

# Regional Operational Centres: A review of the Commission's proposal and recommendations for improvement

Phil Baker, Regulatory Assistance Project

Julie Finkler, Client Earth

Christos Kolokathis, Regulatory Assistance Project

## 1. Introduction

The European electricity sector is undergoing significant changes, including the regionalisation of electricity markets and the integration of intermittent renewable resources that together have resulted in increased and more volatile power flows. These challenges have in recent years led transmission system operators (TSOs) across Europe to increase their regional collaboration and harmonise standards.

In particular, TSOs have been developing Regional Security Coordination Initiatives (RSCIs) on a voluntary basis and have adopted a multilateral agreement in 2015 to make participation in RSCIs mandatory for (signatory) TSOs.<sup>1</sup> The RSCIs aim to enhance the regional coordination of system operation activities by providing services to TSOs. The EU Network Codes will institutionalise RSCIs in the legal framework through the creation of so-called Regional Security Coordinators (RSCs).<sup>2</sup>

In its “Clean Energy for All Europeans” legislative package, the Commission has proposed to further increase regional operations and cross-border cooperation within the Internal

---

<sup>1</sup> For more information, see:

[https://www.entsoe.eu/Documents/SOC%20documents/151210\\_AS\\_TOP\\_07.b\\_D.2\\_RSCI%20MLA%20final.pdf](https://www.entsoe.eu/Documents/SOC%20documents/151210_AS_TOP_07.b_D.2_RSCI%20MLA%20final.pdf).

<sup>2</sup> The System Operation Guideline, approved by Member States in 2016, formalises the RSCs and their role. The Guideline needs the approval from the European Parliament and Council to become binding legislation.

Electricity Market for electricity (IEM). Specifically, the proposed Electricity Regulation proposes the creation of Regional Operational Centres (ROCs) that will build on the framework established for RSCs.

As proposed, the ROCs will carry out defined tasks of regional relevance and will have the power to adopt decisions and make recommendations to national TSOs. The development of ROCs is expected to enhance security of supply and drive cost reductions through more efficient system operation, reduced need for investment, and the cost-effective integration of renewables.

## 2. Benefits of regionalisation

The benefits of regionalisation of system operation activities,<sup>3</sup> particularly in a system with a significant share of variable renewables, are well documented in Europe and in other jurisdictions.<sup>4</sup> Regionalisation can contribute significantly to achieving the Energy Union's goals of reliable, affordable, and sustainable energy.

Operating the power system regionally can help to increase the overall reliability and reduce the costs of achieving that level of reliability. When operating the system over a larger area, the operational risk is pooled; the need for reserve capacity is set by the risk of losing the largest component across the entire region rather than by the accumulated risk of losing the largest component in each of the sub-regions.<sup>5</sup> In addition, as stress periods caused by high demand or low supply are often poorly correlated from one national grid to the next, advantage can be taken of geographic diversity to utilise resources in a more cost-efficient fashion.<sup>6</sup>

Significant cost-efficiencies can also accrue by balancing the power system over larger areas, netting off individual imbalances and resulting in a lower overall imbalance to be dealt with.<sup>7</sup> Similarly, in investment timescales, capacity surplus and deficits across the enlarged area can be netted off to achieve a lower overall capacity margin requirement.

Regionalisation and increased interconnection can also help to integrate renewables at lower costs by allowing surpluses to be exported and curtailment minimised.<sup>8</sup> System flexibility is also increased through diversity in resource characteristics, lowering the cost of integrating

---

<sup>3</sup> For the remainder of the paper we refer to regionalisation of system operation activities simply as regionalisation.

<sup>4</sup> For example, Booz and Co estimated the economic benefits of market coupling for the IEM in the range of €2.5 billion to €4 billion per year. In the United States, the Midcontinent Interconnected System Operator's (MISO) most recent annual benefits report documented between \$2.6 billion and \$3.3 billion in regional benefits for the year 2016, driven by enhanced reliability, more efficient use of the region's existing transmission and generation assets, and a reduced need for new assets. Similar annual reports filed by other U.S. ISO/RTO organisations consistently demonstrate comparable levels of economic and reliability benefits.

<sup>5</sup> This is also referred to as the "N-1" criterion, whereby a TSO must be able to retain the system within its accepted Operational Security Limits after the largest asset (that could be a generating unit or a transmission asset such as an interconnector) in the system has failed.

<sup>6</sup> For example, plant outages of conventional thermal power plants are caused by independent factors, whereas adverse weather rarely affects all parts of Europe at the same time, and patterns of demand at any given time vary widely from west to east and north to south.

<sup>7</sup> If a market has a positive imbalance, or surplus (A), and another a negative one, or deficit (B), and these are operated jointly, then the total imbalance would be the difference between the two (A - B) and as a result, lower than operating the two systems in isolation.

<sup>8</sup> For example, the California ISO estimates the amount of renewable energy not curtailed due to the regional Energy Imbalance Market in the Western Interconnector. For more information, see: <https://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=5180B3C9-2B88-4678-B6AD-2A6B55CE8DEB>.

renewable generation and ultimately achieving the European Union's climate targets.

### 3. The Commission's proposal: A step in the right direction

Following the European Council's commitment to completing the IEM by 2014, Europe's TSOs embarked on developing a suite of network codes, setting out a common set of rules for all market players.<sup>9</sup> In addition and prompted by the events of November 2006, when Europe came close to experiencing a widespread blackout, the TSOs voluntarily agreed on the formation of RSCIs with the objective of providing services on a regional basis. The System Operation Guideline—once it enters into force—will establish RSCIs as RSCs and place an obligation on every TSO to participate in one of them.<sup>10</sup> The RSCs, in essence, have the same functionality as the RSCIs, which consists of five tasks, as determined in the guidelines.<sup>11</sup>

Although significant progress has been made toward the creation of an internal market in these years, the pace has been somewhat slow relative to other developments, such as the significant deployment of renewables. Utilisation of interconnectors remains low,<sup>12</sup> whereas on occasion there is insufficient or lack of cooperation between Member States in cases of emergency. Examples include power flows between Denmark and Germany of less than ten percent of nominal capacity,<sup>13</sup> while the events of January 2017 in southeast Europe, in which some member states blocked cross-border power flows during an extended cold snap potentially placing regional grid stability at risk, clearly demonstrate a lack of cooperation between TSOs and the absence of a clear framework for action in case of a regional crisis.<sup>14</sup> The continued growth of intermittent renewables on European power systems will exacerbate the costs and risks inherent in a lack of coordination and, conversely, increase the benefits of more regional coordination of system operations.<sup>15</sup>

#### Improvements in terms of functionality

The Commission's proposal to create ROCs is a step forward in establishing an institutional

<sup>9</sup> See: [https://www.consilium.europa.eu/uedocs/cms\\_data/docs/pressdata/en/ec/119175.pdf](https://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/119175.pdf).

<sup>10</sup> There are currently three RSCs in place and one in the process of formation. For more information, see: <https://www.entsoe.eu/major-projects/RSC/Pages/default.aspx>.

<sup>11</sup> The five tasks of the RSCs are: (1) Operational planning security analysis, (2) outage planning coordination, (3) coordinated capacity calculation, (4) short- and very short-term adequacy forecasts, and (5) the development of a common grid model.

<sup>12</sup> ACER estimated that the average availability of AC interconnectors for trading was 28 percent of their physical capacity in 2014 and 2015. For more information, see: ACER/CEER, Annual Report on the Results of Monitoring the Internal Electricity Markets in 2015, September 2016.

<sup>13</sup> The German TSO has often resorted to reducing the capacity on the interconnector in order to limit congestion within Germany, and redispatching costs in its area of responsibility. This has resulted in an increase in the costs for European consumers. For more information, see: RWTH, Aachen University (2014), Investigation of welfare effects of increasing cross-border capacities on the DK1-DE interconnector.

<sup>14</sup> For example, see: ENTSO-E, Managing critical grid situation – Success and challenges, May 2017; CEPS, Improving Cooperation among EU Member States in Handling Electricity Crises: Lessons for the Regulation on risk-preparedness, July 2017.

<sup>15</sup> See, for instance: a recent analysis by the Brattle Group of the beneficial role ISO/RTOs have played in facilitating the growth of and reducing the cost of integrating renewable resources in regions of the U.S. Retrieved from [http://www.brattle.com/system/publications/pdfs/000/005/379/original/The\\_Role\\_of\\_RTO\\_ISO\\_Markets\\_in\\_Facilitating\\_Renewable\\_Generation\\_Development.pdf?1481213142](http://www.brattle.com/system/publications/pdfs/000/005/379/original/The_Role_of_RTO_ISO_Markets_in_Facilitating_Renewable_Generation_Development.pdf?1481213142)

framework for regional system operation and optimal use of interconnectors. ROC functionality builds on that of the RSCs and includes additional near-real-time activities of regional relevance. Specifically, it extends the RSC role to include an involvement in the sizing and procurement of balancing reserves, quantifying the contribution of external resources to capacity markets, and tasks related to risk-preparedness such as short-term regional adequacy forecasting and simulating crisis scenarios.<sup>16</sup> The European Network of Transmission System Operators for Electricity (ENTSO-E) can also delegate tasks related to the identification of regional crisis scenarios to the ROCs as well as seasonal resource adequacy assessments. Unlike the RSCI/RSCs, which could only make recommendations, ROCs will have limited decision-making powers with respect to some tasks.<sup>17</sup> TSOs will be required to implement ROC decisions unless to do so would compromise the “safety” of the transmission system.

The Commission's proposals will help to increase economic welfare at both the regional and European level. By bringing a regional dimension to decision-making in areas such as available interconnector capacity and the sizing and procurement of reserves, the ROCs will enhance both system and market efficiency. Their role in monitoring short-term resource adequacy on a regional basis and defining regional crisis scenarios should improve security of supply for Member States, identifying potential problems in advance, and preparing appropriate mitigating actions.

## Improvements in terms of governance

At present, neither primary legislation nor the Network Codes or Guidelines provide for regulatory oversight of RSCs. Instead, ENTSO-E monitors RSCs while ENTSO-E itself is overseen by, and reports to, the Agency for the Cooperation of Energy Regulators (ACER). As the ROCs' responsibilities expand in scope and horizon compared to the RSCs—and because ROCs will be acting as natural monopolies – there is a greater need for more robust and independent regulatory oversight. The need for a strong accountability system is all the greater as the ROCs deal with public goods and the public interest, and will make decisions that have significant implications for market players and the functioning of the IEM.

The Commission's proposals significantly improve the RSCs' governance framework and introduce a new set of reporting and monitoring obligations to oversee the ROCs.<sup>18</sup> Different bodies are involved in their monitoring, including National Regulatory Authorities (NRAs), ACER, ENTSO-E, and the Electricity Coordination Group. NRAs are granted the main responsibilities and powers to supervise both the establishment and activities of the ROCs. They are responsible for approving the governance structure of the ROCs (such as the ROCs' statutes and rules of procedure), monitoring their performance, and ensuring that ROCs comply with their obligations under EU law, among others. In contrast, ACER's monitoring

---

<sup>16</sup> The list of tasks provided in this paper is not exhaustive. For more information on the tasks assigned to the ROCs, see Article 34 of the following Regulation: European Commission, Proposal for a Regulation of the European Parliament and of the Council on the internal market for electricity (recast), 2016/0379 (COD), November 2016.

<sup>17</sup> Specifically, the ROCs are assigned decision-making powers for four tasks: (1) coordinated capacity calculation, (2) coordinated security analysis, (3) regional sizing of reserve capacity, and (4) calculating the maximum available capacity of interconnectors for the participation of foreign capacity in capacity mechanisms.

<sup>18</sup> For instance, ROCs have to report on their operational performance and costs, the outcomes of their decisions, and recommendations.

powers are limited to the performance of ROCs, a task to be undertaken in cooperation with NRAs.

The proposed Electricity Regulation also sets out principles for the ROCs' day-to-day operation. This includes the obligation to develop working arrangements to address planning and operational aspects, a procedure for consulting TSOs when carrying out their duties, and a process for the adoption of decisions and recommendations. These tasks will help streamline the operations of the ROCs and interactions with TSOs.

## 4. What is needed to improve the Commission's proposal

Overall, the Commission's proposal represents an appropriate step toward more efficient regional system operation. Nevertheless, the proposal can be improved in a number of ways. Below we present our recommendations.

### Enhancing the role of the ROCs in the IEM

As stated earlier, the Commission's proposal expands significantly the functions of the ROCs compared to their predecessors, the RSCs, and gives them some decision-making powers. These are expected to deliver significant benefits to European consumers and therefore should be supported by the European Parliament and Council.

### A greater role for ROCs in risk-preparedness

The Commission's proposal puts an obligation on ENTSO-E to develop a methodology for identifying regional crisis scenarios and to undertake the analysis, with the option to delegate the entire analysis or individual tasks to the ROCs. Although ENTSO-E is best placed to develop the methodology, the application of this methodology could most usefully be carried out by the ROCs for individual regions. ROCs will, in time, develop the regional knowledge, necessary expertise, and analytical capability that will allow them to identify regional crisis scenarios more effectively than ENTSO-E or individual Member States. We therefore suggest that the ROCs should be responsible for identifying crisis scenarios. In undertaking this task ROCs should coordinate closely with ENTSO-E and other ROCs, as risks can be cross-regional (e.g., severe weather events can in unusual cases have similar adverse impacts on more than one region at the same time, as happened in January 2017).

ROCs could also play a key role in responding to actual crisis events. Where these events extend beyond national borders, no one Member State or TSO will have the ability to see the whole picture and may therefore be unable to identify the most appropriate response or mobilise the most effective and least costly suite of resources. In contrast, properly equipped ROCs will have all the information available to understand the scope and scale of the crisis and be best placed to coordinate responses. This is evidenced by the events of November 2006, which nearly led to a total European blackout as many individual TSOs did not initially realise that Europe's transmission grid had split into three separate synchronous areas.<sup>19</sup>

---

<sup>19</sup> This event highlighted the need for enhanced regional coordination and resulted in the creation of the RSCIs. For more information

## Real-time operation of the regional transmission network: The ultimate goal

The TSO initiative of establishing RSCIs, later formalised as RSCs, and the Commission's ROC proposal, all recognise the need for near-real-time transmission planning activities to be carried out on a regional basis in the interests of increased market efficiency. However, none of these initiatives addresses the eventual need to take a similar approach to real-time activities. The existing situation, where the real-time operation of Europe's integrated transmission system is dispersed across 43 TSOs (36 countries), seems inconsistent with the efficient operation of the integrated European market or the safe operation of the interconnected transmission system that underpins it. Whereas coordinated near-real-time planning can anticipate credible risks and develop mitigating measures, dealing with unforeseen occurrences in the most effective fashion will require a more coordinated real-time approach than is possible with the existing dispersed arrangements or with the level of real-time coordination envisioned under either the RSC or the ROC proposals. Unforeseen circumstances will inevitably occur and disturbances in one Member State will increasingly have consequences in others, demanding an immediate and focussed regional response – particularly when the transmission system is operating at near maximum capacity in the interests of market efficiency.

Consequently, we propose that the ROC proposal should explicitly anticipate that, ultimately, ROCs should oversee the real-time operation of Europe's regional transmission networks in addition to providing near-real-time analysis and guidance.<sup>20</sup> The functional split between near-real-time and real-time activities proposed by the Commission is a necessary step in this direction, but it should not be considered or presented as the endpoint. Ultimately, when sufficient confidence in ROC capability has been established, their role should be extended to include real-time control responsibility. It would also be necessary to develop an appropriate and adequately resourced regulatory framework capable of supervising ROC activities at a regional level. Effectively, the temporal (near-real-time and real-time) or “vertical” responsibility split established by the Commission's proposals would be replaced by a “horizontal” allocation of responsibilities. The ROCs would take on responsibility for both near-real-time planning and overseeing real-time operation of all assets having a significant regional or market relevance. TSOs would retain near-real-time and real-time operational responsibility for all other transmission assets, and retain physical control and supervision of all transmission assets.

## Recommendations related to the governance of ROCs

There is also a need to ensure that the governance of the ROCs promotes accountability, legitimacy, and transparency for investors and other stakeholders.

### Ensuring independence and a clearer mission for the ROCs

---

on the events of November 2006, see: UCTE, Final report – System disturbance on 4 November 2006.

<sup>20</sup> Physical operation and management of all transmission assets would remain with the TSOs, but the operation of interconnection and other critical transmission assets for the availability of interconnectors would be coordinated at a regional level.

Under the current proposal, ROCs do not have a legally binding duty to act independently from national interests. This entails a risk about the impartiality of their decisions, especially in cases involving a balancing of interests between regional welfare and the maximisation of benefit by individual Member States. Confidence in the ROCs is vital to their success; stakeholders need to see them as independent actors dedicated to the public interest of all consumers in the region, rather than the interests of consumers in one Member State or of specific classes of consumers. Hence, ROCs should have a duty to act independently from any national interests. This should be reflected in their mission.

### **Empowering ACER to exercise stronger oversight of the ROCs**

The Commission's proposal to make the ROCs accountable to a number of authorities—in particular, NRAs, ACER, ENTSO-E, and the Electricity Coordination Group—creates a complicated monitoring system with overlapping and confusing responsibilities.

From a good governance standpoint it is questionable whether NRAs should have the key role in supervising the ROCs. The primary objective of NRAs is, and should be, to protect the interests of the consumers in their respective Member States. Although the interests of consumers in each Member State in a region will be best protected over time by acting in the interest of them all collectively, in the short term it is entirely conceivable that an NRA would feel compelled to protect the short-term interests of its national consumers at the expense of consumers in other Member States in the region. As a result, this would harm the long-term interests of both and, in effect, would be contrary to the interests of all consumers in the region, including their own. In addition, there is a risk that governance of the ROCs through the NRAs could result in fragmented regulations and inconsistencies across regions and stalling progress in completing the IEM in case of disagreement and disputes between them.

Given that the ROCs' operations largely exceed the national reach of the NRAs, it is appropriate to grant ACER a stronger role in monitoring their activities and supervising them. Therefore, the establishment of ROCs should be accompanied by a buildup of ACER's powers to enable a truly European regulatory supervision of these new entities. ACER should have a role in scrutinising their establishment and the development of their governance rules (e.g., to ensure consistency and provide greater coordination and interoperability between the ROCs) and be empowered to make binding decisions where ROCs' actions are inconsistent with EU-level objectives, IEM rules, or the interests of regional consumers.

Enhancing ACER's mandate with regards to the ROCs will also help to prevent national bias from being embedded into the oversight of the ROCs. ACER could also be assigned a central role in coordinating the cooperation of NRAs and resolving any potential disputes between them. To be able to undertake these new tasks effectively, ACER would need to be provided with sufficient additional resources.

### **A legal mechanism for promoting public scrutiny**

Public scrutiny should be ensured when TSOs deviate from a ROC recommendation or decision. Under the Commission's proposal, TSOs are only permitted to do so where the safety of the system will be *negatively affected*.

Specifically, if a TSO disagrees with a ROC instruction, the TSO has the right to require its revision, which then must be confirmed or modified by the ROC. In case of a binding decision, TSOs are obliged to implement the decision until it is confirmed or modified, except *when the*

*safety of the system is compromised*. A TSO has an obligation to report the reasons for deviating from a ROC recommendation to the TSOs and ROC of its system operation region, whereas there is no such obligation in case it does not follow a ROC decision. In addition, there is no obligation on TSOs to report these reasons to the market or publicly. This lack of reporting requirements is a missed opportunity to leave the TSOs accountable to the market.

At first, the Regulation should define under which conditions the safety of the system can be deemed to be *negatively affected* to ensure legal certainty and limit the discretion of TSOs. We interpret this to mean under conditions in which following a ROC decision or recommendation would result in the system moving outside its “operational security limits” as defined in the System Operation Guidelines.<sup>21</sup>

Where a TSO departs from a recommendation or decision issued by a ROC, a process should be in place to review the appropriateness of its decision. We recommend that as a first step, a TSO reports the reasons for declining to accept an instruction (whether a decision or recommendation). Subsequently the relevant ROC should review and issue an opinion on the TSO justification. In case of disagreement, ACER will be responsible for investigating the issue and deciding upon it, including the right to impose penalties for any wrongdoing. Any justification and opinion should be made public to improve market transparency and channel accountability toward the market players involved.

### **Meaningful participation of stakeholders and transparency**

A number of details regarding the framework regulating the ROCs will need to be further elaborated at a later stage. Yet the Commission's proposal does not sufficiently address the need to ensure effective participation of stakeholders and transparency. To facilitate these, the proposal should include a structured process for stakeholder involvement when defining and adopting the rules and methodologies that will underpin the governance of the ROCs (e.g., the rules defining the system operation regions, a procedure for consulting stakeholders in the exercise of their operational duties).

## **5. Conclusions**

Overall, the Commission's proposal to enhance regional system operation through the ROCs is a positive step, expected to deliver significant benefits to all European consumers. The proposal expands the tasks of regional relevance to be undertaken by the ROCs and establishes a framework for their governance.

ROCs will retain the responsibilities of RSCs in near-real-time planning and security analysis, and have additional responsibilities in sizing and procurement of balancing reserves, assessing the maximum contribution of external resources in capacity markets, and tasks related to the risk-preparedness of the power sector. The Commission's proposal establishes a governance framework for the ROCs; this includes monitoring and reporting obligations and principles for their day-to-day operation and cooperation with other market players, among others.

We recommend that the European Parliament and European Council support the Commission's

---

<sup>21</sup> The System Operation Guidelines (article 20) place an obligation on TSOs to maintain the transmission system in a “normal state” at all times, that is, to remain within “operational security limits,” including in the event of a “contingency” from the “contingency list.”

proposal on the ROCs. In addition, we offer suggestions about how to strengthen the proposal.

The tasks assigned to the ROCs by the Commission cover an extended and important range of activities. In addition, the ROCs are ideally placed to play a greater role in the risk-preparedness of the sector, for example, by being responsible for developing the regional crisis scenarios. Ultimately, and for the benefits of the integrated power system to be fully realised, the ROCs should become responsible for overseeing the real-time operation of Europe's regional transmission networks. This will enable the optimisation of the transmission system in the interests of market efficiency and a least-cost transition to a decarbonized power system.

On the governance side, we recommend that the ROCs' mission is clarified to provide a strong regional mandate and in parallel that ACER is given a prominent role in supervising the ROCs. These should ensure that ROCs operate freely from any national bias that would be in conflict with the interests of all consumers in the region. Finally, we recommend that the process for any deviation by a TSO from a ROC decision or recommendation be strengthened (e.g., by obliging TSOs to report the reasons for not following a ROC instruction to the market) in a way that promotes accountability and transparency in the market.



**RAP**<sup>®</sup>

Energy Solutions for a Changing World

---

**The Regulatory Assistance Project (RAP)**<sup>®</sup>  
Belgium · China · Germany · India · United States

---

Rue de la Science 23  
B – 1040 Brussels  
Belgium

---

+32 2-894-9301  
[info@raponline.org](mailto:info@raponline.org)  
[raponline.org](http://raponline.org)