Coreso and TSCNET monitoring report Central Europe SOR

Regulation (EU) 2019/943 Art. 46

YEAR 2024

TSCNET Services coreso

July 2025

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List of abbreviations

2D	Two-Days-ahead
ACER	Agency for the Cooperation of Energy Regulators
BD	Business Day
CCC	Coordinated Capacity Calculation
CCCt	Core Capacity Calculation tool
CCM	Capacity Calculation Methodology
CCR	Capacity Calculation Region
CCROSA	Coordinated Cross-Regional Operational Security Assessment
CEP	Clean Energy Package
CGM	Common Grid Model
CGMES	Common Grid Model Exchange Standard
CM	Capacity Market
CorNet	A co-operation programme between Coreso and TSCNET
CROSA	Coordinated Regional Operational Security Assessment
CRM	Capacity Remuneration Mechanism
CSA	Coordinated Security Analysis
CSAm	Coordinated Security Analysis methodology
DA	Day-ahead
DACC	Day-ahead Capacity Calculation
DACF	Day-ahead Congestion Forecast
DC	Direct Current
DFP	Default Flow-Based Parameters
ECG	Electricity Coordination Group
EMF	European Merging Function

ENS	Energy Not Supplied
ENTSO-E	European Network of Transmission System Operators for Electricity
ERAA	European Resource Adequacy Assessment
FB	Flow-Based
ICS	Incident Classification Scale
ID	Intraday
IDCC	Intraday Capacity Calculation
IGM	Individual Grid Model
IN	Italy North
IOP	Interoperability
IVA	Individual Validation Adjustment
KPI	Key Performance Indicator
LTA	Long Term Allocated
LTCC	Long Term Capacity Calculation
LOLE	Loss of Load Expectation
MA	Month-ahead
MEC	Maximum Entry Capacity
MTU	Market Time Unit
NC ER	Network Code Emergency Restoration (Commission Regulation (EU) 2017/2196)
NRA	National Regulatory Authority
NRAA	National Resource Adequacy Assessment
NRAO	Non-costly Remedial Action Optimiser
NTC	Net Transfer Capacity
OCR	Outage Coordination Region
OPC	Outage Planning Coordination
OPDE	Operational Planning Data Environment
OPI	Outage Planning Incompatibilities

PSE	Polskie Sieci Elektroenergetyczne S.A. (Polish TSO)
PTDF	Power Transfer Distribution Factor
RA	Remedial Action
RAA	Regional Adequacy Assessment
RAM	Remaining Available Margins
RAO	Remedial Action Optimiser
RCC	Regional Coordination Centre
RCOP	Regional Coordination Operational Procedure
RIAR	Regional Incident and Analysis Reporting
ROSC	Regional Operational Security Coordination
ROSCm	Regional Operational Security Coordination methodology
RSC	Regional Security Coordinator
RTE	Réseau de Transport d'Électricité (French TSO)
SDAC	Single Day-ahead Coupling
STA	Short-Term Adequacy
SOR	System Operation Region
SWE	South-West Europe
TS	Time Stamp
TSO	Transmission System Operator
TTC	Total Transmissible Capacity
TY	Target Year
TYNDP	Ten-Year Network Development Plan
UAT	User Acceptance Test
UCTE DEF	Union for Co-ordination of Transmission of Electricity Data Exchange Format
WA	Week-ahead
WG RP	Working Group Risk Preparedness
YA	Year-ahead

1.

Introduction

Coreso and TSCNET have a long operational history in supporting the regional coordination of operational planning for their shareholders, the electricity Transmission System Operators (TSOs) in Europe. Collaboration between TSCNET and Coreso started over a decade ago as a voluntary cooperation of the TSOs. With the progress of the regulatory framework, Coreso and TSCNET were established formally as Regional Security Coordinators (RSCs). RSCs performed services for the TSOs, such as operational planning security analysis, outage planning coordination, coordinated capacity calculation, short-term and very short-term adequacy forecasts, and a common grid model with hourly updates.

In 2022, based on the Clean Energy Package (CEP), the RSCs evolved into **Regional Coordination Centres (RCCs)**. The RCCs shall **complement the role of TSOs** by performing the tasks of regional relevance assigned to them. The TSOs remain responsible for managing electricity flows and ensuring a secure, reliable, and efficient electricity system.

Coreso and TSCNET, the RCCs established in the Central Europe System Operation Region (Central Europe SOR), became regulated entities that will progressively have to meet the additional requirements set out in the European Regulation on the Internal Electricity Market (Regulation (EU) 2019/943). The geographical scope of the Central Europe SOR is visible in Figure 1.

According to Article 46 of the Regulation (EU) 2019/943, the RCCs monitor their own operational performance, coordinated actions issued, effectiveness and efficiency, and submit an annual report based on the outcome of this monitoring. This report, targeting the year 2024, is the third annual report prepared by Coreso and TSCNET.

The target audiences according to the legislation of this report are:

- European Network of Transmission System Operators for Electricity (ENTSO-E),
- European Union Agency for the Cooperation of Energy Regulators (ACER),
- National Regulatory Authorities of the Central Europe SOR (Central Europe SOR NRAs),
- Electricity Coordination Group (ECG),
- Other stakeholders as defined by Regulation (EU) 2019/943.

This report is also publicly available on the websites of Coreso and TSCNET. No confidential information is included.

Figure 1: Overview of the Central Europe SOR[1]

[1] *EirGrid and SONI participate in the Central Europe SOR, however, their obligations pertaining to the RCCs' tasks shall become effective only upon the start of operation of the Celtic Interconnector.*

2.

Regulatory Context

Article 46

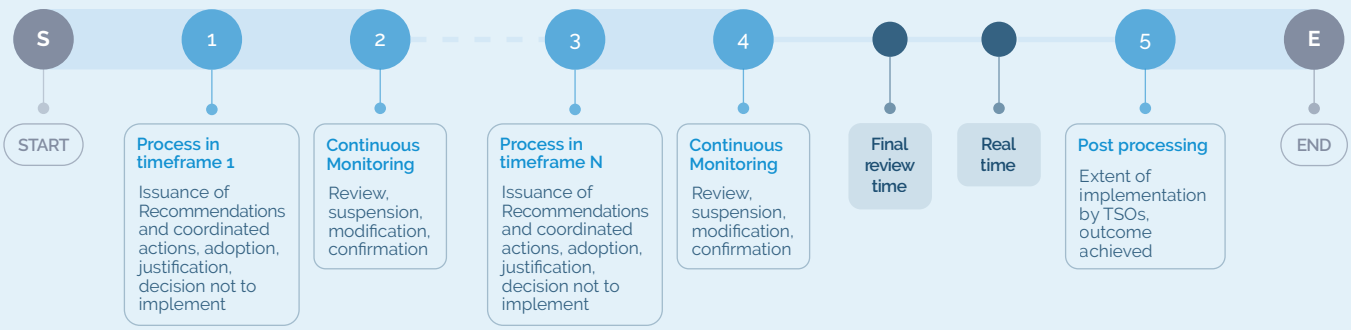
1. *Regional coordination centres shall establish a process for the continuous monitoring of at least:*
   - *(a) their operational performance;*
   - *(b) the coordinated actions and recommendations issued, the extent to which the coordinated actions and recommendations have been implemented by the Transmission System Operators and the outcome achieved;*
   - *(c) the effectiveness and efficiency of each of the tasks for which they are responsible and, where applicable, the rotation of those tasks.*
2. *Regional coordination centres shall account for their costs in a transparent manner and report them to ACER and to the regulatory authorities in the system operation region.*
3. *Regional coordination Centres shall submit an annual report on the outcome of the monitoring provided for in paragraph 1 and provide information on their performance to ENTSO-E, ACER, the regulatory authorities in the system operation region and the Electricity Coordination Group. .*
4. *Regional Coordination Centres shall report any shortcomings that they identify in the monitoring process under paragraph 1 to ENTSO-E, the regulatory authorities in the system operation region, ACER and the other competent authorities of Member States responsible for the prevention and management of crisis situations. Based on that report, the relevant regulatory authorities of the system operation region may propose measures to address the shortcomings to the regional coordination centres.*
5. *Without prejudice to the need to protect security and the confidentiality of commercially sensitive information, regional coordination centres shall make public the reports referred to in paragraphs 3 and 4.*

The present report offers information about the performance of our tasks in line with Regulation (EU) 2019/943 Article 46.1, 3, 4 and 5.

The provisions of Article 46.1.b are based on the business process presented on Figure 2, showing the concepts used in this report.

The provisions of Article 46.2 are not considered in the present report. Coreso and TSCNET have individually submitted their cost report, which is the annual statutory report, to ACER and the NRAs of Central Europe SOR in 2025 in accordance with Belgian and German national regulations.

Figure 2: A high-level business process of the concepts used in this report. The terms used have the meanings defined in Articles 42 and 46 of Regulation (EU) 2019/943



3.

Content of the report

Coreso and TSCNET jointly serve the Central Europe SOR by performing coordination tasks either on a rotational basis or by task repartition. The Regulation (EU) 2019/943 Article 37 describes 16 tasks to be performed by the RCCs. Six tasks originate from Network Codes and Guidelines as RSC responsibilities and are continued in Coreso RCC and TSCNET RCC as part of the transition.

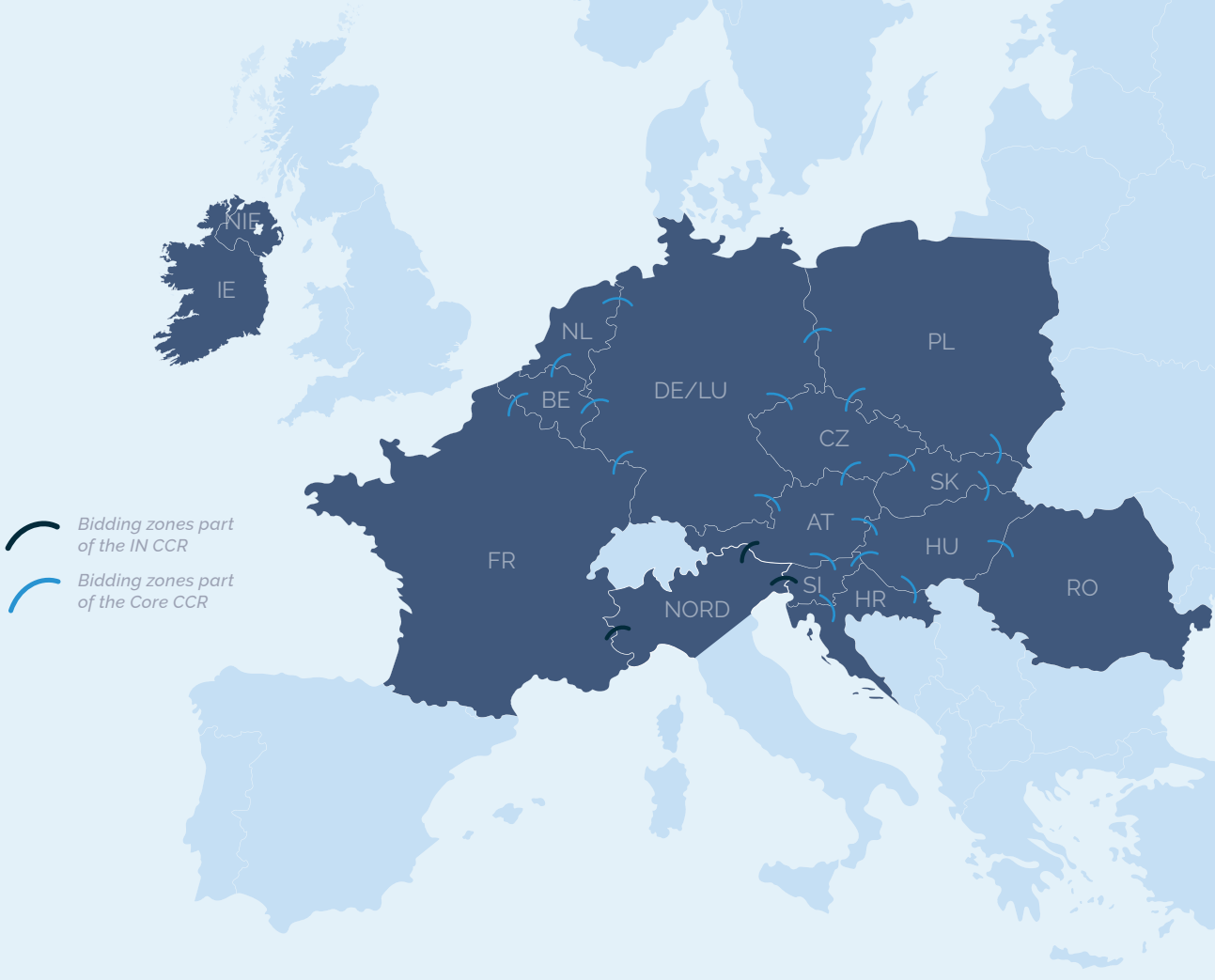


Figure 3: Bidding zones[2] that are part of the Central Europe SOR are indicated in dark blue and the additional bidding zones in light blue make up the Pan-EU region[3]

[2] Central SOR RCCs calculate capacities for the Capacity Calculation Regions (CCRs) of Core and Italy North (IN). The CCRs consist of bidding zones' borders.

[3] EirGrid and SONI participate in the Central Europe SOR, however, their obligations pertaining to the RCCs' tasks shall become effective only upon the start of operation of the Celtic Interconnector.

RCCs report on the monitoring of the operational performance and this report covers RCC tasks for the reporting year 2024.

The different tasks are implemented to varying degrees and are still being developed.

ART. 37.1	SERVICE/TASK	BP STATUS / EXPECTED GO-LIVE DATE	RCC PERFORMING THE TASK
a	CCC DA CORE	In operation and under further development	TSCNET and Coreso
	CCC DA IN	In operation and under further development	Coreso
	CCC ID CORE	In operation and under further development / Go-live: 28.05.2024	TSCNET and Coreso
	CCC ID IN	In operation and under further development	TSCNET and Coreso
	CCC LT CORE	Under development / Go-live: Q4 2026	TSCNET and Coreso
	CCC LT IN	In operation	TSCNET and Coreso
b	CSA CORE[4]	Under development / Go-live CROSA DA: Q4 2028 Go-live CROSA ID: Q2 2029	TSCNET and Coreso
	CSA IN[4]	Under development / Go-live CROSA DA: Q4 2028 Go-live CROSA ID: Q2 2029	TSCNET and Coreso
c	CGM	In operation and under further development	TSCNET, Coreso, SCC, Baltic RCC and SEleNe CC in rotation
d	Defence and restoration plans	In operation / Exercise every 5 years - task performed in 2024-2025 Next exercise in 2029-2030	TSCNET, Coreso, Nordic RCC, SCC, Baltic RCC and SEleNe CC
Not inc.	STA Pan-Eu	In operation and under further development	Coreso, Baltic RCC, Nordic RCC, SEleNe CC and SCC in rotation
e	STA Regional	In operation and under further development	TSCNET and Coreso[5]
Not inc.	OPC Pan-Eu	In operation and under further development	TSCNET, Baltic RCC, Nordic RCC, SEleNe CC and SCC in rotation
f	OPC Regional	In operation[6] and under further development	TSCNET and Coreso[7]
g	Training and certification of staff	In operation and under further development /Go-live process: 18.05.2024 Go-live certification: Q2 2026	TSCNET, Coreso, Nordic RCC, SCC, Baltic RCC and SEleNe CC
h	Regional restoration	Not yet started / Go-live: Awaiting methodology approval	TBD
i	Post-operation and post-disturbances analysis and reporting	In operation	TSCNET, Coreso, Nordic RCC, SCC, Baltic RCC and SEleNe CC
j	Sizing	Under development / Go-live: Q3 2026	TSCNET and Coreso
k	Procurement	Under development / Go-live: Q3 2025	TSCNET and Coreso
l	Settlements	Cost sharing calculation: Under development / Go-live: latest 1 year after CROSA go-live	TSCNET and Coreso
m	Crisis scenario	In operation / Exercise every 4 years – task performed in 2024-2025 Next exercise in 2028-2029	TSCNET, Coreso, Nordic RCC, SCC, Baltic RCC and SEleNe CC
n	Seasonal adequacy assessments	Not requested by the TSOs / Go-live: -	N/A
o	MEC	In operation	TSCNET and Coreso
p	Support TYNDP	Not yet started / Go-live: Awaiting methodology approval	TBD

Table 1: Status overview of the RCC tasks in Central Europe SOR

[4] Legacy Security Assessment is currently in operation at Coreso and TSCNET for their shareholders. The expected go-live dates are referring to the future ROSC.

[5] Regional STA task is split between Coreso and TSCNET. TSCNET performs the task for TSCNET shareholders, while Coreso performs the task for Coreso shareholders.

[6] This refers to the legacy process. Regional Coordination Operational Procedure for OPC task is currently being developed.

[7] Regional OPC task is split between Coreso and TSCNET. TSCNET performs the task for TSCNET shareholders, while Coreso performs the task for Coreso shareholders.

STATUS	DEFINITION
In operation	The task is developed and implemented in line with the legal basis. There are no further functionalities to be added. The status includes recurrent tasks and tasks on demand.
In operation and under further development	The task is developed and implanted in a step wise implementation. Therefore, further developments are still ongoing.
Under development	The methodology is approved, and the development and implementation of the tasks are ongoing.
Not yet started	The methodology or proposal is under drafting or has been submitted, but not yet approved by the NRAs or ACER.
Not requested by the TSOs	The RCCs are not required to provide the business process either because ENTSO-E/ TSOs did not delegate the task, or the task is not involved in the rotational basis of a specific business process.

Table 2: Different statuses in task implementation process with descriptions

As not all tasks are implemented, monitoring is only possible for those tasks that are already live, either fully or partially. This operational report therefore analyses the following tasks that were in operation in 2024:

- Coordinated Capacity Calculation (CCC)
- Common Grid Model (CGM)
- Defence and restoration plans
- Short-Term Adequacy (STA)
- Outage Planning Coordination (OPC)
- Training and certification of staff
- Post-operation and post-disturbance analysis and reporting (commonly known as Regional Incident Analysis and Reporting - RIAR)
- Crisis scenarios
- Maximum Entry Capacity (MEC).

Each task is first described followed by the outcome of the monitoring and identified shortcomings. The outcome of the monitoring follows the obligations in Article 46.1 on (a) operational performance, (b) issuance and implementation of coordinated actions/recommendations, and (c) effectiveness and efficiency. The identified shortcomings follow the obligations in Article 46.4.

4.

CCC – Core CCR

The Day-ahead and Intraday Capacity Calculation (DACC and IDCC) processes within Core CCR areas are overseen by Coreso and TSCNET on a rotational basis. Day-ahead Capacity Calculation is live since 8 June 2022. The CCC task within the Day-ahead time-frame is provided in the Core region as described in the latest version of the methodology approved by Core NRAs on 1 July 2024. For the Intraday time-frame, the CCC task is provided in the Core region as described in the latest version of the methodology approved by Core NRAs on 14 March 2024.

The DACC and the IDCC processes are under continuous monitoring by Coreso and TSCNET operators, who track and report incidents in real time. Additionally, computation files are stored in the Core Capacity Calculation tool (CCCt) database, allowing to perform post-operational analysis and compute historical KPIs.

Both for the Day-ahead (DA) and Intraday (ID) time-frames, the method used to calculate cross-zonal capacities is the flow-based (FB) approach. This approach determines the available energy capacity that can be exchanged between Core bidding zones based on power transfer distribution factors (PTDF) and the remaining available margins (RAMs) of critical network elements. PTDF values indicate how changes in the net position (imports or exports) of each bidding zone affects the power flow on critical network elements.

To meet the requirements outlined in the CEP, specifically the «70% requirement», capacities shall be increased when necessary. These increased capacities ensure that a minimum percentage of maximum cross-zonal capacities is available for trading assuming that remedial actions are available for mitigating eventual security violations. This percentage varies among TSOs, and it is aligned with derogations or action plans targeting for the implementation of the 70% rule from CEP. Subsequently, the market coupling algorithm seeks to optimize energy exchanges within the Single Day-ahead Coupling (SDAC) process.

4.1 Operational Performance

The Operational performance KPI for DACC and IDCC processes within Core CCR focuses on successful computation of the final cross-border capacities and delivering the results to participating TSOs within the agreed delivery deadlines. To display the operational performance of the process, the total number of timestamps successfully delivered (even if fallback procedures are applied), are divided by the total number of possible timestamps for the reporting period.

The two tables below show the operational KPI value of the process as defined above, for the reporting period (year 2024), for DACC and IDCC, respectively.

OPERATIONAL PERFORMANCE KPI	DACC
Successful execution (total number of successfully computed and delivered final cross-border capacities)	100%

Table 3: Core CCR DACC Operational performance KPI for cross-border capacities execution

This KPI shows that for the 95,83% of the total number of timestamps (TSs) in 2024 after IDCC go-live the cross-border capacities have been sent to Cross-Border Intraday platform in IDCC(b) process. Due to technical issues in communication or file deliveries which are used in the process, capacities couldn't be provided for the rest of the TSs. These technical issues have been tracked and most of them have already been resolved.

OPERATIONAL PERFORMANCE KPI	IDCC(a)	IDCC(b)
Successful execution (total number of successfully computed and delivered final cross-border capacities)	100%	95,83%

Table 4: Core CCR IDCC Operational performance KPI for cross-border capacities execution

Operational Performance KPI

Figure 4: Evolution of Core CCC Operational performance KPI for DA and ID time-frames[8]

4.2 Coordinated actions and recommendations

There were no coordinated actions or recommendations issued in the Core region.

Coreso and TSCNET will report on coordinated actions and recommendations once the confirmation procedure as per Article 13 para. 2 "RCC Establishment Provisions" is implemented. The implementation of the coordinated validation will be done according to an implementation plan which is described in the amendment of the Capacity Calculation Methodology (CCM) DA for Core.

4.3 Effectiveness and efficiency

In contrast to Operational Performance KPI, which evaluates the overall number of timestamps where capacity results were delivered, the following KPIs focus on the quality of the delivered results. In this way, not only the availability of results is studied, but also the effectiveness and efficiency of the process to deliver results according to the defined methodology.

Firstly, the Effectiveness KPI analyses if any fallback procedure was applied in the calculation process in order to deliver the capacity results. Two fallback procedures are considered: Spanning and Default Flow-Based Parameters (DFP).

On the other hand, the Efficiency KPI analyses the amount of business days (BDs) for which the capacity results were delivered before the target end time.

4.3.1 Effectiveness

This section contains an overview of results related to the KPI monitoring of the capacity calculation process in Core CCR. The tables below show the operational KPI values from 1 January until 31 December 2024 for DACC and from go-live dates until 31 December 2024 for IDCC processes, which is 28 May 2024. Tables below are displaying the percentage of timestamps for which the CCCt successfully performed the computation of the final cross-border capacities and delivered the computed capacities per border to all the participating TSOs within the agreed delivery deadlines without any fallback procedure divided by the total number of possible timestamps for the reporting period (hereinafter referred to as "Total Computation Rate").

[8] *The Operational Performance KPI, as currently defined, has been monitored for DACC since 2023; therefore, 2022 is not included in the comparison. The IDCC(a) and IDCC(b) processes began in 2024, so 2023 data is not applicable for these.*

4.3.1.1 DACC Effectiveness KPI

The total computation rate indicates successful computation of CCCt without any fallback procedure per year based on each timestamp.

EFFECTIVENESS KPI	DACC
Total computation rate (total number of timestamps where the final cross-border capacities were delivered without any fallback procedures applied, neither DFP nor spanning)	99,63%

Table 5: Core CCR DACC Effectiveness KPI

In the Core capacity calculation process, fallback scenarios are applied when the process is not able to deliver capacity values for the market in time. Applying fallbacks is part of the agreed business process.

The 2 types of fallback procedures in the Core DACC process, as described in the Article 22 of the DA CCM for Core:

- **Spanning**: the spanning calculation for the failed timestamp(s) is based on the intersection of previous and subsequent available flow-based domains. Spanning can only be applied for a maximum of 2 consecutive hours, and not for the last hour of the day.
- **Default Flow-Based Parameters (DFP)**: the capacity values for the missing timestamp(s) are replaced with a default value for which the basis is the Long Term Allocated (LTA) capacity.

The general KPI above considers both fallback procedures combined, but in the table below the individual values for DFP and Spanning can be seen:

FALLBACK PROCEDURE	YEARLY INCIDENTS (TS)
Spanning	7
DFP	25

Table 6: Fallback values on yearly basis for DACC

A detailed description of the TS with fallback applied can be found in the Core DA CC Annual Report – Annex 2, and in JAO website under the Monthly Report section (link).

4.3.1.2 IDCC Effectiveness KPI

The total computation rate indicates successful computation of CCCt without any fallback procedure per year based on each timestamp.

EFFECTIVENESS KPI	IDCC(a)	IDCC(b)
Total computation rate (total number of timestamps where the final cross-border capacities were delivered without any fallback procedures applied)	100%	93,05%

Table 7: Core CCR IDCC Effectiveness KPI

In the Core capacity calculation process, fallback scenario is applied when the process is not able to deliver capacity values for the market in time. Applying fallbacks is part of the agreed business process. According to the Article 19 of the ID CCM, When the Intraday capacity calculation for specific ID CC MTUs does not lead to the final flow-based parameters, the Core TSOs and the CCC shall define the missing parameters by calculating the default flow-based parameters. The calculation of default flow-based parameters shall be based on previously calculated flow-based parameters for the same delivery market time unit.

The general KPI above considers all fallback domains for fallback procedure combined, but in the table below the individual values can be seen:

FALLBACK DOMAIN	YEARLY INCIDENTS (TS) FOR IDCC(a)	YEARLY INCIDENTS (TS) FOR IDCC(b)
ID domain fallback	0	48
DA domain fallback	0	97
Zero capacity fallback	0	0

Table 8: Fallback values on yearly basis for IDCC

A detailed description of the TS with fallback applied can be found in the JAO website under the Monthly Report section (link).

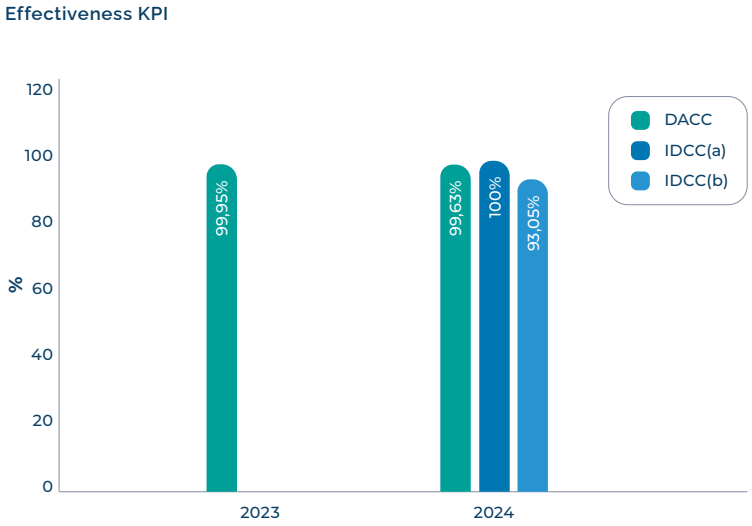


Figure 5: Evolution of Core CCC Effectiveness KPI for DA and ID time-frames[9]

4.3.2 Efficiency

For the CC processes within Core CCR, the efficiency KPI focuses on the efficiency of the process by analysing the amount of business days (BDs) for which the capacity results were delivered before the target end time.

In Core CC processes, there are two different end-time definitions for each step of the process:

- **Target end time**: Time limit to finish the process step and deliver the required documents, in a well-functioning situation. Any capacity calculation participant can deliver files at any time within the target end time with no further consideration.
- **Critical end time**: Additional time to mitigate unexpected situations that can be handled quickly. The process does not wait until critical end time, if it is not needed, and proceeds to the following step as soon as the blocking issue is solved. In this time window, the CCCt logic may unexpectedly close the gate for input files upload or update, if the process can already proceed to the following step without those files.

After Critical end time, the process continues regardless of the missing input files, applying fallback solutions if needed.

This KPI considers the timings defined for the pre-coupling capacity calculation process as defined in the CCCt. These timings may differ from the market parties' internal process timings.

EFFICIENCY KPI	DACC	IDCC(a)	IDCC(b)
Percentage of BD for which the Capacity results were delivered before target end time	95,05%	98,50%	90,18%

Table 9: Core CCR Efficiency KPI

For the 95,05% of BDs for DACC, the 98,50% of the BDs for IDCC(a) and 90,18% of BDs for IDCC(b), capacity results were delivered before target end time. Delays occurring in earlier stages of the relevant CC processes, or in any step of the preceding processes, have led to the capacity results being delivered later than target end time for the failed BDs according to this KPI.

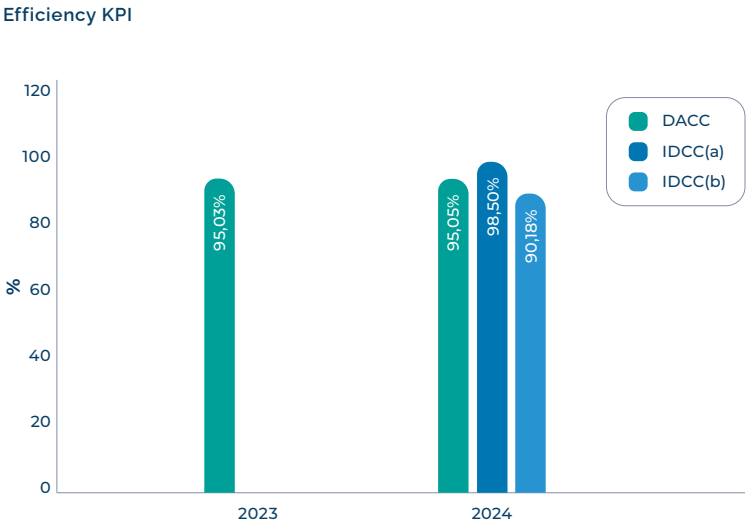


Figure 6: Evolution of Core CCC Efficiency KPI for DA and ID time-frames[10]

4.4 Shortcomings

There were no shortcomings identified for the reported period.

[9] The Effectiveness KPI, as currently defined, has been monitored for DACC since 2023; therefore, 2022 is excluded from the comparison. The IDCC(a) and IDCC(b) processes began in 2024, so 2023 KPI values are not applicable for these.

[10] The Efficiency KPI, as currently defined, has been monitored for DACC since 2023; therefore, 2022 is excluded from the comparison. The IDCC(a) and IDCC(b) processes began in 2024, so 2023 KPI values are not applicable for these.

5.

CCC – Italy North CCR

The Coordinated Capacity Calculation (CCC) process for Italy North (IN) CCR is jointly performed by Coreso and TSCNET. The process for IN CCR also includes the Swiss TSO, Swissgrid. The process to determine the cross-border capacities for both the DA and ID time-frames is based on the coordinated Net Transfer Capacity (NTC) methodology, while the Long Term Capacity Calculation (LTCC) time-frame capacities is computed following a statistical approach, based on historical cross-zonal capacity for Day-ahead or Intraday time-frames calculated in a coordinated manner within the CCR. The LTCC consists of the Month-ahead (MA) and the Year-ahead (YA) process.

According to the DA and ID methodologies approved by IN NRAs, import and export scenarios of NTC allocation for each border within the CCR are to be computed as the outcome of the CCC process. For the IDCC process, the full import scenario was upgraded in accordance with the IN CCM to consider capacities in the export direction with the go-live of the Export Corner computation on 29 November 2023. The Export Corner computation for the DACC process went live on 19 June 2024. To be compliant with the "70% requirement" described in the Clean Energy Package, capacities can be increased in the limit of redispatch potential to ensure that a minimum capacity of 70% of the max cross-zonal capacity is made available for trading.

Article 37.1(a) of Regulation (EU) 2019/943 was amended in 2024, requiring coordinated capacity calculation to be performed for all allocation time-frames. As a result, the responsibilities of the RCCs have been extended to include long-term time-frames. Consequently, LTCC is included for the first time in the Central SOR Report.

The reporting period for the LTCC time-frame covered in the 2024 Central SOR Report spans from 17 July 2024 to 3 December 2024.

5.1 Operational Performance

The operational performance KPI is defined as the total number of timestamps RCCs successfully computed the final cross-border capacities and delivered them to the participating TSOs within the agreed delivery deadlines, divided by the total number of possible timestamps for the reporting period (even if fallback procedure had to be applied).

Both Coreso and TSCNET are responsible for the IDCC process from the total transmissible capacity (TTC) calculation to the NTC calculation and delivery. The IDCC process consists of calculation for 4 timestamps (TS) at each business day but calculation of NTCs is performed for 12TS due to an interpolation process, resulting in a total amount of 4392TS for the entire 2024 reporting period. The performance KPI for IDCC represents the percentage of TS where RCCs were able to deliver the NTC calculation results, within expected fallbacks.

The DACC operational performance of Coreso is assessed on 2 different process steps this year. Coreso was responsible for the TTC calculation phase during the period from 1 January to 18 June, and during this period, Coreso fulfilled the task of delivering results for the appropriate fallbacks in 1269TS out of the 1360TS possible (8TS per day).

As of 19 June Coreso continues the TTC calculation and has taken over responsibility of the NTC calculation phase. The critical phase representing RCC operational performance has become, as for the IDCC, the delivery of NTCs including fallbacks. This indicator was fulfilled 100% of the 4704TS.

The DACC performance KPI indicated in the table below is therefore a composite of these 2 periods of process performance (5973TS out of 6064TS).

Both Coreso and TSCNET are responsible in a Main/Backup RCC rotational basis for the operation of the tool used for the LTCC computation process. The responsibility rotation for the MA process is done monthly, with TSCNET responsible for the even months, while Coreso is responsible for the odd months. The YA process responsibility rotates on a yearly basis, with TSCNET acting as the main RCC for the 2024 YA computation covering the calendar year 2025.

The table below demonstrates that for the IDCC process, both RCCs were able to successfully deliver NTC or to apply fallbacks in 99,73% of timestamps, which implies that for 0,27% of the timestamps, backup NTC values were used by the TSOs, due to failure of the tool to deliver capacities to the TSOs. Such failure occurs when a mandatory input file for the process is missing, or due to an IT-related issue that impacts either the RCC or one of the TSOs – this corresponds to 1 business day impacted for the whole of 2024. For the Italy North IDCC process, RCCs in collaboration with the TSOs have implemented an automated fallback input file replacement strategy for some TSO's input files, in order to ensure the successful computation of capacity if any of the TSO's input

files are missing or are not delivered before the defined delivery deadline.

For DACC process, Coreso achieved 98,50% KPI result, which implies that for 1,50% of timestamps the additional fallback procedures according to methodology had to be applied by Terna. This was only observed during the first half of the year, before Terna handed over the responsibility of final NTC calculation.

PERFORMANCE KPI	DACC	IDCC	LTCC_MA	LTCC_YA
Total number of successfully delivered TS (including TS where fallback procedures had to be applied)	98,50%	99,73%	100%	100%

Table 10: Italy North CCR Operational Performance KPI for DA, ID and LT time-frames

Operational Performance KPI

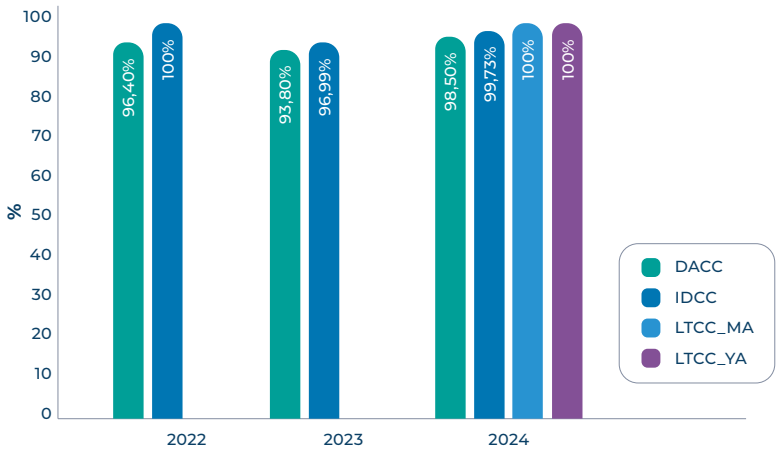


Figure 7: Evolution of the of the IN CCC Performance KPI

5.2 Coordinated actions and recommendations

A Coordinated Action for CC has been defined as a measure for reducing cross-zonal capacities that may be issued by RCCs to TSOs when minimum capacity requirements cannot be secured.

Not providing minimum capacity requirements in case of insufficient available RAs is currently required by the methodologies and hence implemented in the operational processes. Therefore, it is correct to state that the final objective of Coordinated Actions is already fulfilled in the IN CCR. However, there are currently no explicit Coordinated Actions issued by RCCs as the existing operational process

and methodology do not require this. Potentially, this missing feature of coordinated actions will be implemented once IN CCR is merged with the Core CCR, and the Coordinated validation process will be applied by all TSOs of the IN CCR.

Additionally, no recommendations were issued for the reported period.

5.3 Effectiveness and efficiency

The Effectiveness KPI is defined as the ratio of the total number of timestamps for which the RCCs' CCC tools successfully performed the computation of the final cross-border capacities and delivered the computed capacities per border to all the participating TSOs within the agreed delivery deadlines, to the total number of possible timestamps for the reporting period (without applying of any fallback procedure).

For the effectiveness KPI calculation, we use the timestamps when no fallback or backup procedures had to be applied as the CCC tools performed the computation effectively. The fallbacks include cases where the TTC calculation could not be performed or delivered because of missing/invalid TSO inputs or failure of RCC tools.

The Efficiency KPI is defined as the ratio of the total number of timestamps for which the TSOs used the computed TTC by the RCC without reduction to the total number of computed timestamps in the reporting period. The capacity reduction process could be triggered by any of the TSOs during the local validation step of the process; either as a bilateral reduction at a given border or as a global capacity reduction for the entire CCR. The local validation step occurs after the adjustment for minimum margins and the Low TTC threshold application and so the TTCs without reduction are also including TTCs fixed by those 2 process steps. For the LTCC process, the local validation step is performed on a bilateral basis between each of the relevant TSOs and Terna. A bilateral reduction with corresponding reason for reduction is indicated and agreed between the two TSOs in a coordinated approach for each of the borders.

Same responsibility of the process time-frame for both RCCs from section 5.1 applies for the effectiveness and efficiency KPIs below which show the effectiveness and efficiency KPIs respectively for both the ID and DA time-frames.

The DACC robustness is represented by 86,40% in effectiveness, meaning that in 13,60% of the cases Coreso was not able to provide any computed results. For the DACC process, 1,60% of the fallback procedures triggered were due to missing or invalid inputs from the TSOs, and 7,3% were due to IT issues on RCC's tools side. The remaining corresponds to TS where No Secure TTC could be computed, which is dependent on grid situations.

The combined effectiveness rate of 86,28% for 2024 in the IDCC between TSCNET and Coreso implies that for the 13,72% of TS, fallback or backup procedures were necessary to ensure that coordinated capacities were delivered successfully to the TSOs. For the reporting period, 7.47% of the fallback/backup procedures triggered within the IDCC process were due to missing or invalid inputs from the TSOs and 6.25% of the fallback procedures triggered were either due to IT issues on RCC's or TSO's tools and cases where no secure TTC was found due to grid constraints.

For the Day-ahead computation, we observe that in 43,0% of TSs, the validation phase was used by TSOs to reduce the TTC calculated. The initial computed capacity was used in 25,4% of cases, while the Low TTC (minimum applied when comparing TTC planned and TTC calculated) was applied in 14,9% of cases. In 2,0% of cases, the final TTC was determined by adjusting to reach 70% of the minimum margin for cross-zonal trading.

The combined efficiency rate of 60,37% for 2024 in the IDCC, between TSCNET and Coreso, implies that for 39.63% of the reported period, at least one of the TSOs requested for a capacity reduction of the initially computed capacity for the region, either bilaterally between a relevant border or for the entire region, due to a relevant security issue on their local grid from the initial computed value.

By comparing effectiveness results from previous years, we observe a significant improvement in the IDCC process - from approximately 50% in 2022 to over 86% in 2024. Regarding the efficiency KPI, data from 2022 to 2024 shows that the initial capacities computed by the RCC tools were either increased by the TSOs during the validation step or directly delivered to the market as final capacity..

EFFECTIVENESS KPI	DACC	IDCC	LTCC_MA	LTCC_YA
Total number of successfully delivered TS (excluding TS where fallback procedures had to be applied)	86,40%	86,28%	75,50%	84,70%

Table 11: Italy North CCR Effectiveness KPI for DA, ID and LT time-frames

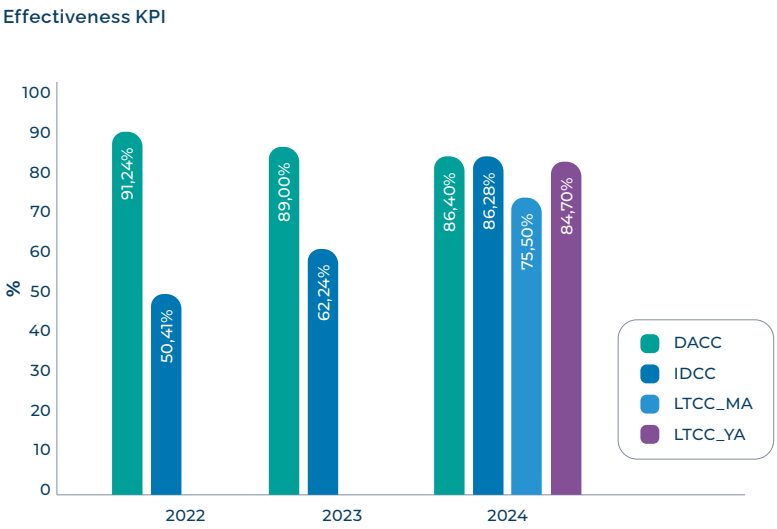


Figure 8: Evolution of the IN CCC Effectiveness KPI

EFFICIENCY KPI	DACC	IDCC	LTCC_MA	LTCC_YA
Share of TS when no reduction by the TSOs was needed	57,00%	60,37%	75,50%	84,70%

Table 12: Italy North CCR Efficiency KPI for DA, ID and LT time-frames

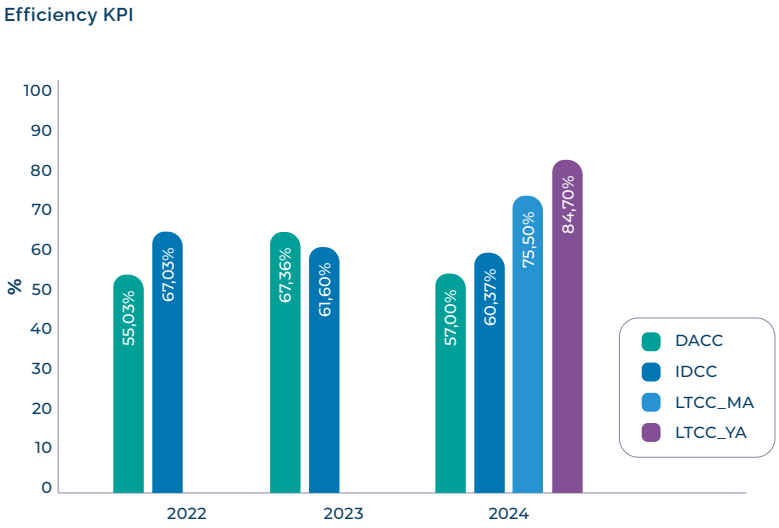


Figure 9: Evolution of IN CCC Efficiency KPI

5.4 Shortcomings

The efficiency of Coreso's DACC calculation may be improved following several diagnosis. The important validation occurrences on the DACC process is expected to be reduced by the usage of NPF as the hypothesis for IN D2CF that replaced the reference day approach in September 2024. Accurate optimized CGMs should lead to less discrepancies with TSOs internal processes. However, the implementation of the CGM scaled to NPF has led to a new source of failure. As all the TSOs' IGMs are not adapted to that target, important adjustment of net positions are necessary and higher frequency of load-flow divergence was observed. Coreso delivers capacity calculation results lower than the LTTC minimum in 14,90% of the cases and it was identified that it is in part related to a specific grid situation that does not benefit from the remedial actions applied after security analysis. Through collaboration with TSOs, inputs can be improved to increase the optimized capacity calculated by Coreso. In parallel, LTTC values are undergoing review from the region and could find themselves to be lower than the current result.

6.

CSA

The CSA task is performed to ensure grid security, meaning that operational security limits shall be respected during normal operation conditions, including the consideration of ordinary and exceptional contingencies defined for the operational planning. The CSA task is based on the CGM input associated with additional specific inputs, such as list available Remedial Actions (RAs). RCC operators with the support of RCC tools then run an optimisation, followed by the coordination of RAs with the TSO operators. The task according to SO GL is not yet live, but currently legacy security assessment is in place.

6.1 Legacy security assessment

Preceding the legal obligation of SO GL, TSOs have organised themselves, on a voluntary basis, to develop common security analyses, frequently including the creation of regional merged grid models in UCTE-DEF. However, these voluntary initiatives were not implemented based on a shared methodology; hence, they are not comparable with each other.

For the Central SOR area, TSCNET and Coreso are the RCCs performing security assessments. For the TSC TSOs area, coordinated by TSCNET, it has been running since 2011, and Coreso since 2009. Both coordinations involve Day-ahead and Intraday time-frame. The processes include the creation of CGM in UCTE-DEF and ensuring operation within the security limits by coordination of RAs.

6.2 Regional Operational Security Coordination

The regional CSA task is composed of coordinated regional and cross-regional operational security assessment (CROSA and CCROSA, respectively), in accordance with Article 76 of SO GL and with the CSAm, which is developed in accordance with Article 75 of SO GL. RCCs shall perform CROSA and CCROSA on the CGM to ensure an operational planning within the security limits on cross border relevant network elements (as defined in Article 2.8 of CSAm), requiring coordination between TSOs and RCCs.

For each detected violation, RCCs are expected to recommend the most effective and economically efficient RAs. All TSOs affected by a recommended RA shall be included in the coordination process so they can evaluate the impact of the recommended RA on their grid before agreeing to activate it. If the RAs agreed within one CCR significantly impact the flows in other CCRs, a cross-regional coordination process between these CCRs shall be initiated (as defined in Article 27 of the amendment of CSAm) are addressed. The legal framework behind the CROSA and CCROSA tasks has been defined in two methodologies, CSAm and ROSCm. CSAm defines the high-level principles and the main steps of the CSA process. At the regional level, each CCR has developed a ROSCm, further detailing the regional specificities while respecting the CSAm. The expected go-live dates of the CSA processes at the CCRs are regularly reported to ACER and NRAs.

As the CSA task was not operational in 2024 according to the SO GL requirements, monitoring and reporting according to Art. 46 of Regulation (EU) 2019/943 are not yet available.

6.3 Core CCR and Italy North CCR

Coreso and TSCNET (together in a rotational schedule) have been appointed to perform the CROSA processes for two CCRs – Core CCR and Italy North CCR. The timeline for implementing the regional CSA processes in each CCR is defined at the regional level. Cross-regional coordination must then be implemented no later than 18 months after the last concerned CCR applies the target solution of the ROSCm, in line with Article 76 of the SO GL.

In the Core CCR, a stepwise implementation of the CROSA task is foreseen. The first implementation step of the Core ROSCm includes the implementation of Day-ahead CROSA. This covers a RAO for at least the optimisation of re-dispatching resources and phase-shifting transformers, as well as the implementation of cost sharing for Day-ahead CROSA in line with the Cost Sharing Methodology. The first implementation step may include some further simplification of the ROSCm.

In the Italy North CCR, the target version as defined in Italy North ROSCm will be implemented directly, skipping the intermediate 1st implementation step.

Core CCR and Italy North CCR, Coreso and TSCNET initiated the cooperative CorNet Programme to ensure efficient and effective tool development and prepare future operations.

7.

CGM

Merging the individual grid models (IGMs) of the TSOs is a well-established process to create the common grid model (CGM) of the interconnected grid of Europe. For everyday operational procedures, it was first introduced two decades ago, when the Day-ahead Congestion Forecast (DACF) procedure was introduced by the TSOs of the Continental Europe synchronous area. This process was focused on exchanging IGMs in the UCTE-DEF and merging them into regional grid models in UCTE-DEF, to take the influence of the neighbouring networks into account. This format still serves as the basis for the legacy operational security assessment processes, provided by Coreso and TSCNET to their shareholder TSOs. These processes support regional coordination until the legally mandated tasks according to the CEP, Network Codes and Guidelines go-live.

The UCTE-DEF, however, does not provide enough flexibility to efficiently model the wide range of assets used in the European Grid. To fulfil the needs to model complex equipment and support the wide range of operational planning tasks, the TSOs and RCCs are preparing for the migration to the more advanced grid model format called Common Grid Model Exchange Standard (CGMES) in the operational process. Once fully implemented with the expected quality level, the resulted pan-European merged grid model called CGM will serve as the main and uniform data input for performing further grid analysis trough the processes in STA, OPC, CSA and CCC tasks.

The first step of the migration was the go-live of the CGM building process in CGMES format at the end of 2021. The CGM is created based on the relevant input data (IGMs, PEVF/CGMA, BDS) obtained via Common Grid Model and Operational Planning Data Environment (OPDE), a process that started in January 2022. CGMs are created for different time-frames (Two-Days-ahead, Day-ahead and Intraday were fully covered in 2024, while Year-ahead time-frame was only covered partially) based on an agreed rotational principle of the involved European RCCs and RSC (Baltic RCC, Coreso, SCC, SEleNe CC and TSCNET).

Before the go-live of the CGM task, ENTSO-E and the RCCs agreed on setting up a RCC rotational principle to perform the task. According to this principle, the CGM creation task is organised in groups (based on time-frames, e.g. Group 1 takes care of the DA and 2D time-frames while Group 2 takes care of the ID time-frame) and roles (Main and Backup role). At a time, one RCC takes one role of one group and performs the CGM creation accordingly. The rotation takes place every four weeks, when each RCC takes the next rotational step, according to the agreed schedule. The Main and Backup roles mean, that for the same time-frame, there are always two RCCs in parallel creating CGMs to guarantee that at least one CGM shall always be available. The agreed rotational calendar and handover process ensure that the process remains efficient, and no extra efforts are wasted.

ENTSO-E and the RCCs are working closely together to provide an overview about the progress of CGM creation task. The main platform of such information exchange is the System Operation Coordination Group. The group consists of representatives from ACER, NRAs, ENTSO-E and European Commission. In quarterly meetings, the representative of the CGM OPDE TT presents the actual progress with the implementation of the CGM creation tasks. These reports sessions are prepared in close collaboration with the RCCs.

In the rest of the CGM chapter, any reference to the CGM building process or CGM used in any process shall refer to the CGM created based on the CGMES format.

Until September 2024, Coreso and TSCNET - like all other RCCs involved in the pan-European CGM building process - relied on manual interventions to increase the probability of successful CGM creation and publication. This approach often resulted in partial or low-quality CGMs but was intended to prevent the process from being blocked by input data containing known issues (e.g. critical warnings according to Modelling group QoCDC classification, incorrect network modelling, causing QoCDC error on CGM level etc.). Following alignment with other RCCs and TSOs, Coreso and TSCNET revised this approach as of 23 September 2024. The main purpose was to demonstrate the CGM building process's readiness for subsequent tasks (such as CSA) by strictly respecting the execution steps as defined in the referential documents. This also enabled a more efficient use of resources by focusing efforts on data quality investigations rather than relying on unsustainable manual adjustments from an operational standpoint.

Since the quality of the CGMs is not yet at the expected level, and combined with non-readiness of regional processes, the CGM created during the reporting period was not used in regional operational processes. However, regional merged models in CGMES format were already used to perform e.g. the capacity calculation for the SWE CCR.

On 1 December 2024 the common EMF tool of Coreso and TSCNET (CorNet EMF tool) went live. Since then, a single common tool is operated by the two RCCs to perform the CGM building process according to the pan-EU rotational principle. The operational and back-office activities are performed in close co-operation of Coreso and TSCNET experts, ensuring efficient allocation of the available resources.

The CorNet EMF tool is the first module of the common RCC Service Platform to perform the RCC tasks for the Central SOR and SWE SOR TSOs, and further CGMES based tasks will be implemented in the upcoming years.

7.1 Operational Performance

During the reported period, the RCCs built CGMs in the following time-frames, based on the number of published CGMs during the data collection phase of this report, accounting as successful also CGMs published after gate closure time, with the implementation of manual data quality intervention:

- Year-ahead (only performed on one selected scenario, as explained in the following paragraph)
- 2D (1 run of CGM building process to provide 24 models for each day[11]),
- DA (1 run of CGM building process to provide 24 models for each day[12]),
- ID (24 Intraday runs of CGM building processes per day[13]; each of which covers the remaining hours from the next target time to the end of the relevant calendar day resulting in 300 models for each day)

Year-ahead (YA) is further away from operational as compared with other time-frames and is still under test phase. In 2024 for the Year-ahead time-horizon, neither Coreso nor TSCNET was in rotation to create the YA CGM for the calendar year 2025.

Operational Performance indicator compares the successful publication only for TSCNET and Coreso, based on the number of expected CGMs during the data collection period of this report. Accounting as successful also partial CGMs published and CGMs published after gate closure time, with the implementation of manual data quality intervention, (i.e. successful validation of the CGM based on the Quality Assurance Portal) to the expected number of CGMs.

DEFINITION	TIME-HORIZON				
	YA	2D	DA	ID	RCC
% of published CGMs/due CGMs (as main or backup RCC)	N/A	62,25%	77,33%	78,11%	TSCNET
	N/A	53,96%	56,04%	86,24%	Coreso

Table 13: CGM building process Operational performance KPI

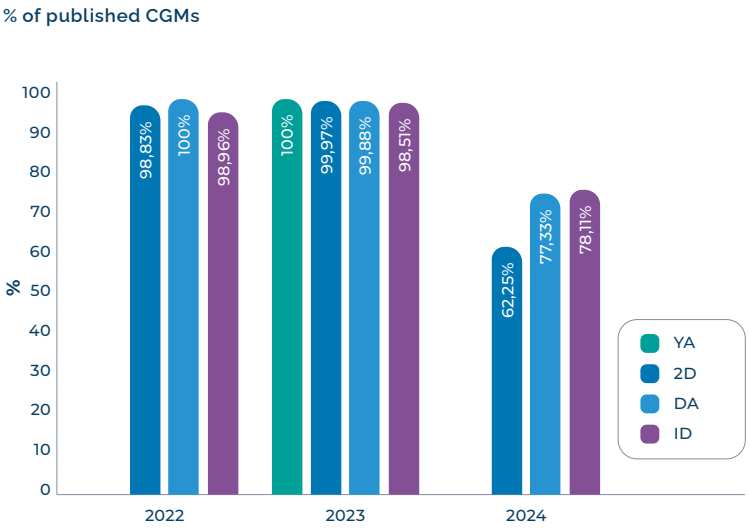


Figure 10: CGM Operational performance KPI evolution – TSCNET[14]

Figure 11: CGM Operational performance KPI evolution – Coreso[15]

[11] Or 23/25 timestamps due to Daylight saving time.

[12] Or 23/25 timestamps due to Daylight saving time.

[13] 23/25 timestamps due to Daylight saving time.

[14] The YA process is performed only in specific years, in accordance with the rotational calendar.

[15] The YA process is performed only in specific years, in accordance with the rotational calendar.

The operational performance KPI for the 2024 reporting period has been significantly reduced due to the stop of manual data quality interventions in all time-frames and also the respect of the process gate closure time, starting in September 2024.

Not all RCCs stopped using manual data quality interventions in 2024, therefore the performance of the RCCs is not comparable. To address this, a new Task Team under the RCC Working Table has been established to phase out such workarounds across all RCCs by the end of June 2025, after which similar performance levels are expected.

The high share of published CGMs observed during the precedent reporting periods shows that the RCCs are capable to perform the process. However, those high shares were not showing the readiness of the entire process to produce CGM that can be used in subsequent operational processes, because of the manual data quality interventions applied.

The performance observed during 2024 reporting period reflects the stop of manual workaround and also the respect of agreed process gate closure time considered for the calculation of the indicator. And the direct consequence is the drop of the performance compared to the previous reporting periods and for all the time-frames.

Lower share of Coreso on the reporting period compared to TSCNET is caused by multiple reasons affecting the process mainly before both common RCCs EMF tool went live. The recurrent ones being IT issues (either on RCC side, or on ENTSO-E central component side) and, overall, no manual data quality intervention after Gate Closure Time for CGM submission.

In 2024 for the Year-ahead time-horizon, neither Coreso nor TSCNET were in rotation to create the Year-ahead CGM for the calendar year 2025.

7.2 Coordinated actions and recommendations

The RCCs do not formally issue recommendations for the CGM task yet. However, each time it is necessary, RCCs advice TSOs on the improvement of IGMs data quality. The known issues hindering the CGM task were tracked in the issue tracker document of the Modelling Group which evolved from a voluntary collaboration lead by Coreso and TSCNET to an ENTSO-E Working Group in September 2024.

7.3 Effectiveness and efficiency

Since the CGM task went live in December 2021, the community of TSOs and RCCs were consistently improving their ability to execute this task more effectively and efficiently. Currently, the key topics are the number of IGMs included in the CGM, the timely delivery of the CGMs, and the metrics used to monitor process performance.

Effectiveness of the CGM process in the current report is defined for Coreso and TSCNET based on the data collected by ENTSO-E and metrics available to all TSOs and RCCs, to keep the reports consistent in the community, until an aligned metric is defined by the RCCs. This metric is illustrated by IGMs inclusion status (M09) defined as follows:

- the percentage of total published IGMs needed by the pan-European CGM process, that were included in the corresponding CGMs (metric M09 from ENTSO-E CGM Building dashboard).

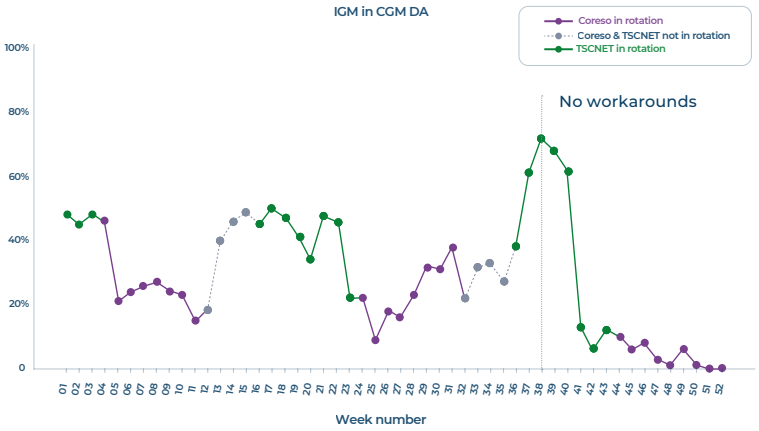


Figure 12: Percentage of IGMs included in CGM for DA time-frame

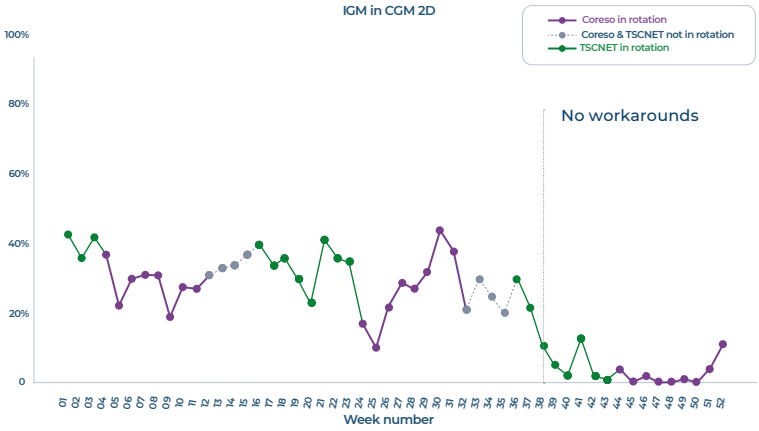


Figure 13: Percentage of IGMs included in CGM for 2D time-frame

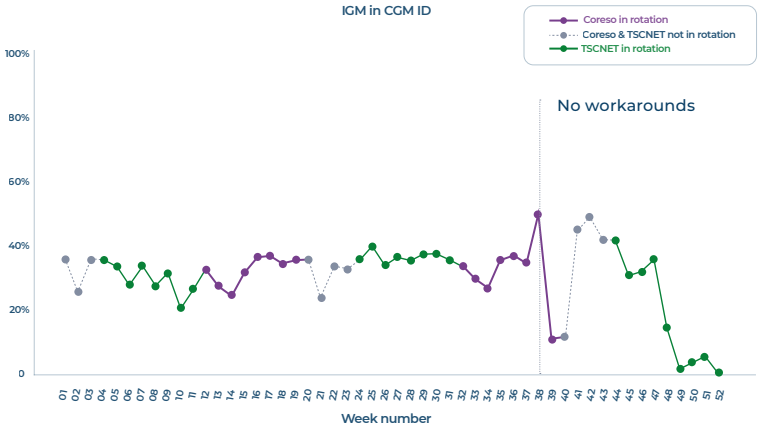


Figure 14: Percentage of IGMs included in CGM for ID time-frame

DEFINITION	TIME-HORIZON			
	2D	DA	ID	RCC
M09	23.47%	40.02%	27.32%	TSCNET
	19.13%	16.25%	31.43%	Coreso

Table 14: CGM Effectiveness KPI

M09

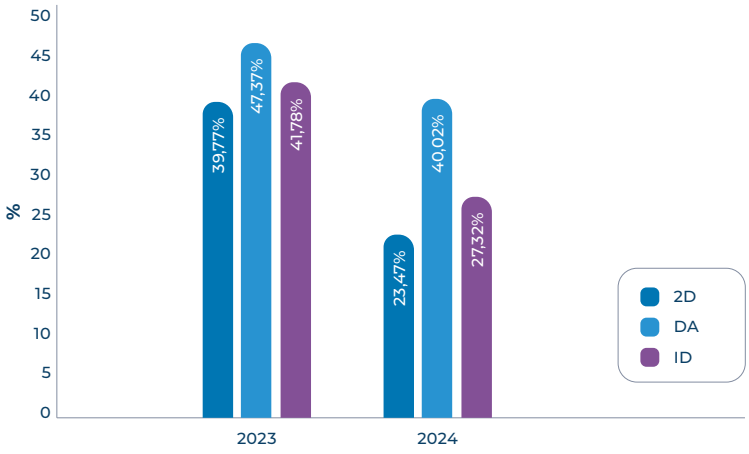


Figure 15: CGM Effectiveness KPI evolution - TSCNET[16]

M09

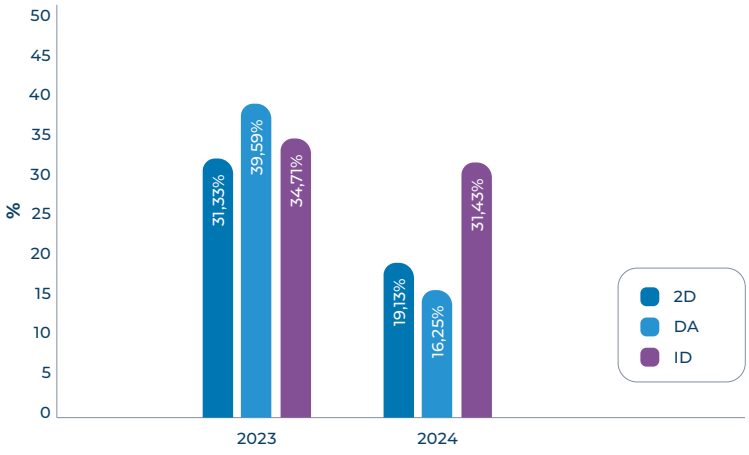


Figure 16: CGM Effectiveness KPI evolution - Coreso[17]

[16] The CGM Effectiveness KPI was not reported for 2022, as the monitoring process had not yet been established at Coreso and TSCNET. The KPI has been redefined and is reported starting from 2023.

[17] The CGM Effectiveness KPI was not reported for 2022, as the monitoring process had not yet been established at Coreso and TSCNET. The KPI has been redefined and is reported starting from 2023.

The effectiveness KPI has been reduced significantly due to the stop of manual data quality interventions in all time-frames, starting in September 2024.

The process of monitoring the efficiency of the merging process is planned to be implemented with the following metrics:

- Ratio of the time it should take to create and submit the CGM and to the time it took to create and submit the CGM (excluding the validation, considering all CGMs)
- Ratio of the time it should take to deliver the CGM and the time it took to deliver the CGM (excluding the validation, considering the published CGM only).

7.4 Shortcomings

The accurate modelling of the very complex transmission network with all its equipment is a challenging task for all involved parties. All involved RCCs and TSOs are working together to reach high-quality CGMs. It has been observed that successfully validated IGMs cannot always be included in the merged grid models. There is no single explanation or cause, and each of the issues need to be investigated separately. These issues were investigated on the following main platforms:

1. Internal investigation of the erroneous timestamps by Coreso and TSCNET to identify the potential root causes (e.g. EMF tool or data quality).
2. Recording of the identified issues in a common issue list, with the purpose to track the progress and the status of the resolution.
3. Weekly alignment with the other RCCs to exchange knowledge about the issues identified to adapt the investigations methods, with e.g. introducing regular, detailed study of CGMs created.
4. Weekly alignment with the TSOs, RCCs and ENTSO-E in the Modelling Group (initiated by Coreso and TSCNET, transferred to ENTSO-E in 2024) to provide a common platform to clarify the modelling issues identified, and agree on the most efficient resolution.
5. Regular Interoperability Tests (IOPs) organised by ENTSO-E. As an outcome of these tests, the TSOs and RCCs receive a detailed, objective report about the data quality issues identified in the IGMs and CGMs.

Resolving the identified issues often need changes in the respective tools of the TSOs and the RCCs, which take longer time to go through the implementation, testing and deployment procedure.

The performance of the CGM building process is regularly reported to the representatives of the EC, ACER and the NRAs in the System Operation Coordination Group.

On 24 April 2024, ENTSO-E's System Operation Committee approved the CGM Action Plan addressing various measures to improve the business process for the CGM creation, including the data quality.

8.

Defence and restoration plans

The consistency assessment of system defence and restoration plans task is carried out by all RCCs including TSCNET and Coreso. This assessment included the results of the monitoring task assigned to ENTSO-E in Article 52 of the Commission Regulation (EU) 2017/2196 of 24 November 2017 establishing a network code on electricity emergency and restoration (NC ER).

The reports drafted for this task particularly covers the consistency assessment of system defence plans and restoration plans carried out by TSOs in accordance with Article 6 of the NC ER. This consistency assessment must be performed at least every 5 years in line with the TSO timeline to review the defence plans and restoration plans as agreed with ACER.

Article 6.1 of the NC ER specifies that when designing its system defence plan pursuant to Article 11 and its restoration plan pursuant to Article 23, or when reviewing its system defence plan pursuant to Article 50 and its restoration plan pursuant to Article 51, each TSO shall ensure the consistency with the corresponding measures in the plans of TSOs within its synchronous area and in the plans of neighbouring TSOs belonging to another synchronous area of at least the following measures:

1. inter-TSO assistance and coordination in emergency state, pursuant to Article 14;
2. frequency management procedures, pursuant to Article 18 and Article 28, excluding the establishment of target frequency in case of bottom-up re-energisation strategy before any resynchronisation to the interconnected transmission system;
3. assistance for active power procedure, pursuant to Article 21;
4. top-down re-energisation strategy, pursuant to Article 27.

In agreement with the Article 6.3 of the NC ER, each TSO transfers the above-mentioned regional coordination measures to their relevant RCCs, set up pursuant to Article 77 of SO GL. TSCNET and Coreso have produced a technical report individually on the consistency of the measures based on the criteria set out in Article 6.2 of the NC ER in close collaboration with the TSOs in the second half of 2024.

8.1 Operational Performance

The report and analysis were delivered within the agreed time-frame to the agreed standard. Ultimately, one border was identified as inconsistent within the Central SOR. The affiliated TSOs were informed; coordination took place, and mitigating actions were then agreed with the TSOs.

8.2 Coordinated actions and recommendations

RCCs do not issue recommendations for this task.

8.3 Effectiveness and efficiency

The effectiveness of this task is assessed based on the following criteria:

- Submission of Regional Reports: TSCNET and Coreso have successfully submitted their regional assessment reports to their respective TSOs and to ENTSO-E in accordance with the agreed timeline, by the end of October 2024.
- SOC Approval of the Final Report, Including RCC Chapters: ENTSO-E has compiled the final report addressing the consistency checks for system defence and restoration. This report integrates the individual submissions from all participating RCCs and has been submitted for review and approval by the SOC. Notably, the submitted report received approval on 12 February 2025.

Efficiency is measured by the number of communications between TSOs and RCCs, and between RCCs:

- The RCCs had a total of seven meetings between February and October 2024 to ensure close alignment on analysis boundaries, analysis standards, timelines, sharing of data and synchronisation of reports.
- Coreso held total of seven and TSCNET total of five meetings, respectively, with their shareholder TSOs from February to October 2024. These meetings ensured close alignment on data provision, analysis standards, timelines, and to set expectations for the next steps.
- A key metric to measure efficiency was to measure the number of data submissions required for each border to complete the consistency analysis. An efficient process would require very few data submissions, and an inefficient process would require multiple data resubmissions from the TSOs before analysis could be completed.
- The below table displays the number of data submissions required to complete analysis on all borders ranging from 2 (the minimum – one data submission from each TSO) to 9, and the percentage of borders which completed analysis within this number of data submissions.

Number of Data Submissions Required to Achieve Consistency	2	3	4	5	6	7	8	9
% of Borders (Coreso)	4%	26%	26%	17%	13%	9%	0%	4%
% of Borders (TSCNET)	39%	29%	17%	5%	5%	2%	2%	2%

Table 15: Number of data submissions required to achieve consistency on all borders

8.4 Shortcomings

The reports drafted for this task specifically cover the consistency assessment of system defence and restoration plans conducted by TSOs in accordance with Article 6 of the NC ER. While this assessment aligns with the TSOs' five-year review cycle, as agreed with ACER, Article 6 of the NC ER only specifies timelines for the 2019 consistency assessment cycle. The regulation does not explicitly mandate a recurring five-year assessment, leaving the room for interpretation.

9. STA

To ensure a good balance between supply and demand, the role of the STA service consists, in the DA to WA time-frame of both pan-European and regional adequacy assessments.

The goal of the pan-European adequacy assessment is to detect situations where a lack of electricity adequacy is expected in any of the control areas or at regional level (pan-European view), considering the cross-border exchange limits. The pan-European assessment is performed using two different approaches, namely the deterministic and probabilistic approach. The deterministic approach performs the assessment based on the best forecast from TSOs, whereas the probabilistic approach considers variations in generation, load and transmission asset availabilities. The pan-European assessment is performed by a central tool managed by ENTSO-E based on a rotational principle among RCCs. Each cycle has a duration of 2 weeks, and for each cycle one main and one back-up RCC is allocated. This ensures that in case of a technical failure at the main RCC's side (e.g. IT issue, power cut) the back-up RCC can take over to complete the process successfully.

Regional adequacy assessment is conducted in the relevant adequacy region which is defined by a matrix showing the TSOs to be included in the assessment depending on the control area/region having the adequacy issue. This assessment is triggered either by the results of STA Cross-Regional assessment or upon TSO request (for instance, in case of regional scarcity issue or insufficient cross-zonal capacities). To resolve the adequacy identified and mitigate the risk of it, the RCC of the affected shareholder TSO/region will then propose remedial actions to the associated TSOs and coordinate them with other RCCs depending on the geographic region identified for the assessment.

9.1 Operational Performance

Operational performance is based upon the successfully completed executions of the STA calculations. Pan-European STA is triggered once a day regularly and in case of a request from a TSO, a second run is also performed. The KPI below reflects the overall performance of the process irrespective of which RCCs are in rotation as RCCs use the same tool to perform the assessment. For the monitored period at the pan-European level, 393 calculations were triggered and only 6 calculations failed. On the other hand, no regional adequacy assessment was triggered.

ART.46 SWE SOR			TIME-HORIZON	REGION
ID	PROCESS	DEFINITION	WA	
KPI-1	Pan-EU STA	% of process successes	98,47%	Pan-EU[18]

Table 16 : Pan-EU STA Operational Performance KPI

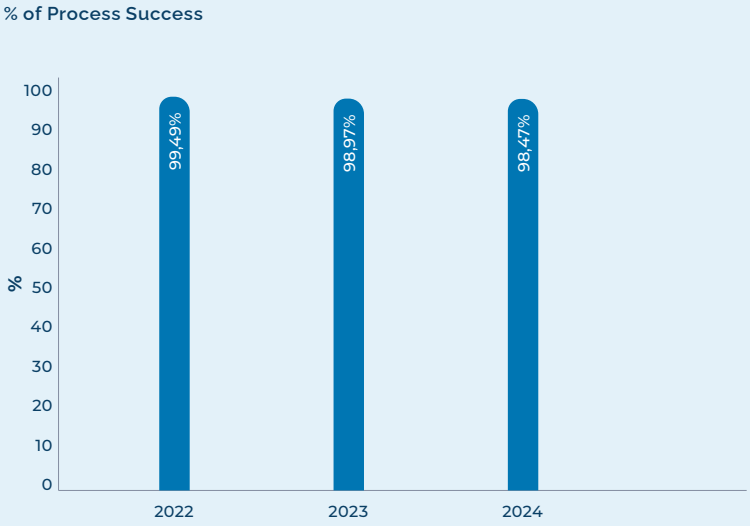


Figure 17: Evolution of STA Operational performance KPI (KPI-1)

[18] Coreso provides the pan-EU STA process for all concerned TSOs in the Central SOR region (both Coreso and TSCNET shareholder TSOs).

9.2 Coordinated actions and recommendations

Proposal of remedial actions (RAs) are only relevant to the regional adequacy assessments. For the monitored period, no regional adequacy assessment was triggered for the TSOs of the Central Europe SOR. Therefore, no recommendation was given to the TSOs.

9.3 Effectiveness and efficiency

An efficiency KPI is defined as the percentage of days without the need of additional STA calculation which is generally triggered in case of input data issues at the pan-European level. Similar to the operational performance KPI, the overall STA process is considered irrespective of RCCs in rotation. During 2024, an additional run was triggered 27 times. Reasons for second run are either data quality inconsistency (e.g. missing TSO input data or required update) or an application issue (e.g. calculation failure in the first run).

ART.46 CENTRAL SOR			TIME-HORIZON	REGION
ID	PROCESS	DEFINITION	WA	
KPI-2	Pan-EU STA	% of days without the need for additional run	92,62%	Pan-EU

Table 17 : Pan-EU STA Efficiency KPI (KPI-2)

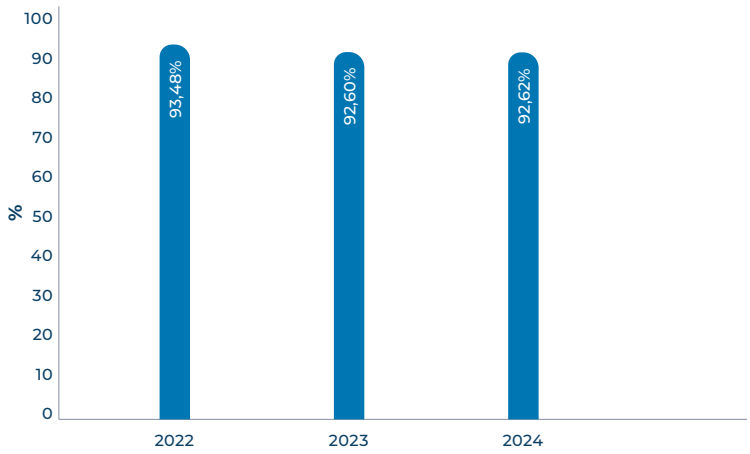


Figure 18: Evolution of STA Efficiency KPI (KPI-2)

On the other hand, an effectiveness KPI is defined by the capability of the process to provide a resolution to the adequacy issue identified at the regional level. Following information will be delivered in the future versions of the report per each Regional Adequacy Assessment (RAA) triggered:

NO	DATE OF ASSESSMENT	DATE OF EVENT	RCC LEADER	NO. OF CONCERNED TSOS	INADEQUACY DURATION	ENS [MWH]	PROPOSED MITIGATION ACTION	RESOLUTION STATUS
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 18 : KPIs for Regional STA Triggers (sample). No values are available as no regional process was initiated.

Date of Assessment: date when the pan-European STA is assessed

Date of Event: date and timestamp of the case for which Regional STA process is triggered

RCC leader: RCC responsible for leading the Regional STA process

No. of concerned TSOs: No. of TSOs participating in the Regional STA process, main affected TSO (for which ENS is detected) and their neighbours that can have an impact on the main affected TSO (determined based on Dynamic matrix)

Inadequacy duration: number of timestamps in the Week-ahead time frame for which the main affected TSO is in inadequacy situation (each timestamp corresponds to one hour)

ENS [MWh]: amount of 'Energy Not Supplied' in the timestamp assessed during the Regional STA process

Proposed mitigation action: list of RAs considered as a solution to the lack of adequacy (this can be one or multiple actions depending on the case assessed)

Resolution Status: status of the resolution of the adequacy issue identified.

9.4 Shortcomings

No shortcomings are reported as there was no regional process triggered.

10. OPC

The OPC task is performed at two levels: pan-European and regional. The pan-European process is performed by the RCCs on a rotational basis, using the centralized pan-European OPC tool managed by ENTSO-E. Each rotational cycle has a duration of 2 months to which one main and one back-up RCC are allocated. The 2-month alternation minimizes disruptions and promotes continuity in process execution considering the Week-ahead time-frame. For the Year-ahead time-frame, there is annual rotation among RCCs considering it is executed at the end of each year, with main and back-up roles respectively. The nomination of a main and back-up role ensures seamless coordination in case of a failure at the main RCC's side (E.g. Connectivity issues, power outage) the back-up RCC can take over to complete the process successfully.

The main purpose of this task is to harmonize the outage plans across Europe.

Due to historical reasons, two regional OPC processes were performed in 2024, one by Coreso and one by TSCNET, based on the technical requirements agreed with the respective shareholder TSOs. Currently, the regional OPC process is performed based on shareholder relationships, but it will be changed to Outage Coordination Region (OCR), which equals to CCR. During these processes, the RCCs propose solutions to solve OPIs towards the TSOs in the form of outage cancellations. These processes are not included in this report as they are not performed based on a commonly agreed Regional Coordination Operational Procedure (RCOP) between TSOs of the respective outage coordination region in accordance with Article 83.1 of SOGL.

10.1 Operational Performance

Operational performance is generally considered as the percentage of processes triggered (irrespective of deadline) compared to the processes expected to be triggered. The KPI below reflects the overall performance of the process irrespective of which RCCs are in rotation they use the same centralized tool. For the reported period in 2024, only 1 out of 208 pan-European OPC processes failed for WA time horizon due to an IT Tool issue. During YA process, all merges were successfully performed.

ART.46 CENTRAL SOR			TIME-HORIZON		REGION
ID	PROCESS	DEFINITION	WA	YA	
1	OPC	% of process successes	99,52%	100%	Pan-EU[19]

Table 19: OPC Operational Performance KPI

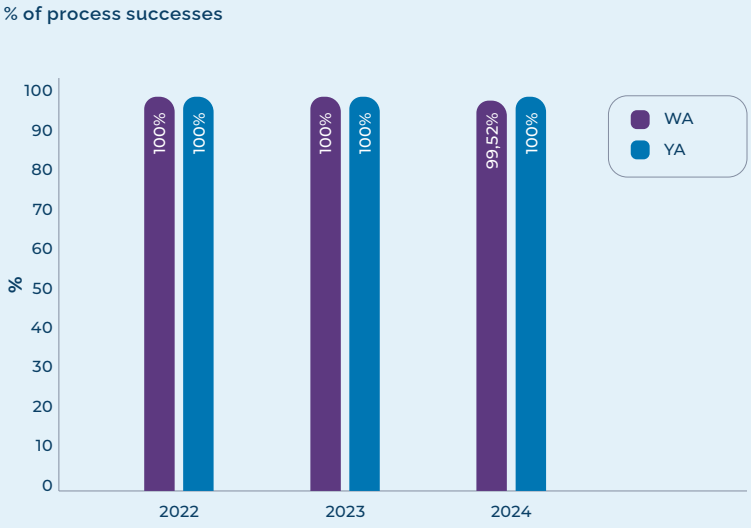


Figure 19: Evolution of OPC Operational performance KPI

[19] *TSCNET provides the pan-EU OPC process for all concerned TSOs in the Central SOR region (both Coreso and TSCNET shareholder TSOs).*

10.2 Coordinated actions and recommendations

The issued recommendations of the regional OPC process, including their status of adoption and implementation, are not included in this report. The necessary RCOP - its development and implementation - is under ongoing assessment in collaboration between the RCC and their delegated OCR.

10.3 Effectiveness and efficiency

We measure the effective performance of the process from the perspective of a timely delivery of the results for the TSOs, so these can be used as input for further processes. The late delivery could cause delays and fallback procedures, resulting in lower effectiveness of the operational planning. Like the operational performance KPI, the overall OPC process is considered irrespective of the RCCs which are in rotation.

To further support the effective performance of the processes, TSCNET and Coreso support the TSOs with tie-line outage inconsistency checking and feedback on the correct mapping of the outages between the OPC format and the grid model used for the regional OPC calculation.

In the reported period for pan-EU TSOs, 1 out of 208 merges was delayed during the Week-ahead OPC process due to tool issues. The delayed merges do not have a significant impact on the final regional coordination, because regional coordination calls are performed on weekly and yearly basis and manual backup procedures are available in case of failure of the automated processes.

The element types power generating modules and demand facilities are currently imported to the centralized pan-EU OPC tool from the Transparency Platform, but not actively coordinated on pan-EU level, since these elements are within the responsibility of DSOs, which are not part of the process.

ART.46 CENTRAL SOR			TIME-HORIZON		REGION
ID	PROCESS	DEFINITION	WA	YA	
2.A	OPC	% of result delivery within defined deadlines	99,52%	100%	Pan-EU
2.B	OPC	% of consistent tie-line outages	95,07%	94,85%	Pan-EU
2.C	OPC	% of correctly mapped assets between OPC & CGM	96,65%	95,26%	Pan-EU

Table 20: OPC Effectiveness and Efficiency KPIs

% of result delivery within defined deadlines

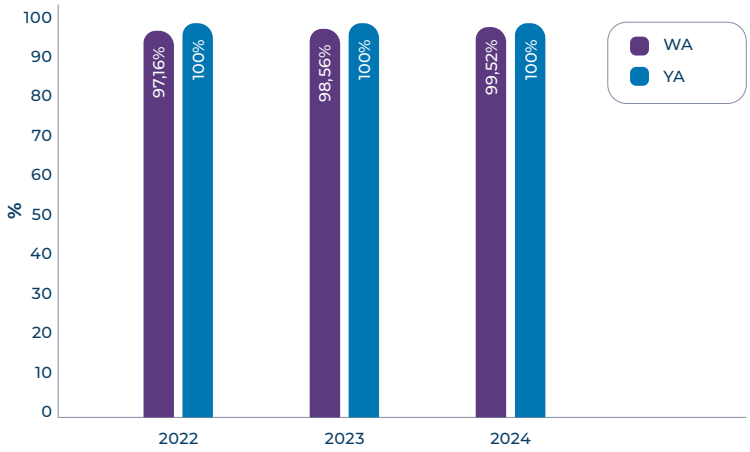


Figure 20: Evolution of OPC Effectiveness KPI (KPI 2.A)

% of consistent tie-line outages

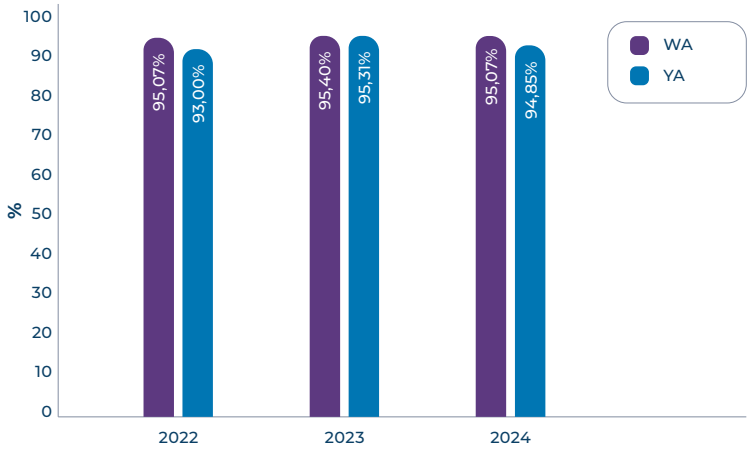


Figure 21: Evolution of OPC Efficiency KPI (KPI 2.B)

% of correctly mapped assets between OPC & CGM

Figure 22: Evolution of OPC Efficiency KPI (KPI 2.C)

10.4 Shortcomings

The development of the RCOP and the subsequent reporting of activities from RCCs towards the TSOs as part of the regional OPC process is currently under review and therefore considered a shortcoming. The development of the procedure under collaboration of the RCC and their delegated OCR is under ongoing assessment[20].

[20] The governance structure of the regional OPC process and the subsequent development of the RCOP is currently under discussion within the Central SOR Joint Management Board.

11.

Training and certification of staff

The task encompasses the establishment and carry out of training and certification programmes for their own staff operating other tasks in accordance with Article 37.1 and Annex I of Regulation (EU) 2019/943. The methodology prescribes 2 regulatory deadlines for this task – to establish the setup for training and certification by May 2024, and the legal requirement to train and certify the operators, which is due by May 2026.

11.1 Operational Performance

Two distinct metrics have been included, corresponding to different regulatory requirements in the methodology:

Article 13.2 – Compliance with Operational Tasks: This metric tracks the progress of issued certifications for tasks that were already operational before the go-live of the RCC Training and Certification Methodology in May 2024. Since RCCs must certify a sufficient number of RCC Operators for these tasks by May 2026, the success rate in this category may vary during the transition period as the certification process is progressively completed.

This metric is determined by assessing the proportion of completed certifications out of the total required to fully certify all RCC Operators for operational tasks.

Article 4.5 – Compliance with Task of New Implementation: This metric reflects the success rate of certifications for new tasks implemented after May 2024. Since a sufficient number of RCC Operators must obtain the necessary certifications before these tasks go live, the success rate shall always be 100%. In cases where RCC Operators do not initially pass the certification process, they receive the required support and additional training to support them on meeting the certification standards before assuming their responsibilities, ensuring full compliance with the methodology.

The total success rate of the certification process is calculated as the number of successful certifications (including first-time certifications and extensions) divided by the total number of certifications performed during the reported period.

By tracking these two metrics separately, we can provide a clear view of certification progress across both operational before May 2024 and newly implemented operational tasks since May 2024.

OPERATIONAL PERFORMANCE KPI	TSCNET	CORESO
Progress of issued certifications for tasks already operational before the go-live of the RCC Training and Certification Methodology (Article13.2)	100%	67,00%
Success rate of certifications for new tasks implemented after RCC Training & Certification of Staff Task live (Article 4.5)	100%	100%

Table 21: Training and certification of staff Operational Performance KPI

11.2 Coordinated actions and recommendations

RCCs do not issue recommendations for this task.

11.3 Effectiveness and efficiency

The success rate of the first attempt in the certification process measures the percentage of certifications that RCC Operators successfully pass on their initial attempt. This metric serves as a key indicator of the effectiveness of training programs, assessment design, and candidate preparedness.

The first-attempt success rate is influenced by the fact that training journeys follow a standardized approach, designed to cover all necessary competencies for various scenarios. Additionally, differences in professional backgrounds and individual learning curves may lead to varying outcomes in certification performance.

Efforts are continuously made to enhance first-attempt success rates. However, a success rate that is either too low or too high on the first attempt could indicate that the training and evaluation processes are set at an inadequate level of challenge, potentially failing to ensure the necessary depth of knowledge and competency required for operational excellence.

This metric should serve as a valuable indicator for further internal assessments by RCCs to refine their training programs and processes.

EFFECTIVENESS AND EFFICIENCY KPI	TSCNET	CORESO
Success rate of the first attempt in the certification process measures the percentage of certifications that RCC Operators successfully pass on their initial attempt	87,50%	82,58%

Table 22: Training and certification of staff Effectiveness and Efficiency KPI

11.4 Shortcomings

No shortcomings have been identified for the task.

12.

Post-operation and post-disturbances analysis and reporting

On 31 March 2022, the post-operation and post-disturbances analysis and reporting methodology was approved by ACER in accordance with the regulation. The task according to this methodology went live on 1 October 2022. In everyday operations, this task is often referred to as Regional Incident Analysis and Reporting (RIAR). The RCCs' process to carry out the post-operation and post-disturbances analysis and reporting interacts with the existing process run by the ENTSO-E Incident Classification Scale (ICS) Expert Panel, established for the investigation of incidents on scale 2 and scale 3, in accordance with the ICS Methodology. After the incident threshold of scale 2 or 3 is triggered, a factual and final report shall be prepared by an expert panel. An RCC Investigation Subgroup is created within the ICS Expert Panel. This group supports the assessment of whether the RCC Investigation Threshold defined in Article 5.1 is met and leads the subsequent investigation relating to RCC activities. A chapter pertaining to RCC activities will be prepared by the RCC subgroup and included in the final report. Details of the interactions and activities led by the ICS Expert Panel and the RCC subgroup are shown in figure 23.

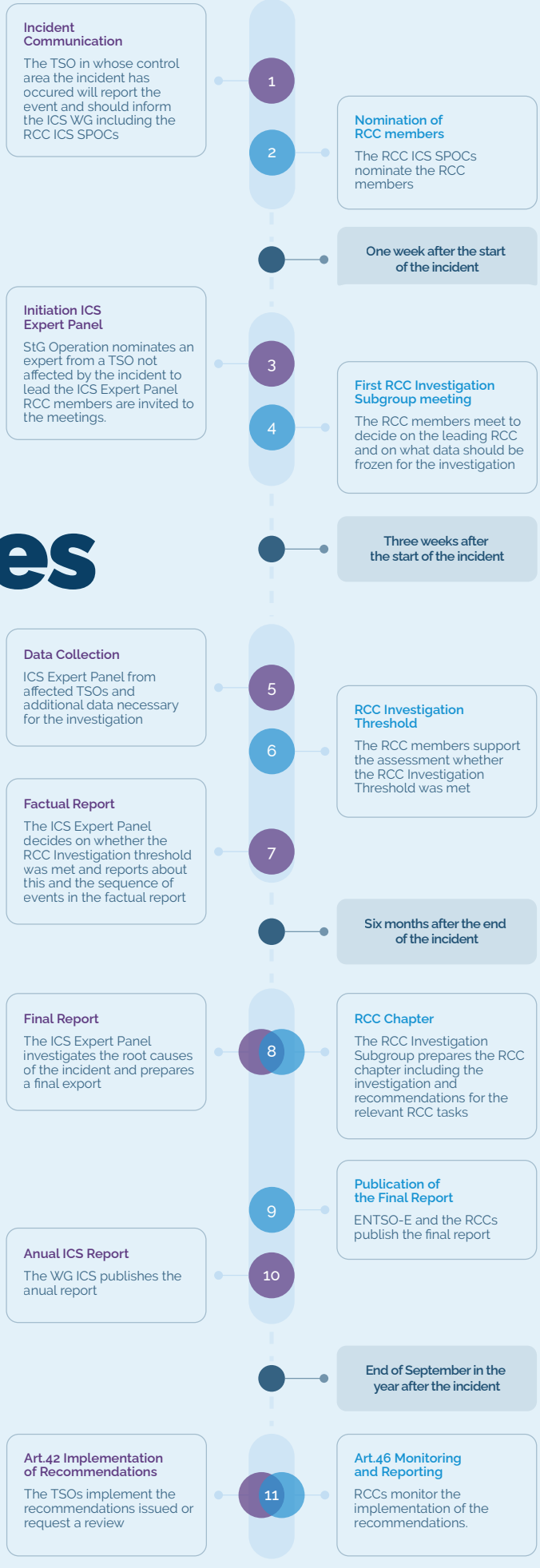


Figure 23: Timeline of an incident investigation conducted by TSOs and RCCs

Recommendations issued by the RCC subgroup will be tracked in a dedicated database and updated by each RCC for their respective SOR (Article 46.3). For the Central SOR region, this will be detailed in this report.

12.1 Operational Performance

In 2024, the ICS SPOCs from Coreso and TSCNET were informed about four incidents which had the potential to be classified as level 2 or 3. In three cases, this information was in time and the nomination of the RCC members could happen within the foreseen time-frame. In the fourth case, there was a delay of 42 days in the communication towards RCCs resulting in a nomination after the deadline of one week after the incident. For the year 2023, Coreso and TSCNET had reported potential for improvements in the communication towards the RCC ICS SPOCs. In 2024, this has already improved significantly.

On Friday, 21 June 2024, a significant incident occurred in South-East Europe, which led to a major disruption in the power system of Continental Europe. The incident resulted in a substantial loss of the capacity of supplying power with the consequence of disruption to meet temporally the electricity demand. This incident affected Albania (OST), Bosnia and Herzegovina (NOSBiH), Montenegro (CGES), and Croatia (HOPS). The event was characterised by a series of single episodes occurring in the transmission network, which ultimately led to a partial blackout in these four countries.

An ICS Expert Panel and an RCC investigation subgroup were established following the incident. Nordic RCC was jointly selected as leading RCC since they were not affected by the incident. On 4 November 2024, the ICS Expert Panel published the Factual Report which concluded that the incident was of scale 3 and above the RCC investigation threshold[21]. The deadline for the Final Report is the publication of the annual ICS report (latest September 2025). This report will also include the conclusions of the RCC investigation. The other three communicated incidents had been classified by WG ICS as scale 1. Therefore, the incidents are not required to be investigated by RCCs as per the RIAR methodology.

12.2 Coordinated actions and recommendations

No recommendations were made during the year 2024, as the investigation of the single incident that was above the incident-investigation-threshold was not completed in 2024. Regulatory deadline for the publication of the Final Report is 30 September 2025 together with the annual ICS report.

12.3 Effectiveness and efficiency

Effectiveness of this task has been defined as:

- Nomination and communication of the RCC members within one week after the incident occurred.
- Publication of the final report, including the RCC chapter by the end of September in the year after the incident.

In three of four cases, the nomination and communication of the RCC members happened within one week after the incident. One case was delayed, but RCCs reacted promptly once they were informed.

No final reports were published in 2024.

The efficiency of this task can be assessed based on published reports in case of the RCC investigation threshold being met. Reducing this down to a one number KPI is not possible since each incident case is unique and difficult to compare with the other cases.

In 2024, TSCNET spent 160 hours and Coreso 125 hours on the regular activities connected with the task such as improvement of methodologies and training material and certifying additional investigators. Additionally, TSCNET spent 340 hours and Coreso 150 hours on incident investigations. Most of these were linked with the incident on 21 June 2024.

12.4 Shortcomings

In the context of the investigated incident on 21 June 2024, all deadlines were met and the TSOs provided all required data for the investigation. Therefore, there are no shortcomings to be reported about 2024. A general challenge which became visible during the incident investigation, was the usage of post-operational data for quality management processes. For the detailed outcomes of the investigation, we refer to the Final Report available on the ENTSO-E website.

Compared to 2023, the communication of incidents by TSOs/ENTSO-E towards RCC ICS SPOCs has improved significantly. One incident has indicated that there is still some room for improvement, but this was likely an exception. towards RCC ICS SPOCs has improved significantly. One incident has indicated that there is still some room for improvement, but this was likely an exception.

INCIDENT START	RCCS INFORMED	NOMINATION	CLASSIFICATION	FACTUAL REPORT	FINAL REPORT
21.06.2024	21.06.2024	27.06.2024	Scale 3 above RCC threshold	04.11.2024	Expected in 2025

Table 23 : List of scale 2 & 3 incidents in 2024

[21] https://www.entsoe.eu/news/2024/11/04/entso-e-publishes-the-interim-factual-report-on-the-grid-incident-in-south-east-europe-of-last-june/

13.
Crisis scenarios

The "*Identification of the Most Relevant Regional Electricity Crisis Scenarios 2024*" has the aim to ensure the most effective and efficient risk preparedness within the European Union. To this end, the regulation aims to build trust between the EU Member States by ensuring coherence in risk evaluations in crisis situation.

A common approach to identify risk scenarios was therefore needed at regional and national levels to achieve this coherence. With this objective, Article 6 of the Risk Preparedness Regulation requires ENTSO-E to identify the most relevant regional electricity crisis scenarios, and to update these at least every 4 years, namely by September 2024.

The Working Group Risk Preparedness (WG RP) was built comprising ENTSO-E, RCCs and TSO which worked closely to identify the most relevant regional electricity crises scenarios.

13.1 Operational Performance

A list of 23 regional electricity crisis scenarios was compiled for evaluation by the WG RP. This list was based on a review of the 31 regional electricity crisis scenarios identified in 2020, and inputs received to a list of scenarios submitted by ENTSO-E to the ECG (Electricity Coordination Group - DG Energy of European Commission), RCCs competent, authorities, and regulatory authorities.

Additionally, the WG RP simulated 2 scenarios: the Severe Winter Scenario and the Severe Summer Scenario. The simulations were conducted under a tight timeline yet yielded significant insights. This initial attempt to simulate the impact of regional electricity crisis scenarios using ERAA (European Resources Adequacy Assessment) models shows promising potential for enhancing risk preparedness in the electricity sector. However, the lessons from this cycle highlight the need to further refine the process and timeline to ensure greater robustness and accuracy in future simulation results.

13.2 Coordinated actions and recommendations

The identification of electricity crisis scenarios at a regional level required close cooperation and coordination between ENTSO-E and stakeholders with consultation of ECG, RCCs, competent authorities and regulatory authorities is therefore included at various stages in the process of identifying regional electricity crisis scenarios.

Additionally, coordination was necessary for assessing Cross-Border dependencies and their impact on system operations within the regions where RCCs perform their tasks.

During this task, no recommendations were issued from the RCCs' perspective. However, the WG RP issued recommendations in the final report, which is not publicly available.

13.3 Effectiveness and efficiency

Timely completion of reports is a key indicator of efficiency in any structured process. Efficiency, in this context, refers to the ability to complete tasks within the allocated time and resources while maintaining the expected quality. The delivery of "Identification of the Most Relevant Regional Electricity Crisis Scenarios" report within the process deadline ensures that all subsequent steps relying on its insights can proceed without delays.

To assess this aspect of efficiency, a KPI is established to monitor whether a report is completed and submitted within the process duration. This metric serves as an objective measure of time management and process coordination, ensuring that reporting activities align with project timelines and support informed decision-making.

The effectiveness of this task is determined by the SOC's approval to distribute the final report on the definition of electricity crisis scenarios.

As a result, the most relevant electricity crisis scenarios for the upcoming 4 years have been compiled, evaluated, and ranked by ENTSO-E, working closely with the RCCs, competent authorities, and regulatory authorities.

The «Identification of the Most Relevant Regional Electricity Crisis Scenarios» report was issued on 5 September by the WG RP after the SOC review on 22 August, in line with the methodology of 2024.

13.4 Shortcomings

There are no shortcomings to be reported for this task.

14 MEC

The Maximum Entry Capacity (MEC) refers to the highest amount of capacity in MW that can be safely integrated into a Capacity Market (CM) from a neighbouring system over a given CM border for a given delivery period. This includes all eligible capacity resources, such as renewable and conventional sources of energy, without compromising the stability and reliability of the system within the CM border. According to Article 2.2(g) of ACER Decision No. 36/2020, a CM border is defined as a bidding zone to bidding zone border between Member States applying a capacity mechanism.

MEC calculations concern only eligible TSOs which currently are ELIA, RTE and PSE. At the moment, TSCNET performs the MEC task for PSE while Coreso performs the task for RTE and Elia. In 2024, the data used as input is ERAA 2023 and the tool used by the RCCs to perform the MEC calculation is a prototype tool developed by PSE using the R – programming language framework. The tool was developed following the legal requirements of the Regulation (EU) 2019/943 of 5 June 2019 and ACER's decision No. 36/2020. A new industrialized tool for MEC has now been developed by ENTSO-E following the same legal requirements and successfully have passed the User Acceptance Test (UAT) phase end of 2024.

The eligibility criteria include having a CM open for direct cross-border participation. The MEC process plays a crucial role in ensuring a coordinated and efficient assessment of available cross-border capacity from different capacity resources and providers to participate in the capacity mechanism within the European energy market.

A more detailed introduction and definition of MEC, including a high-level explanation of the MEC computation procedures and full scope of the MEC task performed by the RCCs in line with the regulatory responsibilities of RCCs, are contained in the published MEC Recommendation to TSO 2024 on both TSCNET and Coreso's website:

- TSCNET – for PSE: https://www.tscnet.eu/wp-content/uploads/TSCNET_MEC_Publication2024.pdf
- Coreso – for Elia: https://www.coreso.eu/media/documents/#flipbook-df_5711/1/
- Coreso – for RTE: https://www.coreso.eu/media/documents/#flipbook-df_5722/1/

14.1 Operational Performance

The Operational performance KPI is defined as the successful completion of calculations requested by each relevant TSO per delivery period. From the RCC's perspective, operational performance is considered one hundred percent successful when the number of calculations successfully performed by the RCC equals the number of calculations requested by the TSO, considering the following conditions:

1. ERAA/NRAA data must be available and meet the requirements defined in the RCC MEC Business Requirements Document.
2. Calculations can be for the full target year (TY) or a partial period, per TSO or general.
3. Calculations performed using a replacement strategy at the TSO's request are also counted.
4. If the MEC calculation cannot be completed due to target year mismatches between ERAA and the TSOs' requested period, and no replacement strategy is available, TSOs must indicate a specific ERAA year. If not provided, the RCC KPI remains unaffected.

The operational performance of the MEC task is measured by the number of calculations performed compared to the number of calculations requested.

PERFORMANCE KPI	CORESO_ELIA	CORESO_RTE	TSCNET_PSE
Number of performed calculations/ Number of requested calculations (%)	66,67%	28,57%	100%

Table 24: MEC Operational Performance KPI

- For Elia, Coreso performed 2 calculations out of the 3 requested calculations due to missing matching target year from ERAA 2023. Moreover, the TSO did not indicate the use the replacement strategy, so according to condition #4 of the Operational Performance, this should not negatively affect the KPI. For RTE, Coreso performed 2 calculations out of the 7 requested calculations, due to missing matching target year from ERAA 2023. Moreover, the TSO did not indicate the use of the replacement strategy, so according to condition #4 of the Operational Performance, this should not negatively affect the KPI.
- For PSE, TSCNET performed 5 calculations out of the 5 requested calculations. For all delivery periods, replacement ERAA data was used due to the unavailability of the corresponding ERAA data for each respective delivery period. The use of the replacement input ERAA data was agreed and approved by PSE and all relevant computations were completed within the agreed delivery timeline of the MEC process as defined in the MEC Rule Book.

14.2 Coordinated actions and recommendations

In line with the with the legal requirements of Article 26.7 of Regulation (EU) 2019/943 and Article 6.7 of ACER decision No. 36/2020, the MEC service delivery by RCC to TSOs includes recommendations for each of the considered CM border and shall include all the details contained within Article 6.7 of ACER decision No. 36/2020. The final MEC recommendation is shared by each RCC with their respective TSOs. In compliance with the transparency requirement from Article 10 of ACER decision No. 36/2020, each RCC is required to publish the recommendation publicly on its website. More details and links are contained in the introduction section of the MEC chapter.

To ensure the compliance to the Article 46 of Regulation (EU) 2019/943, the recommended maximum entry capacity in MW per CM border for each TSO is monitored to confirm if the final capacity that was made available by the regulatory bodies for the capacity mechanism, is different from the recommended capacities of the RCC's MEC computation for each CM border.

14.2.1 Number of recommendations provided to TSOs

The number of recommendations provided for each TSO is contained in the respective RCC MEC recommendation for the given business year computation. Maximum Entry Capacity recommendation is provided for each requested by TSO delivery period. More details on the recommendations provided by both TSCNET and CORESO for PSE, Elia and RTE are publicly available on each RCC's website.

14.2.2 Implementation status of the recommendation in Capacity Mechanism

Through an agreed annual monitoring data collection process triggered by the RCCs to the relevant TSOs involved in the MEC process, TSOs confirm with an answer of "Yes" or "No" on whether they submitted the RCC's recommended entry capacity to their respective regulatory bodies:

- If the answer is «No», the TSO is required to provide the reason why the recommendation from the RCC was not submitted.
- If the answer is "Yes", a follow-up question is asked, to confirm on whether the regulatory bodies implemented the RCC recommended entry capacity or not.
    - If the answer is "Not implemented" or "No", the TSO is also required to provide justification as of why.

For the MEC 2023 computation, below are the details of the monitoring of the MEC coordination process and recommendation implementation status for each of the TSOs:

1. Elia did **not** adopt the RCC MEC recommendation from Coreso for the following key reasons:

    a. ERAA does not provide a central reference scenario with capacity mechanisms, as required for MEC calculations. ERAA 2023 lacked this scenario;

    b. Recommendations were based on draft ERAA 2023 results before gas power plant cost parameters were corrected;

    c. The «reference scenario» used for the Belgian Capacity Remuneration Mechanism (CRM) report differs from ERAA 2023, leading to discrepancies in nuclear availability assumptions and potentially lower MEC values.

2. RTE did **not** adopt the RCC MEC recommendation from Coreso for the following key reasons:

    a. ERAA 2023 lacks a central reference scenario with capacity mechanisms, as required by ACER's technical specifications;

    b. ERAA 2023 assumptions, based on TSO data collection, do not align with RTE's critical perspective on interconnections, renewable energy sources, and flexibility;

    c. ERAA 2023 oversimplifies the French system, particularly regarding nuclear availability and the low number of weather scenarios, affecting thermo-sensitivity representation.

3. PSE submitted the RCC MEC recommendation from TSCNET as an annex to the Own Capacity Market Parameters recommendation report. PSE also confirmed through the RCC monitoring survey that the RCC MEC recommended capacities from TSCNET were not the final values implemented by the responsible Polish National Ministry of Energy due to the following reasons:

    a. The Polish CM follows a different border configuration than the RCC MEC recommendation. Instead of bidding zone-to-bidding zone CM borders, it uses a Member State-to-Member State or Member State-to-Multiple Member States (profile) approach that is defined in EC Staid Aid Decision and national law. As a result, direct implementation of the RCC recommendation was not feasible.

    b. The final (implemented) MEC values by the Polish National Ministry of Energy were calculated using the same inputs as the RCC MEC recommendation but aligned with the existing CM border configuration.

14.3 Effectiveness and efficiency

We defined the Efficiency KPI for the MEC service performed by the RCC as the ratio of the number of delivered final recommendation reports on or before the agreed deadline compared to the total number of delivered final recommendation reports. We considered the recommendation delivered by the RCCs for each of the calculated delivery period to be individual recommendations, covering all the defined CM borders for each of the relevant TSOs. All recommendations for each TSO are contained within a single RCC recommendation report for the respective business year. The efficiency KPI from RCCs perspective is calculated considering the following condition:

- Late delivery or non-delivery of ERAA/NRAA from ENTSO-E/TSO shall not impact this RCC KPI negatively.

For the 2023 business year MEC computation performed in 2024, Coreso as the responsible RCC for both Elia and RTE delivered 2 recommendations out of 2 before the agreed deadline to Elia and RTE, while TSCNET as the responsible RCC for PSE delivered 5 recommendations out of the requested 5 delivery period computation before the agreed delivery deadline. In the case of Elia and RTE, there were more target year delivery period computation requested by the TSOs but the relevant MEC recommendation could not be performed for those delivery periods due to lack of suitable input ERAA data, hence that case does not impact the efficiency KPI of RCC, as it falls within the defined condition of exemption.

EFFICIENCY KPI	CORESO_ELIA	CORESO_RTE	TSCNET_PSE
Number of delivered final recommendation reports on or before deadline agreed/Total number of delivered final recommendation reports (%)	100%	100%	100%

Table 25: MEC Efficiency KPI

For the Effectiveness KPI of the MEC service there is no quantitative metric applicable (N/A), but the RCC considers the MEC service delivery with the prototype tool for 2024 and the ENTSO-E MEC production tool for future computation to be effective based on the following criteria:

1. Compliance with MEC methodology requirements in both design and implementation;
2. Publication of final MEC recommendations and metadata on the RCC website;
3. Ongoing follow-ups with TSOs to monitor implementation in compliance with the Article 46 of Regulation (EU) 2019/943;
4. Proper storage and archiving of all MEC input and result data in accordance with the RIAR methodology.

14.4 Shortcomings

Both Coreso and TSCNET issued the MEC recommendation to their respective eligible TSOs, RTE and ELIA for Coreso and PSE for TSCNET. However, none of these TSO's National Energy Ministries have implemented the RCCs' recommendation in the final published maximum entry capacities for their respective CM Borders.

In the case of PSE, the RCC recommended MEC was submitted to the National Ministry but was not considered by the ministry due to the existence of a different border configuration between the MEC methodology and the implemented CM border in Poland according to the Polish national law.

The key reason for non-implementation for Elia and RTE is related to the ERAA 2023 scenario which differs from CRM dimensioning and does not ensure that Loss of Load Expectation (LOLE) criteria are met. Moreover, ERAA's limited target years do not fully align with capacity mechanism needs, and the quality of ERAA 2023 (more details are given in section 14.2) is not sufficient for reliable decision-making.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