Answers to market parties' questions on CWE flow-based IDCC methodology

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Contents

1 Management summary

1.1 Purpose of this document

The purpose of this document is to answer questions that were submitted following the publication, in March 2017, of the consultation report on the Flow-based Intraday Capacity Calculation methodology, including the points raised by the MPP in its letter of August 18th, 2017.

The remainder of the document is structured as follows: section two contains the glossary with the acronyms used in this document. Section three contains the answers by CWE TSOs to the questions raised by MPs.

2 Glossary

- ATC: Available Transfer Capacity
- BZ-to-BZ: Bidding-Zone to Bidding-Zone
- CACM: Regulation 1222/2015 - Capacity allocation and congestion management guideline
- CNE: Critical Network Element
- CNEC: Critical Network Element and Congestion
- DA: Day Ahead
- D-2: Two-Days Ahead
- DACF: Day-Ahead Congestion Forecast
- D2CF: Two-days Ahead Congestion Forecast
- FAV: Final Adjustment Value
- FB: Flow-based
- Fmax: Maximum allowable flow on a given CNE
- FRM: Flow Reliability Margin
- GSK: Generation Shift Key
- HVDC: High-Voltage, Direct Current
- ID: IntraDay
- IDCC: IntraDay Capacity Calculation
- IDCZGOT: IntraDay Cross-Zonal Gate Opening Time
- Imax: Maximum current on a CNE
- MPP: Market Parties Platform
- MPs: Market Parties
- PST: Phase-Shifting Transformer
- PTDF: Power Transfer Distribution Factor
- SOGL: System Operation Guideline
- XB: Cross-Border
- XBID: Cross-Border IntraDay Market Project

3 MP questions to be addressed by IDCC WG

Please find below the questions posed by MPs on the FB IDCC methodology and the respective feedback from CWE TSOs. Section 3.1 addresses the questions raised in the MPP letter of August 18th, 2017, and section 3.2 addresses the questions submitted to CWE TSOs following the publication of the consultation report of March 2017.

3.1 MPP letter of August 18th, 2017

3.1.1 General

The MPP welcomes the CWE TSOs' intention to proceed with a new capacity calculation in the intraday timeframe, based on updated inputs and considering reduced reliability margins compared to DA capacity calculation.

However, the proposal of the TSOs is insufficient. The documentation disclosed by TenneT still lacks the necessary details of the computations. Deeper comments on the level of detail that should apply to any proposal of a capacity calculation methodology can be found in the Eurelectric, EFET, Nordenergi, MPP response to the CCR proposals for the Capacity Calculation Methodologies in Nordic, Channel, Hansa, Core and SWE CCRs.

Overall, the MPP regrets the lack of transparency on the main methodological choices and the lack of ambition of the current proposal. Nevertheless, we consider this approach is acceptable as an interim solution, as it will improve the actual situation. Consistency with the day-ahead methodology is important in that respect.

The main omissions in this proposal are:

- There is no timeline for implementation, despite the related decisions by CWE NRAs.
- There is no clarity on what will be implemented as much is to the discretion of an individual TSO.

<u>Feedback of CWE TSOs:</u>

CWE TSOs would like to highlight that more detailed information, including the planning for implementation have been drafted in an explanatory note which has been submitted together with the methodology document. The planning was subsequently presented at the Consultative Group Meeting in September.

3.1.2 Inputs

"As a general rule, if there is an agreement between NRAs and TSOs to update the method for the input generation for the D-2 CWE FB process, the consequences of the implementation of these changes for the ID timeframe will be analyzed and, if possible, the FB IDCC method will be adapted in order to align it with the updated D-2 method."

The use of the method is conditional. What is the purpose of this proposal if TSOs are not bound to use it?

<u>Feedback of CWE TSOs:</u>

CWE TSOs foresee to analyse updates made in the D-2 method and consider these changes in ID. In general D-2 and ID consider two different time horizons, therefore it has to be proven, if changes made in D-2 are technically feasible in ID. In that case a link should be made to other projects (e.g. Core), also resources which are necessary to implement these changes have to be taken into account.

3.1.3 CNEC list for the FB computation

"If there is an agreement between NRAs and TSOs to update the method for the CNEC selection for the D-2 CWE FB process, the consequences of the implementation of these changes for the ID timeframe will be analyzed and, if possible, the FB IDCC method will be adapted in order to align it with the updated D-2 method."

The CNEC list for the FB computation is also conditional. What can we expect? What are the issues? In this regards, the MPP would like to stress that the FB package approval by CWE NRAs included the following statement: [excerpt from NRA feedback regarding CBCO selection rule]

As market participants, we would welcome such a demonstration [regarding optimality of 5% CNEC selection rule] and regret that no impact assessment of the CNEC selection process has been communicated so far for the DA and ID timeframes. We also note that such a demonstration should also be made with regard to external constraint selection.

Finally, the CNEC selection process should apply to each market time unit. Unlike what we experience as of today, this would lead to a situation where CNECs with all BZ-to-BZ PTDFs below 5% are never included in the capacity calculation.

Feedback of CWE TSOs:

CWE TSOs foresee to analyse updates made in the D-2 method and consider these changes in ID. In general D-2 and ID consider two different time horizons, therefore it has to be verified if changes made in D-2 are technically feasible in ID.

This topic is currently under discussion among CWE TSOs and NRAs and stakeholders are regularly informed on the status during stakeholder meeting.

3.1.4 Maximum current on a Critical Network Element (Imax) and Maximum allowable power flow (Fmax)

"When the Imax value depends on the outside temperature or wind conditions, its value can be reviewed by the concerned TSO if outside temperature or wind forecast is announced to be much higher or lower compared to the seasonal values."

Including weather conditions should be standard to maximise grid capacity. Especially in the intra-day timeframe, when more accurate forecasts are available. What are the reasons for not including them as a general conduct?

Feedback of CWE TSOs:

CWE TSOs would like to clarify that the limits for lines are not always determined by weather conditions, but could be limited by the sizing of feeder equipments (e.g. switcher, breaker, potential transformer).

When the limit of an element is dependent on weather conditions, and if this element is equipped with dynamic line rating, it is the practice of TSOs to consider weather condition forecasts when determining the limits for capacity calculation.

3.1.5 Day ahead Common Grid Model

"For intraday capacity calculation the latest available version of the day ahead Congestion Forecast process (DACF) will be used at the moment the capacity calculation process is initiated."

What exactly is the latest version that is meant here? In our view TSOs should make an update after the day-ahead market results for the intra-day calculation.

Furthermore, in the case of capacity calculations after the intraday cross-border gate opening time, should not the IDCF file be used? How would then the (moving) market clearing point be accounted in the common grid model used and FRMs considered in later capacity calculations?

Feedback of CWE TSOs:

As detailed in the FB IDCC methodology document, the latest available version of the day ahead Congestion Forecast process (DACF) includes, according to the methodology developed in line with Regulation 1222/2015 Article 16 and 17 (CACM):

- Best estimation of Net exchange program
- Best estimation exchange program on DC cables
- Best estimation for the planned grid outages, including tie-lines and the topology of the grid
- Best estimation for the forecasted load and its pattern
- If applicable best estimation for the forecasted renewable energy generation, e.g., wind and solar generation
- Best estimation for the outages of generating units
- Best estimation of the production of generating units
- All agreed remedial actions during regional security analysis.

The grid model used for ID capacity calculation is created after the DA market coupling in the evening of D-1. So the results of the DA market coupling are taken into account to create the grid model used for ID capacity calculation. The following list provides explicitly all improvements achieved through the recalculation in DACF compared to D2CF:

- Updated estimation of Net exchange program
- Updated estimation exchange program on DC cables
- Updated estimation for the planned grid outages, including tie-lines and the topology
- of the grid
- Updated estimation for the forecasted load and its pattern
- If applicable better estimation for the forecasted renewable energy generation, e.g. wind and solar generation
- Updated estimation for the outages of generating units
- Updated estimation of the production of generating units
- All agreed remedial actions during regional security analysis

In the current process, only one recomputation is coordinated with all TSOs. This recomputation is performed in the evening of the D-1. In the future, additional recomputations (i.e. after IDCZGOT) could be implemented based on the updated set of data: IGMs, but also remedial actions, in order to assess more efficiently the capacity that can be provided to the market players.

3.1.6 Generation Shift Key

"In general, the GSK includes power plants that are market driven and that are flexible in changing the electrical power output. This includes the following types of power plants: gas/oil, hydro, pumped-storage and hard coal. TSOs will additionally use less flexible units, e.g. nuclear units, if they do not have sufficient flexible generation for matching maximum import or export program or if they want to moderate impact of flexible units."

What are the reasons of excluding by fuel type in the standard calculation and only in cases where additional flexible generation is needed? What are the conditions for such cases?

Why are there so many unexplainable differences in the different GSK methodologies? The Dutch, Belgian and French bidding zones use a pro rata approach, which is not market reflective. Other TSOs use a more sophisticated approach. Interesting in this respect is the difference of TenneT NL and TenneT DE.

The assessment of approaches should be transparent with respect to their impact on the level of FRMs for the most critical network elements. This would help determining the most relevant approach for each TSO.

Feedback of CWE TSOs:

CWE TSOs note that not all TSOs differentiate by fuel type in their GSK. For the TSOs who do differentiate, the differentiation between fuel types was derived based on statistical analysis of power plant schedules in order to reflect market activities of power plants. In particular, fuel types allow for a statistical relevant distinction between base load generation and market driven generation, which is a required feature for the GSK.

The technical limitation of the flow based computation requests a pure linear GSK without possibility to consider a min and max value per node. So the pure market driven oriented approach or merit order approach cannot be applied and, TSOs need to accomodate their GSK methodology accordingly, depending on the specificities of the grid and generation pattern in its control area.

CWE TSOs always aim at harmonizing their methodologies. However, the GSK is very specific for each control area and its generation. Therefore, each CWE TSO determines the GSK in a way most suitable for its control area. This explains the difference between TTG and TTN, which reflect the very different generation structure.

3.1.7 FRMs

In our view, deviations related to remedial actions triggered by TSOs (such as voluntary topology changes, HVDC or PST settings, or redispatching) should not be accounted within the FRM setting. Indeed, those result from decisions by TSOs whose impact can be anticipated, unlike the other dimensions mentioned in page 12 of the proposal.

TSOs should clarify how they intend to modify the scheduled flows to account for those voluntary updates between the capacity calculation and real time.

Feedback of CWE TSOs:

The FRM is determined by the timestamps where the forecasted load-flow is lower than the realized load flow. Therefore, only remedial actions that increase the real time load-flow on a CNEC are relevant for the FRM of this CNEC. Moreover, for efficiency in the process and considering the effort needed to archive, list and translate applied RAs from real time back to forecasted dataset, we only focus on the RAs which can, from a qualitative point of view, significantly impact the FRM. Considering these aspects, CWE TSOs compute PST-adjusted FRM values, which do not take into account flow deviations related to PST settings. The use of redispatching and HVDCs generally has a positive effect on FRM values and is then not considered in the adjustment of scheduled flows. As the occurrence of an outage on the grid remains very rare, the consideration of flow deviations related to curative remedial actions has a negligible impact on the FRM values and does also not require to further modify the scheduled flows. It has also to be noted that CWE TSOs provide improved grid models in which foreseen remedial actions at the time of the capacity calculation are already applied.

3.1.8 Validation of capacity (countertrading and redispatch)

"The use of any of the above mentioned instruments has to be monitored, and is not dedicated to enlarge the flow-based or ATC domain, as it would become too large, thus unsecure. The output of this process is the amended flow-based and/or ATC domain."

We certainly acknowledge that the inclusion by individual TSOs of additional constraints in the capacity calculation or allocation because of internal constraints should be thoroughly monitored and justified. But we disagree with the statement that enlarging the FB or ATC domain systematically makes operation less secure. Indeed, TSOs may use alternative remedial actions, such as countertrading or redispatch to restore secure system operation. In this regard, the MPP calls for a capacity calculation and allocation that leads to the most efficient trade-off between the various means TSOs can rely on to secure system operation.

Feedback of CWE TSOs:

As explained in the Consultation report, CWE TSOs welcome the proposal to consider economical parameters in the process. However CWE TSOs consider the topic of implementing costly remedial actions in order to adapt the capacities and use of congestion rent for redispatch to be an NRA decision. TSOs would additionally like to inform that related discussions are also ongoing at ENTSO-E level.

3.1.9 Back-up procedures

"The back-up process has to be reliable in order to ensure that capacity will always be delivered to the market players. In case the process fails, the last computed capacity will be provided to the allocation platform. For example, in case the intraday capacity calculation fails, the TSOs will provide to the allocation platforms the leftover of the day ahead capacity."

It is not clear what this really means. The fall back is the current procedure?

Feedback of CWE TSOs:

The backup procedure foresees that the leftover capacity per CWE border and direction shall be determined based on the Day-ahead flow-based domain and the day-ahead Market clearing point using the ATC extraction algorithm from the current procedure. But no additional (bi- or multi) lateral assessment shall take place.

3.2 Questions by MPs following consultation process

3.2.1 The calculation of ID RAMs

What is taken into account in practice? An example with historical measurements on a particular CNE would be welcome.

Feedback of CWE TSOs:

The calculation of CNE is explained in the Methodology document. The calculation of RAMs does not differ from the DA FB calculation. Historical information from DA point of view is already provided by TSOs on the www.jao.eu website for MPs.

3.2.2 Stopping XB exchanges during the capacity calculation process

MPs consider this might reduce market efficiency (in particular when there are several recomputations) but understand this would allow considering reduced RAMs. Could TSOs provide figures about how much placing ID markets on hold during recomputation leads to reduced RAMs?

Feedback of CWE TSOs:

The FB IDCC methodology does not deal with trading on capacities and does not refer to a stop in the XB exchanges during the CC process.

The CWE FB IDCC method will be operationalized with only one re-computation for the full day before gate opening. More re-computations for Intraday are to be expected as part of the CORE initiative.

3.2.3 Favoring certain directions for capacity increase through RA optimization

In terms of favoring certain directions for capacity increase through RA optimization, MPs want to highlight that their feedback do not oppose. They may differ slightly (mainly due to the extremely short delay they had to answer the consultation: 2 weeks) but tend towards the same direction, as long as there are only a few IDCCs, TSOs should give more value to enhancing the FB domain in the intraday or day-ahead market direction (depending on the timing of the recalculation) than in the reverse direction. At least the impact assessment should monitor such an indicator.

Feedback of CWE TSOs:

The present objective function is to increase the minimum relative margin by finding remedial actions that aim at improved capacities based on the day-ahead market results. The RAO tries to maximize the margins of monitored elements relatively to their sensitivity to exchanges, without market assumption (i.e. without a preference to any particular exchange directions). This can be explained as increasing the space around the market clearing point of the day-ahead market as illustrated in figure 3 below.

$$Relative\ Margin\ (CNEC) = \frac{Margin(CNEC)}{\sum_{i,j \in hubs}|PTDF_{i \to j}(CNEC)|}$$
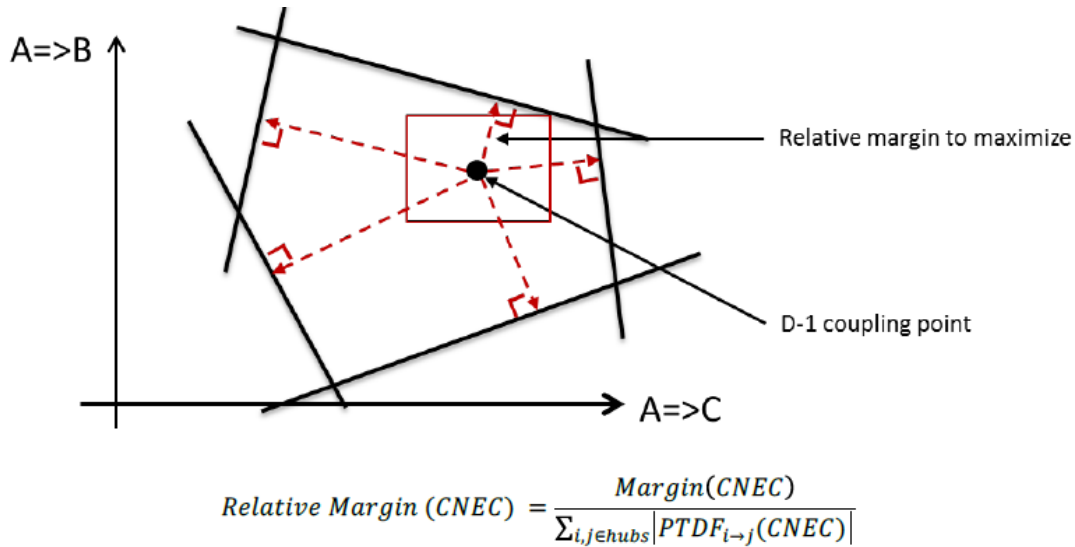
Figure 3: Illustration of the non-discriminatory approach to increase the space around the market clearing point of day-ahead without one border being advantaged over another.

This means that a remedial action will be selected and implemented if it increases the margin on the limiting branch (among the monitored CNECs) considering the already achieved minimum margin.

From this approach it follows that the day-ahead market clearing point (more precisely its position in the FB domain) determines the directions in which the domain is optimized.

Furthermore it can be noted that the objective function of the RAO is always the same independent of the day-ahead market clearing point being included in the FB domain or not.

3.2.4 Impact assessment & performance indicators

MPs questioned the impact assessment, and suggested several performance indicators. Could the TSOs simulate additional results with such indicators since March?

Feedback of CWE TSOs:

CWE TSOs are performing an internal parallel run since May 30th, 2017 in order to get more quantitative results and perform a more reliable and representative impact assessment. This internal parallel run will continue during 2018 and will be followed by an external parallel run, whose results will be shared with Market Parties.

As the behavior of market participants in the intraday timeframe is not predictable, CWE TSOs are not only looking at the capacity in the DA market direction, but are also computing a market indicator that takes into account all the market directions.

CWE TSOs welcome any suggestion from Market Parties about new indicators.

3.2.5 Multiple IDCCs

MPs welcome the announcement by CWE TSOs that multiple IDCCs will be performed in the future. An indicative schedule would be welcome for this development.

Feedback of CWE TSOs:

CWE TSOs acknowledge that multiple recomputations during intraday increases security of supply and reduces the uncertainty level which allows more capacity to be provided to the market. However, due to CACM GL deadlines, no major update (e.g. extension of the number of recomputations) of the intraday capacity calculation methodology is foreseen before the go-live of IDCC in the Core CCR. For Core IDCC, multiple recomputations of capacity are already foreseen as provided in the Core FB IDCC Proposal.

3.2.6 External constraints

As of the external constraint, it is unclear to market parties to which extent voltage stability issues extent can be considered as cross-border related. Also, if external constraints prevent the market clearing point to deviate significantly from the forecast (i.e. the MCP immediately before the recomputation?), this should be duly taken into account in the FRM, which should be reduced consequently.

Feedback of CWE TSOs:

The FRM values cover uncertainties of the input parameters and not of the applied model itself, therefore External Constraints have no effect on the FRM values.

Extreme situations far away from the original market clearing point cannot be reflected in the linear approximation that is used in the DC loadflow. This approximation only remains valid in a certain area around the market clearing point. Therefore, moving far away from the original assumption, leads to large model inaccuracies and a failure of the model. This implies, that a stable grid operation is not guaranteed anymore and TSOs are obliged to prevent this.

3.2.7 XB redispatch

We understand that XB redispatch would shift the FB domain, and would welcome more details on the way CWE TSOs intend to organize XB redispatching. In any case, full transparency should prevail on redispatching as soon as such actions are triggered by TSOs (i.e. before real time), as they can significantly affect price formation in all bidding zones.

Feedback of CWE TSOs:

CWE TSOs agree on the need for transparency for redispatch measures, but XB redispatch is out of scope of the present process. The application of redispatch is not triggered by capacity calculation. Instead some control blocks are using internal processes for the determination of preventive redispatch or real time system operations will decide close to real time if redispatch measures are necessary.

3.2.8 ID Countertrading

Do TSOs foresee to use the countertrading for CWE? If not, why? Is it foreseen in the future?

Feedback of CWE TSOs:

CWE TSOs consider the topic of implementing costly remedial actions (e.g. countertrading) in the process to be an NRA decision. Should these measures be necessary in order to safeguard security of supply, CWE TSOs consider this out of scope for the present process.