Impact Assessment

Regional Energy Strategic Plan Policy Framework

Impact Assessment

Division: Energy System Design and Development

Team: RESP team

Associated documents: Decision on Regional Energy Strategic Plan Policy Framework

Coverage: Full coverage

Type of measure: Policy intervention

Type of IA: Qualified under Section 5A UA 2000

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This is our final Impact Assessment (IA) for the introduction of Regional Energy Strategic Plans (RESP) policy framework. It should be read alongside our RESP Policy Framework decision. The IA sets out the potential impacts of the introduction of the RESP. The conclusion of this IA is that the quantified benefits of introducing the RESP are potentially far greater than the costs.

OFG1161

Executive Summary

What is the problem under consideration? Why is Ofgem intervention necessary?

As we progress towards net zero, the energy system will become more interconnected, and the pace and complexity of planning will change. Decisions will need to be made across the system in a coordinated way to ensure that different levels of planning are aligned, deliver the right outcomes for consumers and maintain security of supply.

At present, electricity and gas network operators typically develop single energy vector plans (eg electricity), with inconsistent approaches to forecast creation and consideration of regional priorities. These inconsistencies exacerbate the challenge of managing uncertainty around where and when demand growth will materialise at a distribution level. Furthermore, the current approach to planning across electricity, gas, heat and so on lacks accountability, meaning there is no formalised process for, nor owner of, transparent decision-making and conflict resolution.

To enable energy system investment when and where it is needed to drive decarbonisation at pace and in a cost effective manner, energy system planning should be coordinated, enable cross-vector synergies, and consider local priorities. It must also be coherent with national energy planning.

In November 2023, we decided to introduce the Regional Energy Strategic Plan (RESP) to provide accountability for strategic energy planning and a focal point for whole system coordination. National Energy System Operator Limited (NESO) will be the delivery body for the regional strategic planning role and will adopt a hub and spoke delivery model, with each of the 11 regions operating as a spoke connected to a central hub. This model will coordinate RESP across GB, whilst allowing for place-based variation in each region.

What are the policy objectives and intended effects including the effect on Ofgem's Strategic Outcomes?

The key objective of the RESP will be to support coordinated development of the distribution system by enabling a more complete understanding of the long-term changes required across the whole energy system. This should ensure investment is made when and where it is needed, making the most of local potential to meet system needs and unlock a faster and better planned energy transition at the lowest cost to consumers.

Establishing the RESP and progressing strategic planning aligns with Ofgem's strategic priority to enable infrastructure for net zero at pace.[1] One of the most immediate challenges in reaching net zero lies in building new electricity infrastructure in the right place and at the right time while unlocking investment at pace to support sustainable economic growth. This includes the network infrastructure that will transport energy around the country. Achieving the scale of infrastructural change needed at pace and fair cost requires a decisive move in favour of a strategically planned, centrally coordinated, and integrated system. Above all, we must ensure the transition is delivered in a way that meets consumers' interests: that they receive a high-quality service at a reasonable cost as electrification of the system increases.

What are the policy options that have been considered, including any alternatives to regulation?

In our April 2022 Call for Input,[2] we began our review into the effectiveness of institutional and governance arrangements at a sub-national level to support delivery of net zero at least cost. We sought views on four framework models which represented potential archetypes that could enable the efficient delivery of key energy system functions and unlock significant benefits for consumers by facilitating a low cost transition to net zero.

In March 2023,[3] we consulted on our preferred policy option to introduce an entity based in regions across Great Britain, that would be responsible for undertaking regional energy system planning activities. In November 2023,[4] we confirmed the introduction of a new regional planning role delivered by NESO to ensure there is appropriate accountability and effective coordination for whole system strategic planning at a regional level. Through the hub and spoke delivery model, NESO will have a regional presence alongside national coordination across GB. We expect NESO to work closely with stakeholders to understand the specific characteristics of their respective regions and ensure the framework is implemented in a way that reflects different local circumstances.

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[1] See Ofgem's strategy and programme of work: https://www.ofgem.gov.uk/about-us/our-strategy-and-proposed-programme-work
[2] See Call for Input on the future of local energy institutions and governance, 2022: https://www.ofgem.gov.uk/call-for-input/call-input-future-local-energy-institutions-and-governance
[3] See Consultation on the future of local energy institutions and governance, 2023: https://www.ofgem.gov.uk/consultation/consultation-future-local-energy-institutions-and-governance
[4] See Decision on the future of local energy institutions and governance, 2023: https://www.ofgem.gov.uk/decision/decision-future-local-energy-institutions-and-governance

This option best aligns with our vision for regional energy strategic planning to be whole system focused and to reflect its regional context (ie local net zero ambitions and demographics) whilst being coherent with national energy system planning. This should result in the coordinated development of the system across electricity, gas, heat and so on, providing confidence in system requirements and enabling infrastructure investment ahead of need. Ultimately, this should support the transition to a net zero energy system in a cost effective manner.

Preferred option - Monetised Impacts (£m)

Explain how Net Benefit was monetised, NPV or other

The Net Benefit of the preferred option was monetised based on:

- The expected costs to implement RESP from the data provided in response to the RFI sent to NESO;
- The expected benefits were calculated based on a percentage of optimisation on the investment needed to meet net zero under the scope of the RESP;
- The timeline of the analysis was up to 2050. The monetised base year of the analysis was 2024; and
- The discounted rate to calculate the NPV of the policy was 3.5% as is recommended by the Greenbook.

The estimated annual costs and the saving investment benefits are then in real terms for each year. Then, the NPV is calculated based on the annual net benefit for each year from 2024 to 2050.

Preferred option - Hard to Monetise Impacts

Describe any hard to monetise impacts, including mid-term strategic and long-term sustainability factors.

The direct benefit of the RESP is hard to monetise for two reasons: First, it is difficult to predict the amount of investment required in energy infrastructure (networks, storage and generation) for the different energy vectors. Second, it is hard to quantify the potential efficiency gains that the RESP could deliver by optimising the planning and use of the energy infrastructure. In addition, potential benefits from regional stimulus and economic activity are hard to monetise. Similarly, potential additional costs from stakeholders are not possible to quantify, and their reflection on consumers' costs are not possible to track.

Key Assumptions/sensitivities/risks

The sensitivity of the policy benefits will be tested through two parameters, the percentage of potential efficiency savings and the level of energy infrastructure investment considered. In addition, different scenarios for the policy costs will be analysed. Therefore, a robust spectrum of possible outcomes will be evaluated, identifying the break-even point for each case, ie total policy costs and the total level of investment or, alternatively, the potential benefit cost ratio (BCR) for policy costs and total investment-optimisation level.

Will the policy be reviewed? Yes	**If applicable, set review date: 2028**

Is this proposal in scope of the Public Sector Equality Duty?	**No**

1. Introduction

Section summary

The Regional Energy Strategic Plans will enable the coordinated development of the energy system, provide confidence in system requirements and enable network infrastructure investment ahead of need. Ultimately, this will support the energy system's transition to net zero in a cost effective manner.

Problem under consideration

1.1 At the sub-national level, there are three energy system functions that are critical to how distribution systems operate: energy system planning, market facilitation of flexible resources and real time operations. We began our review into local governance and institutional arrangements for each of these three functions in April 2022 through a Call for Input.[5] Whilst the focus of this IA is on the RESP policy design, it is important to note that all three energy system functions are critical to how distribution systems ultimately transform. Effective governance arrangements can enable the efficient delivery of these functions and can unlock significant benefits for consumers by facilitating a low cost transition to a smart, flexible energy system.

1.2 We identified specific institutional gaps, and a lack of accountability regarding the delivery of energy system functions. We found that even when roles and responsibilities were clear, they were not always assigned to the institutions best placed to perform them. In addition, we found insufficient, or ineffective, coordination between actors across the energy system.

1.3 An example where these issues play out is that, under the status quo, network companies develop single energy vector plans (eg electricity), with significant variation in how regional context or priorities are factored in. There is information asymmetry over how forecasts are generated and the variance in approaches make

[5] https://www.ofgem.gov.uk/call-for-input/call-input-future-local-energy-institutions-and-governance

it hard to be confident in when the investment is needed or if consumers may end up paying for work that is not yet necessary in a region.

1.4 Whilst networks have expertise to plan their networks in a safe and reliable way, we know that efficient network planning decisions will increasingly rely on active consideration of system interactions between energy vectors (electricity, gas, heat, hydrogen, etc.) at a local and national level. To ensure net zero is delivered in a cost effective way and reflects regional priorities, delivery needs to be inclusive. To address concerns of information asymmetry and the development of plans in silos, there needs to be clear roles, responsibilities and processes for the active participation and feed-in by other actors with relevant expertise, such as local government bodies.

1.5 Our view was that current institutional and governance arrangements present challenges to achieving effective energy system planning and could prevent the most cost effective decarbonisation outcomes.

1.6 Therefore, in March 2023 we consulted on a proposed reform package for local governance arrangements - including to energy system planning.[6] In November 2023 (the "November decision"), we published our decision, confirming the introduction of the RESP.[7]

1.7 Alongside reform to planning, we also decided to assign a market facilitation function to a single entity with sufficient expertise and capability to deliver more accessible, transparent, and coordinated flexibility markets. And we decided real time operations should remain within the network operators, ensuring clear accountability for network reliability and safety.

Policy objective

1.8 As we progress towards net zero, the energy system will become more interconnected, and the pace and complexity of planning will change. Decisions will need to be made across the system in a coordinated way to ensure that different

[6] https://www.ofgem.gov.uk/consultation/consultation-future-local-energy-institutions-and-governance
[7] https://www.ofgem.gov.uk/decision/decision-future-local-energy-institutions-and-governance

levels of planning are aligned, deliver the right outcomes for consumers, and maintain security of supply.

1.9 Our objective is for regional energy strategic planning to be whole system focused and to reflect its regional context (ie local net zero ambitions and demographics) whilst being coherent with national energy system planning. This should result in the coordinated development of the energy system, provide confidence in system requirements and enable investment in network infrastructure investment ahead of need. Ultimately, this should support the transition to a net zero energy system in a cost effective manner.

1.10 The introduction of RESPs is necessary to realise our objective by introducing accountability for transparent strategic energy planning and effective coordination amongst the actors involved. The RESP framework will provide a focal point for whole system coordination among various local actors, including DNOs, GDNs, local authorities, and other stakeholders.

2. Consultation responses and changes to final impact assessment

Section summary

This chapter provides a summary of the consultation responses received and how we have reflected on them in finalising our Impact Assessment. We have not made any changes to the draft Impact Assessment. We reflect on how we can be clearer in how we intend to monitor the framework.

Overview

2.1 In line with the requirements of Section 5A of the Utilities Act 2000, in February, we consulted on our Draft IA[8]. We sought stakeholders' views on our approach to the IA and whether we had, to a reasonable extent, identified and understood the potential impacts of the introduction of RESPs. This included the impacts on different stakeholders, the potential costs and benefits and any unidentified consequences. Finally, we sought to understand if anything in the draft IA had changed stakeholders' views expressed in response to our July 2024 consultation[9].

2.2 We received 19 responses to our consultation. Most responses agreed that the approach taken was reasonable and had identified the impacts associated with the policy. One response did not agree the approach taken was sufficient. Whilst many stakeholders agreed, they noted additional areas of assessment we could explore to strengthen the impact assessment. One area of limitation noted was the inability to assess third party costs at this stage. This was also the reason why one respondent disagreed overall. However, stakeholders did not provide additional data or information within responses or suggest that this data was available. Instead, in recognition of the challenges of having all this data at this stage as well as this being a novel policy area, multiple stakeholders emphasised the importance of monitoring and evaluation.

[8] Regional Energy Strategic Plan Impact Assessment consultation | Ofgem
[9] Regional Energy Strategic Plan policy framework consultation | Ofgem

2.3 We have not made any significant revisions to our IA. As most stakeholders thought the approach taken was reasonable, we are satisfied the IA is appropriate. It is also to be read in conjunction with our RESP Policy Framework decision, as well as our earlier decision to introduce RESPs. These documents outline our rationale for the decision to introduce RESPs and the design of the RESP framework. The IA is a key facet in the decision making and complements the broader policy development.

2.4 One area we do think can be elaborated on further is our approach to monitoring and evaluation. The importance of monitoring and evaluation was raised by a few respondents, and we strongly agree. We have not revised the IA with further detail on the evaluation framework, as we still consider it is too early to define beyond what we have already. However we have expanded on how we will monitor RESP implementation in Chapter 7 of our RESP Policy Framework decision which is published alongside this.

2.5 In the Policy Framework we set out that the RESP update cycles support us to continually monitor and evaluate the policy. An updated RESP will be produced every 3 years. Ahead of each cycle, Ofgem will issue any updates to the RESP guidance that are necessary and approve NESO's methodology. This cadence provides a structured approach to monitor the policy. The evaluation framework will support us in considering what changes may be needed following the first RESPs production in 2027. As we do this it is critical that we engage with stakeholders to ensure we have their insights on the theory of change for RESP, the impacts and outcomes it should be driving.

2.6 Lastly, we will be actively involved throughout RESP delivery through our oversight role within the governance which will also support us to monitor outcomes.

Summary of responses

2.7 Stakeholders were largely supportive of the approach we had taken to the IA and that it helped to understand the impacts of the policy change. There was acceptance we had reasonably identified the potential costs and benefits. Some further enhancements were suggested.

2.8 With regards to costs, some stakeholders considered that we could present a more detailed cost breakdown. One respondent suggested that as NESO was a public body, commercial sensitivity is not an issue. We disagree with that assertion and consider that a detailed cost breakdown could still have potential commercial sensitivities (for example with regards to procurement). In addition, we consider that the level of costs description detail provided, for example in tables 6 and 8, enables a consideration of the ambition, scale, and scope of the RESP role for each scenario.

2.9 Many responses suggested that further assessment could explore third party costs. We address why we have not done this within the IA in paragraph 3.25 and that the net costs are hard to quantity at this stage. We do not consider the scale of costs will diminish the potential benefits identified. Stakeholders agreed that the costs are hard to quantify at this stage and did not suggest that they had cost information at this stage. Instead they considered it was important to monitor going forward.

2.10 A common theme with regards to third party costs, was the impact on local authorities. Many respondents emphasised the importance of considering local authority resource constraints within the design of RESP processes. Whilst funding of local authorities is a matter for Government, we do agree it is important to consider the impacts on local authorities and how to ensure the RESP processes are accessible as possible. This is considered in Chapter 4 of our RESP Policy Framework decision.

2.11 Other areas raised that could be considered further were costs of stakeholder engagement, regulatory burden or the downstream retail impacts. It was also noted that there could be a risk of duplicative costs for DNOs and GDNs. We consider this can be managed through the design of the RESP processes. It is also important that DNOs and GDNs manage this risk also.

2.12 A few respondents noted the importance of monitoring and evaluation, given some of the wider costs of the policy being difficult to quantify and due to the materiality of change. We agree that monitoring and evaluation is critical for these reasons. Whilst it may be difficult to evaluate the overall impacts as these will materialise over the long-term, we think it is critical to closely monitor the policy and any interim impacts. We discuss this in Chapter 7 of the Policy Framework.

2.13 With regards to benefits, there was strong support that we had identified the benefits of the policy well. A few stakeholders suggested that case studies or archetypes for benefit cases could be useful to further the assessment of benefits of the RESP. We have used case studies throughout the development of RESP policy to inform our options and design as well as understanding the impacts of the potential change. For example, the outcomes and impact of projects within

Innovate UK's Prospering for the Energy Revolution programme which concluded in 2023[10].

[10] Enabling smart local energy systems - Innovate UK Business Connect

3. Approach to the Impact Assessment

Section summary

This chapter provides a summary of the chosen consolidation options and the counterfactual that we have assessed them against. We also describe our approach to assessing the impact of each option on industry and consumers.

Scope of Impact Assessment

3.1 The aim of this IA is to identify and evaluate the costs and benefits and compare these to assess the viability of the preferred option to implement the RESP, which will be delivered by NESO. The chosen preferred implementation option is based on the current understanding of the RESP policy design and the ongoing preparation by NESO. We intend to assess whether the implementation of the RESP could enable the realisation of the identified benefits in the efficient allocation of investment in the energy system, from an integrated whole system infrastructure planning perspective.

3.2 Whilst the focus of this IA is on the implementation of the RESP policy, as discussed in Chapter 1, our review of the future of local energy institutions and governance arrangements also introduced the Market Facilitator role to unlock the full value of system flexibility. Therefore, we expect there to be synergies between the RESP and the Market Facilitator role.

3.3 We have sought to undertake quantitative analysis wherever possible to inform the IA. However, due to the complex nature of the policy design and implementation, the range of uncertainties, and the lack of a clear method to define the extent of benefits delivered, we decided to identify the break-even point of the policy costs based on a share of the expected energy infrastructure investment required to achieve net zero. To support the analysis, we have conducted a risk analysis consisting of an exploration of the impacts of different input assumptions, namely changes in cost scenarios, changes on the level of network/system investment and the efficiency gains considered. Similarly, we have also used qualitative analysis to support our thinking.

Options considered

3.4 In our April 2022 Call for Input,[11] we began our review into the effectiveness of institutional and governance arrangements at a sub-national level to support delivery of net zero at least cost. We sought views on four framework models which represented potential archetypes that could enable the efficient delivery of key energy system functions and unlock significant benefits for consumers by facilitating a low cost transition to net zero. To note, the scope of our review began from the perspective of electricity distribution. However, we consider the issues have system wide impacts, and therefore solutions must reflect this.

3.5 The first option considered was internal separation of Distribution System Operator (DSO) roles within Distribution Network Operators (DNOs) to maintain current structures but with enhanced internal separation to address conflicts of interest. This included a variant of legal separation where DNOs would have separate legal entities for DSO functions

3.6 The second option considered was the establishment of new independent institutions to take on some or all electricity DSO roles to create clear separation between network ownership and system operation to avoid conflicts of interest and enhance transparency and accountability.

3.7 The third option was establishing new regional institutions to take on wider cross-vector planning, flexibility market facilitation and operation roles. This option focused on regional planning, ensuring that local contexts and needs are adequately addressed and aimed to integrate multiple energy vectors (electricity, gas, heat, hydrogen) for a holistic approach.

3.8 The final option considered was dispersed roles to create clusters with the strongest functional synergies and existing core competencies. This would leverage existing competencies and synergies by distributing roles among various organisations, ensuring effective coordination and delivery of energy system functions. This model emphasised collaboration and interaction between different entities to optimise the energy system.

[11] https://www.ofgem.gov.uk/call-for-input/call-input-future-local-energy-institutions-and-governance

3.9 A key message from stakeholders in response to our Call for Input was that any governance reform solution should go beyond within-organisation change (eg framework models 1 or 2) and target cross-organisational change (eg framework models 3 and 4). However, we discounted the option to separate out the role of real time operations as it would create unjustifiable risk to quality of supply and safety and would be costly and time-consuming for little tangible benefit.

Preferred option

3.10 Regarding energy system planning, in March 2023, we consulted on our preferred policy option to introduce an entity based in regions across Great Britain, that would be responsible for undertaking regional energy system planning activities. In November 2023, we confirmed the introduction of a new regional planning role to ensure there is appropriate accountability and effective coordination for whole system strategic planning at a regional level. We felt this reform option was proportionate and best addressed the issues faced and would enable the benefits to be realised at pace.

3.11 We decided that NESO should be the delivery body for the new function and should discharge its duties via multiple strategic planning roles across GB. We outlined our plans to introduce a governance mechanism for RESP that embeds democratic representation and accountability within the process.

3.12 There was strong stakeholder support in favour of a new regional entity to orchestrate coordination and ensure consistency of energy system planning. It was widely agreed that the RESP has the potential to streamline the current patchwork planning approach and overcome inefficiencies in existing processes.

3.13 The RESP will ensure that regional energy system planning reflects local net zero ambitions, geographic and demographic specifics, and other regional priorities. By adopting a whole system perspective the RESP can consider multiple energy vectors (electricity, gas, heat and hydrogen) to optimise the energy system and achieve cost effective decarbonisation.

Our approach to assessing the costs and benefits

3.14 In this IA, our approach to assess the viability of the implementation of RESP evaluates the costs and benefits and then compares the ratios between the two components - Benefits Cost Ratio (BCR). The quantitative assessment uses the costs submitted by NESO in response to our Request for Information (RFI). To quantify the benefits, a literature review was conducted, identifying the expected network investment required to enable net zero, and the benefits that coordinated strategic planning can achieve through enhanced efficiency or optimisation.

3.15 The cost benefit analysis (CBA) identifies the break-even point between the policy cost and the quantifiable benefits. Additional analysis considers a given efficiency gain and estimates the BCR in this scenario.

3.16 For the CBA, a risk analysis was conducted, considering two different scenarios for costs and benefits (saving gains levels and total network investment). The two investment cases utilised followed reports by National Infrastructure Commission (NIC) and Department for Energy Security and Net Zero (DESNZ) respectively.

3.17 However, some of the costs and benefits are hard to quantify. Therefore, an assessment of their nature and impact is expanded on in the qualitative assessment segment.

3.18 The approach taken in this IA differs from that originally set out in A1.12 - A1.19 of the March 2023 consultation. We originally identified several areas where the proposals would generate additional benefits with respect to a counterfactual. For example, enhanced decarbonisation synergies, flexibility, data quality improvements, transparency of decision making and increased stakeholder confidence. We then proposed developing low, medium, and high assumptions about the attribution of these benefits to the proposals. For example, what proportion of network investment would be avoided by the RESP compared to the counterfactual.

3.19 However, in this IA we have decided to present the benefits based on efficiency savings from the investment value considered, and analyse the breakeven point for a range of investment levels. We have changed our approach due to the challenges of identifying three scenarios for the direct benefits from the proposal. Further, we believe it is more informative to understand the minimum savings levels required to cover the costs of the policy.

3.20 Additionally, consultation responses indicated that the delivery body (NESO) would provide the most reliable and informed data on costs associated with RESP implementation. Therefore, we decided to follow-up with a RFI to NESO, avoiding the need for other stakeholders to estimate putative costs related to RESP implementation.

Quantitative Assessment

3.21 The assessment conducted consists of the identification of the break-even point of the policy, where the efficiency gains (resulting from more coordinated strategic planning) on the estimated required infrastructure investment equal the policy costs, in present value terms.

3.22 In this section we outline the assumptions for each component of the analysis. For example, all the values of benefits and costs are presented at a constant level, based on 2024 prices. Similarly, the net present value will be calculated using a discount rate of 3.5%, following the 'social time preference rate' suggested on the Green Book for guidance on appraisal and evaluation.[12]

Costs

3.23 For the CBA, the total policy costs were considered, including the costs to implement RESP and the operational costs once the RESP role is established, including recruitment, staff, assets, IT systems and others. These costs were submitted by NESO in response to a Request for Information (RFI) sent by Ofgem. The costs represent the present estimate based on NESO preparation to implement the RESP function, given the policy definition that is known at the consultation stage.

3.24 These costs anticipate a high level of stakeholder engagement and support, and a comprehensive governance framework within each region, involving key stakeholders: DNOs, GDNs, local authorities and other local actors. We expect that the engagement will be vital to ensure the RESP enables a broader and more holistic approach to planning across different vectors (electricity, gas, heat, hydrogen, etc.), enabling synergies and ensuring necessary strategic investments are brought forward.

3.25 Due to future RESP activities, other costs may exist for stakeholders, such as DNOs and GDNs, and local authorities. However, some of these costs already exist in the current context and we anticipate there will be additional savings due to further synergies. Although the net costs are hard to quantify, their scale is unlikely to significantly diminish the substantial potential benefits identified in the literature.

[12] See The Green Book: Appraisal and evaluation in central government. Available at: https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government.

3.26 In Appendix 2, several cost tables present in more detail the costs provided by NESO in response to the RFI, nevertheless, the figures presented are an overview of the costs, to avoid the disclosure of any potential commercially sensitive numbers. The risk analysis also explored significantly higher costs than the central scenario. These two additional scenarios, the Lower and Upper scenarios, were created by Ofgem based on the scenario provided by NESO, to evaluate changes in cost assumptions (-50% and +50%).

Benefits

3.27 The analysis separates benefits into two segments - the quantifiable benefits and the hard to quantify benefits. The quantifiable benefits are the efficiency savings that are expected to occur as the result of more coordinated strategic planning through maximising whole system synergies. The RESP is expected to set the direction of network planning and ensure necessary strategic investments are brought forward when and where they are needed to enable net zero. It is proposed that network companies (DNOs and GDNs) will be required to align their network planning to the trajectory of the RESP and propose strategic investment where need is identified. Therefore, the benefits of the RESP extend beyond enabling collaboration and communication by playing a pivotal role in acting as the starting point for coordinated network investment plans.

3.28 These benefits are quantified based on a percentage over estimated total investment required. As discussed in more detail in Appendix 1, a significant part of the network investment efficiency savings brought by RESP will occur at the distribution level of the network. Therefore, the benefit figure used in the CBA is based on the investment estimated to be required in the distribution networks up to 2050.

3.29 It is acknowledged that additional benefits are likely to be achieved as a result of the implementation of the RESP; however, these are hard to quantify benefits, which are described and discussed in the qualitative analysis, but are not accounted for in the quantitative cost benefit analysis. Appendix 1 provides a more in-depth analysis of the potential benefits and efficiencies as a result on the introduction of the RESP.

Risk Analysis – Uncertainty Analysis

3.30 The risk analysis attempts to assess the implication of uncertainty on the analytical assumptions in the CBA. In this analysis, the uncertainty of both the costs (three scenarios: lower, standard and higher) and the benefits were explored. On the costs side, the two additional scenarios (lower and higher) enable an analysis of the effect of reducing the scope and ambition of RESP, or considering additional costs accounted for by NESO or by other entities (eg DNOs or local authorities). On the benefits side, the effect of different levels of investments and different levels of potential efficiency gains attributed to the RESP were analysed, and a range of break-even points were estimated and the respective BCRs calculated.

Qualitative Assessment

3.31 In this section, we will discuss in qualitative terms how the RESP is expected to deliver benefits. However, these benefits are hard to quantify and are therefore not directly included in the quantitative CBA and we recognise that some of the outcomes generating benefits could also take place under the counterfactual scenario.

3.32 The RESP presents an opportunity to support distribution network investment ahead of need. A more proactive approach to the provision of new capacity through asset investment is necessary, looking ahead, to deliver the network that is needed for a net zero future rather than waiting for demand to materialise in the short term. Our view is that the risk of under investment and hindering net zero ambitions is greater than the risk of over investment. Therefore, the RESP is a key enabler in enabling growth and decarbonisation ambitions across GB.

3.33 The RESP, the Strategic Spatial Energy Plan (SSEP), a spatial plan of energy assets necessary to meet net zero by 2050, and the Centralised Strategic Network Plan (CSNP) a plan for transmission network infrastructure, will be delivered by NESO. This is likely to result in benefits through alignment between generation, transmission and distribution network planning, and therefore more efficient transmission/distribution network investments.

3.34 Whilst significant uncertainty remains around the future of gas and hydrogen investments to meet net zero, the RESP will consider the whole system (ie gas and electricity, but also heat, transport and industry) and therefore, it is likely it will provide further benefits in this area in future.

3.35 This RESP is also likely to unlock significant benefits for consumers by facilitating a low cost transition to a smart, flexible energy system, ensuring the network can support the growth in demand due to the uptake of low carbon technologies, such as electric vehicles (EVs) and heat pumps. This could result in a faster roll out of low carbon technologies due to reduced network constraints.

The Counterfactual

3.36 The counterfactual reflects our view of what would happen in the absence of the intervention proposed (ie the introduction of the RESP). In August 2023, the Electricity Networks Commissioner (ENC), recommended a Strategic Spatial Energy Plan (SSEP) to set out the foundation for future network planning. The purpose of the SSEP is to define the optimal mix and locations of generation technologies needed to deliver net zero by 2050. The SSEP outputs are intended to act as the first stage of the Centralised Strategic Network Plan (CSNP) – a plan for transmission network infrastructure.

3.37 The counterfactual is the scenario where both the SSEP and CSNP are in place, but there is no RESP, and the development of distribution networks is executed in line with the requirements of the relevant price control, by the DNOs and GDNs. In this case, the potential synergetic effects of strategic whole system planning are unlikely to be achieved at all levels of the system.

3.38 In the counterfactual, an investment scenario is considered as the central assumption to represent the level of investment and efforts required to achieve net zero by 2050. This scenario specifically focuses on the investment needed at the distribution level of the network. The choice of this assumption in the counterfactual is based on evidence that such investment is likely to occur, and that any efficiency savings from RESP are most substantial at the distribution level. Additionally, this is considered a conservative estimate of the overall investment required, reflecting political ambitions and estimates tied to the net zero goal.

3.39 Appendix 1 presents a summary of the evidence collected on the level of distribution network investments required to enable net zero in GB and the potential savings achieved by more strategic and coordinated regional energy planning.

3.40 It is relevant to note that in our March 2023 consultation (paragraphs A1.8 to A1.11), we stated that the counterfactual scenario would be the implementation of existing policies, including those required within RIIO-ED2. However, since then there have been several developments in the wider landscape, including the introduction of the SSEP and CSNP. Therefore, the counterfactual must also consider the SSEP and CSNP to account for the broader changes in planning.

4. Quantitative and quantitative analysis

Section summary

This chapter provides a detailed examination of the costs and benefits associated with the implementation of the RESP, as well as an analysis of the uncertainties and risks involved. The analysis is divided into two main sections: the monetised cost-benefit analysis (CBA) and the qualitative assessment. The CBA focuses on quantifying the costs and benefits to determine the break-even point and benefit-cost ratio (BCR) under various scenarios. The qualitative assessment explores additional benefits and costs that are harder to quantify but are crucial for a comprehensive understanding of the RESP's impact. This approach ensures a thorough evaluation of the RESP's potential to deliver efficient and effective energy system planning and investment.

Monetised cost benefit analysis

4.1 The factual scenario of this IA is where the RESP is introduced and is delivered by NESO. Enabling an integrated approach to energy planning, maximising synergies across the spatial planning, energy vectors (electricity, gas, heat, hydrogen, etc.) and the respective distribution and transmission networks. This approach is likely to enable more efficient investment in the individual energy networks. For example, better integration between electricity and gas distribution networks can provide synergies that will reduce the overall investment need to reach net zero. In addition, synergies can be seen in the overall investment needs for transmission reinforcements, interconnectors or overall additional generation requirements.

Costs

4.2 The costs presented for the implementation of the RESP were provided by NESO through a response to an RFI made by Ofgem. In Table 1, the high-level costs are presented, at constant level prices considering both implementation and operation costs. The total at present value is also shown. The table shows the high-level costs in total terms, to avoid any disclosure of potentially commercially sensitive data. The total costs include recruitment, staff, assets, IT systems and others required to deliver the RESP.

4.3 For the CBA performed, the focus is on the present value of the total costs figure, as this enables a comprehensive assessment of the financial impact and ensures that all relevant expenses are considered, thereby effectively addressing the CBA of the policy implementation. In Appendix 2, a more detailed overview of the costs is presented.

Table 1 – Total cost for the RESP

Costs	Implementation	Operational (cumulative annual costs)	Total
2024 Constant level cost	£0.096 bn	£1.008 bn	£1.104 bn
Present value cost	£0.088 bn	£0.608 bn	£0.696 bn

Benefits – Quantitative assessment

4.4 The quantified benefits attributed to the RESP policy are estimated based on the percentage efficiency gain or optimisation on the total investment value expected to be required at the distribution network level to achieve net zero which is expressed based on the counterfactual scenario. Given that the RESP is expected to have the greatest impact on investment at the distribution level of the system, the CBA primarily focuses on this area.

4.5 For the CBA, the total value of the investment is estimated to occur over a period of 25 years, from 2026-2050, when the RESP function is fully established. Similarly, the efficiency gains are considered to occur across the overall investment period, and there is no distinction regarding how the savings may change over the period of the analysis.

4.6 A break-even condition between costs and benefits is considered, where the present value of the estimated benefits is the same as the present value of the estimated costs to introduce the RESP. If the benefits equal the costs associated with implementing RESP, the break-even percentage point of the total investment will be calculated, which represents the percentage of savings from the total investment value considered.

Benefits – Qualitative assessment

4.7 Other benefits that are not directly quantified in the analysis are potential synergies or cost reductions that may exist in the whole system besides the distribution network. It is possible that transmission, generation and other energy system requirements are optimised due to RESP. For example, the RESP may have positive effects (more cost effective and timely solutions, greater confidence and acceleration), on the planning of heat networks.

4.8 Further, both the RESP, and the CSNP a plan for transmission network infrastructure, will be delivered by NESO. This is likely to result in further benefits through alignment between transmission and distribution network planning, and therefore efficient transmission/distribution network investments. Whilst significant uncertainty remains around the future of gas and hydrogen investments to meet net zero, the RESP will consider the whole system and therefore, it is likely it will provide further benefits in this area in future.

4.9 In addition, RESP activities may enable regional and local development and deliver additional economic growth to business activities that are not possible to directly quantify in the IA. The RESP presents an opportunity to support proactive distribution network investment. The RESP will provide greater certainty on the strategic direction and likely future network investment in a region. This could enable greater confidence from investors, accelerating local investment in industry and decarbonisation. This RESP is also likely to unlock significant benefits for consumers by facilitating a low cost transition to a smart, flexible energy system, ensuring the network can support the growth in demand due to the uptake of electric vehicles (EVs) and heat pumps.

4.10 Quantifying the impact of the effects described above is difficult and some of these mechanisms could be attributed to the impact of other policies. For example, it becomes difficult to separate the impact of RESP on benefits for transmission network investments from other policies being implemented on the realm of strategic energy planning. However, by considering the expected investment values for additional infrastructure and assuming a modest saving gain provided by the RESP, it is possible to make an approximation to estimate the order of magnitude of such additional benefits.

Break-even analysis

4.11 The break-even analysis is based on achieving a BCR of 1, where the present value of the benefits is the exact same as the present value of the costs. Table 2 presents total costs and total investment on a present value basis and considering current real costs. Thus, the break-even point is the factor that we need to multiply by the present value of the investment considered (see the counterfactual section and Appendix 1). This is the point where the benefits equal the present value of the costs to implement the RESP. As shown in the formula below, for the policy to break-even, the RESP would need to deliver a 0.45% efficiency saving on the required network investment.

$$Central\ Scenario\ = \frac{Costs}{Investment} = \frac{£0.696\ bn}{£153.9\ bn} = 0.45\%$$

$$Low\ Scenario = \frac{Costs}{Investment} = \frac{£0.696\ bn}{£30.78\ bn} = 2.26\%$$

4.12 The cost figure considered in the calculation above was £695.8 million, the present value of the total standard costs presented by NESO, which at constant value is £1 103.6 million. A more detailed overview of the costs is presented in Appendix 2.

4.13 The potential total investment considered was £250 bn at constant value, equivalent to £153.9 bn at present value. This value was based on data reported in the Electricity Networks Modelling report conducted by DESNZ (then BEIS),[13] which provided a similar estimate for investment in distribution networks for load-related expenditure. From a more extensive review of the literature, that can be further analysed in the Appendix 1, we believe this is a likely amount of required investment on the distribution network.

4.14 A more recent study by the National Infrastructure Commission (NIC) on the Electricity Distribution Network provided an estimate for investment of additional £50 bn at the distribution network level for load-related expenditure.[14] Therefore, this figure is also included in the analysis, to account for the uncertainty in the level of investment required, and to emphasise the implications of a lower-end investment scenario as an alternative. To achieve break-even under these conditions, the RESP would need to deliver a 2.26% efficiency saving on the necessary network investment. Table 2 presents total costs, and the two total investment cases discussed above. The sources of these estimates are indicated, and the values are presented on a present value basis and considering current real costs.

[13] See DESNZ Appendix I: Electricity Networks Modelling, August 2022: https://www.gov.uk/government/publications/electricity-networks-strategic-framework
[14] See NIC Electricity distribution network study: https://nic.org.uk/studies-reports/electricity-distribution-network

Table 2 – Total policy cost for the RESP and the investment expected on the energy systems

Type of cost assessment	Cost	Potential investment central scenario	Potential investment low end scenario
Constant level value	£1.104 bn	£250 bn	£50 bn
Present value	£0.696 bn	£153.9 bn	£30.78 bn
Source	NESO[15]	DESNZ[16]	NIC[17]

4.15 On the other hand, as discussed in Appendix 1, it is known that the policy outcomes of the RESP will deliver higher benefits to the energy network at the distribution level. Therefore, below a scenario assumption is explored which considers an efficiency gain case of 5% over the investment executed. For comparison, the NIC study identifies a potential for 15% savings on the investment required for electricity distribution networks up to 2050 through maximising flexibility. Whilst these savings could not be directly attributed to the RESP, the plan is expected to provide a whole system strategic assessment of energy needs across the region – including the availability of local flexibility services. Highlighting the scope for potential synergies that the introduction of the RESP can play a part in enabling alongside other new functions such as the Market Facilitator. In addition, the additional hard-to-quantify benefits are likely to have a positive impact on the BCR.

4.16 In this scenario, where the RESP delivers a 5% efficiency gain, there is a BCR of 11.1 as shown in the formula below. This level of BCR indicates that the potential benefits of implementing RESP are 11.1 times the value of the cost to implement the policy. Alternatively, in a low-end investment scenario, the BCR would be 2.2.

[15] NESO estimated the costs to implement and deliver RESP. A more detailed explanation of the costs included is presented in Appendix 2.
[16] Figure is based on the DESNZ report for reinforcement investment estimated for the distribution network due to load-related expenditures up to 2050. Further discussion on the figures is included in Appendix 1.
[17] Figure represents a scenario with a much lower investment indicated by the NIC report. This is at the lower end of the spectrum of investment levels considered for the analysis. Further discussion on the figures is included in Appendix 1.

This indicates that even with a lower efficiency gain, the benefits of implementing RESP are still more than double the cost of the policy.

$$BCR\ Central\ Scenario = \frac{Investment \cdot \%eff.gain}{Costs} = \frac{£153.9\ bn \cdot 5\%}{£0.696\ bn} = 11.1$$

$$\boldsymbol{BCR\ Low\ Scenario = \frac{Investment \cdot \%eff.gain}{Costs} = \frac{£30.78\ bn \cdot 5\%}{£0.696\ bn} = 2.2}$$

Risk analysis

4.17 Considering the uncertainty associated with both costs and investment level required in the energy system and the consequent benefits achieved, it is important to explore the impacts of assumption uncertainty on the BCR in the CBA. Thus, two analyses are provided in this section. Based on the two additional policy cost scenarios (lower and higher options), the efficiency gain factor for a break-even condition between benefits and costs is calculated, and these are presented in table 3. The analysis considers the cost scenarios and two different investment cases, one based on a higher level of investment (£250 bn) and the other on a lower level of investment (£50 bn).

Table 3 -Efficiency gain level for a break-even point of the CBA, based on cost scenarios (columns) and investment level (rows)

	Constant value: Annual	Constant value: Total	Cost scenario: Lower	Cost scenario: Standard	Cost scenario: Higher
Investment level	£2bn yr	£50 bn	1.13%	2.26%	3.39%
	£10bn yr	£250 bn	0.23%	0.45%	0.68%

4.18 The results presented in Table 3 show that, in the worst-case scenario presented, which is £50bn total investment up to 2050 and 50% higher costs than identified by NESO, the percentage efficiency saving required to be break-even is 3.39%.

4.19 We have included a lower and high figure for investment to recognise the uncertainty in the level of investment required. However, it is important to note that the lower investment figure, considers a more limited level of load related expenditure expected on the electricity distribution network, as it excludes the 132 kV and low voltage service cables. The analysis also assumes a substantial uptake in flexibility.

4.20 Therefore, as the RESP will consider the whole energy system and inform load related expenditure investment in both the electricity distribution networks (including 132kV in England and Wales) and gas distribution networks it is likely that higher levels of investment are most applicable. Further, other studies reviewed have identified an overall investment requirement at distribution networks exceeding £200bn.[18] [19]

Table 4 – BCRs of the CBA based on different levels of investment (columns) and different levels of efficiency gains (rows)

Annual investment rate ->	£2bn/yr	£5bn/yr
Total investment up to 2050 ->	£50 bn	£250 bn
Efficiency gains		
0.25%	0.1	0.6
0.5%	0.2	1.1
1%	0.4	2.2
2.5%	1.1	5.5
5%	2.2	11.1
7.5%	3.3	16.6
10%	4.4	22.1

4.21 Another option to assess the impact of uncertainty is to evaluate the BCRs associated with a range of possible efficiency savings. In Table 4 we took two

[18] See Department for Energy Security and Net Zero. "Electricity Networks Strategic Framework: Appendix 1 - Electricity Networks Modelling."(page 23), 2022: https://www.gov.uk/government/publications/electricity-networks-strategic-framework and Department for Business, Energy & Industrial Strategy. (2021). *Appendix I: Electricity system flexibility modelling*.
[19] See Regen and MCS Charitable Foundation. (2023). Building a GB electricity network ready for net zero. Regen. Available at: https://www.regen.co.uk/wp-content/uploads/Building-a-GB-electricity-network-ready-for-net-zero.pdf

investment scenarios, £50bn and £250bn, and calculated the BCR of a range of possible efficiency savings associated with the RESP. We set out a range of savings from 0.25% to 10%, which represent a conservative view of the possible savings. In all these calculations we used the standard cost scenario in Table 3.

4.22 For example, if we assume a low level of efficiency savings of 0.25%, the BCRs associated with the £50bn and the £250bn investment scenarios are 0.1 and 0.6 respectively (where the cost would be higher than the benefits). Results in Table 4 indicate that, considering, for example, efficiency savings ratios over 2.5%, the BCR is robust, as it is at least 5.5 times the policy cost, when the overall investment considered is £250 bn up to 2050. Considering an investment of only £50bn up to 2050, £2bn per year, for an efficiency saving of 2.5% the BCR would be 1.1, which is slightly above the breakeven point, at 2.26% as identified in Table 3. For comparison, and as analysed in further detail above, the NIC study identifies a potential for 15% savings on the investment required for electricity distribution networks up to 2050 through maximising flexibility.

4.23 The RESP is one of the policy drivers to enable greater energy system flexibility. The literature reviewed identified investment savings of between 15%-25% resulting from enhanced use of flexibility. Thus, a 5% saving gain due to the RESP seems plausible, which even given a lower investment scenario, represents a greater benefit than the higher cost scenario, with break-even point of 3.39%. In addition, the additional hard-to-quantify benefits are likely to have a positive impact on the BCR.

4.24 In summary, the risk analysis indicates that only under extreme conditions, such as very low network infrastructure investment rates and low efficiency savings rates from the RESP, would the costs of the policy exceed the benefits. It is understood that both conditions are unlikely to occur simultaneously, as it is improbable to have both low investment and low efficiency gains due to the RESP.

Other impacts

4.25 Ofgem is under a statutory duty to conduct an Impact Assessment when an important change is proposed[20]. This includes, but is not limited to, changes that

[20] Section 5A of the Utilities Act 2000.

have a significant impact on persons engaged in the generation, transmission, distribution or supply of electricity. Ofgem IA guidance[21] specifies additional considerations which covers distributional impacts on consumers, biodiversity, growth, Net Zero and Public Sector Equality (PSED) Duties.

4.26 We consider that this Impact Assessment, complies with these obligations. Although the impact of the RESP may be hard to quantify at this stage, the analysis of evidence (See Appendix 1) indicates that in most cases the impact on the areas described above would be either positive or neutral.

Impact on consumers

4.27 Consumers would benefit from the realisation of benefits from better system planning at a regional level. This will require greater strategic planning of investment that takes account of a wider range of objectives. This should deliver greater benefits to consumers – and see them realised earlier – as well as helping to manage the transition to greater electrification more efficiently over time.

4.28 These benefits would be realised through lower energy bills associated with lower network and generation costs, as well with better use of flexibility. There would also be wider social and economic benefits for consumers associated with meeting decarbonisation targets.

4.29 Assessing the potential distributional effects for consumers cannot be done at this stage because we only have indicative benefits based on the review of the literature. However, given the large benefit cost ratio, we do not expect that any section of the consumer population will be worse off due to this proposal.

Impact on the environment and net zero

4.30 The RESP is unlikely to directly impact additional carbon emissions, as the emissions pathway is driven by the net zero ambition for GB. The aim of the RESP is to better coordinate energy system planning and accelerate investments to achieve net zero. Additionally, the RESP is expected to deliver net benefits to the

[21] See Ofgem Impact Assessment Guidance: https://www.ofgem.gov.uk/publications/impact-assessment-guidance

system, reducing cost impacts on consumers from the investment that will be required to meet net zero.

Impact on growth

4.31 Investment in the distribution network is critical to meeting net zero and enabling sustainable economic growth. Greater regional coordination and a more strategically planned energy system should ensure there is sufficient capacity available on the network, when and where it is needed to support decarbonisation of industry, transport and heat, alongside new economic activity, such as data centres.

Public Sector Equality Duty

4.32 The proposal does not have a significant impact on any of the portrayed characteristics of the PSED.

Monitoring and evaluation

4.33 The monitoring and evaluation of RESP implementation should assess whether it has achieved the objectives proposed by the policy. Thus, it should evaluate whether the implemented RESP function is delivered based on our policy framework and guidance to NESO. Many aspects of the design of RESP will evolve alongside of the policy implementation. It is too early to consider a full evaluation plan. However, some of the key elements of the evaluation are set out below.

Objectives and success criteria for the evaluation

4.34 The key objective of the RESP will be to support coordinated development of the distribution system by enabling a more complete understanding of the long-term changes required across the whole energy system.

4.35 In the first instance, success would be measured by the quality of NESO's RESP Methodology, and the subsequent RESPs produced, to ensure alignment with the policy intent. We would monitor the costs to deliver the RESP submitted by NESO through the business planning process. We would also monitor any additional costs or savings incurred by DNOs or GDNs.

4.36 Over time, we would expect efficiency savings on the level of investment that could be attributed directly to RESP. However, identifying those savings from the counterfactual would be challenging due to the number of related policies operating in this space, including changes to price control policy, creation of new functions for flexibility markets, etc. We will be in a better position to develop impact evaluation plans once the first version of the RESP outputs are published by the end of 2027.

4.37 The evaluation method would also need to include secondary objectives such as faster delivery of net zero technologies, increased stakeholder engagement, facilitation of greater levels of flexibility and integration of national and local objectives.

Potential negative outcomes

4.38 The primary potential negative outcome is that we have underestimated the cost associated with the introduction of the RESP.

4.39 In our analysis, we have focused on NESO delivery costs as the main cost category. We are confident that this cost can be adequately controlled through regulatory mechanisms.

4.40 DNO and GDN activities will also be impacted by the introduction of the RESP. We would expect that over time the RESP should enable savings in network planning, as the RESP will establish the energy needs case. However, we have taken a conservative approach and not accounted for these potential savings in our analysis. Through our regulatory mechanisms, we should be able to monitor the impact on DNO and GDN costs as a result of the RESP.

4.41 Finally, the RESP could deliver savings for local government through proportionate support and access to data and tools. But it could also potentially increase costs through, for example, additional resources to engage with the RESP process. The savings and costs attributed to local government are likely to be difficult to quantify. However, we will continue to engage with local government and monitor costs and savings where possible.

Development of a theory of change

4.42 As we move towards net zero, the energy system will become more interconnected, requiring coordinated planning to align different levels of decision-making, ensure consumer benefits, and maintain supply security. The objective is to focus regional energy strategic planning on the whole system, reflecting the local context and aligning with national plans. This approach aims to support coordinated energy system development, provide confidence in system requirements, and enable proactive investment in infrastructure. The RESP framework aims to ensure accountability, transparency, and effective coordination among various stakeholders. Guiding principles include a whole system approach, place-based planning, a vision-led strategy, and proactive development to adapt to uncertainties and support the net zero transition.

4.43 Given the complexity of the policy landscape in scope of the RESP, a theory of change would be important for the evaluation. Our view is that a whole system focus will deliver synergies and efficiencies by coordinating activities at national and local level, identifying the flexibility potential and optimising cross vector energy resources.

4.44 Some of the key assumptions to test in our theory of change are the level of savings that can be attributed to the RESP. Based on a literature review, savings could be around 15% on required distribution network investment. Our evaluation design should develop a methodology to test this assumption. However, it is not possible to give further details at this stage.

Timelines for monitoring and review

4.45 The review of this intervention could occur upon the completion of the first set of RESP outputs (likely to be produced by the end of 2027). At that stage, a post implementation evaluation may be conducted, and the need for a full impact evaluation potentially assessed.

4.46 A full impact evaluation would be conducted if, after the first RESP is published, it is decided that such an assessment is necessary.

Collection of Evidence

4.47 The monitoring and evaluation process should include the actual implementation and operational costs of the RESP policy submitted by NESO through their regulatory business plan reporting.

4.48 Additionally, we will continue to monitor and analyse the level of network investment required by the RESP, as well as CSNP and SSEP initiatives. We expect to monitor the level of investment in the network through the network price control process.[22]

[22] Further details on the Ofgem network price controls can be found here: https://www.ofgem.gov.uk/energy-policy-and-regulation/policy-and-regulatory-programmes/network-price-controls-2021-2028-riio-2

5. Conclusion

5.1 The cost benefit analysis presented for the implementation of the RESP policy shows that a 0.45% efficiency gain on the estimated total investment up to 2050 at the distribution level of energy networks is sufficient to achieve a break-even point. The total energy network investment considered in this condition is £250 bn up to 2050, in constant value, equivalent to an annual investment of £10 bn per year from 2026 up to 2050. The risk analysis shows that even considering more conservative scenarios for cost (50% higher) and lower levels of investment in energy networks (£2bn per year or a total of £50 bn up to 2050), a 3.4% efficiency gain is sufficient to achieve a break-even condition.

5.2 The literature reviewed indicates that to reach net zero by 2050, investment in distribution network infrastructure is likely to exceed £200 bn. Studies also highlighted the potential efficiency savings, in the region of £10bn to £20bn and efficiency gains of 15% to 25%, from more coordinated strategic planning and the synergies resulting from a whole system perspective and the transition to a smart, flexible energy system. We expect that the introduction of the RESP, working in tandem with other reforms to governance such as the introduction of the Market Facilitator role and wider strategic planning, will play a pivotal role in harnessing these efficiency gains and enabling the transformation of the energy system.

5.3 The benefits and level of investment identified in the literature highlight that the efficiency savings required to reach the breakeven point for the RESP policy are conservative. In addition, the risk analysis has highlighted that only under extreme conditions, when very low network infrastructure investment rates (£50 bn) and low efficiency gains (below 3.4%) from RESP occur, would the costs of the policy exceed the benefits. Based on the evidence collected, we understand that both these conditions are unlikely to occur simultaneously. Thus, this evidence shows that the CBA is robust, as even when considering conservative assumptions, both for investments required and the percentage efficiency savings, it is likely that benefits will exceed the costs of implementing the RESP policy.

5.4 In addition, there are hard to quantify benefits, both in wider energy infrastructure planning (transmission, generation, interconnectors, etc), regional and local development, and other externalities that will be achieved directly and indirectly due to RESP activities.

Appendices

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Appendix 1 – Analysis of network investment needs to reach net zero in Great Britain

Section summary

This appendix provides a summary of the analysis review made to the total investment estimated on the energy system up to 2050 to decarbonise GB. We aim to describe and identified the potential needs across distribution, transmission, generation, storage, control/monitoring, renewable gases, storage and flexibility and the potential costs associated to enable development of these plans. This aims to provide an overview of the potential total investment needs as the base to the quantitative analysis of the IA.

1.1. The review of the existing literature presented in this appendix shows a range of very significant net benefits. This assessment acknowledges that some of the benefits can be achieved without the policy intervention. However, some potential benefits will not be realised unless an intervention occurs.

1.2. The papers analysed and reviewed for this IA, and presented in this section, are not solely based on the assessment of what can be achieved by RESP implementation. Therefore, it is very challenging for this IA, at this stage, to attribute specific benefit values to the RESP function. The aim of this review is to present the investment levels assumed in these different studies for the various system components, and the savings that could be achieved through some of the mechanisms that the RESP function can support. In the following sections, this IA presents:

- Investment costs
- Benefits
- Efficiency gains
- Remarks
- List of studies

Investment costs

1.3. This section presents an overview of the costs associated with the significant investment in energy infrastructure that will be required up to 2050 to deliver a net zero future for GB. In preparation for this IA, a review of the literature was conducted, identifying the values estimated to be required for investment in energy infrastructure, to achieve net zero in GB. The following bullet points aim to indicate the figures of the overall investment that are estimated to be required on each of the highlighted studies. For some of these studies, a further level of description is provided, highlighting how much is required for specific parts of the network.

1.4. In summary, the values presented for the overall investment required range from £1 000bn to £1 750bn, and specifically for the distribution network level, the investment required ranges from £50 - 300 bn, up to 2050 in GB.

- "Building a governance framework for coordinated local area energy planning". Energy Systems Catapult, 2022: £40 bn a year up to 2030, extrapolating cumulative values up to 2050, it is £1 000bn
- "GB Energy and market restructuring can deliver energy security". Centre for Economics and Business Research, 2024**:** £1 600bn total investment, £900 bn for generation assets, £330 bn for transmission and distribution and £200bn storage assets
- "The net zero transition: What it would cost, what it could bring". McKinsey & Company, 2022: 2.5% of GDP per year on Net zero investments – Equivalent of £1 750 bn in GB up to 2050, £70 bn a year
- Appendix I: Electricity Networks Modelling, DESNZ, 2022: £240 bn on distribution networks investment for LRE and £120 bn for transmission up to 2050
- Distribution network study, NIC, 2025: The values presented in this study show an additional investment requirement of £37-50bn on electricity distribution network up to 2050. However, it is important to note that the study considers only the level of load related expenditure expected on the electricity distribution network, excluding 132 kV and low voltage service cables, and assumes a substantial uptake in flexibility. As the RESP will consider the whole energy system and inform load related expenditure investment in both the electricity and gas distribution networks it is likely that higher levels of investment are most applicable for this analysis.

Benefits from enhanced coordination from RESP

1.5. In the following segment, we present a summary of the identified findings from the literature review regarding the quantified benefits of enhanced coordination for regional and local energy planning in Great Britain. The benefits quantified in these studies cover various parts and components of the energy infrastructure, making direct comparisons to the analysis and scope of this IA challenging. However, these figures highlight the potential scale of the potential efficiency gains achievable with some of these planning mechanisms. The following bullet points aim to indicate the values of potential benefits from policy interventions on planning policies as identified in each of the highlighted studies:

- Appendix I: Electricity Networks Modelling, DESNZ, 2022: Total benefits Up to 2050, £40 bn to £50bn on transmission and distribution level, and £10 to 20 bn specifically on distribution networks level
- "Building a governance framework for coordinated local area energy planning". Energy Systems Catapult, 2022: indicates benefits of £163-252bn over a 25-year-period
- Distribution network study, NIC, 2025: indicates reduction on load-related cumulative expenditure up to 2050, would be around a 15% saving of the additional investment costs required
- Appendix I: Electricity system flexibility modelling. Department for Business, Energy & Industrial Strategy, 2021: £30bn-£70bn due to enhancements by smart system and flexibility plans
- "Future World Impact Assessment" by Baringa - Energy Networks Association, 2019: highlights potential benefits of £6.2-12.4bn over a 30-year-period
- "Flexibility in Great Britain" by the Carbon Trust and Imperial College London, 2021: highlights potential annual benefits of £9.6-16.7bn/yr in 2050
- "Benefits of flexibility of Smart Local Energy Systems in supporting national decarbonisation" by EnergyREV, 2022: highlights annual benefits of £0.9-3.2bn/yr in 2035

1.6. For example, the Energy System Catapult[23] estimates potential benefits from policy interventions on coordinated local area energy planning of £163 bn- £252 bn up to 2050, while a BEIS study[24] estimates benefits from £30 bn to £70 bn up to 2050. Specifically for the distribution network, DESNZ[25] estimates benefits of £10 bn - £20 bn, and NIC[26] estimates between £10 bn - £12 bn. Although it is difficult to compare quantified benefit results across different scopes of the network studies included, it is possible to infer that efficiency gains are often in the order of 5%-25% of the investments made on energy infrastructure.

Efficiency gain mechanisms

1.7. The efficiency gains that can be attributed to the introduction of the RESP, primarily stem from the benefits of more coordinated whole system planning that provides strategic assessment of energy need (supply and demand) across the region, that is grounded in local priorities. Further the RESP will provide justification for strategically significant areas of network investment need that are more complex due to timescale, geography, or required trade-offs between vectors (electricity, gas, heat, hydrogen, etc.), priorities or actors.

1.8. The RESP is expected to set the direction of network planning and ensure necessary strategic investments are brought forward when and where they are needed to enable net zero. It is proposed that network companies (DNOs and GDNs) will be required to align their network planning to the trajectory of the RESP and propose strategic investment where need is identified. Therefore, the benefits of the RESP extend beyond enabling collaboration and communication by playing a pivotal role in acting as the starting point for coordinated network investment plans.

1.9. Coordinated network investment plans that maximise planning synergies should lead to a more efficient system by preventing misalignment between local government, different

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[23] See Energy Systems Catapult. (2022). Building a governance framework for coordinated local area energy planning. Energy Systems Catapult. https://es.catapult.org.uk/report/governance-framework-for-coordinated-local-area-energy-planning/

[24] See Department for Business, Energy & Industrial Strategy. (2021). Appendix I: Electricity system flexibility modelling. GOV.UK. https://assets.publishing.service.gov.uk/media/60f57aade90e0764cd98a0a3/smart-systems-appendix-i-electricity-system-flexibility-modelling.pdf

[25] See Department for Energy Security and Net Zero. (2022). Electricity Networks Strategic Framework: Appendix 1 - Electricity Networks Modelling. https://www.gov.uk/government/publications/electricity-networks-strategic-framework

[26] NIC study on electricity distribution network, 2025. See: Electricity distribution network - NIC

sectors and networks leading to disrupted investment. For example, better integration between heat networks, electricity and gas networks can provide synergies that will reduce the investment needs for some networks. Coordinated planning should provide confidence to ensure that investment is made when and where it is needed, whilst guarding against work that is not yet necessary in a region.

Remarks

1.10. The literature reviewed presents two main trends: the investment required to achieve net zero in energy networks and systems by 2050 will be very significant, and the potential savings from more strategic coordinated planning could be substantial. Regarding the first trend, the total investment values mentioned exceed £1,000 bn, covering generation, transmission, distribution, and storage requirements. Specifically, the investment in distribution networks alone is estimated to be in the region of up to £200 bn. On the other hand, potential benefits achieved through local planning policies are often over £1 bn to £2 bn annually, amounting to £50 bn by 2050. Savings, specifically from benefits at the distribution network level, could exceed £10 bn by 2050.

1.11. We acknowledge that some of the benefits will be achieved without the proposed intervention, and some will not be realised unless additional interventions occur. At this stage, it is very challenging to attribute specific benefit values to our proposal because the referenced papers are not solely based on what we are proposing. Nevertheless, if we compare the level of potential benefits, at the distribution level, from these policy interventions (ie an accumulated value of at least £10 bn) to the expected investment required, it could be indicated that the expenditure reductions/savings ratio would range from 5 to 10 percent of the total investment, or in some cases even higher.

1.12. Finally, in the IA analysis, the scenarios analysed will utilise assumptions based on the investment and saving potential evidenced in the reviewed literature and explained above, ie a benefit rate of 5% and £250bn investment, a proxy for the investment required at the distribution network level.

List of Studies

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Appendix 2 – Implementation costs of the RESP role

Overview

1.13. NESO provided costs based on their initial development of plans to implement and deliver the RESP across GB. The costs were provided in response to a request for information (RFI) made by Ofgem. Based on the information provided by NESO in the response to the RFI, one main cost scenario to the RESP role (ie the functions required to deliver the RESP outputs) is considered, and two additional cost scenarios are created to facilitate the analysis based on the information provided. Thus, the three scenarios considered are:

- Standard: Based on NESO estimated costs in response to Ofgem's RFI;
- Lower costs scenario: A 50% reduction to the values considered in the standard scenario.
- Upper costs scenario: A 50% addition to the values considered in the standard scenario.

1.14. The cost tables presented below provide a summary of the estimated costs to implement the RESP role and some of the related assumptions:

- Table 5: provides a summary of the RESP's implementation costs, from 2024 to 2026.
- Table 6: presents the total RESP's operational costs for the three scenarios considered.
- Table 7: presents an overview of the RESP's implementation, operational and total costs, from 2024 to 2050, on the three costs scenarios considered.
- Table 8: presents the underlying assumptions on how and where operational costs could change, due to changes in policy and the wider landscape.

1.15. In the following below paragraphs, NESO's underlying assumptions are listed as presented in the RFI response:

- Financially costed RESP against what NESO has reasonable certainty over at present (November 2024). Ofgem is currently considering stakeholder responses to the consultation ("Regional Energy Strategic Plan policy framework consultation", July 2024). Any scope changes or provision of additional detail against the existing proposals and assumptions outlined in the consultation would need to be subject to further assessment and may materially change the values.

- The early stage of development having not yet completed the RESP policy high level design or developed the RESP methodology. Based on this, there is uncertainty on all costs post BP3 (FY26), given the impact the RESP design could have on headcount, IT costs and the overall cost of operation.
- As a result of the uncertainties in what regional teams will need to do to deliver the RESP methodology, headcount numbers are based on:
  - Hours anticipated for engagement and follow up activities within each region associated with key stakeholders: DNOs, GDNs, Local Authorities and other local actors
  - The size of the region, measured by population; and considering the future energy change within each region, obtained from FES 2023 regional breakdown 'Leading the way scenario'.
- The RESP team are currently undertaking a high level design of RESP due for completion in summer 2025. The high level design will result in a more accurate enduring headcount for RESP, based on the methodology and the capabilities to deliver that methodology both regionally and centrally. Regional baselines will start to give a better view on the different regional landscapes, not only in terms of stakeholders, but in terms of data and energy planning maturity.
- For planning purposes, profiled the cost to achieve (CTA) from 31st March 2024 until April 2027 when it is assumed NESO will have completed the set-up phase of Regional Energy Strategic Plan operation (RESP) (table 5).
- Reach the end-state by 31st March 2027, when RESP costs will be considered Operational (table 6). At this point the future RESP headcount split between management and staff levels or between grades is subject to further design.
- Against all costs, no assumptions have been made nor costed to factor for inflationary increases in rates for people and non-people costs in future years.
- The costs reported in the tables below represent the RESP allocation to the delivery and operation of RESP where infrastructure and/or capabilities are already accounted in other NESO functions ie, IT costs, shared services support etc. For property requirements, the costs reflect the RESP requirement for additional properties, and not the wider NESO requirement.

- The costing method uses existing internal comparators where available to benchmark and calculate future costs. Where appropriate costings are based on external market research and comparator estimates for costs.

- NESO IT systems are currently compliant with Data Best Practice Guidance. Any changes to this may change costs, as well as decisions regarding data ownership for RESP inputs.

- Formal separation from Transitional Services Agreement with National Grid Group due to be completed in 2026. This could increase or decrease overhead costs per headcount.

- When costing implementation and operational costs, at this point alternatives have not been considered as part of these costing. NESO provided one set of numbers, and outlined in table 7 where costs could increase or decrease against the FY28 run costs of RESP.

Table 5 Implementation costs of the RESP role

Title	FY 25	FY 26	FY 27	Total
People	£2.5 M	£10.6 M	£20.4 M	£33.5 M
Systems & Data	-	£12.5 M	£21.5 M	£34 M
Assets	-	£1.1 M	£9.1 M	£10.2 M
RESP set up	£2.1 M	£6 M	£7.7 M	£15.8 M
Others	-	£0.7 M	£1.4 M	£2.1 M
Total				£95.6 M

Table 6 – Operational costs – On annual basis, and total from 2027-2050, for three costs scenarios considered

Function	Lower	Standard	Upper
RESP Function	£11.5 M	£23.0 M	£34.5 M
IT Costs	£7.0 M	£14.0 M	£21.0 M
Property Costs	£1.3 M	£2.5 M	£3.8 M
Other Costs	£1.3 M	£2.5 M	£3.8 M
Total Annual	£21 M	£42 M	£63 M
Total Up to 2050	£504 M	£1008 M	£1512 M

Table 7 – Total costs for RESP function up to 2050 (2024-2050), for three cost scenarios considered

Costs type	Lower*	Standard	Upper*
RESP Operational (2027-2050)	£504 M	£1008 M	£1512 M
Implementation (2024-2026)	£47.8 M	£95.6 M	£143.4 M
Total (Up to 2050)	£551.8 M	£1,103.6 M	£1,655.4 M

*NESO presented the costs for the standard scenario. We have added the Lower and Upper scenarios to evaluate changes in cost assumptions (-50% and +50%)

Table 8 - Underlying assumptions on how and where operational costs could change, due to changes in policy and the wider landscape

Decrease in costs	Topic	Increase in costs
• Leverage the support, resource, and capability from central NESO to deliver parts of the RESP capability – likely to be limited to central resources only. • High maturity in external digital and data capability resulting in a high level of self-service offering being practical to be provided by RESP; therefore fewer RESP headcounts needed in the medium and long term.	RESP Function	• Identify an increase in RESP support required to deliver the outcomes and value needed. • An additional need to bring in third parties to help RESP build and deliver support to local actors. • Recruitment delays resulting in backfilling capability through consultants and contractors. • Regional Governance requires more support and effort to drive the outcomes intended by the boards.
• Charging 3rd parties for licensing costs which are associated to external stakeholders accessing NESO's digital and data platform c.700-1000 licenses.	IT Costs	• Delays in standing up digital and data capabilities which will require additional spend. • High level of external digital and data capabilities which NESO would need to meet in order to interact with external RESP stakeholders. • Varied levels of external digital and data capabilities, meaning RESP will need to tailor digital and data build to meet the needs of external stakeholders. • External factors resulting in an increase to third party supplier licencing costs.
• Shared properties with other regional parties. • Descope the need for some regional properties.	Property Costs	• Increase in RESP headcount would result in more space required for regional properties. • Should RESP carry out engagement with external stakeholders using regional properties could result in additional costs. • Delays to standing up regional properties would occur more costs for interim workspaces. • RESP could require additional levels of Critical National Infrastructure (CNI) provision in regional or central properties which could increase the RESP allocation per desk.
• Support is only required for certain periods, resulting in a reduction in RESP allocation time/costs.	Other Costs	• Unable to allocate support services resource in house which would require support (or additional support) from consultants/contractors. • Additional support is required above provisioned allocation.