

NESO SSEP Methodology Review

FINAL REPORT
30th May 2025



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1. Background and Overview

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SSEP: Context and our role

What is the SSEP?

NESO has been commissioned by DESNZ to create a Strategic Spatial Energy Plan for the energy system across Great Britain. The **SSEP will be used to help plan the future of the energy system** by mapping out potential future scenarios for energy generation and storage in the net zero transition. The programme's outputs will feed into future government policy in the energy sector, such as **Clean Power 2030**.

- As part of the plan, **NESO will conduct modelling of a set of different scenarios** of the future energy system.
- Out of the scenarios modelled, NESO will select **up to six pathway options** for how the energy system could look in the future and present them to the UK Energy Secretary.
- **One pathway will be chosen by the Energy Secretary** to be published as the output of the first SSEP.

What are its objectives?

The goal of the SSEP is to help **accelerate and optimise the transition to clean, affordable and secure energy** across GB.

Its objectives are:

- To provide greater clarity and confidence to industry, investors, consumers and the public on what the future energy system will look like.
- To support conversations with stakeholders and the public to build consensus on how the energy system needs to change to enable clean and affordable energy for the future.
- To become part of the framework of planning systems across GB based on the spatial outputs of the programme.

What is the role of PwC?

We will conduct a review of NESO's SSEP methodology to evaluate its alignment with DESNZ's requirements and identify any gaps or areas of improvement, based on our knowledge and expertise of the sector and experience of reviewing similar plans. Our work consists of two key stages:

- **Identifying DESNZ requirements for SSEP;** and
- **Analysis of NESO's strategy to meet these requirements.**

Our approach to reviewing the SSEP methodology

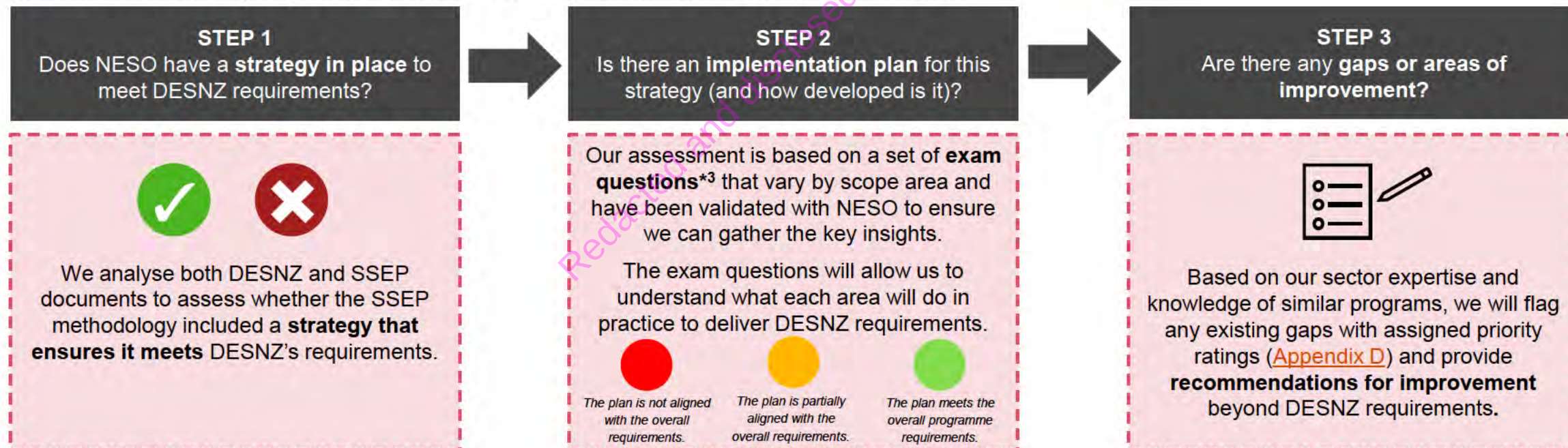
Stage 1: Identify DESNZ requirements in SSEP methodology

We have divided the SSEP methodology into **six scope areas*** to (i) identify and engage the right experts for our interviews for each area^{*2}; (ii) optimise evidence and documentation gathering; and (iii) ensure that our findings and recommendations are more targeted



Stage 2: Analysis of NESO's strategy to meet these requirements - our assessment framework

We have outlined the key steps to assess NESO's current position relative to the desired outcome



2. Executive Summary

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PwC overall key findings on the SSEP Programme

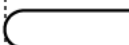
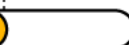
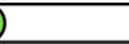
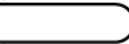
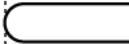
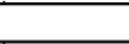
Overall considerations	NESO has defined a methodology for the overall programme which aligns with the requirements set out in the DESNZ Commission. Going forward, we believe the Programme may benefit from a formalisation of several of the processes highlighted in our review, including assurance, sensitivity testing, and the appraisal of pathway options. This would ensure that the Programme meets its ambitions and delivers a comprehensive energy plan for Great Britain.
Modelling	The SSEP is built around a unique and ambitious modelling exercise , designed to map technologies across economic zones in Great Britain. The plan to deliver the economic and geospatial modelling is complex, and further work could be done to improve the clarity in the SSEP methodology to make it more accessible to a broader audience. The approach to deliver sensitivity testing could also be developed to ensure that the minimum requirements set out by DESNZ are met in the limited time available.
Assurance	Successful delivery of the modelling and the wider SSEP programme relies on establishing effective assurance processes at key milestones . NESO has defined an assurance strategy built around a three-lines of defence model, however additional steps are necessary to define the processes in each line and the capabilities needed to deliver the assurance activities. We have seen positive steps with individual workstreams already undertaking assurance activities and going forward these need to be better coordinated within a centralised plan.
Governance	As outlined in the DESNZ Commission, a key principle for the SSEP is to seek consensus between organisations and receive endorsement from key stakeholders. NESO has established a productive governance structure built around DESNZ, Ofgem, the devolved governments, and industry stakeholders. These groups have been responsible for providing strategic guidance and advice to the SSEP, and we have seen evidence of how they have been used effectively and with agility to flex their input around key delivery points. As the programme develops, it is vital that the governance plan is aligned to the delivery plan of individual workstreams to ensure timely feedback is received from relevant stakeholders.
Stakeholder engagement	DESNZ also stressed the importance of putting the views of local communities at the heart of the SSEP to ensure it is underpinned by public support. NESO has set out a detailed plan to engage with societal stakeholders throughout the development of the programme and beyond the official public consultations in December 2024 and June 2026. This will ensure that the views of wider society are reflected as the SSEP evolves.
Pathway option appraisal	These views will be incorporated into the appraisal of pathway options, with the aim to streamline a final shortlist of up to six options to present to the Energy Secretary. The deliverability assessment is currently structured to meet DESNZ's guidance to appraise pathways by examining the economic, environmental, and societal trade-offs . We suggest adding more details in the methodology on how this assessment will be implemented in practice, and NESO should review the approach to include a swing weighting exercise to adjust the criteria.

We have set out a **summary of our programme review and our recommendations** on the next two pages.

Summary of PwC review by scope area

Below we have provided our overall assessment of each scope area and assigned a RAG rating based on the alignment of the implementation plan against the requirements set out in the DESNZ Commission*.

RAG Key:	 The SSEP methodology aligns with the requirements set out in the DESNZ Commission. The supporting processes needed to enable effective implementation of the plan have also been established.	 The SSEP methodology aligns with the requirements set out in the DESNZ Commission. However, the supporting processes needed to enable effective implementation of the plan are not yet fully in place.	 The SSEP methodology does not fully align with the requirements set out in the DESNZ Commission. The supporting processes needed to enable effective implementation of the plan are also not yet in place.
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Scope Area	Strategy	Implementation plan			Rationale	Page reference
		Green	Amber	Red		
Economic and Geospatial Modelling					The methodology aligns with the requirements set out in the DESNZ Commission, but risks remain around the deliverability of the modelling exercise NESO intends to undertake in the next eight months given its scale.	11 – 13
Environmental and Societal Considerations					The plan in place is well-defined and it aligns with the requirements set out in the DESNZ Commission. The assessment of environmental impacts is well structured and NESO is planning to engage a wide range of societal stakeholders to ensure the SSEP takes the views of wider society into account.	14 – 16
Development of Pathway Options					The methodology aligns with the requirements set out in the DESNZ Commission to deliver a shortlist of up to six pathway options, but risks remain around the development of the pathways and the structure of the appraisal process to ensure the deliverability of the pathways.	17 – 19
Governance					The SSEP's external governance structure aligns with the requirements set out in the DESNZ Commission. Alignment of the governance plan to the delivery plan needs improvement, to ensure the input provided by the advisory groups is incorporated effectively.	20 – 22
Public and Stakeholder Consultation					The methodology aligns with the requirements set out in the DESNZ Commission. NESO is planning to engage with the right set of stakeholders and plans to effectively incorporate their feedback in the SSEP, particularly in the development of the pathways.	23 – 25
Assurance of Delivery					NESO's assurance strategy based on a three lines of defence model is aligned with DESNZ requirements. However, NESO still needs to define a detailed plan outlining the assurance activities and the capabilities needed to validate the ongoing delivery of the SSEP Programme.	26 – 28

Summary of recommendations by scope area

Scope Area	Recommendations	Owner	Due date
Economic and Geospatial Modelling	• Provide more clarity in the modelling methodology – We have suggested reviewing certain parts of the methodology to make the description of process for economic and geospatial modelling more understandable to the reader.	NESO	30 th June 2026
	• Mitigate against risks in sensitivity testing – Given the tight deadline, we have suggested defining a clear and efficient process to run the analysis focusing on 'must-do' sensitivities and internal reviews.		30 th June 2025
Environmental and Societal Considerations	• Apply a consistent approach to applying the SEA assessment framework – We recommend that NESO outlines clearly in its SEA Scoping Report, or any relevant documents thereafter, a consistent approach to applying the SEA Framework to assess pathways.		30 th June 2026
	• Clarify the process for assessing pathways against the societal pillar – Define the criteria by which pathways will be assessed against the societal pillar and the process by which this will be done to ensure consistency across pillars.		30 th June 2025
Pathway Options	• Refine the deliverability assessment weighting exercise – We recommend that NESO either sets stricter and more binding criteria for the deliverability of a scenario, or if NESO intends to pursue its approach to include swing weighting, we recommend that NESO is very clear in its process and maintains a consistent, well-evidenced approach throughout.		18 th July 2025
	• Define the process for stakeholder input to pathway options – After identifying the right people within the governance groups, establish a set structure to collect and incorporate their feedback into the development of pathway options.		30 th June 2025
Governance	• Establish a clear record of the input from governance groups – This is particularly important at key decision points, as it establishes an audit trail to provide evidence of engagement.		30 th June 2025
	• Align the governance plan with the SSEP's delivery plan – The forward-looking governance plan should align with the key delivery points outlined in each workstream's scope to ensure the input from the advisory groups remains effective.		30 th June 2025
Public and Stakeholder Consultation	• Define how the Societal Acceptability Index will be constructed – To secure buy in from societal stakeholders, we suggest a more transparent description of how the index is built. NESO should also ensure it is built to be sufficiently reflective of societal views.		31 st July 2025
	• Ensure safe AI usage in the consultation – To mitigate potential biases and mistakes in AI generated summaries and insights, NESO should record prompts and test them on sample feedback to validate accuracy.		30 th September 2025
Assurance of Delivery	• Finalise the processes for the modelling workstream – Finalising the modelling workstream's delivery plan, including clearly defined milestones, would allow establishing an appropriate first line of controls and building the broader SSEP assurance plan around it.		30 th June 2025
	• Refresh the overall assurance plan – The three lines of defence need to be better coordinated by clearly defining the roles, responsibilities, and activities within each line.		30 th June 2025
	• Finalise the resourcing plan – NESO should assess capacity across all workstreams to ensure sufficient resources are in place to meet assurance requirements and identify the most suitable individuals for each line of defence.		31 st July 2025

3. Findings and Recommendations

Redacted and disclosed under the EIR

Economic and Geospatial Modelling

Overview of DESNZ Requirements and NESO's approach

DESNZ Requirements

- The SSEP should identify potential **cost-effective locations for future electricity and hydrogen infrastructure**, co-optimising the electricity and hydrogen systems and high-level network needs to minimise total energy system cost.
- The results of the modelling must be realistic and subject to robust energy security constraints, net zero emissions targets, and land and sea constraints.
- NESO should model various scenarios of future versions of the energy system and **conduct sensitivity testing to test areas of uncertainty**.
- NESO should use the outputs from the modelling exercise to create a set of between **four and six SSEP pathway options**, modelled over a ~25 year time horizon.

Summary of NESO's approach

Strategy

- The SSEP will use **economic and geospatial modelling** to identify scenarios for the future of the GB energy system.
- The geospatial modelling, which assesses the spatial configuration of the future energy system and what land is available to be used, will feed directly into the economic modelling and produce potential scenarios to be appraised.
- NESO will use **PLEXOS for the economic modelling**. This is an energy market simulation tool that is designed to optimise aspects of the energy system and minimise the total system cost for the given simulation.
- The energy network and generation context used for the government's **Clean Power 2030 Plan** constitutes the **SSEP baseline**, which is the starting point for the multiple scenarios modelled.

Implementation

- SSEP uses PLEXOS to simulate energy system scenarios and optimises costs to identify the **optimal zonal distribution of electricity and hydrogen generation and storage technologies**.
- The economic modelling incorporates **inputs determined by NESO, DESNZ, and Ofgem**. Inputs include demand forecasts, technology costs, and spatial exclusions, amongst others.
- Based on a set of inputs to the PLEXOS model, the economic modelling produces an initial output and **iterates with the geospatial modelling** to shape and develop pathway options for the SSEP.

Economic and Geospatial Modelling – Summary

Analysis of NESO's strategy and implementation plan



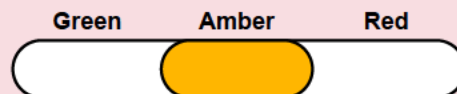
Step 1: Strategy



NESO has established a strategy which meets DESNZ requirements.



Step 2: Implementation plan



The methodology aligns with the requirements set out in the DESNZ Commission, but risks remain around the deliverability of the modelling and the assurance processes.



Step 3: Key Observations

- **Capabilities using PLEXOS:** NESO has established it will model the GB energy market using PLEXOS. NESO has experience with this tool, having conducted analysis with it in similar use cases. NESO is also working with Energy Exemplar (the PLEXOS software developer) to ensure the SSEP modelling team is sufficiently skilled to use the software by running training sessions.
- **Assurance of the modelling:** Implementing the correct assurance processes in the modelling is a key step to meeting DESNZ requirements and delivering a successful SSEP. The assurance activities are not yet formalised and there is the risk that they are missing key first line activities, which are key to enabling successful of second and third line activities. The next step is to ensure the second and third line activities are coordinated alongside these. This is covered in more detail in the Assurance section.
- **Lack of clarity in the economic modelling:** The SSEP methodology document lacks clarity in explaining the end-to-end modelling process and could be improved using more visuals and better signposting throughout the text to make complex modelling accessible to a broader audience.
- **Spatial suitability assessment:** NESO will run a 'spatial suitability' assessment to account for the 'soft' spatial constraints. The assessment will review spatial constraints and opportunities based on a set of scoring criteria, which is still being developed. Whilst the process and application was clear from our interviews, this could be developed further in the methodology to give more clarity.
- **Delivery risks in sensitivity testing:** We noted the potential risk of NESO not having sufficient time to run its planned sensitivity testing in a one-month window. NESO has been ambitious in its plan to test both pathway and exploratory sensitivities, with each requiring considerable time to test thoroughly. NESO has begun to take steps to mitigate this risk by setting out a priority list of sensitivities, which is an appropriate step. Developing the internal review process around the sensitivities is a key additional step to bring rigour to the analysis and avoid mistakes being discovered subsequently.

Economic and Geospatial Modelling – Findings and recommendations

	1 – Clarity in the modelling methodology	2 – Mitigate against risks in sensitivity testing
Finding	There are sections of the economic modelling methodology which are very rich with content, but they are presented in a way that makes it difficult to understand and follow the process .	Due to the deadline of delivering pathway options by the end of the year, there is the risk that there is insufficient time to complete the sensitivity testing , a key part of the modelling exercise.
Impact	There is the risk that readers do not understand the modelling and analysis underpinning the SSEP. This would undermine the success of the programme in securing buy in from the public and industry stakeholders.	NESO is being ambitious with its plan to run both pathway and exploratory sensitivities. If any of these sensitivities are not completed, this could result in delays in subsequent stages of the SSEP as pathways are developed and appraised. Additionally, key stakeholders could question the reliability of the SSEP if important sensitivities are not run due to bottlenecks in the process.
Recommendation	We have identified several ways to improve the methodology: 1. The modelling assumptions could be summarised with a consistent structure, moving any additional detail into the Appendix. 2. The diagram of the modelling process is key to visualise the end-to-end process and should be used in each step of the methodology. 3. The process for Optimisation could be improved by representing the process visually in a similar style as the modelling process. 4. Use a worked example for the spatial suitability assessment, for example the analysis shown in the SEP technical webinar on the 3rd April.	We recommend setting a clear and efficient process to run the sensitivity analysis: 1. Focus the testing on the 'must do' sensitivities which deliver the minimum requirements of the SSEP modelling. 2. Validate the plan of key sensitivities to test with the governance groups. 3. Conduct internal reviews of the modelling before starting the sensitivity testing and review the outputs of the testing to validate the results.
Priority	Medium	High

Environmental and Societal Considerations

Overview of DESNZ Requirements and NESO's approach

DESNZ Requirements

- The SSEP will give **due consideration to environmental impacts** and the government's environmental commitments, statutory duties and targets, throughout its production and in the economic and geospatial modelling exercise.
- The UK Energy Secretary will select one pathway for NESO to use for a **habitats regulations assessment (HRA)** and will be the 'draft plan' for the purposes of the **Strategic Environmental Assessment (SEA) Report**, before finalising the SSEP.
- The SSEP should consider wider demands on land and sea, such as **competing cross-sectoral demands** (e.g. food production, transport, tourism, and others).

Summary of NESO's approach

Strategy

- The SSEP will integrate **environmental considerations throughout, from conceptualisation to completion**, as shown in [Appendix B](#), based on three distinct but complementary processes:
 - Spatial evaluation / Strategic Environmental Assessment (SEA) / Habitats Regulations Assessment (HRA).
- NESO will engage with the relevant regulatory bodies throughout and will share the draft SEA and HRA reports for comment.
- It will also engage with the SSEP's Environmental Working Group throughout, which includes relevant Statutory Nature Conservation Bodies, and the Societal Groups Working Group as the outputs from the modelling are developed.

Implementation

- NESO has developed a structured approach for conducting the SEA and HRA assessments. It will use AECOM, an external delivery partner, to undertake the assessments and validate the results.
- The **deliverability of different pathways will be assessed against environmental and societal impacts** using a weighted deliverability assessment.
- In addition to the SEA and HRA, NESO has identified through engagement with relevant stakeholders that it should also undertake a **Marine Conservation Zones (MCZ) assessment of the pathway options**. The approach for this is being developed alongside the other environmental assessments.
- Once the final pathway has been chosen by the UK Energy Secretary, the results of the environmental assessments will be made public for consultation.

Environmental and Societal Considerations – Summary

Analysis of NESO's strategy and implementation plan



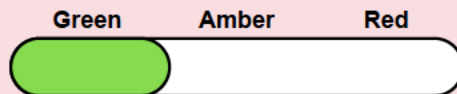
Step 1: Strategy



NESO has established a strategy which meets DESNZ requirements.



Step 2: Implementation plan



The assessment of environmental impacts and NESO's plan for societal engagement in the SSEP are well structured and align with the requirements set out in the DESNZ Commission.



Step 3: Key Observations

- **Approach to conducting environmental assessments:** NESO has established a clear process for the HRA and SEA assessments which aligns with the DESNZ Commission, delivered by AECOM, detailed in [Appendix B](#). AECOM as an independent third-party bring strong experience in environmental impact assessments and compliance with environmental legal standards.
- **Addition of the MCZ environmental assessment:** In response to stakeholder feedback, and going beyond the DESNZ Commission, NESO is planning to conduct a Marine Conservation Zones (MCZ) assessment of the pathway options. The addition of the MCZ helps mitigate against one of the delivery risks of the SSEP, whereby NESO could receive pushback from stakeholders on compliance with environmental legislation.
- **Societal research:** NESO is planning to undertake societal research to understand the views of different stakeholder groups on the developing of pathway options. This is in addition to the public consultations on the methodology (covered in the Public and Stakeholder Consultation section) to get emerging views on potential pathways and support decision making. This is a positive step to ensure a wide range of views, not just in industry and government, are consulted.
- **SEA assessment criteria:** NESO has set out an SEA framework to assess the environmental impact of pathway options with a comprehensive set of questions covering a range of environmental criteria. While the framework is comprehensive, the large number of indicators makes it complex for the evaluation to remain practical to apply.
- **Societal considerations in the deliverability assessment:** NESO's approach to assessing the deliverability of pathway options against four pillars includes a societal and an 'other spatial uses' pillar. As outlined in the Pathway Options section, the assessment of impacts against these pillars remains slightly unclear, posing a potential risk to the consistent evaluation of pathway options.

Environmental and Societal Considerations – Findings and recommendations

	1 – Apply a consistent SEA assessment framework	2 – Deliverability assessment societal pillar
Finding	NESO intends to use a specific set of assessment questions and indicators from the SEA framework based on what is relevant to the assessment each time. Fewer questions reduce the burden on the assessor and make the process more manageable. However, this process has not been made clear in the SSEP methodology, or the SEA Scoping Report.	The methodology for the deliverability assessment on the pathway options does not provide sufficient detail on the criteria that will be used to assess the pathways against the societal pillar.
Impact	A lack of clarity in the process used to assess the environmental impacts of pathways risks undermining the process and resulting in external stakeholders applying challenge to NESO's approach.	Without appraisal against a defined set of criteria, there is a risk the process will be inconsistent and not withstand external scrutiny . In particular, the absence of clear criteria for assessing and comparing pathways against the societal pillar risks undermining stakeholder buy-in.
Recommendation	We recommend that NESO outlines clearly in its SEA Scoping Report, or any relevant documents thereafter, its approach to applying the SEA Framework to assess pathways. This should include: • more detail on how NESO selects which questions and indicators to be used based on their relevance to the pathway in question; • more details on how the assessment will be undertaken. This is to ensure consistency and provide a clear evidence base in the eventuality that NESO is challenged by external stakeholders to provide its reasoning behind the environmental assessment process.	During the pathway deliverability process, decide upon the best- and worst-case pathway impacts against the societal pillar. Once this is established, define the criteria by which pathways will be assessed against the societal pillar and the process by which this will be done to ensure consistency and give clarity for how this pillar will be assessed.
Priority	Low	Medium

Pathway Options

Overview of DESNZ Requirements and NESO's approach

DESNZ Requirements

- NESO should use the results from the modelling exercise to create a **set of between four and six SSEP pathway options**.
- Pathway options should range from **at least one “low regret” pathway**, featuring future infrastructure that will be robust across most/all plausible futures, to other options reflecting different, higher risk scenarios featuring additional infrastructure that will be robust across some plausible futures.
- The **UK Energy Secretary will choose the final pathway** to be published, but it is up to NESO to decide which options to present to them. NESO should include commentary for each pathway, the results of the modelling exercise, environmental assessments, and how they align with wider government policies.

Summary of NESO's approach

Strategy

- NESO will present a set of up to six pathway options to the UK Energy Secretary, including a ‘low regrets’ option. The other options will consist of **those most likely to succeed across a range of plausible futures**, while considering the interests of stakeholder groups.
- The modelling exercise will facilitate the assessment of multiple scenarios and identify the trade-offs. The developed pathways will be presented to the governance groups to gather feedback and aid NESO's decision making.
- NESO will accompany all shortlisted options with an explanation of when and where infrastructure should be built across GB on a zonal level, how this differs between pathway options, and the key factors driving these differences.

Implementation

- NESO has established a **policy framework that considers future scenarios for the energy system** to guide the development of the modelling exercise. The framework examines scenarios using different proportions of renewables and usage of hydrogen vs electrification for heat.
- **Pathways will be assessed against their ability to achieve SSEP objectives**, with the principles guiding this being: minimising costs, minimising spatial impact, maximising spatial opportunity, achieving future policy scenarios.
- This pathway assessment will be conducted using a ‘**deliverability assessment**’, whereby pathways are scored against criteria to assess how deliverable they are.

Pathway Options – Summary

Analysis of NESO's strategy and implementation plan



Step 1: Strategy



NESO has established a strategy which meets DESNZ requirements.



Step 2: Implementation plan



The methodology aligns with the requirements set out in the DESNZ Commission, but further clarity is needed on the deliverability assessment and how stakeholder input will be used to assess pathways.



Step 3: Key Observations

- **Clarity of the deliverability assessment:** NESO will assess each pathway's option deliverability against four pillars - economic, environmental, societal, and other spatial uses. Our review suggests that the approach NESO uses to assess the societal pillar is unclear and should be developed (as discussed in the Environmental and Societal Considerations section).
- **Aligning with Green Book guidance:** Our preliminary high-level assessment reveals that the process of appraisal of the pathway options appears to be aligned to Green Book guidance on "longlist options appraisal". This involves creating a longlist of options and applying a clear and defined set of criteria to filter these to a shortlist, with the reasons for exclusion or inclusion recorded transparently. The Green Book also recommends stakeholder engagement throughout the process, which NESO is doing effectively through its use of the governance groups.
- **Approach to weighting the deliverability assessment:** NESO proposes that if a pathway option is deemed not deliverable due to its impact on one or more pillars, a swing weighting exercise will be used to identify any compromises that can be made on the criteria weightings to achieve a deliverable pathway. However, the process for this weighting exercise is unclear and risks undermining the purpose of running the deliverability assessment.
- **Stakeholder input to choosing and guiding the pathway options:** NESO plans to engage with stakeholders throughout the process using its governance structure to provide feedback on the development of the pathway options. This feedback should be collected in an organised way to feed into the appraisal process.

Pathway Options – Findings and recommendations

	1 – Refine the deliverability assessment swing weighting exercise	2 – Define the process for stakeholder input into pathway options
Finding	When a pathway is deemed undeliverable against the four pillars, NESO plans to use a <i>swing weighting</i> exercise to identify any compromises that can be made on the criteria weightings to achieve a deliverable pathway. The rationale behind this, and the different steps of the process, are not clearly explained in the SSEP methodology.	NESO intends to consult a wide range of stakeholders and the timeframe in which to do this is very narrow.
Impact	The purpose of the assessment is to compare the deliverability of pathways. The swing weighting exercise risks validating pathways that are deemed to be undeliverable against the existing framework. Validating such pathways would imply that the pillars can be flexed subjectively, and this undermines the credibility of the assessment framework.	Insufficient time might result in a lack of support for the final pathway options from the stakeholder groups whose engagement was rushed. This might hinder, or slow down, the pathway development and implementation of their feedback.
Recommendation	We recommend that NESO either (a) eliminates the swing weighting and sets a new set of deliverability criteria that do not require adjustments. These criteria need to be sufficiently loose to deem viable the pathways that were requiring adjustments under the current framework; or (b) if NESO intends to pursue its approach to include swing weighting, it needs to clearly set what the process is and maintain a consistent, well-evidenced approach throughout. NESO should give the Secretary of State and stakeholders full visibility of (i) where and why <i>swing weighting</i> of the criteria has been applied; (ii) the consequences against each of the pillars for doing so.	After ensuring the right people have been identified in the governance groups, establish a set structure to collect and incorporate feedback into the development of pathway options. We suggest collecting feedback in written form at particular milestones, for example with a scoring or voting system, which are easy to store and interpret.
Priority	High	Medium

Governance

Overview of DESNZ Requirements and NESO's approach

DESNZ Requirements

- Effective external governance* needs to be in place throughout the development of the SSEP to **ensure accountability** and that the **SSEP is underpinned by a clear, democratic mandate** while fully respecting NESO's operational independence.
- A key principle is to **seek consensus between organisations**, with the SSEP needing to be aligned with wider UK government objectives.
- NESO should implement a governance structure, which at a minimum should include:
 - An SSEP Committee
 - UK Government Advisory Group
 - Devolved Administration Advisory Group
 - Expert Advisory Group
 - Analytical Evidence Advisory Group

Summary of NESO's approach

Strategy

- NESO has established a governance structure which will **provide advice and guidance to the SSEP**, giving oversight and accountability from government and facilitating feedback from a wide range of stakeholders.
- As the SSEP develops, NESO will ensure that crucial outputs and discussion points are taken to the relevant external governance forums to provide external steer and validate the approach taken to deliver key outputs.
- The **governance groups are not decision makers** and are there to provide the necessary support to the SSEP, whilst respecting NESO's operational independence.

Implementation

- NESO has implemented an **external governance structure aligned to that proposed by DESNZ**, with five main groups (SSEP Committee, Cross Government Advisory Group, Devolved Administration Advisory Group, Analytical Evidence Advisory Group, Expert Advisory Group) and additional working groups. The structure is shown in [Appendix B](#).
- These groups meet at a cadence of every 1-2 months, and are attended by representatives across NESO, DESNZ, Ofgem, the devolved governments, and industry representatives where necessary.
- The **SSEP Committee provides overall strategic direction and advice** on the development and production of the SSEP, with other advisory groups escalating issues to the SSEP Committee.

Governance – Summary

Analysis of NESO's strategy and implementation plan



Step 1: Strategy



NESO has established a strategy which meets DESNZ requirements.



Step 2: Implementation plan



The governance structure aligns with the requirements set out in the DESNZ Commission, and as the pathway options are developed it is key that the governance plan is aligned with the SSEP's delivery plan.



Step 3: Key Observations

- **Structure of the governance groups:** The external governance framework is well defined, with clear communication channels and well-established group roles and memberships. The groups are structured to feed into one another efficiently, supporting coordination throughout the SSEP Programme.
- **Industry membership of groups:** NESO's external governance structure includes key stakeholders as recommended by DESNZ. Feedback from the first public consultation proposed broader representation from industry groups in the Expert Advisory and Industry Working Groups, which has been reflected in the updated methodology. This is a good step to ensure buy-in from key industry stakeholders in the SSEP, and NESO will need to remain flexible in ensuring the right stakeholders are in attendance and contributing to the SSEP.
- **Monitoring governance groups contribution:** NESO has been clear that the governance groups are there to provide guidance on the development of the SSEP but not make decisions. Based on our interviews with SSEP workstreams we have seen evidence of this role being played by the governance groups. Going forward, it is important to keep track of feedback from these groups throughout the development of the SSEP.
- **Align meetings to delivery plan:** NESO has applied an agile approach to its use of the governance groups as it developed the modelling approach. As the modelling develops in the coming months, it is important that NESO aligns the schedule of the governance groups to key delivery points where the expert advice provided by external stakeholders can be most beneficial.

Governance – Findings and recommendations

	1 – Establish a clear record of the input from governance groups	2 – Align the governance plan with the SSEP's delivery plan
Finding	The process by which NESO records and implements the input received from governance groups could be developed to show that the SSEP is underpinned by support from key stakeholders.	The SSEP has not yet established a formalised governance plan for the next phase of the programme , which presents a risk that the governance groups are not feeding into the SSEP at the right time, or with the right stakeholders.
Impact	Given the SSEP will be delivered independently by NESO and will not have regulatory authority to enforce the chosen pathway, it will need to demonstrate alignment with all key stakeholder groups and be able to evidence that engagement through the governance groups. Failure to effectively capture the outputs from governance could undermine the SSEP's ability to demonstrate stakeholder buy-in and may result in challenges for the final SSEP pathway option.	As the programme progresses into the modelling stage and input is required on pathway options, a lack of structured and frequent engagement with external advisory groups could reduce the effectiveness of governance to support timely decision making.
Recommendation	NESO should set a robust way of receiving and recording feedback from governance groups throughout the development of the SSEP. We suggest maintaining clear records of the input from the governance groups at key decision points , establishing an audit trail to provide evidence of engagement. For example, we suggest establishing a written channel for stakeholders to provide written feedback, to form a record of inputs alongside the minutes collected from meetings.	The programme should update its governance plan to align with the key delivery points outlined in each workstream's scope. We recommend establishing sessions at key points in the development of pathways, such as a set date where a longlist of options can be presented to receive feedback from all groups. This would create structure and ensure that key stakeholders remain engaged with the SSEP.
Priority	Medium	High

Public and Stakeholder Consultation

Overview of DESNZ Requirements and NESO's approach

DESNZ Requirements

- The SSEP will be informed by engagement with the British public and interested parties, including industry bodies, NGOs and relevant local government associations.
- The purpose of the consultation is to listen to views of the public and create a channel where GB's energy transition can be discussed. The views of societies and communities should be at the heart of the SSEP.
- Once the SSEP pathway has been chosen, NESO will consult the public, industry and statutory bodies to seek feedback on the chosen pathway.
- Engagement techniques should include roundtables, workshops, surveys and innovative techniques of engagement.

Summary of NESO's approach

Strategy

- NESO will gather **insights, perspectives and recommendations from a wide range of stakeholders** in the development of the SSEP. This includes the UK government, industry groups, environmental and societal bodies, and local communities.
- There will be different channels for these, with engagement happening **via the governance groups and through public consultation**.
- After the Energy Secretary has selected the final pathway for the SSEP, NESO will give a wide range of stakeholders the opportunity to have their say, with feedback implemented into the final published SSEP.

Implementation

- NESO will engage with the public through opinion surveys, focus groups, outreach to prominent interest and campaign groups, and producing sector-specific briefing packs. The first consultation on the draft methodology has already taken place in December 2024, with feedback implemented into the updated SSEP.
- NESO will deploy a range of communication tools and diverse engagement methods, including visual representations of the plan, technical webinars, and stakeholder meetings.
- The **consultation plan for the final SSEP pathway option and the environmental assessments has been established** and will begin after the Energy Secretary has chosen the pathway option.

Public and Stakeholder Consultation – Summary

Analysis of NESO's strategy and implementation plan



Step 1: Strategy



NESO has established a strategy which meets DESNZ requirements.



Step 2: Implementation plan

Green

Amber

Red



The methodology aligns with the requirements set out in the DESNZ Commission, and NESO is planning to engage with the right range of stakeholders and reflect this feedback in the SSEP.



Step 3: Key Observations

- **Engagement from industry stakeholders:** NESO will hold consultations on the draft methodology and draft SSEP. While DESNZ Commission does not mention the requirement of any further consultations, NESO recognises the need for ongoing stakeholder engagement. A key area is proactive engagement with industry groups, and NESO has taken steps to expand the Industry Working Group and Expert Advisory Group, ensuring a broader range of views from the energy industry are considered.
- **Consultation timing:** NESO's methodology consultation took place over the Christmas period, and the draft SSEP consultation is scheduled for summer 2026. These timings may be disruptive and, given the holiday period, reduce engagement. We note that to mitigate this, NESO is engaging with stakeholders through societal forums and governance groups, ensuring feedback is gathered continuously and fed into the development of the SSEP.
- **Societal engagement:** For an inclusive approach, societal views need to be integrated into the pathway appraisal. NESO has taken steps to do so by proposing a Societal Acceptability Index which will be provided in the evidence base share with the Energy Secretary. It is important for the Societal Acceptability Index to be built in a transparent way, reflecting societal perspectives.
- **Use of innovative technology:** To support the review and analysis of responses, NESO will use a range of tools, including AI, to enhance efficiency and summarise the public feedback. From our interviews we understand that safeguards will be put in place to ensure that the AI software and its outputs will be reviewed and will not be used to make decisions independently. However, we see a risk that biases might remain in the AI software, such as certain inputs being given higher weighting in the outputs.

Public and Stakeholder Consultation – Findings and recommendations

	1 – Define how the Societal Acceptability Index will be constructed	2 – Ensure safe AI usage in the consultation
Finding	Societal perspectives and consent are essential to designing an inclusive, robust programme. The process for constructing the Societal Acceptability Index and how it will be used to assess pathway options is not clear in the methodology.	Using AI to summarise and analyse the large volume of information gathered through the public consultation could lead to inaccurate outputs due to biases existing in the AI software towards particular feedback or wording.
Impact	Failing to embed ongoing societal feedback throughout the development of the SSEP risks possible pushback from community groups who may feel excluded from the decision-making process.	AI technology can often function as a black box, and without appropriate safeguards for responsible use and human verification, there is a risk of inaccuracies—such as certain feedback being given disproportionate weight.
Recommendation	To ensure meaningful feedback, the societal groups currently used as proxies must accurately reflect broader societal perspectives. For transparency, NESO should document the steps taken to build the index and demonstrate how it will represent wider societal opinions and relevant stakeholder views. Once established, this explanation should be included in the methodology.	We suggest 3 steps to ensure safe AI usage: • Use detailed and clear prompts to AI when interrogating the feedback. • Record the prompts used and the results generated to allow for independent reviews during the assurance process. • Use test runs on a small sample of feedback to test the results the AI has provided, such as asking for quotes and manually verifying them.
Priority	Medium	Medium

Assurance of delivery

Overview of DESNZ Requirements and NESO's approach

DESNZ Requirements

- NESO should clearly set out their proposed quality assurance process in the SSEP methodology, which should align with **Aqua Book guidance** and make use of the DESNZ quality assurance and modelling assumptions logs.
- Quality assurance documents should be regularly reviewed by the Analytical Evidence Advisory Group.

Aqua Book guidance on assurance

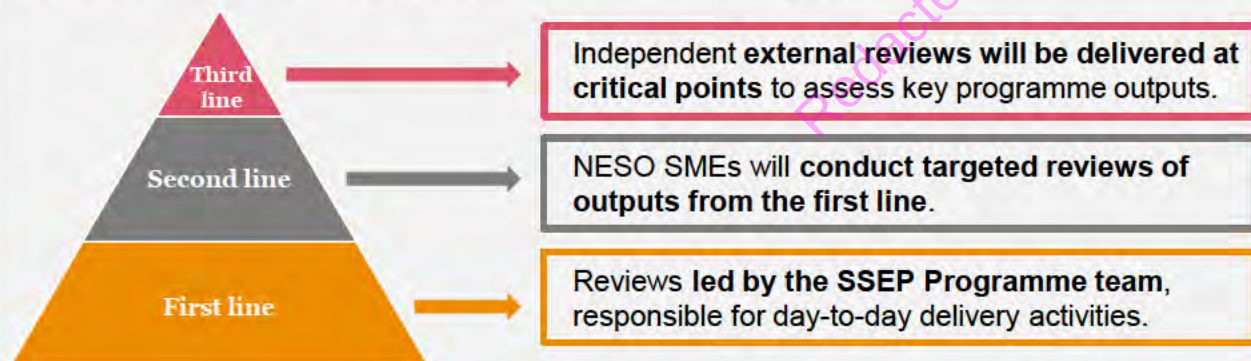
There is no “one size fits all” approach to assurance. Rather, quality assurance is delivered through a variety of different activities depending on the programme context.

Quality assurance guidance includes:

- ✓ *Creating the right environment*: Assurance requires a **well understood chain of responsibility** and sufficient time for effective challenge;
- ✓ *Embedded assurance*: Assurance **throughout the lifecycle of the analysis**, as opposed to just at the end;
- ✓ *Peer review*: Internal or external critical challenge on the analysis to **provide sufficient rigour**.

Summary of NESO's approach

- NESO has established a ‘three lines of defence’ model for assurance:



- SSEP assurance is split between **programme delivery assurance** and **technical assurance**.

- Programme delivery will focus on the management of SSEP and ensuring the programme delivers its outputs on time.
- Technical assurance will prioritise reviewing the analytical work that underpins the SSEP. This includes the role of the Analytical Evidence Advisory Group that oversees the modelling process.

Assurance of delivery – Summary

Analysis of NESO's strategy and implementation plan



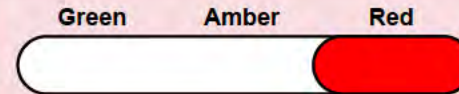
Step 1: Strategy



NESO has established a strategy which meets DESNZ requirements.



Step 2: Implementation plan



NESO has developed an assurance strategy; however, it is yet to define a detailed plan outlining the assurance activities and the capabilities needed within the three lines of defence.



Step 3: Key Observations

- **Defining the lines of defence:** The programme has, through working with its external delivery partner, Turner & Townsend, developed an assurance strategy based on a three lines of defence model.
 - **First line:** These activities will be carried out within the programme teams to assure the quality of its outputs. From interviews with individual SSEP workstreams, we found that several activities within this line are already taking place.
 - **Second line:** This set of reviews will be conducted by NESO resources who are independent of the SSEP. NESO has established that the programme is only able to advance at several key milestones once assurance by the second line has taken place. Although people have begun to be identified for this line, the assurance activities have not yet started.
 - **Third line:** An independent third-party is scheduled to perform reviews of the SSEP at key milestones of the modelling and programme delivery, with the first milestone outlined in the assurance strategy for May.
- **Aligning with Aqua Book guidance:** The SSEP Programme has recognised the need to meet Aqua Book guidance and is developing its assurance strategy accordingly. This is noticeable particularly in the modelling workstream where our interviews have confirmed that assurance activities are established which align with Aqua Book guidance, including maintaining logs of assumptions and model runs, and internal peer reviews.

Assurance of delivery – Findings and recommendations

	1 – Finalise the processes for the modelling workstream	2 – Refresh the overall assurance plan	3 – Finalise the resourcing plan
Finding	The scope of work and key delivery points in the modelling are not yet defined, which has prevented the programme from establishing its first line assurance controls, limiting the progress of the broader assurance plan.	The three-lines of defence plan for assurance is well-founded but could be better coordinated between the lines and the points of action for when assurance is necessary.	It is unclear whether NESO have identified the right people for each line of defence , and whether they have sufficient capacity to deliver the right level of assurance.
Impact	The lack of a defined scope has prevented the programme from setting its first line controls, and subsequent second and third line assurance activities. The lack of clarity makes it difficult to establish when reviews are needed and risks having to backtrack the assurance process.	Without effective coordination between the three lines of defence, there is a risk of gaps in assurance coverage. If it cannot be evidenced that robust assurance has been applied throughout delivery, this could lead to key aspects of the SSEP pathways being challenged in the future.	Without sufficient capacity and time given to assurance, there is the risk that it is not thorough enough which results in delays to the SSEP.
Recommendation	The modelling workstream should prioritise finalising its delivery plan, including clearly defined milestones. Once this is completed, it would enable the establishment of appropriate first line controls , focusing on the key risks within the modelling delivery activities.	To refresh the assurance plan, NESO should: - Clearly define the parties and activities involved in each line of defence. - Structure the second and third line activities that enable oversight and independent review of the first-line controls.	Once the scope of work has been finalised in each workstream, NESO should consider whether it has the available capacity in each workstream to deliver the assurance requirements. It should review the resourcing model built into each line to ensure there is sufficient capacity around the key milestones to avoid bottlenecks and delays.
Priority	High	High	Medium

Appendix A: Fieldwork

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How have we used our sources

How have we used our document reviews and stakeholder interviews?



Document reviews

- In each scope area we have reviewed relevant documentation which supplements the main SSEP methodology, as shown on slide 30.
- This documentation has provided further details beyond what was published publicly by NESO and given insights into the process followed by individual workstreams to arrive at the draft SSEP methodology.



Stakeholder interviews

- In each scope area we have conducted interviews with key stakeholders, as shown on slide 31.
- In these interviews we have used the exam questions by scope area (slides 37-38) to guide the questioning.
- The interviews have been used to interrogate the SSEP methodology further and understand how it has evolved as the programme has developed, and validate our understanding based on what we found from our initial review of the methodology.

Documents reviewed

Ref	Document
Overall programme files	
01	DESNZ: SSEP Commission to NESO
02	NESO: SSEP, Draft methodology (December 2024)
03	NESO: SSEP, Updated methodology (March 2025)
Economic and Geospatial Modelling	
04	Evaluation Framework Options Decision
05	Spatial Evaluation Framework Draft Playbook
Environmental and Societal Considerations	
06	SSEP SEA Scoping Report (Draft)
Governance	
07	SSEP External Governance Structure Master Pack
08	SSEP External Governance Tracker (Excel)
09	SSEP Committee minutes and files (5 meetings)
10	SSEP Committee Working Group minutes and files (6 meetings)

Ref	Document
Public and Stakeholder Consultation	
11	SSEP Engagement Plan
12	SSEP Stakeholder Strategy
13	SSEP Stakeholder Map
14	SSEP Industry Engagement Plan
15	Societal Forum Mapping
16	Host Area - stakeholder mapping and routine engagement programme
Assurance	
17	SSEP assurance strategy (Turner & Townsend)
18	SSEP integrated assurance plan
19	SSEP assurance RACI matrix

Stakeholder interviews

Interviewee	Programme Role	Date
		6 th and 12 th March 2025
		11 th and 21 st March 2025
		11 th March 2025
		13 th March 2025
		18 th March 2025
		18 th March 2025
		18 th March 2025
		21 st March 2025
		21 st March 2025
		21 st March 2025

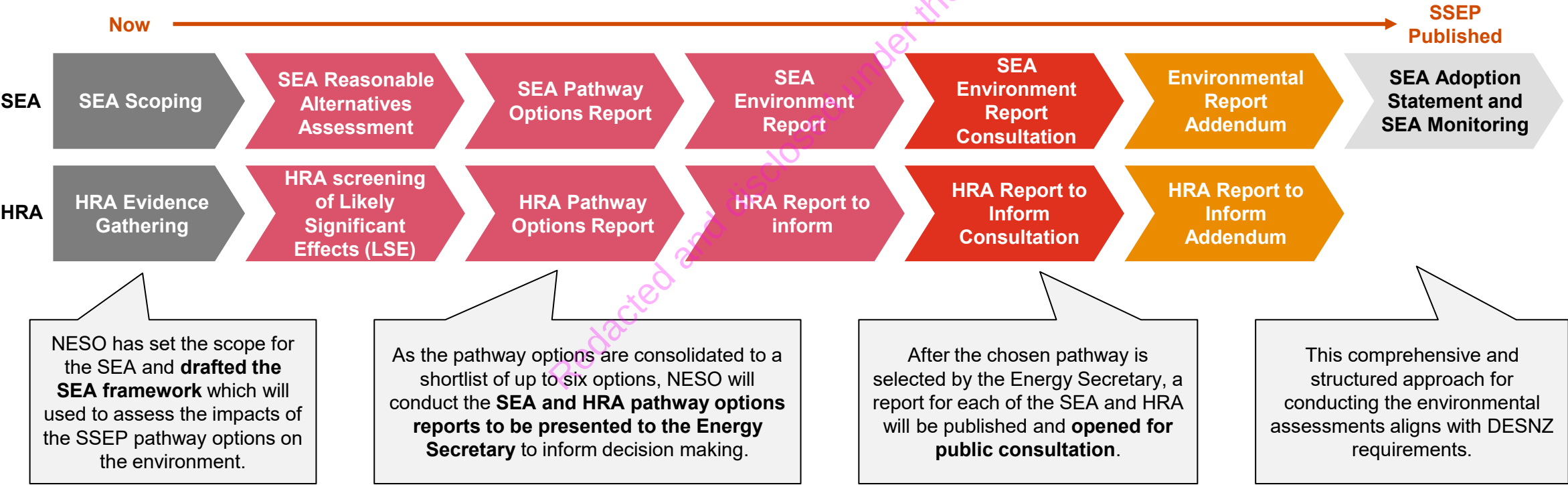
Appendix B: Background

Redacted and disclosed under the EIR

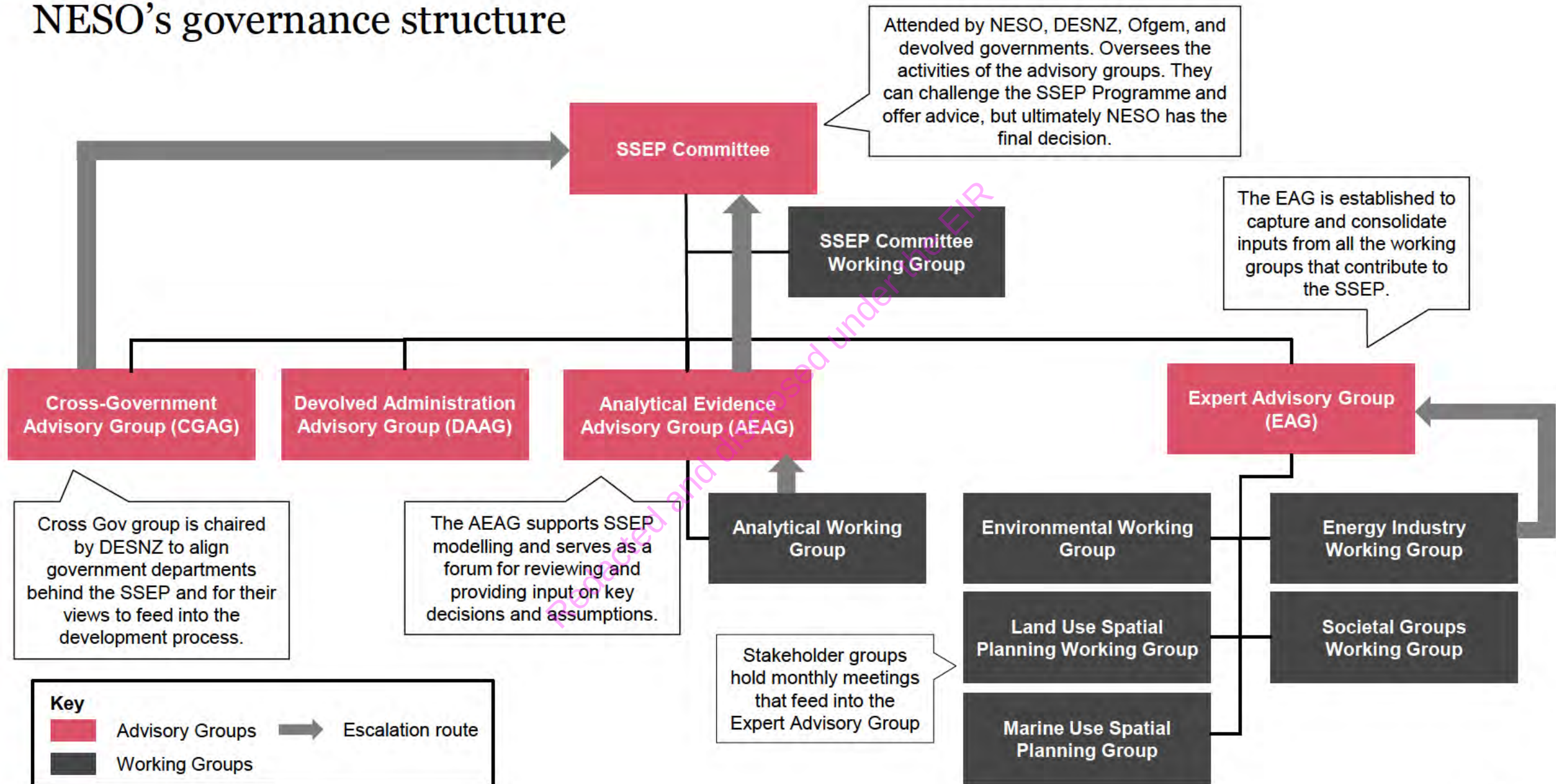
Environmental assessment approach

SEA and HRA integration within SSEP

- DESNZ requirements state that as part of developing the SSEP, NESO is to conduct an SEA and HRA as part of the assessment of the pathway options.
- NESO have mapped out the process for integrating the SEA and HRA environmental assessments in the SSEP Programme as shown below, with clear stages where different steps will be triggered.
- From our review of the updated methodology as of March 2025, and fieldwork with the environmental team at NESO, we can see there is an ongoing process to integrate a Marine Conservation Zone (MCZ) assessment into the SSEP.



NESO's governance structure



SSEP assurance roadmap

Where is NESO currently and what needs to be done

Assurance Strategy Development

In response to the SSEP requirements outlined in DESNZ's original consultation, the SSEP Programme developed an assurance strategy that applies a three lines of defence model to support ongoing validation of the SSEP deliverables.

Define Assurance Plan

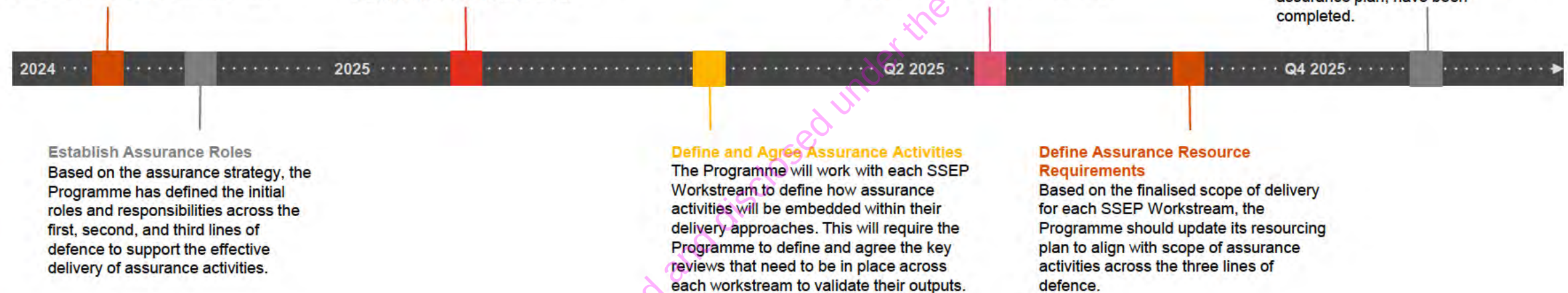
The SSEP Programme is developing its assurance plan, which will outline all assurance activities across the first, second, and third lines. The plan will define the assurance activities needed to validate the SSEP deliverables.

Refresh the Assurance Plan

Based on the agreed assurance activities for each SSEP Workstream, the Programme should update its assurance plan to capture the assurance activities across the three lines of defence needed to support ongoing and future delivery.

Embed Assurance Within Internal Governance and Stage-Gate Reviews

The Programme should use existing stage-gate and internal governance reviews to validate that the required assurance activities, as outlined in the assurance plan, have been completed.



Summary of assurance activities to date

- **Governance Oversight** – The programme has used internal governance structures, including the SEP Programme Management Board and Steering Committees, to review key outputs such as the methodology. The internal governance has also been used to support alignment between the SSEP and the wider SEP Portfolio, including CSNP.
- **Assurance Strategy Development** – The Programme has developed an assurance strategy based on a three lines of defence model, but further work is needed to define roles and timings for when assurance is necessary.

Appendix C: Scope area questions

Redacted and disclosed under the EIR

Questions by scope area

We have outlined the following key exam questions to evaluate how well NESO's SSEP methodology aligns with DESNZ's requirements for SSEP. These questions are based on our understanding of DESNZ's key requirements, as outlined in the DESNZ commission to NESO.

Topic Area	Key Exam Questions
<i>Economic and Geospatial Modelling Approach</i>	1. Does the SSEP methodology establish a structured approach for economic modelling that effectively identifies cost-effective, and realistic locations for future electricity and hydrogen infrastructure while minimising total energy system costs? 2. Does the SSEP methodology define how “hard” constraints (legal/physical restrictions) and “soft” constraints (environmental, cross-sectoral land/sea use considerations) will be applied within models? 3. Has the SSEP methodology defined how scenario testing and sensitivity analysis will be applied to enhance the resilience of models against future energy system uncertainties? 4. To what extent does the approach outlined in the NESO SSEP methodology align with HM Treasury's Green Book principles, supporting a comprehensive cost-benefit analysis and value-for-money assessment?
<i>Environmental and Societal Considerations</i>	1. Does the SSEP methodology establish a comprehensive approach for capturing environmental considerations to inform the inputs for economic and geospatial models? 2. Does the SSEP methodology establish a clear and systematic approach for conducting Strategic Environmental Assessment (SEA) and Habitats Regulations Assessment (HRA), ensuring compliance with relevant legislative requirements?
<i>Development of Pathway Options</i>	1. Does the NESO methodology define how the SSEP pathway options will be developed, including a 'low regret' option and alternative pathways, using insights from economic and geospatial models? 2. Does the methodology outline an approach for assessing pathway options by considering infrastructure costs, environmental implications, and alignment with UK, Scottish, and Welsh government policies, plans, and targets? 3. Does the methodology establish a clear and transparent process for reviewing, refining, and approving the pathway options, including engagement with the SSEP Committee, devolved administrations, and final sign-off by the UK Energy Secretary?

Questions by scope area

Topic Area	Key Exam Questions
<i>Governance</i>	1. Does the SSEP methodology establish a clear governance framework that enables accountability, transparency, and alignment with DESNZ, Ofgem, and devolved government administrations? 2. To what extent does the SSEP methodology define the roles and interactions of governance groups (SSEP Committee, Advisory Groups, and Analytical Evidence Advisory Group) to support effective consideration of environmental, societal, and sectoral requirements in SSEP modelling? 3. Does the SSEP methodology define structured decision points that enable government oversight, facilitating the UK Energy Secretary and Ofgem having a clear role in reviewing and approving key aspects of the SSEP?
<i>Public and Stakeholder Consultation</i>	1. Does the SSEP methodology define a structured and inclusive approach for engaging local communities, industry bodies, NGOs, and local government associations, ensuring their views are meaningfully integrated into the planning process? 2. Does the SSEP methodology define clear mechanisms for capturing, analysing, and reflecting public and stakeholder feedback, particularly in relation to regional impacts and societal considerations within the modelling approach? 3. How effectively does the SSEP methodology outline a strategy for raising public awareness, facilitating discussions on the future energy system, and supporting societal consent for strategic spatial energy planning?
<i>Assurance of Delivery</i>	1. Has the SSEP methodology defined an approach to allow for the continuous iteration of the SSEP based on changing technology and energy requirements? 2. Has internal expert challenge been applied throughout the development of key methodology artefacts?

Appendix D: Clarifying guidance

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Reviewing the DESNZ Commission and mapping to the SSEP Methodology

DESNZ SSEP Commission to NESO (October 2024)		SSEP Methodology (December 2024)
Scope	➡	Economic and Geospatial Modelling
Uncertainty	➡	Economic and Geospatial Modelling
Within a wider landscape	➡	Governance
Roles, responsibilities, governance	➡	Governance
Economic Modelling	➡	Economic and Geospatial Modelling
Pathway Options	➡	Pathway Options
Quality Assurance	➡	Assurance of delivery
Environmental Assessments	➡	Environmental and Societal Considerations
Public and Stakeholder Consultation	➡	Public and Stakeholder Consultation
Producing the final SSEP	➡	Pathway Options
Monitoring & Evaluation	➡	Assurance of delivery

On the left, we have outlined the sections of the DESNZ Commission to NESO, published [here](#) in October 2024. We have mapped these to the SSEP Draft Methodology, published by NESO [here](#) in December 2024.

This mapping is structured around six scope areas, which form the basis of our review. Together, these areas comprehensively cover all elements in the DESNZ Commission, ensuring our independent review is thorough and covers all areas of the Commission.

Basis of the priority assessment of our recommendations

How have assigned priority ratings to recommendations

High		The recommendation seeks to support an essential component required for the SSEP being successful and meeting the requirements set by DESNZ and should be addressed as a matter of priority.
Medium		The recommendation suggests a significant improvement opportunity that will support successful future delivery of the SSEP and should be addressed.
Low		The recommendation suggests an improvement opportunity that will support successful future delivery of the SSEP and should be addressed where time and resources allow.

Thank you

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