

CCR Nordic Regulatory Authorities statement of disagreement on the CCR Nordic TSO's proposal on Capacity calculation methodology according to Commission Regulation (EU) 2016/1719 (FCA GL)

General background on the proposal and it's application in CCR Nordic

The capacity calculation methodology according to FCA GL is generally used for calculation of forward capacities to be allocated via long-term transmission rights (LTTR's). Since LTTR's are only allocated for the Danish bidding zone border DK1-DK2 and not for other borders in CCR Nordic, the primary application of the methodology is currently to provide market participants with a forecast on future capacities to be available for the market.

The proposal by the TSOs is a methodology that builds upon the flow-based inputs and parameters used for DA capacity calculation. Respecting the boundaries of the flow-based domain, the methodology applies an optimization based CNTC extraction via a so-called boxing formulation. This serves to maximise the total available CNTC capacities within the flow-based security domain.

General background on the process

- CCR Nordic NRAs and TSOs initiated discussions on the FCA CCM during the fall of 2018. NVE participates in discussions with the CCR Nordic NRAs on an informal basis pending the implementation of EU's third energy package and subsequent regulations in Norwegian law.
- TSOs' proposal was received by the last NRA of CCR Nordic on the 16th of January 2019
- Latest date for approval or a request for amendment according to FCA GL Art 4.9 is thus 16th of July 2019
- NRAs discussions thru 2018 and 2019 have identified substantial diverging views on the legal compliance of basic attributes of the proposal. These diverging views have blocked NRAs discussions on the proposal as a whole.

Summary of NRAs diverging legal interpretations

According to Article 10.2 of FCA GL, the approach used in the common capacity calculation (CCM) shall be either a coordinated net transmission capacity (CNTC) approach or a flow-based approach. The methodology shall also be compatible with the CCM for the day ahead and intraday timeframes. The approved CCM methodology for the day ahead market in CCR Nordic is the flow-based approach and for the intraday market, it is a CNTC approach.

During the approval of the FCA CCM process it has become evident that the CCR Nordic NRAs hold diverging legal interpretations on the necessary content of the two options for capacity calculation methodologies that the FCA GL provides (Art 10.2).

The TSOs have labelled the proposed methodology as "CNTC". They argue that the proposed methodology fulfils the requirements and definition of CNTC (Art 2.8 of CACM) and should be assessed as such. The Swedish NRA Swedish Energy Markets Inspectorate (Ei) and the Danish NRA Forsyningstilsynet (DUR) deem that the methodology presented by TSOs is compliant with the legal provisions for a CNTC methodology. The Finnish NRA Energiavirasto (EV) finds that the proposed methodology, even though labelled as CNTC, does not follow the requirements set in the CACM art.

21.1(b)(vi) for CNTC approach nor the already approved CNTC methodology for ID. Instead, the proposed methodology seems to follow a flow-based approach, including PTDF matrices and RAMs.

EV's view

EV finds the proposed methodology not to follow relevant requirements for CNTC approach nor the intention of the legislator with two different approaches for capacity calculation.

EV emphasizes that in line with FCA GL there are two alternative approaches for the FCA capacity calculation; flow-based and CNTC. The TSOs are free to select the chosen approach between the two options, provided that the methodology fulfills the requirements stated in the guidelines.

EV finds the content of proposed methodology to follow a flow-based approach even though labelled as CNTC. This is because the methodology is based and is using the elements of the flow-based approach as listed in CACM art. 29(7), including PTDF matrices and RAMs. Moreover, the content of the proposed FCA methodology is in line with the already approved flow-based methodology for DA in the Nordics with the addition that the resulted FB domain is used to receive NTC values. EV also notes that in this sense the proposed methodology is similar with the adopted flow-based methodology for CORE and its fallback procedures.

Should the TSOs opt for flow-based approach for FCA CCM, they should provide data in accordance with the conditions listed in FCA art. 10 (5) to demonstrate that the approach leads to an increase in economic efficiency, and that the flow-based results are accurate. According to FCA art. 10(5):

All TSOs in each capacity calculation region may jointly apply the flow-based approach for long-term capacity calculation time frames on the following conditions:

- (a) the flow-based approach leads to an increase of economic efficiency in the capacity calculation region with the same level of system security;*
- (b) the transparency and accuracy of the flow-based results have been confirmed in the capacity calculation region;*
- (c) the TSOs provide market participants with six months to adapt their processes*

Should the TSOs opt for CNTC approach, the art. 10(5) conditions are not applicable and thus, the burden proof seem less than when opting for flow-based approach which may explain this wish for different labelling than is intended.

According to CACM art. 21(1)(b), if following the CNTC approach, the methodology should include **the rules for calculating cross-zonal capacity**, including **the rules for efficiently sharing the power flow capabilities** of critical network elements among different bidding zone borders whereas for the flow-based approach, the methodology should include mathematical description of **the calculation of power transfer distribution factors** and of **the calculation of available margins** on critical network elements.

EV agrees that the description for CNTC approach may seem less clear than for flow-based approach. For the flow-based approach, calculation of PTDFs and RAMs are explicitly mentioned whereas for the CTNC, rules for calculating and efficiently sharing the capacities are asked. If the intention of the formulation is that PTDFs and RAMs are the rules for calculating capacities, it would seem odd to describe two different approaches for capacity calculation as they would be in practice the same.

Also, if we consider the ask for describing the rules for **efficiently** sharing the power flow capabilities of critical network elements, we should conclude that depending on the system characteristics, the use of PTDFs and RAMs are ruled out if they do not efficiently share the capabilities of the system.

Using PTDF and RAM concepts includes transposition of non-linear power system restrictions to linear ones, expressed in MW values for each critical network element. This transposition is inherent for flow-based approach but not for CNTC approach. This transposition introduces error to capacity calculation, which in practice means lower capacities as this error has been taken into account conservatively. This inherent error caused by PTDFs and RAMs may be justified if the full flow-based domain is provided to the market as the TSOs do not have to make a choice when sharing the power flow capabilities of critical network elements before the market clearing. However, if the full flow-based domain is not provided to the market but merely used to capture NTC values, the result is that unnecessary error is introduced to the calculation and drawbacks of both calculation approaches – treatment of non-linear constraints for flow-based and limited presentation of the results for CNTC – are taken without receiving the benefits.

The Nordic region is characterized by being limited by non-linear dynamic constraints. The phenomenon for limiting the capacities is most often a dynamic constraint. Thus, it is questionable if a methodology first linearizing those constraints and then reducing the resulted flow-based domain to NTC values shall prove to be efficient. EV finds that FCA art. 10(5) sets the conditions for applying such an approach. EV finds that a CNTC approach in line with relevant regulation requirements, objectives and the legislators intention builds a security domain presenting the relevant security constraints per bidding zone border. For any given border, the allowed flow is limited by the most constraining phenomenon. Thus, a security domain is a multidimensional presentation of the acceptable operating boundaries for secure grid operation defined by operational security limits such as thermal limits, voltage limits, short-circuit current limits, frequency and dynamic stability limits where the dimensions of the domain reflect the bidding zone borders. Further details, including mathematical formulation for consideration, is presented in the attached RfA draft prepared by EV.

DUR and Ei's view

The request of having ATC values published for the forward time frame has been put forward by market participants in the Stakeholder meetings and consultations regarding the CCR Nordic capacity calculation methodology according to Commission Regulation (EU) 2015/1222 (CACM). Stakeholders have explicitly requested to have ATC-values calculated in the forward timeframe while day ahead (DA) capacities will be calculated and allocated using the flow-based methodology approved under CACM in July 2018.

DUR and Ei are of the opinion that the overall methodology as presented by the Nordic TSOs as CNTC, is within the legal boundaries of CACM GL and FCA GL. NVE supports DUR and Ei's view.

FCA GL Art 10.2 states: "The approach used in the common capacity calculation methodology shall be **either** a CNTC approach **or** a flow-based approach." This Article makes clear that there are two distinct types of methodologies to choose from. FCA GL does however not mention any specific characteristics of CNTC and flow-based.

The minimum requirements for any CCM are instead outlined in CACM GL Art 21. Any CCM shall include *at least* the requirements in this article. **Only two requirements differ between CNTC and flow-based, these are stated in Art. 21.1(b)(v) and in 21.1(b)(vi).** Art 29.7 and 29.8 also repeat, as a

consequence of the choice of methodology, what the coordinated capacity calculator shall do to fulfil the requirements for capacity calculation.

From CACM art. 21 and 29, it is clear, that the **final outcome of flow-based** should be **PTDFs and RAMs** on CNEs while **the final outcome of CNTC** should be explicit **cross-zonal capacities**. All the other requirements are essentially the same for both types of methodologies.

DUR and Ei find that the proposed methodology meets the provisions as laid out in Art 21 (b) (i)-(vii). As the outcome of applying the proposed methodology will be “cross-zonal capacities”, it should be correct to label the methodology proposed by CCR Nordic TSOs CNTC and not flow-based, although the methodology makes use of many of the elements that also a flow-based methodology would have.

DUR and Ei further find that the proposed methodology’s use of PTDFs and RAMs to describe power flows and flow capabilities in order to comply with the requirements in CACM art. 21, does not make it less compliant with the provisions and process laid down for the CCC to perform capacity calculation according to a CNTC methodology in CACM Art. 29.8.