

Electricity System Restoration Assurance Framework 2024/25



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Executive Summary

The Electricity System Restoration Standard (ESRS) prescribes new restoration targets effective from 31st December 2026, for the Electricity System Operator (ESO) to have sufficient capability in place, in the event of a Total System Shutdown, to restore:

- 60% of National Demand within 24 hours across all the 7 restoration regions¹ and
- 100% of National Demand within 5 days.

The ESO is also obligated under the ESRS to submit an Assurance Framework demonstrating how the ESO will comply with the ESRS to the Office of Gas and Electricity Markets (OFGEM) for approval annually. This is the Assurance Framework for 2024/25 which is the third report since the Department for Energy Security and Net-Zero (DESNZ)'s ESRS directive in 2021.

The ESO acknowledges that extensive work is required industry wide to comply with the ESRS. To ensure compliance the ESO is implementing its adopted strategy and will now:

- tender for more Restoration Contractors (RCs) from onshore, offshore and embedded Distributed Energy Resources (DERs).
- commence implementation of the provisions of modifications to regulatory frameworks to achieve compliance with the ESRS (Grid Code-GC0156, STC-CM089, STCP- PM0128, SQSS-GSR032, CUSC-CMP398, BSC-P451 D-Code- DCRP/MP/22/02).
- select a vendor to deliver the Restoration Decision Support Tool (RDST) to support control engineers during a restoration event.
- commence the industry wide compliance monitoring of ESRS Assurance Activities.
- provide targeted training for the industry.

We have also identified ESRS implementation risks in this iteration and proposed mitigations to the identified risks.

¹ North Scotland, South Scotland, North East, North West, Midlands, South East and South East

Introduction

Electricity System Restoration (ESR) is the procedure to recover from a Partial or Total Shutdown of the National Electricity Transmission System (NETS), which has caused an extensive loss of supply. The ESO has Grid Code obligations (CC6.3.5 and ECC 6.3.5) to, at all times, be able to restore the NETS in the event of a Partial or Total Shutdown within the stipulated timeframes. This will be facilitated by agreeing commercial contracts with Restoration Contractors who have plants at a number of strategically located sites. For Restoration Contractors embedded in the Distribution Network, the contract terms will be agreed between the ESO, the relevant Network Operator and the Restoration Contractor.

A Total Shutdown in Great Britain has never occurred. It is categorised as a High Impact, Low Probability (HILP) risk in the National Risk Register. This means that even though a Total Shutdown is unlikely to occur, its impact, should it occur, will be detrimental to the economy and society in general.

The Department for Energy Security and Net Zero (DESNZ)², aiming to mitigate this risk, issued a directive to the ESO, known as the Electricity System Restoration Standard (ESRS) in 2021. The ESRS directs the ESO to have the capability and arrangements in place by 31st December 2026 to restore 60% of peak National Demand across all System Restoration Regions within 24 hours and 100% peak National Demand in all System Restoration Regions within 5 days.

In Special Condition 2.2.1, the ESO is obliged to abide by DESNZ's directive and to also produce an ESR Assurance Framework detailing how the ESO will comply with the ESRS. This document presents the Assurance Framework for the regulatory year 2024/25 and includes, but is not limited to the following:

- The current and future strategies adopted by the ESO,
- The progress of activities presented in the previous Assurance Framework reports. This can be found in appendix 4,
- The risks and mitigations to the proposed strategy,
- Modelling results and interpretation.

Vision

The vision of the ESO is set out by our RIIO-2 Business Plan 2, April 2023 - April 2025 (published on 30 August 2022) and includes but is not limited to:

- Develop new, competitive market services to support operational needs.
- Maintain legacy systems, develop new systems and tools to future-proof the Control Centre.
- Deliver requirements of the new Electricity System Restoration Standard (ESRS).
- Lead deeper and quicker reform of codes/regulatory frameworks.
- Build on our system insights.
- Improve visibility of DER and focus on whole electricity system coordination.
- Develop networks fit for the future and improve network access.

² DESNZ was formally known as Department for Business, Energy and Industrial Strategy (BEIS)

The ESO is committed to implementing the ESRS by 31st December 2026 and is committed to investing in activities that will lead, organise and build consensus with Government, Regulator and the industry to drive improvements to system restoration capability.

Progress to date

This section provides updates on the progress the ESO has made towards the implementation of the ESRS in areas such as the modification of industry codes, sensitisation and training of the industry, and on-going competitive tenders including wind specific tenders.

Regulatory Framework modification

To implement the ESRS, the ESO proposed modifications to the Grid Code. As a result of these Grid Code modifications, the ESO proposed consequential modifications to other industry codes such as the STC/STCP, the SQSS, the BSC and CUSC. Important industry codes and standards like the System Defence Plan, System Restoration Plan, System Test Plan and Electrical Standards (including the Control Telephony, Communication Standard and Distribution Restoration Zone Control System Standard) were also modified to align with the Grid Code changes. The table below shows the status of the various code modifications.

Code	Modification	Progress	Status
Grid Code- GC0156	Changes to include all requirements proposed by the Grid Code Working Group	Final Modification Report submitted to Ofgem on 24th July 2023	Decision expected in January 2024
STC -CM089/091	Changes to include TO specific requirements and to allow OFTOs to participate in restoration	Final Modification Report submitted to Ofgem on 13th September 2023	Decision expected in January 2024
SQSS-GRS032	Changes to allow TOs' design-of their network to be ESRS compliant	Final Modification Report submitted to Ofgem on 4 th October 2023	Decision expected in January 2024
BSC- P451	Changes to allow RCs that are non-BSC (embedded within DNOs) to claim avoidable cost for their role during restoration	Report phased consultation from 17 October 2023-17 November 2023 Final Modification Report to be submitted on 19 th December 2023	Decision expected in January 2024
CUSC- CMP398	CMP398 proposes to introduce a codified cost recovery mechanism to prevent the affected parties being	Final Modification Report submitted to	Decision expected in January 2024

	commercially disadvantaged by the implementation of the new obligations	Ofgem on 11th July 2023	
Distribution Code DCRP/MP/22/02	Changes to allow Distributed Restart	Submitted to Ofgem on 22 nd August 2023	Decision expected in January 2024
Relevant Industry standards and plans <ul style="list-style-type: none"> • System Defence Plan • System Restoration Plan • System Test Plan • Control Telephony Standard • Communication Standards • Distribution Restoration Zone Control System Standard 	Consequential changes to align with GC0156 changes	Submitted to Ofgem together with GC0156	Decision expected in January 2024

Table 1-ESRS Code modification changes and progress

Training and Sensitisation

As part of the ESO’s strategy adopted to comply with the ESRS, the ESO has and will conduct additional industry wide training and sensitisation sessions. Additionally, the ESO will be conducting training sessions for control engineers focused on aspects of restoration critical to improving the ESO’s ability to comply with the ESRS. The table below shows ESO’s training and industry workshop plans. It also captures major training already carried out.

Training	Date
ENCC control engineers training	7 th ,14 th ,21 st ,26 th ,28 th September 2023
Interactive webinar (Distributed Restart team) Redhouse live trial	11 th October 2023
ESO, TO, DNO workshop (BAU)	9 th November 2023
ESRS training for SO-TO control engineers (ESRS Implementation team)	May 2024
Cross Industry Training (BAU team)	2024- 2026

Table 2-Training timelines

Distributed ReStart Project

The Distributed Restart Project, which ended on 31st October 2023, was a Network Innovation Competition funded initiative that examined if embedded assets (such as generators and batteries connected to distribution networks) can provide restoration services to the ESO in the event of a Partial or Total Shutdown. The conclusions of the project proposed the creation of Distribution Restoration Zones (DRZs) as a means for facilitating the restoration process with distribution connected assets. The creation of DRZs provides additional options for restoration and is partly the basis for the modification of the Grid Code and the Distribution Code. The conclusions of the Distributed Restart Project are that it is technically possible but not a mandatory requirement for DNOs, or potential Restoration Contractors to develop or participate in a DRZ. Nevertheless, following the live trials which have been established as part of the Distributed Restart Project, the information exists for DNOs to consider developing these capabilities to help support achieving the implementation of the ESRS.

More details of the Distributed Restart project can be found at <https://www.nationalgrideso.com/future-energy/projects/distributed-restart>

Distributed ReStart Project Transition Timeline

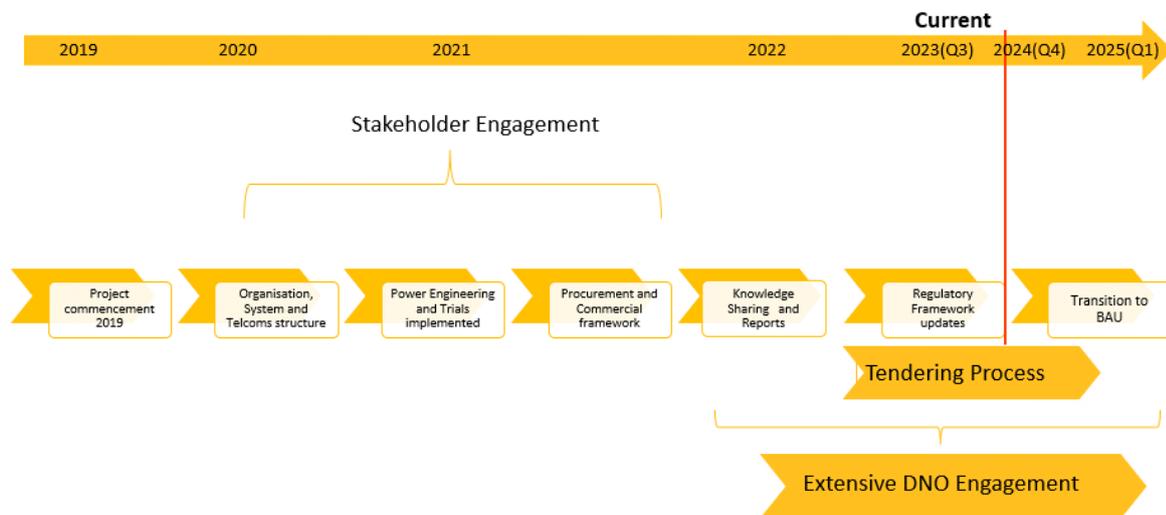


Figure 1--Distributed ReStart Project timeline

The High-level findings from the Distributed ReStart project and their integration status are listed in the table below.

Findings	Integration to BAU as of regulatory year 2024/25
<ul style="list-style-type: none"> • Distributed restoration can harness the growth of DERs to provide bottom-up restoration requirements <ul style="list-style-type: none"> ○ Over the past three years, Distributed ReStart has proven this capability via thorough testing, live trials and stakeholder engagement discussing the commercial, technical, and organisational designs. 	<ul style="list-style-type: none"> • In line with the new holistic approach to restoration, the ESO, through the South East and Northern tender rounds, is seeking to contract DERs to provide bottom-up restoration to complement top-down restoration.
<ul style="list-style-type: none"> • DERs can contribute towards ESRS compliance <ul style="list-style-type: none"> ○ Distributed restoration will be supplementing the traditional restoration service. 	<ul style="list-style-type: none"> • ESRS implementation in progress
<ul style="list-style-type: none"> • Doing the right thing for all participants <ul style="list-style-type: none"> ○ The proposed procurement process provides a more open and transparent route to market for DER providers, through a technology agnostic competitive tender route. 	<ul style="list-style-type: none"> • The BSC Modification P451 seeks to provide non-BSC Restoration Contractors to claim avoidable cost in a restoration event.
<ul style="list-style-type: none"> • The importance of being stakeholder-led <ul style="list-style-type: none"> ○ Co-creation with DER stakeholders, DNOs and other industry expertise through numerous webinars, bi-laterals, exercises, live trials and networking with various key industry forums. 	<ul style="list-style-type: none"> • The final industry wide webinar organised by the Distributed ReStart project to engage industry on the project and its world-first Redhouse live trial was held on 11th October 2023.
<ul style="list-style-type: none"> • Use of the automated Distribution Restoration Zone Control System (DRZCS) – <ul style="list-style-type: none"> ○ A pure ‘manual’ DER-based restoration will be slow and difficult to manage. Our DRZCS design supports automation and acceleration of the process, which could help meet the ESRS regional restoration targets. 	<p>The DRZC standard drafting in progress.</p>

Table 3-Distributed Restart findings and ESO implementation

Wind

In the STC Modification, CM089/CM091, new requirements were included to allow offshore generators to participate in restoration. We believe these requirements will lead to an increase in the number of wind energy sources participating as Restoration Contractors. Any successful Wind specific contracts will be awarded in March 2024 in line with published tender arrangements.

Tenders

Procurement activities to date:

Procurement Activities	Regulatory year 2024/25
Northern	The Northern tenders cover North Scotland, South Scotland, North East and North West restoration regions. The tenders were launched in 2022. The contracts will be awarded in April 2024. Awarded contractors are to be in service by November 2025. Currently there are 66 potential NETS connected contractors and 3 potential embedded contractors in the competitive tendering process.
SW & Midlands	New SW and Midlands tenders will be launched within regulatory year 2024/25. The ESO is initially meeting with relevant stakeholders as part of tender kick offs.
South East	The South East tenders were launched in 2022. The contracts will be awarded in December 2023. Awarded contracts are to be in service by July 2025. Currently there are 15 potential NETS connected contractors and 1 potential embedded contractor in the competitive tendering process.
Wind - GB	The Wind specific tenders were launched in 2022. The contracts will be awarded in March 2024. Awarded contracts are to be in service by August 2025. Currently there is only 1 potential NETS connected wind generator in the tender.

Table 4-Procurement Activities

Restoration Decision Support Tool

As part of ESO’s strategy to implement the ESRS, we will be developing a Restoration Decision Support Tool to deliver decision support capability and additional visualisation to the Control Room Engineers during a restoration event to reduce restoration time and ease cognitive load on control engineers. The tool will do this by:

- Taking inputs from existing control room systems i.e. EMS, Balancing, Forecasting, Data Historian, and pre-agreed Plans (LJRP, DRZP, and Switching Strategy Workbook (SSW)).
- Processing the inputs and enabling Route Optimisation by running appropriate models and providing suggestions to the Control Room Engineer.
- Enabling visualisation to depict situational awareness by forecasting the health of different zones.
- Generating appropriate alarms during critical conditions.
- Providing a logging ability for audit purposes.
- Integrating with other systems in the control room.
- Providing a non-real-time simulation environment for Control Room Engineer training.

Key dates for the development of the tool can be found in the table below:

Project Activities	Timelines
FP Launch	10/01/2024
RFP completion	18/03/2024
RDST supplier chosen	07/05/2024
RDST Tool delivery	01/10/2025

Table 5- RDST Project timelines

Inter-Control Centre Communications protocol (ICCP) links to DNO

As mentioned earlier, our strategy includes the creation of DRZs which would require an embedded generator as a Restoration Contractor. Currently, the ESO does not have the required visibility of the DNO networks to monitor the necessary parameters for the operation of the DRZs. As a result, the Distributed Restart Project recommended that the ESO sets up resilient communication links with all 6 DNOs, covering all 14 DNO licence areas.

The Regional Development Program (RDP) project, under investment INV5527C RDP N-3 Intertripping, has delivered 3 new links to:

- UKPN - UK Power Networks,
- SSED (Southern) - Scottish and Southern Electricity Networks Distribution, and
- NGED - National Grid Electricity Distribution (formerly Western Power Distribution)

For Restoration, the ICCP links to ENW, SPEN and NPG were to be delivered under investment INV6667. An ICCP link to SSEN was initially considered as part of INV6667, as there existed a PI link which we anticipated could be used for restoration but after further discussions with SSEN, we agreed that it would be beneficial to replace the PI link with an ICCP link. This extra link has been included to the INV6667 project scope via CR369.

- ENW - Electricity North West,
- SPEN - Scottish Power Energy Networks,
- NPG - Northern Powergrid
- SSEN – Scottish and Southern Energy Network (Northern Scotland)

Key dates for the delivery of the ICCP links can be found in the table below:

Project Activities	Timelines
ENW	Built test and Go-Live Q1 FY25 (June 2024)
SPEN	Built test and Go-Live Q2 FY25 (Sept 2024)
NPG	Built test and Go-Live Q3 FY25 (Dec 2024)
SSEN	Built test and Go-Live TBC

Table-ICCP links project timelines

Restoration Strategy

On 28th August 2003, Great Britain experienced a Partial System Shutdown. Around 47000 customers in South London experienced loss of supply. The public experienced major disruption to London rail and tube, with many commuters seeing themselves trapped in tunnels and on trains. The rails and tube services took several hours to return to normal. However, a Total System Shutdown event has never occurred in Great Britain; this makes it very difficult to test the performance of our restoration capability and arrangements in real time. As such we rely on probabilistic modelling methods to measure the performance of our restoration capability. The latest modelling results shows that it will take an average of 32.0 hours to restore 60% of National Demand in 2024. The ESRS requires that 60% of national demand is restored across all regions within 24 hours.

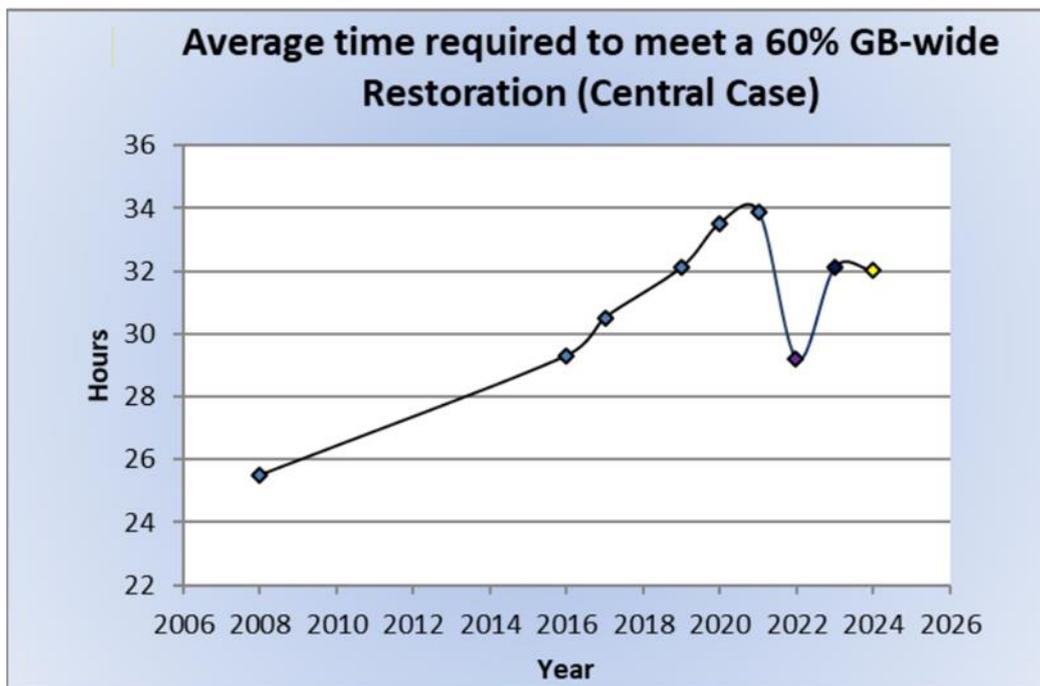


Figure 2-Modelled annual restoration times

We acknowledge that there is a significant amount of work to be done by all the relevant parties to be ESRS compliant by 31st December 2026. To achieve industry wide compliance, the ESO is implementing its adopted strategy as presented in figure 3.



Figure 3- ESRS implementation strategy

- **Implementation of learnings from Distributed ReStart:** Following successful implementation of the Distributed ReStart project, the world's first bottom-up restoration approach is being sought to compliment the traditional top-down restoration approach. The progress made so far is summarised in Table 3 above.
- **Significant increase in tendering volumes for new Restoration Contractors:** Tenders are currently ongoing to contract several Restoration Contractors of diverse technologies, across the 7 restoration regions³, to allow for uniform restoration across GB. The progress made so far is summarised in Table 4 above.
- **Updates to Regulatory Frameworks:** The ESO has proposed modifications to the Grid Code (GC), Distribution Code (DC), System Operator Transmission Owner Code (STC), Connection and Use of System Code (CUSC), Balancing and Settlement Code (BSC) and Security and Quality of Supply Standards (SQSS). The progress made so far is summarised in Table 1 above. Ofgem decisions on the modifications are still pending.
- **Deliver the Restoration Decision Support Tool:** This tool will provide decision support capability and additional visualisation to the Control Room Engineers during a restoration event to reduce restoration time and ease cognitive load on control engineers.

³North Scotland, South Scotland, North East, North West, Midlands, South East, South West.

ESO

- It will also provide real-time restoration progress on both the Transmission & Distribution Network, and log critical decisions during the restoration process. The progress made so far is summarised in Table 5 above.
- The inclusion of Offshore Generation in the restoration process: new requirements in the STC for developing Offshore transmission network will now enable Offshore resources to participate in restoration.
- Compliance Progress Monitoring: The ESO will be coordinating the industry wide compliance to ESRS Assurance Activities. It will do so by receiving, assessing and reporting on both compliance and noncompliance to Ofgem. The ESO will also be reporting on its own activities to meet the ESRS.
- Training: The ESO will carry out targeted training on ESRS requirements industry wide.

Risks to strategy implementation

We have identified several risks associated with the implementation of our adopted strategy to meet the ESRS by 31 December 2026. The ESO's mitigation strategy is to continuously analyse and assess all potential risks to identify any changes in their level of severity and propose adequate mitigation measures for them.

Table 7 shows some of the identified risks to ESRS implementation.

ESRS strategy /delivery areas	Risks	Mitigation
Regulatory Framework/ Policy	<ol style="list-style-type: none"> Delays with approving code modifications leaving little to no time for industry to implement ESRS requirements before the deadline Send back code modification by Ofgem Risks arising from project Yarrow Time constraints for industry to implement new ESRS requirements. *** Redacted*** 	<ol style="list-style-type: none"> Offer support to Ofgem when required and promptly respond to queries to aid Ofgem's decision. Continuously inform Ofgem with modification updates Continuously engage regulator on any issues arising from Project Yarrow Early decision from Ofgem and effective industry wide compliance monitoring
Implementation of Distributed Restart	<ol style="list-style-type: none"> Disproportionate nature of DERs location across restoration regions e.g., Western Isles DNOs may not be confident in setting up DRZ-Controllers. 	<ol style="list-style-type: none"> Competitive tendering for DRZs as part of ongoing and future tender rounds Webinars on Distributed Restart project with DNOs enlightening them on project outcomes and provide continuous support
Tendering for Restoration Contractors	<ol style="list-style-type: none"> Not enough parties showing interest in tenders and not getting variety of technologies in the tenders or not enough access to potential contractors 	<ol style="list-style-type: none"> Targeted webinars to bring opportunities of being RCs to suppliers.
Inclusion of Offshore Generators	<ol style="list-style-type: none"> No Cost recovery mechanism for OFTOs to recover cost of providing ESRS compliant networks. 	<ol style="list-style-type: none"> Engaging Ofgem for a solution before contracts are awarded.
RDST & ICCP links	<ol style="list-style-type: none"> Delay in project dependencies such as NCMS project affecting the delivery of the RDST project. The cost of delivering this project could be higher than the BP2 forecasts because the project budget has already been reduced due to scope change. Slow paced of work by the chosen supplier. 	<ol style="list-style-type: none"> Periodic review of project dependencies and by developing proper programme interlocks between dependencies. Regular review of forecasted cost and actual spend throughout RIIO-2 period. Ensure that the most qualified supplier is selected and by maintaining an effective agile project management throughout project delivery.
Compliance Progress Monitoring	<ol style="list-style-type: none"> Delay in implementing provisions of Grid Code Modifications. 	<ol style="list-style-type: none"> Early initiation of changes to ESO. processes /systems to facilitate ESRS

	2. Inadequate resources in place for compliance monitoring for the wider industry including ESO.	2. Prompt escalation of resource needs to management.
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Table 6-Risks affecting restoration strategy and mitigations

Restoration Approach

Current Restoration Approach

The current restoration approach is to use restoration contracted large power stations and interconnectors to energise sections of the Transmission System using local Demand to establish stable Power Islands in line with pre-agreed Local Joint Restoration Plans (LJRPs). Subsequently, other generators will join the growing System, and the synchronization of Power Islands progressively takes place to re-energising the whole network and restore Demand across the country until full restoration is completed.

As the energy industry works to meet clean energy targets, DERs are replacing with traditional large fossil fuel-based power stations. It has become necessary that these DERs are also able to contribute to the restoration process so the transition to renewable energy sources does not adversely affect restoration ability. The ESO is proposing a holistic Restoration Approach that considers both top-down and bottom-up approach to restoration.

I. Regulatory year – 2024/2025

- Industry wide compliance monitoring commences in this regulatory year. TOs, Network Operators and Generators will be submitting their Assurance Activities and compliance reports as part of week 24 submissions to the ESO. The ESO upon receiving the reports will assess them and report both compliance and non-compliance to Ofgem. In the case where there are derogation requests the ESO will follow the codified procedures in addressing them. The ESO will also be reporting on its own ESRS compliance to Ofgem. The figure below identifies the industry wide new compliance areas within the relevant codes.

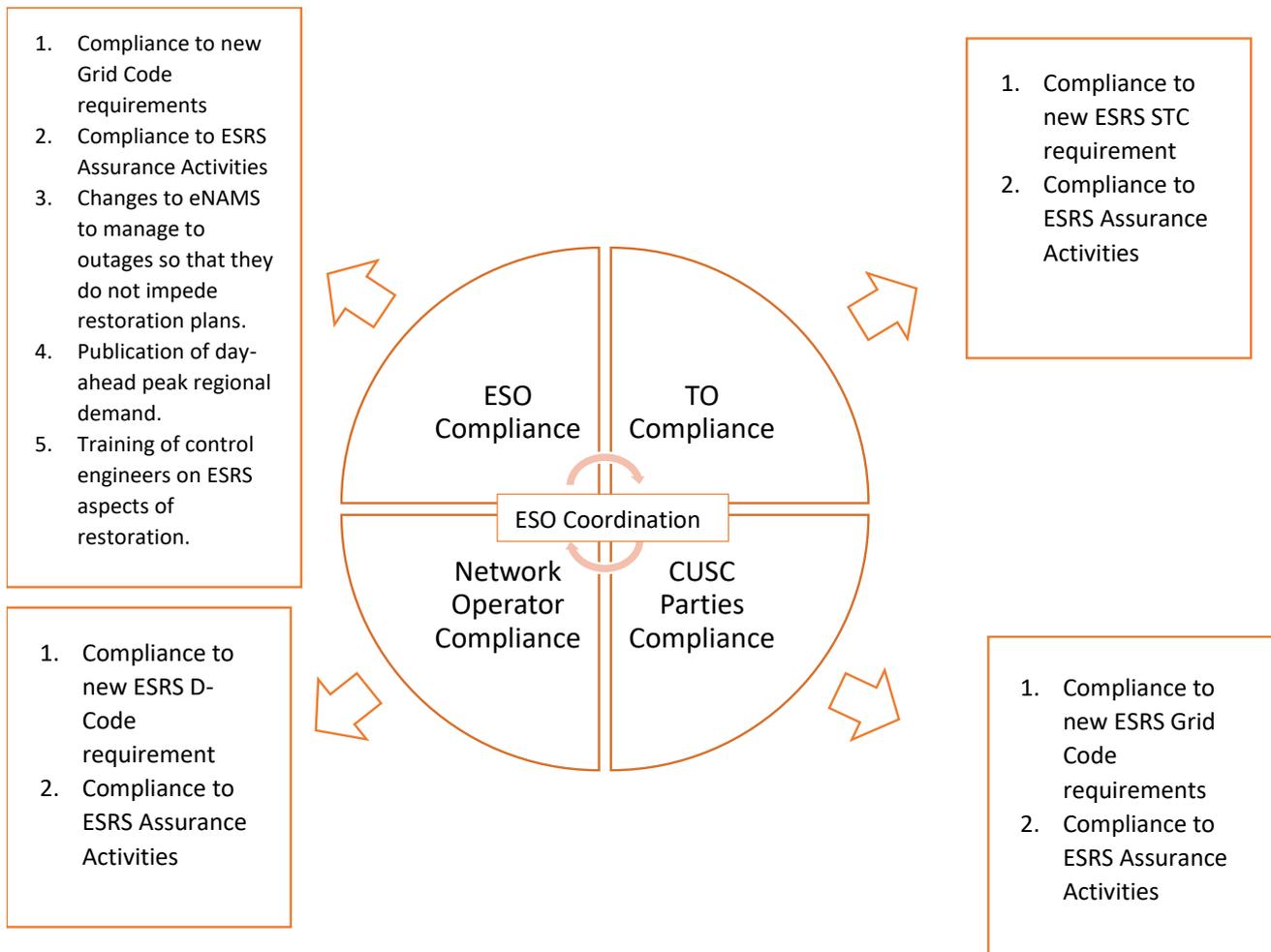


Figure 4- ESO's role in compliance progress monitoring

- In this regulatory year, the development of ICCP links to ENW, SPEN and NPg will be completed however, the RDST project will be ongoing.
- The ESO will be working in conjunction with Elexon to publish forecast peak National and Restoration Regional Demand on BMRS that would be used as the restoration targets during system restoration events. A modification will be raised to modify the BSC to this effect within this regulatory year.
- The ESO will be modifying its Electricity Network Access Management System (eNams) platform within this regulatory year enable TOs /DNO to indicate whether their planned outages in their system will impact restoration plans.
- The ESO will be organising training in conjunction with all TOs for control engineers where they will practice scenario-based simulations to achieve ESRS targets.

- The ESO will be sensitising the industry on ESRS requirements and obligations in this regulatory year.

II. Regulatory years – 2025/2026, 2026/2027

- The ESO will continue to monitor both the industry and its own compliance within regulatory year 2025/26 and report to Ofgem.
- Annual training on System restoration will continue.
- The RDST will be delivered within 2025/26. Training on the tool will be organised for control engineers.
- Restoration Contractors who will receive contracts under the South East and Northern tender rounds will be expected to be in service within these regulatory years. This means there will be new LJRP as well as the first DRZPs within these regulatory years.
- First awarded Restoration Contractors from Offshore farms will be in service within these regulatory years. This will be dependent on the ongoing work to determine an appropriate cost mechanism for ESRS compliant systems for OFTOs.
- Ongoing assurance visits to Restoration Contractors, TOs and Network Operators facilities.
- ESRS compliance deadline falls within the regulatory year 2026/27. The ESO will assess its ESRS implementation performance and report to Ofgem.

III. Subsequent Regulatory years (beyond 2027)

The ESRS should be fully incorporated into normal business operation within this period. ESO's post compliance activities will include:

- Managing Restoration Contractors via competitive tendering.
- ESRS Assurance Activities.
- Assessing ongoing compliance and feedback to Ofgem.

Monitoring compliance

The structure of oversights in ensuring compliance to the ESRS is shown in the figure below. The ESO will be monitoring industry wide performance by collating and assessing Assurance Activities reports furnished by relevant parties. The reports frequency as well as the type of testing required is in DRC Schedule 16 as attached in Appendix 1.

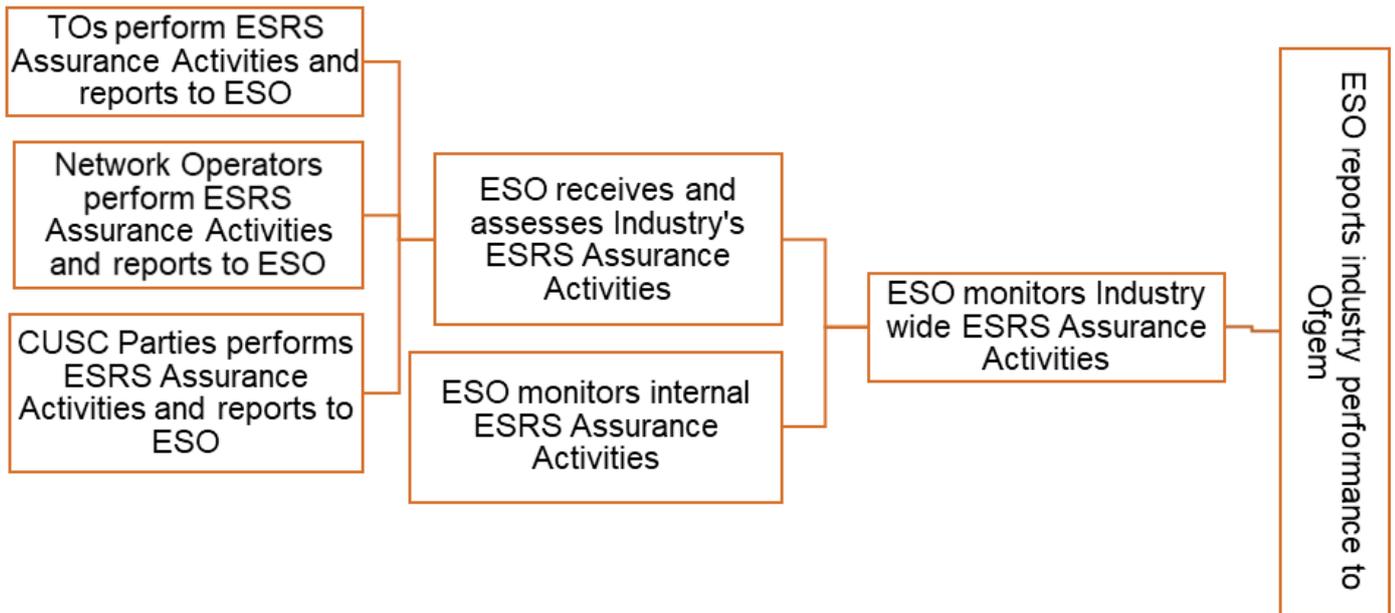


Figure 5- Levels of Assurance Activities monitoring and reporting

From 2024, Generators and Network Operators will be submitting evidence that they are working towards achieving ESRS compliance as indicated in PC.A.5.7.3 below:

*"...From 1st January 2024 until 31st December 2026, evidence to support the work **Generators, HVDC System Owners, DC Converter owners, Non-Embedded Customers, and Network Operators** are carrying out to achieve these requirements on or after 31st December 2026 shall be provided in their Week 24 submission,"* the industry will be submitting evidence to the ESO that they are working towards achieving ESRS compliance by the stipulated compliance deadline. The ESO is working on how to collate and assess the evidence submitted as well as assess any derogations.

This requirement was caught for TOs in STCP 08-3 3.1.5 as shown below:

"...From 1st January 2024 until 31st December 2026, evidence to support the work TO's are making as to how they will satisfy these requirements shall be provided by submitting Part III of DRC Schedule 16 of the Grid Code...This data shall be provided in accordance with STCP 12-1 annually during calendar week 24."

As a result of these requirements, the ESO is working with the timeline presented in the table below to monitor and ensure progress towards ESRS compliance by the implementation deadline. The overall ESRS implementation timeline is presented in appendix 3.

ESRS Assurance Activities progress Monitoring	Timeline
<p>ESO Assurance Activities</p> <ul style="list-style-type: none"> • Adopting regional restoration approach (2023- 2025). The new restoration regions are shown in appendix 2. • Development of the RDST/ICCP Links (2023-2025) • Compliant to activities in DRC Schedule 16 (2024-2026) • Training on ESRS (2023-2026) • Compliant to demand publication requirement under ESRS on BMRS (2023-2024) • Develop internal processes to coordinate industry outages. (2023-2024) 	<p>2023-2026</p>
<p>Wider industry assurance monitoring</p>	
<p>TO Assurance Activities</p> <ul style="list-style-type: none"> • Compliant to activities and reporting timelines in DRC Schedule 16 (2024-2026) • Compliant to Appendix I of the SQSS (2024-2026) • Compliant to new STC/STCP ESRS additions (2024-2026) 	<p>2024-2026</p>
<p>Network Operator Assurance Activities</p> <ul style="list-style-type: none"> • Compliant to activities and reporting timelines in DRC Schedule 16 (2024-2026) 	<p>2024-2026</p>
<p>CUSC Parties Assurance Activities</p> <ul style="list-style-type: none"> • Resilience of Critical Tools and facilities (2024-2026) • Compliant to activities and reporting timelines in DRC Schedule 16 (2024-2026) 	<p>2024-2026</p>

Table 7-Assurance Activities timelines

**** Probabilistic Modelling (Redacted)****

Appendix 1-Assurance Activities template

Assurance Activity	Grid Code Reference	Parties Involved	Frequency of Assurance Activity	The Company Witness required	Date of test result submission/visit	Annual Statement of Compliance (Y/N)
System Restoration Power Island review	OC9.4.7.6.1 OC5.7.4(iv)	Relevant Transmission Licensees, Network Operators and The Company	Every 3 years	Not applicable		
System Restoration Power Island availability assessment	OC9.4.7.6.1 OC5.7.4(iv)	Relevant Transmission Licensees, Network Operators and The Company	Yearly	Not applicable		
Remote Synchronisation test - TO/DNO	OC5.7.2.1(g) OC5.7.2.3 (d)	Relevant Transmission Licensees, relevant Network Operators, Restoration Contractors and The Company	Every 3 years	No		
Low Frequency Demand Disconnection Relay test	CC.A.5.4.3 / ECC.A.5.4.3	Relevant Transmission Licences, relevant Network Operators, Non-Embedded Customers and The Company	Every 3 years although this may be extended to no more than every five years if considered to be required for operational purposes	No		
Anchor Restoration Contractor test	OC5.7.2.1 /OC5.7.2.2 / OC5.7.2.3	Relevant Transmission Licensees, Network Operators, Anchor Restoration Contractors and The Company	Every 3 years	Yes		

Top Up Restoration Contractor test	OC5.7.2.4	Relevant Transmission Licensees, Network Operators, Top Up Restoration Contractors and The Company	Every 3 years	Yes		
Resilience to Partial Shutdown or Total Shutdown of Restoration Contractor	OC9.4.7.6.2 OC5.7.4.2(iv)	Restoration Contractors and The Company	Yearly	No		
Quick Resynchronisation Unit Test	OC5.7.2.5	EU Generators in respect of Type C and Type D Power Generating Modules, relevant Network Operators and The Company	Yearly	Yes		
Distribution Restoration Zone Control System test	OC5.7.2.6 Electrical Standard - Distribution Restoration Zone Control System High Level Functional Specification	Network Operators, Restoration Contractors and The Company	Every 3 years	Yes		
Dead Line Charge test	OC5.7.2.1(g)(a) OC5.7.2.3(d)(a)	Transmission Licensees, relevant Network Operators Anchor Restoration Contractors and The Company	Every 3 years	Yes		
Remote Synchronisation test -Restoration Contractor	OC5.7.2.1(g)(b) OC5.7.2.3(d)(b)	Relevant Transmission Licensees, relevant Network Operators, Restoration	Every 3 years	Yes		

		Contractors and The Company				
Assurance Visits	OC5.7.4 OC5.7.5	The Company, Relevant Transmission Licensees, relevant Network Operators to visit Restoration Contractors	Every 3 years	Yes		
Voice Systems Resilience test or equivalent	OC5.7.4.2(vi)	CUSC Parties, relevant Network Operators, Relevant Transmission Licensees Restoration Contractors and The Company	Yearly	No		
Critical Tools and Facilities control systems resilience demonstration – power resilience including power resilience demonstration & connectivity and alarm event handling	OC5.7.2.6 OC.5.7.4.2(iii) OC5.7.4.2(ix) OC5.7.4.3 CC.7.10 ECC.7.10	CUSC Parties, relevant Network Operators, Relevant Transmission Licensees, Restoration Contractors and The Company	Yearly	No		
Control systems resilience demonstration – diagram & topology	OC5.7.2.6 OC.5.7.4.2(iii) OC5.7.4.2(ix)	CUSC Parties, relevant Network Operators, Relevant Transmission Licensees, Restoration Contractors and The Company	Yearly	No		
Cyber-Security	CC.7.10.6 ECC.7.10.6 OC.5.7.4.2(iii)	CUSC Parties, relevant Network Operators, Relevant	Yearly	No		

	OC5.7.4.2(x)	Transmission Licensees, Restoration Contractors and The Company				
Telephony services test per month as per CC/ECC.6.5.4.	CC.6.5.1 – CC.6.5.5 ECC.6.5.1 – ECC.6.5.5 OC.5.7.4.2(vi) OC5.7.4.2(xi) OC5.7.4.2(xii)	CUSC Parties, relevant Network Operators, relevant Transmission Licensees, Restoration Contractors and The Company	Yearly	No		
Resilience to Partial Shutdown or Total Shutdown of CUSC Parties	OC5.7.4 OC5.7.5	CUSC Parties and The Company	Yearly	No		
Restoration Procedure review	OC9.4.7.6.2 OC5.7.4.2(iv)	The Company, Relevant Transmission Licensees, relevant Network Operators, CUSC Parties and Restoration Contractors	Every 3 years	Not applicable		
LJRP & DRZP reviews	OC9.4.7.6 OC5.7.4.2(iv)	The Company, Network Operators, Transmission Licensees and Restoration Plan signatories	Every 3 years	Not applicable		
Awareness training for Restoration Contractor and CUSC Parties	OC9.4.7.6.2 OC5.7.4	The Company, relevant Network Operators, Transmission Licensees, CUSC Parties and	Every 3 years	Not applicable		

		Restoration Contractors				
Cross industry training	OC9.4.7.6.2 OC5.7.4	The Company, Network Operators, Transmission Licensees, CUSC Parties and Restoration Contractors	Every 3 years	Not applicable		

Table 8--Assurance Activities template

Appendix 2-Restoration Regions

There are 7 Restoration Regions. The Restoration Regions are shown in the diagram below.

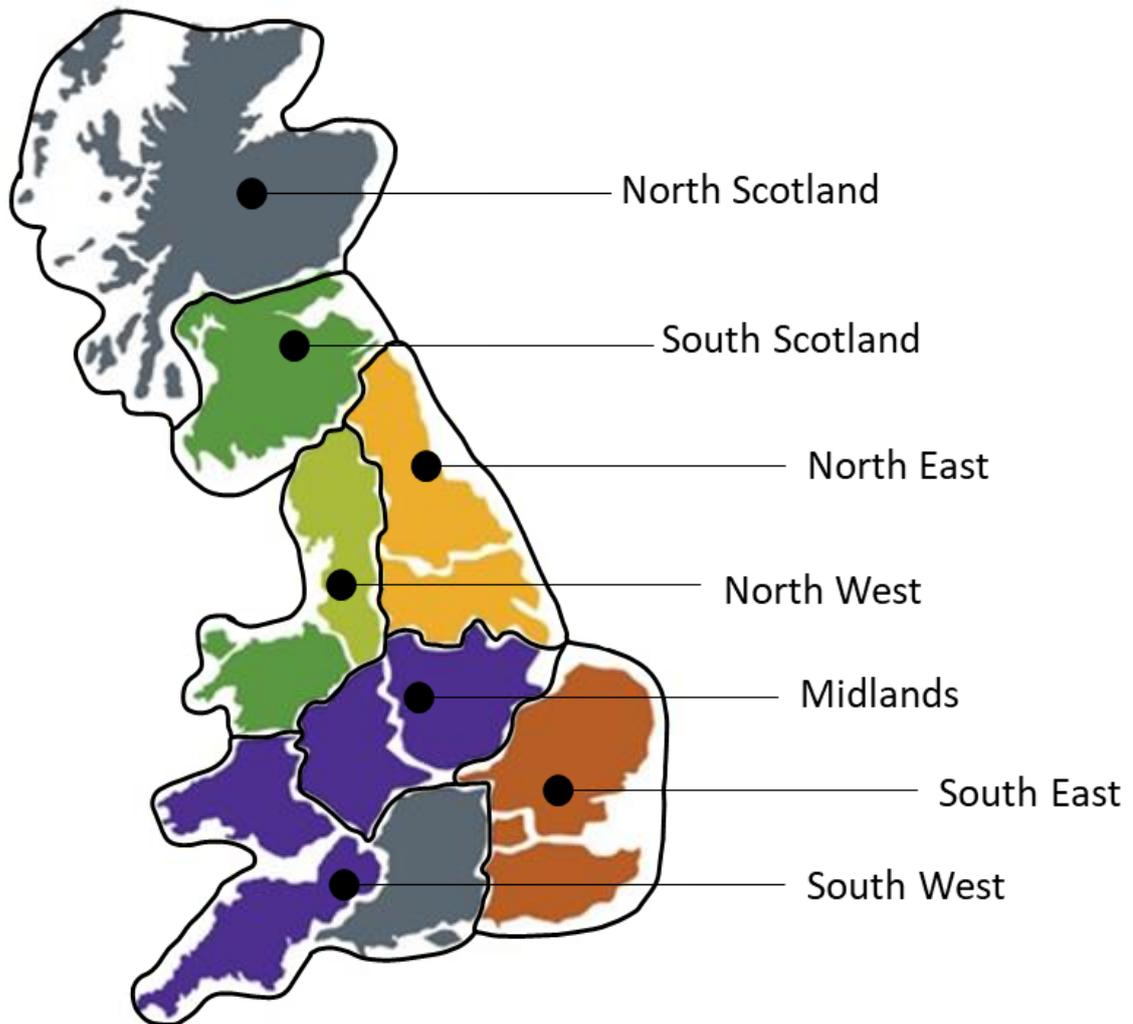


Figure 6-Restoration Regions

Appendix 3-ESRS implementation and Assurance Activities timeline

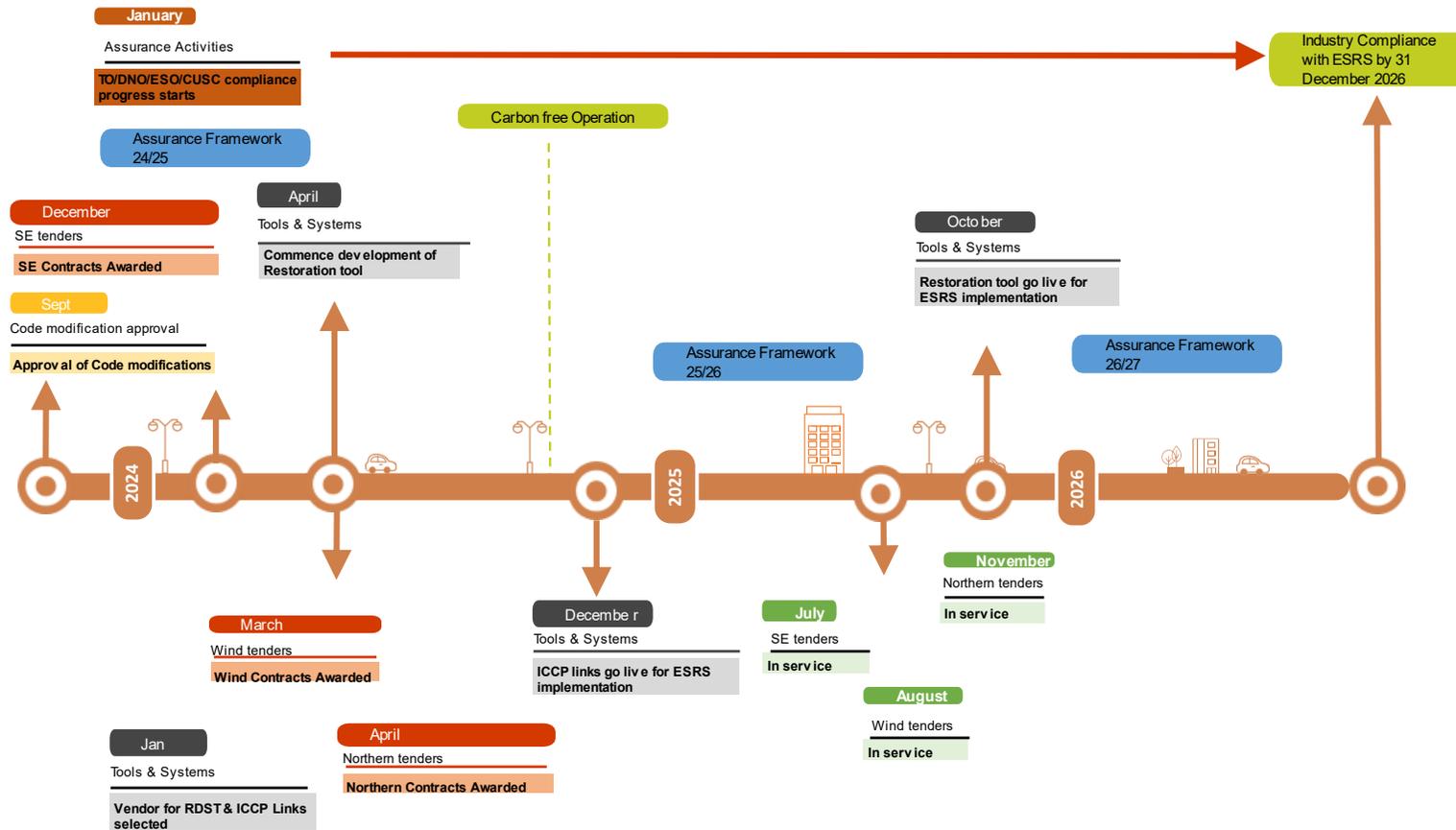


Figure 7-ESRS implementation and Assurance Activities timeline

Appendix 4-Progress Update on Activities in Assurance Framework 23/24

Activities under Regulatory year 22/23	Progress as of 2023/24	Anticipated Progress within 2024/25
<p>1. Transition from the current strategy to the ESRS</p>	<ul style="list-style-type: none"> The ESO continues to identify the gaps in the current strategy and propose a more holistic strategy that will ensure compliance to ESRS which includes implementing the recommendations from the Distributed ReStart project. The strategy is presented in this year's Assurance Framework. 	<ul style="list-style-type: none"> The implementation of the adopted ESRS strategy will be ongoing in 2024/25. The ESO will continue to work on the RDST and ICCP projects. The timelines of these projects are in table 5 and 6.
<p>2. Improving the restoration time, whilst broadening participation for ESR services</p>	<ul style="list-style-type: none"> The restoration times as shown in the model for GB is 32.1 hours for 2023 which is worse than the 29.2 hours achieved in 2022. This is due to a changing portfolio of contracted services and changing market conditions including levels of unit warmth at some key locations. However, it is crucial to note that implementing the new restoration strategy will reduce the restoration time to comply with ESRS. See redacted section. 	<ul style="list-style-type: none"> The ESO will be monitoring its strategy implementation as well as the industry's performance towards ESRS compliance.
<p>3. Increase both the market awareness of the service and open the service to a wider range of providers</p>	<ul style="list-style-type: none"> We increased awareness about the service via several industry engagements and have launched 3 tenders in the last year (2022) with significant interest from a range of providers. In addition, our strategy is to have a minimum of 3 different technologies in each DNO licence area, but we acknowledge this may be challenging. 	<ul style="list-style-type: none"> We will continue to engage with the industry on the awareness of ESRS services via the tender processes

ESO

<p>4. Categorise providers' capability according to their contribution to different phases of restoration. This will be further reviewed, evolved, and enhanced as the industry workgroups (formed to deliver ESRS implementation) are progressed.</p>	<ul style="list-style-type: none"> • The thinking has evolved around the use of different phases as specified in the Assurance Framework 2022/23, however, Transmission connected Restoration Contractors are expected to respond within 2 hours while Distribution connected Restoration Contractors within 8 hours. • The terms "Anchor" and "Top-up" have also been introduced into the Grid Code legal text drafting (GC0156) to differentiate between parties contracted to provide restoration services based on their level of involvement in the restoration process. 	<ul style="list-style-type: none"> • The ESO is securing the services of both Anchor and Top-up services for both LJRP and DRZPs in the ongoing tenders.
<p>5. Have sufficient secondary levels of generation¹ available for an efficient and sustainable restoration following the initial stages.</p>	<ul style="list-style-type: none"> • The restoration strategy has evolved since the last Assurance Framework. To achieve ESRS, all CUSC parties are proposed to have 72 hours resilience following Partial or Total System Shutdown. This will ensure sustainable restoration following initial stages. 	<ul style="list-style-type: none"> • Will update following Ofgem decision on GC0156.
<p>6. Develop a Restoration tool as per RIIO2 business plan. Initial discussions on this tool commenced in October 2021 with an expectation to further develop from early 2022.</p>	<ul style="list-style-type: none"> • We have held various external and internal stakeholder workshops to collate requirements and develop User Stories to support the delivery of the Restoration Decision Support Tool. • We have also viewed prototypes from other organisations with restoration tools. • We are in the process of launching Request for Interest. 	<ul style="list-style-type: none"> • Timelines for the RDST provided in table 5.

¹ Secondary level of generation is now referred to as non-restoration CUSC parties.

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<p>7. A full tender for the Southeast (SE) region will be launched from Q1 2022</p>	<ul style="list-style-type: none"> • New SE tender launched in June 2022 which included the recommendations of the Distributed ReStart project for the first-time round. • The ESO progressed 48 unique offerings across 7 technology types during ITT Part 1. The Final stage of the tender launched in Q1 of 2023. 	<ul style="list-style-type: none"> • Successful tenders will be awarded contracts in January 2024.
<p>8. Competitive tendering process for Northern regions</p>	<ul style="list-style-type: none"> • New Northern tender launched in October 2022 to replace the previously awarded tenders when they come to an end. • The ESO has been inundated with over 202 unique offerings across 11 different technology types. This tender will run until contract awarded in April 2024 with a service start date of November 2025. 	<ul style="list-style-type: none"> • Successful tenders will be awarded contracts in May 2024.
<p>9. Wind</p>	<ul style="list-style-type: none"> • The ESO launched a one-off initiative to demonstrate that offshore or onshore wind generation can also meet Primary Service technical requirements for restoration services at Transmission level in August 2022. • We received good amounts of interest from different wind providers across the nation, the intention is to have service delivery by Q3 2025 but following feedback from multiple potential providers who explained about their investment project timelines, we provided another option for go-live by 2028 for those able. 	<ul style="list-style-type: none"> • Successful tenders will be awarded contracts in March 2024.
<p>10. Distributed Restart</p>	<ul style="list-style-type: none"> • The tenders mentioned above included potential providers from the DNO Network (Distributed ReStart) to 	<ul style="list-style-type: none"> • The tenders mentioned above includes potential contractors from the DNO Network (Distributed ReStart)

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	support the strategy which is bottom-up and top-down approach to restoration.	to support the strategy which is bottom-up and top-down approach to restoration.
11. Ongoing industry collaboration to implement the ESRS alongside the obligations in the Network Code on Emergency & Restoration (NCER).	<ul style="list-style-type: none"> Comprehensive industry collaboration commenced in April 2022 for the Grid Code modification (GC0156) and consequential modifications are being progressed for STC, SQSS, BSC, CUSC and Electrical Standard for Control and System Telephony. 	<ul style="list-style-type: none"> Industry engagement sessions and training plans in the pipeline.
12. Changes to Grid Code, SO-TO Code Procedures (STCP), potential expansion of SGUs (Significant Grid User) to ensure a more resilient restoration and updates to the electrical standards for Control and System telephony.	<ul style="list-style-type: none"> Modification processes to Grid Code (GC0156), STC (CM089), STCP (PM0128), CUSC (CMP398), BSC (P451) and Electrical Standard for Control and System Telephony are ongoing. 	<ul style="list-style-type: none"> Approval received from Ofgem on all ESRS related modification expected in January 2024. Implementation commences 20 days post ESRS approval.

Table 9--Progress Update on Activities