

Consultation on Scottish Hydro Electricity Transmission's (SHET's) MSIP Re-opener (Gremista Grid Supply Point Project)

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We¹ are consulting on the needs case, engineering justification and preferred option for SHET's proposed Gremista Grid Supply Point Project. 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](https://www.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. Ofgem is the office of the Authority.

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Executive Summary

The RIIO-ET2 price control runs from 1 April 2021 until 31 March 2026. It includes a range of Uncertainty Mechanisms (UMs) that will allow us to assess further funding during RIIO-ET2 as the need, cost or timing of works becomes clearer. This ensures that consumers fund projects only when there is clear evidence of benefit and we have clarity on likely costs. These mechanisms also ensure that the RIIO-ET2 price control has flexibility to adapt as the pathways to Net Zero become clearer.

Where possible, we have set automatic UMs, such as the Generation and Demand Connection Volume Drivers, which provide Electricity Transmission Owner (ETOs) with immediate funding when they are required to undertake new customer connection works. In other areas, where the degree of uncertainty is too great to allow for an automatic mechanism, we set “re-openers” which will allow us to robustly assess ETO proposals once information with sufficient accuracy is made available.

The Medium Sized Investment Projects (MSIP) re-opener provides ETOs with an annual opportunity to request additional funding for sub-£100m projects, many of which may be critical for achieving Net Zero targets. It was developed to ensure that ETOs are able to undertake necessary investments in the transmission network, funding for which has not been provided in RIIO baseline allowances.

An ETO can submit a request for additional funding for activities outlined in Special Condition (SpC) 3.14.6 of SHET’s Electricity Transmission Licence² via the MSIP re-opener during specific “windows” (each regulatory year between 25 January and 31 January) where it considers a project to be atypical in scope and where the forecast costs are expected to be less than £100m. Projects that meet the criteria will be eligible for consideration and scrutiny by Ofgem, who will assess the needs case and the level of efficient costs.

This document summarises the MSIP submission received from SHET for the Gremista Grid Supply Point project and sets out our minded-to view to approve the needs case and preferred option to address the needs case. Ofgem will undertake an assessment of the

² [Decision on the proposed modifications to the RIIO-2 Transmission, Gas Distribution and Electricity System Operator licence conditions - 1 April 2022 | Ofgem](#)

efficient costs following SHET's submission of detailed costs in January 2023. Final approval of the project is subject to approval of the efficient costs.

We welcome views from stakeholders on our minded-to views on the project outlined in Chapters 3 to 5.

1. Introduction

What are we consulting on?

1.1. We are consulting on the needs case, optioneering and preferred option for the installation of a Grid Supply Point³ (GSP) in Gremista, submitted by SHET under its MSIP re-opener submission in January 2022.

1.2. The MSIP licence condition⁴ provides for companies to make re-opener submissions during the RII0-2 price control period for projects that meet certain conditions in their licences. SHET regards this project as having met the criteria relating to Demand Connection projects.⁵

1.3. Shetland is not currently connected to the mainland transmission system. It is instead served by an isolated distribution network with two main generation sources, a diesel-generated power station at Lerwick and a small wind generation station. With the Lerwick Power Station⁶ (LPS) nearing the end of its operational life, security of supply for Shetland must be ensured via alternative means.

1.4. Scottish Hydro Electric Power Distribution (SHEPD), the Distribution Network Operator (DNO) that run the low voltage system on Shetland, submitted analysis which they believed demonstrated that the most economic and efficient solution to deliver enduring security of supply was by utilising the Shetland HVDC Link.⁷ SHET aim to facilitate this connection by establishing a GSP in Gremista.

³ A Grid Supply Point (GSP) is a Systems Connection Point at which the transmission system is connected to a distribution system.

⁴ Electricity Transmission Licence, Special Condition (SpC) 3.14 | [Ofgem](#)

⁵ SpC 3.14.6(b)

⁶ Lerwick Power Station, located in Gremista, is diesel-fuelled and generates a total of 66 MW of power.

⁷ [Decision on Scottish Hydro Electric Power Distribution's proposals to contribute towards proposed electricity transmission links to Shetland, Western Isles and Orkney | Ofgem](#)

1.5. SHET provided engineering reports and other documentation in support of its submission in January 2022. Since then, SHET has provided additional information through a combination of meetings with Ofgem and Supplementary Question (SQ) responses.

Consultation approach

1.6. SHET provided Ofgem with evidence of the needs case for this project and information to justify its preferred option for addressing it. Costs included as part of the January 2022 MSIP submission do not represent SHET's final assessment of the costs associated with its preferred option. Ofgem are therefore not consulting on the efficiency of these costs or proposing output and/or allowances at this stage.

1.7. In line with the provisions set out in paragraph 3.4 of the RIIO-2 Re-opener Guidance and Application Requirements Document,⁸ SHET has presented a case for dividing its MSIP application into two stages. SHET intends to make a further submission in January 2023 which will set out the costs, outputs, delivery date(s) and allowances to be included in Appendix 1 to SpC 3.14.

1.8. This case was presented on the basis that the fixed annual MSIP reopener window does not align with the process to develop costs through market testing with the supply chain. SHET's view is that such testing provides greater overall cost confidence.

1.9. We agree that a two-stage approach is appropriate in this case. As well as ensuring that greater cost confidence can be achieved through market testing, the approach will help ensure the timely and efficient progress of preparatory works.

1.10. SHET's indicative view of potential direct capital expenditure for the Gremista GSP MSIP project in RIIO-2 is set out in Section 6 of its Stage 1 MSIP Re-Opener Application.⁹ These estimated costs have been developed and approved in compliance with SHET's Transmission's Large Capital Projects Governance Manual. We have not assessed them.

⁸ [RIIO-2 Re-opener Guidance and Application Requirements Document](#)

⁹ [Gremista GSP MSIP Submission \(ssen-transmission.co.uk\)](#)

1.11. This consultation outlines our minded-to position on the following areas of the Gremista GSP project:

- The needs case
- Alternative options considered by SHET

1.12. Our minded-to position will be presented for the needs case and the optioneering for the proposed project. Our position relating to the efficient costs will be made following the January 2023 MSIP submission window after SHET have conducted market testing, due to take place in mid-2022.

Context and related publications

1.13. Information on this project can be found in SHET’s Gremista GSP Project MSIP Submission.¹⁰ This document is intended to be read alongside:

- SHET Special License Conditions 3.14 and 9.4¹¹
- RIIO-2 Re-opener Guidance and Application Requirements Document¹²
- RIIO-2 Final Determinations Core Document Paragraph 8.20 – 8.26¹³
- Decision on SHEPD’s proposals to contribute towards proposed electricity transmission links to Shetland, Western Isles and Orkney¹⁴

Consultation stages

1.14. This consultation will close on 24 May 2022. We intend to publish all consultation responses 10 working days after this date. We intend to publish our decision by 20 June 2022.

How to respond

¹⁰ [Gremista \(Shetland\) Grid Supply Point \(GSP\) Project \(ssen-transmission.co.uk\)](https://www.ssen-transmission.co.uk)

¹¹ [RIIO-2 Transmission, Gas Distribution and Electricity System Operator Licence Conditions](#)

¹² [Re-opener Guidance and Application Requirements Document \(ofgem.gov.uk\)](https://www.ofgem.gov.uk)

¹³ [RIIO-2 Final Determinations - Core Document \(ofgem.gov.uk\)](https://www.ofgem.gov.uk)

¹⁴ [Decision on Scottish Hydro Electric Power Distribution’s proposals to contribute towards proposed electricity transmission links to Shetland, Western Isles and Orkney | Ofgem](#)

1.15. We want to hear from anyone interested in this consultation. Please send your response to riioelectricitytransmission@ofgem.gov.uk.

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

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

Your response, data and confidentiality

1.18. 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.

1.19. 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.

1.20. 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.

1.21. 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

1.22. 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?

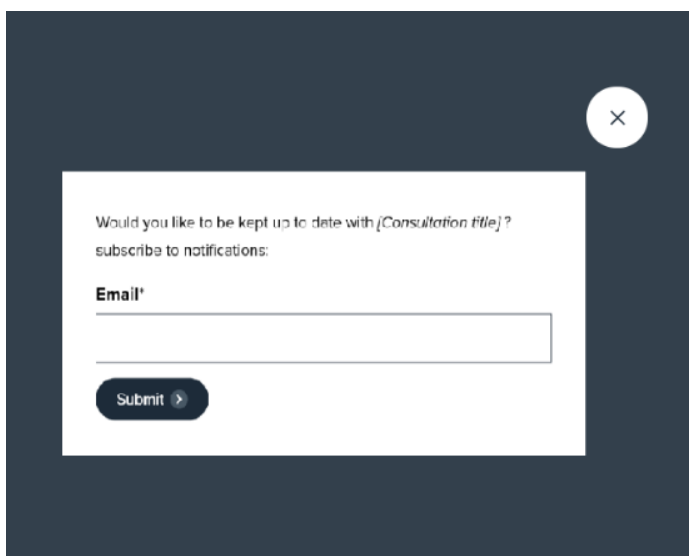
Please send any general feedback comments to stakeholders@ofgem.gov.uk

How to track the progress of the consultation

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.

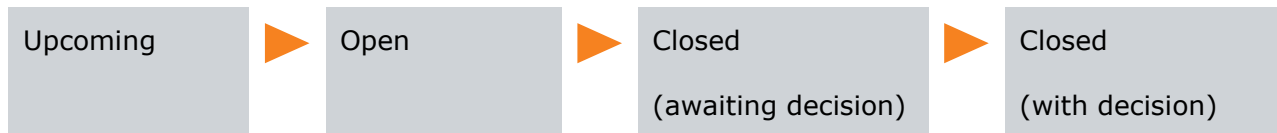
[Ofgem.gov.uk/consultations.](https://www.ofgem.gov.uk/consultations)

Notify me +



The image shows a dark-themed modal window with a white background for the form. At the top right of the modal is a close button (X). The form text reads: "Would you like to be kept up to date with [Consultation title]?" followed by "subscribe to notifications:". Below this is a label "Email*" and a text input field. At the bottom left of the form is a "Submit" button with a right-pointing arrow.

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:



2. Assessment against Re-opener Requirements

Section summary

In this Chapter, we set out Ofgem’s assessment of SHET’s application against both the general Re-opener application requirements and the specific requirements for the Medium Sized Investment Project Re-opener application.

Table 1: Re-opener application requirements

Document	Requirement	Has the requirement been met?
SpC 3.14	To relate to one of the activities defined in SpC 3.14.6	Y
	Includes a statement setting out what MSIP the application relates to (SpC 3.14.8(a)).	Y
	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 (SpC 3.14.8(b)).	Cost information will be part of the stage two submission in January 2023, and will detail the requested amendments to the outputs, delivery date(s) and allowances in SpC 3.14 Appendix 1 in order to enable Ofgem to set a Price Control Deliverable.
	To provide such detailed supporting evidence as is reasonable in the circumstances to justify the technical need including cost benefit analysis, impact assessments, risk mitigation, and engineering justification (SpC 3.14.8(c)).	Yes (technical need and engineering justification). As noted above, detailed information on costs and risk, and associated cost benefit analysis, will be provided in a further submission.

	To provide an application with expected costs exceeding the Materiality Threshold but less than £100m. Costs must be limited to those incurred on or after April 2021. (SpC 3.14.9).	Y
SpC 9.4	To prepare applications for Re-openers in accordance with the Re-opener Guidance and Application Requirements Document.	Y
RIIO-2 Re-opener Guidance and Application Requirements Document	Assurance requirements: <ul style="list-style-type: none"> - To provide applications that are accurate, unambiguous, complete and concise - To provide written confirmation from a suitable senior person of the same - To provide a point of contact for each application. (Paragraph 2.1 – 2.3)	Y
	To publish applications within 5 working days of submitting it to Ofgem with only necessary redactions; unless this would pose a risk to national security. (Paragraph 2.4 – 2.6)	Y
	To provide clear answers on: <ul style="list-style-type: none"> - Why an adjustment is justified - What that adjustment should be (Paragraph 3.1)	Yes (why an adjustment is justified). As noted above, specific information on the proposed adjustment will be provided as part of a second submission.

	<p>To contain:</p> <ul style="list-style-type: none"> - Alignment with overall business strategy and commitments - Demonstration of needs case/problem statement - Consideration of options and methodology for selection of the preferred option - The preferred option - Project delivery and monitoring plan (Paragraph 3.9 – 3.15) 	Y
	<p>To contain an explanation of how stakeholder engagement contributed to the identification and design of the preferred option (Paragraph 3.16 – 3.18)</p>	Y
	<p>To follow a style and structure that clearly and concisely sets out the evidence that licensees wish to present in support of their request (Paragraph 4)</p>	Y

2.1. The qualification of this submission as an MSIP has been made on the basis of expected costs. SHET note that their estimated cost is at an early estimate stage of maturity. It is therefore possible that total costs may exceed the £100m upper materiality threshold for MSIP submissions outlined in SpC 3.14.6(b).

2.2. SHET state the current cost estimate is between -30% and +40% of the actual cost of delivery. Should the costs remain within this tolerance, we consider that it would be inappropriate to delay the project by initiating a separate process to reconsider the project under Large Onshore Transmission Investment (LOTI) re-opener conditions given the need to provide security of supply by 2025. We therefore consider that this submission should continue to be assessed as an MSIP provided the costs submitted remain within the accuracy tolerance outlined in the MSIP submission.

2.3. Should the costs exceed the accuracy range specified in the MSIP submission, we view that the Gremista GSP project may need to be reconsidered under the LOTI re-opener criteria.

2.4. Ofgem has deemed that the submission from SHET has met all of the requirements set out in both the applicable licence conditions and the RIIO-2 Re-opener Guidance as listed in the Table above. In the following chapters we set out our assessment in more detail and our minded-to view based on the evidence submitted by SHET.

3. Needs Case for the Project

Section summary

This section summarises the needs case for the Gremista GSP project and sets out our minded-to view on this needs case.

Question 1: Do you agree with our view on the needs case for the Gremista GSP project?

3.1. Shetland is the most northerly point in the British Isles and its energy needs are currently served by an isolated distribution network. This consists of a diesel generated power station in Lerwick (Lerwick Power Station - LPS) and a small wind generation station connected to the existing 33kV and 11kV distribution networks. Gas fired generation is also available at the independently owned Sullum Voe Terminal if required.

3.2. LPS was built in 1953 and is approaching the end of its operational life. It was originally expected to exceed emissions standards set by the Industrial Emissions Directive (IED) in 2020. Consequently, SHEPD was previously required by Ofgem to run a competitive process to identify the most efficient solution for Shetland's future energy needs (Shetland New Energy Solution - SNES) in April 2014.¹⁵

3.3. In November 2017, the costs associated with the proposed SNES were rejected by Ofgem on the basis of two developments.¹⁶ Firstly, the 2020 deadline relating to IED emissions standards was extended to 2030 for engines on 'small isolated systems' and 'micro isolated systems', such as that on Shetland. Secondly, the Government announced that, subject to receiving State Aid approval, wind farms on remote islands such as Shetland would be eligible to compete for a Contract for Difference¹⁷ (CfD) in the next auction for less established technologies, which was planned for 2019. Furthermore, SHEPD confirmed that

¹⁵ [Ofgem's determination of SHEPD's submission under CRC18A](#)

¹⁶ [Decision on Shetland New Energy Solution | Ofgem](#)

¹⁷ A contract between a low carbon electricity generator and the Low Carbon Contracts Company, designed to give electricity generators greater certainty of revenues by reducing their exposure to wholesale prices.

with targeted investment, security of supply on Shetland could be provided until 2025 through a combination of LPS and additional supporting measures at an annual cost significantly below that of the proposed SNES.

3.4. In October 2018, SHET submitted a needs case under the RIIO-1 Strategic Wider Works (SWW)¹⁸ mechanism to construct a 600MW high voltage direct current (HVDC) link between Shetland and the mainland GB grid. The project was aimed at supporting the development of a significant amount of wind generation on and around the Shetland Islands. Ofgem approved the needs case for the project on 16 July 2020.¹⁹

3.5. In 2019, SHEPD made a proposal to contribute to this transmission link and utilise it to provide security of supply to Shetland as part of a wider consultation on similar contributions to transmission links to the Western Isles and Orkney.²⁰ SHEPD's proposal involved the connection of Shetland's distribution and transmission networks to enable the primary energy route to be provided by the transmission system, with SHEPD securing generation back-up. This was approved by Ofgem 30 July 2020.²¹

3.6. In order to meet its obligations to provide a secure connection to SHEPD in an economic and efficient manner, in line with its obligations under Standard Licence Condition (SLC) D4A: 'Obligations in relation to offers for connection etc' of its electricity transmission licence,²² SHET proposes the establishment of a GSP at Gremista.

3.7. A Transmission Owner Construction Agreement (TOCA)²³ is in place between SHET and the National Grid Electricity System Operator (NGESO)²⁴ to provide a demand connection to

¹⁸ Mechanism used during RIIO-1 to allow TOs to bring forward large investment projects where funding was not awarded as part of the price control settlement.

¹⁹ [Decision on the Final Needs Case for the Shetland electricity transmission project | Ofgem](#)

²⁰ [Consultation on SHEPD proposal to contribute to proposed transmission links to Shetland, Western Isles and Orkney | Ofgem](#)

²¹ [Update on decision to approve SHEPD's proposed methodology to contribute to the Shetland transmission project | Ofgem](#)

²² [Electricity Transmission Standard Licence Conditions 24 07 2021 \(ofgem.gov.uk\)](#)

²³ An agreement setting out the required works, key milestones and costs associated with any direct transmission connections. This agreement sits beside the Bilateral Connection Agreement throughout the construction period of a project and falls away on connection.

²⁴ The party with the responsibility for the minute-to-minute operation of the system and transmission network, ensuring it is balanced and stable.

SHEPD at Gremista GSP, close to the main demand centre around Lerwick, in November 2024.

Our view on the needs case

3.8. We consider that the needs case put forward by SHET is valid for the reasons set out in the following paragraphs.

3.9. There is a need to find a suitable alternative to LPS for meeting local demand on Shetland. LPS currently supplies approximately half of Shetland’s electricity on an annual basis. As part of Ofgem’s 2017 decision on the proposed costs of the SNES, we stated that the establishment of an alternative enduring solution by 2025 is necessary due to LPS nearing the end of its operational life. The proposed transmission link, outlined in paragraph 3.5, provides a means of continued security of supply to Shetland.

3.10. SHEPD’s proposal to contribute to the cost of any transmission link to Shetland is based on its identification and quantification of the likely benefits the link would have for its customers on Shetland. We consider that their contribution methodology calculates a value that may appropriately reflect the value of the transmission link to demand consumers. If this value is to be realised, there is a need to establish a transmission link. Further details on these benefits can be found in our December 2019 ‘Decision on SHEPD’s proposals to contribute towards proposed electricity transmission links to Shetland, Western Isles and Orkney’.²⁵

3.11. We also recognise the need to introduce energy diversification on Shetland and decarbonise the demand network. As the continued operation of LPS relies on the burning of diesel fuel, finding an alternative solution to meet local demand should help towards achieving Net Zero goals.

²⁵ [Decision on SHEPD’s proposals to contribute towards proposed electricity transmission links to Shetland, Western Isles and Orkney: Page 4](#)

4. Justification and Assessment of Options

Section summary

This section outlines the technical justification provided by SHET for the Gremista GSP project, along with the alternative options it considered. It then sets out our views on the options and our minded-to position.

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

Question 3: Do you agree with our minded-to view of the option proposed by SHET?

Engineering assessment of the range of options

4.1. In considering the range of options available to meet the needs case, SHET used the following factors to determine its preferred option:

- The location of the Shetland HVDC Link at Kergord.²⁶
- SHEPD's request that that the connection be located near the site of the LPS for ease of connection to the existing distribution infrastructure.
- Shetland's lack of pre-existing transmission infrastructure.
- Shetland's unique and challenging environment.

4.2. We have undertaken a technical review of the options considered by SHET. The material we reviewed comprised SHET's pre-engagement presentation materials, its MSIP submission and its responses to SQs.

²⁶ Kergord is the site of the new 132kV AC to DC converter substation which connects Shetland to Blackhillock substation on the GB mainland via the Shetland HVDC Link. It is located around 13 miles away from the proposed site of the GSP at Gremista.

High-level options assessment

4.3. Following a high-level options assessment, SHET determined that there were two viable options available to take forward for detailed analysis. These options have been included below.

- A 33kV solution from Kergord
- GSP at Gremista with 132kV linear circuit to Kergord

4.4. SHET did not consider a 'do nothing' option on the basis that it is obliged under SLC D4A to provide adequate transmission capacity to facilitate transmission connections to customers in the north of Scotland.

4.5. No 'market based' solution was considered on the basis that no transmission network presently exists on Shetland.

4.6. SHET's view on each of the high-level options it considered to be viable has been included below.

33kV solution from Kergord

4.7. This would involve connecting the existing 33kV distribution system on Shetland to the transmission system at Kergord.

4.8. SHET discounted this solution, citing the impracticality of reconfiguring and reconnecting the existing 33kV distribution network to the transmission link in Kergord. In its view, this option would involve the installation of up to six 33kV distribution circuits from Lerwick to Kergord and would therefore result in significant cost and disruption caused by the construction of several circuits on an island on which stakeholders have environmental and visual amenity concerns.

4.9. As part of our review process, we sent SHET SQs to determine whether an alternative 33kV solution could be considered, which would involve upgrading either one or two of the existing 33kV circuits to 132kV using existing route corridors to make it suitable for a transmission connection to Kergord.

4.10. In its response, SHET stated that it had not considered this alternative solution for the following reasons:

- The existing 33kV wood pole structures are not suitable for operating at 132kV and therefore it would be required to undertake a full rebuild of the 33kV circuit, which would not have provided a cost benefit.
- An additional build at 132kV would not remove the requirement for the 33kV circuits as these provide customer connections. Removal of these 33kV circuits would require additional transformation, which it did not consider to be economic.
- Two 132kV circuits are required to provide the distribution system with a Security and Quality of Supply Standard (SQSS)²⁷ compliant design for loss of a single asset between Gremista GSP and Kergord 132kV substation.

Grid Supply Point solution

4.11. This would involve the construction of two new 132kV circuits between the 132kV Kergord substation and the SHEPD proposed GSP site at Gremista as well as two 132kV gas insulated switchgear²⁸ (GIS) feeder bays at Kergord Substation (currently underway as part of the Shteland HVDC Link project) and two indoor 132/33kV air insulated switchgear²⁹ (AIS) substation bays at Gremista.

4.12. SHET preferred this solution, stating this would allow a firm demand connection in line with the connection request submitted by SHEPD. It was therefore considered by SHET to be the only viable solution which was suitable for more detailed analysis.

²⁷ The Security and Quality of Supply Standard sets out the criteria and methodology for planning and operating the National Electricity Transmission System.

²⁸ A Gas Insulated Switchgear is a device capable of making, carrying and breaking currents under normal circuit operation. The device is insulated using sealed enclosures filled with an insulating gas, typically sulphur hexafluoride (SF₆) or a combination of SF₆ and other insulating gases. The main advantage of a GIS is the reduced footprint of the device relative to AIS. [Electricity Distribution Glossary of Terms - Regulatory Instructions and Guidance](#)

²⁹ An Air Insulated Switchgear is a device capable of making, carrying and breaking currents under normal circuit operation. Air is the main medium used to insulate the busbars in the device. [Electricity Distribution Glossary of Terms - Regulatory Instructions and Guidance](#)

4.13. Given SHET's view that this was the only feasible technical option, a full Cost Benefit Analysis (CBA) was not undertaken. All subsequent optioneering was therefore focused on determining the optimal sites and routes as well as the lowest cost technical solution.

Further detail on the proposed GSP solution

4.14. SHET's proposed solution required detailed studies for both the siting of the GSP and the preferred route for the transmission line. The following sections give details of the considerations by SHET's design teams for these issues.

GSP site location

4.15. As the party responsible for the siting of the connection, SHEPD carried out the site optioneering exercise to determine the optimal location of the proposed GSP, with SHET offering technical input. The results of this evaluation were contained within the 'Shetland Gremista 132/33kV GSP Site Selection Report' which was submitted as part of SHET's MSIP submission and reviewed by Ofgem. A summary of the analysis in the site selection report can be found in Appendix 2 – Summary of GSP site selection risk assessment.

4.16. A total of six sites were considered. Five of these sites were evaluated using a risk assessment which assessed the suitability of each location against operational, technical, economic, and environmental criteria defined through the Scottish and Southern Electricity Networks (SSEN) distribution substation site selection procedure. These options have been listed below.

Option 0

4.17. It was initially proposed that that the GSP was to be located within the existing site boundaries of LPS.

4.18. SHEPD discounted this option after a joint review by both SHET and SHEPD of the available area within LPS boundaries. It was determined that the standard AIS design for two transformer buildings and associated control/33kV GIS hall building would not fit within the designated area.

Option 1A

4.19. This option was rejected due to the technical and environmental challenges of the diverting the South Burn of Gremista, a stream running through the proposed site. This would also likely have a significant cost increase compared to the other sites.

Option 2

4.20. This option was rejected due to the site not being previously being allocated for development in the Shetland Island Council Local Development Plan (LDP).³⁰ Additionally, the site contains nationally important carbon-rich soils which may require further ground investigation works.

Option 3

4.21. This option was rejected as it has only been designated in the LDP for light industrial use. There had also been a previous planning application in the area rejected.

Option 4

4.22. This option was rejected due to significant amount of earthworks and peat management required.

Option 1B

4.23. Based on the results of the site selection report, SHET identified option 1B as the preferred option for the following reasons:

- Located near to LPS and the existing 33kV distribution network.
- It has already been designated for industrial development in the LDP.
- It would avoid the need to divert the South Burn of Gremista stream, as in the case for option 1A.
- Any visual impact would be limited.
- Less peat compared to other sites.

³⁰ The Shetland Islands Local Development Plan sets out a strategy for the development of land in the Shetland Islands over the next 10-20 years: [Shetland Local Development Plan](#)

Preferred route

4.24. Full details of the optioneering undertaken by SHET relating to the routing options were provided in its 'Route Selection Study Report'. This report formed part of its MSIP submission and was reviewed by Ofgem.

4.25. In addition to the GSP connection, Mossy Hill wind farm³¹ also requires connection to the substation at Kergord. Given the close proximity between the proposed GSP site and Mossy Hill, SHET undertook its route selection with an aim to deliver a transmission link to both Mossy Hill and the proposed GSP.

4.26. SHET state that this aim is in line with its obligation to facilitate the connection of renewables generators to the grid through an economical, efficient, and coordinated approach to transmission reinforcement.³²

4.27. In accordance with the process outlined in the Holford Rules³³ and SHET's Routing Guidance,³⁴ a least-cost asset technology approach was adopted. This involves selection of the lowest cost solution that is technically feasible.

4.28. The least-cost asset technology option would involve the use of two Trident woodpole circuits running in parallel with each other. Further information on the configuration of these woodpoles can be found in Appendix 4 – Trident woodpoles.

4.29. SHET divided the route into three sections for ease of comparative appraisal. These three sections are listed below.

- Entry into Kergord
- Entry into Gremista GSP
- Route south following the A970

³¹ Mossy Hill is a wind farm development based in Shetland.

³² Statutory duties under section 9(2) [Electricity Act 1989 \(legislation.gov.uk\)](#)

³³ These are rules, first created in 1959 by Lord Holford and since developed by transmission operators, which are commonly used to guide the routing of overhead lines [SSEN Holford Rules](#)

³⁴ SEN Transmission's Routing Guidance (Procedures for Routing Overhead Lines and Underground Cables of 132kV and above)

Entry into Kergord

4.30. SHET view the least-cost option as unsuitable as it does not have permission to construct new infrastructure within the exclusion zones³⁵ pre-agreed as part of the Shetland HVDC Link project. It also stated that Overhead Lines (OHLs) at this section of the route would present a consenting issue due to the proximity to a local Site of Special Scientific Interest (SSSI)³⁶.

4.31. SHET determined that a cable solution would be suitable for this section of the route. All subsequent analysis was conducted on the basis that underground cable would be used for this section of the route.

Entry into Gremista

4.32. SHET view the least-cost option as unsuitable because placing new OHL infrastructure within Viking Wind Farm boundaries would require both a construction and maintenance and operations agreement with PEEL L&P Energy. In addition, the close proximity of the proposed Mossy Hill wind turbines to any OHLs would require a Risk Assessment as per ENA Engineering Recommendation L44.³⁷ They anticipate this assessment would conclude that there is insufficient topple and maintenance clearance between the assets, though this assessment has not been undertaken.

4.33. SHET determined that a cable solution would be suitable for this section of the route. All subsequent analysis was conducted on the basis that underground cable would be used for this section of the route.

Route south following A970

4.34. SHET view the least-cost option as being suitable for this section of the route. Potential development constraints present on the other route sections, such as proximity to SSSIs,

³⁵ The exclusion zones are legal land agreements which are in place to ensure landowners can maintain access to their land during construction.

³⁶ NatureScot, Scotland's nature agency, define Sites of Special Scientific Interest as those areas of land and water that are considered to best represent natural heritage in terms of their flora, fauna, geology, geomorphology or a mixture of these features. It is a statutory designation under the [Nature Conservation \(Scotland\) Act 2004](#) and confers a level of protection for the site.

³⁷ [Energy Networks Association Separation Wind Turbines Overhead.pdf \(spenergynetworks.co.uk\)](#)

were not observed on the central section of the route. All subsequent analysis was conducted on the basis that Trident woodpoles would be used on this section of the route.

Routing assessment methodology

4.35. In its 'Alignment Consultation Document Kergord to Gremista', SHET outline the methodology for identifying the optimal route. This report was reviewed by Ofgem as part of the assessment of the options considered in meeting the needs case.

4.36. SHET state that the overall aim of the route alignment process was to develop a proposed alignment in a systematic manner, which is technically feasible, economically viable and could be anticipated to cause the least disturbance to the environment and those living in it, working in it, visiting or using it for recreational purposes.

4.37. The selection of the preferred route option was undertaken through a combination of operational, technical, economic, and environmental assessment scores for each of the routes using their defined route selection procedure. The assessment is based on a Red/Amber/Green (RAG) status using set criteria to provide a comparative score across the routing options.

4.38. The summary of this comparative analysis has been included in Appendix 3 - Preferred routing alignment.

Ofgem's view on the potential solutions

4.39. Following a detailed review of the analysis submitted by SHET, we are minded to agree that the construction of the GSP at the proposed site in Gremista, along with the associated 132kV OHL and cable infrastructure, is required to facilitate this connection. We set out the reasons for this view below.

High-level solutions

4.40. We consider the high-level assessment of the overarching options was appropriate in this case. This avoided the possibility unnecessarily undertaking detailed analysis for options which could be identified as unviable from the outset.

4.41. We view that a 'do nothing' option is not viable given SHET is required to provide a transmission connection in accordance with its various statutory duties³⁸ and licence obligations, including SLC D4A. Additionally, we agree that an alternative enduring solution to LPS must be found as it currently supplying the majority of local demand in Shetland.

4.42. We view that the lack of a 'market based' solution was justified given that there is presently no transmission infrastructure on Shetland.

4.43. We do not view a 33kV option from Kergord as being viable. We do not consider that it would be economic and efficient given the number of distribution circuits required, based on typical capacity. Additionally, this solution would run in parallel to the connection to the Mossy Hill wind farm and would therefore not represent a coordinated approach to transmission reinforcement.

4.44. We view the reasons given to discount the uprating of the existing 33kV infrastructure for transmission, described in paragraph 4.10, as being valid. As the 33kV woodpole structures are not capable of operating at 132kV, a full rebuild of the existing infrastructure would not have been economical.

4.45. We view the GSP and associated 132kV linear circuit as representing the most appropriate high-level solution which allows SHET to fulfil its obligation to deliver a firm demand connection to SHEPD as the range of alternative 33kV options are not considered to be economical.

4.46. We do not consider that undertaking a full CBA was necessary as part of the high-level optioneering process as the alternative options presented by SHET were not appropriate.

Site selection

4.47. In our view, the site selection process undertaken by SHET evidences a robust analysis of the available options. We note that consideration has been given to relevant risk factors, which are included in Appendix 2 – Summary of GSP site selection risk assessment.

³⁸ Statutory duties under section 9(2) [Electricity Act 1989 \(legislation.gov.uk\)](https://www.legislation.gov.uk)

4.48. We view option 0 as being unsuitable due to the inability of the proposed site to house the standard AIS design for two transformer buildings and associated control building.

4.49. We view option 1A as being unsuitable due to the additional technical and environmental challenges of the diverting the South Burn of Gremista and the impact this would have on the costs of the project.

4.50. We view option 2 as being unsuitable as the site has not been designated within the LDP as being suitable for development, along with the potential risk for developmental constraints caused by the presence of Class 1 soils.³⁹

4.51. We view option 3 as being unsuitable due to planning applications to utilise the site having been refused as a consequence of its closeness to a neighbouring residential area, along with its designation as a site for light industrial use only.

4.52. We view option 4 as being unsuitable due to significant peat depth across the site, which would have implications in terms of planning and approval from the Scottish Environment Protection Agency (SEPA). A Peat Management Plan would likely be required for any planning application associated with this site.

4.53. We view option 1B as being the optimal site for the proposed GSP for the reasons cited in the site selection report and set out in paragraph 4.23 above.

Route selection

4.54. Our view is that the comparative analysis conducted as part of the dedicated route selection report represents a comprehensive analysis which gives due consideration to relevant risk factors. The specific factors considered have been included in Appendix 3 – Preferred routing alignment.

Our minded-to position on the proposed project

³⁹ Defined by NatureScot, Scotland's nature agency, as nationally important carbon-rich soils, deep peat and priority peatland habitat. These are likely to be areas of high conservation value. [Carbon and Peatland 2016 map | NatureScot](#)

4.55. Our review has concluded that the establishment of a GSP in Gremista is the most appropriate option which addresses the needs case. Therefore, our minded-to view is that the Gremista GSP represents the optimal solution.

4.56. The range of benefits the option would bring include:

- It would complete the whole system process which has included to date the approval of the LT09 Shetland HVDC Final Needs Case⁴⁰ and SHEPD Shetland Whole System contribution.⁴¹
- It would avoid the need for significant additional investment to maintain the existing LPS by procuring a new enduring solution.
- Demand would primarily be supplied from a source of low carbon power rather from than a diesel power station.

Accordingly, we are minded to accept the justification for the Gremista GSP project.

⁴⁰ [Shetland transmission project: Decision on Final Needs Case and Delivery Model | Ofgem](#)

⁴¹ [Decision on Scottish Hydro Electric Power Distribution's proposals to contribute towards proposed electricity transmission links to Shetland, Western Isles and Orkney | Ofgem](#)

5. Consultation proposal summary

5.1. We are proposing to accept the needs case for the Gremista GSP project and the preferred option presented by SHET in addressing this needs case.

5.2. The decision on the needs case and preferred option is the first stage in a two-stage process, with a decision on the efficient costs of the delivery of the project being made following the January 2023 MSIP submission window to allow greater cost certainty to be achieved.

6. Next steps

6.1. We welcome your responses to this consultation, both generally, and in particular on the specific questions in Chapters 3 and 4. Please send your response to riioelectricitytransmission@ofgem.gov.uk. The deadline for response is 24 May 2022.

6.2. We will aim to conclude our assessment of SHET's Gremista GSP project with a provisional decision in June 2022.

6.3. Once a final submission including cost details has been submitted by SHET, which it expects to do in January 2023, we will seek to establish the efficiency of the proposed costs. Our approach to assessing network company costs relies on a combination of bespoke review and comparison across the companies, as appropriate to the nature of the cost.

6.4. We will also consider changes in the connection scope or capital expenditure programme where this may have an impact on the needs cases and optioneering.

6.5. In the event that we decide that SHET should be funded for this project, it will be categorised as an evaluative Price Control Deliverable (PCD). Given the potential level of difference in materiality between the delivery modes, we consider it appropriate to protect consumer interests by reviewing the delivery.

6.6. Further work will be necessary to set explicit outputs, delivery dates and the profile of the project allowances for the PCD, after which we will undertake a statutory consultation to make the relevant changes to the licence in line with SpC 3.14.10.

Appendices

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Appendix 1 – Consultation questions

Question Number	Question
1	Do you agree with our view on the validity of the needs case for the Gremista GSP MSIP Project?
2	Do you agree with our technical assessment of the range of solutions to meet the needs case?
3	Do you agree with our minded-to view on the solution proposed by SHET?

Appendix 2 – Summary of GSP site selection risk assessment

The results of the 'Shetland Gremista 132/33kV GSP Site Selection Report', which was submitted as part of SHET's MSIP submission, are summarised below.

Each topic within the environmental, technical, and cost categories were considered by SHET in terms of the potential for the site to be constrained and a RAG rating was applied.

The specific risk factors considered as part of the report included:

- Ownership of the site
- Environmental
- Ground conditions/civil works
- Access
- Planning
- Services

Number	Site Selection Summary			
	Land Option Description	Total Red Items	Total Amber Items	Total Green Items
0		7	9	31
1A		1	9	37
1B		1	6	40
2		1	11	35
3		1	14	32
4		1	8	38

The RAG ratings were defined as follows:

- Green: Low potential for the development to be constrained
- Amber: Medium potential for the development to be constrained
- Red: High potential for the development to be constrained

Appendix 3 – Preferred routing alignment

SHET states that the overall aim of the route alignment process was to develop a proposed alignment in a systematic manner, which is technically feasible, economically viable and could be anticipated to cause the least disturbance to the environment and those living in it, working in it, visiting or using it for recreational purposes. The topics considered as part of the alignment process have been included below.

Topic	Specific aspect of the topic
Environmental Constraints	
Natural Heritage	Designations
	Protected Species
	Habitats
	Ornithology
	Hydrology, Geology and Hydrogeology
Cultural Heritage	Designations
	Cultural Heritage Assets
People	Proximity to dwellings
Landscape and Visual	Designations
	Landscape Character
	Visual
Land Use	Agriculture
	Recreation
Planning	Proposals
Technical Constraints	
Infrastructure	Major crossings (132 kV, 275 kV, Rail, 200+m wide river, navigable canal, gas or hydro pipeline)
	Road crossings
Environmental Design	Elevation
	Atmospheric pollution
	Contaminated land
	Flooding
Ground Conditions	Terrain

	Rock
	Peat
Construction/Maintenance	Access
	Angle towers
	Angles of deviation
	Cable haul road
Proximity	Clearance distance
	Windfarms
	Communication masts
	Urban environments
	Metallic pipelines
Design	Reactive compensation (HVAS circuits only)
	Joint bays and link box chambers
Economic Constraints	
Capital	Construction
	Diversions
	Public road improvements
	Tree felling
	Land Assembly
	Consent mitigations
Operational	Inspections
	Maintenance

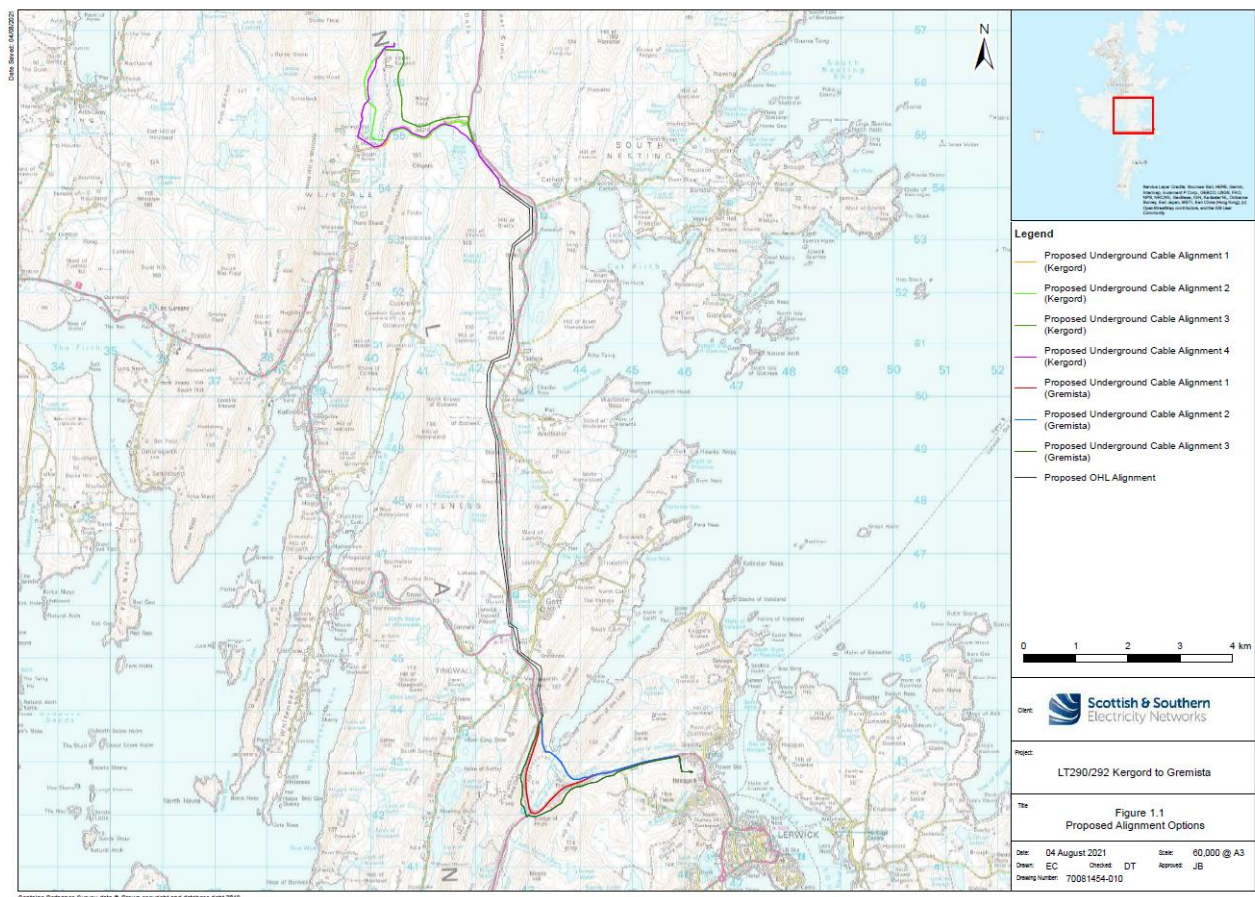
The results of the analysis have been summarised below. In assigning a RAG description, consideration was also given by SHET to the relative importance or sensitivity of the environmental or technical feature in question. For example, direct interactions with international natural heritage designations would be classed red; interactions with blanket bog habitat would be classed amber over interactions with moorland or coniferous plantation, which would be classed green.

Section	Option	Total Red Items	Total Amber Items	Total Green Items
Section 1: Kergord Entry Cable	1	8	13	15
	2	8	11	17
	3	11	8	17
	4	6	13	17
Section 2: OHL section	1	7	7	21
Section 3: Gremista GSP	1	5	6	26
	2	4	6	27
	3	7	5	25

The RAG ratings were defined as follows:

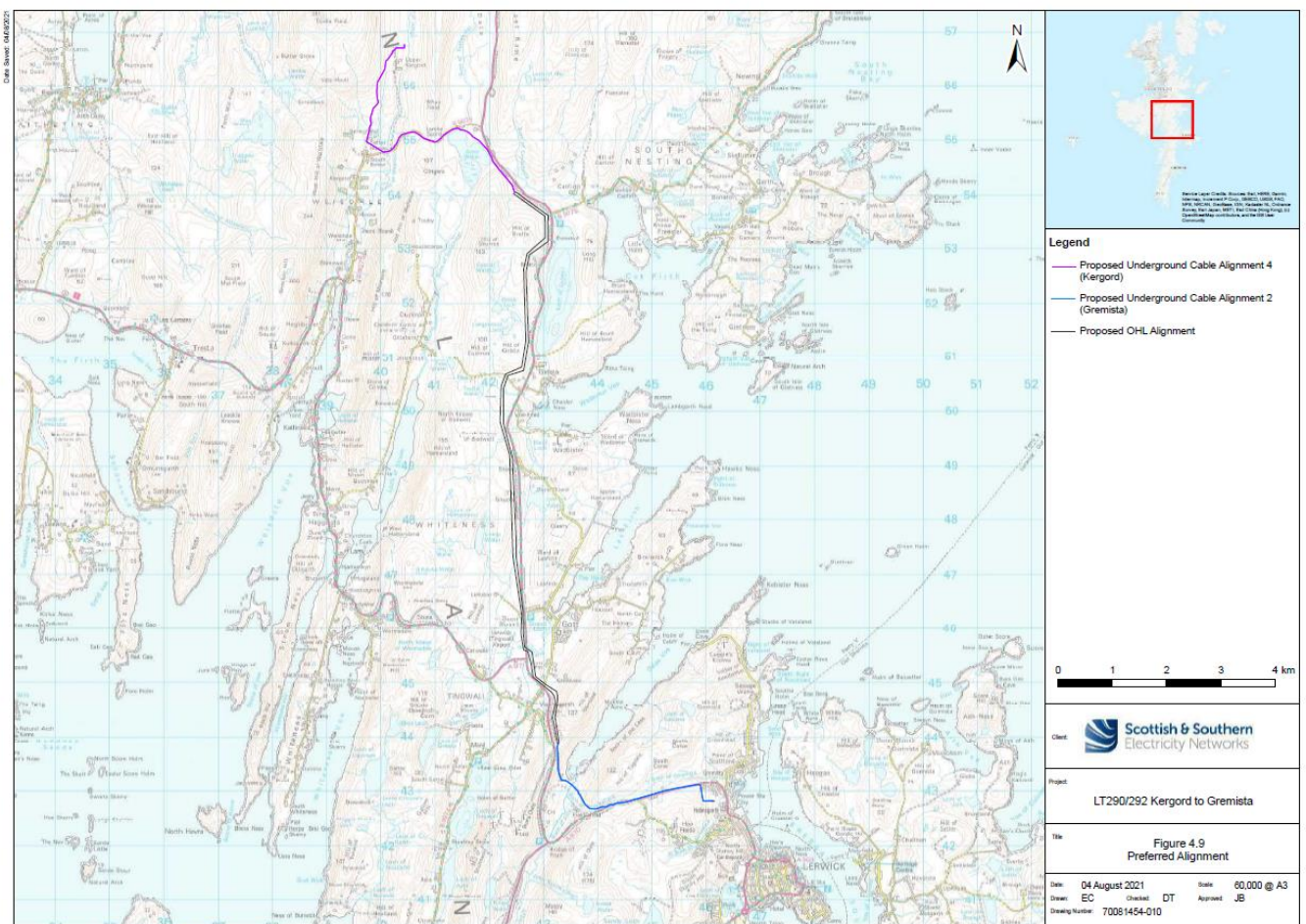
- Green: Low potential for the development to be constrained
- Amber: Medium potential for the development to be constrained
- Red: High potential for the development to be constrained

An illustration of the alignments for the routing options has been included below. The route options correspond to the options outlined in the previous RAG table.



An illustration of the preferred alignments for the routing options has been included below. In line with the preferred options outlined in the previous table:

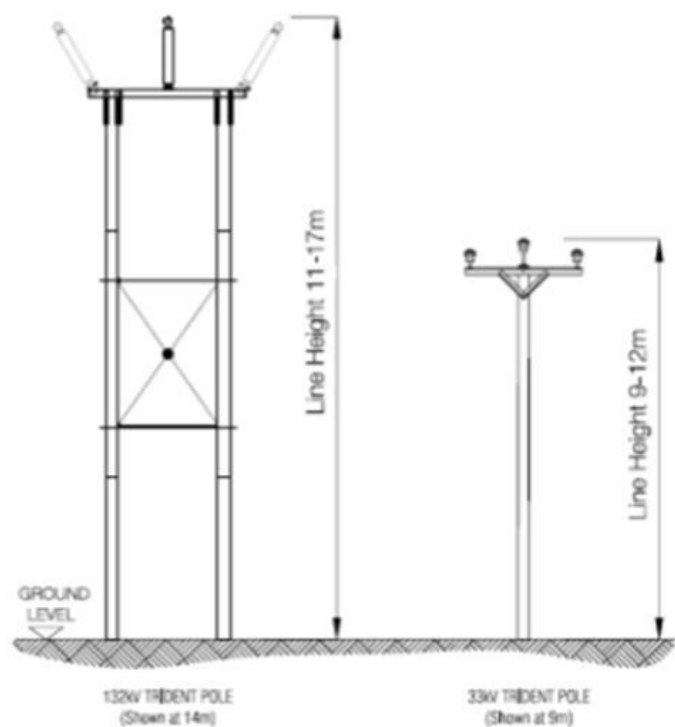
- Option 4 has been selected for the section of the circuit entering Kergord
- Option 2 has been selected for the section of the circuit entering the proposed GSP site
- Option 1 has been selected for the OHL section of the route (no other options were presented for this section)



Appendix 4 – Trident woodpoles

The proposed low-profile Trident woodpoles would have a nominal height of approximately 11-17m, inclusive of insulators and support. This is necessary to achieve the required statutory ground clearance of 6.7m. The spacing between poles would vary depending on topography and altitude. The distance between the two OHLs would be a minimum of 30m. The span length would be approximately 80m.

The image on the below left demonstrates the typical configuration of a Trident woodpole. The image below right shows a comparison of the scale of the proposed 132kV transmission infrastructure relative to the existing 33kV infrastructure.



Appendix 5 – 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 as 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](#)”.