ENTSO-E Annual Work Programme

2025 Edition – ENTSO-E's Work on Legal Mandates

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ENTSO-E Mission Statement

Who we are

ENTSO-E, the European Network of Transmission System Operators for Electricity, is the **association for the cooperation of the European transmission system operators (TSOs)**. The **40 member TSOs**, representing 36 countries, are responsible for the **secure and coordinated operation** of Europe's electricity system, the largest interconnected electrical grid in the world. In addition to its core, historical role in technical cooperation, ENTSO-E is also the common voice of TSOs.

ENTSO-E **brings together the unique expertise of TSOs for the benefit of European citizens** by keeping the lights on, enabling the energy transition, and promoting the completion and optimal functioning of the internal electricity market, including via the fulfilment of the mandates given to ENTSO-E based on EU legislation.

Our mission

ENTSO-E and its members, as the European TSO community, fulfil a common mission: Ensuring the **security of the interconnected power system in all time frames at pan-European level** and the **optimal functioning and development of the European interconnected electricity markets**, while enabling the integration of electricity generated from renewable energy sources and of emerging technologies.

Our vision

ENTSO-E plays a central role in enabling Europe to become the first **climate-neutral continent by 2050** by creating a system that is secure, sustainable and affordable, and that integrates the expected amount of renewable energy, thereby offering an essential contribution to the European Green Deal. This endeavour requires **sector integration** and close cooperation among all actors.

Europe is moving towards a sustainable, digitalised, integrated and electrified energy system with a combination of centralised and distributed resources.

ENTSO-E acts to ensure that this energy system **keeps consumers at its centre** and is operated and developed with **climate objectives** and **social welfare** in mind.

ENTSO-E is committed to using its unique expertise and system-wide view – supported by a responsibility to maintain the system's security – to deliver a comprehensive roadmap of how a climate-neutral Europe looks.

Our values

ENTSO-E acts in **solidarity** as a community of TSOs united by a shared **responsibility**.

As the professional association of independent and neutral regulated entities acting under a clear legal mandate, ENTSO-E serves the interests of society by **optimising social welfare** in its dimensions of safety, economy, environment and performance.

ENTSO-E is committed to working with the highest technical rigour as well as developing sustainable and **innovative responses to prepare for the future** and overcoming the challenges of keeping the power system secure in a climate-neutral Europe. In all its activities, ENTSO-E acts with **transparency** and in a trustworthy dialogue with legislative and regulatory decision makers and stakeholders.

Our contributions

ENTSO-E supports the cooperation among its members at European and regional levels. Over the past decades, TSOs have undertaken initiatives to increase their cooperation in network planning, operation and market integration, thereby successfully contributing to meeting EU climate and energy targets.

To carry out its **legally mandated tasks**, ENTSO-E's key responsibilities include the following:

- Development and implementation of standards, Network Codes, platforms and tools to ensure secure system and market operation as well as integration of renewable energy;
- Assessment of the adequacy of the system in different timeframes;
- Coordination of the planning and development of infrastructures at the European level (**Ten-Year Network Development Plans, TYNDPs**);
- Coordination of research, development and innovation activities of TSOs;
- Development of platforms to enable the transparent sharing of data with market participants.

ENTSO-E supports its members in the **implementation and monitoring** of the agreed common rules.

ENTSO-E is the common voice of European TSOs and provides expert contributions and a constructive view to energy debates to support policymakers in making informed decisions.

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General Introduction

European cooperation and democratic values have been key to ensure the good functioning and steady development of Europe's electricity system. What has been achieved in the power sector so far is a successful model of European integration that brings concrete benefits to EU citizens, by ensuring them a reliable and secure access to electricity. As we progress towards carbon neutrality, these values and commitment to work with one another in an inclusive, transparent and democratic way will be even more important to make our energy system more sustainable. Europe only works with electricity and electricity only works with Europe.

As highlighted in ENTSO-E's Strategic Roadmap 2023–2025, the core mission of Transmission System Operators (TSOs) is twofold:

- To ensure that the future power system will be fit for carbon neutrality. The future system will rely on carbon-neutral energy sources, on flexibility resources to complement the weather-dependent generation, and on a secure, efficient power grid. The pivotal role of electrification and the growing interdependencies across sectors make the European electricity system and grid infrastructure central to the future energy landscape and the European economy.
- While preparing for this, TSOs also need to continue providing a secure and efficient power system for the whole of Europe.

In other words, TSOs need to prepare a future European power system that is fit for carbon neutrality, while managing the present one in a secure and efficient way.

This annual work programme details the different activities ENTSO-E is planning for 2025 in order to fulfil this twofold mission.

Policy Context

Electricity grids have recently gained significant political attention. Indeed, it is now clear that electricity grids play a key role in the transition to a carbon neutral energy system and are a priority if we want to successfully implement the European Green Deal and achieve the new ambitious climate targets. At the same time, the energy price crisis that followed the Russian invasion of Ukraine has reminded us how important it is to have a well-functioning, secure, efficient, reliable and affordable energy system.

This new context led to some important policy and legislative developments during the mandate of the current Commission. The revision of the TEN-E regulation, the recent reform of the Electricity Market Design, the new gas package, the EU Action Plan for Grids, the EU Wind Package, the F-Gas regulation or the Fit for 55 package are all important initiatives that now need to be implemented and translated into actions. Several of those new policies will also lead to an increase in the tasks of ENTSO-E. In parallel, additional work is still needed to further strengthen supply-chains for grid infrastructure, to finance their scale up and to further adapt the regulatory framework to facilitate the timely delivery of those infrastructures. ENTSO-E has already started working with EU policy makers and industry stakeholders on those aspects.

In June 2024, European citizens voted to elect their representatives for a new legislative mandate 2024 – 2029. Following those elections, a new European Parliament and a new College of Commissioner has been appointed. In light of those changes, it is important to keep the momentum created by the EU Action Plan for Grid that the focus on grids remains high on the policy agenda. The work that has been started should continue during the next EU legislative cycle to achieve our collective climate and energy goals.

- **REGULATION (EU) 2019/943 on the internal market for electricity**
- **REGULATION (EU) 2019/941 on risk-preparedness in the electricity sector**
- **REGULATION (EU) 2022/869 on guidelines for trans-European energy infrastructure**
- **REGULATION (EU) No 543/2013 on the submission and publication of data in electricity markets (Transparency Regulation)**
- **Commission Regulation (EU) No 838/2010 of 23 September 2010 on guidelines relating to the inter-transmission system operator compensation mechanism**

1 System Operation

System Operation Guideline

Regulation (EU) 2017/1485 establishing a Guideline on electricity transmission system operation (SOGL) sets out harmonised rules on how to ensure security of supply through efficient grid operation in a variable renewables paradigm. The implementation of the SOGL and the methodologies that stem from it entails several tasks for ENTSO-E and TSOs at the pan-European, synchronous area and regional levels. Work at pan-European level is facilitated by ENTSO-E, whereas synchronous areas' activities are organised by TSOs in respective regional groups. Other developments regarding the implementation of the SOGL will be regularly communicated through the System Operations Committees.

ENTSO-E will continue the implementation work pursuant to Art. 44 of the Methodology for coordinating operational security analysis (CSAM) which requires the development of a probabilistic risk assessment methodology. The progress made in this methodology will be described in the next biennial report, which is due in December 2025, providing more insights on the content of the methodology.

In addition, the publication of annual reports on the incident classification scale and load-frequency control will continue as per the legal requirements under Art. 15 and Art. 16 of the SOGL. In that regard, their content will be reinforced following trends that may impact operational security negatively in the future, such as the increased number of voltage violations due to the increased amount of renewable energy sources in the power generation mix. For the additional reporting obligation as per Art. 14 of the SOGL, ENTSO-E will further commit to implement data delivery for monitoring purposes to ACER in 2025. This includes the detailed listing of the relevant operational data and the implementation of the necessary IT tools.

Network Code Emergency & Restoration (NC ER)

Regulation (EU) 2017/2196 establishing a network code on electricity emergency and restoration (NC ER) sets out harmonised rules on how to respond to emergency situations and restore the system as efficiently and as quickly as possible.

In 2025, ENTSO-E will continue to coordinate, where necessary, the implementation of the NC ER by the TSOs and address potential issues that require cross-border alignment. ENTSO-E will finalize the consistency assessment of the defence and restoration plans after reviewal of the plans in accordance with Art. 6 of the NC ER. The developments at Member State level will be communicated regularly through the Market and System Operations Stakeholders Committees.

Synchronous Areas & Regional Groups

Depending on the specific arrangements with each Regional Group corresponding to a synchronous area, ENTSO-E supports on an ad-hoc basis or provides administrative and technical support for the Region on a continuous basis. ENTSO-E will continue its work to develop mutual coordination and support between synchronous areas, using the functionality of high-voltage direct current (HVDC) links to implement new services.

The work aims to coordinate short- and long- term measures to mitigate the frequency deviations in Continental Europe, notably the deterministic frequency deviations related to the change of scheduling programmes at the early morning and late evening hours. ENTSO-E also continues to support the project of synchronisation between the Baltic TSOs and the synchronous area of Continental Europe. In 2025, work on the elaboration of the relevant procedures and essential system checks for the synchronous operation will continue.

Coordination with Third Country TSOs

As part of the Synchronous Area Continental Europe, Moldelectrica needs to follow its rules and be involved in its Operational Processes. ENTSO-E will provide guidance and support Moldelectrica' s implementation of these requirements. As part of the Long Term Agreement in place with TEIAS, ENTSO-E continues to have a close cooperation and engagement with TEIAS for all the operational processes and technical procedures in place.

Also, ENTSO-E will continue its close cooperation with KOSTT to ensure a secure operation of the Continental Europe grid.

In addition, ENTSO-E is working with NGESO (GB TSO) to develop and implement coordinated operation across the Chanel, following the Brexit. The discussions will take place both on technical and legal level, in the framework of the TCA and the working arrangements.

European Awareness System (EAS)

In the last two years, the EAS has been significantly developed by new functionalities. The main spectrum of changes was focused on the integration of data from the Wide Area Monitoring System (WAMS), within the framework of which operators were provided with an enhanced frequency map and new voltage and angle maps. Furthermore, data from balancing platforms MARI and PICASSO will be soon integrated into the EAS system. Regarding the development of the existing system, due to the expected end of the current EAS based on Siemens SPECTRUM 4 at the beginning of 2027, ENTSO-E will focus on preparing the transition to a new system while each development requirement will be carefully considered from the point of view of operational needs and investments made. With exception of routine integration of new data into existing maps and improvement of data quality, new developments are foreseen such as implementable functions based on WAMS data and an ex-post analytical platform for the purpose of analysing operational events on WAMS data, which were also part of the recommendations provided from the 2021 grid incidents reports.

Risk Preparedness Regulation

ENTSO-E will continue to improve on the process for identifying regional electricity crisis scenarios, pursuant to Art. 6 of the Risk Preparedness Regulation, based on the experience of the cycle in 2024 and the updated Risk Preparedness methodology. Furthermore, the working group will remain vigilant for any new circumstances that warrant for the regional electricity crisis scenarios to be updated.

Common Grid Model (CGM)

The CGM and the Operational Planning Data Environment (OPDE) are critical enablers of the operational coordination and the security of supply on the European level. Ensuring greater visibility and insight into pan-European interconnection flows is a critical step in the broader effort to strengthen grid security, ensure cost-efficient operation, and increase cooperation and collaboration among the European TSOs and RCCs (Regional Coordination Centers). The CGM and OPDE development and implementation are led by the Steering Group Regional Coordination at ENTSO-E level.

The legal basis for the CGM and OPDE is found in three of the Network Codes: The SOGL (Art. 64), the Capacity Allocation & Congestion Management (CACM) Regulation (Art. 17) and the Forward Capacity Allocation (FCA) Regulation (Art. 18). The CGM is a prerequisite for several services harmonised in the Network Codes, including Coordinated Capacity Calculation (CCC), Coordinated Security Analysis (CSA), Outage Planning Coordination (OPC) and Adequacy Analysis (STA).

A CGM compiles the Individual Grid Models (IGMs) of each TSO, covering timeframes from one year before real time to one hour before real time. TSOs' IGMs, after following a quality assessment and pan-European alignment process, are provided to RCCs, who merge them into a pan-European CGM and feed the merged CGM back into the OPDE system. In 2025, further work would be done to ensure the pan-European CGMs generated are fit-for purpose for the different regional and pan-European services which consume the CGMs, such as OPC, STA, CSA and CCC. A significant improvement in the performance of the system would also be foreseen with the faster delivery of the grid models on OPDE which can cater the requirements of the different operational processes.

Regional Coordination Centres (RCCs)

Regional coordination first became a legal mandate in SOGL with five core tasks to be performed by RCCs and was expanded in the Clean Energy Package and Regulation (EU) 2019/943 to become 16 tasks. RCCs are entities owned and appointed by TSOs in System Operation Regions (SORs) to fulfil tasks according to Art. 37.1 of Regulation (EU) 2019/943. Through their recommendations to TSOs, RCCs contribute by the efficiency in system operation coordination, minimising the risks of wide-area events such as brownouts or blackouts, and lowering costs by ensuring the maximised availability of transmission capacity to market participants.

ENTSO-E supports the development and implementation of new RCC tasks according to Art. 37 of Regulation (EU) 2019/943 and is regularly consulting stakeholders in the Steering Group Regional Coordination (StG ReC), which is established in line with Art. 30.1 e) of Regulation (EU) 2019/943 since end of 2021. The main purpose of the StG ReC is to facilitate, coordinate and develop regional coordination, most notably among RCCs and TSOs. The StG ReC framework serves as a platform for efficient, transparent and smooth collaboration between RCCs, TSOs, the regions (CCRs/SORs) and ENTSO-E, as well as external stakeholders.

For the RCC tasks, where a pan-European or cross-regional approach is legally required or requested by TSOs, the StG ReC shall steer the business requirements, business development, implementation, rollout and operation of the tasks to the extent legally required or requested by TSOs. For the RCC tasks at regional level, the StG ReC shall facilitate cooperation and coordination among the regions and RCCs and monitor the performance of those tasks.

The implementation of the RCC services from SOGL is still ongoing:

- STA and OPC processes are both in operation but will continue to be updated according to the continuous development of process improvement. These activities include backlogged features and new features and requirements that were not in the original scope. These features are necessary or important for the process efficiency and quality of results;
- CGM is live, and IGMs are provided by TSOs over OPDE into pan-European CGMs;
- The implementation of CSA and CCC in the regions according to regional methodologies will be pursued; and
- Consistency assessment of system defence plans and restoration plans (Art.6 of NC ER) is already established.

In line with its legal mandate, pursuant to Articles 30 and 34 of Regulation (EU) 2019/943, ENTSO-E will continue working into a consistent framework for implementing the regional coordination tasks, as applicable in the form of EU methodology proposals or as a forum for RCCs and TSOs of the different regions, promoting consistent and efficient implementation of the regional coordination.

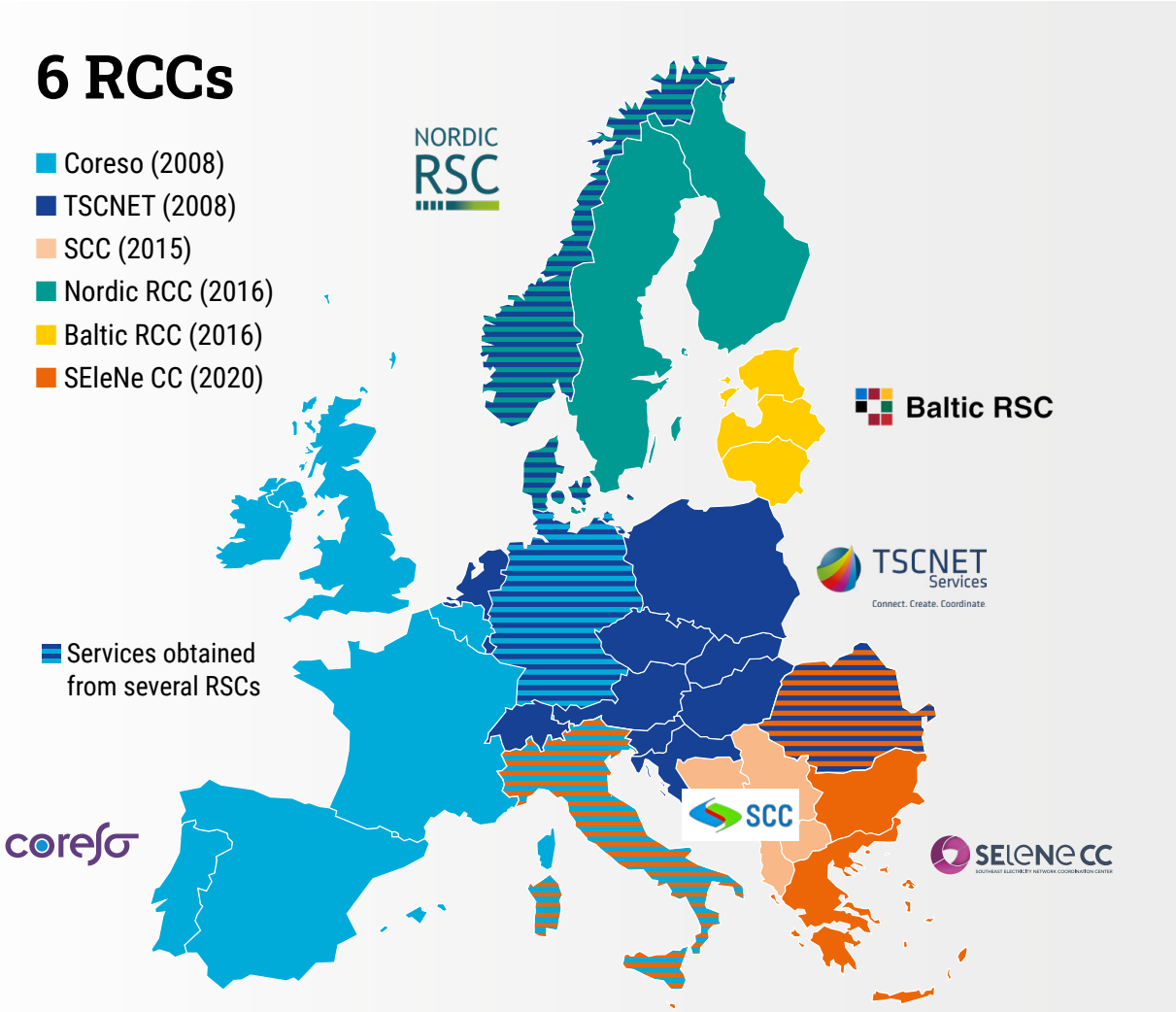


Figure 1: Map that shows the main Member States related to an RCC*

* Norway and Denmark is serviced by both NRCC and TSCNET, Germany is serviced by both TSCNET and Coreso, Italy is serviced by both TSCNET and Selene-CC, and Romania is serviced by both Selene-CC and TSCNET. Kosovo borders are indicated in the RCC map as KOSTT signed the Connection Agreement with ENTSO-E in 2020. This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence. Kosovo is as of yet not serviced by an RCC.

In particular, ENTSO-E will work as relevant during 2025 on the framework and implementation of the following services:

- **Art. 37 (1)(g):** Training and Certification: execution phase is expected to last until 2026.
- **Art. 37 (1)(h):** Supporting restoration: methodology proposal planned to be delivered in September 2024 after which implementation will be initiated.
- **Art. 37 (1)(j) and Art.37 (1)(k):** Sizing and procurement of balancing capacities: implementation by RCCs is expected in the coming years, a project team has already started to work.
- **Art. 37 (1)(l):** Inter-TSO settlement: implementation will be done where applicable, if requested by TSOs.
- **Art. 37 (1)(o):** Maximum Entry Capacity: task go-live and first delivery in 2024, ENTSO-E will continue to actively support the continuous development of process improvement. These activities include backlogged features and new features and requirements that were not in the original scope. These features are necessary or important for the process efficiency and quality of results. In addition, ENTSO-E will provide legal support for the contractual framework applicable to the Maximum Entry Capacity Tool to be used for the performance of the task.
- **Art. 37 (1)(i):** Carrying out post-operation and post-disturbances analysis and reporting; ENTSO-E will provide legal support for the contractual framework applicable to the task.
- **Art. 37 (1)(p):** The need for new infrastructures, which is related to system development: currently on hold pending full implementation of CGM and CSA/CC processes.

2 Market

Capacity Allocation and Congestion Management Guideline

The Capacity Allocation and Congestion Management (CACM) Regulation sets out the methods for calculating how much cross-zonal capacity can be offered to Single Day-Ahead Coupling and Single Intraday Coupling without endangering system security and harmonises how day-ahead and intraday timeframes are operated in Europe to facilitate market integration and increase competitiveness. The implementation of the CACM Regulation is almost complete at the pan-European level. Nevertheless, implementation of the methodologies is still ongoing and regular amendment of the methodologies is performed to ensure the consistency of the full regulatory framework. Furthermore, the Electricity Market Design Reform initiated by the European Commission in 2022 could impact some methodologies, which will have to be adapted accordingly to comply with it. The following paragraphs describe the ENTSO-E and All TSOs tasks to be undertaken in 2025, according to the existing CACM Regulation. The implementation of the CACM Regulation and the methodologies stemming from it entails several tasks for ENTSO-E and TSOs at the pan-European and regional levels.

Work at pan-European level is facilitated by ENTSO-E, whereas the regional activities are organised by TSOs in respective regional groups and facilitated by ENTSO-E at ad-hoc bases.

› **All TSOs (supported by ENTSO-E) will perform the review of the Algorithm Methodology (Art. 37 CACM Regulation).** In accordance with ACER Decision No 04/2020 of 30 January 2020 on the proposal of the Nominated Electricity Market Operators (NEMOs) for the price coupling algorithm and for the continuous trading matching algorithm – also incorporating TSOs' and NEMOs' proposals for a common set of requirements (Art. 37 CACM Regulation) and the deadlines set in Regulation (EU) 2019/943.

- The work on the adaptations needed for the implementation of 15-minute products in Day Ahead will be achieved in Q1 2025.
- The work on the adaptations needed for the implementation of Flow based allocation in the intraday timeframe will continue in 2025.

- **All TSOs and All NEMOs** will review the effectiveness of the price coupling and continuous trading matching algorithms according to Art. 37.6 of the CACM Regulation, will start in 2025, the review is to be achieved beginning of 2026.
- **All NEMOs and All Transmission System Operators (TSOs)** report to the regulatory authorities on the costs of establishing, amending and operating Single Day-Ahead (SDAC) and Single Intra-Day Coupling (SIDC) according to Art. 80 of the Commission Regulation (EU) 2015/1222 of 24 July 2015 – CACM Regulation. Costs directly related to SDAC and SIDC shall be clearly and separately identified and auditable. The report shall also provide full details of contributions made to NEMO costs by TSOs in accordance with Art. 76(2) of the CACM Regulation. The CACM cost report for the cost incurred in 2024, will be delivered mid-2025 by the Market Coupling Steering Committee (MCSC) body, which has been established in 2022 by the NEMOs and the TSOs.
- Following the requirement of Article 8(1) of the revised Electricity Regulation, the intraday cross-zonal gate closure time will need to be amended to be set at maximum 30 minutes before delivery. The amendment will need to be approved by the 1 January 2026.
- If necessary, the All TSOs will amend the regional fallback procedures (Art. 44 CACM Regulation) to further harmonise and integrate the Shadow Auctions Rules.
- **In accordance with ACER Decision 16-2023** on the Congestion Income Distribution (CID) methodology, the All TSOs will:
  - Implement the cross CCR congestion income distribution. The project is expected to run until June 2025 to bring forward the necessary tools and processes in order to handle the cross-CCR CID needs from the implementation of Advanced Hybrid Coupling.
  - Assess the results of the application of the CACM CID methodology with regard to the requirement of ensuring fair and non-discriminatory treatment in accordance with Art. 3(e) of CACM Regulation and share their assessment with all regulatory authorities and ACER. If necessary to ensure fair and non-discriminatory treatment, TSOs shall propose amendments of the congestion income distribution methodology in accordance with Article 9(13) of the CACM Regulation in order to fulfil the ACER Decision on the Congestion Income Distribution methodology. This task will be initiated in 2025.
- **Capacity Calculation Regions (Art. 15 CACM Regulation):** Art. 2 of the CACM Regulation defines the capacity calculation regions (CCRs) as those 'geographic areas in which a coordinated capacity calculation is applied'. Therefore, a CCR defines the set of bidding zone borders among which the tasks of capacity calculation are coordinated by the TSOs. In accordance with ACER Decision No 04/2021 of 7 May 2021, the TSOs assessment of the configuration of the CCRs is due by three months after the implementation of the first version of the regional operational security coordination, in accordance with Article 76(1) of the SOGL in the Core. In addition to this exercise All TSOs will continue supporting the development of the market integration in the Energy Community countries in accordance with the adapted regulation.
- ENTSO-E is coordinating some of the **regional work from the CCRs** and especially on some key projects like the implementation of Flow based. This will continue in 2025.
- **Internal Energy Market Regulation Bidding Zone Review (Art. 14 (6) Electricity Regulation):** Following the delivery of the Bidding Zone Review (BZR) in 2024, ENTSO-E will follow up on the publication of the results and its presentation to the stakeholders, as well as on the decision making by the Member states during 2025.

Forward Capacity Allocation (FCA) Guideline

The FCA Regulation sets out the rules for cross-zonal capacity calculation and allocation in the long-term timeframe. The implementation of the FCA Regulation is completed at the pan-European level. Nevertheless, implementation of the methodologies remains ongoing, and regular amendments of the methodologies are being performed to ensure the consistency of the full system.

Long-Term Market: All TSOs continue the conceptual discussions on long-term design, based on the observed results of the long-term flow-based simulations and taking into account the challenges and questions raised by market participants and some Regulators. All TSOs remain committed to develop and implement the improvements needed for a well-functioning long-term market and will therefore continue working on this direction in 2025. The Harmonised Allocation Rules pursuant to Art. 51 of the FCA Regulation are planned to be delivered in March 2025 according to the biennial rhythm and subject to the results of the review.

All TSOs and ENTSO-E will contribute to the assessment of the Long Term Market as defined in the Market Design reform which is expected to enter into force in June 2024.

Electricity Balancing Guideline

Regulation (EU) 2017/2195 establishing a guideline on electricity balancing (EB Regulation) lays down a detailed guideline on electricity balancing. The implementation of the EB Regulation and the methodologies that stem from it entails several tasks for TSOs at pan-European and regional levels. Work at pan-European level is facilitated by ENTSO-E. During 2024, ENTSO-E will continue to advance the implementation of the EB Regulation.

Harmonisation of Cross-Zonal Capacity Allocation Processes

In accordance with Art. 27(7) of ACER Decision No 11/2023 of 19 July 2023[1], the Cross-zonal Capacity Allocation (CZCA) Harmonised Methodology has been approved by ACER and several amendments have been submitted to ACER in July 2024. The submitted amendments can be distinguished in two different types: 1) Mandatory amendments on governance and forecasting to be performed by All TSOs; and 2) voluntary amendments on the maximum limits on CZC for the balancing capacity exchange, if considered necessary.

In January 2025, ACER's decision on the submitted amendments is expected, following which All TSOs will focus on the implementation activities.

Amendment Proposals: a) of the European methodology for balancing energy pricing and b) the Implementation Framework for aFRR Platform

All TSOs proposed amendments to the Implementation Framework (IF) for the European platform for the exchange of balancing energy from frequency restoration reserves with automatic activation (Art. 21 EB Regulation) and the Methodology for pricing balancing energy and cross-zonal capacity used for the exchange of balancing energy or operating the imbalance netting process (Art. 30(1) EB Regulation) were submitted to ACER on 7 February 2024. ACER's decision is expected by 7 August 2024, following which All TSOs will proceed to the implementation of the proposed amendments in late 2024 – early 2025.

Amendment Proposal: to RCC Procurement Methodology in accordance with Art. 37(1)(k) of the Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity

The ACER decision No. 13/2023[2] was received on 19 July 2023. In Mid-2025, based on individual SOR assessment, the parameters (reliability levels) for the Annex of the RCC Procurement Proposal will need to be submitted to ACER by All TSOs via a Request for Amendment (RfA), in accordance with Art. 37(1)(k) of the Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity (the Electricity Regulation). In 2024 – 2025, All TSOs will be working on these parameters (reliability levels).

European Balancing Platforms

In addition to drafting the All TSOs and ENTSO-E methodologies and supporting the regional methodologies when requested, ENTSO-E will continue to support the implementation and operation of the European balancing platforms. Following regular practice, ENTSO-E will organise at least one public workshop on the European balancing platforms in Q4 2024.

1 **Decision (entsoe.eu)**

2 **Decision (entsoe.eu)**

Inter-Transmission System Operator Compensation (ITC)

The Inter Transmission System Operator Compensation (ITC) Agreement is a multiparty agreement concluded between ENTSO-E and its member TSOs in addition to KOSTT and National Grid ESO, which offers a single frame for compensating European TSOs for costs associated with hosting transit flows.

The ITC mechanism is governed by Art. 49 of Regulation (EU) 2019/943 as further specified by Regulation (EU) No 838/2010 on laying down guidelines relating to the ITC mechanism and a common regulatory approach to transmission charging. The ITC covers both the utilisation of the grid infrastructure by transits and the losses caused by transits. The ITC Funds are financed by all importing and all exporting ITC Parties, including fees applied to the Perimeter Countries for scheduled energy exchanges with ITC Parties.

Two TSOs are the Data Administrators of the ITC Agreement implementing the legislated tasks of ENTSO-E and its member TSOs. They are in charge of the Compilation Report, the Report on Capacity Allocated in a Manner not Compatible with Congestion Management Guidelines, the Report on the Snapshots, the Report on Transit Losses, and monthly Preliminary and Final Settlement Notifications, which are then sent by ENTSO-E to ITC parties for their signature. Each Data Administrator covers a specific geographical area.

In 2025, as every year, the ITC parties provide and check the values for the calculation of the annual perimeter fee, such as cost of losses, vertical load and capacity allocated not compatible with the CACM Regulation. ENTSO-E publishes the perimeter fee and the ITC Transit Losses Data Report on its website. In addition, ENTSO-E, on behalf of the ITC parties, provides information to ACER upon request, which ACER uses for their monitoring report on ITC.

Future Improvements and Changes to the ITC Mechanism

While the compensation of costs associated with transits ensured through the ITC Mechanism has enabled significant progress towards an integrated internal electricity market, a review of the Mechanism and the underlying Regulation (838/2010) is needed. Following ACER's Recommendation 01/2023, ENTSO-E has undertaken to review and propose key improvements to operating the ITC Mechanism. Recommendations notably address the number of snapshots, the pricing of transit losses, and more generally the method for estimating the volume of transit losses.

While ENTSO-E's main recommendations are expected in 2024, ENTSO-E plans to continue working with the EC and ACER in 2025 on implementing agreed proposals and will advise policymakers where necessary improvements require legislative change

3 System Development

The Seasonal Outlooks: Summer Outlook 2025 and Winter Outlook 2025–2026

ENTSO-E's Seasonal Outlooks (Seasonal Adequacy Assessments as per Art. 30(1)m, of Regulation (EU) 943/2019) investigate at pan-European level the security of electricity supply ahead of each winter and summer period. They are released twice a year with a Summer Outlook in June and a Winter Outlook in December. The role of the Outlooks is to identify when and where system adequacy – the balance between supply and demand for electricity – is at risk. Outlooks are not forecasts of the future. Rather, they identify potential vulnerabilities for the upcoming season which can be addressed proactively with preparation or mitigation measures. Each outlook is accompanied by a review of what occurred during the previous season.

Performing the Seasonal Outlooks is one of ENTSO-E's legal mandates as specified in the Regulation (EU) 943/2019 (Electricity Regulation) and as defined in Art. 9 of the Risk Preparedness Regulation (Regulation (EU) 2019/941). ENTSO-E performs this assessment to inform national authorities, TSOs and relevant stakeholders of the potential risks related to the security of electricity supply in the coming season. The Seasonal Outlooks reflect the implementation of the methodology as developed by ENTSO-E as per Art. 8 of the Risk Preparedness Regulation and as approved by ACER on 6 March 2020. The outlooks are based on data collected from TSOs and on a probabilistic methodology. ENTSO-E uses a common database and tool structure for Seasonal Outlooks, as it does for the ERAA, including the Climate Database, Pan-European Market Modelling Data base and demand forecast tool.

The European Resources Adequacy Assessment (ERAA) 2025

The Electricity Regulation places resource adequacy in a central position in the European energy policy context. ENTSO-E's yearly European Resources Adequacy Assessment (ERAA) investigates whether the electricity system has sufficient resources to meet demand – also referred to as power system resource adequacy – in the coming decade, which sets us on a net-zero pathway. The report is built upon models and analyses of possible events that could adversely impact the balance between the supply and demand of electric power. ERAA is legally mandated based on Art. 23 of Regulation (EU) 2019/943.

ERAA 2025 will be the fifth edition of the ERAA based on the ERAA methodology approved by ACER decision No 24/2020 of 2 October 2020, building on the first editions ERAA 2021 – 2022, 2023 and 2024. The implementation of the ERAA builds on ENTSO-E's advancing experience as well as ACER's decision and feedback received from other stakeholders. The ERAA 2025 package will be released and provided for consultation in November 2025. It will contain the findings of the study and provide a description of the process, input data, main assumptions and methodological advancements. The delivery also builds on regular consultations and workshops or webinars with stakeholders throughout the full project timeline.

The Regulation (EU) 2024/1747 amending Regulations (EU) 2019/942 and (EU) 2019/943 as regards improving the Union's electricity market design e foresees a re-opening of the ERAA methodology. ENTSO-E will contribute to the discussion based on its expertise and experience of the four ERAA cycles.

The Ten-Year Network Development Plan (TYNDP) 2026

The TYNDP is ENTSO-E's network planning tool and the European electricity infrastructure development plan. Mandated by Regulations (EU) 2019/943 and (EU) 2022/869, it provides a pan-European vision of the future power system and investigates how transmission infrastructure and storage can be developed to enable the energy transition to take place in a cost-effective and secure manner.

The TYNDP is published by ENTSO-E every two years and feeds into the process of European Projects of Common Interest and Projects of Mutual Interest, run by the European Commission. The TYNDP is the outcome of a three-year lengthy process with three major steps, starting with the development of scenarios outlining how the European energy system might evolve towards 2050. The main role of the TYNDP is to identify where investments in various technical solutions in the electricity system would help to release the expected system constraints, and by doing so provide a fit-for-purpose infrastructure across diverse scenarios. This is accomplished in two stages: first, by performing a system needs analysis that identifies a high-level overview of constraint relief options to allow the decarbonisation of the EU power system at the lowest cost, followed by a call for transmission and storage projects (under different stages of development) across Europe, complemented by a cost–benefit analysis (CBA) of their impacts under different scenarios.

2026 Scenarios

Scenarios are the first key step and a crucial outcome of the TYNDP process. As outlined in Regulation 2022/869, ENTSOG and ENTSO-E are required to use scenarios as the basis for their respective TYNDPs and for the calculation of the cost-benefit analysis used to determine EU funding for electricity and gas infrastructure PCIs and PMIs. The scenarios are designed specifically for this purpose. Where possible, they are derived from official EU and Member-State data sources and are intended to provide a quantitative basis for infrastructure investment planning.

The work on the TYNDP 2026 scenarios jointly by ENTSO-E and ENTSOG begins in 2024 with the development of a stakeholder engagement plan and continues until the submission of the scenarios to the European Commission, ACER and EU Member States in early 2026, with strong stakeholder engagement throughout the process. A new stakeholder group, the Scenarios Stakeholder Reference Group, started operating in end 2023 and will be contributing to the 2026 scenarios cycle.

Preparations for Assessing Onshore and Offshore System Needs and for the Cost-Benefit Analysis of Projects

In 2025 ENTSO-E will start the development of TYNDP 2026 system needs study, offshore network development plans and cost-benefit analysis of projects. This will entail the release of an overview of the planned scope of TYNDP 2026 and of the stakeholder engagement plan. Several stakeholder engagement activities will take place in 2025, via written public consultations and/or workshops or webinars, including on the main methodologies of TYNDP 2026 and on the Guidance for project promoters. The window for promoters of infrastructure projects to submit projects to TYNDP 2026 will also take place in 2025.

The InterLinked Model

Art. 11 (10) of Regulation 2022/869 states that ENTSO-E and ENTSOG must jointly submit to the Commission and ACER a consistent and progressively integrated model that will provide consistency between single sector methodologies based on common assumptions including electricity, methane and hydrogen transmission infrastructure as well as storage facilities, liquefied methane and electrolysers. The rationale for developing an interlinked model is to ensure that the mutual influence of the methane, hydrogen and electricity sectors are considered during the evaluation of infrastructure projects in the cost-benefit analysis of ENTSO-E and ENTSOG's respective TYNDPs. ENTSO-E and ENTSOG prepare to release this integrated model by October 2025.

Connection Network Codes (CNCs)

The three Connection Network Codes (CNCs) – Regulation (EU) 2016/1388 establishing a Network Code on Demand Connection (DC), Regulation (EU) 2016/631 establishing a Network Code on requirements for grid connection of generators (RfG), and Regulation (EU) 2016/1447 establishing a Network Code on requirements for the grid connection of HVDC and direct current-connected power park modules – define the technical capabilities of system users (power generating modules, demand facilities and HVDC systems) to provide a system-supportive performance under all system operation conditions, thus contributing to preserving or restoring system security, especially in the event of exceptional out-of-range contingencies.

In 2022, according to Art. 60 of Regulation (EU) 2019/943, ACER has initiated the process of the CNCs (NC RfG and NC DC only) amendment. Based on ENTSO-E's implementation monitoring reports, new tasks from Regulation (EU) 2019/943 (the Electricity Regulation), TSOs' experiences from national implementations and issues discussed in the European Stakeholder Committees (ESCs) and their Expert Groups (EGs), in September 2023, ENTSO-E submitted the proposals to ACER that included the detailed high priority proposals for amending NC RfG and NC DC. Upon stakeholders' proposals assessment, **ACER published its final recommendation** to the European Commission on 19 December 2023. In addition, ENTSO-E participates in the amendment process of the Network Code HVDC. The public consultation on the NC HVDC was initiated by ACER in June 2024 and it will be based on **Expert Group on Connection Requirements for Offshore Systems phase II report**, approved by Grid Connection ESC and published in December 2023. Following the expected roadmap from European Commission, all three amended CNCs will entry into force by the end of 2024. From 2025, when the three codes come into force, the TSO will have a three-year national implementation period.

ENTSO-E is planning to continue assessing the list of the Implementation Guidance Documents (IGDs) over 2025, according to Art. 58 of the NC RfG, Art. 56 of the NC DC and Art. 75 of the NC HVDC. The IGDs are non-binding reports, mainly for TSOs and other system operators, which give guidance and clarification on both technical and non-technical issues with a view to enhancing coordination and harmonisation where appropriate. Revisions or the creation of new IGDs is likely to support the amendment proposals for upcoming national implementations.

Furthermore, ENTSO-E will continue monitoring and providing recommendations where relevant on both existing and new European standards as mandated by Art. 7.3.f of the NC RfG, Art. 6.3.f of the NC DC and Art. 5.3.f of the NC HVDC. A continuous gap analysis will continue to support the overall CNC assessment, trigger the revision of some standards, and achieve better alignment between standards and Network Codes.

In addition, ENTSO-E will perform the yearly process mandated by Art. 59.2 of the NC RfG and Art. 76.2 of the NC HVDC and requested by ACER in their letters from 14 March 2017 on NC RfG and on NC HVDC, regarding the collection and submission to ACER of information from TSOs and DSOs about the compliance (and still non-compliance) of the installed generation capacities and HVDC systems.

4 Transparency Regulation

Regulation (EU) No 543/2013 on the submission and publication of data in electricity markets (Transparency Regulation) sets out the criteria for data submission and its publication on a centralised platform, namely the ENTSO-E Transparency Platform (TP).

In line with the requirements set out in Art. 5 of the Transparency Regulation, to facilitate the harmonised data submissions to the platform, ENTSO-E developed a Manual of Procedures (MoP) comprised of technical guides in which data definitions and the technicalities related to data exchanges are elaborated.

Market-related fundamental information on generation, consumption, transmission and balancing is published on the TP, which is collected through various sources such as TSOs, power exchanges and other third parties including Single Intraday Coupling, the SAP and European Balancing Platforms.

TP Implementation to Comply with the MoP updates

In line with the Transparency Regulation (EU) No 543/2013, MoP of the TP was further revised and updated in 2023 and was approved in 2024. The release (v3.4) includes amendments to the continuous allocation and Nordic flow-based publications, inclusion of energy storage and other improvements.

In addition to the MoP v3.4 released in 2024, a new release (v3.5) was in preparation during 2024, which foresees to implement flow-based allocation in the long-term domain for at least Nordic and Core CCRs, along with a number of other amendments aimed to improve data publications in TP, in line with the Transparency Regulation. The switch from Net Transfer capacities (NTC) to a Flow-based approach in the long-term timeframe in these two regions has different implications, from methodology amendments to new IT developments or to new processes. These amendments will impact the current data publications and will generate new data publication requirements on the TP, from which the users will benefit. To process and publish flow-based parameters, as well as other changes foreseen as part of the MoP v3.5, in 2025 all implementations on TP is planned to be completed, dates contingent upon the go-live date of Long-Term Flow-based Allocations project.

Finalisation of the TP Architecture Implementation

Following the improvements of the Graphical User Interface (GUI) and of the back-end architecture to manage ever increasing data publications, the complete set of data items stored in the TP will be migrated to the renovated platform through several major releases, planned to be completed in Q2/3 2025.

The last implementation will bring increased robustness through enhanced functionalities and hosting capabilities, without any technical impact on data providers or on the end users.

Implementation of New Data Items for Statistical Purposes

The data items in the Statistical Data Portal will be implemented on TP. This change will replace the existing reports containing aggregated operational data, and it will enable the submission and publications of data primarily intended for statistical purposes.

TP Vision 2030

The ever-increasing publication requirements on the TP and increasing number of TP users calls for a development of TP vision and strategy to further contribute to efforts for net zero emissions and better qualify TP as an advisor for specialists, politics and the broader public. Within this context, TP Vision 2030 approved by the Market Committee in 2023 addresses three roadmap themes for TP to become Europe's most trusted energy knowledge platform, by the reinvention of the TP mobile app, improving data quality and enhancing user engagement. The work started on these three projects during 2024 is set to continue and bring results in 2025.

Following the Phase 1 (Discovery phase) of the TP App Reinvention project in 2024, Phase 2 (Implementation phase) will be undertaken to develop and deliver the new app in 2025 with a new supplier. This will grant the TP users with ease of access to the TP data and brand-new functionalities.

Furthermore, Discovery and Implementation phases for the other two roadmap themes will be tackled during 2025 in parallel, addressing data quality improvements and deepening of user engagement. For both of these projects, the scope and requirements defined with support of the project subgroups and external consultants will be in development phase in Q2 2025.

Relevant stakeholders and user groups, ETUG and Co-creation User Group (launched in 2024) will be involved in development and testing phases of the app to incorporate the needs and preferences of the market participants. These measures as part of TP Vision 2030 are set to improve the reliability and usability of the Transparency Platform and its services to the broader public.

ACER Data Exchange

ENTSO-E, in accordance with Arts. 30(1), 30(2) and 32 of Regulation (EU) 2019/943 (previously Arts. 8(8), 8(9) and 9(1) of Regulation (EC) No 714/2009), as well as Arts. 82(4) and 82(5) of the CACM Regulation and Art. 63(3) of the FCA Regulation, will make available data items from the CACM and FCA lists of information to ACER. The lists of information were discussed and agreed between ACER and ENTSO-E. Once the capacity calculation methodology in each CCR becomes compliant with CACM and with FCA, the respective TSOs are legally mandated to provide on a six-month basis these data items to ENTSO-E for delivery to ACER for its monitoring. The TP will be used to accommodate the submission of data from the CACM and FCA lists of information. Data provided on the TP for this purpose will not be available publicly and will only be provided to ACER.

In accordance with Art. 14(2) of the SOGL, ENTSO-E shall make available to ACER data included in the SOGL list of information, as agreed between ACER and ENTSO-E. The list of information has been updated to reflect the developments to the RCC services. To facilitate the provision of data from the SOGL list of information on the TP, the functionality of the TP will be extended.

5 Research, Development & Innovation

Tackling the Implementation Challenge for Innovation

ENTSO-E's Research, Development, and Innovation (RDI) activities, as legally mandated by Art. 30 (1)(i) of Regulation (EU) 2019/943, involve the coordination of research, development and innovation planning of TSOs and the deployment of those plans through efficient research programmes.

As the next step of the so called RDI Roadmap-cycle – the planning part of the regulation –, in 2025 ENTSO-E will publish its new **RDI Implementation Plan**, as a follow-up action of the RDI Roadmap 2024 – 2034. The Implementation Plan is based on a set of designed project concepts to be initiated by TSOs in collaboration with key stakeholders and supported by policy makers and regulatory authorities in the coming years. The document builds on the vision set out in the form of six Flagship topics in the ENTSO-E RDI Roadmap 2024 – 2034 and translates its milestones into tangible RDI project ideas. The Implementation Plan justifies the prioritisation of activities and serves as a guiding instrument for TSOs and the wider energy sector to prepare and activate urgently required RDI projects.

Related to the deployment of those plans and project ideas, ENTSO-E is continuously assessing the opportunities from open and future research programmes (e. g. EU funded) related to the priority topics of the TSOs i. e. flexibility, digitalisation and new technologies, higher electrification and stability management.

Flexibility: Priority for the Energy System, Priority for ENTSO-E

ENTSO-E has been working on implementing its Vision for a Power System for a Carbon Neutral Europe addressing system flexibility needs in preparation of the EU's **Electricity Market Design Reform** mandate to ENTSO-E and EU DSO Entity to develop a methodology to support the flexibility needs assessment at member state level. This workstream has officially started in Q2 2024 and will deliver results in 2025.

Digitalisation, Flexibility, Grid Efficiency: The EU Action Plans

Implementing the **'Digitalising the Energy System EU Action Plan'** will imply further tasks in 2025 as part of the joint work between the EU DSO Entity and ENTSO-E that is ongoing since 2023. This collaboration focuses on the development of a common framework for a digital twin of sophisticated virtual models for the European electricity grid, which can enhance the efficiency and smartness of the grid.

Furthermore, the EU **Action Plan for Grids** implies additional RDI-related tasks for ENTSO-E. Namely, Action 7 tasks **'ENTSO-E and the EU DSO Entity to promote uptake of smart grid, network efficiency and innovative technologies'**. As a part of this action, in 2025 the two Associations will continue updating jointly the **Technopedia**, a catalog of the state-of-the-art and innovative technologies of the industry, following closely the advancements and emerging trends relevant for the TSOs and the DSOs on a yearly basis.

In 2025, ENTSO-E is already committed to the following EU-funded projects:

1. **Int:NET (2022 – 2025)** consists of 12 partners (among those ENTSO-E external stakeholders E.DSO and Florence School of Regulation) and aims to create a common knowledge base for interoperability activities on energy services in Europe and to develop a comprehensive and accepted Interoperability Maturity Mode. The main effort of ENTSO-E regards Interoperability testing activities which aim to foster the harmonisation and interoperability of energy services, such as the Common Grid Models Exchange Standard (CGMES).
2. **TwinEU (2024 – 2026)** is a project involving 75 partners across 15 EU countries, with 13 TSOs directly involved in the project and two more as associated entities. The TwinEU aims to create an adaptable federated Pan-European digital twin ecosystem to enable a reliable, resilient and safe operation of the infrastructure while facilitating new business models that will accelerate the deployment of renewable energy sources in Europe. ENTSO-E's involvement focuses on ensuring that the TwinEU reference architecture and the related pan-European scenarios are aligned with the related TSO activities (such as the Digitalisation of Energy Action Plan).

6 New Network Codes, Guidelines and Regulations

Network Code Demand Response (NC DR)

Based on Art. 59 (9) of Regulation (EU) 2019/943, on 9 March 2023 the EU Commission invited ENTSO-E and DSO Entity to submit a proposal to ACER for the Network Code on Demand Response (NC DR) in line with the ACER Framework Guideline on Demand Response, within a reasonable period of time that should not exceed 12 months.

Pursuant to the mandate received, ENTSO-E and DSO Entity formed the TSO-DSO Development Team to draft the joint NC DR proposal and established a drafting committee to receive guidance and support from key stakeholder associations at European level. In order to foster transparency, enable public to present their views, and collect the views of stakeholders, ENTSO-E and the DSO Entity held a public consultation from 29 September to 10 November 2023 and organised two public workshops on 24 April and 13 October 2023.

After the final submission of NC DR, ENTSO-E, in cooperation with DSO Entity, will focus on implementation planning and implementation of NC DR in 2025.

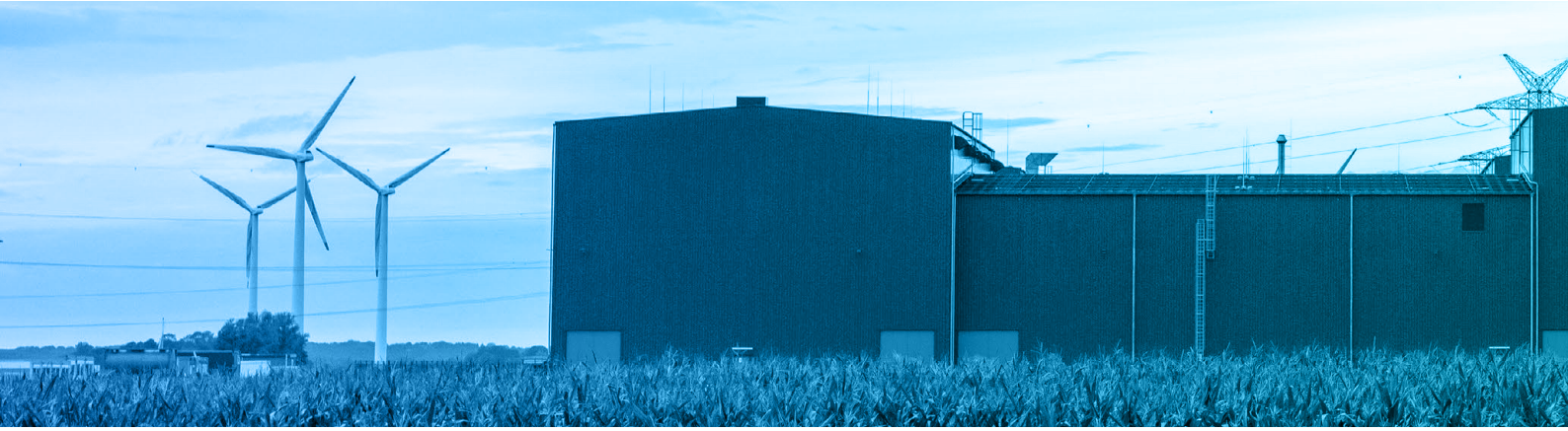
Network Code on Cybersecurity (NCCS)

On 23 July 2021, the European Commission (EC) requested that ENTSO-E, in close collaboration with the EU DSO entity and in accordance with Art. 59 (9) of Regulation (EU) 2019/943, submit a proposal for a Network Code on Cybersecurity (NCCS) aspects of cross-border electricity flows, including rules on risk assessments, common minimum requirements, planning, monitoring, reporting and crisis management, by 14 January 2022 to ACER. ACER submitted the revised NCCS, in consultation with ENTSO-E and the EU DSO Entity, on 6 July 2022. The EC shared the revised NCCS for a Public Consultation taking place from 20 October 2023 to 17 November 2023.

During 2025, all the entities falling under the scope of this Network Code shall perform activities to comply with the legal obligations.

For ENTSO-E, in close collaboration with the EU DSO entity, this would mainly, but not exclusively, mean the activities on:

- Supporting ACER in issuing non-binding performance indicators;
- Performing feasibility study to develop common tool to share incidents for all entities;
- Developing the cybersecurity risk assessment methodologies;
- Preparing a provisional list of European and international standards and controls;
- Developing the cybersecurity incidents classification scale methodology;
- Preparing a template to perform cybersecurity exercise (entity/national level).



Implementing Acts Data Interoperability

As required by Art. 24(2) of Directive (EU) 2019/944, in June 2023 the European Commission adopted the first Implementing Regulation on interoperability requirements and non-discriminatory and transparent procedures for access to metering and consumption data **(Commission Implementing Regulation (EU) 2023/1162)**, entered into force on 5 July 2023.

As part of this Implementing Regulation, ENTSO-E and EU DSO entity established a Joint Working Group on data interoperability.

The main tasks of the Joint Working Group shall include:

1. Developing guidance to assist Member States in the reporting of national practices;
2. Collecting the reports of national practices provided by Member States regarding the implementation of the reference model;
3. Publishing the reports of national practices in a publicly available repository which shall be kept up to date;
4. Assisting the European Commission in the monitoring of the implementation of the reference model included in the first implementing act and its further development as a result of regulatory, market or technology changes; and
5. Support the European Commission, upon its request, in developing, as part of future implementing acts, interoperability requirements and non-discriminatory and transparent procedures for access to data required for customer switching, demand response, and other services.

The next implementing acts deal with customer switching data and demand response data. The Joint Working Group, in which ENTSO-E participates, is currently supporting the European Commission in developing these acts. The Joint Working Group will have to cooperate with all relevant stakeholders, including representatives of national regulatory authorities, consumer associations, electricity retailers, European standardisation organisations, service and technology providers, and equipment and component manufacturers.

7 Cooperation on the Transmission & Distribution Interface

Regulation (EU) 2019/943 requires ENTSO-E to cooperate with the EU DSO Entity and Distribution System Operators (DSOs). In this vein, in January 2022, ENTSO-E and the EU DSO Entity signed a Memorandum of Understanding (MoU) which further specifies the principles of this cooperation. This MoU covers the following areas described in this chapter and is complemented by a specific common work plan updated every year.

Network Codes and Guidelines

ENTSO-E will pursue the ongoing cooperation with the EU DSO Entity on the development of a European framework for demand-side flexibility (see chapter 6). ENTSO-E also strives to align positions with the EU DSO Entity on amendments of existing Network Codes and guidelines. Cooperation will also continue regarding the implementation of the Cybersecurity Network Code (see chapter 6).

Cooperation on Applying Best Practices on Operation and Planning of the Transmission and the Distribution Systems

Based on Art. 55(2) of Regulation (EU) 2019/943, ENTSO-E will strengthen its cooperation with the EU DSO Entity in various areas pertaining to the planning and operation of the transmission and distribution systems. Related to system planning, ENTSO-E will further involve DSOs in the TYNDP 2024 and 2026 besides common scenarios building. It aims to exchange and promote best practices on TSO – DSO cooperation for network development at the national level. Both Associations will also work together in the development of new implementing acts and maintenance of reference model for data interoperability and access (see chapter 6). Related to research and development, ENTSO-E will continue to work together with the EU DSO Entity in 2025 on the implementation of the EU Action Plan Digitalizing the Energy Sector, including the development of a framework for the digital twin of the electricity grid. In addition, ENTSO-E and the EU DSO Entity might also organise, at ad hoc basis, a series of thematic workshops focusing on planning and operational issues.

In addition, ENTSO-E with other relevant stakeholders, will organise as well as more forward-looking discussions on topics such as the realisation of an ENTSO-E Vision of a power system for a carbon-neutral Europe, but also the elements being provided in the ENTSO-E strategic roadmap.

8 Interoperability and Data

ENTSO-E develops and maintains the Electronic Data Interchange (EDI) library and the Common Grid Model Exchange Standard (CGMES) library. These gather documents and definitions for the harmonisation and implementation of standardised electronic data interchanges to enable interoperability between actors in the European electrical industry.

ENTSO-E also maintains and develops the tooling necessary for data exchange harmonisation. In accordance with Art. 30(1)(k) of Regulation (EU) 2019/943, ENTSO-E should contribute to the establishment of interoperability requirements and non-discriminatory and transparent procedures for accessing data.

Main activities in 2024 will include the development of the Common Information Model (CIM) and implementation guides to support data exchanges required from the Network Codes and Clean Energy Package; work on international standards; updating the CGMES and RCC services data exchange profiles; maintaining the harmonised role model, participating in the Joint Working Group and contributing to the development, implementation and monitoring of data interoperability implementing acts and access; contributing to Common Energy Data Space and Digital Twin discussions as foreseen in DESAP; implementing Art. 55(2)(a, b, c) of Regulation (EU) 2019/943 and Art. 24 of Directive (EU) 2019/944; and training activities for the TSO–RCC community.

9 Monitoring and Reporting Activities

ENTSO-E will publish the yearly Market Report. The report will cover the progress made in the implementation of CACM, FCA, and EB Regulations which are in bringing the internal European electricity market closer to full realisation. The report will be published in accordance with Art. 82 of the CACM Regulation, Art. 63 of the FCA Regulation, and Art. 59 of the EB Regulation.

Additionally, ENTSO-E will publish the Biennial Report on Capacity Calculation and Allocation which will outline the results of monitoring the implementation of the coordinated capacity calculation processes in each CCR in ID, DA, and long-term timeframes.

The report will be published in accordance with Art. 31 and Art. 82(2)(b) of the CACM Regulation as well as Art. 26 and Art. 63(1)(c) of the FCA Regulation.

Annex 1: List of Abbreviations

ACER	Agency for the Cooperation of Energy Regulators
aFRR	automatic Frequency Restoration Reserves
AWP	Annual Work Programme
BZ	Bidding Zone
BZR	Bidding Zone Review
CACM Regulation	Regulation (EU) 2015/1222 establishing a guideline on capacity allocation and congestion management
CBA	Cost Benefit Analysis
CC	Capacity Calculation
CCC	Coordinated Capacity Calculation
CCR	Capacity Calculation Region
CGM	Common Grid Model
CGMES	Common Grid Model Exchange Standard
CID	Congestion Income Distribution
CIM	Common Information Model
CN	Communication Networks
CNC	Connection Network Code
CSA	Coordinated Security Analysis
CSAM	Coordinated Security Analysis Methodology
CZC	Cross-zonal Capacity
DCC	Regulation (EU) 2016/1388 establishing a Network Code on Demand Connection
DSO	Distribution System Operator
EAS	European Awareness System
EDI	Electronic Data Interchange
EED	Energy Efficiency Directive
EG	Expert Group
ENTSO–E	European Network of Transmission System Operators
ENTSOG	European Network of Transmission System Operators for Gas
ERAA	European Resource Adequacy Assessment
ESC	European Stakeholder Committee
EU	European Union
FCA Regulation	Regulation (EU) 2016/1719 establishing a guideline on forward capacity allocation
FSKar	Financial Settlement of KΔf, ACE and ramping period
GUI	Graphical User Interface
HVDC	Regulation (EU) 2016/1447 establishing a Network Code on requirements for the grid connection of high voltage direct current systems and direct current-connected power park modules
IGD	Implementation Guidance Document

IGM	Individual Grid Model
IN	Imbalance Netting
ITC	Inter Transmission System Operator Compensation
mFRR	manual Frequency Restoration Reserves
MoP	Manual of Procedures
MoU	Memorandum of Understanding
NC DSR	Network Code on Demand Side Response
NC ER	Regulation (EU) 2017/2196 establishing a Network Code on electricity emergency and restoration
NCCS	Network Code on Cybersecurity
NEMO	Nominated Electricity Market Operator
NTC	Net Transfer capacities
OPC	Outage Planning Coordination
OPDE	Operational Planning Data Environment
RCC	Regional Coordination Centre
RDI	Research, Development and Innovation
RfG	Regulation (EU) 2016/631 establishing a Network Code on requirements for grid connection of generators
RG CE	Regional Group Continental Europe
Risk Preparedness Regulation	Regulation (EU) 2019/941 on risk-preparedness in the electricity sector
RPP	Risk Preparedness Plan
RSC	Regional Security Coordinator
SAFA	Synchronous Area Framework Agreement
SAP	Single Allocation Platform
SOGL	Regulation (EU) 2017/1485 establishing a guideline on electricity transmission system operation
SOR	System Operation Region
STA	Short-term Adequacy
StG ReC	Steering Group Regional Coordination
TEN-E Regulation	Regulation (EU) 2022/869 on guidelines for trans-European energy infrastructure
TCA	Trade and Cooperation Agreement
TP	Transparency Platform
Transparency Regulation	Regulation (EU) No 543/2013 on the submission and publication of data in electricity markets
TSO	Transmission System Operator
TYNDP	Ten-Year Network Development Plan
WAMS	Wide Area Monitoring System

Annex 2: List of Deliverables

Topic	Regulation	Article	Level 1 | Article | content / activity	J	F	M	A	M	J	J	A	S	O	N	D
MARKETS															
Annual Work Programme	Reg. 2019/943	A. 30.1 j	Adopt an Annual Work Programme							W					
CACM	Reg. 2019/943	A. 8.4	Implementation of 15 minutes products in ID and DA												
CACM	Reg. 2019/943	A. 15	CCR determination – possible relevant amendments												
CACM	Reg. 2015/1222	A. 49 A. 56	Review of the Scheduled Exchanges methodologies	The exact timeline of work is to be provided											
CACM	Reg. 2019/943	A. 44	Review of the regional fallback procedures												
CACM	Reg. 2015/1222	A. 37.6	NEMOs review of the algorithm methodology in cooperation with TSOs												
CACM	Reg 2015/1222	A. 59	Intraday cross-zonal gate opening and intraday cross-zonal gate closure times – EMDR implementation												
CACM	Reg. 2015/1222	A. 73	Assessment of the CID methodology												
CACM	Reg. 2015/1222	A. 73	Implementation of the Cross CCR CID – ACER's decision												
Capacity Mechanisms	Reg. 2019/943	A. 26 (11)	Annual Report on Cross-Border Participation to Capacity Mechanisms												
Congestion Revenues	Reg. 2019/943	A. 19	Prepare Annual Congestion Revenues Overview Report 2024												
EB	Reg. 2017/2195	A. 20.6	Implementation of mFRR Platform (change requests implementation, technology upgrades, etc.)												
EB	Reg. 2017/2195	A. 21.6	Implementation of aFRR-Platform (change requests implementation, technology upgrades, etc.)												
EB	Reg. 2017/2195	A. 21	Proposal for amendment of the implementation framework of aFRR-Platform.												
EB	Reg. 2017/2195	A. 30 (1)	Proposal for amendments of the Methodology for pricing balancing energy and cross-zonal capacity used for the exchange of balancing energy or operating the IN process												
EB	Reg. 2017/2195	38 (3)	TSO implementation tasks pursuant to CZCA Harmonised Methodology												
EnC TF	Adapted EnC Reg 2019/243, etc.	N/A	Support EnC TSOs and the TSOs from adjacent EU MSs with matters on EnC legislation compliance, and strategic engagement with EnC Secretariat, ACER, EC												
FCA	Reg. 2016/1719	A. 51	Harmonised Allocation Rules (FCA Article 51) – subject to the results of the review												
FCA	Reg. 2016/1719	A. 49 A. 57 and A. 61	Long-Term Market development												
FCA	Reg. 2016/1719		Develop the amendment of the FCA regulation	The exact timeline of work is to be provided											
ITC	Reg. 2018/838	Annex A A. 7.3	Collection of annual data, audit and publication of the perimeter fee												
ITC	Reg. 2018/838	Annex A A. 4.3	Transit Losses Data Report												
ITC	Reg. 2018/838		Promote structural improvements to the ITC Mechanism												
Monitoring CACM	Reg. 1222/2015	A. 80.2	Annual CACM cost report	The exact timeline of work is to be provided											
Monitoring CACM	Reg. 1222/2015	A. 82.2	Monitor the implementation of single day-ahead and intraday coupling including progress and potential problems with the implementation												
Monitoring CACM	Reg. 1222/2015	A. 82.4 & A. 82.5	Collect data from TSOs/CCRs based on the list of information agreed between ACER and ENTSO-E. Data is to be submitted following the go live of the methodologies in each CCR and on a six-month basis following that. The data will be made available to ACER in order to complete its monitoring activities.*												
Monitoring CACM	Reg. 1222/2015	A. 31.2	Capacity Calculation and allocation report												
Monitoring EB	Reg. 2017/2195	A. 23.1	Report on costs of establishing, amending and operating European balancing platforms												

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Topic	Regulation	Article	Level 1 | Article | content / activity	J	F	M	A	M	J	J	A	S	O	N	D
Monitoring EB	Reg. 2017/2195	A. 63.1	Monitoring of the implementation of the EB												
Monitoring EB	Reg. 2017/2195	A. 63.3 & A. 63.4	Collect data from TSOs based on the list of information agreed between ACER and ENTSO-E.												
Monitoring FCA	Reg. 2016/1719	A. 63.1	Monitor the implementation of forward capacity allocation and the establishment of single allocation platform including the progress and potential problems with the implementation												
Monitoring FCA	Reg. 2016/1719	A. 63.3 & A. 63.4	Collect data from TSOs/CCRs based on the list of information agreed between ACER and ENTSO-E. Data is to be submitted following the go live of the methodologies in each CCR and on a six-month basis following that. The data will be made available to ACER in order to complete its monitoring activities.												
Monitoring FCA	Reg. 2016/1719	A. 26.2	Capacity Calculation and allocation report												
NC DR	Reg. 2019/943	Article 59.1e (NC DSR)	Rules implementing Article 57 of this Regulation and Articles 17, 31, 32, 36, 40 and 54 of Directive (EU) 2019/944 in relation to demand response, including rules on aggregation, energy storage, and demand curtailment rules												
RCC	CEP	A. 37.1.k	RCC Procurement Proposal – Definition of Parameters to be applied to Assessment of available non-contracted platform bids									W			
Tariff	Reg. 2019/943	A. 18	Publish Transmission Tariff Overview Report 2024												
TEN-E	Reg. 2022/869		Preparatory work towards application of the cost-benefit and cost-sharing to the priority offshore grid corridors	The exact timeline of work is to be provided											
TP	Reg. 2013/543		Continuation of TP back-end architecture and front-end implementation												
TP	Reg. 2013/543		TP Vision 2030 Data Quality improvement project												
TP	Reg. 2013/543		TP Vision 2030 User Engagement project												
TP	Reg. 2013/543		TP app development												
	EU Grid Action Plan	Action 8	Promote sound and fair regulatory treatment of TSO costs that promote cost efficiency, performance, and innovation												
	EU Grid Action Plan	Action 4	Propose solutions on the treatment of anticipatory investments												
SYSTEM OPERATION															
RCC	CEP	37.1.j	RCC Sizing Proposal: Definition of parameters values									W			
RCC	Reg. 2019/943	A. 30 (2)	Report to ACER on shortcomings identified regarding the establishment and performance of regional coordination centres.												
RCC	Reg. 2019/943 Reg. 2017/2196	A. 37.1.d A. 6 (3)(4)	ENTSO-E shall develop proposals for RCC tasks – Consistency defense and restoration plans												
RCC	Reg. 2019/943	A. 37.1.e	ENTSO-E shall develop proposals for RCC tasks – Short term adequacy												
RCC	Reg. 2019/943	A. 37.1.f	ENTSO-E shall develop proposals for RCC tasks – Outage Planning Coordination												
RCC	Reg. 2019/943	A. 41 (2)	ENTSO-E and RCCs shall operate transparently and publish documents on websites, full transparency towards stakeholders												
RCC	Reg. 2019/943	A. 37.1.o	Implementation for the MEC task												
RCC	Reg. 2019/943	A. 46 (3)	ENTSO-E to receive from RCCs the RCC Annual Report												
RCC	Reg. 2019/943	A. 37.1.h	ENTSO-E shall develop proposals for RCC tasks – supporting regional restoration	The exact timeline of work is to be provided											
RGCE Operations	Reg. 2017/1485	A. 156	RG CE: Implementation Art. 156 SO GL – TminLER for FCR (frequency containment reserves) by LER (low energy reservoirs)												
RPP	Reg. 2019/941	A. 6	Review of simulation / evaluation methods based on experience in 2024, with a revision of the methodology 2027.												

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SOGL	Reg. 2017/1485	A. 114	* Operate an ENTSOE operational planning data environment (OPDE) for the storage, exchange and management of all relevant information for the CGM Business Process.												
SOGL	Reg. 2017/1485	A. 65	Common list of year-ahead scenarios against which TSOs assess the operation of the interconnected transmission system for the following year												
SOGL	Reg. 2017/1485	A. 14.2	Comprehensive, standardised format, digital data archive of the information required by ACER												
SOGL	Reg. 2017/1485	A. 15	Annual incident classification scale report												
SOGL	Reg. 2017/1485	A. 16	Annual report on load-frequency control												
SOGL	Reg. 2017/1485	A. 17	Annual report on regional coordination assessment												
SOGL Regional	Reg. 2017/1485 Reg. 2017/2196	SOGL A. 13/ A. 118 E&R A. 10	Agreement for Future Synchronous Operation between Continental Europe TSOs and Moldelectrica												
SOGL Regional	Reg. 2017/1485 Reg. 2017/2196	SOGL A. 13/ A. 118 E&R A. 10	Implementation of the agreement for Synchronous Operation between Continental Europe TSOs and KOSTT												
SOGL Regional	Reg. 2017/1485 Reg. 2017/2195 Reg. 2017/2196	SOGL A. 13/ A. 118 EBGL A. 50, 51 E&R A. 10	RG CE: Implementation of SAFA methodologies (including FSKar)												
SOGL Regional	Reg. 2017/1485	SOGL A. 118	CFI agreements of BS TSOs before synchronization and adherence to SAFA after their synchronisation with SA CE												
SOGL/CSAM	Reg. 2017/1485	A. 75.1/ A. 44.1	Report on status on probabilistic risk management approaches and maturity												
RESEARCH, DEVELOPMENT & INNOVATION													
EMDR	Provisional agreement in Dec 2023, Entry into force will be 16 July 2024		Methodology for the Analysis by TSOs and DSOs of the National Flexibility Needs (ENTSO-E and EU DSO Entity)												
System Flexibility Needs	n/a	n/a	System Flexibility Needs for the Energy Transition												
RDI			IntNET project work												
RDI	Reg. 2019/943	A. 30.1/i.	RDI Roadmap-cycle (Roadmap, Implementation Plan, Monitoring Report)												
RDI	Reg. 2019/943	A. 30.1/i.	Initiation of projects based on the ongoing programmes												
RDI	Reg. 2019/943	A. 30.1/i.	Development of new programmes												
RDI			Digitalisation of Energy Action Plan (DoESAP)												
RDI	EU Action Plan for Grids – Action 7		Technopedia yearly update												
RDI			Digital Twin for Europe (TwinEU)												
RDI			Strategic Roadmap Implementation (Former Vision Implementation)												
SYSTEM DEVELOPMENT													
Adequacy	Reg. 2019/943	A. 23	ERAA (European Resource Adequacy Assessment)												W
Adequacy	Reg. 2019/943	A. 30.1 m	Summer Outlook						W						
Adequacy	Reg. 2019/943	A. 30.1 m	Winter Outlook												W
DC	Reg. 2016/1388	A. 56	Non-binding guidance on implementation of DC NC, explaining technical issues, conditions and interdependencies												
HVDC	Reg. 2016/1447	A. 75	Non-binding guidance on implementation of HVDC NC, explaining technical issues, conditions and interdependencies												
HVDC	Reg. 2016/1447	A. 76.2	NC HVDC List of information to ACER												
RfG	Reg. 2016/631	A. 58	Non-binding guidance on implementation of RfG NC, explaining technical issues, conditions and interdependencies												
RfG	Reg. 2016/631	A. 59.2	RfG List of information to ACER												
RfG, DC, HVDC	Reg. 2016/631, 2016/1388, 2016/1447	A. 59.1, A. 57.1, A. 76.1	Monitoring (analysis and preparation of report) – joint CNCs report												

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RfG, DC, HVDC	Reg. 2016/631, 2016/1388, 2016/1447	A. 7.3.f & preamble 27, A. 6.3.f & preamble 17. A. 5.3.f & preamble 13	Monitoring of existing and under development standards												
TYNDP	TEN-E	A. 11	CBA methodology	The exact timeline of work is to be provided											
TYNDP	TEN-E	A. 12	TYNDP scenarios												
TYNDP	TEN-E	A. 13	TYNDP 2024 gap analysis / system needs												
TYNDP	TEN-E	A. 13	TYNDP 2026 gap analysis / system needs												
TYNDP	TEN-E	Annex III, 2, 1	TYNDP 2024 CBA												
TYNDP	TEN-E	Annex III, 2, 1	TYNDP 2026 CBA												
TYNDP	TEN-E	A. 14.2	Offshore Network Development Plans 2024												
TYNDP	TEN-E	A. 14.2	Offshore Network Development Plans 2026												
TYNDP	TEN-E	A. 11, para 10 & 11	Interlinked model												
TYNDP	TEN-E	A. 15	Application of the cost-benefit and cost-sharing to the priority offshore grid corridors												
	EU Grid Action Plan	Action 6	Harmonised definitions of available grid hosting capacities and pan-EU overview												
	EU Grid Action Plan	Action 13	Develop common technology specifications and improve visibility of grid projects pipelines	The exact timeline of work is to be provided											
ICTC															
Communication Networks (CN)	Reg. 2017/2196	Art. 41	Communication Systems for the restoration plans/needs during an emergency state	The exact timeline of work is to be provided											
Cybersecurity	NCCS	A. 12 (5)	Support ACER to issue non-binding performance indicators for the assessment of operational reliability that are related to cybersecurity aspects of cross-border electricity flows.												
Cybersecurity	NCCS	A. 6(2) (a) / A. 18 (1)	Develop proposals for the cybersecurity risk assessment methodologies												
Cybersecurity	NCCS	A. 35 & 36	Develop sets of cybersecurity procurement recommendations												
Cybersecurity	NCCS	A. 19 (1)	Perform union-wide cybersecurity risk assessment	The exact timeline of work is to be provided											
Cybersecurity	NCCS	A. 24 (5)	Provide analysis of entity aggregation to NCCS-NCAs	The exact timeline of work is to be provided											
Cybersecurity	NCCS	A. 43 (5)	Make available template to perform cybersecurity exercise (Entity/National)												
Cybersecurity	NCCS	A. 44 (6)	Make available template to perform cybersecurity exercise (Regional/Cross-Regional)	The exact timeline of work is to be provided											
Cybersecurity	NCCS	A. 37 (9)	Perform feasibility study to develop common tool												
Cybersecurity	NCCS	A. 6 (2) (e) & A. 37 (8)	Develop a cybersecurity incidents classification scale methodology												
Cybersecurity	NCCS	A. 48 (6)	Prepare a provisional list of European and international standards and controls												
EAS	SOGL A. 42, 152, NCER A. 28	SOGL A. 42, 152, NCER A. 28	EAS renewal / upgrade												
EAS	SOGL A. 42, 152, NCER A. 28	SOGL A. 42, 152, NCER A. 28	EAS WAMS Phase 1	The exact timeline of work is to be provided											
EAS	SOGL A. 42, 152, NCER A. 28	SOGL A. 42, 152, NCER A. 28	EAS WAMS Phase 2												
EAS	SOGL A. 42, 152, NCER A. 28	SOGL A. 42, 152, NCER A. 28	EAS Balancing platforms integration	The exact timeline of work is to be provided											
EAS	SOGL A. 42, 152, NCER A. 28	SOGL A. 42, 152, NCER A. 28	WAMS ex-post analysis tool												
EAS	SOGL A. 42, 152, NCER A. 28	SOGL A. 42, 152, NCER A. 28	EAS Data Streaming Pilot	The exact timeline of work is to be provided											
Interoperability	Reg. 2019/944	A. 23 & 24	Draft/Monitor Implementing acts on data access and data interoperability + maintain reference model												

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