

# Enhanced TSO Regional Coordination for Europe

Act locally, coordinate regionally, think European



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While the regional cooperation of transmission system operators (TSOs) extends beyond operations and markets, this ENTSO-E report on enhanced TSO regional coordination for 2030 focuses on operational and market needs.

This focus is important, as markets and operations are getting closer by the day: electricity is traded closer to real time, markets are more volatile, generation is more variable, and cross border and long-distance transmission are on the rise. This calls for tightening the knots between markets and physics to guarantee a high level of security of supply for Europeans.

This paper presents a series of recommendations and a roadmap for TSO coordination to continue support for a “European pathway” to maximise social welfare while guaranteeing, for the next decade and beyond, the same level of supply as we have today.

TSOs' main task is to ensure the operational security of the power system from long term to real time. Besides transporting electrical power on a national level from generators to large consumers and distribution grids and from/to interconnections, TSOs are responsible for planning, developing and upgrading the power networks to maintain security of supply, cost efficiency and deliver policy targets on climate and energy. TSOs facilitate power markets and cross border electricity trade. To ensure secure operation on European level TSOs closely coordinate at regional and pan-European level.

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# 1 TSO regional coordination: Where do we start?

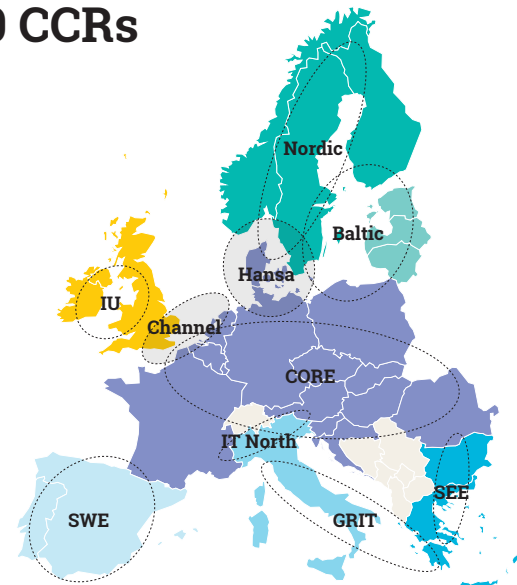
TSO regional coordination in system operations and markets is organised around 10 capacity calculation regions (CCRs), five synchronous areas (SAs), and five regional security coordinators (RSCs) (see Figure 1). ENTSO-E provides the platform to ensure the interoperability of the different regional settings and tools to enable delivery of TSO regional coordinated tasks.

The Clean Energy Package (CEP) has introduced the following provisions affecting TSO regional coordination:

- **Regional Coordination Centres (RCCs)**, should be built, based on RSCs experience, with regulatory oversight on their coordination performance and additional tasks
- **A Risk Preparedness Regulation**, under which Member States, regulators, and TSOs – supported by ENTSO-E and RCCs – assess and propose aligned measures to cope with a lack of system adequacy, will be enforced
- **System Operation Regions (SOR)**<sup>1</sup> should be established specifying the included TSOs, bidding zones, bidding zone borders, CCRs, and outage coordination regions. SORs, supported by RCCs, should ensure higher transparency on the joint TSO decision-making processes. A SOR shall include at least one CCR.

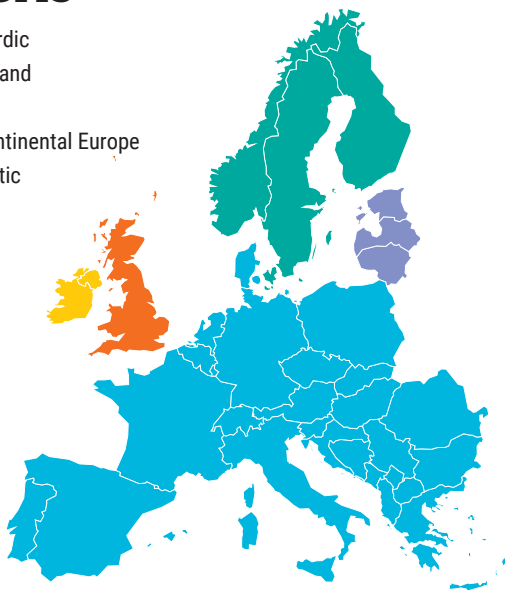
<sup>1</sup> Article 36 of proposal for Electricity Regulation in CEP

## 10 CCRs



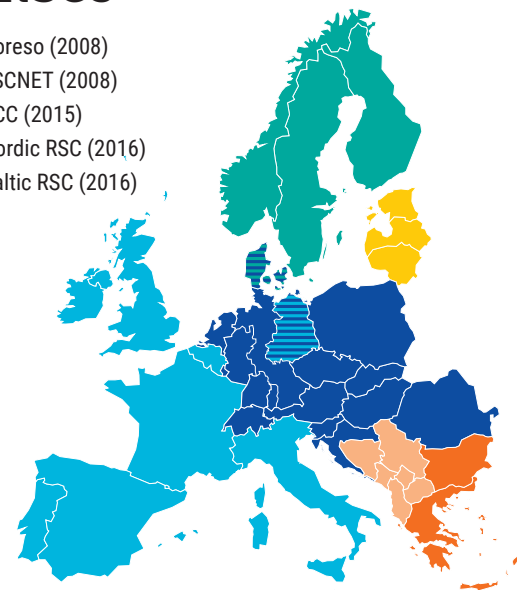
## 5 SAs

- Nordic
- Ireland
- UK
- Continental Europe
- Baltic



## 5 RSCs

- Coreso (2008)
- TSCNET (2008)
- SCC (2015)
- Nordic RSC (2016)
- Baltic RSC (2016)



■ Services obtained from several RSCs ■ Services currently obtained from SCC

Figure 1: State of play of TSO regional coordination in markets and system operations.



## 1.1 Focus on markets: Evolution of CCRs

The evolution of CCRs is bound to the following points (see Figure 2):

- development, approval and implementation of capacity calculation methodologies<sup>2</sup>,
- development, approval and implementation of countertrading and redispatching methodologies,
- implementation of 15-minute market time units in day-ahead, intraday, and balancing, as well as during imbalance settlement periods, and
- harmonisation of rules within and between CCRs.

A new configuration of the CCRs can be envisaged only after all these work packages, which have been kick-started, are completed. Any new configuration is to be weighed against alternative measures such as introducing advanced hybrid coupling and strengthening cooperation between CCRs. The key drivers for the evolution of the CCRs should be the harmonisation of technical processes – because of the increased interdependency of the flows – and socioeconomic efficiency.

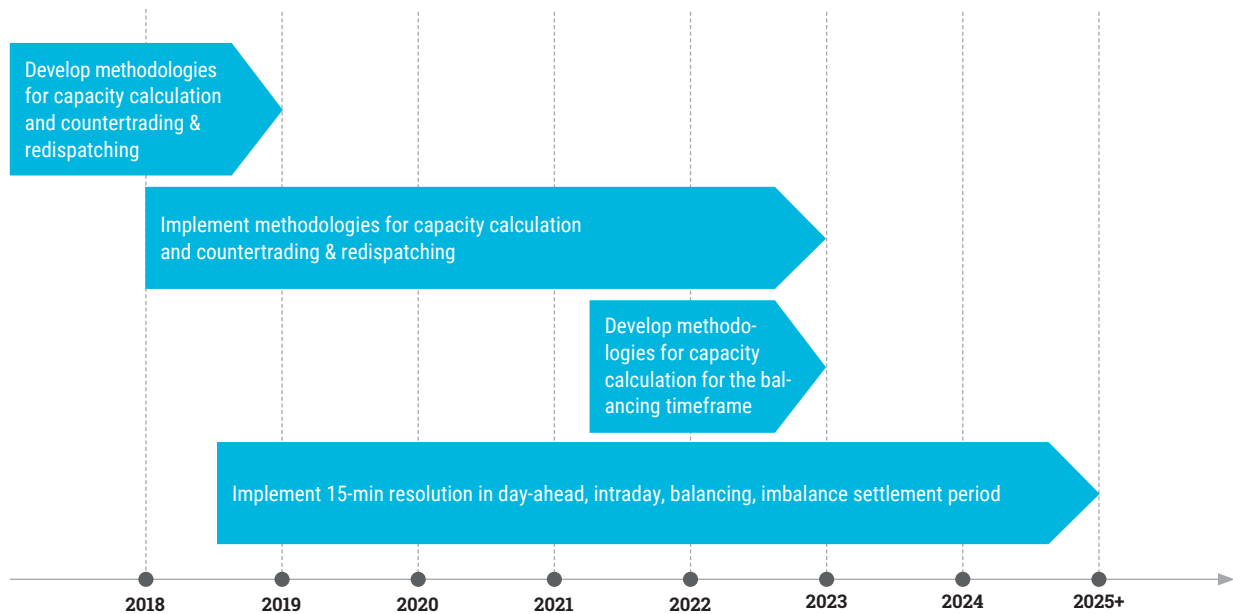


Figure 2: Timeline for major evolution of the CCRs

<sup>2</sup> Harmonisation of all flow-based methodologies into a single one is a CACM target. However, it might not be implemented in some regions at this time. A flow-based methodology is used to calculate available cross-border capacity based on the actual situation of the national grids. It takes into account the fluctuation of energy flows, and it offers market participants and public authorities a more accurate view of the grid on which to base their decisions. Approved capacity calculation methodologies for different regions can be found [here](#).

## 1.2 Focus on operations: from RSCs to RCCs

RCCs will evolve from RSCs experience as required by the CEP. The five standard operational services<sup>3</sup> – common grid model, coordinated operational planning, security analysis, outage planning coordination, short- to medium-term adequacy forecast, and coordinated capacity calculation – and the service for organisational support<sup>4</sup> – consistency check of TSOs’ system defence and restoration plans – will be transferred from RSCs to RCCs in the next decade.

critical grid situations – and new tasks identified in the CEP will become part of the RCCs’ portfolio, while other tasks mentioned in the CEP will be part of the RCCs’ portfolio only if delegated by the TSOs.

The RCCs’ portfolio (see Figure 3) should remain flexible, allowing TSOs to adapt to regional needs and to go beyond legal requirements as needed.

The services that TSOs will identify in the future as in need of regional coordination – such as the management of

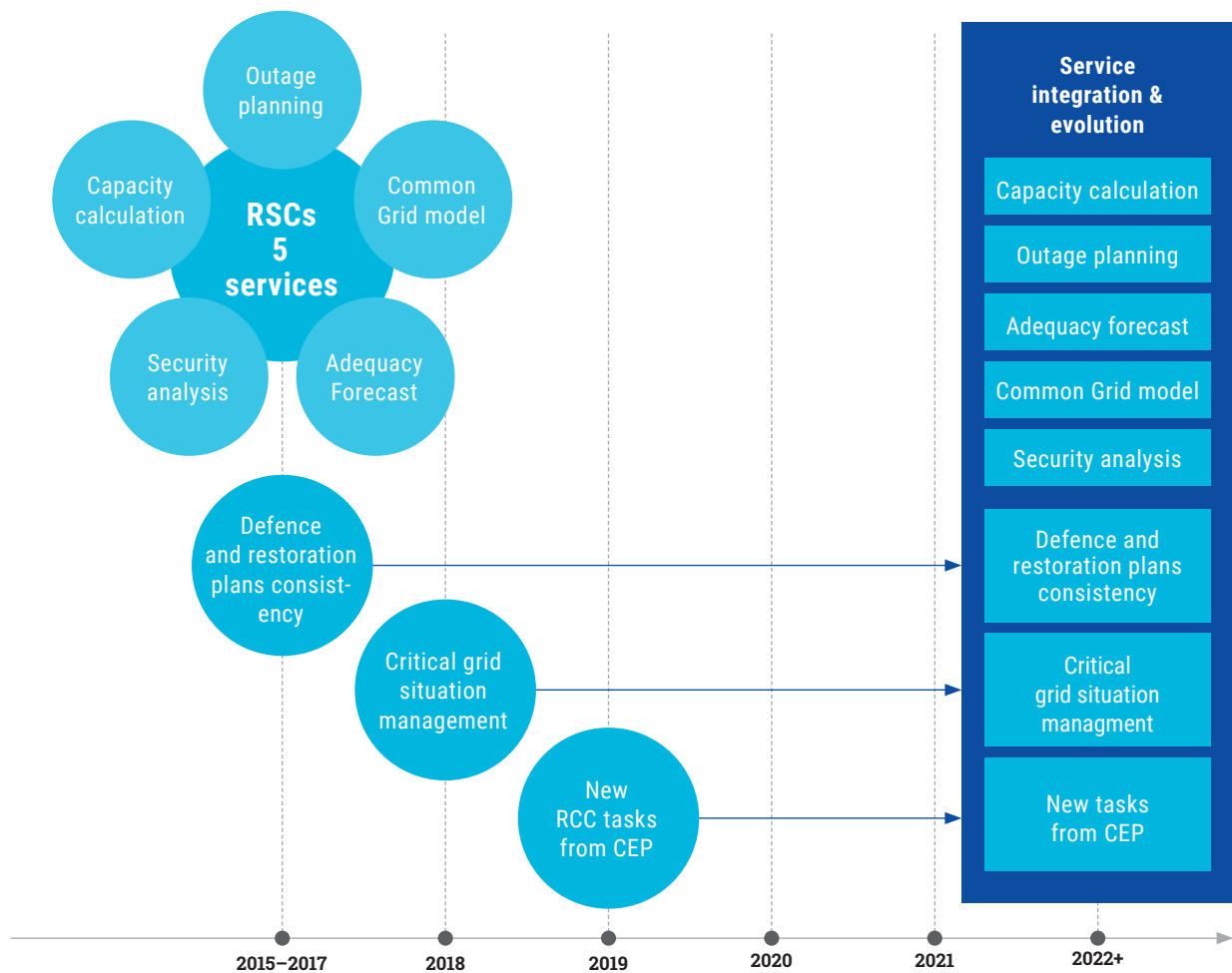


Figure 3: Evolution in regional coordinated services (Timeline refers to entry into force and implementation of relevant network codes, all TSO decisions, and CEP regulation.)

3 Common grid model, coordinated operational planning, security analysis, outage planning coordination, short- to medium-term adequacy forecast (all pursuant to SO GL), and capacity calculation (pursuant to CACM).

4 Consistency check of TSOs’ system defence and restoration plan pursuant to NC ER.

## 2 TSO enhanced regional coordination: How to get there

ENTSO-E has identified seven key pillars, or key principles, for enhanced regional TSO coordination in the next decade.

### Key Pillars for enhanced TSO regional coordination by 2030

- 1. TSOs act locally, coordinate regionally – within and across regions – and collectively think European. TSOs coordinate for the benefit of society at large.**
- 2. The evolution of regional TSO coordination should be pragmatic and follow an evolutionary approach, taking stock of lessons learned to resolve new challenges.**
- 3. Strengthening the link between system and market operation is essential for a secure, sustainable, and cost-effective electricity supply in Europe.**
- 4. The Regional Coordination Centres (RCC) should build upon the positive structures and services of RSCs to TSOs. Under the CEP, RCCs should address the capacity calculation regions (CCRs) and appropriately accommodate the future concept of System Operation Regions (SORs)<sup>5</sup>.**
- 5. Coordination services should grow in a flexible, modular, and organic manner, addressing the needs for running CCRs and SORs and going beyond legal requirements as needed.**
- 6. TSO regional coordination should have a suitable legislative and regulatory framework and sufficient time to deliver the legally mandated tasks. Regional Energy Forums should support the evolution of TSO coordination by providing policy alignment and perspective.**
- 7. TSO coordination should support a “European pathway” to maximise social welfare in partnership with DSOs and relying on close cooperation of all Member States, NRAs, EC, ACER, and other relevant stakeholders.**

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<sup>5</sup> System operation regions of CEP of tomorrow will be defined by ENTSOE, ensuring consistency of requirements in Guidelines and effective implementation of CEP requirements.

Based on these seven key pillars, ENTSO-E proposes a three-time-horizon roadmap for an enhanced regional TSO coordination (see Figure 4). Beyond 2030, with all RCCs op-

erational and CEP provisions up and running, new market models and new ways for system operations would move to centre stage.

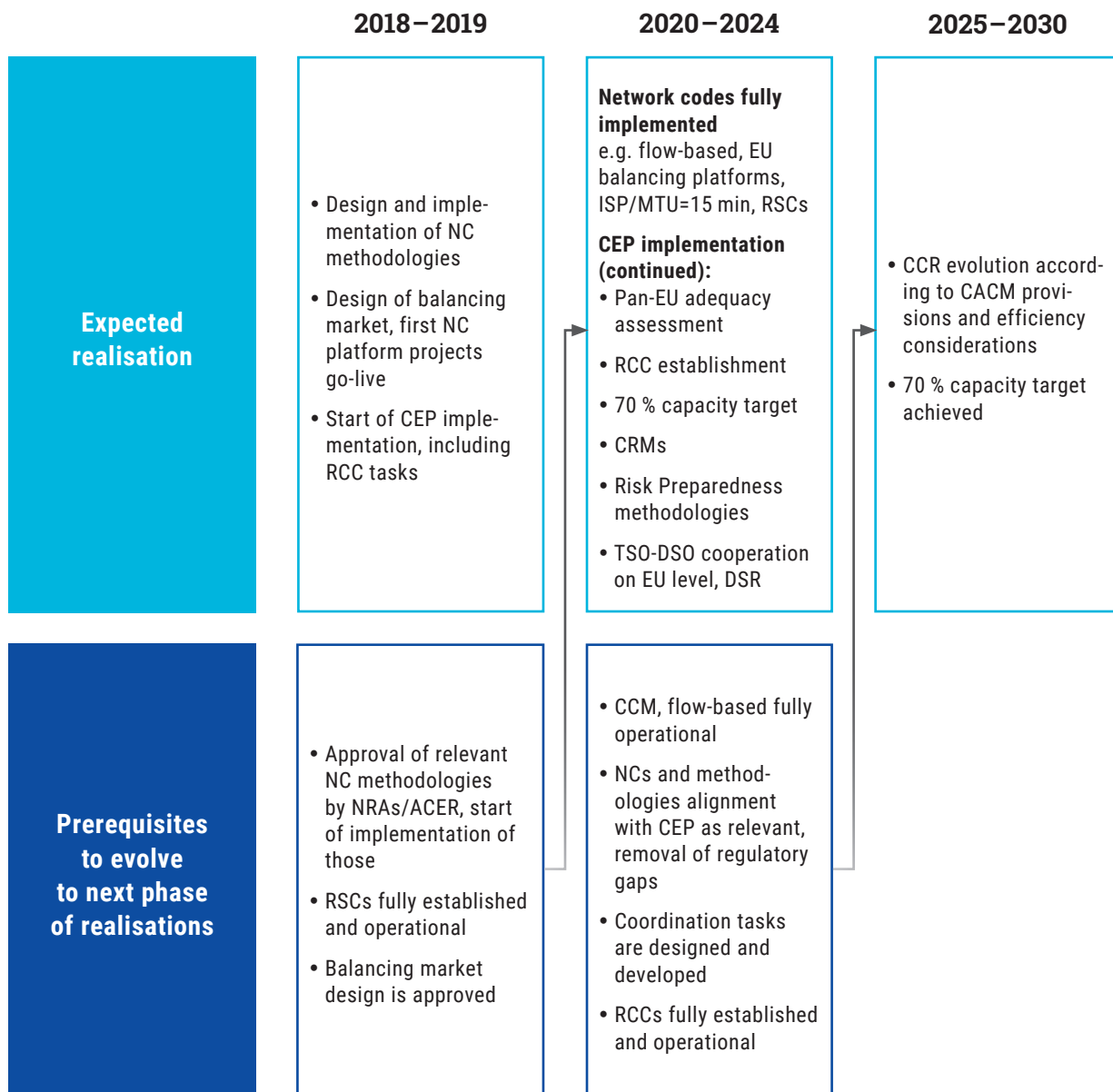


Figure 4: Roadmap for TSO regional coordination in markets and operations



# 3 European TSOs committed to enhanced coordination

The commitment of European TSOs to stronger regional coordination comes at an important time for Europe's electricity system. Indeed, before the end of 2019, the COP25<sup>6</sup> on implementing the Paris Agreement will have taken place, new National Energy and Climate Plans will have been submitted to the European Commission, a new European Parliament and Commission will have taken office and possible new climate and energy targets as well as stricter monitoring of the achievement of targets by the EU policy makers will be proposed.

If 2019 closes an important decade for Europe's power system, the next 10 years will be equally decisive, with the full implementation of EU network codes and of the CEP on the agenda. This comes with complex capacity calculation and increased cross border coordination to manage the security of supply.

European TSOs stand ready to enhance their coordination to bring additional value to the over 500 million customers they serve, be it in terms of economic efficiency, the security of supply, or sustainability. The recommendations and roadmap included in this paper are a token of this commitment. Policy and regulatory coordination, as well as cooperation across the electricity value chain, within and between regions, are needed to move Europe's power system and market from the 2020s to the 2030s.

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6 25<sup>th</sup> session of the Conference of the Parties (COP 25) to the UNFCCC, expected to take place 02–13 December 2019.



European Network of  
Transmission System Operators  
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