

RES-E

Multi-year Plan 2022-20226
Consultation Response Paper
June 2022



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Introduction

EirGrid, in its capacity as Transmission System Operator (TSO), published a consultation paper on the TSO RES-E incentive multi-year plan for the period 2022-2024 as well as 2025 and 2026 at high level¹. The consultation on the proposed multi-year plan was open from 28 October to 03 December 2021. This paper responds to the feedback received as part of the consultation.

The CRU, as per Section 7.12 of its PR5 Regulatory Framework, Incentives and Reporting Decision Paper (CRU/20/154)², requires the TSO to publish a detailed multi-year plan for 2022-2024, as well as a high-level plan for 2025-2026, for consultation.

This document summarises the responses received and outlines EirGrid's response to the feedback, some comments submitted related to matters such as resourcing, dispatch down, system service future arrangements and the joint programme of work between DSO and TSO³ all of which are outside the scope of the consultation. As a result, these comments have not been addressed in this consultation response document.

We would like to thank all those who took the time to respond to this consultation. All responses received have been reviewed and considered. A total of seven responses were received from the following organisations:

- Électricité de France (EDF)
- Irish Energy Storage Association (IESA)
- Bord Gáis Energy (BGE)
- Wind Energy Ireland (WEI)
- Bord na Mona (BnM)
- Electricity Supply Board Generation and Trading (ESB GT)
- Demand Response Association of Ireland (DRAI)

Consultation Responses

This section summarises the comments received from participants, which relate to the specific TSO workstreams: System Non-Synchronous Penetration (SNSP) increase, Rate of Change of Frequency (RoCoF) limit change, Operational Policy Roadmap, Nodal Controller, reducing number of large synchronous sets, reducing inertia floor, Greenlink Operational Procedures, Celtic Operational Procedures, enhanced reporting of renewable statistics and detailed studies and analysis to support progress to 2030 targets and the proposed weighting.

1. SNSP Increase

This section summarises the comments received from participants in relation to SNSP increase. This section also contains the TSO's response to the comments received.

¹ <http://www.eirgridgroup.com/site-files/library/EirGrid/PR5-RES-E-Incentive-Multi-Year-Plan-Consultation-Paper.pdf>

² <https://www.cru.ie/wp-content/uploads/2020/12/CRU20154-PR5-Regulatory-Framework-Incentives-and-Reporting-1.pdf>

³ <http://www.eirgridgroup.com/site-files/library/EirGrid/DSO-TSO-Joint-Incentive-Multi-Year-Plan-Consultation-Paper.pdf>

1.1. Respondents' comments

EDF notes that a greater level of ambition is needed from the TSO. EDF also note that investment should be focused on facilitating the increased future power demand on the grid and striving towards a zero-carbon system that can operate with 100% System Non-Synchronous Penetration by 2030. IESA are surprised that there is no interim SNSP trial of 80% in 2024. WEI is supportive of the incentive to increase the SNSP level to 85% by 2025 but feel the plan lacks detail.

1.2. EirGrid Response

The TSO has consistently demonstrated its ambition with the DS3 programme and very successfully increased SNSP while maintaining security of the all island power system. The target of 85% SNSP set out in the consultation will see the all-island power system operating at higher SNSP levels than any other equivalent synchronous power system in the world. This 85% SNSP limit will be a key enabler for the electricity sector to achieve 70%+ RES-E by 2030. This 70% in 2030 will put EirGrid TSO as a world leader in non-synchronous penetration.

The TSO is in the process of developing an Operational Policy Roadmap to 2030, which is scheduled to be completed in 2022. It is planned to update the Operational Policy Roadmap every two years. The further detail provided in the Operational Policy Roadmap will be considered in the development of future multi-year plans.

2. RoCoF Limit Change

This section summarises the comments received from participants in relation to RoCoF limit change. This section also contains the TSO's response to the comments received.

2.1. Respondents' comments

BGE notes that RoCoF was an expectation under the PR4 pricing period. They do not believe that this should be remunerated under PR5.

2.2. EirGrid Response

The ability of units to remain synchronised during a high RoCoF event is a key requirement for the safe, secure and reliable operation of the Transmission System. RoCoF continues to be a complex and multi-faceted project, involving the TSO, DSO, transmission connected and distribution generation. The project therefore involved significant liaison, with a wide variety of stakeholders, reviews of detailed studies and live testing. As a prudent system operator, the TSO must be confident of the ability of units to remain synchronised at the new RoCoF value required, before operating the system to the new standards.

Phase 1 of the 1 Hz/s RoCoF trial (i.e., for investigating a potential increase of the RoCoF operational policy range from ± 0.5 Hz/s to ± 1.0 Hz/s over 500 ms) commenced on 17 June 2020 and ran until October 2020. Analyses carried out as part of Phase 1 of the trial highlighted challenges in reducing the inertia floor to 20,000 MWs (originally a deliverable of Phase 2 of the RoCoF trial) in advance of reducing the minimum number of large synchronous units on the system from 8 to 7. In particular, reducing the number of units requires the Voltage Trajectory Tool to be in place, installation of which is subject to separate delays. Based on this analysis, the TSOs submitted a change request to the SEMC in March 2021 to extend Phase 2 of the RoCoF trial by 11 months with a September 2021 completion date. The SNSP trials were ongoing in parallel (the 70% SNSP trial started in January 2021, was completed in March 2021 and the 75% SNSP trial then started in April 2021).

However, only about 30 hours of system operation with all-island RoCoF levels beyond ± 0.5 Hz/s were observed by September 2021. This was attributed to a range of system conditions, primarily the comparatively high inertia of units running on the all-island power system, and to a smaller extent, the must-run status of certain thermal plants over the trial period. In view of this, another change request was submitted by the TSOs to the SEMC in September 2021 wherein it was proposed that Phase 2 of the RoCoF trial be extended by a further 6 months (in parallel with the 75% SNSP trial) with a final completion target date of 31 March 2022. This was approved by the SEMC in September 2021 (and advised by email to the TSO on 13 October 2022). The trial analysis has flagged that under certain system conditions, issues arise with the frequency / RoCoF response of the Northern Ireland power system for tie-line contingencies. This requires EirGrid and SONI to look at how we coordinate the Power System Stabiliser (PSS) settings across generators in Northern Ireland. Pending this review, EirGrid and SONI's Operational Policy Review Committee decided (on the 29 March 2022) to not yet approve ± 1.0 Hz/s RoCoF as the enduring operational policy at this stage but to continue to operate to this limit under trial conditions until the issues are resolved.

Therefore, although significant work was completed, and progress achieved, on the RoCoF project, in the PR4 period, the project has extended into the PR5 timeframe.

3. Operational Policy Roadmap to 2030

This section summarises the comments received from participants in relation the Operational Policy Roadmap to 2030. This section also contains the TSO's response to the comments received.

3.1. Respondents' comments

Two respondents were supportive of this initiative, another respondent noted they would welcome greater detail.

3.2. EirGrid Response

The TSO notes the comments made regarding more detail in various areas. The TSO is in the process of developing an Operational Policy Roadmap to 2030, which is scheduled to be completed in 2022. It is anticipated that publication of this Roadmap will provide the detail sought by the respondent. It is planned to update the Operational Policy Roadmap every two years. The further detail provided in the Operational Policy Roadmap will be considered in the development of future multi-year plans.

4. Nodal Controller

This section summarises the comments received from participants in relation to the Nodal Controller. This section also contains the TSO's response to the comments received.

4.1. Respondents' comments

BnM in its response welcomed the work focused on the Nodal Controller project. Furthermore, BGE does not agree with the principle that a project that is not achieved in one price review can be rolled over to be achieved and remunerated in a subsequent price review. Similarly, WEI note the nodal controller trial has been on-going for many years now and the timeline for the completion of the trial without any further steps on further roll out is concerning. They suggest that a cost benefit analysis should be carried

out, including the cost to renewable generators, of the retrofitting of nodal controllers into wind farm projects and more detail on next steps and timelines to rollout these opportunities to more renewable generators on the distribution system.

4.2. EirGrid response

The use of tools like the Nodal Controller, are enablers to maximising RES-E. As this is the first Nodal Controller project in Ireland there were a number of technical, commercial, operational and IT issues to be resolved, in liaison with a number of stakeholders such as the DSO and Distribution Connected Generators. Therefore, this project has spanned PR4 and the start of PR5. The TSO is central to the Nodal Controller project as the benefit of the Nodal Controller is voltage regulation of the Transmission System. The Nodal Controller trial was carried out from 21 December 2021 until 28 March 2022. As this is a complex multi-stakeholder and multi-faceted project, numerous technical issues were encountered, which took some time to resolve. However as this is the first Nodal Controller, learning's from this project can be used for potential future Nodal Controller Projects.

5. Reduce number of large synchronous units

This section summarises the comments received from participants in relation to the reduction of large synchronous sets. This section also contains the TSO's response to the comments received.

5.1. Respondents comments

WEI are fully supportive of this workstream but feel that as many of the steps and studies needed to reduce the number of units should already be complete. IESA are surprised that the reduction is only from 8 units to 7 units. They would have expected that greater reductions could be achieved with a mix of synchronous condensers to provide inertia, fault current and electromagnetism together with energy storage for ramping. BGE note in its response the double counting of initiatives. They note these two measures also appear under the TCG area of the imperfections and constraints incentive and so should be excluded as a measure against which progress should also be assessed for the purposes of this RES-E incentive.

5.2. EirGrid Response

Reducing the minimum number of large synchronous units from 8 units to 7 units is a challenge, for a synchronous system that is already at the forefront, worldwide, with regard to SNSP. It is worth noting that each of these large synchronous units is circa. 400 MW. Therefore, it will require a mixture of new technologies (some of which have only recently, or have not yet, connected) and some ingenuity, as well as operational experience and real time performance monitoring, to enable the reduction of minimum large synchronous units from 8 to 7, without reducing the transmission system security and reliability. As outlined in the multi-year plan, it is prudent for the TSO to implement this change on a phased basis, starting with studies then progressing operational trials, all while developing operational policies, in parallel and finally implementing the enduring operational policy.

The reduction of large synchronous units from 8 to 7 will have a significant positive impact on both RES-E and Imperfections and Constraints and therefore the TSO is of the opinion that this initiative should be included in both incentives to provide the appropriate balanced focus. The TSO note the comments from respondents, however we will always focus on ensuring that the high security standards that exist and demonstrated throughout the journey to 2030 are maintained into the future.

6. Reduce Inertia Floor

This section summarises the comments received from participants in relation to the reduction of inertia floor. This section also contains the TSO's response to the comments received.

6.1. Respondents' comments

BGE note that the reduction of inertia floor also appears as measures in the imperfections and constraints incentive and should be excluded from the RES-E incentive. WEI are fully supportive of this incentive however they feel that the steps and studies needed to reduce inertia should be complete or in the process of being completed under DS3.

6.2. EirGrid Response

Adequate inertia is required to maintain system stability; however lowering inertia (via having a reduced number of conventional generators) will increase RES-E. The TSO acknowledge the comments around the two incentives, however the TSO would be of the view that they should be included in both. The reason is that a focus on one area neglecting another may not be efficient. For example, it is possible to reduce inertia floor while continuing to run generation in high renewable areas which adversely affects RES-E constraints.

Prior to reducing the inertia floor in real time operations, it is necessary for the TSO to follow a process to ensure that system security is maintained to the high standards expected of customers. This process entails conducting studies, conducting trials to confirm capability, reviewing outcomes of trials and any unexpected outcomes. Finally, a complete internal review and approval process must be carried out before implementing enduring operational policy changes.

The reduction of the inertia floor will have positive impacts on both RES-E and Imperfections and Constraints and therefore the TSO is of the opinion that this initiative should be included in both incentives.

7. Greenlink Operational Procedures

This section summarises the comments received from participants in relation to the Greenlink Operational Procedures. This section also contains the TSO's response to the comments received.

7.1. Respondents comments

WEI are supportive of the additional development of interconnection but emphasize the need to ensure that the right operation policy is in place to provide the interconnector to operate efficiently and provide maximum benefit in terms of RES-E.

7.2. EirGrid Response

The TSO acknowledges the comments raised by WEI. As per this consultation, there is a comprehensive programme of work to develop processes, operating procedures and protocols for Greenlink to ensure that Greenlink's integration into the network is done in a way that facilitates renewable penetration in Ireland. With the current HVDC interconnectors on the island, the TSO has demonstrated that it can successfully integrate a new interconnector to the benefit of all customers.

8. Celtic Operational Procedures

This section summarises the comments received from participants in relation to Celtic Operational Procedures. This section also contains the TSO's response to the comments received.

8.1. Respondents' comments

WEI note that the Celtic Operational procedures should also determine any negative impact of the Celtic interconnector on constraints in the south-west region.

8.2. EirGrid Response

The TSO notes these comments. As per this consultation there is a comprehensive programme of work to design how the interconnector will operate and key to this is to agree and finalise TSO and joint stakeholder processes and operating procedures which will be updated in future multi-year plans. With the current HVDC Interconnectors on the island, the TSO has demonstrated that it can successfully integrate a new interconnector to the benefit of all customers.

9. Enhanced Reporting of Renewable Statistics

This section summarises the comments received from participants in relation to enhanced reporting of renewable statistics. This section also contains the TSO's response to the comments received.

9.1. Respondents' comments

WEI welcomes this workstream but feel it should be consulted on with industry on the exact methodologies and data sets being proposed. They suggest that the TSO engage with industry on these reporting measures and work collaboratively on this initiative. BGE note these studies better sit under the imperfections and constraints incentive and would form part of the assessment around constraints, their drivers and respective imperfection costs of constraints under that incentive.

9.2. EirGrid Response

The TSO actively engages with industry in relation to renewable reporting. Reports such as System and Renewable Data, Renewable Connections and Forecasting, Dispatch Down and TCG reports (see Figure 1) are regularly published to the TSO website⁴ which enables on-going monitoring of progress against targets. The TSO also holds regular meetings and has provided assistance to stakeholders in the development of their own reporting. The TSO looks forward to continuing this engagement and building on this work in terms of both tools and data accessibility.

⁴ <http://www.eirgridgroup.com/how-the-grid-works/renewables/>

System and Renewable Data	Renewable Connections and Forecasting	Renewable Dispatch-Down (Constraint and Curtailment) Reports	Constraint Group Reports/Updates
Fuel Mix 2020 (Pie Chart) Wind Installed Capacities - 1990 to date (Table) System & Renewable Summary Report (Spreadsheet) System Data Qtr Hourly (Spreadsheet) 2020/21 2018/19 2016/17 2014/15	List of Connected & Contracted Generators in Ireland Wind Forecasting Accuracy Report - April 2021 Wind Forecasting Accuracy Report - May 2021	Wind Dispatch Down - 2011 to Date (Table) Annual Renewable Dispatch-Down Report 2020 2019 2018 2017 2016 2015 2014 2013 2012 2011 Historical Monthly & Qtrly DD Summary Report (Spreadsheet) Quarterly Wind Dispatch Down Report (User Guide PDF)	Information Note on Wind Dispatch Tool Constraint Groups South East Wind Constraint Group

Figure 1

10. Detailed studies and analysis to support progress to 2030 targets

This section summarises the comments received from participants in relation to detailed studies and analysis to support the progress to 2030 targets. This section also contains the TSO’s response to the comments received.

10.1. Respondents’ comments

ESB GT are supportive of this workstream but emphasise the need for transparency to understand barriers and how it can help to create solutions. WEI also welcomed this workstream and they suggest it starts with a detailed study on the impact of the current and historical renewable integration limiting factors on dispatch down levels. BGE believe that this workstream would sit better under the Imperfection and Constraints incentive.

10.2. EirGrid Response

These comments are noted. Both short-term and long-term studies are required to understand how the introduction of new technologies and the reduction of conventional energy generation and increasing SNSP will impact the system into the future. The TSO plans to have on-going engagement with the industry regarding detailed studies and analysis to support progress to 2030 targets. EirGrid does not believe that this belongs in the Imperfections & Constraints Multi Year Plan.

11. Weighting

This section summarises the comments received from participants in relation to the proposed weighting of the workstreams. This section also contains the TSO’s response to the comments received.

11.1. Respondents’ comments

A number of respondents’ commented on the equal weighting of the workstreams contained within the plan. While they note that each is important, they feel that they should not be weighted equally.

11.2. EirGrid Response

The TSO notes the comments on weightings of each workstream. However, EirGrid proposes no change to that initially proposed, whilst noting that the decision is ultimately for the CRU in this matter.