

Public

## NESO reply to consultation comments

NESO acknowledged all the comments from SHETL and had a follow-up meeting to clarify their questions and concerns. The key discussion points and subsequent actions from the meeting are summarised as follows.

- **Slow paced FRCR policy implementation plan**

SHETL highlighted the necessity of adopting a precautionary perspective. NESO concurred with SHETL on the cautious approach to implementing the reduced minimum inertia requirement of 102 GVA.s. It is emphasised that system security remains the primary concern, and the phased approach is designed to ensure its maintenance throughout the implementation process.

- **Governance and assurance**

SHETL welcomed the assurance tasks NESO introduced for FRCR 2025. SHETL also recommended considering an independent technical analysis of specific parts of the assessment or conducting "spot checks" across the entire FRCR model and analysis. This could serve as a third option, alongside the existing FRCR process assurance and a full independent technical analysis. NESO agreed with SHETL that the governance and assurance of FRCR should be discussed in the SQSS panel meetings for future FRCRs.

NESO explained that although a complete independent analysis is not being conducted, reviews and investigations have been performed following significant events to ensure the analysis tools, data, and assumptions remain appropriate and that frequency policy remains effective, serving as a form of assurance. NESO suggested highlighting this process in the final report, possibly in the system performance review chapter.

- **Innovation opportunity and collaboration**

An action will be taken by SHETL to check with their innovation team about any existing or potential projects using AI to enhance system performance understanding, such as analysing TO asset behaviours during system events with lower inertia levels. Concurrently, NESO will check with their innovation team. Both NESO and SHETL will continue to explore future innovation opportunities together.

## Public

The NESO would like to thank you for the participation in the FRCR 2025 consultation process. We appreciate all the comments and feedback. Please find our response to your valuable input below.

No	Questions	Comments	NESO Response
7	<b>Do you agree that the FRCR 2025 has been prepared appropriately? Please elaborate...</b>	<p>We believe that the FRCR 2025 has been prepared in accordance the guidelines set out in Appendix H of the NETS SQSS. We welcome the preparation and publication this year of the Data Handbook and the series of Webinars associated with this year's report. We note the data gathered as part of the experience gained operating the system with the previously recommended reduction in minimum system inertia of 120 GVA.s. Whilst this does not appear to have indicated particular concerns, we strongly urge that a similar approach is adopted following a further reduction in minimum system inertia, with continuous monitoring to detect any untoward effects. For example, has the expected positive impact of the ALoMCP in reducing inadvertent tripping been observed in practice.</p> <p>The report indicates that NESO has not detected an obvious connection between minimum system inertia and any previous SSO incidents in Scotland, however, as the characteristics of the system alter the desire to operate a fully decarbonised system must be balanced, at least in the shorter term, with continued secure and reliable operation.</p> <p>Particularly as the System moves further away from well established and long experience based</p>	<ul style="list-style-type: none"> <li> <b>Implementing further reduction of inertia</b>            Thanks for the feedback. We will continue monitoring and reporting system performance and actual cost saving gained from 120 GVA.s operation. When implementing 102 GVA.s, we will do this in a phased manner. The first phase will be reducing the minimum inertia to 110 GVA.s for at least 5 weeks, to see system behaviours and to gain experience. The next step is to further reduce to 102 GVA.s. We will notify the start of the change to the industry and communicate any observations. We will monitor system behaviour under the lower inertia level during normal operating conditions and following system faults, to ensure data and assumptions in the FRCR 2025 assessment are adequately considered.         </li> <li> <b>Inertia vs. SSO</b>            We acknowledge your comments regarding SSO and other new system phenomena and their correlation with inertia. We have established the SSO taskforce group, in which SHETL is participating, and have made huge progress in understanding this problem. We continue observing the conditions that correlate with oscillations. When these conditions materialise,         </li> </ul>

## Public

		<p>on operating a system with higher minimum inertia. Continued progress towards any further reduction in minimum system inertia must be prosecuted with caution, with periods of pause, if necessary, in order to maintain network security whilst analysing and understanding the new system conditions arising as the industry moves further away from the historical experience base. The introduction this year of a third-party review of the FRCR methodology and the process of governance followed to produce the report has been a positive development and we would support the continuation of this.</p>	<p>we take action to increase damping. This action may result in an increase of inertia beyond 102 GVA.s. The FRCR recommendations do not affect this. A similar process would apply for other operability phenomena.</p> <p>In the longer term we are also looking at Grid Forming technologies which have the capability to supply short circuit current and inertia to the system. Grid Forming is a key catalyst for achieving net zero, especially in contributing to system stability. Not only do Grid Forming plants contribute to inertia but they also provide phase jump power (system support and injection of MW during phase jumps but also contribute to damping power), so it is important that the issue is not just confined to inertia. Although non-mandatory, Grid Forming requirements already exist in the Grid Code at present. That said we have recently established an expert group to review the industrial experience from Grid Forming as a future requirement though the inertia requirements would still be subject to market arrangements. This is all quite long term, however in the fullness of time it is possible that a greater proportion of inertia may come from Grid Forming plants than necessarily from DC. Batteries are a naturally good technology at providing Grid Forming Capabilities but the volumes need to ramp up before the economics start to stabilise. It is however important that these longer-term aspects are examined so that</p>
--	--	--	--

## Public

			<p>system stability can be managed in the most economic way. Although further work is necessary going forward to stabilise the system both regional and national volumes of Grid Forming will be necessary, one driver being the need to manage regional RoCoF rates in addition to the contribution to fault infeed.</p> <p>Also, to better understand regional operability issues and the interaction with a national inertia policy, we are planning an inertia workshop to understand views from industry. We will communicate details of this workshop soon.</p> <ul style="list-style-type: none"> <li>• <b>Future Assurance</b></li> </ul> <p>Thank you for your comments on the integrated technical review we introduced this year. We will collate all the feedback from the consultation and discuss with the SQSS Pane to understand if an independent technical assessment would be required, or if a simple process assurance would be adequate.</p>
8	<p><b>Do you believe there has been sufficient industry engagement in preparing FRCR 2025? Please specify further suggestions.</b></p>	<p>Industry engagement has, in our opinion, shown improvement from previous FRCRs. Earlier engagement, through some additional webinars throughout the year could be considered or specific FRCR sessions with in the OTFs</p>	<p>Thank you for the comments. We will continue the good engagement with industry in future FRCR cycles.</p>

## Public

9	<b>Overall, do you agree that the FRCR 2025 represents the appropriate level of development in determining the way that the NESO will balance cost and risk in maintaining frequency security while operating the system at a reduced inertia down to 102 GVA.s? Please use the boxes below for the bullet points.</b>	Please see comment above	
10	<b>Do you agree with the recommendation to reduce minimum inertia requirement down to 102 GVA.s?</b>	Please see comment above	
11	<b>Do you agree with the recommendation to secure all BMU-only events (including consequential RoCoF)? If not, please explain why.</b>	Yes. The report sets out justification for this.	
12	<b>Do you agree with the recommendation to procure additional DC-Low service provision by 200 MW ? If not, please explain why.</b>	Yes. The report sets out justification for this.	

## Public

13	<b>Do you have any other comments to the recommendations?</b>	No	
14	<b>In your view, what should the future FRCR focus on?</b>	<p>The proposed areas for development set out in Section 8.1 seem appropriate. As TO for the network in the north of Scotland we are very interested in the regional or local inertia aspect and continued consideration of system inertia and its control influence on the wider range of system response to disturbances beyond the response to fundamental frequency. We would also be interested to see any consideration and outcome of AI application to examination of historical technical performance and experience of operation with a reduced minimum system inertia policy.</p>	<ul style="list-style-type: none"> <li>• <b>Regional inertia / RoCoF</b> We agree that regional inertia and RoCoF is the area we need to explore more in the future. We would like to further explore the regional inertia interaction to other regional phenomena, e.g. SSO. As mentioned in FRCR future work, we welcome your views and will assess the impact internally and with the industry on a workshop planned this summer. We would also note the longer term Grid Forming work in this area which has been highlighted above.</li> <li>• <b>Utilisation of AI to understand system and asset behaviour under lower inertia</b> From the NESO point of view, we could examine system behaviour by applying “what if” hypothetical scenarios, e.g. system conditions were unchanged but inertia levels varied. We applied this approach during recent frequency events to ensure our model, tools and assumptions in the FRCR policy are valid and adequate.</li> </ul>
15	<b>Do you foresee any issues that may arise from moving the obligation to produce the FRCR to a NESO License Condition rather than an Annex to the NETS SQSS?</b>	<p>We believe that that the overarching system frequency criteria should not be removed from the NETS SQSS. The method for achieving and documenting how those criteria are not breached from a techno-economic standpoint is where the NESO and the FRCR take the lead. TO's, however, retain licence obligations in respect of planning</p>	<p>Thank you for sharing your thoughts.</p>

## Public

		and developing the network in accordance and in compliance with the NETS SQSS. And in this regard must continue to have the NETS SQSS criteria to refer to in order to assess the behaviour of the network from a wider system and a connections standpoint and design the network accordingly.	
16	<b>If the obligation to produce the FRCR and the governance rules surrounding that process are moved to NESO's License, do you believe that the NETS SQSS Panel should continue to provide oversight?</b>	Yes, since the area of interest is one crucial to the continued security of the network and the system; key and fundamental considerations of the NETS SQSS	Thank you for sharing your thoughts.
17	<b>If your answer to question 16 is "Yes", to what extent should this oversight be? For example, should it include technically assessing the recommendations and approving/rejecting it, or should it be limited to confirming that the governance process has been followed correctly?</b>	The extent of oversight needs careful and detailed consideration. We recognise the challenges around detailed technical assessment of the recommendations arising from the increasingly complexity of the various factors, including inputs and assumptions considered within the FRCR. However, some other options lying between a full detailed technical assessment and 'simply' confirmation of adherence to correct governance should be explored.	Thank you for sharing your thoughts.