

TSO RES-E

Multi-Year Plan 2023-2027

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1 Introduction

The PR5 Regulatory Framework, Incentives and Reporting Decision Paper (CRU/20/154)¹ contains direction and guidance to EirGrid as the Transmission System Operator (TSO) on incentives and reporting arrangements for the Price Review 5 (PR5) period, 2021-2025. The objective of the Commission for Regulation of Utilities (CRU) PR5 reporting and incentives, as per the Executive Summary of CRU/20/154, is to ensure that network companies are focused on delivering better outcomes for customers; using innovation to deliver services more efficiently; and meeting key national strategic objectives.

Section 7.2 of CRU/20/154 introduced a new incentive for Renewable Energy Source - Electricity (RES-E), targeting an increase in RES-E to 55% by 2025. The RES-E incentive has been developed in response to the unique challenges of managing renewable electricity on the transmission system. This form of energy is generated far from where it's needed, comes from variable sources and has a different frequency to the rest of the power on the grid; thus, presenting a number of challenges for the TSO's National Control Centre (NCC). As outlined in CRU/20/154, the changes to Ireland's electricity mix shows that the TSO has been moving in the right direction in recent years, culminating in renewable generation accounting for 43% of electricity consumption in 2020.

To achieve our 2030 RES-E targets the electricity system on the island will need additional renewable generation capacity by 2030. The exact value of additional generation will be dependent on factors such as demand growth, dispatch-down mitigation measures and the overall portfolio of plant connected to the system (including the increase in levels of storage on the system). It is currently expected that the significant growth in RES-E will derive from offshore and onshore wind, solar and new technologies. Large growth of these technology types will be coupled with the phasing out of coal, oil and peat as we make the transition.

In that context, the CRU has set out stretching annual RES-E targets for the PR5 period, 2021-2025 detailed in the table below.

PR5	2021	2022	2023	2024	2025
Target RES-E %	43%	46%	49%	52%	55%

Table 1: PR5 RES-E Targets, CRU/20/154

The underlying objective of this RES-E incentive is to ensure that the TSO plays its part in increasing the portion of electricity coming from renewable sources to achieve a 3% increase each year. Over the duration of the PR5 period, the TSO will seek to implement measures that ultimately contribute to the achievement of our 2030 RES-E targets and lay the foundation for achieving net zero carbon emissions by 2050.

The measures the TSO will take for the period 2023-2025 are designing to facilitate the increasing penetration of renewables, with a specific focus on the changes required to ensure that operational policies and procedures align with the wider efforts to make the electricity grid stronger and more flexible. These measures will enable the NCC to effectively manage the challenges associated with facilitating a low carbon future in a way that does not adversely impact system security. The detailed targets for 2026 and 2027 will be confirmed as part of the rolling annual submission.

¹ [CRU/20/154 PR5 Regulatory Framework, Incentives and Reporting Decision Paper](#)

Progress against the actions set out within previous multi-year plans does not form part of this document. The TSO will report to CRU on progress as part of the TSO's outturn reporting.

2 Workstream Overview

2.1 Operational Policy Roadmap to 2030

EirGrid and SONI are securely operating the all-island power system with world-leading variable renewables penetration, primarily from wind energy. In 2020, 43% of energy consumed on the island came from renewable resources. In 2022, the operation of the all-island power system on the basis of up to 75% of instantaneous generation from non-synchronous resources became operational policy. However, while these achievements are leading the way worldwide, to meet evermore ambitious decarbonisation targets in the years ahead, the electricity system will need to accommodate greater amounts of renewable energy. This means that operational constraints will need to be relaxed to facilitate another step change in the accommodation of renewable energy resources.

The accommodation of unprecedented penetrations of variable non-synchronous RES such as offshore wind, onshore wind, and solar, whilst keeping curtailment levels to a minimum and maximising renewable generation will require significant changes to the way in which the NCC manages the system. This encapsulates the way in which system services are utilised, the role of interconnection and, more broadly, challenges the TSO to facilitate the development and integration of new technologies and innovations on the power system to enable them to operate efficiently and effectively.

In December 2022, EirGrid and SONI published the Operational Policy Roadmap for 2023-2030² ('the Roadmap'). The Roadmap outlines the key actions in the operational policy space that will be required to deliver on the Climate Action Plan targets while continuing to securely operate the electricity system. The Roadmap sets out how operational policy and standards, along with operational tools, will be modified to reflect the new way in which the TSO will act as RES-E increases in Ireland.

The power system will undergo radical transformation in order to meet 2030 targets. Drivers of the need for changes in operational policy are noted below.

- **Demand Growth:**
Total energy use is expected to grow from 42.5 TWh to 56.5³ TWh by 2031 while peak demand is expected to increase from 7.45GW to 8.89GW³
- **Network Evolution:**
This will include two new HVDC interconnectors (one each to Great Britain and to France) and plans for a second North-South interconnector. An offshore network will have to be

² [The Operational Policy Roadmap for 2023-2030](#)

³ The figures provided represent All-Ireland Total Energy Use, Peak Demand and Non-Synchronous Generation as per [The Operational Policy Roadmap for 2023-2030](#).

developed to enable offshore wind generation. There is also expected to be an increase in smart network devices.

- **Generation Capacity Growth:**

There is expected to be significant growth in Non-Synchronous Generation over the next 8 years, increasing from c. 6 GW to c. 18GW³

- **Government Targets:**

Government targets inform the goals of EirGrid both in terms of CO2 emissions and renewable energy generation.

Any changes proposed to operational policy will take place within the operational policy framework. The EirGrid and SONI operational policies sit within an overarching framework, governed by relevant European and National Legislation and Network Codes, and guided by published codes and standards. This framework ensures that any changes to EirGrid's operational policy in order to reach our RES-E targets will not compromise the stability of the network.

Operational policy in EirGrid is monitored, reviewed, and updated according to a five-stage continuous cycle process:

1. Ongoing monitoring
2. Information gathering
3. Analysis and system studies
4. Operational trial
5. Trial review and policy update.

This five-stage process enables the effective delivery of the key objectives within the Roadmap. Individual actions are broken down step-by-step in the Roadmap with studies and operational trials taking place throughout the PR5 period.

EirGrid's Operational Policy Framework has three policy areas:

1. Dynamic Stability
2. Reserves and Ramping
3. Operational Security

1. Dynamic Stability

Dynamic stability refers to a power system's capacity to resume a stable state of operation following significant disturbances. There is one operational policy and four constraints in the dynamic stability policy area. The purpose of these constraints and metrics is to ensure enough synchronous generator traits are maintained to a level that guarantees secure and safe system operation. The actions within this operational policy area will aim to reduce reliance on conventional generation to provide these traits, therefore enabling greater RES-E %.

2. Reserves and Ramping

To ensure the operational and statutory frequency limits are met, in a cost-efficient manner, frequency response and reserves are essential to cope with the inherent variability of demand,

generation and changes in HVDC interconnector power transfers. Ramping is the term used for the rate of change of active power per unit time. Ramping Margin was introduced as part of the DS3 Programme to enable safe and secure system operation with higher penetration of renewable generation.

The Operational Policy Changes planned in this area aim to address the need to reduce the reliance on conventional generation to provide frequency reserves and to increase ramping rates in order to meet market and system demands. This will assist in decarbonising the power system, allowing for higher RES-E penetration within the generation mix.

3. Operational Security

The operational security policy area includes Voltage and Reactive Power Management, Short Circuit Management and Thermal Management. Changes to Operational Policy in this area will assist with the need to tackle the constrained transmission system, introduce new network connections and technologies and enhance coordination between the TSO and DSO. Over time these policy changes will enable greater RES-E penetration through the removal of constraints and enabling the introduction of greater renewable generation.

Implementation of the measures outlined in the Roadmap under each of the three policy areas will ultimately contribute to the achievement of our 2030 renewable electricity targets.

3 Actions

The following table outlines the proposed actions which will be progressed and tracked as part of the RES-E multi-year plan and will ultimately contribute to the achievement of our 2030 renewable electricity targets.

Workstream	2023	2024	2025
Operational Policy Roadmap Implementation	<p>Implementation of the 2023 Dynamic Stability measures outlined in the Roadmap</p> <p>Implementation of the 2023 Reserves and Ramping measures outlined in the Roadmap</p> <p>Implementation of the 2023 Operational</p>	<p>Implementation of the 2024 measures outlined in the Roadmap that will ultimately contribute to the achievement of 2030 renewable electricity targets</p>	<p>Implementation of the 2025 measures outlined in the Roadmap that will ultimately contribute to the achievement of 2030 renewable electricity targets</p>

Workstream	2023	2024	2025
	Security measures outlined in the Roadmap		
Operational Policy Roadmap Monitoring	Continual review and monitoring	Commence review and update of the Operational Policy Roadmap Publish an updated version of the Roadmap	Continual review and monitoring

4 High-Level Plans 2026 - 2027

The high-level plans for 2026 and 2027 will be dependent on the outcome of the work undertaken in 2023 to 2025; hence, more detail on the proposed plans for these years will be provided in future years as part of the rolling annual submission. A number of actions for 2023-2025 in the Roadmap include studies and trials, the outcome of which will inform detailed actions for subsequent years. The Operational Policy Roadmap is expected to be updated in December 2024. Actions included in the 2024 Roadmap will be incorporated into future multi-year plans.

5 Interdependencies/Assumptions

It should be noted that, while EirGrid is committed to progressing these actions in accordance with the timelines detailed in the Roadmap, factors beyond EirGrid's control may impact on EirGrid's ability to meet these targets e.g. climatic conditions, Climate Action Plan targets and the portfolio of plant connected to the system. In evaluating performance, recognising that not all factors affecting the achievement of the RES-E targets are within EirGrid's control, CRU/20/154 states that EirGrid's proposals should allow for the evaluation of areas within its control and not.

The medium and long-term milestones and targets set out in the Roadmap are dependent a number of factors including but not limited to the outcome of extensive studies, applicable Regulatory Authority decisions, the development and timely deployment of alternative innovative solutions which will determine the future operational policy and constraints. Also, operational trials are dependent on system and operational conditions.

6 Performance Assessment for 2023

The RES-E is a binary incentive, therefore if the annual target is not achieved, no reward is applied, and if the annual target is achieved the CRU will assess EirGrid on our performance against; quality of the plan, quality of implementation, and effectiveness of the plan.

EirGrid proposes that the incentive should be split evenly across the workstreams with deliverables to be achieved in each calendar year. In EirGrid's outturn performance report to CRU each year we will evidence how we have performed against the multi-year plan.

7 Next Steps

Stakeholders' are invited to respond outlining their views on the proposed approach to the RES-E multi-year plan.

Interested stakeholders' views are invited until COB on 31 March 2023, responses can be submitted through the [EirGrid consultation portal](#).

Please note that, in the RES-E consultation response document which will be made publicly available, we will respond to consultation respondents' comments and feedback within the scope of this consultation only. Comments and feedback outside the scope of this consultation will not be included in the consultation response document. Please mark your response as confidential if you do not wish for elements of your response to be referenced in the RES-E consultation response document.

8 Appendix - Acronyms

Abbreviation	Definition
CRU	Commission for Regulation of Utilities
DS3	Delivering a Secure Sustainable Electricity System
DSO	Distribution System Operator
HVDC	High Voltage Direct Current
NCC	National Control Centre
PR5	Price Review 5
RES	Renewable Energy Schemes
RES-E	Renewable Energy Source - Electricity
RESS	Renewable Electricity Support Scheme
TSO	Transmission System Operator