

# Methodology for capacity calculation for ID timeframe

## NRA approval package

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# 1 Introduction and purpose

This document gives a description of the calculation of the intraday (ID) capacity for the CWE internal borders. Pursuant to Regulation (EC) 714/2009 (+Annex 1) and based on regulatory approved splitting rules, TSOs allocate capacity in different market timeframes (long term, LT; day-ahead, DA; and intraday, ID). TSOs try to maximize available capacity in all time frames.



The scope of this methodology is strictly limited to the ID timeframe. This model is part of a coordinated approach by the TSOs involved in accordance with the ENTSO-E policies and assumes that the day-ahead capacity, allocated to the market, is the result of the CWE Flow Based Market Coupling.

Up to now no capacity is reserved for ID allocation. All ID capacity given to the market is a result of non-used DA capacity, increase processes after DA allocation, or due to the netting effect.

The target of the CWE Flow Based Market Coupling (FBMC) project was to increase efficiency of capacity allocation in the DA timeframe. This goal was achieved as the increase of DA net positions referring to higher market activity at the border with a higher trade volume. As FBMC is a process for the entire CWE region on all time frames for the capacity market (LT, DA, ID), an increase in the DA net position by default means a decrease in available capacity for the ID market.

The aim of this ID capacity calculation methodology is to have the possibility to release additional capacity to the market players after the flow based market coupling.

Note: this document is an update of the Methodology for capacity calculation for ID timeframe as submitted to CWE NRAs on 05.11.2015.

The main changes compared to the version 1.0 are the following:

- Updates related to the inclusion of the DE-AT bidding zone border

## 2 Definitions

- **CBCO**: Critical Branch Critical Outage
- **CMT**: Central Matching Tool. Central tool used for intraday increase/decrease process to consolidate the increase requests and the decrease notifications.
- **D2CF**: Two-Days ahead Congestion Forecast. Daily procedure to create a representative load flow model of the grid for the region of the participating TSOs for a specific hour. The dataset to create this model includes the best estimation for: the planned grid outages, the outages of generators, the representative load pattern, wind and solar generation and the load-forecast.
- **DA CGMs & ID CGMs** are the Day Ahead & Intraday Common Grid Models which are the result of the merging of the Individual Grid Models provided

around the DA market clearing point is the result of a unique and common centralized computation.

2. The second step is a local evaluation by each involved TSO to request a possible increase (Basecase) or decrease (in special situations) on his own borders.
3. The third step is a merging step by a common system. The Central Matching Tool (CMT) consolidates the increase requests and the decrease notifications.
4. During the fourth step, based on this consolidated input, each involved TSO performs a local analysis that enables him to accept fully, accept partially or reject the requested capacity increases in a justified manner.
5. In the fifth step, these acceptance or rejection messages are then gathered and handled in a common way by the CMT. The System will distribute these consolidated acceptances and rejections back to the local TSOs.
6. In the last and sixth step, each TSO will then be able to use these common CWE ID ATCs and NTCs as input for the capacity allocation of their respective borders.

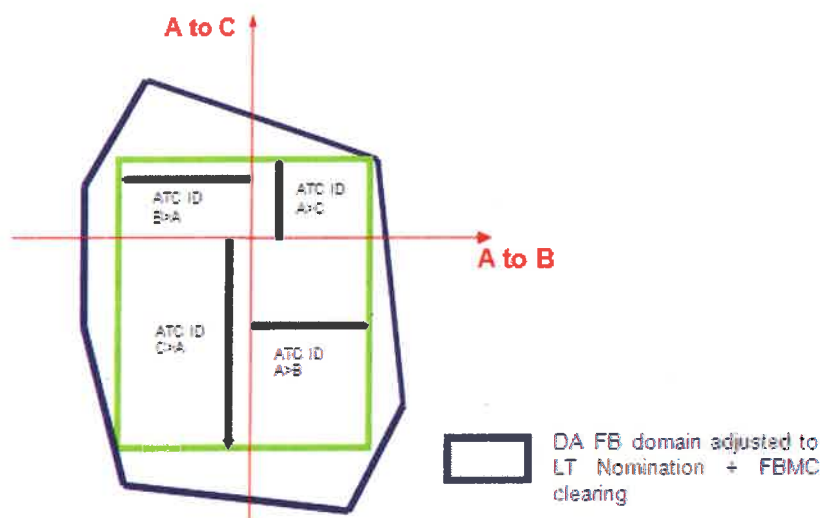
The steps 4 to 6 can be performed several times a day for a certain period of trading. For example, the assessment can be done during the evening for the night hours and during the night for the day hours. The number of iterations depends on the border. For an overview of the proposed ID ATC capacity calculation process see Figure 1.

## 4.1.14.2 Initial ID ATC Computation

### 4.1.14.2.1

### Introduction

The hereafter described procedure is an intermediate step, to make the D-1 Flow Based method compatible with the current ID ATC process. The aim is to assess ID ATC values deduced from the D-1 Flow Based parameters, which have been adjusted according to the D-1 FB MC results. The ID ATCs can be considered as a leftover of the D-1 Flow Based capacity as illustrated below. With that respect the initial ID ATC computation is not a new capacity calculation process.



The calculated ID ATCs are then used in the same way as the current ID ATCs. This chapter focuses on the process of the ID ATC computation. The input and output parameters are described and the iterative method is explained using a pseudo-code and an example calculation.

### 4.1.24.2.2

### Input data

Despite the two days per year with a long-clock change, there are 24 timestamps per day. The following input data is required for each timestamp:

- Market Coupling net positions.
- Presolved Flow Based parameters adjusted to LT nominations; curtailed to zero margins in case of a negative RAM.
- Tolerance margin (in MW), with the possibility to activate it for every country by the respective TSO (may be used in order to propose minimum ID ATC values).

### 4.1.34.2.3

### Output data

The calculation leads to the following outputs for each timestamp:

- initial ID ATC
- number of iterations that were needed for the ID ATC computation
- branches with zero margin after the ID ATC calculation
- indication if the tolerance margins were activated, and if so, which ID ATC was affected by this

### 4.1.44.2.4

### Algorithm

The ID ATC calculation is an iterative procedure and part of the so-called post-coupling process.

#### **Starting point**

First, the remaining available margins (RAM) of the pre-solved CBs, which were given to the DA market at the end of the pre-coupling process, have to be adjusted to the MC

The tolerance margin can be activated by one or more CWE TSOs, which are neighbours to the border, by setting a non-zero value into a reference table. Such TSOs are here labelled with 'TSO\_act'.

	TTG	TTB	Amp	TNG	RTE	Elia	APG
DE->NL	0	0	0				
NL->DE	0	0	0				
NL->BE		0				0	
BE->NL		0				0	
BE->FR					0	0	
FR->BE					0	0	
FR->DE			0	0	0		
DE->FR			0	0	0		
DE->AT	0		0	0			0
AT->DE	0		0	0			0

The value in the table is valid for the whole day (all timestamps) and remains unchanged until it is reset by the responsible TSO\_act.

The tolerance margin is only accepted within the algorithm if it does not introduce overloadings on the CB of those TSO, which did not activate the tolerance margin (labelled with TSO\_other). But the CBs of TSO\_act can be overloaded with respect to this procedure.

The following procedure describes the calculation of the tolerance margin:

Define first the TSO(s)/countries having activated the tolerance margin in the ID ATC computation as 'TSO\_act', whereas the other TSOs are identified as 'TSO\_other'. Then perform the following check, which may result in an adjustment of the ID ATCs corresponding to the borders of TSO\_act:

```

FOR all TSO_act DO
  Store the old ID ATC values of TSO_act
  IF the ID ATCs of TSO_act < tolerance margin THEN
    Set TSO_act ID ATCs to the tolerance margin value
  IF this leads to overloaded TSO_other CBs THEN
    Discard the new ID ATCs for TSO_act and retrieve the stored ones
  ELSE
    Store and apply the new set of TSO_act ID ATCs
    
```

The tolerance margin<sup>3</sup> used for the ID ATC calculation takes into account the level of uncertainty of the ID ATC calculation based on the D2CF grid model. Given the uncertainty level of these calculations in the D-2 stage, some TSOs have the possibility to put a minimum value on the ID ATC in order not to prematurely and maybe unnecessarily block the market. The initial value of the ID ATC will then not be initially lower than the tolerance margin, however security calculations performed after day-ahead market coupling (e.g.

<sup>2</sup> Since the CWE FB project considers the DA market only, the usage of the ID tolerance margin should be discussed in the current ID framework.

<sup>3</sup> The tolerance margin is one of the options currently being investigated by a dedicated workgroup and out of scope of this approval package.

- In case a Decrease Notification has been sent, the notification for decrease will prevail over an increase request for the same hour. The CMT will consider the minimum value of the notified decrease<sup>4</sup>.

The CMT will then send for each hour of the Day D and for each CWE border and direction (which is covered by the re-computation process) the resulting increase or decrease to the CWE TSOs.

#### 4.2.34.3.3

#### Assessing the

#### feasibility of requested increases

After receiving the requests of increase and notification for decrease, the involved TSOs have to assess locally the feasibility of the requests.

A request for increase can be:

- **Fully accepted**
- **Partially accepted**

There are situations when requested capacity increases on different borders compete for available margin on the same network element.

In this case, the TSO will partially accept increases on the borders on non-discriminatory basis.

- **Rejected** in case the consequences of the requests cannot be fully nor partially accepted by the TSO.

After the assessment, the TSO will notify the CMT with the status of each request for each MPT before the Increase Feedback Deadlines.

#### 4.2.3.14.3.3.1 Local implementation

##### Amprion

Amprion checks upon the feasibility of capacity increases via a local simulation tool that models the effect of capacity increases of Amprion's network. The tool uses DA CGMs or ID CGMs and models the impact of capacity increases via linear sensitivities.

In case this tooling should not be available when the process goes live, a slimmer, intermediate method based on contingency analysis results will be applied for a limited time. For the borders BE-NL and BE-FR no rejections of increase requests are planned to be conducted with this slimmer, intermediate method.

##### Elia

ELIA assesses ATC around the clearing point in D-1 and in intraday on Belgian borders and in all directions based on DA CGMs or ID CGMs. Calculation will be performed for a given MTP on representative hour(s) for this period. In this assessment, realistic values in the direction of the likely corner(s) are considered for the non-Belgian borders. Based on this, ELIA defines for this period the (partial) increase ID ATC possible on the Belgian borders and motivated (partial) acceptances or rejections for other borders, if any.

For the assessment, the same set of acceptance criteria and remedial actions as the ones used locally at Elia for the DACF process is considered.

On request of ELIA, Coreso may be in charge for Elia of the assessment whether or not to increase capacity for the aforementioned time periods. Based on this information Elia's operator will decide about possible rejections of capacity increases.

In all cases, the notification of rejections will be provided to the CMT by Coreso.

##### RTE

<sup>4</sup> For example, the CMT will receive two requests for decrease (-100 MW and -200 MW) and one increase request (100 MW), in this case the CMT will consider the minimum value, namely -200 MW, as consolidated notification of decrease.

**4.2.54.3.5**

**Providing ID**

**ATCs for allocation**

After receiving the updated capacity from the CMT, the responsible TSOs offer the capacity to the market players with the allocation rules and platforms.