Methodology for the Calculation of Scheduled Exchanges resulting from single intraday coupling – Explanatory Note

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Article 56(1) of the Commission Regulation 2015/1222 establishing a Guideline on Capacity Allocation and Congestion Management (hereafter referred to as “CACM Regulation”) requires that, by 16 months after the entry into force of CACM Regulation, all Transmission System Operators (hereafter referred to as “TSOs”) which intend to calculate scheduled exchanges resulting from single intraday coupling (hereafter referred to as “SIDC”) shall develop a proposal for a common methodology for this calculation.

The common proposal for a Methodology for calculating Scheduled Exchanges (hereafter referred to as “ID SEC Methodology”) shall be subject to approval by all National Regulatory Authorities (“NRAs”) as per Article 9(7)(d) of the CACM Regulation. According to Article 9(9) of the CACM Regulation, the ID SEC Methodology proposal shall be submitted to ACER in parallel with the submission to all NRAs. In accordance with Article 9(11) of the CACM Regulation where the regulatory authorities have not been able to reach agreement in due time or upon NRAs joint request, the Agency shall adopt a decision concerning the submitted proposals for terms and conditions or methodologies within six months in accordance with Article 8(1) of Regulation (EC) No 713/2009.

1. Introduction

Article 56(1) of the Commission Regulation 2015/1222 establishing a Guideline on Capacity Allocation and Congestion Management (hereafter referred to as "**CACM Regulation**") requires that, by 16 months after the entry into force of CACM Regulation, all Transmission System Operators (hereafter referred to as "**TSOs**") which intend to calculate Scheduled Exchanges resulting from single intraday coupling (hereafter referred to as "**SIDC**") shall develop a proposal for a common methodology for this calculation.

The common calculation methodology (hereafter referred to as "**ID SEC Methodology**") shall be subject to approval by all National Regulatory Authorities ("**NRAs**") as per Article 9(7)(d) of the CACM Regulation. According to Article 9(9) of the CACM Regulation, the ID SEC Methodology proposal shall be submitted to ACER in parallel with the submission to all NRAs. In accordance with Article 9(11) of the CACM Regulation where the regulatory authorities have not been able to reach agreement in due time or upon NRAs joint request, the Agency shall adopt a decision concerning the submitted proposals for terms and conditions or methodologies within six months in accordance with Article 8(1) of Regulation (EC) No 713/2009.

This document is an explanatory note accompanying the ID SEC Methodology and describing the background as the basis for the methodology.

Capitalised terms used in this document are understood as defined CACM Regulation, Regulation (EC) No 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity (hereafter referred to as "Regulation (EC) No 714/2009"), Commission Regulation (EU) 543/2013 and the ID SEC Methodology proposal.

2. Current Situation

In order to create a clear understanding of the requirements laid out in Article 56 of the CACM Regulation, the current situation across Europe is described.

The SIDC solution has been (partly) implemented in the EU. The target model for the European cross-zonal intraday market consists of a continuous implicit intraday market based on a single capacity management module[1] and a shared order book[2] in a one-to-one relationship as defined by the CACM Regulation, this does not consider the intraday auctions. This target model[3] has been the basis for the requirements for the intraday market and capacity allocation formulated in the CACM Regulation and within the current XBID implementation project.

[1] Defined in Article 2(40) of the CACM Regulation.
[2] Defined in Article 2(24) of the CACM Regulation.
[3] Based on this model, several TSOs and NEMOs have, via the XBID project, commenced with the build of a platform with an integrated shared order book and capacity management module.

Currently the requirements for the intraday auctions (as a way to introduce intraday cross zonal capacity pricing) are being developed by TSOs and NEMOs pursuant ACER decision 01-2019 and are, for the time being, excluded from the scope of this methodology.

2.1 Background

The SIDC is currently based on a continuous matching process of sell and buy orders. Orders are collected by NEMOs and forwarded to the Shared Order Book function for matching. In the SIDC for each order, the originating NEMO is known as well as the originating area.

During the continuous trading, each trade will have to be given a certain path individually, contrary to the Single Day-Ahead Coupling (**SDAC**) where all trades are routed at the same time during the coupling. As a result, while using the same concepts as SDAC, the cost coefficients are different in the SIDC. In addition, the scope and allocation methods in both projects are different which could lead to a different set of cost coefficients.

Remaining sections of this chapter explains overview how Scheduled Exchanges are derived from XBID solution.

2.2 Matching and capacity allocation

The matching of orders is driven by the price, however only where a path is available for the physical shipping through the grid. The matching of orders takes into account relevant constraints of the grid i.e. the available capacity and allocation constraints such as ramping limitations.

Once a preliminary match of orders has been reached, the required capacity on Bidding Zone borders or underlying Scheduling Area borders is allocated. The routing algorithm searches for the cheapest (= shortest) possible path from the NEMO trading hub of the sell order (Source) to the NEMO trading hub of the buy order (Sink).

The routing algorithm functions in a similar manner as for the SDAC, the objective function is to minimize the total costs of an exchange between the Source and Sink. As such, each bidding zone border get assigned a certain cost coefficient and each path consists of a set of bidding zone borders. The cheapest path is then selected by ensuring the minimum cost for the total exchange (which can consist of a set of paths).

During the continuous trading, each trade will have to be given a certain path individually, contrary to the SDAC where all trades are routed at the same time during the coupling. As a result, while using the same concepts, the cost coefficients are not necessarily the same in SIDC compared to the SDACbecause the scope and allocation methods in both mechanisms are different.

The result of SIDC are matched orders and, attached to each pair of matched orders, an allocation path from Source to Sink.

2.3 Enrichment of the allocation path

The full allocation path of each individual pair of matched orders is enriched to enable the physical and financial shipping, except where the buy and the sell orders are coming from the same NEMO in the same Scheduling Area.

- The enrichment assigns Central Counter Parties (hereafter referred to as “CCPs”) to Source and Sink, representing the involved NEMOs in the Source and Sink.
- The enrichment assigns a Shipping Agent for the shipping between two NEMOs in the same Scheduling Area.
- The enrichment assigns a Shipping Agent to take care of the export from the Source.
- The enrichment assigns a Shipping Agent to take care of the import into the Sink.
- The enrichment assigns a Shipping Agents to take care of the import into any transit area and the export out of the transit area.

This enrichment results in the following handovers, where the source and the sink area are the same:

1. The CCP of the Selling NEMO hands over to the assigned Shipping Agent;
2. The Shipping Agent hands over to the CCP of the Buying NEMO.

This enrichment results in the following handovers, where hand over 1 and 4 only occur once and hand over 2 and 3 occur zero, one or multiple times:

1. The CCP of the Selling NEMO hands over to the assigned Shipping Agent responsible for exporting out of the area;
2. The Shipping Agent exporting out of an area (Source or transit) hands over the Shipping Agent importing into an area (transit or Sink);
3. The Shipping Agent importing into an area (transit or Sink) hands over to the Shipping Agent exporting out of the transit area; or
4. The Shipping Agent hands over to the CCP of the Buying NEMO.

2.4 Output

The SIDC will be performed by three modules, each having its own output.

- The relevant output of the Shared Order Book module (SOB)
  - Matched orders
  - Local views on the Shared Order Book

  This information is only available to the NEMOs.

- The relevant output of the Capacity Management module (CMM):
  - Capacity allocation per border
  - Net Flow per border

- The output of the Shipping Module (SM):
  - Each hand over between CCP and Shipping Agent for the Source and the Sink;
  - Each hand over between Shipping Agents on a border;
  - Each hand over between Shipping Agents within an (transit) area.

To the CCPs and Shipping Agents the above-mentioned output is provided at the detailed level of trades and includes information for clearing as well.

The SIDC delivers all basic information to calculate any kind of scheduled exchange belonging to the Net Positions resulting from the SIDC:

To the TSOs the above-mentioned output is provided after aggregation and netting is applied, per area up to the level of pairs of CCP and Shipping Agent or pair of Shipping Agents and per border up to the level of pairs of Shipping Agents.

2.5 Net Positions

As per Article 52 of the CACM Regulation, All NEMOs, as part of their MCO function, shall ensure that the continuous SIDC delivers Net Positions as a clear data item. Net Positions can be derived from the results of the SIDC:

- The Net Position of a Scheduling Area is equal to the aggregation and netting of matched buy and sell orders in the Scheduling Area;
- The Net Position of a Bidding Zone is equal to the aggregation and netting of matched buy and sell orders in the Bidding Zone.

2.6 Scheduled Exchanges

NRAs requested an amendment to the Scheduled Exchanges Methodology proposals submitted by TSOs. For the ID SEC Methodology proposal, the main actions points were: delivers all basic information to calculate any kind of Scheduled Exchange belonging to the Net Positions resulting from the SIDC:

- Regarding article 4 - Calculation of scheduled exchanges between bidding zones and scheduling areas: All NRAs ask all TSOs to improve the description of the calculation of scheduled exchanges between bidding zones and scheduling areas for the intraday timeframe in order to properly reflect the links to the scheduled exchanges between NEMO trading hubs to be introduced (see next paragraph).

- Regarding calculation of scheduled exchanges between NEMO trading hubs: As described for the day-ahead proposal, all NRAs ask all TSOs to include an additional article covering the calculation of scheduled exchanges between NEMO trading hubs, defined as “electricity transfer scheduled between NEMO trading hubs operating within or between scheduling areas or bidding zones” in the ACER Decision No 08/2018 on the NEMO’s proposal for the price coupling algorithm and the continuous trading matching algorithm.
    - between CCPs in the same area; and
    - between a CCP and a Shipping Agent.

In order to address the concerns of the NRAs, TSOs have made the following changes to the ID SEC Methodology proposal:

- TSOs have clarified that the calculation of scheduled exchanges is an integral part of the SIDC, hence the requirements for this calculation will be covered in the Algorithm requirements.

The aggregation and netting shall be done at the level of Scheduling Area as well as Bidding Zones.

TSOs have clarified that the calculation of Scheduled Exchanges is a two step approach. First a ‘path’ is determined for each trade between a Source and Sink (NEMO trading hub). Next, all exchanges are aggregated to create the scheduled exchanges between NEMO trading hubs, scheduling areas and bidding zones.

Annex 1: list of cost coefficients used in XBID