



**Study on the final development and
establishment of a Coordinated Congestion
Management in the SEE Region
(SOFiDE CCM SEE)**

commissioned by the

Energy Community Secretariat (ECS)

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Executive Summary

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Executive Summary

Introduction

On the backdrop of the Athens Forum process and the Energy Community Treaty for South-East Europe (SEE), the TSOs in SEE endeavour to develop and implement a co-ordinated congestion management method for the allocation of cross-border electricity transmission capacity in the region.

In this context, the project of investigating flow-based coordinated auctions on the basis of a dry run has turned out to be a key driver for further development of market based cross-border energy exchange in the region.

This study, which constitutes a continuation of our previous studies in the region, was commissioned by the Energy Community Secretariat (ECS) in order to

- resolve open issues of the technical concepts developed so far,
- address crucial organisational and commercial issues, such as risk management, business process development, revenue distribution,
- and, ultimately, substantiate the proposals for the content of the potential future congestion management method in SEE and for the organisational structure to implement it.

The study focuses on flow-based coordinated explicit auctions, based on the understanding that this is, for the time being¹, the target solution for congestion management in SEE.

¹ Once the power market is more mature, further evolution to implicit auctions (market coupling) would be a logical next stage.

Disclaimer

- **In order to highlight the principles of the investigated methodical variants, we performed exemplary test calculations in the course of this study.**

- **The only available consistent data source was the Dry Run of FBA.**

We are highly grateful for SETSO's permission to use these data.

- **The Dry Run setup is decided on by SETSO.**

The setup may evolve over time (and has done so in the past).

It is beyond our competence to interfere with the Dry Run setup.

- **Due to the Dry Run setup at the time from which the data for this study originated, the Dry Run data do not exactly reflect the structure of the SEE region as defined by the Ministerial Council (2008/02/MC-EnC, 27 June 2008). In particular,**

- **During the Dry Run the Serbian TSO (JP EMS) provided data for the territory under jurisdiction of UNMIK**
- **MAVIR and ELES are missing**

- **This data driven treatment of areas in the exemplary test calculations shall**

Analysis of MF Approach technical parameter calculation concept

The “maximum flow” (MF) approach constitutes a concept for the determination and application of a flow-based capacity model in which the flow constraints of the transmission grid are represented by the maximum active power flow on individual branches (i.e. lines or transformers) in base case and outage topologies. It is the approach currently pursued in SEE and other European regions. In this study we analyse a number of particular implementation aspects of the MF approach. The following table gives an overview of these aspects and provides information about which properties of the concept are affected by them.

Aspect	Relevant for
Improvement of UOF concept	Balance between network security and amount of capacity
Avoidance of negative AMF	
PTDF/AMF recalculation frequency/triggers	Process efficiency and network security
Common load flow model	Technical accuracy
Consideration of generator outages	
Feasibility of FBA at different time horizons	Balance between effort, transparency, and economic optimality
Application of MF approach when some TSOs do not participate in FBA	Options for FBA evolution

Our analysis leads to the following conclusions:

- The technical issues of the concept are solvable.
- Proper control of the network security level is crucial for achieving acceptable results. FBA offers suitable parameters for controlling operational risk and hence network security. These parameters differ from the way in which network security is addressed by the NTC approach (currently being used for capacity allocation). In fact, FBA allows for a more explicit and informed treatment of operational risk. The study demonstrates how the statistical assessment of uncertainties can improve the transparency of risk control and increase risk awareness.
- FBA can work for a subset of the SEE TSOs (potential interim step to SEE-wide application), as long as these form a contiguous area. Exemplary calculations show that theoretically, the amount of allocated capacity as well as welfare gain and auction revenues could still be significant in such a constellation. However, the practical consequences and the acceptance of such a development path are hard to analyse and remain somewhat unclear.

Revenue distribution

In bilateral auctions the revenues accrue separately for each border and are usually distributed equally among the two TSOs involved. This way to distribute revenues is incompatible with FBA, because the FBA revenues accrue centrally for all involved borders. Therefore, it is indispensable to introduce a new way to distribute these revenues.

In past studies numerous distribution keys have been assessed against the criteria for revenue distribution. Our related work in this study builds upon this experience and focuses on im-

proved fulfilment of the stability and continuity criteria as well as fairness of the distribution key. Based on our previous work on the subject, on the past exchange of views with regulatory authorities and TSOs and on the new considerations in this study, we come to the following conclusions:

- In order to limit the scope of issues to be solved in the context of FBA introduction we recommend introducing a distribution key, i.e. a formula by which the centrally accruing FBA revenues are allocated to the borders of the region (and, subsequently, 50:50 to the two TSOs whose areas form the border). Further topics dealing with auction revenues, e.g. a regional approach to defining their use, can be treated independently from FBA introduction.
- We recommend applying a combination of a static (agreed ex ante, e.g. for one year) and a dynamic (based on data of each auction round) distribution key. The share of the static key should dominate at the beginning (e.g. 75 % static / 25 % dynamic), but could decrease over the years (partial or complete phase-out of static key).
- It is reasonable to determine the static key on the basis of past auction revenues. However, a straightforward and unambiguous algorithm for calculating the static key cannot be applied in SEE due to a lack of consistent data. Therefore, the static key needs to be negotiated. Historic auction results can serve to inform such negotiation.
- We recommend applying the “modified absolute usage” (MAU) as dynamic key when FBA is introduced. The definition of the dynamic key should be re-assessed after the first year of operational experience with FBA, based on then available actual FBA result data.

Organisational issues

The best solution seems to be the foundation of a common administration entity in the form of a joint-venture company. Due to complicated legal mechanisms and control mechanism the other two options (one TSO working as a service or in behalf of the others or a service provider) are not advantageous.

Project structure

Considering economic reasons (project costs, etc.), financial aspects (i.e. donors), contacting authorities and project organisation we recommend the foundation of a project company as soon as possible. The project company can be transformed into the operational CAO.

Project organisation

The focus of the dry run and working groups is very technical focused. To assure the full operation of the CAO, not only the auctions but also the clearing and settlement activities and the supporting processes have to be created and organised.