Explanatory document for the amended Nordic synchronous area methodology to determine limits on the amount of exchange of FRR/RR between synchronous areas defined in accordance with Article 176(1)/178(1) and to determine limits on the amount of sharing of FRR/ RR between synchronous areas defined in accordance with Article 177(1)/179(1) of the Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation

Explanatory document to the proposed methodology of 01 July 2026

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1. Introduction

The Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation (hereafter referred to as the **"SO Regulation"**)[1] sets out rules on relevant subjects that should be coordinated between Transmission System Operators (hereafter referred to as "**TSOs**"), as well as between TSOs and Distribution System Operators (hereafter referred to as "**DSOs**") and with significant grid users, where applicable. The goal of the SO Regulation is the safeguarding of operational security, frequency quality and the efficient use of the interconnected system and resources. In order to deliver these objectives, a number of steps are required.

One of these steps is to determine the limits for the exchange of FRR between synchronous areas. Pursuant to Article 118(1)(z) of the SO Regulation, all TSOs in the Nordic Synchronous Area shall jointly develop common proposals for the methodology to determine limits on the amount of exchange of FRR between synchronous areas defined in accordance with Article 176(1) and the methodology to determine limits on the amount of sharing of FRR between synchronous areas defined in accordance with Article 177(1). Furthermore, pursuant to Article 118(1)(aa) of the SO Regulation, all TSOs in the Nordic Synchronous Area shall jointly develop common proposals for the methodology to determine limits on the amount of exchange of RR between synchronous areas defined in accordance with Article 178(1) and the methodology to determine limits on the amount of sharing of RR between synchronous areas defined in accordance with Article 179(1).

According to Articles 6(3)(d)(ix) and 6(3)(d)(x) of the SO Regulation the methodologies for limits on the amounts of exchange/sharing of FRR/RR between synchronous areas in accordance with Articles 176(1),

[1] As amended by Commission Implementing Regulation (EU) 2021/280 of 22 February 2021, amending Regulations (EU) 2015/1222, (EU) 2016/1719, (EU) 2017/2195 and (EU) 2017/1485 in order to align them with Regulation (EU) 2019/943.

177(1), 178(1) and 179(1) shall be submitted for approval by the relevant national regulatory authorities (hereafter referred to as the "**NRAs**").

The methodology that is accompanied by this explanatory document amends the methodology that has been approved by the NRAs in July 2019. This methodology is from all TSOs of the Nordic synchronous area.

This document contains an explanation of the amended Methodology. The legal requirements for the Methodology and the interpretation of the scope are presented in Chapter 2. Chapter 3 describes the objective of the limits on the amount of exchange/sharing of FRR/RR between synchronous areas. Chapter 4 provides an overview of the existing situation and chapter 5 describes the developments that trigger the need for this amendment. Chapter 6 describes and explain the amendments introduced in each (sub)-article. Finaly, Chapter **Fel! Hittar inte referenskälla.** describes the public consultation.

2. Legal requirements and interpretation

2.1 Legal references and requirements

The SO Regulation provides the mandate and approval framework for this Methodology and defines the substantive requirements that the Methodology must fulfil. There are several articles in the SO Regulation which the Methodology must take into account. These are cited below:

(1) Pursuant to Article 118(1)(z) and 118(1)(aa) of the SO Regulation, all TSOs of the Nordic synchronous area shall jointly develop a methodology to determine limits on the amount of exchange and sharing of FRR between synchronous areas, and, where applicable, a methodology to determine limits on the amount of exchange and sharing of RR between synchronous areas. Article 118(1)(z) and 118(1)(aa) has the following content:

"1. By 12 months after entry into force of this Regulation, all TSOs of each synchronous area shall jointly develop common proposals for:[…]

(z) the methodology to determine limits on the amount of exchange of FRR between synchronous areas defined in accordance with Article 176(1) and the methodology to determine limits on the amount of sharing of FRR between synchronous areas defined in accordance with Article 177(1); and

(aa) the methodology to determine limits on the amount of exchange of RR between synchronous areas defined in accordance with Article 178(1) and the methodology to determine limits on the amount of sharing of RR between synchronous areas defined in accordance with Article 179(1);

(2) In accordance with Article 118(2) and Article 6(3)(d)(ix)–(x) of the SO Regulation, the Methodology is subject to approval by all regulatory authorities of the concerned synchronous area and, following approval, shall be incorporated into the synchronous area operational agreement. Article 6(3)(d)(ix) and 6(3)(d)(x) has the following content:

"The proposals for the following terms and conditions or methodologies shall be subject to approval by all regulatory authorities of the concerned region, on which a Member State may provide an opinion to the concerned regulatory authority: […]
(d) methodologies, conditions and values included in the synchronous area operational agreements in Article 118 concerning: [...]
(ix) limits on the amount of exchange of FRR between synchronous areas defined in accordance with Article 176(1) and limits on the amount of sharing of FRR between synchronous areas defined in accordance with Article 177(1);

(x) limits on the amount of exchange of RR between synchronous areas defined in accordance with Article 178(1) and limits on the amount of sharing of RR between synchronous areas defined in accordance with Article 179(1)"

Article 118(2) has the following content:

"All TSOs of each synchronous area shall submit the methodologies and conditions listed in Article 6(3)(d) for approval by all the regulatory authorities of the concerned synchronous area. Within 1 month after the approval of these methodologies and conditions, all TSOs of each synchronous area shall conclude a synchronous area operational agreement which shall enter into force within 3 months after the approval of the methodologies and conditions."

(3) Article 176(1) of the SO Regulation requires that the synchronous area operational agreement specify a method to determine limits for the exchange of FRR with other synchronous areas. Article 176(1) has the following content:

"All TSOs of each synchronous area shall specify in the synchronous area operational agreement a method to determine the limits for the exchange of FRR with other synchronous areas. That method shall take into account:
(a) the operational impact between the synchronous areas;
(b) the stability of the FRP of the synchronous area;
(c) the ability of TSOs of the synchronous area to comply with the frequency quality target parameters defined in accordance with Article 127 and the FRCE target parameters defined in accordance with Article 128; and
(d) the operational security."

(4) Article 177(1) of the SO Regulation requires that the synchronous area operational agreement specify a method to determine limits for the sharing of FRR. Article 177(1) has the following content:

"All TSOs of each synchronous area shall specify in the synchronous area operational agreement a methodology to determine limits for the sharing of FRR with other synchronous areas. That methodology shall take into account:
(a) the operational impact between the synchronous areas;
(b) the stability of the FRP of the synchronous area;
(c) the maximum reduction of FRR that can be taken into account in the FRR dimensioning in accordance with Article 157 as a result of the FRR sharing;
(d) the ability of the synchronous area to comply with the frequency quality target parameters defined in accordance with Article 127 and the FRCE target parameters defined in accordance with Article 128; and
(e) the operational security."

(5) Articles 178(1) and 179(1) of the SO Regulation establishes corresponding requirements for the exchange and sharing of RR. As the Nordic TSOs currently do not utilise RR, this Methodology does not specify limits for RR.

2.2 Interpretation and scope of the Methodology

The Nordic TSOs apply two types of Frequency Restoration Reserves (FRR): manual FRR (mFRR) and automatic FRR (aFRR). The two types have different specifications and could in theory be handled differently

in this methodology. However, as different European TSOs currently use aFRR and mFRR differently in the balancing process and future processes are uncertain, Nordic TSOs propose that articles 3-5 of this methodology applies to the sum of mFRR and aFRR. The TSOs currently do not utilise Replacement Reserves (RR). Consequently, this methodology does not include limits on the amount of exchange and sharing of RR between synchronous areas in accordance with articles 178 and 179 of the SO Regulation.

The dimensioning rules for FRR in accordance with Article 157 of the SO Regulation result in the required FRR capacity to be guaranteed by each TSO. Part of this FRR capacity requirement can be fulfilled by exchanging or sharing FRR with other synchronous areas. The framework for the exchange and sharing is the scope of this Methodology.

Currently, the exchange and sharing of FRR capacity is only taking place between Nordic TSOs. More bilateral agreements or extended/other capacity markets may be relevant in the future.

It is expected that the Nordic TSOs will join the European platform for the exchange of balancing energy from frequency restoration reserves with manual activation (hereafter referred to as "**MARI**") within the next year. Energinet and Fingrid have already acceded to the European platform for the exchange of balancing energy from frequency restoration reserves with automatic activation (hereafter referred to as "**PICASSO**"), while Statnett and Svenska kraftnät are expected to join within the next years.

This Methodology will apply to both the exchange and sharing of FRR capacity and to the exchange of FRR energy via the European platforms.

3. Objective of limits for the exchange and sharing of FRR

Exchange and sharing of FRR capacity contribute to the efficient operation of the electricity system by allocating FRR capacity more efficiently. However, in order to maintain operational security, FRR exchange and sharing of capacity must be limited as there are limitations in available grid capacity. The objective of the limits on the amount of exchange and sharing of FRR capacity is to guarantee that operational security is maintained. In particular, one of the objectives is that the limits shall make sure that the stability of the Frequency Restoration Process can be ensured and that the synchronous area can comply with the frequency quality target parameters defined in accordance with Article 127 and the FRCE target parameters defined in accordance with Article 128.

4. The existing situation

Currently, the Nordic FRR requirements are specified per control area, and each TSO has the obligation to meet their required amount of FRR. For fulfilling part of their obligation each TSO may exchange or share FRR capacity with one or more TSOs in one or more other synchronous area(s). Since situations may be different for the different HVDC interconnectors, the TSOs do not apply generic rules on limits of the amount of FRR that can be exchanged or shared with TSOs in other synchronous areas. The Nordic TSO involved in the exchange or sharing is responsible for assessing and monitoring the impact of the exchange and/or sharing on the available FRR in its own area and the possible impact on other control areas in the synchronous area. The exchange and sharing arrangements between TSOs within the LFC block and with other synchronous areas are included in the Nordic System Operation Agreement.

The Nordic activation process for FRR is changing gradually:

- Energinet (18 October 2024) and Fingrid (28 March 2025) have acceded to the aFRR balancing platform PICASSO.
- The TSOs have implemented a common Nordic activation optimisation function (AOF), that automated the activation of mFRR from the common bid list (previously activated manually), since 4 March 2025. This was driven by the move to 15-minute MTU resolution, and it functions as a necessary bridge between the old manual processes and integration into MARI.

5. Developments in the balancing markets triggering this amendment

Today, exchange on the HVDC interconnectors between the Nordic and CE Synchronous Areas is mainly based on the results of the day-ahead and intraday markets as the volumes of FRR exchange are small.

Considering the future developments in the Nordic power system, the Nordic TSOs expect that the operation of HVDC interconnectors will be different from today. Firstly, there will be more flow changes than today because of increased volatility in production due to increased production shares from wind- and solar production. Secondly, there will be increased exchange of balancing energy when the Nordic balancing markets connects to MARI and PICASSO. This will result in more fluctuation caused by 15 minutes schedules of day-ahead, intraday and scheduled mFRR exchange and increased maturity of centralized FRR activation in the European activation platforms. In addition, occasionally there will be the need for mFRR direct activation, sometimes with large volumes, especially related to disturbances. Moreover, there will also be continuous changes (every 4 seconds) for aFRR exchange. In general, the TSOs expect larger volatility than today over time because of more automated activations.

By connecting all Nordic LFC areas to the MARI and PICASSO platforms almost all European countries will have access to Nordic balancing energy and the other way around. Because of the large availability of FRR at a competitive price in the Nordic synchronous area, potentially large amounts of FRR may be exchanged over the HVDC interconnectors between the Nordic and other synchronous areas. This exchange may have significant impact on the flows on these HVDC interconnectors and consequently an impact to frequency quality, FRCE parameters for LFC areas and flows within the Nordic synchronous area.

In addition, the volatility of exchange over the HVDC interconnectors is expected to increase after connecting to MARI and PICASSO. This means that balancing market results may require more frequent changes of the HVDC setpoints. Older HVDC interconnectors are however designed for a more stable operation, and they do not necessarily support continuously changing setpoints. Therefore, TSOs strive to operate these interconnectors to stay below 1000 direction changes per year, as the vendors for older HVDC interconnectors specify that more than 1000 direction changes per year may have significant impact on the lifetime of the cables. Some relevant challenges may be:

- Operation within dead bands around zero flow;
- Frequent direction changes of flows as a result of energy markets and balancing markets;
- Large and fast changes in flows.

Since the TSOs operate a variety of HVDC interconnectors these operational restrictions are different for each HVDC interconnector. Consequently, the TSOs conclude that it shall be possible to set operational restrictions for FRR on each HVDC interconnector individually.

Balancing markets vs the energy markets

Considering that the limitations for energy exchange for the day-ahead and intraday markets were defined to maximise the use of the interconnector under given frequency quality considerations, there may be little room for additional exchange of balancing energy, unless the day-ahead and intraday market do not use the full potential or exchange capacity has been reserved for balancing timeframe.

The TSOs consider it inefficient to restrict the day-ahead and intraday market in order to create the possibility to exchange more in the balancing markets. Furthermore, the TSOs do not want to compromise on operational security or the ability to comply with the frequency quality target parameters defined in accordance with Article 127 and the FRCE target parameters defined in accordance with Article 128. Consequently, the TSOs conclude that the allocation constraints for exchange on HVDC interconnectors as defined under the Methodology in accordance with SOGL 137 (3, and 4) shall – after the connection to the European balancing platforms – apply to the day-ahead market, intraday market and the exchange of balancing energy together.

Given all uncertainties that come from the combined introduction of relatively new features in the wholesale electricity markets (15 min MTU day-ahead and intraday), recent introduction of Nordic mFRR EAM, the Flowbased Market Coupling, the continuing increasing amount of renewable energy, combined with FRR capacity market and the coming MARI and PICASSO accessions, it is impossible to know how the activation of Nordic bids and hence how the flows via the HVDC interconnectors with Continental Europe will be affected. Also, it is uncertain how that could affect the transmission grid in terms of congestions. Therefore, the TSOs decided to implement a two-step approach:

- **STEP1** is introduced with this amendment and will be applicable from the approval of this methodology until 3 years after all Nordic TSOs are connected to PICASSO. STEP1 is characterised by that the different LFC areas may face different magnitude and local effects of FRR exchange with Continental Europe and hence the Nordic TSOs have agreed that each TSO should have a possibility to define allocation constraints based on local needs and assumptions, within certain boundaries and conditions that are explained in chapter 6, where each article is described. For safety reasons for the total synchronous area, a maximum flow change is introduced for each interconnector, safeguarding the system.

- TSOs intend to address a **STEP2** in a separate amendment to the methodology at a later stage, based on the TSOs' evaluation of operational experience gained from the use of the European balancing platforms during the initial years of operation. This STEP2 methodology is intended to enter into force when STEP 1 no longer applies. It is the intention that STEP2 will include requirements for a yearly evaluation of FRCE parameters as the TSOs will have sufficient experience with activation procedures in MARI and PICASSO and the resulting activation requests coming from these balancing platforms. The result of each yearly evaluation are allocation constraints for each Nordic LFC area. The TSOs are aware that the criteria for these yearly evaluations must be known before STEP2 enters into force. The expectation is that there will not be a need for an upper bound as determined by article 5.1 of the proposal and that the lower bound can be raised as long as the monitored FRCE-parameters and potential other agreed KPIs are within their agreed limits.

6. Amendments to the Methodology

The amendment includes some minor linguistic clarifications to the Whereas section, as well as some small legal and factual precisions added to provide content.

6.1 Amendment to Article 1 and 2

The text has been updated to make the sentences more clear and in article 2 we added definitions for clarification. The term technical profile is used in the Implementation Framework-documents for MARI and PICASSO and commonly used within the TSO-community. However, it has not been defined in official legislation, so far.

6.2 Amendment to Article 3 and 4

The word "capacity" has been added to make a distinction between article 3 and 4 relating to capacity, and the new article 5 relating to energy.

6.3 Amendment: new Article 5

Given the developments mentioned in chapter 5, the TSOs consider the activation of FRR very similar to a change in the day-ahead or intraday schedule and consequently also adding to the issues being mitigated by allocation constraints as stipulated for the day-ahead and intraday markets.

The starting point will be that the same restrictions on maximum flow change between MTUs which is applicable for the Day Ahead and Intraday markets will also apply for the Balancing Markets. This

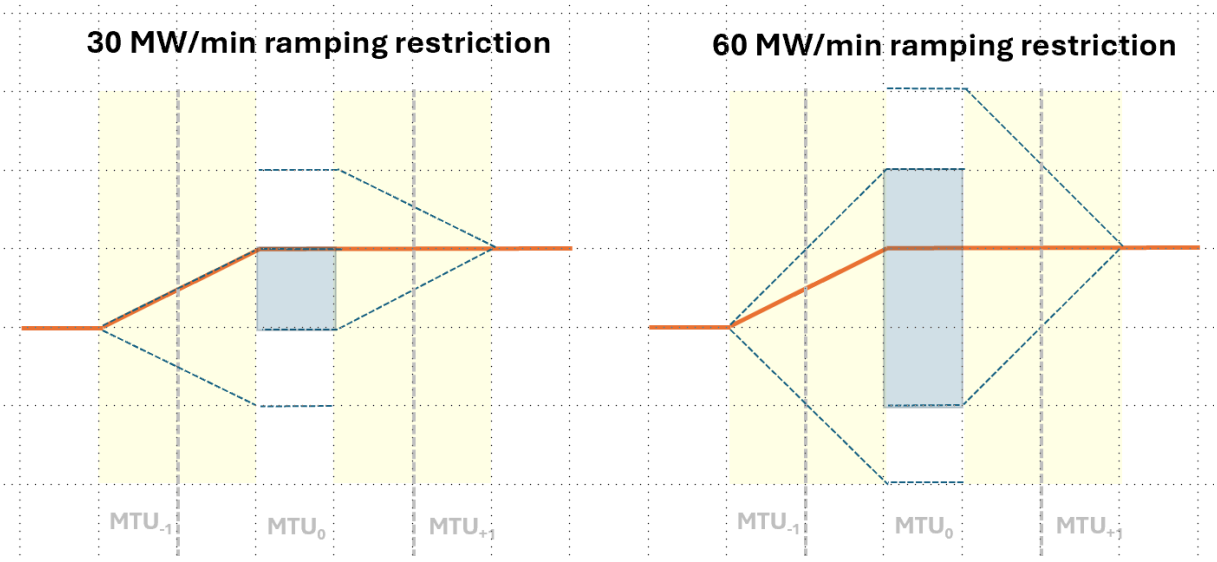
methodology does however acknowledge, as mentioned before, that there are different needs for different LFC areas within the Nordic LFC block. The number of HVDC interconnectors and the local grid situation varies a lot between the LFC areas, and therefor the ability to manage structural imbalances caused by HVDC flow changes also varies. For this reason, Article 5(1) opens for increasing the allowed flow change between MTUs for FRR up to 600 MW per interconnector.

The 600 MW is a limit based on TSOs' best assessment of the needs for secure system operation. Even if frequency quality currently is good, this limit is based on concerns related to future frequency quality given the expected increase in exchange between the Nordic and CE Synchronous Areas.

The purpose of having a bandwidth for restrictions, is to allow each TSO to maintain system security in their control area and at the same time not to restrict exchange more than necessary. A generic Nordic restriction would have been more restrictive for market parties. By this, each TSO can consider technical and operational limits only for the HVDC interconnectors or the LFC Areas that cannot facilitate the expected volatility in FRR exchange or sharing for their control area.

For illustration purposes, the Nordic TSOs provide the following example:

The maximum flow change must not be exceeded neither going into an MTU or going out of an MTU. To ensure this a "feasibility range" is calculated. The feasibility range for each MTU will depend on the schedule (after DA+ID + previous FRR activations) and the bound for maximum flow change determined for each border. Cross border FRR-activations will only be possible within the "feasibility". This is depicted in below figure.



The actual limits for FRR vary, depending on the result of the day-ahead, intraday markets and FRR-activations in previous MTU(s). For instance, in a situation where the DA and ID schedule changes going into the relevant MTU but does not change going out of the relevant MTU:

If a TSO chooses to apply the lower bound (Article 5(1)(a)), the maximum flow change caused by FRR can (currently) be 300 MW/MTU. If the DA+ID schedule results in a flow change of 300 MW/MTU, then for this MTU-change there will be 0 MW available for FRR in the same direction. In the opposite direction there will be 600 available MW for FRR.

If a TSO chooses to apply the upper bound (Article 5(1)(b)), the maximum flow change caused by FRR can be 600 MW/MTU. If the DA+ID schedule results in a flow change of 300 MW/MTU, then for this MTU-change there will be 300 MW available for FRR in the same direction. In the opposite direction there will be 900 MW available for FRR.

Article 5(2) ensures that if a TSO applies combined restrictions, based on the Methodology under Article 137 of the SO Regulation (ramping restrictions of active power output), in day-ahead and intraday, then these restrictions may also be applied for the exchange of FRR with other synchronous areas.

Article 5(3) stipulates that TSOs may use a technical profile in the MARI and PICASSO platforms, for system security reasons. A technical profile can limit the sum of capacity for a set of both HVAC and HVDC interconnectors together. This may be used for instance when encountering grid issues. It may be used for shorter or longer time periods. The TSOs will justify when it uses or applies technical profiles.

Article 5(4) describes that TSOs are allowed to impose additional allocation constraints when dealing with technical limitations of HVDC-interconnectors, in accordance with Articles 4(2)(d)(ii) of the Implementation Frameworks of MARI and PICASSO. This ensures that the differences in technical capabilities of the different HVDC interconnectors can be respected. This possibility is necessary due to the different technology and age of these interconnectors. Some are quite new and are not impacted by rapid flow changes, while others are old and not built for the power markets we see today and further ahead.

Finally, the TSOs proposes to use a similar procedure as is used in Article 3(2)(d) of the Methodology under article 137 of the SOGL, to maintain transparency on which limits each TSO apply. This means that the Nordic TSOs will include and keep update the allocation constraints in the Nordic System operation Agreement. The formulation of Article 5(5) is in line with the Capacity Calculation Methodology (CCM) for the balancing timeframe for the Nordic Capacity Calculation Region (CCR), especially with Article 6(5)(b). The text of Article 5(5) attempts to combine the descriptions in the CCR methodology with what is relevant in this methodology.

Lastly, TSOs of other synchronous areas may have their own allocation constraints. As the Balancing Platforms must use one cross-zonal capacity limit (which allocation constraints may restrict in the capacity calculation) for each clearing for the exchange of FRR, the most restrictive value of two connected TSOs of an interconnector will be used to safeguard system security. Hence, the end-result may lead to deviation from the resulting allocation constraints according to the rules in this methodology.

6.4 Amendment: new Article 6

Article 6 arranges the validity of article 5, regulating the different steps the TSOs have defined (see paragraph 5.2). The TSOs think it is necessary to make sure that the methodology is valid until 3 years after all Nordic TSOs have acceded to the PICASSO platform. The TSOs will then have sufficient data to redraft the Methodology making it fit for STEP2, where the yearly evaluation of the limits can be performed.

Moreover, in case not all TSOs have connected to PICASSO, Article 5 shall be applicable until the latest 1 January 2032.

6.5 Amendment to Article 7

In the previous 2019 version of the Methodology, paragraph 2 of Article 5 (corresponding to Article 7 of this version) has been removed. This paragraph was about implementing the proposal not later than when the Nordic synchronous area operational agreement entered into force.

7. Public consultation

Article 11 of the SO Regulation states that: *"TSOs responsible for submitting proposals for terms and conditions or methodologies or their amendments in accordance with this Regulation shall consult stakeholders, including the relevant authorities of each Member State, on the draft proposals for terms and conditions or methodologies listed in Article 6(2) and (3). The consultation shall last for a period of not less than one month."*

This Appendix lists the comments coming from the public consultation held between 20 April and 20 May 2026.

Six organisations responded. All organisations agreed that their comments can be published. Two organisations wanted to remain anonymous, meaning that the Nordic TSOs can publish their comments but will not publish the name and the organisation of these respondents.

The Nordic TSOs would like to raise awareness to the fact that they would like to introduce one slight addition in Article 5(1). For transparency reasons, this addition is added in the last row in the matrix below that shows all the comments from the public consultation.

Organisation	Comments	Response Nordic TSOs	Update Explanatory Document	Update Methodology
Anonymous	*We are interested in how the capacity for activation of frequency restoration reserves will be allocated. This was presented during the dedicated call held on 27 April 2026, but we would like to confirm that our understanding is correct and that the following logic applies.* *The maximum power change within one MTU is equal to 10 × RR (where RR is the ramping rate and 10 is the duration of the ramping period in minutes). The remaining capacity constitutes the available transmission capacity for balancing services: 10 × RR − (+) dP, where dP is the difference between the power traded in the ID/DA market at the current MTU and the power traded in the ID/DA market at MTU+1. If the power flow is from Area 1 to Area 2, then:* *capacity for FRR activation in the upward direction (increasing flow from Area 1 to Area 2) is: 10 × RR − dP; capacity for FRR activation in the downward direction (reducing flow from Area 1 to Area 2) is: 10 × RR + dP.* *Could you please confirm whether our understanding is correct?*	Yes, your understanding is correct, though it is worth mentioning, that the calculation of ramping limitation will be on both ends of an MTU (MTU0/ MTU1 and MTU1/MTU2, where MTU1 is the MTU the capacity for activation of FRR is calculated for). Hereby it is ensured that the ramping restriction is neither exceeded going into the MTU or out of the MTU.	Yes, the Nordic TSOs included an example for illustrative purposes	No
National Grid	*National Grid (NG) welcomes the opportunity to respond to this consultation and is broadly supportive of the*	The Nordic TSOs agrees with your considerations and reflections on the proposed increased ramping rates but	No	No

	proposed measures to enhance market efficiency and cross-border integration. *As an owner and operator of electricity interconnectors, including the North Sea Link connecting the UK and Norway, NG considers that efficient utilisation of cross-border capacity is essential to delivering security of supply, supporting decarbonisation, and reducing costs for consumers. Reforms that improve price formation and facilitate effective cross-border participation are therefore strongly supported. The technical capabilities of HVDC assets are an important enabler of market efficiency. Increasing ramp rates on assets linked to the Nordic synchronous area will enhance the responsiveness of interconnectors to changing market conditions, supporting more efficient allocation of capacity closer to real time and helping to minimise imbalance positions across connected systems.* *We therefore welcome the review of day-ahead and intraday ramp rates in accordance with article 137 of the SOGL and the resulting increase in the ramp rate applied to the North Sea Link interconnector to 25MW per minute. We note, however, that this is significantly lower than the technical limits of the interconnector and the ramping limit applied to HVDC links in GB (generally set to 100MW/min). Subject to the*	would like to point out that the consultation dealt with the review and amendment of the existing Methodology under Article 176 / 177, and not with the one under Article 137.		

	safe and reliable operation of connecting markets, we would like to see further increases in interconnector ramping limits towards this level. *In summary, NG supports the direction of travel set out in the consultation. Ensuring that interconnectors can operate flexibly, respond to market signals, and participate efficiently across all timeframes will be critical to maximising the benefits they deliver for consumers in the markets they connect. NG looks forward to continued engagement as the proposals are developed.*			
Anonymous	*Extending the existing ramping restrictions from Day-Ahead and Intraday to the balancing timeframe will likely decrease the crossborder capacity available for the balancing process. This may lead to increased overall costs of balancing the Nordic power system as well as higher, more volatile and unpredictable imbalance prices, though the extent is unclear. Given the situation and recent challenges on the balancing markets, we therefore find the proposal concerning.* *We encourage the TSOs to investigate and communicate expected consequences of the proposal. Relevant metrics could be reduction in MTUs where FRR exchanges are possible, impact on balancing prices and overall cost of balancing the system, and impact on the dimensioning of the reserves per LFC area*	The Nordic TSOs understand and agree that introducing limitations also in the balancing timeframe can be perceived as sub-optimal. However, the Nordic TSOs currently do not have operational data based upon which analysis to the effect of the amendment proposal can result in usable quantitative information and proposals. As the Nordic TSOs tried to explain in the explanatory document, the evaluation not of the methodology but of the impact of the accession of all Nordic TSOs to MARI and PICASSO shall be assessed, when there will be at least one full calendar year of operational data available. This should provide the Nordic TSOs with ample time to evaluate the impact on frequency quality and more especially on the FRCE (frequency restoration	Yes	Yes

	particularly if sharing arrangements are impacted. In addition, we suggest a more granular time plan with more frequent evaluations of the methodology. The proposal foresees a two-step approach where the first step – the current proposal – will be applicable from the approval of the methodology and until 3 years after all 4 Nordic TSOs have connected to PICASSO. Only hereafter step 2, consisting of an evaluation of step 1 and development of an updated proposal, will be initiated. With the current accession roadmap for PICASSO, step 1 can therefore be expected to be operational until 2031 without further evaluation. Given the many large developments in the market, we suggest a yearly evaluation starting from the first application of the methodology. *In step 1, the proposal foresees the starting point for the ramping restrictions to be the same as currently applied to day-ahead and intraday markets. However, the proposal also provides the possibility for TSOs to set individual ramping constraints or technical profiles per interconnector depending on the technical capabilities of the cable or surrounding grid though max 600MW. We welcome this opportunity for the TSOs to relax some of the current ramping restrictions. It is however unclear to us how the process for such adjustments would be. We would also welcome a*	control error) in each bidding zone. Based on these results, an updated methodology will be prepared that can replace the one that is currently foreseen to reflect step 1. The TSOs would like to propose to use a similar procedure as is used in Article 3(2)(d) of the Methodology under article 137 of the SOGL, and to include this in Article 5 of the Methodology under Article 176 of the SOGL. This means that the Nordic TSOs will include and keep updated the allocation constraints in the Nordic System operation Agreement.		

	description of the process of updating the ramping restrictions.			
Baltic Cable	*The definition of the lower bound in par. 1 in Article 5 seems not to be correct for all market situations. The lower bound will change depending on the market result of the day-ahead and intraday markets.* *On top of that mFRR could be activated as scheduled activation (ramping time same as day-ahead and intraday markets) and also as a direct activation where the ramp could start at any time. This seems not to be covered by the Article 5.* *As a result and to avoid misinterpretations, we are of the opinion that the methodology should rather set a maximum ramping rate for FRR.*	The lower bound is the ramping rate that TSOs should as a minimum provide to the markets (a sum for DA+ID+FRR). As the comment suggests the capacity which will be available to balancing timeframe, will then depend on the result of DA+ID markets. Though not stated explicitly in the methodology, the remaining ramping rate (depending on the results from DA+ID) can be applied in the mFRR scheduled activation, mFRR direct activation or aFRR-activations. The sum of activations from all three products plus the DA+ID schedules must not exceed the maximum ramping rate. I.e. there will only be capacity provided also for direct activations or aFRR activations during the MTU, if the flow can return to the DA+ID schedules for following MTU without exceeding the maximum ramping rate.	Yes	No
Stegra AB	*Any reform of the balancing markets should have the reduction of price volatility as a central objective, so that long-term investments in heavy industry can once again be enabled. Before introducing new proposals, the Nordic TSOs should carry out a thorough assessment of how cross-border exchanges will affect price formation and*	The Nordic TSOs understand the concern but would like to point out that a reform or update of any methodology under the System operation Guideline should be in line with the objectives set out therein. The aim of the SOGL is laid down in Article 4, basically stipulating that the TSOs should aim at developing common	No	No

	volatility in the mFRR and balancing markets. If such analysis indicates that volatility will increase, the TSOs should exercise significant caution, as higher balancing-market volatility would undermine the investment conditions required for industrial electrification and the green transition.	principles, operational processes and security requirements. The Nordic TSOs believe that is what they are doing with this amendment, also bearing in mind the 2-step approach as explained in the explanatory document.		
Lyse Produksjon AS	*The amendment states that the Nordic area can be a considerable contributor to the balancing markets in Europe, due to secure reserves and competitive prices. When MARI (mFRR activation) and PICASSO (aFRR activation) are introduced in the rest of the Nordic areas, these reserves will be available for balancing in the neighboring Central European areas.* *One can therefore assume that there is a high socioeconomic value in securing high capacities on the cross-border exchange of these reserves.* *Still, the amendement suggests to introduce restrictions on the exchange of FFR-volumes from the Nordic Synchronous area.* *There are listed arguments for this, among others:* *-It is considered inefficient to restrict the day-ahead and intraday market to create possibility to exchange more in the balancing markets* *- Security on the HVDC-interconnectors* *- Increased frequency of flow changes*	The Nordic TSOs understand and agrees that introducing limitations also in the balancing timeframe can be perceived as sub-optimal. However, the Nordic TSOs currently do not have operational data based upon which analysis to the effect of the amendment proposal can result in usable quantitative information and proposals. As the Nordic TSOs tried to explain in the explanatory document, the evaluation not of the methodology but of the impact of the accession of all Nordic TSOs to MARI and PICASSO shall be assessed, when there will be at least one full calendar year of operational data available. This should provide the Nordic TSOs with ample time to evaluate the impact on frequency quality and more especially on the FRCE (frequency restoration control error) in each bidding zone. Based on these results, an updated methodology will be prepared that can replace the one that is currently foreseen to reflect step 1. In addition, the Nordic TSOs would like to point out, that	No	No

	We find that arguments and calculations supporting these statements are lacking, as well as an assessment of the costs associated with the constraints and a comparison with alternative options. In many situations, the balancing need on the interconnectors will be stable in one direction, and will not introduce more frequent flow changes. And there should be economic reasons behind how different markets are prioritized. *In the recent period, during which several new market designs have been introduced, the Nordic TSOs have addressed the need for more balancing volumes. We therefore find it inconsistent that the methodology suggests to introduce more constraints.* *We approve the proposal to avoid a generic Nordic restriction (Chapter 6.3). But we find it little transparent how the local TSOs shall be allowed to set the local constraints, and how other solutions are considered.* *It is important that information about the the capacities are predictable in the long term for the market participants.* *Summary: Before approving the methodology, the implications should be thoroughly assessed and compared with alternative options that do not contribute*	the current proposal is actually allowing more exchange of FRR compared with the existing situation. This is mainly because we open up more borders: the Nordic area will drastically utilise more borders for FRR exchange via the EU balancing platforms, compared to the existing situation. The Nordic TSOs will include the limits in the Nordic System Operational Agreement, for transparency purposes.		

	to a reduction in cross-border exchange capacity.			
Nordic TSOs	*The Nordic TSOs would like to propose to add in the Methodology the word 'maximum' in article 5(1)(a) and 5(1)(b).*	The proposal is as follows: *the <u>maximum</u> load flow change on an HVDC interconnector from one MTU to the next MTU shall….* Although a slight alteration, the TSOs consider that this provides a clear understanding of the intention of article 5.	No	Yes