Consultation

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National Electricity Transmission (NGET) Melksham Operational Tripping Scheme Phase 2 Project

Subject	Details
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We[1] are consulting on Melksham Operational Tripping Scheme (OTS) Phase 2 Project proposed by NGET. We would like views from people with an interest in electricity transmission and distribution networks. We would also welcome responses from other stakeholders and the public.

This document outlines the scope, purpose and questions of the consultation and how you can get involved. Once the consultation is closed, we will consider all responses. We want to be transparent in our consultations. We will publish the non-confidential responses we receive alongside a decision on next steps on our website at Ofgem.gov.uk/consultations. If you want your response – in whole or in part – to be considered confidential, please tell us in your response and explain why. Please clearly mark the parts of your response that you consider to be confidential, and if possible, put the confidential material in separate appendices to your response.

[1] The terms 'we', 'us', 'our' refer to the Gas and Electricity Markets Authority (the Authority). Ofgem operates under the direction and governance of the Authority.

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1. Executive summary

1.1. We are consulting on our assessment of the needs case, optioneering and efficient costs for an Operational Tripping Scheme (OTS) Medium Sized Investment Project (MSIP). This project was proposed by National Grid Electricity Transmission (NGET) under its MSIP Re-opener submission made in January 2022.

1.2. The MSIP Re-opener allows the electricity transmission companies to request new funding during the RIIO-2 price control period for projects that meet certain conditions in their licence and cost less than £100m.

1.3. National Grid Electricity Transmission expects that new interconnectors and generation connecting in the South West of England by 2024 will result in operational issues if a double circuit unplanned outage occurs during planned outages. NGET contends that the most efficient way to manage these issues is to install phase 2 of an Operational Tripping Scheme (OTS) at its Melksham substation. The OTS will monitor circuits and automatically switch or disconnect generation in the event of a fault to avoid instability or unacceptable thermal or voltage conditions on the transmission system.

1.4. Based on our assessment, we are satisfied that NGET's analysis of the current and future system stability issues in the South West of England is valid and that an intervention is needed to avoid significant costs from constraining generation in future.

1.5. We also consider that the option of extending the existing OTS at Melksham to monitor local connections and manage system stability is likely to be more cost efficient compared to other alternatives.

1.6. We have assessed NGET's proposed costs for the Melksham OTS phase 2 project. We consider that NGET's proposed direct activity costs for the project are efficient and are minded-to adjust NGET's price control allowances for these. However, we consider that NGET included some indirect activity costs in its MSIP funding application which we propose to remove. Instead, NGET will receive an automatic funding uplift from an allowance escalator included in its price control specifically to cover the costs of indirect activities on new projects.

1.7. The rest of this document summarises NGET's MSIP submission and explains our findings to support our minded-to position.

2. Introduction

What are we consulting on?

2.1. We are consulting on our assessment of the needs case, optioneering and efficient costs for an Operational Tripping Scheme (OTS) Medium Sized Investment Project (MSIP). This project was proposed by National Grid Electricity Transmission (NGET) under its MSIP Re-opener submission made in January 2022.[2]

2.2. The MSIP licence condition[3] allows the electricity transmission companies to make re-opener submissions during the RIIO-2 price control period for projects that meet certain conditions in their licence and cost less than £100m.

2.3. NGET considers that this MSIP submission meets the relevant criteria set out in Special Condition (SpC) 3.14.6(f) of the licence condition and that it is made in accordance with the RIIO-2 Re-opener Guidance and Applications Requirements[4] which provides how licensees must prepare their Re-opener applications pursuant to SpC 9.4 (Re-opener Guidance and Application Requirements Document. We agree with NGET that this project meets the MSIP eligibility criteria and we have provided a summary of our assessment in Appendix 2.

Consultation approach

2.4. In its MSIP Re-opener submission, NGET provided Ofgem with supporting evidence of the needs case for the Melksham OTS Phase 2 project, driven by the anticipation of additional generation connections into the South West region of England that will result in thermal, voltage and stability issues for its network. To mitigate these issues, NGET proposes to extend the existing Melksham OTS to effectively accommodate the anticipated generation connections.

2.5. NGET has provided Ofgem with information to justify its proposed connection solution and the associated costs of its preferred option.

[2] We note NGET made the request to redact some information from this publication on the grounds of commercial sensitivity. We partially accepted the request to redact some information, but do not consider information published in this competition breaches competition law.
[3] Statutory consultation on modifications to the RIIO-2 Transmission, Gas Distribution and Electricity System Operator licence conditions | Ofgem
[4] Re-opener Guidance and Application Requirements Document (ofgem.gov.uk)

2.6. This consultation sets out our minded-to position on the Melksham project in the following areas:

- the needs case
- the alternative options and the justification for the proposed project, and
- the efficient costs for the proposed project.

Context and related publications

2.7. The scope of this consultation is limited to NGET's Melksham MSIP project. Additional information on this MSIP project can be found in Melksham's MSIP Re-opener application document.[5]

Consultation stages

2.8. This consultation will open on 24 May 2022 for 28 days and close on 22 June 2022. We will review and publish the responses 14 days after the consultation closes. We will aim to publish our decision in July 2022.

How to respond

2.9. We want to hear from anyone interested in this consultation. Please send your response to the person or team named on this document's front page.

2.10. We've asked for your feedback in each of the questions throughout. Please respond to each one as fully as you can.

2.11. We will publish non-confidential responses on our website at www.ofgem.gov.uk/consultations.

[5] A4 simple report 1-col no divider Nov 2019 (nationalgrid.com)

Your response, data and confidentiality

2.12. You can ask us to keep your response, or parts of your response, confidential. We'll respect this, subject to obligations to disclose information, for example, under the Freedom of Information Act 2000, the Environmental Information Regulations 2004, statutory directions, court orders, government regulations or where you give us explicit permission to disclose. If you do want us to keep your response confidential, please clearly mark this on your response and explain why.

2.13. If you wish us to keep part of your response confidential, please clearly mark those parts of your response that you *do* wish to be kept confidential and those that you *do not* wish to be kept confidential. Please put the confidential material in a separate appendix to your response. If necessary, we'll get in touch with you to discuss which parts of the information in your response should be kept confidential, and which can be published. We might ask for reasons why.

2.14. If the information you give in your response contains personal data under the General Data Protection Regulation (Regulation (EU) 2016/679) as retained in domestic law following the UK's withdrawal from the European Union ("UK GDPR"), the Gas and Electricity Markets Authority will be the data controller for the purposes of GDPR. Ofgem uses the information in responses in performing its statutory functions and in accordance with section 105 of the Utilities Act 2000. Please refer to our Privacy Notice on consultations, see Appendix 4.

2.15. If you wish to respond confidentially, we'll keep your response itself confidential, but we will publish the number (but not the names) of confidential responses we receive. We won't link responses to respondents if we publish a summary of responses, and we will evaluate each response on its own merits without undermining your right to confidentiality.

General feedback

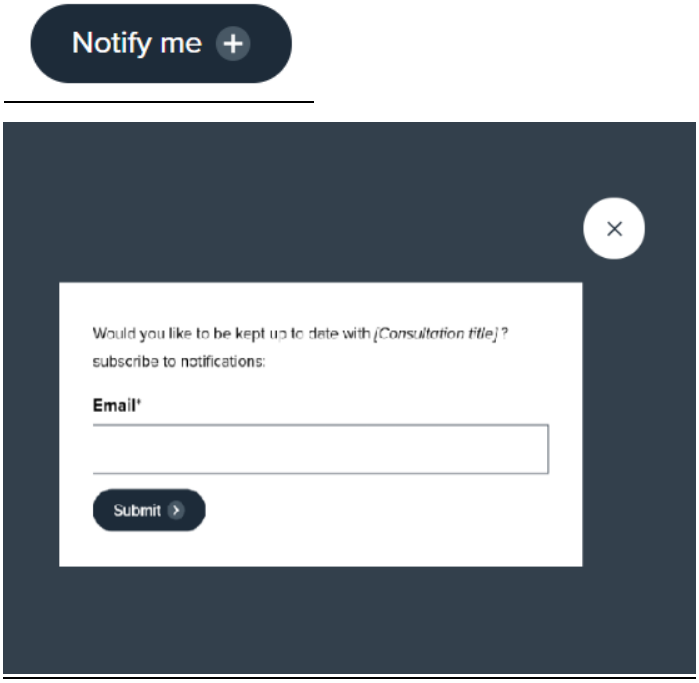
2.16. We believe that consultation is at the heart of good policy development. We welcome any comments about how we've run this consultation. We'd also like to get your answers to these questions:

1. Do you have any comments about the overall process of this consultation?
2. Do you have any comments about its tone and content?
3. Was it easy to read and understand? Or could it have been better written?
4. Were its conclusions balanced?
5. Did it make reasoned recommendations for improvement?
6. Any further comments?

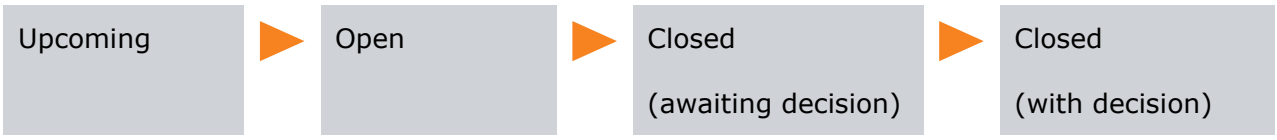
2.17. Please send any general feedback comments to stakeholders@ofgem.gov.uk

How to track the progress of the consultation

2.18. You can track the progress of a consultation from upcoming to decision status using the 'notify me' function on a consultation page when published on our website. Ofgem.gov.uk/consultations



2.19. Once subscribed to the notifications for a particular consultation, you will receive an email to notify you when it has changed status. Our consultation stages are:



3. Needs case for the proposed project

Section summary

In this section, we summarise the main issues that form the needs case for the Melksham OTS Phase 2 project.

Consultation Question 1: Do you agree with our 'minded to' view on the validity of the needs case for the Melksham OTS Phase 2 MSIP Project?

3.1. NGET is required by its transmission licence to provide reliable connections for customers and to maintain a safe and reliable transmission system. NGET's baseline RIIO-T2 business plan included a range of new generation customers, interconnectors and tertiary customers[6] to be connected in South West England during RIIO-2 price control period.

3.2. Under certain unplanned network conditions, these additional connections could exacerbate a range of thermal, voltage and stability issues[7] on the electricity transmission system. If approved, the Melksham OTS Phase 2 project would involve additional monitoring and control systems being installed to avoid these issues in the future and provide additional flexibility to National Grid Electricity System Operator (NG ESO) in managing constraints in the network.

Background

3.3. Over the next five years, a significant increase of generation is contracted to connect to the electricity transmission network in the South West of England (see Table 1).

[6] NGET provides two main ways to connect to its network at NGET's existing substations: a high voltage 'bay' connection or a lower voltage connection through a 'tertiary'. A tertiary connection is typically suitable for smaller projects looking to connect directly to NGET's network. It is called a tertiary as it uses the third winding on existing high voltage transformers.

[7] Thermal, voltage and stability issues are grouped together in this example as resultants of excess generation operating on a limited network. These issues can result in damage to, or failure or, system assets, DNO asset and potentially generation or demand customers, if not managed correctly.

Table 1: Future connections in South West England during RIIO-2

Connection Type	Customer	Connection site	TEC (MW)	Connection Year
New Tertiary	Pivot Power (Battery	Alverdiscott	49.9	2023
	Pivot Power (Solar PV and Battery Storage)	Landulph	49.9	2023
	Enso Green Holdings (Solar PV and Battery Storage)	Melksham	57.0	2023
	Pivot Power (Battery	Taunton	49.9	2024
	Harbour Energy (Battery	Axminster	49.9	2024
	IQ Energy Centre (Solar PV and Battery Storage)	Indian Queens	49.9	2024
	Pivot Power (Battery	Indian Queens	49.9	2024
	Mannington BRL (Solar PV)	Mannington	49.9	2024
	Nursling Energy 2 (Battery	Nursling	49.9	2024
	Enso Green Holdings (Solar PV and Battery Storage)	Fleet	57.0	2025
	Pivot Power (Battery 202 5 Storage)	Exeter	49.9	2025
Interconnectors	Aquind	Lovedean	2000	2024
	FABLink	Exeter	1400	2024
New Generation	Hinkley Point C Unit 1	Shurton	1670	2024
	Hinkley Point C Unit 2	Shurton	1670	2025

3.4. When there are multiple connections (including interconnectors) to the electricity transmission system, the system may experience increased thermal loadings or deviation from the stipulated voltage limitations during certain scenarios, which could lead to an unreliable and unsafe network. NGET is required by its licence to comply with network security standards to alleviate these phenomena via investment in transmission assets such as Operational Tripping Schemes (OTS).

3.5. An OTS allows connected generation to operate unconstrained, where possible, during fault/outage events, or N-2/N-3 scenarios.[8] It does this by monitoring electricity transmission lines and in the event of a fault or combination of faults will automatically switch or trip

[8] An N-2 scenario in the transmission network is defined as when a circuit is on planned outage followed by a single circuit fault reducing the transmission capacity by 2 circuits. An N-3 scenario in the transmission network is defined as when a circuit is on planned outage followed by a double circuit fault reducing the transmission capacity by 3 circuit.

generation[9] if needed to avoid instability or unacceptable thermal or voltage condition on the transmission system. An OTS also provides NGESO with flexibility in managing constraints across the network.

3.6. In 2019, NGET installed an operational tripping scheme, known as Melksham OTS Phase 1, at its Melksham 400kV substation located in Wiltshire, England. The Melksham OTS Phase 1 is currently monitoring several circuits in the local region, such as the IFA2 interconnector.[10] Melksham's OTS is one of four OTS installed by NGET to monitor the South West of England and manage network system stability by feeding into the Active Network Management (ANM)[11] schemes of the Distribution Network Operator (DNO).

3.7. The Melksham OTS Phase 1 is controlled by the Station Level Controller (SLC) at Melksham substation, and it has capacity to be extended to accommodate and monitor additional generation connections.

Demonstration of needs case

3.8. NGET contends that further OTS services are required to keep the electricity transmission system safe and operable under N-3 scenarios when future connections are made in the South West of England during the RIIO-T2 period.

3.9. One option is that each new connection is required to have its own independent OTS arrangement. However, NGET argues that multiple OTS within the same region will result in the overlapping of system monitoring requirements. This will be inefficient compared with the alternative of extending an existing OTS to cover all the anticipated connections in the region.

3.10. NGET identified the Melksham OTS as the most efficient local OTS to be extended. The Melksham OTS Phase 1 was designed to be extendable should the need arise.

[9] Tripping a generation is the pre-emptive disconnection of generation plant to avoid a fault causing further thermal, stability or voltage issues by removing the excess generation above that which the network can safely operate.
[10] IFA 2 is a subsea electrical interconnector, running beneath the English Channel between France and the United Kingdom. The 204-kilometre high voltage DC cable operates at +/-320kV with the capacity to transmit 1,000 MW of power.
[11] In electricity distribution circuits, Active Network Management (ANM) describes control systems that manage generation and load for specific purposes. This is usually done to keep system parameters (voltage, power, phase balance, reactive power and frequency) within predetermined limits. ANM generally refers to automated systems.

Our initial view of needs case

3.11. We are satisfied that NGET's analysis of the current and future system stability issues in the South West of England is valid. We note that the network in the area is currently under pressure by the existing connections, and it will be at further increased risk from unanticipated outages when a large volume of new connections link to the system by 2024.

3.12. We note that NGET's information on future connections in South West England (Table 1) in the next few years is not up to date. The Secretary of State for Business, Energy and Industrial Strategy rejected planning permission for the Aquind interconnector, meaning that the proposed connection date in 2024 is not likely to be achieved.[12] However, even without Aquind, we consider that an intervention to accommodate contracted or potential future connections is needed.

3.13. We agree that managing system stability by protecting network circuits during unplanned faults is an economic and efficient way to protect the interests of consumers. Moreover, we agree with NGET that extending the Melksham OTS to monitor several local connections is likely to be more cost efficient compared to the option of several overlapping independent OTS.

3.14. Considering all these factors, we consider that NGET's needs case is reasonable and is sufficient to justify an intervention of the scale proposed by NGET.

3.15. NGET has considered several options to address the needs case and has provided detailed information on its analysis for the two shortlisted options. We set out in the following Chapter our view on the optioneering carried out by NGET.

[12] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN020022/EN020022-004431-EN020022%20-%20Secretary%20of%20State%20Decision%20Letter.pdf

4. Assessment of options and justification for the proposed project

Section summary

We detail our assessment of all the options considered by NGET from a technical viewpoint and its justification for the chosen options. We analyse the relative costs of these options and discuss our minded-to view of their proposed solution.

Consultation Question 2: Do you agree with our technical assessment of the range of solutions to meet the needs case?
Consultation Question 3: Do you agree with our minded-to view of the solution proposed by NGET?

Option Selection

4.1. NGET has assessed six options for delivering the Melksham's OTS Phase 2 Project to satisfy the needs case. The broad options and their variations were:

- Do Nothing,
- Installation of new local or regional OTS,
- Extension of the existing Sellindge OTS.
- Network reinforcement solutions, or
- Extension of the existing Melksham OTS.

4.2. We have undertaken a technical review of the alternatives considered by NGET, including engineering justification papers, networks system studies and NGET's Cost Benefit Analysis (CBA). These were included within NGET's MSIP submission and responses to Supplementary Questions (SQs) from NGET.

4.3. We have summarised below the options that NGET assessed, alongside with NGET's view on their viability.

Option 1: Do nothing

4.4. This option was assessed and shortlisted by NGET as a viable solution.

4.5. It explores the situation where NGET would not proceed with any capital work related to customers' connection into the network. The Do nothing option would result in N-3 events on the system under certain planned outages that could bring the network's state to unacceptable levels of instability. Under this scenario, generation would need to be constrained and generators will be asked to reduce their load or disconnect. To maintain the balance of the system, NGESO would then seek to replace the constrained generation from generation outside this area. These constraint activities fall under the Balancing System Use of System Charges (BSUoS) and would eventually result in the ESO passing through the constraint management costs to consumers.

Option 2: Installation of a new local OTS for each generator/interconnector

4.6. This option was assessed and discounted by NGET from further consideration. NGET claims that this option will result in increased costs to consumers due to the installation of several new OTS systems. Moreover, costs might be increased by the requirement for use of Portable Relay Rooms at some sites due to lack to space within the existing relay rooms.[13]

Option 3: Installation of a new regional OTS that covers all new generators/interconnectors

4.7. This option was assessed and discounted by NGET from further consideration. NGET claims that this option will result in increased costs to consumers as the installation of a new OTS system would be more expensive than extending the existing scheme. Moreover, similarly to Option 2, costs might be increased further by the requirement for use of Portable Relay Rooms at some sites due to lack to space within the existing relay rooms.

[13] Portable relay rooms are self-contained, fully integrated portable buildings containing several interconnected sub-systems. They can be positioned at a substation, often near the project completion date and simply cabled up to a single marshalling kiosk. Lack of space within the existing relay rooms within Melksham's substation will require the installation of portable relay rooms, resulting to increased costs.

Option 4: Extension of the existing Sellindge OTS

4.8. This option was assessed and discounted by NGET from further consideration due to its increased costs. This option will be expensive due to both the need of monitoring a greater number of circuits and excessive overlapping with Melksham OTS services that will result in inefficiencies.

Option 5: Undertaking network reinforcement

4.9. This option was assessed and discounted by NGET from further consideration due to its increased costs within RIIO-T2 period (>£500m). Moreover, finalisation of these wider works would be unrealistic for NGET due to insufficient planned outages, NG resources and supply chain resources.

Option 6: Extension of the existing Melksham OTS (Phase 2)

4.10. This option was assessed and shortlisted as viable solution by NGET, as it combines the avoidance of constraint costs and/or network reinforcements. The existing Melksham OTS can be extended to accommodate future connections efficiently and contribute to system stability. NGET's application presents the case of having a wider OTS (i.e. extension of Melksham OTS) that will cover all the new generations instead of several standalone OTS that will result in overlapping of system monitoring activities.

Ofgem's view of the potential solutions

4.11. Having considered the variety of solutions presented by NGET, we are satisfied that they have considered an appropriate range of options to address the needs case.

4.12. We agree that the installation of new local or regional OTS (Options 2 and 3) to accommodate future generation/interconnectors would be costly and not a consistent approach with the existing OTS assets in the region, and we agree with NGET's decision to discount these options.

4.13. We also agree with NGET's decision to discount the alternative solution of extending the existing Sellindge OTS (Option 4), as it would be an inefficient choice both from cost and operational perspective compared to the shortlisted Option 6- extension of Melksham OTS solution.

4.14. We challenged NGET on Option 5 - network reinforcement and whether some non-load replacement works that are planned in the area would help to reduce constraints. However, NGET confirmed that the benefit will be limited and that the level of constraints would be at a high level. For that reason, we consider that for NGET would be significantly expensive choice to address the needs case, compared with the preferred option, and agreed with NGET's decision to discount this option.

Methodology for option selection

4.15. To address the needs case drivers discussed in the previous chapter, NGET undertook a Cost Benefit Analysis (CBA) on the two shortlisted options (Option 1 - Do Nothing and, Option 6 - Extension of the existing Melksham OTS) for assessing the costs. In the CBA, NGET assessed the costs associated with each option up to the end of life of NGET's and customer's physical assets, starting from 2024 (last customer connection) and running for 20 years. Such costs included the cost of intervention and any future replacement costs for extension of the Melksham OTS option and constraint costs based on the range provided by NGESO for Do nothing option.

4.16. NGET did not include direct or indirect benefits for consumers or the wider network in Melksham's CBA. For more information on Ofgem's approach on NGET's CBA, please see paragraphs 4.36-4.37 below.

Baseline option - Do nothing

4.17. Under this scenario, NGET would not proceed with any capital works to manage network issues that could result from additional generation connections in the near future.

4.18. To manage the additional load of the system, generators would be forced to restrict their export and as a result constraint management costs would be incurred directly by the NGESO and passed through to consumers.

4.19. To assess the potential constraint management costs NGET used cost figures from high-level studies undertaken by the NGESO for the existing Melksham OTS design and installation process. The assessment included figures regarding predicted demand and embedded generation, Future Energy Scenarios and typical circuit availability, and also a limited number of planned outages to determine constraints based on a conservative £/MWh figure.

4.20. The assessment used the year 2024 as a starting point for constraint costs, when interconnectors and customers are expected to connect into the transmission system. According to NGET's analysis, constraint costs in this scenario will peak in 2023(c. £23m), when the bulk of new load (generation and interconnectors) will be connected into the system. Constraint costs in 2024 alone will be higher than total costs of extending Melksham OTS.

4.21. Overall, the net present cost for consumers of Do-Nothing option for 20 years (2024-2044) is estimated to be £471.89m (see Table 2 below).

4.22. NGET says this option should be rejected as the constraint costs incurred are uneconomic and inefficient compared to the net present value of the other viable option.

Option 1 – Do nothing (low sensitivity scenario)

4.23. NGET also considered a variation of the Baseline option which reflects the lowest forecast scenario regarding constraint costs from the Do-nothing option. NGET's CBA assessed the costs for the option to be in the range of £4.5m/annum from 2024 when new generation is forecast to connect, compared with £23m/annum for baseline option.

4.24. The net present cost for consumers of Do-nothing option (low sensitivity scenario) for 20 years (2024-2044) will be £92.33m. As with Baseline option, this low sensitivity scenario remains more expensive and inefficient compared to the net present value of the Option 2 – Extension of the existing Melksham OTS (Phase 2) (see Table 2 below).

4.25. NGET has rejected this option, as with Baseline Do nothing option.

Option 2 – Extension of the existing Melksham OTS (Phase 2)

4.26. NGET has considered and assessed the option to extend the existing Melksham OTS in order to accommodate future generation/interconnections and secure the uninterrupted operability of transmission system.

4.27. In its CBA, NGET included the lifetime costs for Melksham OTS Phase 2 extension works that were based on contractor's submitted costs for installing and commissioning the OTS equipment and internal NGET costs.

4.28. NGET also included on its analysis the costs of replacing the Melksham OTS Phase 1 when its 20-year asset life ends in 2039. This is to allow for a fair comparison of overall

system costs for continuing with a wider OTS strategy as against the capital investment options. NGET did not include constraint costs in the CBA of this option because the Melksham OTS Phase 2 is expected to minimise the need for new generators to reduce their load or disconnect from 2024 compared to the baseline option – do nothing.

4.29. NGET explained on its application that the difference between the viable options are the constraint costs on Baseline options and the cost of extending the OTS for the extension solution.

4.30. NGET's preferred solution is to extend the existing Melksham OTS system, as it is significantly more cost effective, on a net present value basis (NPV), compared to the Do nothing options (£m 471.89 vs 92.33 vs 17.90) and it represents the best value for consumers. For calculating the NPV, NGET incorporated all investment and constraint costs, while these costs were discounted using the Spackman method.[14] A cost summary of NGET's assessment on these options can be found in Table 2 below.

4.31. NGET also argued that the costs for extending Melksham OTS will be covered by the avoidance of constraint costs during RIIO-2.

Table 2: NPV analysis on shortlisted options

Option	Preferred Option	Total Forecast Expenditure (£m)	Total NPV	Delta (Option to Baseline)	NPV 10 years
Baseline option - Do nothing	**N**	**0**	**(471.89)**	**-**	**(147.59)**
Option 1 – Do nothing (low sensitivity scenario)	**N**	**0**	**(92.33)**	**379.56**	**(28.88)**
Option 2 – Extension of the existing Melksham OTS (Phase 2)	**Y**	**(28.67)***	**(17.90)**	**453.99**	**(5.23)**

*Investment includes initial extension and replacement of Melksham OTS Phase 1 assets in 2039.

[14] Spackman approach to CBAs which discounts all costs (including financing costs as calculated based on a WACC) and benefits at the Social Time Preference Rate (STPR).

Economic assessment of short-listed options

4.32. NGET has provided Ofgem with the relative costs of the viable solutions over the next 20 years (2024 – 2045). This is summarised in Table 3 below and includes constraint costs for the Baseline option and Option 1, as well as the forecast expenditure for Option 2 – Extension of Melksham OTS.

4.33. Of the shortlisted options that meet the needs case, we have focussed on looking at the relative cost over time of the solutions that meet those outcomes.

4.34. We reviewed the details included in the assessment of NGET's CBA for the short-listed options presented above. We acknowledge that the extension of the Melksham OTS (Option 2) is significantly more cost efficient for the consumer compared to incurring the forecast constraint costs under the Do Nothing options. Effectively, the costs of the OTS extension (£1.43/year) will mean customers avoid constraint costs of between £4.5m/year and £23m/year that are expected from 2024when the new generation is connected to the network.

4.35. We also agree with NGET that the extension of the Melksham OTS option has a much smaller negative Net Present Value compared to the Do Nothing options both in total figures and in the initial 10-year period (see Table 2 above). More specifically, the Melksham OTS extension option has a total NPV of -£17.90m, compared to a NPVs of -£471.89 and -£92.33m for the Do Nothing options. The delta difference of the preferred option compared to baseline option (453.99) gives high confidence that the extension of the Melksham OTS is the most cost-efficient solution to address the needs case both in the short and longer term for consumers.

Table 3 – Relative costs of the shortlisted options

Option	Preferred Option	Constraint costs p/a 2024 - 2045 (£m)	NGET OPEX costs p/a 2024 - 2045 (£m)
Baseline option - Do nothing	**N**	**23**	**0**
Option 1 – Do nothing (low sensitivity scenario)	**N**	**4.5**	**0**
Option 2 – Extension of the existing Melksham OTS (Phase 2)	**Y**	**0**	**1.43***

* For Option 2, total relative costs include investments during and post RIIO T2 (i.e. cost of replacing OTS ~ £16m).

4.36. We asked NGET for clarification on why its NPV calculation presented only negative values for options. We considered that an intervention such as the Melksham OTS extension which will contribute to network stability and resilience should also include the wider indirect benefits for consumers and GB's transmission system. Consequently, an approach that combines both direct and indirect costs and benefits would likely result a positive NPV, at least for NGET's preferred option.

4.37. NGET's responded that for the Melksham CBA, NGET included relevant costs such as the cost of intervention and any future replacement costs for Option 2 and constraint costs based on the range provided by NGESO for Do nothing options – upper value of £23m per annum and lower value of £4.5m per annum.

4.38. NGET also presented a different summary of NPV results as part of its Melksham submission which showed the additional cost to consumers (or regret) of each option over and above the most economic option to deliver the network outcome (see Table 4 below).

Table 4 – Consumer regret of the shortlisted options

Option	Preferred Option	Consumer regret – NPV (£)
Baseline option - Do nothing	**N**	**453.99**
Option 1 – Do nothing (low sensitivity scenario)	**N**	**74.43**
Option 2 – Extension of the existing Melksham OTS (Phase 2)	**Y**	**--**

4.39. We consider that the overall economic assessment of the Melksham OTS extension could be improved by the inclusion of direct and indirect benefits of the options in the CBA. However, in this case, NGET's comparison of capital and constraint costs is sufficient to show that the Melksham OTS extension is the most economical option for both consumers and the network system.

Our minded-to view of the proposed project

4.40. Our review concluded that NGET's shortlisted options are all technically feasible. However, our minded-to view is that NGET's preferred option (extension of Melksham OTS) represents the most optimal solution.

4.41. Ofgem agrees with NGET that Do Nothing options cannot be considered as an reasonable option to this case. Our view is that the Do Nothing option (even on the lowest forecast scenario) does not provide the most cost-effective solution for addressing the needs case. The constraint costs experienced under the least onerous scenario are still in excess of the intervention costs presented within NGET's preferred option.

4.42. We also agree with NGET that the preferred option entails a number of benefits:

- it contributes to the resilience and stability of network system;
- it provides strategic cover ahead of the anticipated generation/interconnectors in the near future;
- it allows for utilisation of the existing inter-tripping services (Melksham OTS) and enhances them through the extension; and
- it provides value to consumers as it is the most cost-efficient solution.

4.43. Accordingly, we are minded-to accept the justification for the extension of Melksham OTS project. The following Chapter analyses the costs for this project that have been submitted for consideration by Ofgem.

5. Cost assessment of the proposed project

Section summary

This section sets out our assessment of the submitted costs of the Melksham OTS Phase 2 project. The results represent our current view of the efficient costs of the solution.

Consultation Question 4: Do you agree with our cost assessment of NGET's proposed Melksham project?

5.1. NGET's cost submission for the Melksham project was broken down into a combination of:

- Contractor costs
- NGET's commissioning costs
- NGET's contingency costs, and
- NGET's closeout costs.

5.2. Our treatment of each area is as set out below and is based on our treatment of cost submissions for the RIIO-ET2 price control. More generic information on our cost assessment approach can be found in the ET2 Final Determination documents.[15]

5.3. We note that as this project was submitted under the MSIP Reopener it is subject to the OPEX escalator which provides NGET with a pre-determined mechanistic uplift to its Closely Associated Indirects (CAI) allowance.[16] This OPEX escalator allowance consists of a 17% uplift on the total efficient Direct Costs allowance assessed for each project. Details of

[15] RIIO-2 Final Determinations for Transmission and Gas Distribution network companies and the Electricity System Operator | Ofgem

[16] This OPEX escalator allowance calculation is predicated on the view of efficient CAI baseline allowances established at Final Determination (FD) which utilised the relationship between direct capex and CAI and subsequently applies this relationship to any direct capex allowances agreed under a defined list of uncertainty mechanisms.

the OPEX escalator approach, the applicable uncertainty mechanisms (UM) and the calculation methodology is set out in full under the UM Chapter of NGET's FD.[17]

Technical scope of the solution

5.4. On the summary of works required for the preferred options for Melksham project, please find more information on Appendix 3.

Procurement Strategy

5.5. NGET has undertaken a Direct Allocation with the original equipment manufacturer (OEM) of the existing Melksham OTS as the scope of works for the proposed project is the extension to existing protection equipment.

5.6. Ofgem sought additional justification from NGET on whether a Direct Allocation to the OEM for this project was the most appropriate action compared to a tender, and to highlight if there are any other suppliers who provide similar systems and/or services.

5.7. NGET highlighted that the Direct Allocation to the OEM for Melksham's OTS extension project is the most cost-effective solution, because the existing OTS system has been constructed based on the OEM's unique Intelligent Electronic Device (IED). If the scope of works was competitively tendered, the project management costs are expected to be higher because other suppliers would have had to sub-contract their works to the OEM. The alternative option of installing a new OTS and connect future customers via a competitively tender would also result to additional interfacing costs, added costs from changes to the existing Melksham, risks regarding additional outage requirements, the installation of Portable Relay Rooms for panels in substations with limited space and fibre optic connectivity.

5.8. We are satisfied with NGET's response and based on our analysis we consider that the Direct Allocation to the OEM for Melksham's OTS extension project is a cost optimal approach and requires fewer work interventions compared with the competitively tendered option.

[17] As part of RIIO-2, we have a established a mechanistic calculation (OPEX escalator) of the efficient uplift to CAI and NOC allowances for each UM based on the methodology employed in setting CAI baseline allowances in our RIIO-2 Final Determination and the historical relationship observed between NOC and asset additions.

Overview of project costs

Contractor costs

5.9. NGET categorized under contractor costs a series of work packages that were fully and solely tendered, such as:

1) Site management,

2) Detailed Design,

3) Procurement and installation,

4) Common works,

5) Commissioning, and

6) Risk.

5.10. We have assessed these tendered costs against our reporting protocols we have for RIIO–T2 price control.[18]

5.11. One element which we propose to adjust is the Site Management and Detailed Design subcategories included in Contractor costs.

5.12. Our RIIO-T2 reporting guidance instructs the Transmission Owners (TOs) on defining costs of Direct or the Closely Associated Indirect Activities (CAI). In summary, Direct costs are those which include expenditure attributable to physically delivering works on assets on site. Direct costs do not include works which have no physical interaction with the assets. We asked NGET to provide more information on what activities have been included in the above two cost subcategories and why they have been categorized as Direct costs instead of CAI.

[18] The RIGS Guidance provides instructions on TO's about the information we plan to collect, guide them on how to provide this information and enable licensees to put systems in place to collect the data to the detail we require.

5.13. Based on our analysis, we consider that NGET has miscategorized the contractor's Site Management and Detailed Design subcategories under Direct costs instead of CAI costs. Accordingly, we propose to remove these cost elements from the Direct funding requested by NGET for the Melksham OTS extension project. Instead, NGET will receive an automatic uplift (OPEX escalator) for its CAI activities. This will ensure that NGET does not receive double funding for the contractor's Site Management and Detailed Design activities.

NG Commissioning costs

5.14. We have assessed the reasonableness of NGET's proposed commissioning costs for the Melksham project and consider them to be at an efficient level. Consequently, we are minded to allow these in full. In future we will retain this information to build a range of acceptable commissioning costs for future projects.

Contingency costs

5.15. We have assessed the reasonableness of NGET's proposed contingency costs for Melksham project and consider them to be at an efficient level due the fact that the projects have been delivered / are in delivery at the time of publication.

5.16. We asked a range of questions on risks and the issues identified by NGET were those where we believe the mitigations should have reduced the risk further than what was presented to us. In future we will refer to our ET2 accepted 7.5% of Direct costs being used as our initial benchmark for further discussion. Furthermore, in future submissions we would require NGET to provide further details on mitigation efforts for projects that have been delivered / are in delivery at the time of our review.

NG Closeout costs

5.17. We have assessed the reasonableness of NGET's proposed closeout costs and consider them to be at an efficient level. Consequently, we are minded to allow these in full. In future we will retain this information to build a range of acceptable closeout costs for future projects.

5.18. Table 5 summarises NGET's total allowance request for Melksham project.

Table 5: Melksham project total allowance request*

Classification	Activities	Source	Total Cost (£k)
Indirect	NG Project Management Costs	Estimate based on resources anticipated for the delivery stage of	1,546.4
Indirect	NG Optioneering / Development costs	Optioneering/Development costs are based on an actual costs for the completion of the development	341.9
Direct	Contractor Costs	Tendered	9,088
Direct	NG Commissioning Costs	Estimate based on previous projects	669.9
Direct	Contingency value	Estimate based on QRA & previous projects	822.9
Direct	NG Closeout Costs	Estimate based on previous projects	110.3
	Total Costs		**12,579.4**
	Direct allowances requested		**10,691.1**

* Post-submission updated figures.

Summary of costs

5.19. The table below summarises NGET's funding request, our proposed reductions, and our proposed allowances against each of the components for the Melksham project. Specifics of the work packages have been redacted for commercial sensitivity.

5.20. As explained in paragraph 4.3, NGET will receive an additional 17% of the proposed total allowances for Direct activities from the OPEX escalator for its CAI activities for Melksham project.

Table 6: Melksham project proposed funding and proposed adjustments*

Direct activity	NGET Request (£k)	Ofgem Proposed Adjustments (£k)	Ofgem Proposed Allowances (£k)
Contractor Costs	9,088.0	-1884.6	7,203.4
NG Commissioning Costs	669.9	0	669.9
Contingency Value	822.9	0	822.9
NG Closeout Costs	110.3	0	110.3
Total	**10,691.1**	**-1884.6**	**8,806.5**

* Post-submission updated figures.

6. Next Steps

6.1. We welcome your responses to this consultation, both generally, and in particular on the specific questions in Chapters 2, 3 and 4. Please send your response to: graeme.barton@ofgem.gov.uk. The deadline for response is 27 June 2022.

6.2. We will conclude our assessment of NGET's **Melksham OTS Phase 2 MSIP project** with a decision in 2022. If our initial view does not change through the consultation and MSIP assessment processes, our decision will confirm our provisional view that SPT should be funded for the efficient delivery of **Melksham OTS Phase 2 MSIP project.**

6.3. We are minded to categorise this project as an evaluative Price Control Deliverable (PCD) as we believe there is some flexibility in the manner by which this project can be delivered. Given the potential level of difference in materiality between the delivery modes, we consider it appropriate to protect consumer interests by reviewing the delivery. As such, if we confirm our decision that NGET should be funded for the project, we expect to initiate a statutory consultation to make the relevant changes to the licence required to set explicit deliverables, timescale(s) for delivery and the profile of the project allowances for the PCD.

Appendices

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Appendix 1 – Consultation questions

Consultation Question 1: Do you agree with our 'minded to' view on the validity of the needs case for the Melksham OTS Phase 2 MSIP Project?

Consultation Question 2: Do you agree with our technical assessment of the range of solutions to meet the needs case?

Consultation Question 3: Do you agree with our minded-to view of the solution proposed by NGET?

Consultation Question 4: Do you agree with our cost assessment of NGET's proposed Melksham project?

Appendix 2 - Assessment on Re-opener application requirements

In this section, we detail Ofgem's assessment of NGET's application for Melksham project against the Re-opener application requirements in in Special Condition 3.14 and the Re-opener Guidance and Application Requirements Document. (See Table 6 below).

Table 6: Re-opener application requirements

Document	Requirement	Has the requirement been met?
Special Condition 3.14.6 (f)[19]	The licensee may apply to the Authority for a direction amending the outputs, delivery dates or associated allowances in Appendix 1 of the licence in relation to one or more activities set out in that section. The two projects qualify for submission via the MSIP Reopener under the following: (j) a system operability, constraint management or 0MW connection project or substation work which is required to accommodate embedded generation, which in each case has been requested in writing by the System Operator;	Yes
Special Condition 3.14, paragraph 9	Includes a statement setting out what MSIP the application relates to.	Yes
Special Condition 3.14, paragraph 9	To give details of the associated amendments to the outputs, delivery dates or allowances and an explanation of the basis of the calculation for any amendments requested to allowances.	Yes
Special Condition 3.14, paragraph 9	To provide such detailed supporting evidence as is reasonable in the circumstances to justify the technical need including cost benefit analysis,	Yes

[19] More detail is available in the RIIO-ET2 "ET Annex" Final Determinations document, paragraphs 4.19 and 4.20. See link: RIIO-2 Final Determinations for Transmission and Gas Distribution network companies and the Electricity System Operator | Ofgem

	impact assessments, risk mitigation, and engineering justification.	
Special Condition 9.4.3	Must prepare any applications for Re-openers in accordance with any applicable provisions of the Re-opener Guidance and Application Requirements Document.	Yes
RIIO-2 Re-opener Guidance and Applications Requirements 3.3	Each application must include a table that maps out which sections of the application relate to individual requirements as set out in the relevant Re-opener licence condition and Chapter 3 of RIIO-2 Re-opener Guidance and Applications Requirements.	Yes
RIIO-2 Re-opener Guidance and Applications Requirements 3.4	Where the licensee will not be able to provide the required information listed in the RIIO-2 Re-opener Guidance and Applications Requirements, the licensees must provide a justification for not providing all of the required information.	Yes
RIIO-2 Re-opener Guidance and Applications Requirements 3.8	All Re-opener applications must include a needs case whether or not this is a specified requirement of the relevant Re-opener licence condition or Re-opener Guidance.	Yes
RIIO-2 Re-opener Guidance and Applications Requirements 3.10	The needs case must contain a clear statement of how the proposed expenditure aligns with the licensees' overall future business strategy and commitments, including consideration of how it relates to the licensee's RIIO-2 licence or other statutory obligations and, if relevant, its RIIO-3 business plan.	Yes
RIIO-2 Re-opener Guidance and Applications Requirements 3.11	Must include a clear statement as to the need for the proposed expenditure or the problem the licensee is trying to address in the context of its significance for consumers and network assets. The affected consumers / assets must be identified, and the associated risk being addressed quantified, where possible.	Yes
RIIO-2 Re-opener Guidance and Applications	Must provide the rationale for the level of expenditure proposed and why this level should be regarded as being efficient.	Yes

Requirements 3.12		
RIIO-2 Re-opener Guidance and Applications Requirements 3.13	Must include a clear description of the long and short list of options considered and the selection process undertaken to reach the preferred option.	Yes
RIIO-2 Re-opener Guidance and Applications Requirements 3.14	Must include a clear description of the preferred option, sufficient to allow us to make an informed decision on whether the preferred option is suitable.	Yes
RIIO-2 Re-opener Guidance and Applications Requirements 3.15	Must include a clear statement as to any project delivery and monitoring plan for the preferred option.	Yes
RIIO-2 Re-opener Guidance and Applications Requirements 3.16, 3.17	Must include an explanation of how stakeholder engagement contributed to the identification and design of the preferred option. Where stakeholder engagement may not be necessary because there is no material impact on stakeholders, or where the application is driven by statutory obligations, a brief explanation must be provided as to why stakeholder engagement was not considered appropriate.	Yes
RIIO-2 Re-opener Guidance and Applications Requirements 3.19, 3.20	To provide sufficient cost information to justify: - why expenditure is additional to that already provided for by baseline allowances or other mechanisms; and - why the level of costs is efficient. This should be submitted in accordance with the format and detail specified at paragraph 3.20.	Yes
RIIO-2 Re-opener Guidance and Applications Requirements 3.21, 3.22	Where Cost Benefit Analysis and Engineering Justifications Papers are included in an application, these must be consistent with Ofgem's guidance published in September 2019.	Yes

Ofgem has deemed that the submission from NGET has met the necessary requirements set out in both the applicable Special Licence conditions and the detailed Re-opener application criteria set out in the RIIO-2 Re-opener Guidance as listed in the Table above.

Appendix 3 – Melksham OTS Phase 2 project summary of works

Due to the nature of the work that required for extending Melksham OTS, NGET has chosen to maintain the centrally located Station Level Controller (SLC) within Melksham's substation premises and update it accordingly in order to improve its capacity to monitor the circuits and trip the future generators that will be connected in the Transmission system.

A detailed breakdown of the required works that NGET has planned to proceed for the Melksham extension can be found below:

- Installation of monitoring devices at the circuit ends that require monitoring. The circuits that have been identified include those highlighted within the Table 1 below.

- Installation of tripping devices at the remote sites that the generators are connected to;

- Undertaking staged database changes as required for the inclusion of the new devices, circuit selections, and outputs into the existing Melksham OTS; and

- Installation of fibre optic cables, patch fibres, ethernet switches and other communication hardware to establish connections between the new devices and existing OTS hardware.

A detailed breakdown of the 400kV substations that NGET will proceed with works and the circuits that will be monitored for the Melksham extension can be found in Table 7 below.

Table 7: Circuits that require monitoring for Melksham OTS project

Abham - Exeter - Langage 1	Bridgwater – Shurton 2	Hinkley Point – Sandford	Melksham – Sandford
Abham - Exeter - Langage 2	Cilfynydd - Imperial Park	Hinkley Point – Sandford – Seabank	Melksham – Sandford – Seabank
Alverdiscott - Indian Queens - Taunton 1	Cilfynydd - Seabank - Whitson	Hinkley Point – Shurton 1	Melksham SGT10
Alverdiscott - Indian Queens - Taunton 2	Fleet SGT 1B	Hinkley Point – Shurton 2	Melksham SGT7
Alverdiscott SGT1	Fleet SGT 2	Indian Queens - Landulph 1	Melksham SGT8
Bramley - Melksham 1	Fleet SGT 3A	Indian Queens - Landulph 2	Melksham SGT9
Bramley - Melksham 2	Fleet SGT 3B	Landulph - Langage 1	Melksham SGT9A
Bridgwater – Melksham – Shurton 1	Fleet SGT 4A	Landulph - Langage 2	Shurton – Taunton 1
Bridgwater – Melksham – Shurton 2	Fleet SGT 4B	Mannington SGT1	Shurton – Taunton 2
Bridgwater – Shurton 1	Hinkley Point – Sandford	Mannington SGT2	

Appendix 4 – Privacy notice on consultations

Personal data

The following explains your rights and gives you the information you are entitled to under the General Data Protection Regulation (GDPR).

Note that this section only refers to your personal data (your name address and anything that could be used to identify you personally) not the content of your response to the consultation.

1. The identity of the controller and contact details of our Data Protection Officer

The Gas and Electricity Markets Authority is the controller, (for ease of reference, "Ofgem"). The Data Protection Officer can be contacted at dpo@ofgem.gov.uk

2. Why we are collecting your personal data

Your personal data is being collected as an essential part of the consultation process, so that we can contact you regarding your response and for statistical purposes. We may also use it to contact you about related matters.

3. Our legal basis for processing your personal data

As a public authority, the GDPR makes provision for Ofgem to process personal data as necessary for the effective performance of a task carried out in the public interest. i.e. a consultation.

3. With whom we will be sharing your personal data

(Include here all organisations outside Ofgem who will be given all or some of the data. There is no need to include organisations that will only receive anonymised data. If different organisations see different set of data then make this clear. Be a specific as possible.)

4. For how long we will keep your personal data, or criteria used to determine the retention period.

Your personal data will be held for ***(be as clear as possible but allow room for changes to programmes or policy. It is acceptable to give a relative time e.g. 'six months after the project is closed')***

5. Your rights

The data we are collecting is your personal data, and you have considerable say over what happens to it. You have the right to:

- know how we use your personal data
- access your personal data
- have personal data corrected if it is inaccurate or incomplete
- ask us to delete personal data when we no longer need it
- ask us to restrict how we process your data
- get your data from us and re-use it across other services
- object to certain ways we use your data
- be safeguarded against risks where decisions based on your data are taken entirely automatically
- tell us if we can share your information with 3rd parties
- tell us your preferred frequency, content and format of our communications with you
- to lodge a complaint with the independent Information Commissioner (ICO) if you think we are not handling your data fairly or in accordance with the law. You can contact the ICO at https://ico.org.uk/, or telephone 0303 123 1113.

6. Your personal data will not be sent overseas (Note that this cannot be claimed if using Survey Monkey for the consultation as their servers are in the US. In that case use "the Data you provide directly will be stored by Survey Monkey on their servers in the United States. We have taken all necessary precautions to ensure that your rights in term of data protection will not be compromised by this".

7. Your personal data will not be used for any automated decision making.

8. Your personal data will be stored in a secure government IT system. (If using a third party system such as Survey Monkey to gather the data, you will need to state clearly at which point the data will be moved from there to our internal systems.)

9. More information For more information on how Ofgem processes your data, click on the link to our "Ofgem privacy promise".