it is not possible to assert it, and that final gap that measures the distance to the most promising welfare of the unexplored nodes can be provided. Note also that there may exist negative values of final gap, which are the result of the limited precision used for the calculations. Nevertheless, these negative values are expected to be small. For SDAC, the final gap and the final gap expressed as percentage of the value of the economic surplus of the final solution in (%) are also reported since the data in which MIC/MP and load gradient orders were discontinued (on delivery date 19/03/2025).

[6] Individual impact of products

1) Usage of default and special configurations.

All the scenarios, except for the one in which piecewise curves are converted in stepwise curves, are calculated using default configuration (the one used in production). For the scenario in which piecewise curves are converted in stepwise curves, different internal parameters have been used, as suggested by the algorithm provider (these are different from the default configuration). This approach is the same that was followed for previous years.

[8] SIDC

Technical operation of SIDC is fully regulated by the Master Service Agreement (MSA) between NEMOs and the XBID system vendor. MSA's contractual arrangements stipulate that the vendor is the sole party having access to the XBID technical components as e.g. XBID databases. Hence, the data which are included in this report are mainly based on the technical regular reports provided by the vendor to SIDC parties. This also implies that all requests on the extension of the reporting obligation (including the existing reporting obligations which are not implemented yet), and which require extension of XBID source data provided by the vendor, are subject of the change management process and release management process stipulated with the vendor. It shall be also noted that the MSA sets out principles of confidentiality which, among others, apply to the provisions of the Service Level Agreement regulating e.g. availability and performance of the XBID system. Based on the confidentiality principles, the details may be, and are, shared with SIDC stakeholders (NRAs, ACER, EC) but cannot be revealed to the general public and therefore they are not integrated within this report. Note that NRAs have full access to the MSA.

[9] SIDC Performance indicators & Performance monitoring

The evaluation of the performance indicators is carried out in SIDC on a monthly basis in line with the processes stipulated in the MSA. As a basis for the evaluation of the performance the Service Level Agreement (SLA) applies. The SLA represents contractually agreed parameters and in combination with agreed system boundaries it defines the performance of SIDC guaranteed by the vendor. The technical thresholds of SIDC are not defined (known) though it is assumed that they are well above the SLAs (which is also proven by the scalability report). Every month the vendor provides an evaluation of the performance indicators, based on the production data, in the form of a performance report. SIDC parties review the performance report and provide the vendor with anticipated changes of the processed data, such as e.g. changes/growth in the number of implicit and explicit orders. The vendor analyses the provided data and in case the analysis indicates a risk or need of the optimisation measures the vendor provides a proposal for the SIDC Solution improvements which are jointly discussed.

[10] Order Transaction

means Order entry (including activation of new iceberg slice), Order modification (including Order activation and deactivation) and Order deletion (excluding Order deletions due to contract expiration); partial matches as well as full Order executions are not to be considered as Order Transaction.

Disclaimer

The data source of this report has been provided by SDAC and SIDC respectively.

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