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# Inter-TSO Settlements methodology Explanatory note

1 July 2022

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## **Disclaimer**

This explanatory document is submitted by ENTSO-E to the Agency for the Cooperation of Energy Regulators for information and clarification purposes only accompanying the “ENTSO-E’s proposal for methodology for inter-TSO settlements in accordance with Article 37(5) of Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity”.



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## I. INTRODUCTION

This document is an explanatory note developed by ENTSO-E in order to provide additional information about the draft “Methodology for the Optimisation of Inter-Transmission System Operators Settlements” (hereafter referred to as “inter-TSOs settlements methodology”) related to cost sharing of redispatching and countertrading according to Article 74 Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management (hereafter referred to as “CACM Regulation”)<sup>1</sup>. This methodology shall only apply in case the relevant TSOs within one capacity calculation region (“CCR”) jointly request support from Regional Coordination Centers (“RCCs”)<sup>2</sup> on the optimisation of inter-transmission system operators settlements.

This explanatory document is structured in the following way:

- Chapter I gives a short introduction.
- Chapter II describes the legal background as a motivation for this task.
- Chapter III presents the main essence of the inter-TSOs settlements proposal and introduces the process overview.
- Chapter IV provides a further description on the “technical” part of cost sharing (meaning the calculation and assessment of costs) performed by RCCs.

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<sup>1</sup> Under CACM 2.0 it is possible that cost sharing requirements are to be moved from CACM 74 to SOGL 76 and eventually enhanced.

<sup>2</sup> As from July 1<sup>st</sup> 2022 according to the CEP regulation, Regional Security Coordinators (RSCs) will become Regional Coordination Centers (RCCs) in the EU. Outside of the EU, the definition of RSC (as defined in CACM) will still prevail.

## II. MOTIVATION: LEGAL BACKGROUND

Article 37(1)(l) of Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity (hereafter referred to as “Electricity Regulation”) lists a task for the RCCs to support TSOs, at their request, in optimization of inter-TSOs settlements.

- Article 37(5) requires ENTSO-E to develop proposals for ACER approval for the tasks outlined in Article 37(1)(l), in this case, in clear relationship to redispatching and countertrading (RDCT) cost sharing settlements.

### **Regulation on the internal market for electricity 943/2019, Article 37(1)**

Each regional coordination center shall carry out at least all the following tasks of regional relevance in the entire system operation region where it is established: [...] (l) supporting transmission system operators, at their request, in the optimization of inter-transmission system operators' settlements; [...]

Therefore, the related methodology establishing the management of the settlement process and managing the related financial flows must be developed until July 1<sup>st</sup>, 2022.

### **Inter-CCR cost sharing**

According to the “Methodology for Coordinating Operational Security Analysis” (CSAm), a cross-regional cost sharing process exists as well, called inter-CCR cost sharing. However, it is not the scope of this explanatory note and methodology to define this process into details. This process is described briefly on the following paragraph and in Figure 5 as interdependencies exist with the regional cost sharing process according to article 74 of the CACM Regulation.

The inter-CCR cost sharing is defined as the settlement of cost sharing of redispatching and countertrading of overlapping cross-border relevant remedial actions (XRAs) for TSOs. An overlapping XRA which is activated to solve residual violations and is fully or partially eligible for cost sharing must first undergo a cross-regional cost sharing process to assign its costs to any of the impacted CCRs or impacting CCRs of the overlapping zone through regional cost sharing keys. Once the regional cost sharing keys are determined, the corresponding costs are shared at the level of each region with a positive sharing key. This process must be performed according to the regional methodologies.

The settlement for the inter-CCR cost sharing is proposed to be done by a Central Settlement Entity (CSE) within the regional cost sharing processes, if requested by TSOs.

### III. PROCESS OVERVIEW

In line with the regional work currently done on the CCR Core level, ENTSO-E considers the process for cost sharing of redispatching and countertrading to be split into two major parts:

1. **Calculation of costs:** "technical" part of cost sharing (=assessment/calculation)
2. **Financial settlement and clearing:** "financial" part of cost sharing (=invoicing/payment)

The first part is dedicated to cost sharing calculations and is considered as purely technical. The second one is more formal and covers the financial part of the cost sharing process. To identify the best approach for putting this concept into practice, different options were assessed.

#### Assessment of feasible options for the technical part of inter-TSOs settlements

For the technical part of inter-TSOs settlements several options are existing. Two dominating concepts are identified, a centralised and a decentralised approach. The assessment was performed with the boundary condition, that TSOs request support from RCC(s) for their regional cost sharing process.

If TSOs request the support of RCC(s), the centralised approach would be a "RCC-distributed" model, the decentralised approach a "TSO-TSO and RCC-distributed" model. The two models are illustrated in figure 1 below.

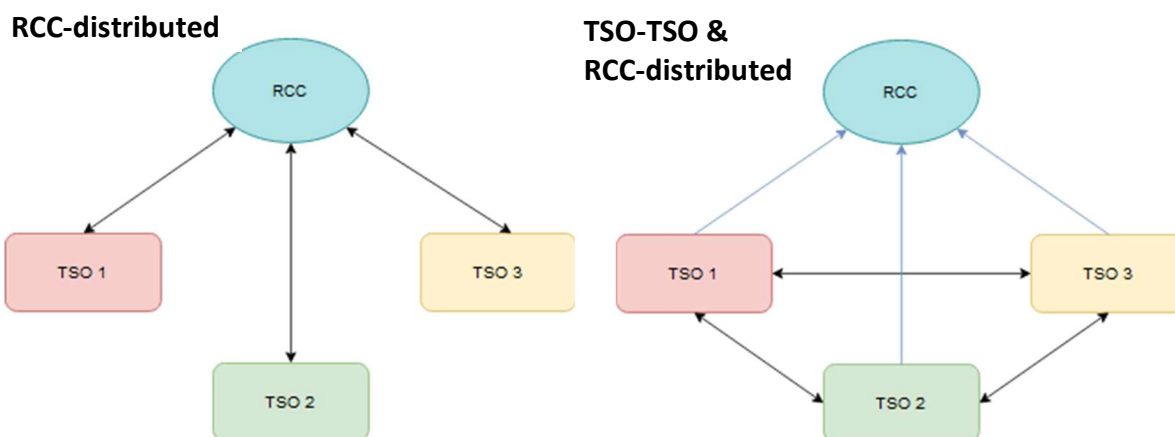


Figure 1 Comparison of RCC-distributed versus TSO-TSO & RCC-distributed model for the cost sharing calculation

At the RCC-distributed model, all affected TSOs must interact with the relevant RCC(s), but not with each other. This has the clear advantage, that the communication is facilitated and that all calculations can be performed in a bundled way. In addition, regulatory requirements can be met easier. The obligation for monitoring the cost sharing process is significantly more efficient if it is centralised. The support of RCC(s) is an added value.

At the TSO-TSO & RCC-distributed model, the TSOs are interacting both with the RCC(s) and with each other. This is much more complex and requires a higher level of coordination and increased efforts for tooling and process controlling. This leads to higher costs and a lower level of process stability.

Considering efficiency and economic benefits, the centralised RCC-distributed model is preferable. Especially for CCRs with a complex structure the RCC-distributed model offers significant advantages in the fields of operation, regulation and effectiveness.

## Detailed process overview

This section provides further explanation on the two main parts of the cost sharing process.

On the following graphic, the process steps and the distinction between the two parts (technical and financial) are illustrated. The sub process steps will be explained in a detailed manner in the section Detailed Process Description.

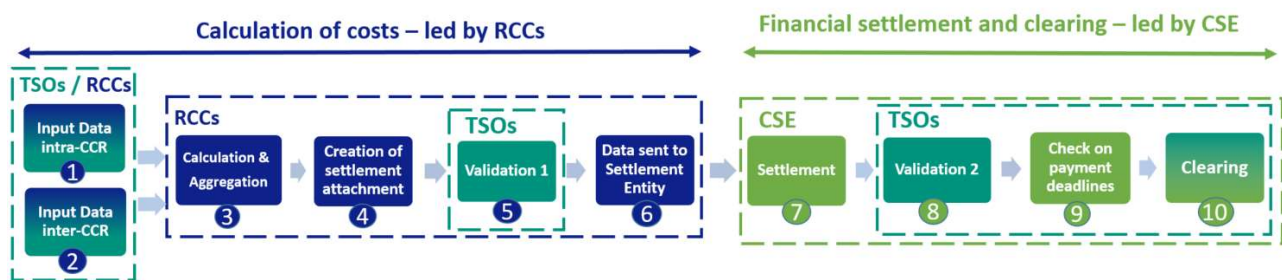


Figure 2 Full process of inter-TSOs Settlements

### 1. Calculation of costs: "technical" part of cost sharing (=assessment/calculation)

With "assessment/calculation" the process is meant, where the costs and revenues resulting from redispatching and countertrading are calculated per bidding zone and/or TSO. If jointly requested by the TSOs of a CCR, this process can be led by the regional RCC(s). This process consists of the following sub-parts:

- input data gathering,
- calculation of the cost sharing key and
- aggregation of the monthly total costs per bidding zone and/or TSO.

### 2. Financial settlement and clearing: "financial" part of cost sharing (=invoicing/payment)

With "invoicing/payment" the process is meant, where the costs and revenues assigned to a bidding zone and/or a TSO are invoiced and paid. After the costs and revenues resulting from redispatching and countertrading are aggregated and validated for each bidding zone and/or TSO, the financial part starts with the two main aspects being:

- invoicing and
- payment execution.

If jointly requested by the TSOs of a CCR, this process can be led by the CSE.

As article 37(1)(l) of the Electricity Regulation refers to the delegation of tasks of TSOs to RCCs only, the financial part is not subject of the inter-TSOs settlements methodology.

In this explanatory note the inter-TSOs settlements proposal is demonstrated for the cost sharing of redispatching and countertrading, based on what the draft methodology was developed.

## IV. DETAILED PROCESS DESCRIPTION

Referring to the approach agreed at Core CCR, the methodology proposes to divide the inter-TSO settlement into a technical and a financial part. For both parts a centralised model was agreed. With this approach it can be ensured that the process steps are assigned to entities having valuable experience and expertise.

### 1. Technical part of cost sharing, calculation of costs assigned to BZs/TSOs

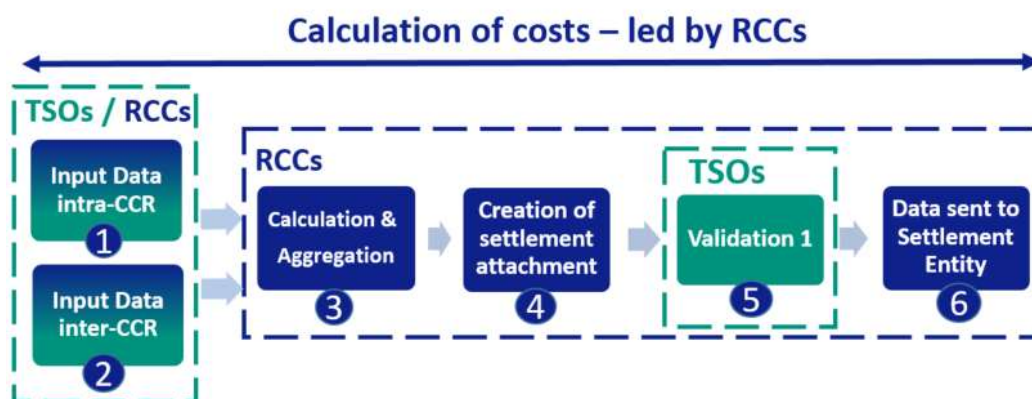


Figure 3 Technical part of the inter-TSOs settlements

Title 2 sets the calculation of the costs assigned to the BZs/TSOs resulting from redispatching and countertrading, which is strongly linked to the network characteristics of the CCRs. Nevertheless, the basic scheme is the same. TSOs define costs eligible for their regional cost sharing processes. These costs are aggregated and shared among the relevant parties. Performing this task can be quite easy, if the cost sharing key calculation is based on simple principles, for example the requester pays principle (RPP). CCRs applying the polluter pays principle (PPP) face a significantly higher effort for the cost sharing key calculation. RCCs can support these calculations by taking over central tasks, if requested by the TSOs.

Article 3 defines the input data gathering as the starting point of the redispatching and countertrading cost sharing process.

#### 1.1. Input Data-intra CCR

Currently, the amount and type of input data is strongly dependent on the cost sharing calculation methodology applied in one CCR. Although a harmonisation process is ongoing, the scope of the

calculation of the costs assigned to BZs/TSOs is strongly dependent on the network structure at the different CCRs. Therefore, complete harmonisation is not likely. Nevertheless, RCCs have a high potential to support TSOs performing this process step. On one side, the input data consists of information like network models and activated (costly) remedial actions. This input data can be provided from various sources:

- from other IT-Platforms (e.g. ROSC regional platform),
- from RCCs (e.g. grid models) or,
- from TSOs (e.g. provider costs).

On the other hand, the information regarding the costs and volumes of the activated costly remedial actions are (usually) provided by the TSOs within a certain deadline. The supervision of input data gathering and the subsequent input data validation can be done in a centralised way by RCCs, decreasing the workload and costs on TSO side. The data should be compliant with the format defined by ENTSO-E CIM<sup>3</sup> expert group.

### **1.2. Input Data-inter CCR**

Cross-regional cost sharing keys reflecting redispatching and countertrading costs of overlapping XRAs for TSOs are passed on as an input for the regional cost sharing process of each CCR.

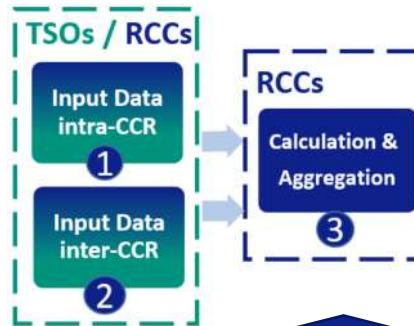
### **1.3. Calculation and Aggregation**

After the input data gathering is finished, the cost sharing calculation chain starts. This hierarchical process, where the cross-regional costs are mapped to regions first is detailed in Article 4. Then, together with regional costs, the cross-regional costs are mapped to TSOs according to regional methodologies

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<sup>3</sup> CIM stands for Common Information Model. This group at ENTSO-E level is in charge of harmonizing data exchanges formats between stakeholders of the TSO community.





Detailed process description

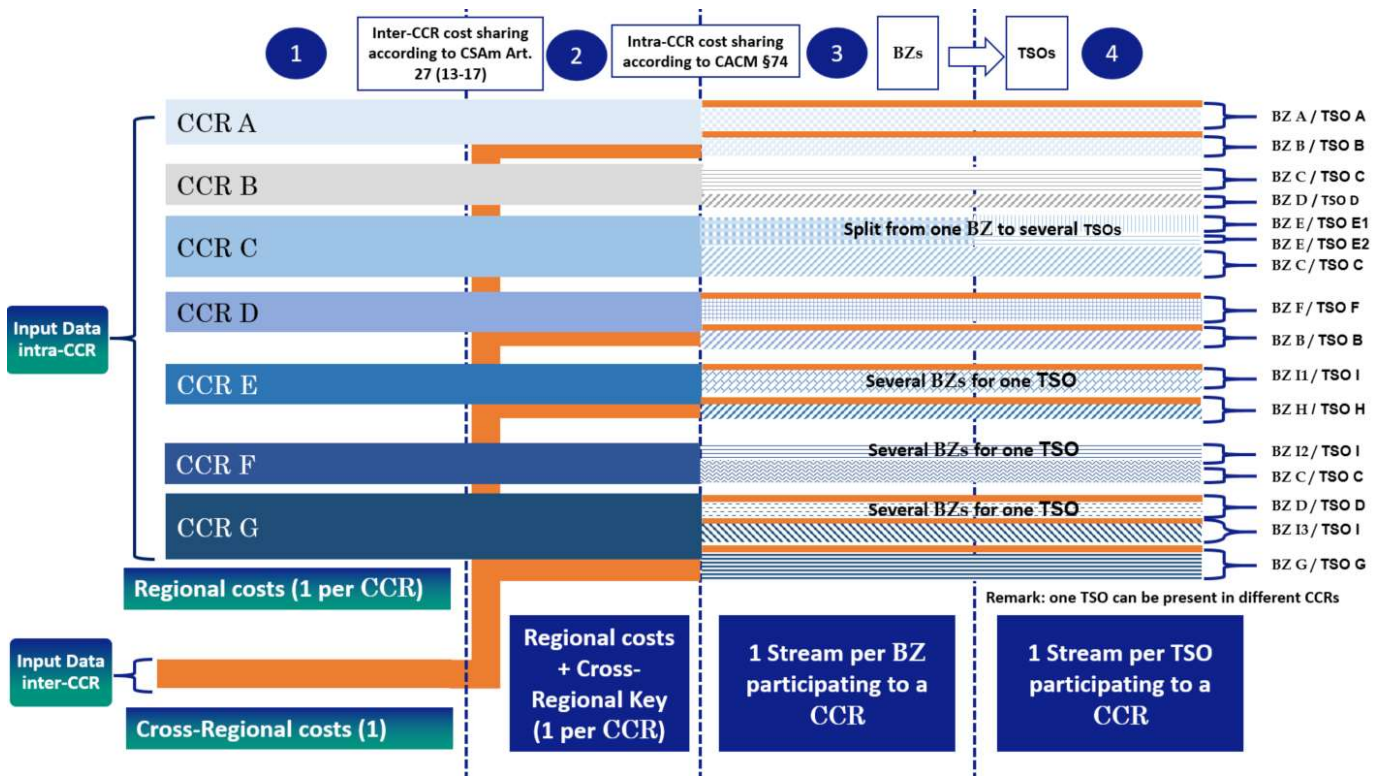


Figure 4 Illustration of differences between Intra and Inter-CCR cost sharing processes

### **1.3.1. Cross-regional costs: Inter-CCR cost sharing**

Costs coming from redispatching and countertrading are used to address residual violations in the cross-regional part of the coordinated operational security analysis (CSA) must be first attributed to regions according to their regional keys.

### **1.3.2. Regional costs: Intra-CCR cost sharing**

After the regional keys from the cross-regional process are determined, they must be shared with the TSOs - together with the costs of remedial actions used for solving regional violations. Pending on the cost sharing principle applied, this can be a simple calculation or a challenging chain of several sub-calculations, e.g. for PPP. Especially in this case, a high-quality supervision is necessary. At this task, RCCs can support TSOs in an effective and efficient way. RCCs are acting as operators of a centralised regional platform to support TSOs with their unique experience in this field. This approach has several advantages:

- The cost sharing process can be operated 24/7, enabling to shorten the overall calculation time. Indeed, the process can be planned based on calendar days instead of working days, as (national) holidays and weekends do not have to be considered.
- The group of experts operating the process is smaller. With the approach of TSOs operating the cost sharing calculation (e.g. in a rotating way), the number of involved experts would be much higher and the frequency to execute the process smaller for each expert. Maintaining knowledge and performing periodic training is easier for a smaller number of experts. In this way, the risk of errors/failures caused by a human factor can be reduced significantly.
- To decrease the costs for development and maintenance of the regional cost sharing solution for each TSO, the technical calculation can be performed on a regional platform together with other regional services that are a prerequisite to perform the cost sharing calculation (e.g. CSAm and SOGL §76). Upcoming issues, starting from IT problems to erroneous calculated costs, can be managed by RCC experts in a centralised way.
- RCCs are already experienced in these kinds of services (e.g. Flow Based Common System at CCR, operated by Coreso and TSCNET).

## **1.4. Creation of the “Settlement Attachment”**

The cost sharing calculation tool of each CCR used by RCCs will create the necessary input data for the further steps of the cost sharing process, as the TSO-validation and the financial part of the cost sharing process. The Settlement Attachment is the result of the cost sharing calculation between BZs/TSOs, where costs and revenues per TSOs/BZs are specified. The Settlement Attachment – once validated by TSOs, see next section – is the basis for the financial settlement and clearing.

## **1.5. Validation 1 – Validation of the calculation results**

Although RCCs are performing the calculations, the final validation of the results remains the responsibility of TSOs. To be able to meet the process deadlines, TSOs must validate the costs and revenues assigned to them within a predefined timeframe. Otherwise “deemed acceptance” is applied if no other solution was agreed at the specific CCR. The validation period can be individual for CCRs, corresponding to the complexity of the cost sharing calculation process. RCCs should

support TSOs during this validation phase by acting as a moderator if issues are detected. So, the problem identification and solution can be managed in a fast and effective way, coordinated by RCCs. This is defined in Article 5.

### 1.6. Data provided by the RCC(s)

Article 6 defines the last step of the technical part. The validated results are submitted via the Settlement Attachment. This task should be executed by RCCs to be able to provide the data bundled and on time. When the results of the cost sharing calculations are sent, the technical part of the cost sharing process is finalized.

### 1.7. Monitoring of activated redispatching and countertrading measured

In addition to the above-mentioned tasks, RCCs may support TSOs on their request in the monitoring of the information related to activated costly remedial actions, in accordance with the provisions of Commission Regulation (EU) No 543/2013 of 14 June 2013 on submission and publication of data in electricity markets and amending Annex I to Regulation (EC) No 714/2009 of the European Parliament and of the Council. This is defined in Article 7.

## 2. Financial part of the cost sharing process, invoicing and payment execution

The financial part of the cost sharing process is not covered by the inter-TSOs settlements methodology. Nevertheless, in the following a short description of the concept “Central Settlement Entity” (CSE) is given.

Complex financial processes are not the key business of RCCs. Considering the requested experience in handling large amounts of money and executing a high number of transactions, this purely financial part of the cost sharing process is proposed to be assigned to a specialised entity: the Central Settlement Entity. The CSE acts as a centralised, single counterparty for the financial flows of TSOs related to the cost sharing of redispatching and countertrading, illustrated on the following graphic:

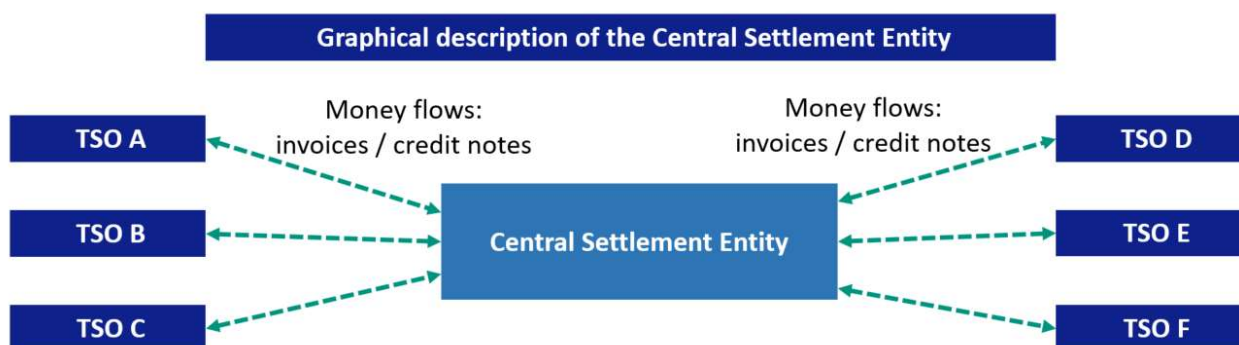


Figure 6 Illustration of the Central Settlement Entity

The largest benefit of this approach is the reduction of costs and efforts for TSOs. With the support of a CSE especially TSOs present in different CCRs will have significant advantages, by using a standardised process. Additionally, it would guarantee efficiency and effectiveness for involved parties by avoiding parallel developments for tooling and processes and therefore limiting the costs for all.

## 5 Implementation of inter-TSO cost sharing methodology

If TSOs request the support of RCCs, this methodology shall be implemented by the TSOs at latest 12 months after the regional cost sharing process has entered into operation (Article 8).

For the implementation of the inter-TSO cost sharing methodology TSOs can request RCCs' support. During this process, RCCs should:

- Supervise the drafting of the high-level business process
- Supervise the drafting of the requirements related to the IT-Tooling, with focus on the regional platform
- Support TSOs during the tendering
- Support TSOs during the IT-development acting as a SPoC for the selected IT-provider
- Support TSOs during the testing phases
- Supervise the parallel run/experimentation phase
- Coordinate the implementation with the CSE

The services provided by RCCs - if TSOs are requesting their support - are not limited to the above-mentioned list. This list shall be a guideline and can be adapted in case of further regional needs.

## LIST OF ACRONYMS/ABBREVIATIONS

Abbreviation	Definition
ACER	European Agency for the Cooperation of Energy Regulators
BZ	Bidding Zone
CACM Regulation	Commission Regulation (EU) 2015/1222 of 24 July 2015
CCR	Capacity Calculation Region
CIM	Common Information Model
CSAm	Methodology for Coordinating Operational Security Analysis
CSE	Central Settlement Entity
CT	Countertrading
ENTSO-E	European Network of Transmission System Operators for Electricity
RCCs	Regional Coordination Centers
RD	Redispatching
SOGL	Commission Regulation (EU) 2017/1485 of 2 August 2017
SPoC	Single Point of Contact
TSO	Transmission System Operator
XRA	Cross border relevant remedial action