Guidance

NESO Roles Guidance 2023-2025

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National Energy System Operator (NESO) is an expert, impartial body with responsibilities across both the electricity and gas systems, driving progress towards net zero while maintaining energy security and minimising costs for consumers. It performs a number of important functions from the real time operation of the electricity system, through to energy market development, managing electricity system connections and leading on strategic energy network planning. We regulate NESO to help ensure the actions it takes align with the interests of consumers. NESO's regulatory and incentives framework aims to encourage transparency and high performance from NESO, and make NESO more clearly accountable to its stakeholders.

This Guidance Document provides further explanation of NESO's roles and the associated expectations, which underpin NESO's regulatory framework. The purpose is to help to align expectations between NESO, Ofgem and stakeholders, support the enforceability of NESO's obligations and create a more transparent framework overall. Under NESO's regulatory and incentives framework, NESO must also provide evidence of how it has performed in relation to its roles.

This document is subject to the Secretary of State designating NESO as the Independent System Operator and Planner (ISOP), making the electricity licensing direction for the Electricity System Operator (ESO) licence[1] and granting the Gas System Planner (GSP) licence.[2] The document will come into effect on the same date that NESO's ESO and GSP licences come into effect.

[1] Under this direction, the Secretary of State would use powers under section 167 of the Energy Act. Please see: https://www.ofgem.gov.uk/sites/default/files/2024-08/ESO_Licence_Direction_and_Terms_and_Conditions_Unsigned.pdf

[2] Please see: https://www.ofgem.gov.uk/sites/default/files/2024-08/GSP_Licence_Terms_and_Conditions_unsigned_and_subject_to_SoS_decision_to_grant.pdf

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Contents

NESO Roles Guidance 2023-2025 1
Version history 4
1. Introduction 7
2. Role 1: Control centre operations 9
Activity 1a: Electricity system operation 10
Immediate and ongoing 10
Activity 1b: Electricity system restoration 18
Activity 1c: Transparency, data and forecasting 22
3. Role 2: Market development and transactions 26
Activity 2a: Markets for electricity system services 27
Activity 2b: Electricity Market Reform 34
Activity 2c: Wholesale markets, industry codes and charging 38
4. Role 3: System insight, strategic planning and network development 43
Activity 3a: Electricity connections and network access 45
Immediate and ongoing 45
Activity 3b: Energy system strategy and insights 63
Immediate and ongoing until the end of RIIO-2 63
Activity 3c: Optimal network investment 67
Immediate and ongoing 67
5. Expectations for establishing NESO 81
Expectations for establishing NESO 82
6. Quality of Outputs 84

Version history

The table below summarises the changes made to NESO Roles Guidance (and predecessor documents established under the Electricity System Operator's (ESO) regulatory framework)

Version	Date published	To be applied	Summary of changes
1.0[3]	July 2017	July 2017 – March 2018	N/A
Consultation on changes[4]	December 2017	N/A	Expanding Role 1 to better reflect the ESO's system operability role.
2.0[5]	February 2018	April 2018 - March 2019	• Clarifications on the status and purpose of the roles and principles. • Clarifications on how the roles and principles will be updated going forward. • Clarification to Principle 4 to include European Network Codes.
3.0[6]	March 2019	April 2019 onwards	• Clarifications and updates to introductory text. • Rewording the title of Principle 2. • Clarifications to supporting principal guidance for Principles 2, 3, 5, 6 and 7.
Consultation on change[7]	January 2020	N/A	Streamlining the roles framework by moving from 4 to 3 roles.

[3] Available at: https://www.ofgem.gov.uk/system/files/docs/2017/07/future_so_reg_framework_july_2017_working_paper.pdf
[4] Available at: https://www.ofgem.gov.uk/system/files/docs/2017/12/eso_roles_and_principles_appendix.pdf
[5] Available at: https://www.ofgem.gov.uk/system/files/docs/2018/02/eso_roles_and_principles.pdf
[6] Available at: https://www.ofgem.gov.uk/system/files/docs/2019/03/eso_roles_and_principles_guidance_2019-20.pdf
[7] Available at: https://www.ofgem.gov.uk/publications-and-updates/call-input-2020-21-eso-regulatory-and-incentives-framework

4.0[8]	6 March 2020	1 April 2020 – 30 March 2021	• Streamlining the roles framework by moving from 4 to 3 roles. • New text on competition and FES.
Consultation on change[9]	September 2020 & December 2020	N/A	Updated guidance to align with start of RIIO-2 price control.
5.0[10]	17 March 2020	1 April 2021	Updated guidance to align with start of RIIO-2 price control.
Consultation on change	31 November 2022	N/A	Updated guidance to align with the ESO's second business plan cycle[11] during the RIIO-2 price control.
6.0[12]	28 March 2023	1 April 2023	Updated guidance to align with the ESO's second business plan cycle during the RIIO-2 price control.
Consultation on change	25 May 2023	N/A	Updated guidance to better align our expectations with the ESO's current role in industry.
7.0[13]	1 November 2023	1 November 2023	Updated guidance to better align our expectations with the ESO's current role in industry.
Consultation on change	24 May 2024	N/A	Changes to reflect the introduction of NESO.

[8] Available at: https://www.ofgem.gov.uk/system/files/docs/2020/03/eso_roles_and_principles_guidance_2020-21.pdf
[9] Available at: https://www.ofgem.gov.uk/publications-and-updates/consultation-eso-roles-guidance
[10] Available at: https://www.ofgem.gov.uk/sites/default/files/docs/2021/03/eso_roles_guidance_2021-23_1.pdf
[11] The business plan cycle is the period for which the business plan is applicable. The first business plan cycle (BP1) covers the incentive scheme starting on 1 April 2021 and ending on 31 March 2023. The second business plan cycle (BP2) covers the incentive scheme starting on 1 April 2023 and ending on 31 March 2025.
[12] Available at: https://www.ofgem.gov.uk/sites/default/files/2023-03/ESO%20Roles%20Guidance%202023-2025.pdf
[13] Available at: https://www.ofgem.gov.uk/publications/decision-amendments-bp2-eso-roles-guidance

8.0	12 September 2024	From NESO Day 1	Changes to reflect the introduction of NESO.

1. Introduction

1.1 The NESO Roles Guidance document provides further explanation of NESO's roles and our expectations for how NESO should carry out these roles under its regulatory framework. This guidance document outlines our current view of the activities and outcomes expected from NESO for the RIIO-2 Business Plan 2 (BP2) period, which commenced on 1 April 2023 and ends on 31 March 2025.

1.2 Alongside the roles are the performance expectations, behaviours and the predominant licence conditions that they relate to. The guidance has been drafted with the intention that it should help to outline the types of activities that we would consider to be meeting expectations, or exceeding expectations, with regard to NESO's licence obligations and incentives. NESO's licence conditions underpin the roles and remain the legal obligations that NESO must fulfil.

1.3 In the rest of this chapter, we set out further details of the three roles we have defined for NESO for BP2, and the additional expectations we have set for NESO in relation to establishing new activities and independent back-office capabilities. Throughout all these expectations are the cross-cutting themes of ensuring NESO provides most value to consumers e.g. protecting consumers from undue costs, enabling secure cost-effective decarbonisation, being a trusted source of information and insight, transparency in its actions, and high levels of engagement with industry and other network operators.

1.4 The expectations include immediate and ongoing expectations for BP2 as well as expectations that NESO should seek to achieve by the end the RIIO-2 price control.[14] We have also aimed to be clear at the start of each section whether the expectations apply to NESO's electricity roles, gas roles, or to both fuel types and licences.

1.5 These regulatory expectations are intended to be complementary to NESO's statutory duties[15]. We ultimately expect NESO to carry out all its activities (which we acknowledge have a degree of overlap and interaction in practice) in a manner that it considers is best calculated to promote its objectives under Section 163 of the Energy Act 2023, whilst also having regard to the matters

[14] For the avoidance of doubt, this refers to NESO's price control period which ends on 31 March 2026.
[15] Please see: Energy Act 2023 (legislation.gov.uk)

specified in Section 164 of the Energy Act 2023, and in line with its duty to have regard to the Strategy and Policy Statement.

Status and purpose of the NESO Roles Guidance

1.6 This document provides updated guidance on NESO's roles and the behaviours we expect to see when NESO fulfils its roles. This guidance should be considered as a non-exhaustive list of examples of how we currently envisage NESO should fulfil its roles when undertaking its functions. The roles are underpinned by NESO's binding Electricity System Operator and Gas System Planner licences obligations – particularly Condition C1 (General obligations on NESO activities)[16].

1.7 NESO gained new responsibilities and activities when the Electricity System Operator (ESO) was designated as NESO. We have made targeted changes to this guidance document to reflect NESO's new responsibilities and activities. This includes minimal changes to the expectations in the pre-existing three roles (as outlined and Chapters 2-3) and the introduction of a new set of cross-cutting expectations on the establishing NESO (as outlined in Chapter 5). This reflects the practicalities around the designation of NESO occurring part way through an existing regulatory period and is in line with our phased approach to the development of a new regulatory framework for NESO[17]. We recently published a consultation on moving to a consolidated assessment of new and existing NESO roles from April 2025 onwards[18].

1.8 In the event that NESO does not meet its licence obligations, it may be found to be non-compliant. This Guidance Document (in all its versions) will inform any future decisions taken by the Authority when considering possible investigation and enforcement issues arising out of non-compliance with the relevant licence obligations.

[16] Our response to the statutory consultation on the National Energy System Operator (NESO) licences: https://www.ofgem.gov.uk/decision/response-statutory-consultation-national-energy-system-operator-licences-and-other-impacted-licences

[17] Please see Section 1.1 of https://www.ofgem.gov.uk/decision/response-statutory-consultation-national-energy-system-operator-licences-and-other-impacted-licences#:~:text=Decision%20for&text=In%20March%202024%2C%20the%20Secretary,conditions%20of%20other%20existing%20licences

[18] Consultation on NESO's performance incentives framework for BP3 | Ofgem

2. Role 1: Control centre operations

2.1 Balancing the National Electricity Transmission System (NETS) in a safe, reliable and efficient way is a core function for NESO. The Electricity National Control Centre (ENCC) performs the day-to-day, short-term (within day and day-ahead) operational activities for the NETS.

2.2 The ENCC carries out real-time system balancing by contracting and trading with energy market participants (e.g. generators, storage providers and third-party providers of aggregated flexibility). This is achieved primarily via the Balancing Mechanism (BM) and utilisation of contracted balancing services. The ENCC also requests that transmission network owners (TOs) optimise physical network configurations using network assets, e.g. flexing voltage tolerances or amending specific circuit ratings or planned outages and maintenance.

2.3 Alongside the real-time operation of the NETS, other key electricity control centre functions include:

- Coordinating with other network operators on operational decisions and outage changes, and network planning out to one-year;
- Short-term energy forecasting;
- Managing and sharing system data and information; and
- Restoration and emergency response (to system instability events).

2.4 NESO's central position in the energy sector means it has an important responsibility in relation to data, information sharing and digitalisation. NESO should develop to be a data-led organisation, with a strong digital and IT systems capability. NESO has a responsibility to lead by example in improving sectoral energy data practices that are integral to the well-coordinated and cost-effective delivery of net zero.

Activity 1a: Electricity system operation

Meets expectations predominantly underpinned by licence conditions:

Electricity System Operator licence conditions	Gas System Planner licence conditions
C1.2; C1.3; C1.4(b); C1.5(a); C1.5(d); C3; and C7.	n/a

The expectations in Activity 1a apply to electricity roles only.

Output	Meets expectations	Exceeds expectations
Immediate and ongoing		
Balancing efficiently	• Balancing economically and efficiently, in line with the 'meets expectations' benchmark of performance metric 1A (Balancing costs). Including by: ➢ taking actions that minimise consumer costs irrespective of provider type or size. ➢ planning ahead to accurately forecast reserve, foot room requirements and system constraints. ➢ using the full range of available balancing services and options (e.g. from both market parties and network companies).	• Implement a comprehensive plan to proactively mitigate any projected material increases to balancing costs, in line with the 'exceeds expectations' benchmark of performance metric 1A (Balancing costs). Including by: ➢ acting early and proactively to reduce drivers of higher costs. ➢ continually refreshing and upgrading control room processes to deliver a demonstrable improvement in the accuracy of forecasting contingency needs and system constraints (evidenced, for

		example, through robust back-casting). ➢ proactively exploring, developing and utilising improvements to existing balancing services and new innovative types of services.
Maintaining system frequency and voltage	• Maintain system frequency and voltage within statutory limits (including the Security and Quality of Supply Standard (SQSS)). • Demonstrably minimise any increases in the number of instances where the system frequency is outside operational limits but within statutory limits (for example, excursions beyond 0.3Hz) or transparently demonstrate why tolerating increases in these excursions strikes an appropriate between security and cost-efficiency. • Respond swiftly to any event (expected or unexpected), on the NETS or otherwise, to secure stable frequency across the NETS. • Assess existing, emerging, and potential risks (including risks materialising from distribution networks) to the maintenance of stable frequency and security of supply across the NETS. Managing those risks appropriately to minimise associated costs and occurrence of unexpected events.	• Maintain stable system frequency and maintain or decrease the number of instances where the system frequency is outside operational limits but within statutory limits (for example, excursions between 0.3Hz and 0.5Hz). • Develop innovative operability solutions to unexpected events that maintain system security and minimise costs in a fair and transparent way.

Facilitating electricity security of supply	Support Ofgem, Government, and industry as a technical expert by:
	
	• Proactively identifying, assessing and communicating existing, emerging, and potential future risks to electricity security of supply through continuous assessment, horizon scanning and industry engagement. For example, by developing adequate methodologies and relevant scenarios informed by energy market developments and intelligence.
	• Managing those risks appropriately and transparently to minimise associated costs and maintain safe operation, including (but not limited to) by:
	  ○ Improving forecasting of and situational awareness to those risks in terms of scope, accuracy and timeliness.
	  ○ Improving existing and developing new solutions that maintain, in so far as reasonably practicable, electricity security of supply whilst being cost-effective, and enhancing industry participation in these tools.
	• Establishing and maintaining strategic working-level
		• Developing new and innovative solutions in a timely manner, that maintain, in so far as reasonably practicable, electricity security of supply whilst being cost-effective, and enhancing industry participation in these tools.

	relationships with all interconnected TSOs. • Supporting Government and Ofgem in delivering relevant legislative or regulatory changes by providing expert advice. • Provides comprehensive and timely briefings to the Authority on any extraordinary issues that may lead to system security concerns.	
Making trade-offs across time horizons	• Consider the appropriate trade-offs between short-term costs and longer-term market developments in the interests of consumers now and in the future.	• Evidence of new processes, or innovative balancing actions, that reduce costs (compared to the counterfactual) in the short-term and facilitate market developments that provide longer-term cost reductions.
Ensuring future operability	• Development of plans to ensure known/expected future operability challenges can be managed once the challenges materialise (for example through the continued production of the System Operability Framework and Operability Strategy reports[19]). • Produce and transparently share an assessment of the most material risks to system operability.	• Proactive testing of plans to manage future operability challenges and evidence of taking necessary steps to reduce the severity before these challenges materialise. • Produce and transparently share an assessment of the risks to system operability, with consideration of how these are likely to develop in future and identify mitigation measures.
Coordinating with other	• Coordinate with other network/system operators to	• Coordinate with DNOs through ensuring NESO dispatch of DER and DNO network management

[19] More information about the Operability Strategy reports can be found at the following address: https://www.nationalgrideso.com/news/operability-strategy-report-our-insight-zero-carbon-electricity-system

network operators	optimise the use of balancing resources. Including by: ➢ identifying and progressing changes to outage plans in order to minimise constraint costs (e.g. through the effective use of System Operator Transmission Owner Code (STC) processes), ensuring the costs put forward by TOs are reasonable. ➢ exchanging information and data with distribution network operators (DNOs) to ensure efficient dispatch of distributed energy resources (DER).	actions deliver total electricity system[20] benefits. • Facilitate the development and implementation of innovative services from network operators in order to achieve significant reductions to overall operational costs (compared to the counterfactual) across the total electricity system. Including by: ➢ Providing network operators with a high degree of visibility of the transmission constraint cost savings that can be achieved through enhanced network services and conducting robust analysis on any services offered. • Developing improved, integrated systems and processes that optimise total electricity system dispatch decisions.
Minimising outage changes caused by error	• A small proportion of short notice changes to planned outages are caused by NESO error, in line with the 'meets expectations' benchmark of performance metric 1D (Short notice changes to planned outages).	• No or only a very small proportion of short notice changes to planned outages are caused by NESO error, in line with the 'exceeds expectations' benchmark of performance metric 1D (Short notice changes to planned outages).
Oversight of balancing	• Effective systems for proactive surveillance of balancing market	• In-depth and independent market surveillance and data

[20] For the purposes of this NESO Roles Guidance, total electricity system means the national electricity transmission system and the distribution systems of all authorised electricity operators which are located in the national electricity transmission system operator area.

services markets	activity and monitoring the quality / accuracy of information received from market participants. Effective engagement with Ofgem on any concerns that come to light. • Ensures balancing actions and related processes and communications do not create significant inefficiencies and distortions in the balancing or wholesale markets or create perverse incentives with respect to market participants' behaviour or decision making.	analytics to anticipate credible risk of anticompetitive behaviours or actions that may undermine wholesale energy market integrity. Swift and comprehensive engagement with Ofgem to support compliance investigations.
Maintaining effective and reliable IT systems	• Continual and responsive development of IT systems. • High IT system availability and reliability compared to historical averages, with reduced unplanned outages from RIIO-1. • Timely completion of ongoing and incremental upgrades to IT systems delayed from RIIO-1. • Regular engagement with industry on design of NESO IT systems.	• Proactive development of innovative IT systems capable of adapting to future operational requirements. • High IT system availability and reliability compared to historical averages, with progressive step change reductions in unplanned outages from RIIO-1. • Proactive engagement with industry on all types of potential IT system solutions. Acting on stakeholder feedback, and any burdens imposed on stakeholders, to inform future IT development.
By the end of RIIO-2[21]		

[21] "RIIO-2" period for both Gas and Electricity Transmission Systems is 01 April 2021 – 31 March 2026 and thus, "End of RIIO-2" refers to 31 March 2026.

Operating the network carbon free	• In a majority of settlement periods where the electricity markets deliver a carbon free solution, NESO has the ability to efficiently and economically operate the system carbon free (i.e all NESO actions are also carbon-free). To underpin this ➢ NESO has replaced legacy IT systems with systems that are fit for purpose in the future energy system, shaped through good engagement with industry. ➢ NESO's control centre engineers have fit for purpose training and simulation tools that enable them to efficiently operate a zero carbon network in most situations.	• In all settlement periods where the electricity markets deliver a carbon free solution, NESO has the ability to efficiently and economically operate the system carbon free (i.e all NESO actions are also carbon-free). To underpin this: ➢ NESO has engaged extensively with all types of energy industry stakeholders and IT solution providers to deliver high quality, flexible and future proofed IT systems. These are capable of being updated ahead of system developments and interoperating with the digital systems of other related organisations in the sector and in other sectors. ➢ NESO's training and simulation tools equip highly skilled control room engineers to achieve the outcomes and benefits expected in the RIIO-2 plan.
Coordinating with other network operators	• NESO ensures its processes and systems facilitate close operational coordination between different electricity network operators. To underpin this: ➢ NESO exchanges all necessary real-time	• NESO has proactively led the development and implementation of frameworks and processes that ensure the optimal real time operation of the whole energy system. To underpin this:

	operational information with other network operators. ➢ NESO has regularly engaged with DNOs to inform DNOs' operability plans and process development and, where appropriate, has adapted its own plans and processes in light of DNO insights.	➢ NESO IT systems capable of interoperating with the systems of other related organisations in the sector and in other sectors wherever this would provide overall benefit. ➢ NESO has shared guidance and expertise (e.g. training) to DNOs to ensure common practices (e.g. through joint simulator training) are in place that maximise total electricity system benefits and facilitate seamless and efficient system operation across voltage levels.

Activity 1b: Electricity system restoration

Meets expectations predominantly underpinned by licence conditions:

Electricity System Operator licence conditions	Gas System Planner licence conditions
C1.2(a), C1.2(b), C1.2(c), C1.2(d); C1.3; C1.4(a); C1.4(b); C1.5(a), C1.5(b), C1.5(c), C1.5(d); and C4.	n/a

The expectations in Activity 1b apply to electricity roles only.

Output	Meets expectations	Exceeds expectations
Immediate and ongoing		
Restoration plans and tools	• Maintain fully-tested plans and processes to support incident management and system restoration.	• Develops and progresses future restoration plans and tools that can continuously adapt to network changes in advance of, and during, real time system operation or system restoration.
Restoration policy	• Publish an assurance framework for the system restoration standard in line with Condition C4 (Electricity System Restoration Standard) of NESO's Electricity System Operator licence. • Timely implementation of the system restoration standard in line with obligations set by Government. • Publish an ex-post annual report detailing the total costs that NESO has incurred whilst procuring system restoration	• Activities that lead, organise, convene and build consensus with Government, regulators and industry to drive improvements to the system restoration strategy for the future. • High quality implementation of the system restoration standard by leading, organising, and building consensus with industry on the most appropriate implementation framework that enables the system restoration standard to be met, whilst satisfying the majority of

	services during the year as part of the C16 process. • Build consensus with Government, regulators and industry to drive improvements to the system restoration strategy for the future. • Determine an appropriate implementation framework to enable a system restoration standard to be met in a fair and non-discriminatory way. • Demonstrable awareness and understanding of risks to restoration processes outside of its current modelling capabilities. Risks are raised with relevant stakeholders rapidly and transparently.	stakeholders and ensuring maximum value for money for consumers. • Development of a holistic plan for managing all risks and identification of new risks to system restoration, providing surety for the Authority and Government in NESO's system restoration strategy.
Restoration services procurement	• Provide accessible information to market participants on system restoration service requirements, costs and current and future needs. • Full implementation of RIIO-1 commitments in the Product Roadmap for Restoration[22]. • Conclude NESO's Distributed ReStart project[23] to establish a pathway to enabling the full participation of DER in restoration services, with evidence of findings being	• Actively maximises the ability for non-traditional sources of generation at all voltage levels to participate in restoration plans (and any restoration activities) to minimise restoration times in Great Britain (GB). • Achieves a significant continual, and overall, increase in the level of restoration services that are competitively procured, that are consistent with exceed expectations benchmarks

[22] The NESO's Roadmap for Restoration can be found at the following address: https://www.nationalgrideso.com/sites/eso/files/documents/National%20Grid%20SO%20Product%20Roadmap%20for%20Restoration.pdf
[23] More information about the project can be found at the following address: https://www.nationalgrideso.com/future-energy/projects/distributed-restart

	included in business as usual (BAU) processes. • Achieves a continual increase in the level of restoration services that are competitively procured, that are consistent with meet expectations benchmarks performance metric 2A (Competitive procurement).	performance metric 2A (Competitive procurement).
By the end of RIIO-2		
Restoration plans and tools	• Plans and processes to support incident management and system restoration that are fit for purpose for a zero carbon electricity system.	• NESO has dynamic restoration tools that are able to advise control centre engineers on the best route for restoration at any point, enabling them to manage potentially hundreds of restoration providers, and demonstrably reducing potential restoration times. To underpin this: ○ Successful development and implementation of the necessary IT to enable such a decision-making tool, in close collaboration with other relevant parties.
Restoration service procurement	• Competitively procure the majority of system restoration services. • Ensures that procurement is fair and accessible to all market participants and technologies at transmission and distribution	• Develop liquid markets for system restoration services such that all providers, from transmission and distribution voltage levels, can be procured competitively at an economic price in all restoration zones if

	voltage levels if they can meet the technical criteria.	they can meet the technical criteria.

Activity 1c: Transparency, data and forecasting

Meets expectations predominantly underpinned by licence conditions:

Electricity System Operator licence conditions	Gas System Planner licence conditions
C1.3; C1.4; C1.6(c); and C3.	C1.2(b); C1.2(c); C1.2(d); and C3.

The expectations in Activity 1c apply to both electricity and gas roles, unless otherwise specified.

Output	Meets expectations	Exceeds expectations
Immediate and ongoing		
Provision of market information	• NESO ensures that information it publishes is well-organised, accessible and shared proactively. • Provide user-friendly, comprehensive and accurate information, including transparency on electricity control room decision making. • Develop processes to identify and meet stakeholder needs. • Consistent messaging across documentation and stakeholder engagement such that there are no contradictions or omissions that lead to misunderstanding. • Engage market data participants/data users to establish needs and data value and publish outcomes.	• Proactive information provision that shares valuable information to market participants and network companies before this is requested, and ensures they have a high degree of understanding of NESO's operations and decision-making. • Develop mechanisms to share real time electricity system state data in accordance with stakeholder needs.

Driving the energy sector digitalisation	• Make available a Digitalisation Strategy and Action Plan, with the Digitalisation Strategy and Action Plan[24] updated at least once every two years, and the Action Plan updated at least once every six months. Demonstrate progress against that plan and how it is driven by the needs of stakeholders and market expectations, such as the recommendations made by the Energy Data Task Force.[25] • Collate and publish feedback on NESO DSAP. • Identify and progress code modifications to enable digitisation. • Develop and publish a digital dashboard showing progress against digital actions.	• In addition to the required actions to meet expectations NESO will: ○ Set an example to the whole sector for the pace of change and progress made delivering the Energy Data Task Force recommendations (or any subsequent recommendations by the Energy Digitalisation Taskforce[26]) and beyond (e.g. by demonstrating that NESO is ahead of other parties in delivering those recommendations, and has actively encouraged broader up-take). ○ Participate in and lead cross-sectoral initiatives for UK infrastructure and Net Zero, such as the Centre for Digital Built Britain's Information Management Framework.[27]
Using and exchanging data	• NESO ensures that its data is well-organised, accessible and shared proactively (where data collected by one team can benefit and inform the work of	• NESO collaborates actively with electricity DNOs to promote data sharing solutions and platforms that maximise consumer benefits. Collaboration should inform the development of

[24] More information about the Digitalisation Strategy and Action Plan can be found at the following address: https://www.ofgem.gov.uk/publications-and-updates/early-draft-digitalisation-strategy-and-action-plan-guidance-available

[25] More information about the Energy Data Taskforce can be found at the following address: https://www.gov.uk/government/groups/energy-data-taskforce

[26] More information about the Energy Digitalisation Taskforce can be found at the following address: https://es.catapult.org.uk/case-study/energy-digitalisation-taskforce/

[27] More information can be found at the following address: https://www.cdbb.cam.ac.uk/news/pathway-towards-IMF

	another team) by its teams within the organisation. • Use of data by NESO complies with the expectations of Energy Data Best Practice, such as making available robust and reliable processes for exchanging operational information with DNOs. • Treating energy system data as open for all to use by default,[28] only restricting access in accordance with a published data triage policy where there is evidence of a good reason to do so (e.g. if the data contains sensitive information). The rationale for withholding information is made clear to industry. • Creates a data portal user group and publishes material associated with groups.	electricity DNO RIIO-2 Business Plans to ensure future platforms are fully interoperable. • Making data (and its associated methods for data processing) widely available and easy to work with in open collaboration to give stakeholders the opportunity for greater contributions to the decision-making processes related to NESO's activities. • Treating energy system data, processing methods and algorithms as open to all by default. If data is withheld, the reason for doing so should be published for transparency. • Develops and publishes metadata standards to enable the discovery of data. • Creates reference renders for market data information to create visualisations for users without the necessary tools.
Electricity Forecasting	• Provide accurate forecasts with continuous incremental improvements to electricity forecasting accuracy, in line with the 'meets expectations' benchmark in performance metrics 1B (Demand forecasting) and 1C (Wind generation forecasting).	• Step-change improvements in electricity forecasting accuracy each year through improvements to forecasting models and processes, in line with the 'exceeds expectations' benchmark in performance metrics 1B (Demand forecasting)

[28] The Data Triage programme would be a good starting point to contribute towards this expectation, including publishing data triage process, although we expect NESO to explore and implement other ways in which it can make energy system data open by default without waiting for stakeholders to request it.

	• Full implementation of Energy Forecasting Project Roadmap commitments for 2018-21.[29] • Electricity forecasts are accurate at both national and regional level and methodologies used are regularly updated to reflect changes at each Grid Supply Point (GSP). • Model and understand developments on the electricity distribution system which impact electricity transmission-level demand.	and 1C (Wind generation forecasting). • Dynamic electricity forecasting processes which utilise machine learning to ensure forecasts are highly accurate for each half hour period, at both the national and regional level. • Undertakes activities that lead, organise, convene and build consensus to ensure all network operators are sharing and using consistent information to create accurate, total electricity system forecasts. • Publish electricity forecasting models where practicable.
By the end of RIIO-2		
Data use and exchange	• NESO has implemented a data and analytics platform (and an associated data portal) which achieves most of the outcomes in its RIIO-2 Business Plan but may still require some additional functionality to achieve all planned outcomes.	• NESO has integrated all tools and systems within its data and analytics platform, achieving all outcomes set out in its RIIO-2 Business Plan, and receiving highly positive stakeholder feedback. • Data and analytics platform enables the seamless real time exchange of information with DNOs and other system users to enable efficient total electricity system operation.

[29] The NESO's Energy Forecasting Project Roadmap is available at the following address: https://www.nationalgrideso.com/document/145941/download

3. Role 2: Market development and transactions

3.1 NESO operates the electricity balancing mechanism and develops and procures a number of additional balancing services to balance and operate the electricity system in a safe, reliable and efficient way. NESO's regulatory framework for procuring balancing services provides NESO with significant scope and flexibility in the design of these services. The design of these services and approach to procurement are important as these can have significant impacts on the revenues available to different providers of these services and the ability for new entrants to compete with existing providers. This can also have a further impact upon short-term price signals and revenues in the wholesale traded electricity markets.

3.2 NESO also has a number of additional roles related to market rules and wider energy market design. NESO administers the Connection and Use of System Code (CUSC), the Grid Code, the SO-TO Code (STC), and the Security and Quality of Supply Standard (SQSS). It is also a party to the Balancing and Settlement Code (BSC), the Distribution Code and the Uniform Network Code (UNC). NESO is able to propose changes to these codes, provide its expertise and analysis to aid industry discussions, and influence the final recommendations that go to the Authority.

3.3 NESO is the Electricity Market Reform (EMR) delivery body, and it has responsibilities related to cross-border electricity arrangements and associated legislation. Pursuant to NESO's GSP Licence, NESO is also responsible for strategic gas network planning and gas market strategy coordination.

Activity 2a: Markets for electricity system services

Meets expectations predominantly underpinned by licence conditions:

Electricity System Operator licence conditions	Gas System Planner licence conditions
C1.3; C1.4(b); C1.5(a), C1.5(b), C1.5(c), C1.5(d); C1.6(c); and C9.3	n/a

The expectations in Activity 2a apply to electricity roles only.

Output	Meets expectations	Exceeds expectations
Immediate and ongoing		
Competitive, market-based procurement	• Procurement of balancing services through market-based competitive approaches, consistent with the 'meets expectations' benchmark in performance metric 2Ai (Phase out of non-competitive balancing services).	• Procurement of balancing services through market-based competitive approaches, consistent with the 'exceeds expectations' benchmark in performance metric 2Ai (Phase out of non-competitive balancing services).
Close to real time procurement	• Procurement of balancing services in timeframes compliant with relevant GB policy and UK regulations – the proportion of balancing services procured in these timeframes does not drop below that seen in BP1[30] and is	• Clear plans and demonstrable progress towards maximising the procurement of all balancing services at day-ahead (or closer to real time), with a clear and transparent explanation of the

[30] The proportion of balancing services procured in these timeframes should not drop below 30%, in line with

	in line with Metric 2X (Day-ahead procurement). • Close to real time procurement displaces volumes procured at earlier than day-ahead timeframes.	circumstances in which this is not in consumers' overall interest.
Delivering accessible markets	• Simplified suite of balancing services with participation requirements that provide opportunities for revenue -stacking[31], ensure a level playing field, and maximise participation regardless of provider type or size. Including by: ○ Transparent completion of all balancing market reform commitments[32] with justification of any necessary changes to priorities or plans. ○ Ensuring fit for purpose, reliable procurement, communications and settlement systems that do not present any material barriers to participation, with NESO clearly demonstrating how it has responded, or is responding to previous issues raised.	• Works extensively with industry to implement a complementary and fully integrated suite of balancing services, with no material barriers to participation (evidenced through stakeholder feedback). Including by: ○ Implementation of a single integrated platform for NESO markets (in line with RIIO-2 Business Plan timescales) in a joined-up manner with wider IT system changes and with positive user feedback. ○ The majority of NESO markets being accessible through this platform, with clear reasoning for those markets not included. ○ The single markets platform should integrate with all necessary up/downstream processes, ensuring a 'one-

NESO's legal obligation following our approval of a derogation for certain products from this requirement. Our derogation letter can be accessed here: https://www.ofgem.gov.uk/publications/decision-grant-eso-derogation-requirements-article-69-electricity-regulation-and-exemption-requirements-article-323-ebgl-mandatory-and-firm-frequency-response

[31] Revenue-stacking is the ability to derive revenue from the provision of multiple services.

[32] Including those contained in the Product Roadmaps for Response, Reserve, Reactive, and Wider Access to the BM (https://www.nationalgrideso.com/research-publications/future-balancing-services)

	• Markets introduced have a 'compliant first' design approach, following the principles set out in retained EU legislation. In doing so, allow market participants to prepare for NESO markets more easily, with knowledge of the design principles, and receive the correct procurement signals. ○ Where derogations from these principles and rules are required, it is by exception and only where NESO sees significant consumer and market value from doing so, and / or system security requires it. • Using lessons learned from Network Services Procurement (previously known as pathfinders) and related projects, create a detailed plan for implementing enduring markets as solutions to stability, voltage and thermal constraints. • Development of market-based, competitive balancing services that allows appropriate time for design (or co-design), regulatory	stop shop' for service providers to NESO.[33] ○ A year on year step change in the satisfaction levels of industry parties, with greater numbers and types of parties responding positively about the accessibility of platforms, and fewer reporting issues and delays in market access. • Establishes routine process for market introduction and development that allows market participants to engage more easily, and relieves pressure on market parties and NESO itself.[34] • Using lessons learned from Network Services Procurement and related projects, demonstrate clear progress in implementing enduring markets as solutions to stability, voltage and thermal constraints. • Development of market-based, competitive balancing services that allows appropriate time for efficient design (or co-design), regulatory consideration, and

[33] We note that there could be instances where adding a service to the single markets platform might not add consumer value. In such cases, we would not expect NESO to do so, but would expect a clear rationale to be provided for these instances, and expect such instances to be uncommon and by exception. If such instances arise, it would not be at a detriment to NESO's performance, subject to providing that rationale.

[34] For example, NESO has created and communicated an annual development, engagement, and approval process for its suite of response services, and we envisage NESO moving all services onto a similar process. This cycle allows for NESO to continually improve and develop services as markets evolve. This should not detract from our expectation that NESO introduces efficient markets for NESO implementation.

	consideration, and market parties to prepare for delivery.	market parties to prepare for delivery.
Signalling procurement needs	• Transparent and clear communication to market participants on current and future system challenges and NESO balancing service needs, in line with the objectives of the Operability Strategy Report. • Procuring services from market participants based on clear and transparent needs which, wherever possible, the market understands ahead of procurement activity.	• Proactive, transparent development of balancing services markets to solve foreseen future system challenges (before NESO would need to incur significant costs to address these challenges). • Notice of procurement rounds signalled to stakeholders sufficiently in advance to enable optimal participation.
Coordinated procurement across the total electricity system	• Collaborates with other network operators to ensure that balancing services procurement is coordinated and where beneficial for consumers (e.g. contract terms, service requirements and frequency of procurement) standardised across networks. • Active participation in projects and forums that drive improved coordination in procurement, including relevant data sharing (such as Open Networks).	• Inputting proactively into the development of distribution network ancillary services (including inputting actively to DNO RIIO-2 plans) to enable integration with NESO markets and facilitate the future efficient, total electricity system procurement of balancing / ancillary services. • Organises, convenes and builds consensus with other network / system operators to drive changes that will optimise balancing service procurement across the total electricity system, using high quality information / analysis to support the process.
Developing technical procedures	• Fulfilment of obligations in line with the TCA and / or as	• NESO plays a leading role in coordinating and progressing

specified in the GB-EU Trade and Cooperation Agreement (TCA)[35]	instructed by the Specialised Committee on Energy (SCE).[36] • Review of the barriers and opportunities for interconnectors (ICs) in all NESO balancing markets and develop plan to remove / take advantage of these. • Facilitate cross-border trade over ICs. • NESO is proactive in setting GB rules for ICs that maximise flows and works in the interests of all stakeholders, while ensuring system security / operability.	actions in line with the TCA and SCE instruction. • Removes the barriers (or significant progress made toward this) for entry for ICs in majority of NESO balancing markets, providing opportunity to take advantage of potential benefits. Where barriers cannot be removed, this is explained clearly and plans are in place to address (either directly or indirectly). • NESO is proactive and forward-looking when considering GB rules for IC, with a view of the impact of future interconnected capacity.
By the end of RIIO-2		
Competitive procurement	• NESO has introduced market-based, competitive procurement in most balancing services, with few, and only minor, examples of non-competitive procurement remaining.	• NESO has introduced full competition everywhere, in all balancing services with a transparent and well evidenced explanation of the circumstances in which this is not in consumers' interest.
Close to real time procurement	• Significant phase out of earlier than day-ahead procurement of balancing services.	• Significant phase out of earlier than day-ahead procurement of balancing services, with a clear plan for achieving total compliance where appropriate.

[35] The Trade and Cooperation Agreement between GB and the EU sets out (under Title VIII) requirements for TSOs to establish technical procedures for the exchange of energy over interconnectors at the day-ahead, intra-day and balancing timeframes.
[36] The Specialised Committee on Energy is a joint forum between the UK and the EU. This Committee oversees the majority of the provisions agreed between the UK and EU in the energy title (Title VIII) of the Trade and Cooperation Agreement and sets out further detail (including timelines) for how TSOs should establish their technical procedures. Details on the SCE, including minutes of their meetings, can be accessed at: https://www.gov.uk/government/groups/specialised-committee-on-energy

		• Consideration of 'within-day' procurement, where this adds value.
Delivering accessible markets	• NESO has incorporated procurement of most services within a user-friendly single markets platform. • Few and only minor issues with market access, with NESO acting quickly to improve functionally and address any issues as they arise. • Introduction of enduring markets for solutions to stability, voltage and thermal constraints. • Markets introduced or developed such that they provide for efficient system operation at best value to consumer, while maintaining investment signals and revenue streams for providers. • NESO has established routine process for market introduction and development that allows market participants to engage more easily, and relieves pressure on market parties and NESO itself.	• NESO has developed and implemented well-constructed markets that have incorporated procurement of all services within a single, highly accessible market platform, which is praised routinely by market participants. In particular, the platform would: ○ minimise cost and complexity for users, enabling them to easily capture the value they provide to the system across multiple services. ○ maximise participation from all different types and sizes of participants or business models. ○ be flexible, future proofed and easily adaptable to enable a quick response to feedback or changes in the wider system. ○ Interact with all necessary up/downstream processes, ensuring a 'one-stop shop' for service providers to NESO • Market design enables NESO to progress to its zero carbon operability targets. • Creation of competitive, fully-functioning, enduring markets for solutions to stability, voltage and thermal constraints, which provide appropriate, dependable

		investment signals for market participants.
Coordinated procurement across the total electricity system	• NESO run markets are coordinated with distribution-level flexibility markets, providing minimal complexity for providers looking to maximise the value from their services.	• When in consumers' interests, service providers have a single, consistent set of procurement requirements when looking to provide services to NESO or DNOs. • Providers have a single interface point (or consistent standardised interface points) for providing services to NESO and DNOs.
Develop cross-border markets	• Significant progress made toward removing barriers to interconnectors entering balancing markets.	• Interconnectors able to provide services to NESO as appropriate to allow system operability. • Evidence NESO is accounting for future IC volumes and multi-purpose interconnectors when developing cross-border markets.

Activity 2b: Electricity Market Reform

Meets expectations predominantly underpinned by licence conditions:

Electricity System Operator licence conditions	Gas System Planner licence conditions
C1.4(b); C1.4(d); and C1.5(e).	n/a

The expectations in Activity 2b apply to electricity roles only.

Output	Meets expectations	Exceeds expectations
Immediate and ongoing		
User experience with the EMR portal	• An evident improvement in the user experience (e.g. existing issues are resolved, resulting in lower barriers to entry for providers). Underpinned by: ➢ Timely completion of the refreshed EMR IT portal with positive user feedback, which ensures NESO and the IT portal have the ability to respond to change quickly and cost efficiently.	• Extensive engagement with industry with a view to maintaining a highly accessible EMR portal.
Implementation of policy and rule changes	• Policy changes, or system workarounds, should be implemented continuously in a timely and cost efficient way to ensure compliance with legal obligations, and no	• Developing and implementing a proactive process so that NESO actively initiates, captures and assesses policy, rule and process improvements and,

	later than 12 months following identification of the relevant Rules or Regulations, unless otherwise stated by Ofgem or DESNZ.	when necessary, feeds into the Capacity Market Advisory Group.
Providing support to EMR parties	• Supports industry parties through the CfD & CM prequalification and auction processes through provision of accurate & timely guidance to parties on relevant rules and changes to those rules. • Ensure fair provision of guidance and support. This may require a targeted strategy depending on the type of Capacity Provider and eligible generator to ensure a level playing field. For example, smaller parties should not lose out due to lack of resource, with a variety of communication channels allowing for this.	• Delivery of an evidenced step change in query management with demonstrable improved feedback from Capacity Providers[37] and eligible generators[38].
Making accurate prequalification decisions	• Accurate CM prequalification and agreement management decision making, based on compliance with the Capacity Market Rules and The Electricity Capacity Regulations 2014. • Accurate CfD qualification decision making, based on	• Evidence of exceptional decision making for Tier 1 disputes, resulting in zero overturns by the Authority at the Tier 2 stage.

[37] Market participants that have a capacity market agreement.

[38] As defined in the Contracts for Difference (Definition of Eligible Generator) Regulations 2014 (as amended).

	compliance with the Rules and Regulations. • Very few errors made or decisions overturned by Ofgem in the Tier 2 process following CM and CfD qualification.	
Improving EMR processes	• Readily, regularly and accurately present information demonstrating the ongoing effective operation of the Capacity Market processes with Delivery Partners. • Ensure that auction recommendations assessments are accurate and responsive to recommendations for improvements.	• Evidence of continuous improvement to prequalification and auction delivery, resulting in improved user experience for Capacity Providers. Lessons learned implemented demonstrably and result in an increase in the effectiveness of applicants applying to prequalify and participate in the auctions.
Monitoring compliance with rules	• Proactive engagement with delivery partners when issues are identified and alerts Ofgem of any potential instances of non-compliance with their licence within a working day from discovery of the issue. Other issues are communicated in a timely fashion.	
Capacity Adequacy modelling	• Endorsement from the Panel of Technical Experts (PTE) on annual modelling approach. • Proactively engages with connected TSOs, as well as pan-European bodies such as ENTSO-E where appropriate,	• Step change improvements in medium term demand forecast accuracy, through the proactive identification of changes to the methodologies and input data.

	and effectively consults GB TSOs with respect to medium- and long-term security of supply modelling. • Engages with stakeholders on how to improve new longer term capacity adequacy studies and enhance modelling from this engagement.	• Evidence of excellent value added to industry on security of supply risks from capacity adequacy reporting.
By the end of RIIO-2		
User experience with the EMR portal	• An EMR IT portal with a user-friendly and accessible interface – backed up by feedback with a consistent, high degree of satisfaction. • Full integration of the EMR portal with the Digital Engagement Platform	• Full integration of the EMR portal with other NESO markets within a single markets platform, subject to necessary regulatory amendments. • Evidenced positive step change in user experience.

Activity 2c: Wholesale markets, industry codes and charging

Meets expectations predominantly underpinned by licence conditions:

Electricity System Operator licence conditions	Gas System Planner licence conditions
C1.3; C1.4(b); C1.5(b); C1.6(d); and C1.6(e).	C1.2(b); C1.3; and C7.

The expectations in Activity 2c apply to both electricity and gas roles, unless otherwise specified.

Output	Meets expectations	Exceeds expectations
Immediate and ongoing		
Managing codes changes	• Quality code administration service in line with other industry codes. • Provide a code change process that supports widest participation of industry participants as possible and integrates effectively with changes to other codes. • Provides unbiased, detailed analysis or modelling to support code modifications.	• Exemplary code administration service compared to other code administrators (demonstrated through comparative surveys and stakeholder feedback). • Proactively works with Ofgem and government on improvements to energy code governance, including providing robust evidence and thought leadership into the Energy Codes Review. • Proactively considers, identifies and addresses any unintended consequence(s) of code modification prior to submission of final report to Ofgem.
Improving GB rules and standards	• Proactive identification of the most necessary changes to GB frameworks to remove	• Continuous and frequent activities that organise, convene, listen and build

	distortions and to ensure a level playing field. • Propose and support code modifications that promote the relevant code objectives, in the interests of GB consumers. • Contributes views and analysis to aid the development of electricity distribution-level rules and frameworks. • Be as open and transparent as possible, sharing insights, comparisons of alternative proposals and robust analysis that can inform workgroup deliberations. • Provide assessment of areas of GB legislation that might be improved under arrangements following GB's exit from the European Union, and engage relevant parties where improvements for the better can be achieved. • Coordinating discussions on gas strategic network planning, leading the Future of Gas Steering Group or equivalent, and actively inputting to the relevant Gas reports or documents and relevant UNC code changes.	consensus to ensure the GB electricity market framework develop in the best interests of existing and future consumers. • Development and implementation of activities and relationships that will enable NESO to organise, convene, listen and build consensus to ensure the GB gas market frameworks develop in the best interests of existing and future consumers. • Insights, analysis and change proposals that consider the links and dependencies between balancing, wholesale and capacity markets, and between gas and electricity, (i.e. taking account of the potential impacts on areas outside of the discrete change proposal). • Ensure change proposals evaluate effectively trade-offs between options, in the context of the broader reform environment (e.g. consideration of changes taking place in other energy codes and the sector more broadly). • Proactively shapes and provides electricity system operation expertise and insights into the development of electricity distribution-level operational frameworks. • NESO takes a leading role in explaining the virtue of the rules

		in place, and how they provide a framework which benefits markets and consumers of today and the future.
Coordinating and Influencing Cross-Border rules	• Remain aware of changes to rules in connected regions, and assess impacts with a view to maximising positives and minimising negatives for GB consumers.	• NESO retains a position of influence and maintains strong working relationships with connected regions, and where possible, influences arrangements for betterment of all consumers. • Engage strongly through official fora, such as providing leadership and input under TCA activities.
Promoting efficient charging and access arrangements	• Competent and responsive development, management and maintenance of the charging process. • Provides insight, clarity and transparency through role as Charging Futures lead secretariat. • Chair relevant workgroups through Charging Futures. • Take a leading role in TNUoS Task Force, Transmission Charging Methodologies Forum Sub-groups and code modification Working Groups.[39] This should include providing modelling of transmission-level tariff options, analysis of the merits of different transmission	• Undertake activities that organise, convene and build consensus to contribute directly to the development of new approaches to network charging, which maximise long-term benefits for consumers. This could include providing views on any links and dependencies between charging matters and its other works areas. • Undertake activities that utilise NESO's technical understanding of the transmission system and charging methodologies to provide additional insight and qualitative and quantitative policy insight and innovative ideas.

[39] More information about the Access SCR Delivery Group can be found at the following address: http://www.chargingfutures.com/charging-reforms/access-forward-looking-charges/resources-2/scr-delivery-group/

	options, comment on interactions with distribution-level changes and developing plans for option implementation. • Ensures forecasts of industry charges are as accurate as possible by maintaining fit for purpose forecasting models and processes, consistent with the methodologies set out in the various Codes (e.g. the CUSC). • Shares the information needed by other parties (where these are onshore TOs, this information should be in accordance with the STC) to enable them to understand and manage their financial exposure to changes in expected charges.	
By the end of RIIO-2		
Managing code changes	• NESO has successfully introduced a single digitalised grid code, with positive user experience. Some discrepancies between transmission and distribution code change processes may remain.	• NESO has introduced a single, accessible technical code for transmission and distribution which achieves the user functionality and benefits set out in its RIIO-2 plan. This includes NESO successfully transforming the Grid Code to incorporate existing transmission and distribution codes into an IT system with artificial intelligence enabled navigation and, document and workflow management tools that provides users with a more user-friendly,

		inclusive and tailored experience.
Improving GB rules and standards	• NESO has progressed a number of key changes to technical standards to facilitate a zero carbon energy system, in line with government recommendations. • NESO has ensured compliance with relevant GB legislation.	• NESO has proactively influenced, comprehensibly reviewed and (subject to DESNZ conclusions) successfully implemented necessary changes to the Security and Quality of Supply Standard (SQSS) and other electricity technical standards to ensure they are fit for purpose for a zero-carbon energy system.

4. Role 3: System insight, strategic planning and network development

4.1 NESO provides several functions relating to strategic planning and network development as well as providing independent, expert insight on the energy system. These activities are undergoing a significant evolution as NESO takes on greater and expanded roles compared to the ESO. The description and expectations associated with Role 3 do not include several major new, whole system planning NESO responsibilities such as the Strategic Spatial Energy Plan (SSEP)[40], strategic gas network planning, and work on Regional Energy Strategic Planners (RESPs)[41]. These are instead covered by expectations in Chapter 5. We expect to update our regulatory processes and documents to provide a consolidated set of expectations for strategic planning from April 2025 onwards.

4.2 It is the role of NESO to manage and deliver the following network planning frameworks that are critical for investment in GB's energy networks[42]:

- **Centralised Strategic Network Plan (CSNP)** – NESO is developing capabilities and processes to provide an independent, coordinated, and longer-term approach to wider strategic network planning in GB to help meet the government's net zero ambitions.[43] The first iteration will focus on the electricity transmission network - onshore, offshore and interconnectors, as well as gas transmission and may evolve to include a proposed hydrogen network at the national level. Leading up to the enduring CSNP, NESO will also deliver transitional versions of the CSNP (tCNSP[44]) that informs investment decisions from specified Network Options Assessment (NOA) outputs, and the Holistic Network Design Follow Up Exercise (HNDFUE).[45]

[40] Decision on the framework for the Future System Operator's Centralised Strategic Network Plan (ofgem.gov.uk)
[41] Decision on future of local energy institutions and governance | Ofgem
[42] The development of the guidance for NESO with respect to the expectations of each respective framework is currently being developed by Ofgem. It is the duty of NESO to develop the methodology by which each respective framework will operate.
[43] Decision on the framework for the Future System Operator's Centralised Strategic Network Plan (ofgem.gov.uk)
[44] This guidance covers versions of the tCSNP developed during the April 2023 to March 2025 period.
[45] https://www.nationalgrideso.com/future-energy/beyond-2030

- **NOA** - NESO will continue to undertake activities relating to the NOA and the tCSNP until it is superseded by the enduring CSNP process. The NOA process assesses and recommends solutions to electricity onshore and offshore transmission system needs and provides an analysis of optimal interconnector capacity growth. The wider NOA methodologies also provide a foundation for NESO to contract for long-term operability solutions (e.g. to solve network constraints and stability issues) via its NOA pathfinding projects.

4.3 To support the coordinated development of the energy system, NESO publishes, or will publish, a variety of key insight documents. This includes the Future Energy Pathways (FEP), that develop different, credible long-term pathways for the energy sector, informed by modelling on future energy demand and supply.

4.4 Over the course of BP2, the ESO and NESO have also supported the development of a plan and policy framework to introduce Early Competition in network development[46] and an assessment of options for a more coordinated approach to offshore transmission network planning and delivery[47].

4.5 NESO is also responsible for the process for parties to connect to the electricity transmission system and for managing the impacts on the NETS from new connections of new offshore generation as well as at distribution level, through liaison with developers and DNOs to ensure that offshore/onshore networks are planned holistically.

[46] The Transmission Acceleration Action Plan (TAAP) published in November 2023 outlines the government's commitment to introduce competition in the delivery of onshore transmission. Ofgem is working with NESO to identify the first eligible project(s) for competition in onshore electricity transmission by the end of 2024.
[47] Offshore transmission network review - GOV.UK (www.gov.uk)

Activity 3a: Electricity connections and network access

Meets expectations predominantly underpinned by licence conditions:

Electricity System Operator licence conditions	Gas System Planner licence conditions
C1.2(e); C1.3; C1.4(b); C1.6(a), C1.6(b), C1.6(c); C1.6(f); and C1.6(g).	n/a

The expectations in Activity 3a apply to electricity roles only.

Output	Meets expectations	Exceeds expectations
Immediate and ongoing		
Managing connections	• Competent, effective and proactive development, management, maintenance and improvement of the total electricity network connections process, in order to facilitate a timely and efficient transition to a Net Zero electricity system. Including by: ➢ Supporting throughout the connections process all parties fairly, providing visibility, transparency and understanding of connection processes along with continuous improvement of applicable pre-application information and processes,	• Provides and supports an efficient and smooth connections experience to electricity networks across GB (including both transmission and distribution networks). Including by: ➢ Processing connection requests in a timely manner so as to significantly reduce backlog of connection requests. • Performance displays step change improvements, supported by Regularly Reported Evidence 3Y (Percentage of Right First Time Offers) and achieves 100% of offers within the required period, supported by 3X (Timeliness of Connection Offers), as well as substantial, rapid and sustained improvements in the

	building on the Connections Portal. • Provide appropriately targeted support, guidance and information with dedicated account functions for customer groups such as DER where required. • Producing timely and accurate connection offers, with efficient and timely connection dates providing transparency and certainty over connection completion dates. This should display marked improvements supported by Regularly Reported Evidence (3X (Timeliness of Connection Offers) and 3Y (Percentage of Right First Time Offers)) and associated reporting. • Scrutinising connection offers put forward by TOs to ensure system designs consider the wider impacts on the NETS and are in the interests of consumers. • Undertaking proactive horizon scanning, identifying potential future challenges and planning ahead for longer-term responses to ensure integration and resilience to developments in the system and market, including considering changes	scale of the queue and reductions in connection dates offered (once relevant industry processes are in place), as evidenced by reporting on these indicators. • NESO has in place processes and procedures which allow NESO to scrutinise connections offers from TOs, establishing the impacts of the proposed connection on system operation.[48] Such assessment of TO offers by NESO should include at least the whole life cost analysis covering impacts on elements such as outages, demand and generator constraints, and other services (eg reactive power control, inertia, etc) to ensure economic and efficient outcomes. Where an NESO assessment of a TO connection offer mandates alternatives, NESO notifies the TO and Ofgem of the required changes and the affected customer(s) of the impacts. • Working with connecting parties to understand early whether there are services they can provide to the system that would mitigate other system costs. • Leading industry thinking by developing economic and efficient conceptual solutions to enable coordinated development of NETS including offshore along with the pan-European network.

[48] This should consider, at least, the operability and extendibility of the site and the ability to replace primary assets at the site.

	in regulation and government policy, such as wider network charging reforms, network investment and planning developments and connections reforms, e.g. other strategic planning processes such as Offshore Transmission Network Review (OTNR), Holistic Network Design (HND), HND follow-up exercise, Accelerated Strategic Transmission Investment (ASTI), and the Centralised Strategic Network Plan (CSNP). • Having processes in place to allow efficient and timely support for connections, taking into account the need to respond quickly and efficiently to anticipated changes, for example in application volumes, which may impact on workload or process requirements identified through horizon scanning activities above. • Efficient, collaborative and timely delivery and implementation of near- and long- term connections reforms, showing clear and consistent benefits supported by evidence under Regularly Reported Evidence 3X (Timeliness of Connection Offers) and 3Y (Percentage of	• Helping to deliver a high degree of coordination between connections and network access processes across transmission and distribution networks.

	Right First Time Offers) and evidenced by a step change improvement in the scale of the queue and reduction in connection times offered to customers to better meet customers' needs in line with net zero pathways, including other beneficial improvements, eg to transparency of data to support informed connection applications and decisions, which can be implemented in the near term, including any identified through Connections Reform.	
Outage and medium- and long-term access planning	• Coordinate with all TOs and significant sources of generation to implement efficient outage plans that minimise costs to consumers. • Provide visibility on the costs and / or benefits associated with changing network outages, through system analysis and cost assessments. • Transmission access programmes planned on a total electricity system basis using open data where appropriate. • Works with DNOs to coordinate and collectively optimise network access and planning through exchanging all relevant data in consistent formats, including but not limited to the sharing of detailed transmission	• Facilitates an optimal, total electricity system approach to network access and planning by coordinating seamlessly with all network operators via common data exchange systems (with use of open data where appropriate) to shape the future development of network access polices. • Works with network operators to identify and bring forward innovative, medium and long-term network solutions that drive significant constraints savings for consumers (e.g. through Joint Works projects).

	asset level data, including operational status, details of projects with connection agreements, their associated enabling work and available headroom at GSPs.	
Connections Reform	• Leading a holistic and comprehensive, collaborative, industry-wide programme to review connections arrangements and develop and implement Connections Reform in close collaboration with other network operators, industry, developers and stakeholders including Ofgem and Government.[49] This should have a total electricity system approach, to support efficient outcomes for all customers interacting with the transmission system and processes. • Reforms should be fast-paced, based on a clear and robust case for change, and ensure connections arrangements facilitate a timely transition to net zero in line with relevant pathways, delivering improvements at pace to connection offer dates and processes, to be fit for purpose for now and resilient and	• Taking collaboration and coordination further, where NESO looks beyond its own processes to support substantial and aligned process improvements are delivered across the whole energy system, including connections for electrolysis plants and other vectors where required for efficiency. • Identify and, where applicable, recommend and take forward improvements identified to associated aspects of system arrangements, such as investment planning where these will work in tandem with improvements to connections arrangements to deliver reform objectives and Ofgem outcomes as signalled through Ofgem's open letter and reform programme. • Draw on thinking on longer term models and assessment to inform wider reform programmes, such as the REMA, future system planning approaches and others as applicable. This includes, but it is not limited to:

[49] While we understand there are dependencies, we anticipate this can be completed by no later than the end of 2025. NESO performance will graded against this expectation, accounting for delays due to reasons outside of their control.

	adaptable to the evolving energy system and wider future reforms. These should deliver value to consumers and significant improvements in customer experience, enabling higher quality applications, where possible, with reduced impact of speculative applications. This includes but is not limited to: ○ Collaborative and transparent option development and assessment underpinned by effective and wide-ranging stakeholder engagement and consultation to support identification, testing and validation of options, and robust analysis supported by the Case for Change. ○ Effective governance and coordination arrangements in place to support timely and well-developed conclusions, informed by rigorous assessment and a robust understanding of expected impacts, input from relevant parties including TOs and DNOs, including via effective	○ Proactively providing other parties (including Ofgem and Government) clear and timely direction in what is required to enable the reforms identified, giving sufficient notice to enable productive responses and consideration in all cases.

	coordination with and participation in the ENA's Strategic Connections Group, with robust implementation plans and processes. ○ Timely delivery of review conclusions with design of solutions, a clear roadmap for delivering Connections Reform, and planned implementation stages, in line with timeframes communicated to broader industry and deliverables updated by the end of 2023, with improvements brought forward more quickly where possible and beneficial to enable early, rapid improvements in connection times. ○ Early and clear identification of any questions which may require strategic regulatory or policy direction, which should be identified and brought forward to relevant parties for consideration (including Ofgem or Government). ○ Continuous identification,	

	development and implementation of any required changes, considering implications for regulatory, code and contract frameworks and the introduction of new processes to give effect to conclusions to achieve all objectives of the reform work. • To ensure a complete and holistic set of reforms across the total electricity system, addressing strategic network investment, efficient network management and fit for future connection process which is iterative and coordinated, and meet the reform objectives.	
Tactical Response to Connections Challenges	• Iterative and coordinated series of improvements to connection processes, in tandem and close coordination with the wider work already underway to accelerate network planning and investment, to ensure learnings can inform improvements on both connections process and network (including outage) planning and investment processes, demonstrating marked improvements for Regularly Reported Evidence 3X (Timeliness of Connection Offers) and 3Y (Percentage of	• Taking collaboration and coordination further, where NESO looks beyond its own connection processes to support urgent and coordinated changes and process improvements are delivered across the whole energy system in relation to connections. • Identify and, where applicable, recommend and take forward improvements identified to associated aspects of system arrangements, such as investment planning where these will work in tandem with improvements to connections arrangements to deliver reform objectives and Ofgem

	Right First Time Offers), with clear forecast benefits and associated reporting on projected and actual improvements. • Improved data and monitoring on the status of connections arrangements for customers across GB, the expected impacts of identified near term improvements and longer-term reforms, demonstrating substantial improvements and a clear view of where further action is needed. • Ensure learnings, insights and improvements made via deployment of tactical measures are reflected in Connections Reform proposals and deliverables. There should also be a process to have a clear view of where further action is required.	outcomes as signalled through Ofgem's Open letter and reform programme. • Proactive and collaborative work with TOs and DNOs, including through the ENA's SCG, to develop and implement aligned proposals for managing connections as needed across system boundaries, delivering a step change in improvements of Regularly Reported Evidence 3X and 3Y and substantial, rapid and sustained improvements in associated reporting of the scale of the queue and reduced connection times.
Connections Portal	• Develop and implement consistent and coordinated connection processes for customers, which facilitate efficient connection and access to the system with improved data, information and service provision via the connections portal and enabling efficiencies to better manage increasing complexity and volume in connection requests.	• Make proactive improvements to the Connection Portal beyond any planned improvements or recommended changes identified through the Connections Reform work, through an iterative and continuous process informed by seeking feedback and learning from industry stakeholders.

	• This includes beneficial improvements identified through the Connections Reform work or elsewhere, such as: ○ Alongside TOs, develop processes and frameworks which look to provide substantially improved data, engagement, tools, and information for customers from the pre-application stage, such as current capacity, where they are able to connect, and potential timeframes for connection, to improve application quality and to reduce the volume of speculative connection applications. ○ Allow customers the ability to track and monitor all their projects, provide direct feedback, easy access to self-service tools, access to information which includes consistent data and quality insights. ○ Works towards having standardised (and digitalised) application processes such that if the necessary industry processes are in place	

	the interface across distribution and transmission is better managed, underpinned by greater collaboration between them. ○ Iterative improvement process to respond to further improvements identified as part of the connection Portal trial and Connections Reform work.	
By the end of RIIO-2		
Managing connections & Outage and medium- and long-term access planning	• Near- and long-term reforms have been implemented at pace, against required timelines[50] driving significant improvements in connection offered dates and processes, underpinned by appropriate resourcing and systems. • Reforms are integrated with system planning and operational approaches (including outage planning), as evidenced through reporting on improvements in the scale of the queue, and demonstrating significant reductions in connection dates offered as well as being supported by	• Beyond the Connection Reform work, NESO has actively improved coordinated connection and network access planning approaches across the total electricity system. There are clear points of contact, and the processes are run in coordination with other network operators, ensuring a seamless experience and efficient and timely connections service for all types of parties and facilitates efficient planning. • Network development and investment plans are well informed and underpinned by a forward look of anticipated connections volumes and requirements, through effective collaboration with TOs and DNOs,

[50] Following discussions with NESO, we understand that these reforms can be delivered within BP2 timescales, and so this is our expectation. We further understand that the timeline could be delayed for reasons outside of NESO's control, if such risks materialise then our expectation would be for NESO to be able to implement reforms at the early stage possible once those barriers are removed.

	Regularly Reported Evidence 3X (Timeliness of Connection Offers) and 3Y (Percentage of Right First Time Offers). • NESO has helped to deliver a high degree of coordination between connections and network access processes across transmission and distribution networks. • Substantially improved pre-application information, customer experience and efficient process through the Connection Portal and other near-term improvements. Pre-application stage should inform customers of when and where they are able to connect, manage expectations about network constraints and potential timeframes for connection. The customer should have access to support and information in a timely manner to support decision.	such that preparatory work can be identified and undertaken in a timely way and strategic approaches to network development enable reduced connection dates, in line with customers' requirements and a timely transition to a net zero.
Connections Reform	• Connection Reform changes and improvements are implemented to have a meaningful difference to the connections process, while accelerating progress towards net zero and delivering benefits for consumers. The reform project delivering on all its objectives and outcomes. For example transparent and	• As needed, proactive consideration and preparations underway for how the connections and access framework may need to develop in the longer term to align with and inform wider market and system developments, identifying and taking appropriate steps to enable coordinated and timely delivery of any further future changes.

	consistent data, improved quality of connection applications with efficient progress, reforms being delivered with improvements and greater coordination across system boundaries. • Reform projects should identify the opportunity to enable delivery of, as early as possible,[51] rapid improvements in connection timescales to allow long lead time activities which contribute to 2035 zero carbon operations. • Connection offers are made to applicants with shorter connection dates which better meet customers' needs and enable a timely transition to net zero. Customers are provided with efficient processes, improved experience, timely and accurate connection offers, through a transparent and auditable process, supported by accessible and standardised data. • Reforms account for the diversity and complexity of connections within an evolving whole energy system, learnings and improvements carried out	• Robust, data-based understanding and monitoring of connections trends and performance, horizon scanning effectively embedded in BAU processes on an enduring basis ensuring any potential emerging issues and opportunities for further future improvements are identified and resolutions or improvements swiftly brought forward to deliver improvements or address potential emerging challenges before they escalate in scale or severity.

[51] We anticipate that we should see a reformed connections process in place in early 2025, and connection dates for some projects start to be accelerated by no later than the end of 2025, alongside adoption of new processes by other network organisations and subject to delays for reasons outside of NESO's control. Where possible, aspects of the Reform should be delivered earlier, particularly if materially value-adding.

	under the tactical initiatives and are resilient and adaptable as needed to wider reforms (for example to system planning and market arrangements) and avoiding recurrence of any issues or delays in future. • Reforms should be well integrated with system planning arrangements and enable improved outcomes and processes across system and organisational boundaries to deliver improve and more consistent total electricity system outcomes, improving coordination and alignment of processes where this can deliver benefits and accelerate progress towards net zero.	
Tactical Response to Connections Challenges	• Short to medium term change and improvements are implemented to have a meaningful difference to the connections process, while accelerating progress towards net zero and delivering benefits for consumers. • Achieve marked improvements in connections performance, evidenced by Regularly Reported Evidence 3X (Timeliness of Connection Offers) and 3Y (Percentage of Right First Time Offers) and associated reporting of	• The Regularly Reported Evidence shows a rapid, substantial step change and sustained and consistent improvements across the relevant Regularly Reported Evidence 3X (Timeliness of Connection Offers) and 3Y (Percentage of Right First Time Offers) and associated reporting on improvements in the scale of the connections queue and connection times. • Robust, data-based understanding and monitoring of connections trends and performance, horizon scanning effectively embedded in BAU processes on an enduring basis

	improvements to the scale of the queue and connection times. • Where, through the Connections Reform work, the opportunity is identified and supported to deliver on earlier change, this should be delivered as early as possible. This should be done to enable delivery of rapid improvements in connection timescales to allow long lead time activities, which contribute to 2035 zero carbon operations. • Short to medium term improvements should enable connection offers to be made to applicants with shorter connection dates which better meet customers' needs and enable a timely transition to net zero. Customers are provided with efficient processes, improved experience, timely and accurate connection offers, through a transparent and auditable process, supported by accessible and standardised data. • Tactical (short to medium term) initiatives should ensure to support, inform and align with Connections Reform and other wider reforms (for example to system planning and market arrangements) and	ensuring any potential emerging issues and opportunities for further future improvements are identified and resolutions or improvements swiftly brought forward to deliver improvements or address potential emerging challenges before they escalate in scale or severity.

	avoid disruption or for introduction of any in future, to those wider reforms. • Robust, data-based understanding of the status of connections across GB, providing a clear picture to Ofgem, government and stakeholders, allowing the impact of tactical initiatives and other trends to be projected and tracked. For example, by improving information on connections current and future contracts, connections timescales and overview of planned transmission reinforcement projects, to better inform and enable development of future connections applications. Near term reforms (particularly NESO's 5 point plan) have been implemented driving improvements in connection offered dates and processes, underpinned by appropriate resourcing and systems and well-integrated with system planning and operational approaches (including outage planning).	
Connections Portal	• The connections portal is well established, bringing data and process improvements, allowing customers to receive and provide direct feedback	• NESO has contributed to the implementation of a central highly accessible connections portal, which is fully interoperable with the systems of other network operators.

	and enable efficiencies to partly offset the increasing complexity and volume in connections, and delivers the outcomes described in NESO's RIIO-2 plan, for example an enhanced understanding for all parties of the available capacity and the costs of connecting to different parts of the whole network. Including, but not limited to: ○ Improved access to data and information from the preapplication stage onwards providing clarity on the available and expected capacity and associated costs across the system. ○ Providing customers easy access to signed agreements, charges, operational notifications and tracks the progress of their connection applications. ○ Improves support to connections project that require increased level of engagement and support. ○ Further enhance the customer connection experience, including broader support for smaller parties. ○ Efficient management of connection contracts	• The portal advises customers of capacity opportunities on both the distribution and transmission networks and acts as a one stop shop for all connection-related information.

		programmes, where industry processes allow, to secure timely delivery of connections.	

Activity 3b: Energy system strategy and insights

Meets expectations predominantly underpinned by licence conditions:

Electricity System Operator licence conditions	Gas System Planner licence conditions
C1.3; C1.4(b); C1.4(c); C1.6(a); C1.6(c); and C15.	C1.2; C1.4(b); and C10.

The expectations in Activity 3b apply to both electricity and gas roles, unless otherwise specified.

Output	Meets expectations	Exceeds expectations
Immediate and ongoing until the end of RIIO-2		
Providing energy insights	• Informs the future development of the electricity and gas systems through the production of clear, accessible and timely insight documents, which are informed by robust stakeholder engagement. • Ensure due consideration is given in any long-term forecast to cross-border infrastructure and a coordinated European energy system, and to work holistically with European neighbours to	• Uses expertise to produce timely, trusted and highly valued insights that shape and inform policy decisions on the energy transition and support decision making for the UK's 2050 net zero commitment.

	support the development of holistic and robust scenarios.	
Producing analytically robust long-term pathways	• Competent and responsive development, management and maintenance of the Future Energy Pathways (FEP) process[52], with evidence for assumptions and decisions through a record of data inputs and the cross section of stakeholders views gathered, in line with the FEP Guidance. • Provide justifiable and credible long-term scenarios covering a sufficiently wide range of outcomes, both in terms of future energy system development and the associated costs of operating the electricity system in those scenarios. • Stress-testing of scenarios, analysis and assumptions and consideration of whether scenarios and forecasts remain fit for purpose at least on an annual basis. • Invites and proactively facilitates collaboration from all interested stakeholders to drive forward the improvement of industry data to achieve more reliable energy forecasting capabilities. • High degree of engagement, transparency and justification of decision making to stakeholders	• Through the FEP process and publications, monitors and evaluates previous analysis / scenarios, including by analysing forecast vs. actual outcomes, to improve accuracy in future publications and explain clearly the reasons for shorter-term deviations between forecast and realised outcomes. • Exceptional stakeholder engagement which, for example, demonstrates greater and/or more diverse participation than previous years, embracing best practice and new innovative approaches in engaging with stakeholders. • Continually expands the functionality of energy demand models to provide step changes in accuracy, in particular by better taking into account profiles across the year, changes at the regional level and developments across vectors. This may include evidence of effective and timely stakeholder engagement to inform, and communicate, developments in this area.

[52] The FEP was previously known as the Future Energy Scenarios (FES)

	throughout the development process. • Actively utilise data from industry to inform energy modelling. • Work collaboratively with other parties to improve industry data (where possible and relevant) to support the development of scenarios. • Undertake a review of the purpose of the FEP and develop a new FEP Methodology • Ensure FEP analysis and modelling takes account of SSEP analysis and modelling	
Ensuring coordinated Pathway development	• Engages and coordinates with stakeholders (e.g. Ofgem, national and devolved government, Committee for Climate Change, industry, other licensees (e.g. Gas System Operator, DNOs)) to ensure regional and cross-sectoral interactions are clearly taken into account in the pathway development processes. • Provides inputs and produces outputs which consolidate network planning, including across-borders,[53] where appropriate. • Continues supporting DNOs with Distribution FEP("DFEP") processes, for example through	• Proactively brings together as many relevant industry parties (where appropriate including European neighbours) as possible, both directly and through working with open data, to produce consistent factual data that can be used to identify pathways that meet decarbonisation targets, across the whole energy system. • All insight and pathway documents (including, where applicable, the SSEP, the FEP, ETYS, Operability Strategy Reports, HND, the System Operability Framework Report, and the Gas Network Capability Needs Report) work together

[53] Including with future connections

	timely sharing of data, to provide a coherent set of whole-system scenarios.	(toward a centralised strategic network planning process) to present a clear, coherent, and coordinated view of all future needs across the whole system (evidenced through stakeholder feedback). This includes sharing all data, where appropriate, and sharing FEP models where possible. • Considers and implements ways in which more data can be made 'open' to stakeholders.

Activity 3c: Optimal network investment

Meets expectations predominantly underpinned by licence conditions:

Electricity System Operator licence conditions	Gas System Planner licence conditions
C1.3; C1.4(b); C1.6(a), C1.6(b), C1.6(c); C1.6(f); and C17.	C1.2(b); C12

The expectations in Activity 3c apply to electricity roles, unless gas is specified.

Output	Meets expectations	Exceeds expectations
Immediate and ongoing		
Identifying network needs and solutions	• Make recommendations to other parties and take NESO procurement decisions that lead to the economic and efficient design and operation of the transmission network (including onshore, connections for offshore wind and interconnection). • Conducting fit-for-purpose analytical assessments, including by: ○ Identifying future high-cost network issues in advance of the additional	• Conducting exemplary analytical assessments, including by: • Identifying all material transmission network needs[54] in advance of additional costs being incurred. • Introducing timely, significant improvements to the analytical tools underpinning the assessment processes (which might include developing tools to allow introduction of year-round assessment considerations or a stability tool for SQSS transient

[54] At present we understand that thermal constraints, voltage and stability issues are the most material network needs. We expect NESO to keep all network needs under review and, if necessary, expand upon this.

	costs being incurred and providing recommendations to mitigate these issues. ○ Demonstrate the number and types of solutions available. ○ Take into consideration the system needs associated with Net Zero. ○ Where appropriate, identifying additional solutions not proposed by other parties including optimised combinations of solutions to target a known issue, or identifying a solution that may address multiple issues. ○ Identify options which are eligible under Early and Late Competition models. ○ Assess all options based on a high quality, robust and transparent cost benefit analysis that provides a high degree of confidence that NESO has recommended the optimal solution(s). ○ Assessing all options fairly, based on robust and transparent cost benefit analysis, including by ensuring that TO delivery dates are robustly challenged and	analysis) to ensure future needs of the net zero carbon power system can be appropriately analysed. • Ensure maximum possible participation in assessments and tenders, including by: • Proactively facilitating and encouraging all types of providers (network and non-network, transmission and distribution connected) to provide solutions to all material transmission network needs Ensure that all assessments and tenders are accessible to all potential providers of commercial alternative solutions, facilitating effective competition against traditional network reinforcement based solutions. • Data system improvements are implemented and provide demonstrable new insights.

	sufficiently understood to allow for fair CBA comparison of both TO and non-TO options. ○ Producing clear, accessible and timely NOA and CSNP publications. ○ Regular engagement with Ofgem, industry and interested stakeholders on the development of the NOA and the CSNP methodologies to ensure that the system planning process is fit for purpose. Approaches to stakeholder engagement and outcomes will be transparent and published on the NESO website. ○ Building upon past learning to continually improve the models, methodologies and analytical tools underpinning the assessment process of the NOA and CSNP Pathfinders (renamed as Network Services Procurement for BP2). ○ Widen Network Services Procurement participation by making assessment and outcomes more transparent to stakeholders (e.g. Ofgem and industry).	

	• Using medium-term market solutions as a cost-effective approach to keep network investment options open against uncertainty.
	• Ensure wide participation in assessments and tenders, including by:
	  ○ Inviting all types of providers (network and non-network, transmission and distribution connected) to provide solutions to network issues.
	  ○ Seeking and inviting potential commercial alternative solutions to compete against traditional network reinforcement-based solutions.
	• Improve data systems to ensure the NOA, (and transitional and enduring CSNP considers current and future connections to support system planning and proactively prevent network constraints.	

Coordination between network assessments	• Ensuring proactive coordination between the different assessments of solutions to transmission network needs (e.g. ensuring coherence between the NOA and CSNP assessments, assessments for Network	• Demonstrate value that has arisen from development of a co-optimised assessment for all transmission network needs. This should be regularly reported to Ofgem. Including by:

	Services Procurement and offshore wind connections). Including by: ○ Setting out and meeting a clear and coherent timetable / calendar for when the different assessments are to take place. Ensuring that it is easily accessible to all that wish to engage with the NOA, CSNP, Network Services Procurement and any new assessment / tender processes. ○ Identifying barriers to achieving greater coordination (both technical and regulatory), making these barriers clear to all parties, and proposing solutions to overcome these barriers.	○ Developing a clear future vision and strategy for an optimal network assessment process (or suite of integrated processes with harmonised timings) capable of addressing Net-Zero system needs. ○ Implementing solutions for addressing any barriers when these are within NESO's gift.
Procurement of network solutions	• Share well-defined, timely, clear needs specifications for all tenders. • Continual improvements made to the procurement process informed by stakeholder feedback. • Work with Ofgem and undertake stakeholder engagement to finalise an Early Competition model. • Develop contractual arrangements for Early competition and work with Ofgem to appropriately	• Share well-defined, timely, clear needs specifications for all tenders, which contain requirements that do not limit the participation of any viable technologies or potential commercial solutions (or transparently demonstrate why requirements that limit participation are in consumers' interests). • Use of the methodologies and lessons learned through developing the Network Services Procurement and is implementing

	determine which elements should feature in contract vs. licence. • Development of a new Cost Benefit Analysis tool which fairly compares licensee options against third party alternatives. • Continue to implement Network Services Procurement methodology for stability, voltage and thermal constraints.	regular, dependable, bankable markets for stability, voltage and thermal constraints (to be implemented under Activity 2a). • Develop contractual arrangements for Early competition and recommend to Ofgem how best to appropriately determine which elements should feature in contract vs. licence.
Transitional CSNP	• Publish a transitional CSNP, (which includes as a minimum the HNDFUE and NOA8) in 2023, and similar outputs beyond 2023 as required. A transitional CSNP should: ○ Support the Government ambition for 50GW of offshore wind by 2030 for GB including 5GW of GB floating wind, as well as contributing to the Sixth Carbon Budget targets for 2035 and net-zero by 2050 for GB and by 2045 for Scotland (Scottish Government target) clearly and transparently identify investments on the onshore and offshore transmission network Be based on transparent, plausible future energy demand and supply scenarios.	• NESO develops new capability enabling it to produce network reinforcement solutions to strategic system needs, that are above and beyond any requirement on it through existing workstreams such as the OTNR Pathway to 2030 (PT2030) HND and HNDFUE. • NESO develops the capability to make recommendations of whole system solutions, that span beyond electricity transmission network, for example electricity distribution, gas transmission, or the wider energy system such as optimising the development of existing or new loads and/or generation, to solve needs identified for the whole system.

	○ Be based on capacity and operational constraints that might occur (including those beyond transmission boundary thermal constraints). ○ Be based on NESO scrutinising and challenging inputs from other parties, and coordinating network needs and developments. • Readiness to ensure fit for purpose assessments in future, including by:Develop processes for the performance of future whole system activities, and establish internal framework that enables those activities	
Development of the CSNP	• Develops a methodology (with Ofgem, the Secretary of State, and stakeholders) for producing the CSNP, based on the latest CSNP policy requirements or guidance as developed by Ofgem.[55] • Aid Ofgem in stakeholder engagement to ensure fair and appropriate roles and responsibilities for licensees in network planning e.g. to prevent bias in future competitive tenders.	• Work with stakeholders to develop data sharing procedures which ensure third parties can easily provide network investment options. • Development and implementation of interoperable data and digital infrastructure which enable data transfer between NESO and TOs/DNOs. • Leads on developing a methodology together with stakeholders, to enable the development of whole energy

[55] At a minimum we expect NESO to consider the criterion, proposals, potential approaches and decisions relating to CSNP stages, that are set out in all the publications (consultations and decisions, including appendices) relating to the Electricity Transmission Network Planning Review (ETNPR).

	• Leads on developing the methodology for Future Energy Estimates (or the outputs under stage 1 of CSNP as described within Ofgem's "Consultation on the initial findings of our Electricity Transmission Network Planning Review") that are anticipated to meet the future objectives of the CSNP (as they may develop), in conjunction with stakeholder engagement to inform electricity and gas transmission network planning.[56] • Supporting the development of all stages of CSNP. For example, by leading workshops with stakeholders and developing potential alternative approaches to various aspects and stages of CSNP, providing recommendations on a preferred approach, and licence drafting. • Working iteratively with Ofgem in developing and agreeing potential alternative approaches to modelling demand and supply and its use in analysis and decision making to inform electricity and gas transmission network planning. For example, considering the use of a single short term 'central estimate', followed by multiple scenarios for the longer term and how they	system modelling and recommended solutions, that span beyond electricity transmission network, eg electricity distribution, gas transmission and gas distribution network, or the wider energy system such as optimising the development of existing or new loads and/or generation, to solve needs identified for the whole system. • Utilise lessons learned from development of demand and supply modelling from electricity and gas transmission to, where appropriate, improve accuracy of regional scenario development. • Develop capabilities in options identification of non-network solutions such as batteries, demand side response and electrolysis to produce Hydrogen to co-optimise the network and wider energy system. When developing capabilities, utilise stakeholder engagement and consider third party solutions at option identification stage.

[56] At a minimum we expect NESO to have considered the criterion set out in pages 64-66 of Consultation on the initial findings of our Electricity Transmission Network Planning Review | Ofgem

	could be used to inform network investments. Develop an agreed methodology (with Ofgem and stakeholders) for robust and credible long-term pathways (updated to reflect the latest CSNP Guidance) covering a wide range of outcomes, both in terms of future energy system development and the associated costs of operating the electricity and gas system. This should ensure greater transparency e.g. providing information on how stakeholder engagement is undertaken, areas of modelling that have been altered due to this engagement and sectors/bodies that have been engaged within this process. • Leads on developing the methodology for the identification of system needs stage of CSNP. This should include assessing the needs of the system against all electricity system constraints, including capacity and operational constraints, that might occur because of the modelled future supply and demand. It should also include identification of strategic system needs, such as those which enable meeting government policy and targets. • Leads on developing the methodology (working with stakeholders) for the	

	identification of options to address system needs. This should consider all the possible economic and efficient solutions to address system needs, including innovative, non-network or commercial solutions as well as enduring capital-intensive solutions. It should include identification of strategic investments. ○ It should include a methodology for developing a clear role for NESO to identify or originate network solutions for meeting network needs identified in stage 2 of CSNP, such that these solutions are developed sufficiently through the stage 4 assessment for CSNP. ○ It should include a methodology for a minimum standard of option development by transmission owners and third parties such that options put forward for consideration in CSNP are consistently developed to a minimum level of detail so as to ensure a robust analysis of investments and a clear role for NESO in identifying solutions.	

	• Leads on developing the methodology for stage 4 of CSNP such that NESO can perform robust analysis and decision making appraisals to form a strategic plan that resolves future network needs to meet net zero. Work with Ofgem and other stakeholders in developing a cost benefit analysis tool and methodology which enables efficient assessment of the costs and benefits of different types of solutions. This should consider technical and economic aspects, as well as community and environmental impacts. • Assist Ofgem or lead (as applicable) in the development of code modifications to enable new roles and functions within CSNP. • Assist Ofgem or lead (as directed) in determining appropriate timing and style of CSNP publications and outputs within it. • Leads on developing a methodology, together with Ofgem and stakeholders on integrating planning of offshore networks within CSNP. This should include the methodology for enduring arrangements for designing coordinated connection solutions for offshore connections (including to multipurpose interconnectors where applicable) and any associated	

	onshore and offshore network reinforcements. • Leads on developing a methodology, together with Ofgem and stakeholders on how CSNP will include a strategic advisory output for future interconnectors. • Regular engagement with Ofgem, industry and interested stakeholders on future changes to CSNP methodology to ensure that the system planning process is fit for purpose. Approaches to stakeholder engagement and outcomes should be transparent and published on the NESO website.	
By the end of RIIO-2		
Identifying network needs and solutions	The NESO has ensured that a wider range of types of solutions, to transmission network needs are fully and equally assessed in all of its long-term network development work. • The NESO has ensured that its network planning processes enable a long-sighted, strategic planning function at the onshore / offshore boundary (subject to the outcomes of the Offshore Coordination Project[57]).	• The NESO methods and analytical tools (including IT systems) ensure that all different types of solutions, to all material transmission network needs are fully and equally assessed and the most efficient solutions are brought forward. • The NESO has implemented new processes to identify the optimal combination of options to address the full range of year-

[57] More information about the Offshore Coordination Project can be found at the following address: https://www.nationalgrideso.com/future-energy/projects/offshore-coordination-project

	• The NESO's network planning processes and tools have been progressively extended year-on-year to facilitate the submission of innovative solutions to transmission network needs.	round challenges over the medium and long-term. • The NESO has implemented tools and processes that ensure that different types of solutions to all material transmission network needs are fully assessed, using all FES scenarios, which cover a full range of within-year conditions ("year-round assessments") and ensure the optimal solutions are brought forward. This includes: • high-quality, fully tested, year-round tools for: voltage optimisation; OPF analysis for thermal assessments; stability assessments and analysis of dynamic stability, RoCoF, new technology challenges and load model impacts. • Improvements to model outage planning in year-round.
Coordination between network solutions	• The NESO's long-term network development process ensures that all assessments and tenders are part of a complementary and coordinated set of processes which ensures the efficient solutions are brought forward. • The NESO has produced, and continually updated, one overarching methodology and timetable that clearly shows how the different assessments of	• The NESO's network planning process ensures that all relevant different types of solutions, to all stability, voltage and thermal constraints needs, are fully and equally assessed in a co-optimised[58] manner to ensure the optimal whole-system solutions are brought forward.

[58] See footnote 31.

	solutions to different transmission network needs interact.	
Consistency with distribution network planning	• The NESO has assisted the DNO's in developing network planning processes and methodologies which are consistent with those at the transmission level, engaging at regular intervals to share expertise, with NESO having supported and proactively made recommendations to shape the DNO's RIIO-2 ongoing network planning and re-opener submissions as required.	• Network planning processes and assessments at the transmission level are coordinated with those at the distribution level (e.g. apply consistent processes and methodologies and are timed such that they take account of their respective outputs), with NESO having supported and proactively made recommendations to shape the DNO's RIIO-2 ongoing network planning and re-opener submissions as required to ensure optimal total electricity system network development.

5. Expectations for establishing NESO

5.1 NESO has carried out extensive work during the BP2 period to facilitate the transition from ESO to NESO and to establish NESO's new and enhanced capabilities. This chapter sets out the general performance expectations we have for NESO in relation to its NESO implementation work (also known as 'FSO Transition Activities'[59]), as well as its delivery of several new NESO roles from NESO go-live to the end of March 2025. These expectations will be used to inform a supplementary assessment of NESO's performance the end of BP2, as described further in the NESORI Arrangements Governance document which has been published alongside this document.

5.2 The NESO activities that will be considered as part of this assessment include:

- FSO Transition Activities;
- NESO's Advisory Functions;
- Whole system security and resilience roles, including the Office of Energy Resilience and Emergency Management, and gas supply risk assessments;
- Whole system strategic planning activities not included in chapter 4, including:
  - the Strategic Spatial Energy Plan (SSEP)[60];
  - Gas strategic network planning activities;
  - work related to implementation of the Regional Energy System Planners (RESPs)[61]; and
- All other work to develop new and prospective NESO activities.

[59] See Decision on the funding of the transition to a Future System Operator | Ofgem.
[60] See Electricity System Operator licence condition C16 and Gas System Planner licence condition C11.
[61] For more information please see: Future of local energy institutions and governance (ofgem.gov.uk)

Expectations for establishing NESO

Expectations also underpinned by the following licence conditions:

Electricity System Operator licence conditions	Gas System Planner licence conditions
B1.18; B1.21(d); C1.6(g); C1.7; C6; C7; C16; D1; and F1.4.	B1.18; B1.21(d); C1.3(a); C1.3(c); C1.4; C1.5; C4; C5; C6; C8; C11; D1; and F1.4.

5.3 Our expectations on NESO until 31 March 2025 are outlined in the table below:

Area	Expectation
Value for Money	• Provide value for money to consumers through the delivery of FSO Transition Activities and new NESO roles and responsibilities.
Transition to NESO	• Manage a successful transition from ESO to NESO, including through effective communication and engagement with other key parties involved in the delivery of NESO. • Develop and secure the resource, skills, capabilities and processes necessary to robustly deliver NESO's Day 1 obligations and responsibilities. • Develop a clear strategy for exiting Transitional Service Agreements with National Grid plc and developing standalone enabling services and capabilities, and make demonstrable progress against that strategy.
Delivery of new roles	• Deliver key activities from new NESO roles and responsibilities to a good standard and according to the expected timelines, including but not limited to: o Where requested, providing clear NESO Advice in line with the timings in the request, its statutory duty and the process in NESO Advice Process Document; o Making demonstrable progress on new whole energy system security and resilience activities, including by carrying out the necessary preparation for (or where applicable delivery of) reports, assessments or requests required under the licence;

	○ Delivering the requirements (relevant to this assessment period) set out in the Secretary of State's Commission for a SSEP methodology, whilst ensuring coordination with wider strategic planning activities and developments such as the FEP, CSNP, the Gas Network Capability Needs Report, The Gas Options Advice Document, and RESPs; ○ Making demonstrable progress embedding gas forecasting and strategic planning capabilities within NESO (inclusive of strategic planning for hydrogen transport and storage infrastructure), including by coordinating and progressing the new Gas Options Advice Document and the Gas Network Capability Needs Report so it is on track to meet the required timelines; ○ Collaborating effectively with Ofgem and impacted stakeholders to further define the processes and methodologies associated with the RESPs.
Culture and industry perception	• Demonstrably building and embedding a culture that puts NESO's statutory duties at the centre of its decision-making, as well as promoting transparency on decision-making, and robust engagement and collaboration with a broad and diverse range of energy industry stakeholders. • Make a clear shift (evidenced through positive feedback) towards being viewed widely by industry as a trusted, impartial, and expert organisation which is taking the lead on driving the energy system transformation.

6. Quality of Outputs

6.1 In order to strengthen our expectations in the Roles Guidance document, we have decided to integrate our Quality of Outputs criteria into this document. This section of the Roles Guidance captures our expectations that underpin all the activities NESO undertakes.

6.2 This not only ensures NESO has met our expectations in terms of delivering activities and outcomes to maintain an economic, efficient, and co-ordinated system but also sets expectations as to how NESO undertakes these activities.

6.3 This set of criteria also gives NESO the opportunity to demonstrate that their activities meet, or even exceed, our expectations for NESO's day-to-day undertakings or any activities that may not be explicitly captured by the main body of the Roles Guidance document found above.

6.4 These criteria also form a minimum standard of delivery for NESO's activities referenced in the main body of the Roles Guidance document. If NESO has not delivered its activities in line with the relevant criteria, without appropriate justification, we may deem that NESO has not met our expectations for delivery of those activities.

6.5 We note that the Quality of Outputs criteria covers a wide range of NESO activities. In order to ensure reporting is proportionate, we do not expect NESO to report against every criteria listed below. Nevertheless, NESO should be able to demonstrate where it is exceeding our expectations. We will regularly engage with NESO to discuss feedback and performance in these areas.

6.6 These criteria are not role specific and may underpin several of NESO's expected activities, including the activities related to establishing NESO outlined in the previous chapter.

Area	Meets expectations	Exceeds expectations
Publications	• Timely publication of external facing documents. Any delays to expected publications have clear	• Publications are fit for purpose and contain the optimal depth of detail and

	reasoning. Where NESO delays publications stakeholders are made aware at the earliest opportunity. This should include an explanation of the reasons for the delay where appropriate. • Publications are fit for purpose and contain sufficient detail and analysis to benefit and inform industry. • Publications are advertised such that stakeholders are aware of publication. • Evidence of continual improvement in any iterative documentation, showing NESO is improving the quality of its publications based on experience and stakeholder feedback. • Publications are easy to find and available in an accessible format for all stakeholders. • A structure for published documents such that stakeholders can easily navigate NESO documents.	analysis to benefit and inform industry. • Publications are targeted and advertised to the appropriate stakeholders. • Evidence of step-change improvements in any iterative documentation, showing NESO is actively seeking to improve the quality of its publications based on experience and stakeholder feedback. • A structure for published documents, consistent in approach where suitable, such that stakeholders can easily navigate NESO documents.
Stakeholder Engagement	• NESO ensures it engages with all relevant stakeholders when it is undertaking its activities.	• NESO ensures it tailors its engagement for all relevant stakeholders when it is undertaking its activities.

	• NESO ensures the full range of stakeholders are appropriately represented, including non-traditional stakeholders. • NESO takes a leading role in industry fora where appropriate. • Where stakeholder surveys are conducted, NESO builds on constructive feedback.	• NESO actively seeks to conduct stakeholder surveys where appropriate to improve its performance. Where these are conducted, NESO builds on constructive feedback.
Submissions to the Authority	• Submissions are fit for purpose, clearly articulating the needs case and rationale behind the decision made in the submission. The submission includes information addressing concerns raised during any formal consultation. Minimal clarifications are required by the Authority. • Timely submission of required documentation to the Authority, in line with relevant obligations or needs of the wider industry and consumers. • Where clarifications are required, NESO provides the necessary information to the Authority as soon as practicable.	• Submissions are fit for purpose, clearly articulating the needs case and rationale behind the decision made in the submission. The submission includes high quality analysis and answers to questions or concerns raised by stakeholders during any engagement. Minimal clarifications are required by the Authority. • Proactive engagement with industry and the Authority to ensure timely submission of required documentation to the Authority, in line with relevant obligations or needs of the wider industry and consumers, mitigating the risk of submission or decision delay. • Where clarifications are required, NESO provides high quality information to the

		Authority as soon as practicable.
Proactivity	• Knowledge of current and future risks to delivery of the business plan activities and evidence of mitigations implemented where appropriate. • Proactive testing of plans and regular refresh of internal information to ensure all knowledge is up to date. • Continuously reassesses plans proactively to ensure that NESO continues to deliver value. • Flexible approach to delivery. NESO will act appropriately where evidence suggests that additional benefit would be gained through a change in deliverable or approach.	• Strong knowledge of current and future risks to delivery of the business plan activities and evidence of optimal mitigations implemented expediently where appropriate. • Proactive testing of plans and regular refresh of internal information to ensure all knowledge is up to date. Clear evidence that this has been embedded in systems and decisions. • Continuously reassesses plans proactively to ensure that NESO is maximising value to the consumer. • Flexible approach to delivery. NESO will act appropriately to deliver optimal benefit through a change in deliverable or approach.
Data and Information	• NESO's data is easy to find and navigate and is considered open by default and provided to stakeholders in an accessible format. • Where NESO withholds data from industry, there should be coherent reasoning and this reasoning should be published in its stead.	

	• Messaging across documentation and stakeholder engagement is as consistent as practicable such that there are limited contradictions or omissions that lead to misunderstanding.	
NESO Policy[62]	• NESO ensures all relevant stakeholders are considered when undertaking its activities and NESO can evidence this consideration. • Policy outcomes and assumptions are revisited and reviewed as appropriate. • Decisions and policy are underpinned by a proportionate level of evidence and analysis.	• NESO ensures all relevant stakeholders are considered when undertaking its activities. NESO can evidence high quality consideration of impacts of policy on stakeholders. • Completed policy undergoes high quality review at an appropriate timeframe to ensure policy continues to deliver optimal output for consumers.

[62] NESO Policy is generally, but not limited to, where NESO develops services and operational policies which have impacts on the electricity industry.