

HEBRIDES AND ORKNEY WHOLE SYSTEM UNCERTAINTY MECHANISM

Re-Opener Application - Core Narrative

July 2024 Addendum



Scottish & Southern
Electricity Networks



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EXECUTIVE SUMMARY

Our January 2024 Hebrides and Orkney Whole System Uncertainty Mechanism (HOWSUM) re-opener application focused primarily on the future demand and generation needs of the Outer Hebrides islands group, while also addressing the Pentland Firth East 3 (PFE3) project. We recommended interventions for Lewis, Harris, the Uists, Eriskay and Barra to address short-term needs, and set out our 2050 vision for the islands to meet the net zero trajectory and to support growth, considered through a whole system lens.

At that time, we set out that we would provide a further update on Skye – South Uist 33kV cable replacement costs in July 2024 following initial returns from a competitive tender process for the project. We also set out that we were developing delivery optimisation solutions to both potentially bring forward the initial delivery date of 2027/28 and recognising the high risk of failure of the existing Ardmore – Loch Carnan cable. This submission covers these elements.

As a result of our further work to assess delivery optimisation, and our engagement with the subsea market on pricing, we confirm our plan to **progress the Dunvegan – Loch Carnan solution recommended in our original application (Option 18), [REDACTED], complemented by an additional [REDACTED] 33kV subsea circuit optimisation from Ardmore to Loch Pooltiel.**

There is a range of benefits identified in developing this combined option:

- we expect to be able to accelerate delivery of the Skye - Uist solution to [REDACTED] than envisaged under [REDACTED];
- we will [REDACTED] on the Dunvegan – Loch Carnan route, [REDACTED];
- Loch Carnan and Barra power station **costs and emissions, and curtailment of embedded generation, will be significantly reduced** in the event of failure of the existing single Skye-Uist cable, prior to completion of the new solution;
- we will **add resilience and operational flexibility to the Skye-Uist-Harris network in both the near- and longer-term,** [REDACTED] and, in doing so,
- **the costs and emissions impact of running island power stations on the Uists, Harris and Lewis, and curtailment of renewable distributed generators, are expected to be reduced in the longer-term.**

Our engagement with the market has confirmed our original estimates for this project were approximately correct (subject to the outcome of our tender negotiations). The capital cost of the [REDACTED] has added £ [REDACTED] m to the estimate set out in our January 2024 application, with the total RIIO-ED2 cost estimate included in this submission being £ [REDACTED] m (excluding development costs, which are covered by the HOWSUM development funding allowance). The whole life NPV for the preferred option of the Dunvegan – Loch Carnan solution including the Loch Pooltiel optimisation loop [REDACTED]. This has the second best NPV of the options - with a difference of only £ [REDACTED] m over a 55 year assessment period compared to the best option - and offers the greatest benefits overall.

We have set out more detail on procurement and delivery milestones which demonstrate the need for Ofgem to make a determination on adjustments to our allowances before the end of December 2024. This will provide the confidence in funding for the solution [REDACTED], internal governance, and [REDACTED]



[REDACTED]. This is summarised in Figure 1 and detailed further in Sections 2.5 and 2.7.

[REDACTED] which is unique to SHEPD among DNOs, going forward. This is discussed in Sections 2.4, 2.5 and 2.7.

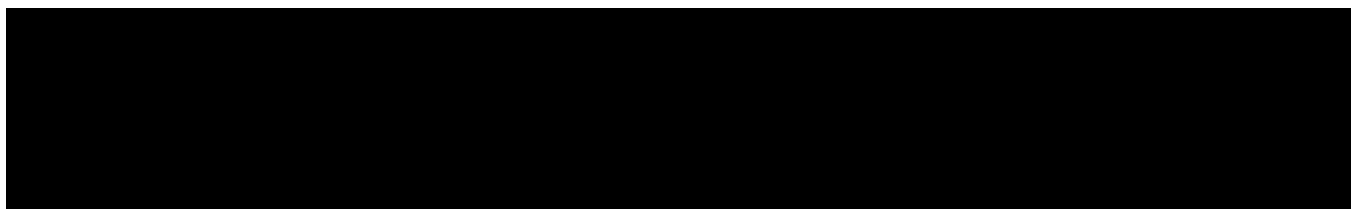


Figure 1: Skye – Uist delivery timeline

This recommendation is the basis for our application:

- for an adjustment to allowances for Skye – Uist in ED2 of £ [REDACTED] m;
- for a cost adjustment mechanism provided to enable us to manage [REDACTED] outside of our control;
- to continue engagement with Ofgem on this project, [REDACTED], to increase certainty of cost for SHEPD and customers and [REDACTED];
- for Ofgem to make determinations on our January and July 2024 HOWSUM submissions before the end of calendar year 2024, to enable us to meet our delivery programme for the Outer Hebrides.

We discuss these aspects further in this Core Narrative Addendum and the accompanying EJPs and CBA,

- Appendix 3A – Outer Hebrides 2050 Whole System Proposals EJP (Skye-Uist-Harris) Addendum and Appendix 3B – Outer Hebrides 2050 Whole System Proposals CBA (Skye-Uist-Harris); Addendum, and
- new Appendix 8A - Outer Hebrides 2050 Whole System Proposals EJP (Ardmore – Loch Pooltiel Optimisation) and associated Appendix 8B – Outer Hebrides 2050 Whole System Proposals CBA (Ardmore – Loch Pooltiel Optimisation).

Finally, we note that some content in this application is confidential, and a redacted suite of documents will be published on our website within 5 working days of submission to Ofgem.



MEETING OFGEM'S REQUIREMENTS

Structure of this application

This July 2024 submission is an addendum to our January 2024 re-opener application, and consists of five documents:

- This July 2024 Core Narrative Addendum ('Core Narrative Addendum') developed to contextualise and summarise all key changes further to our original January 2024 application, and to confirm where we address the requirements of Ofgem's Re-opener Guidance for all of the recommended solutions included in our application;
- An Addendum to both the original Appendix 3A – Outer Hebrides 2050 Whole System Proposals EJP (Skye-Uist-Harris) ('Appendix 3A Addendum') and associated updated Appendix 3B – Outer Hebrides 2050 Whole System Proposals CBA (Skye-Uist-Harris) ('Appendix 3B Addendum'), capturing mainly cost updates derived from our procurement processes; and
- A new Appendix 8A - Outer Hebrides 2050 Whole System Proposals EJP (Ardmore – Loch Pooltiel Optimisation) ('Appendix 8A') and a new associated Appendix 8B – Outer Hebrides 2050 Whole System Proposals CBA (Ardmore – Loch Pooltiel Optimisation) ('Appendix 8B'), which assesses a number of delivery optimisation sub-options on our preferred solution for Skye-Uist, and drives our final recommendation set out in this submission.

The documents comprising this July 2024 application are set out in Figure 2 in dark green, shown in the context of the wider content of the January and July 2024 applications.

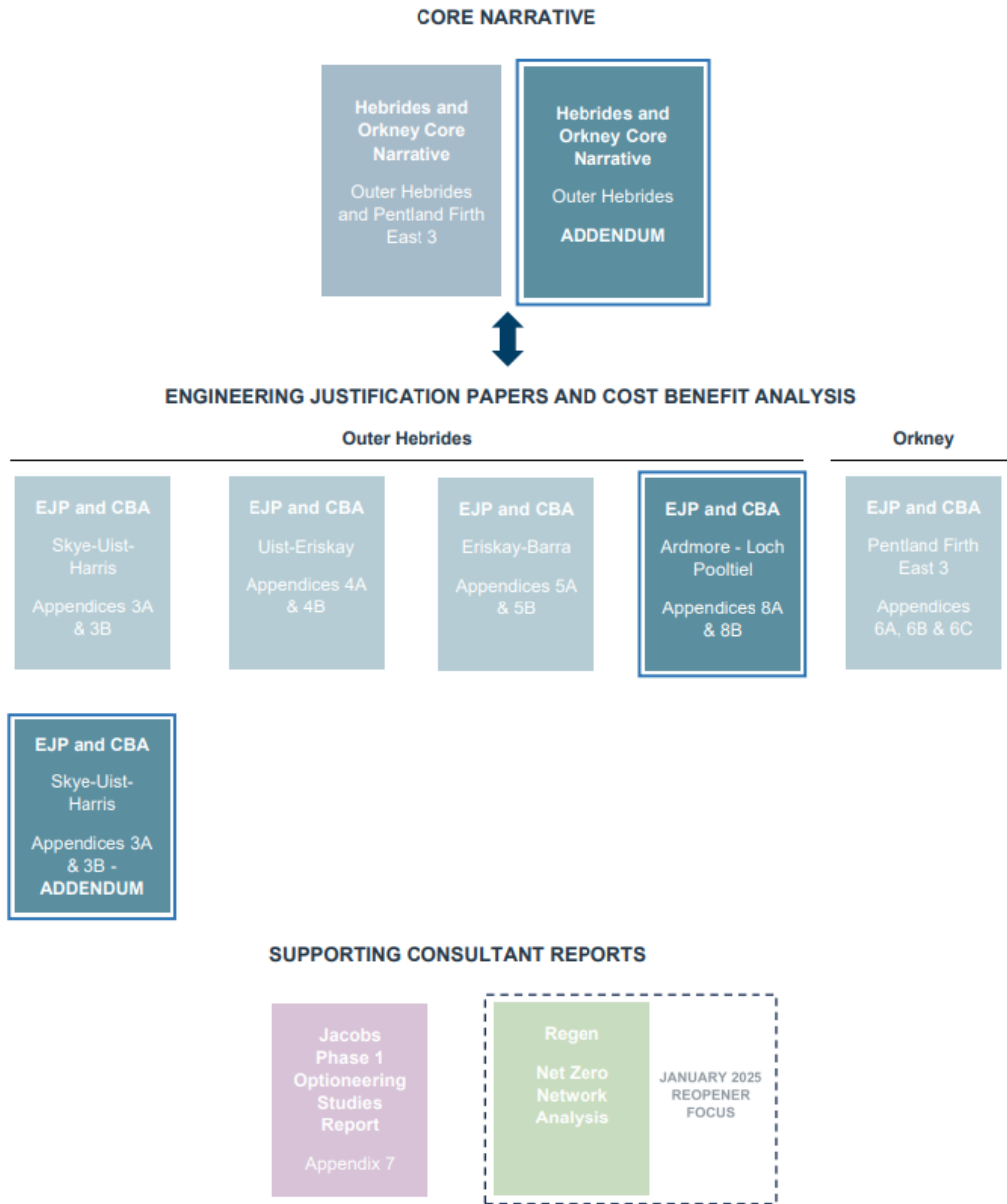


Figure 2: July 2024 HOWSUM submission structure



Ofgem re-opener requirements

We set out how our application meets Ofgem’s requirements in our January 2024 application. Table 1 sets out how we meet Ofgem’s Re-Opener Licence requirements across our January and July 2024 applications.

Ofgem Re-Opener Licence requirement	Requirement met?	How addressed
<p>(a) the licensee has incurred or expects to incur costs as a result of changes to the scope or timing of work relating to twelve subsea cables:</p> <ul style="list-style-type: none"> i. Skye to Uist (North route); ii. Skye to Uist (South route); iii. Pentland Firth West; iv. Pentland Firth East; v. Mainland Orkney – Hoy South; vi. Orkney (additional 66kV circuit) vii. Eriskay – Barra 2; viii. South Uist – Eriskay; ix. Mull to Coll (double circuit); x. Coll – Tiree (double circuit); xi. Mainland – Jura (double circuit); and xii. Jura – Islay (double circuit); or 	✓	SHEPD has incurred or expects to incur costs for Pentland Firth East, Skye – Uist, Uist – Eriskay and Eriskay – Barra.
<p>(b) the licensee has incurred costs associated with ensuring security of supply in the Scottish islands, and can demonstrate efficient whole systems considerations have been taken into account, including considering alternative activities to installing the cables listed; or</p>	N/A	
<p>(c) the licensee has incurred or expects to incur costs associated with the outcomes of additional whole system analysis in the Scottish Islands to contribute to net zero Carbon Targets and ensure long-term security of supply, including any alternative activities to installing the cables outlined in 3.2.105(a); and</p>	✓	This application includes interventions which are associated with the outcomes of whole system analysis in the Scottish islands to contribute to net zero carbon targets and ensure long-term security of supply.
<p>the change in those costs in paragraphs 3.2.105(a) or 3.2.105(b) exceeds the Materiality Threshold and are not otherwise funded by the special conditions.</p>	✓	The costs incurred or expected to be incurred exceed the Materiality Threshold (£2.26m).

Table 1: Mapping Ofgem’s Re-Opener Licence requirements



Summary of bilateral engagement

We have held a number of meetings with Ofgem in preparation for our July 2024 submission and welcome the time and engagement Ofgem have provided. Key areas of focus and outcomes to date are summarised in Table 2.

Engagement (date)	Scope	Discussion and outcomes
31 January 2024		January 2024 submission
22 February 2024	Seventh core meeting	Ofgem provision of initial feedback on January 2024 submission, and thoughts on consultation process. Ofgem note current plan to cover SHEPD July 2024 cost submission in a separate consultation. SHEPD emphasises need for determination on Skye-Uist before year end 2024 to meet programme. SHEPD shares info on upcoming stakeholder engagement webinars and Regen Orkney demand and generation analysis.
21 March 2024	Eighth core meeting	SHEPD cover aspects of January 2024 submission, including thinking on options to optimise delivery for Skye – Uist solution, and confirmation July 2024 submission which assess Ardmore – Loch Pooltiel subsea cable loop. SHEPD shares information on island resilience policy. Discussion on SQs completed and in progress.
24 April 2024	Ninth core meeting	Discussion on SQs completed and in progress, including focus on Skye-Uist and PFE3 SQs. SHEPD shares proposals on format for the July 2024 submission.
20 May 2024	Tenth core meeting	Discussion on SQs completed and in progress, including focus on Skye-Uist and PFE3 SQs. SHEPD shares more detailed overview of Skye-Uist optioneering and CBA process, and on PFE2 / PFE3 history and optioneering. SHEPD shares proposals on format for the July 2024 submission – Ofgem agree with Option 2 -.short new addenda confirming changes to January 2024 submission.
20 June 2024	Eleventh core meeting	Discussion on SQ process, including focus on Skye-Uist and PFE3 SQs. SHEPD shares proposal for July 2024 submission structure incorporating updated core narrative and Skye-Uist EJP, and new EJP on delivery optimisation EJP. SHEPD shares information [REDACTED] and raises request for Ofgem to consider mechanism to manage SHEPD's cost risk. SHEPD provides overview of scope of January 2025 submission, noting focus on DEG emissions



Engagement (date)	Scope	Discussion and outcomes
		reductions and implementation of island resilience policy. Ofgem confirms January 2024 submission consultation timing impacted by General Election, and determination to come several months after consultation.
4 July 2024	Cost risk focus meeting	SHEPD shares more information from tender process, including draft costs, [REDACTED]. Ofgem proposes SHEPD sets out cost risk mechanism proposals in July 2024 submission. SHEPD shares further thinking on embedded diesel generation emissions reduction drivers for January 2025 submission.
25 July 2024	Twelfth core meeting	Discussion on SQ process, including focus on PFE3 SQs. Ofgem confirms intention to consult on January 2024 submission in August. Discussion on costs and benefits of Loch Pooltiel delivery optimisation proposal which is key element of July 2024 submission.
31 July 2024	July 2024 submission	

Table 2: HOWSUM bilateral engagement with Ofgem since January 2024 submission



1. ADJUSTMENT SUMMARY

Table 3 provides a high-level summary of the adjustment relevant to the January and July 2024 re-opener applications, now including updated Skye – Uist costs. A comparison of this adjustment with the original estimate in our January 2024 submission is provided in Table 10.

It was agreed as part of RIIO-ED2 Final Determinations that SHEPD would receive development funding for HOWSUM projects. The adjustment summary takes account of this funding by defining the development costs associated with each recommended solution and deducting the development costs from the funding request and associated allowance adjustment.

Adjustment summary (£m, 2020/21)	2023/24	2024/25	2025/26	2026/27	2027/28	Total
HOWSUM baseline development funding:						£20.6m
– Skye - Uist development costs ¹	■	■	■			■
Adjustment request:						
– Skye – Uist			■	■	■	■
– Of which are development costs ²			■			■
Total adjustment	■	■	■	■	■	■

Notes:

1. The HOWSUM Development Funding provision of £20.63m was provided to cover development funding for HOWSUM-eligible projects.
2. We have deducted the total development cost funding value from 2025/26 for the purpose of phasing the annual allowances.

Table 3: Skye-Uist adjustment summary



2. SKYE – UIST UPDATES

2.1. Basis for the July 2024 application

We provide two key updates in this application.

Skye-Uist cost refinement

The main driver for providing this updated application was to allow us to time to engage with the market on our proposed solutions, and to set out our request for allowances for the Skye – South Uist cable replacement based on tendered pricing.

In the original Appendix 3A – Outer Hebrides 2050 Whole System Proposals EJP (Skye-Uist-Harris), SHEPD identified Option 18 as the preferred long-term strategy for meeting the region's electricity demands whilst ensuring a resilient network, sufficient capacity, and low carbon footprint. This option involved replacing the existing Ardmore to Loch Carnan subsea cable with a [REDACTED] cable from Dunvegan to Loch Carnan in RIIO-ED2 and installing a new cable between Harris and Clachan substations and laying a second subsea cable alongside the existing Ardmore to Harris route at a later date.

At the time of our January 2024 application, we were preparing for the first phase of tender exercises for the Skye – South Uist cable replacement. As such the January 2024 application represented the first stage of the re-opener process for this work and focused on outlining the needs case for investment and the preferred solution, with estimated costs and CBA based on recent comparable projects. This July 2024 second stage application provides a more informed view of the costs based on initial returns from the market, and also confirms our intention to progress with [REDACTED] 33kV cable instead of [REDACTED] for the Loch Pooltiel – Loch Carnan circuit. We summarise the updated costs in Table 10, providing a comparison with the January 2024 estimate, and detail them further in Appendix 3A Addendum and Appendix 3B Addendum. **The updated costs for the core elements of Option 18 are [REDACTED], at £[REDACTED]m compared to the original estimate of £[REDACTED]m. – and Option 18 remains the preferred core solution from a CBA perspective, complemented by the Ardmore - Loch Pooltiel optimisation loop.**

Delivery optimisations, and enhanced flexibility and resilience

Through the deliverability assessment of the options considered, it was identified that the proposed overhead line section from Dunvegan GSP to the subsea cable landing point at Loch Pooltiel in Option 18 [REDACTED]. We referenced this in our January 2024 application. We have now carried out extensive landowner engagement which has confirmed [REDACTED].

In response to this, we have assessed the contingency subsea route between Ardmore GSP and Loch Pooltiel alongside the preferred solution. This additional subsea section is expected to be delivered by [REDACTED] and would enable earlier implementation of the Dunvegan – Loch Carnan subsea cable at this point, [REDACTED], and providing earlier contingency in the event of failure



of the existing Skye-Uist link, which has a current Health Index rating of 5 and is at risk of failure. It will also offer ongoing flexibility and resilience in the longer term, adding to operational network optionality for Skye, the Uists and Harris.

In our January 2024 application we also identified the option to underground 15km of cable between Dunvegan and Loch Pooltiel as an alternative to overhead line, presented as Option 19, a sensitivity on Option 18. We now have preliminary cost and delivery information from the market on this option [REDACTED].

Finally, we propose that both subsea circuits included in our recommendations are sized at [REDACTED].

We provide more detail on this and a number of alternative sub-options assessed on the core recommended option below in summary, and in detail in the new Appendix 8A and associated Appendix 8B.

2.2. Summary of updates on key areas

Table 4 sets out where we meet Ofgem's Re-Opener Guidance requirements in this application, providing an overview of key updates further to our January 2024 application.

Ofgem re-opener guidance requirement	Requirement met?	Where met	Further comments
Needs case and preferred option	✓	Jan 2024 application, with supplementary information in Appendices 8A (sections 3, 4 and 5) and 8B	Our needs case has not changed. Refinements to optioneering are summarised in this document and set out in detail in Appendices 8A and 8B.
Stakeholder engagement and whole system opportunities	✓	Jan 2024 application, with supplementary information in Appendices 8A (sections 3, 4 and 5) and 8B	Further to the stakeholder engagement set out in our original application, we have had contact with landowners at the proposed subsea cable landfall site at Loch Pooltiel and held a community event on the project in June 2024. Engagement with the community and landowners along the land route is also ongoing. There are many landowners who hold shares in the land. There have been negative and positive responses to the proposed works.



Ofgem re-opener guidance requirement	Requirement met?	Where met	Further comments
Cost information	✓	Appendix 3A Addendum (sections 8, 9, 10 and 11), Appendix 3B Addendum, Appendix 8A (sections 5, 6, 7, 8, 9) and Appendix 8B	<p>We continue to hold regular engagement with SSEN Transmission on relevant island interactions.</p> <p>We are currently scheduling webinars with stakeholders on each of the island groups as part of our HOWSUM January 2025 optioneering work.</p> <p>We have noted updates on whole system benefits brought by our preferred option in Appendix 8A.</p> <p>We have confirmed pricing updates from the market, summarised in this document and detailed in Appendices 8A and 8B.</p> <p>We have set out the material volatility and cost uncertainty presented in the current subsea market [REDACTED]</p> <p>Taking this into account, we have asked Ofgem to provide a mechanism to enable us to manage uncertain costs.</p> <p>As with the January 2024 application, we have highlighted where HOWSUM ex ante development funding applies to our costs and have deducted this from the total requested allowance adjustment.</p>
Cost Benefit Analysis and Engineering Justification	✓	Appendix 3A Addendum (section 10 on CBA), Appendix 3B Addendum, Appendix 8A (all sections of EJP, and section 8 on CBA, 8, 9) and Appendix 8B	<p>We have assessed four 'sub-options' to mitigate potential challenges on our baseline preferred option and have applied the refined costs from the market in CBA. Our recommended option has the second best NPV, with additional operational benefits which make it preferable to the option with the best NPV.</p>

Table 4: Mapping Ofgem’s re-opener guidance requirements - summary of key updates



2.3. Recommended solution

2.3.1. Overview

In our original EJP for the Outer Hebrides submitted in January 2024 (Appendix 3A – Outer Hebrides 2050 Whole System Proposals EJP (Skye-Uist-Harris)) SHEPD identified Option 18 as the preferred long-term strategy for meeting the region's electricity demands whilst ensuring a resilient network, sufficient capacity, and low carbon footprint. Under this option we will replace the existing Ardmore to Loch Carnan subsea cable (95mm²) with a [REDACTED] from Dunvegan to Loch Carnan within RIIO-ED2. In the longer term, in RIIO-ED3 or beyond, we have also proposed a new cable from the Harris to Clachan substations, via Lochmaddy, and a secondary subsea cable alongside the existing Ardmore to Harris route. Each route will be supported with onshore connections to the substations. This will provide N-1 capacity and cater for demand growth until at least 2050.

Through the deliverability assessment of all the options considered, it has been identified that the proposed overhead line section from Dunvegan GSP to the subsea cable landing point at Loch Pooltiel [REDACTED]

These [REDACTED] have led to us investigate the implementation of a 'delivery optimisation' circuit to allow the replacement of the existing Ardmore - Loch Carnan cable [REDACTED]. In assessing this option, we have also considered three other optimisation 'sub-options' alongside the baseline Dunvegan – Loch Carnan option (Option 18). These are set out in Table 5 and are detailed in Appendices 8A and 8B.

Option no.	Description
Baseline	Continue with the network interventions outlined in the Outer Hebrides 2050 Whole System Proposals EJP (New Dunvegan – Loch Carnan subsea cable / OHL) as planned. Capital is allocated to ensure that emergency service repair can take place, in the event of failure occurring in RIIO-ED2.
1	Refine the proposed scheme, where OHL section from Dunvegan GSP to Loch Pooltiel subsea landing point is replaced with a UG section on the same route.
2	Augment proposed scheme with additional [REDACTED] subsea route from Loch Pooltiel (Skye) to Ardmore GSP.
3	Progress both Dunvegan – Loch Pooltiel onshore underground cable and Ardmore – Loch Pooltiel subsea cable sections to deliver a three-ended circuit.
4	Abandon Dunvegan – Loch Pooltiel section and progress for Ardmore – Loch Pooltiel – Loch Carnan circuit.

Table 5: Optimisation 'sub-options' considered



2.3.2.1. PREFERRED OPTION

The cost benefit analysis presented in the above section outlines the benefits of including the additional subsea cable route from Loch Pooltiel to Ardmores GSP. [REDACTED] with additional operational benefits to the wider network on the Western Isles and Skye.

With its operational advantages, [REDACTED] - augmentation of the original Dunvegan – Loch Carnan proposal with additional subsea route from Loch Pooltiel to Ardmores GSP - is being taken forward as the preferred option in this EJP. Table 8 shows the costs of the core baseline option and Loch Pooltiel delivery optimisation. We have included a standard risk allowance in the costs, discussed further in Section 2.5. Figure 3 shows a map of this option.

Line Items	Route	Cost (£m)
Subsea cable	(Dunvegan - Loch Carnan)	[REDACTED]
Subsea Cable (Risk)	(Loch Pooltiel - Loch Carnan)	[REDACTED]
Onshore - OHL	(Dunvegan - Loch Carnan)	[REDACTED]
Onshore - Poles	(Dunvegan - Loch Carnan)	[REDACTED]
Onshore - 33kV U/G Cable	(Dunvegan - Loch Carnan)	[REDACTED]
Subsea cable	(Ardmore – Loch Pooltiel)	[REDACTED]
Substation upgrade - Dunvegan	[REDACTED]	[REDACTED]
Switching Station [REDACTED]	[REDACTED]	[REDACTED]
		[REDACTED]

Table 8: Baseline cost breakdown – RIIO-ED2 only (2021 prices)

This option will allow SHEPD to remove the existing HI5 subsea cable from Ardmores GSP to Loch Carnan GSP [REDACTED], whilst delivering enhanced operational capabilities with their associated benefits to customers.

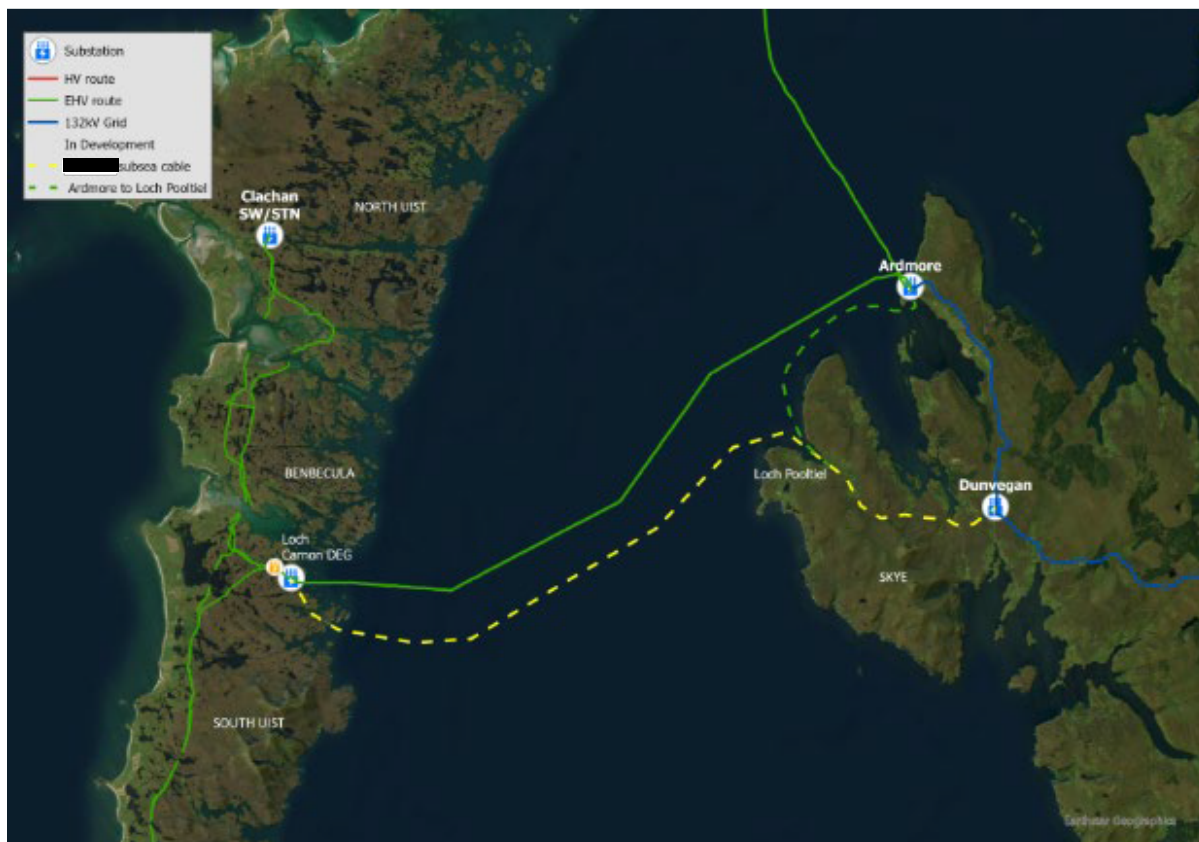


Figure 3: Augmented Outer Hebrides 2050 Whole System Proposal including Ardmore – Loch Pooltiel optimisation

More detail is included in Appendices 8A (particularly Sections 6 and 7) and 8B.

2.3.3. Key outputs

Table 9 details key expected outputs associated with our recommended interventions. No other changes to key outputs or forecast delivery for the other projects detailed in the January 2024 application have been identified at this stage.



Project element	Key outputs	Forecast delivery dates ¹
Skye – Uist – Harris	New 33kV subsea cable and 33kV overhead line Skye – Uist, and onshore substation upgrades - Dunvegan – Loch Carnan	Forecast delivery [redacted] ²
	New 33kV subsea cable and onshore substation upgrades – Ardmore-Loch Pooltiel	Forecast delivery [redacted]
	<i>New 33kV subsea cable Skye – Harris</i>	<i>Forecast delivery [redacted]</i>
	<i>New 33kV subsea cable and overhead line Harris – Uist</i>	<i>Forecast delivery [redacted]</i>

¹ Delivery dates are estimated, not wholly within our control and will be refined as projects are further developed.

² Delivery date subject to [redacted] e are in parallel progressing the Ardmore – Loch Pooltiel optimisation [redacted].

Table 9: Expected key outputs and years of delivery based on HOWSUM July 2024 updates

2.4. Cost update

Table 10 sets out the original and updated RIIO-ED2 costs for Skye – Uist including the Ardmore – Loch Pooltiel optimisation loop, [redacted] between Dunvegan and Loch Pooltiel, and the difference between the original estimate and the updated values. Table 13 sets out the updated Skye – Uist allowance adjustment in the context of the entire January and July 2024 HOWSUM applications. No changes to any other costs included in our January 2024 application have been identified at this stage.

Cost summary (£m, 2020/21)	2023/24	2024/25	2025/26	2026/27	2027/28	Total
<i>Skye – Uist – January 2024 estimate</i>	-	-		[redacted]	[redacted]	[redacted]
Core Skye – Uist – July 2024 update	-	-	[redacted]	[redacted]	[redacted]	[redacted]
- Ardmore – Loch Pooltiel optimisation	-	-	[redacted]	[redacted]		[redacted]
Total Skye-Uist costs			[redacted]	[redacted]	[redacted]	[redacted]



Cost summary (£m, 2020/21)	2023/24	2024/25	2025/26	2026/27	2027/28	Total
Total Skye-Uist adjustment	-	-	████████	████████	████████	████████
<i>Difference from January 2024 application</i>	-	-	████████	████████	████████	████████

Notes:

1 These are estimated costs provided prior to beginning our procurement process.

2 These are refined costs based on current tender returns, at ██████████ estimate stage, including development costs.

3 These values include development costs already funded through RIIO-ED2 HOWSUM Development Funding, and include a standard risk allowance.

4 These values *exclude* development costs already funded through RIIO-ED2 HOWSUM Development Funding, and include a standard risk allowance.

Table 10: Skye – Uist January 2024 and July 2024 cost comparison

2.4.1. Assumptions and data sources

Subsea cable cost data

In our January 2024 application for Skye – Uist, the cost estimate was based on a unit rate derived from the actual costs incurred in delivery of the PFE3 project noting that Skye – Uist is intended to utilise the same contracting model. Our July 2024 update applies costs confirmed by the market. A summary of key cost data utilised in our analysis is in Table 11. More detail on our cost assumptions is included in the accompanying EJPs and CBAs. The basis for wider cost assumptions (onshore overhead line, underground cable and substation works) remains per our January 2024 application.

Cost type	Cost assumptions	Justification
Skye – Uist options (subsea cables and associated works)	Tender returns, June 2024 (████████████████████)	We have applied tendered costs from the market. These are at ██████████, do not yet reflect ██████████. We will share pricing updates with Ofgem at a later date.

Table 11: Core cost assumptions - update



2.4.2. Key cost drivers

Subsea

As set out in our January 2024 application, the primary cost drivers for the Skye-Uist project, and all HOWSUM projects requiring submarine cables, are survey, supply, installation, and protection of the submarine cables. The supply of the submarine cable is driven primarily by the cost of materials, resources, manufacturing, and transport of the submarine cable from the manufacturing location to the work site.

The survey, installation and protection of the submarine cable will be driven primarily by the cost of vessels and the duration of time they are required to complete the works. Multiple vessels and equipment are required to complete the works. Surveying requires vessels and different equipment for geophysical and geotechnical surveys to map the seabed and inform environmental and ground conditions. Installation and protection of the submarine cables will require a Cable Lay Vessel, Trenching Vessel/Equipment, Support Vessels, and a Boulder Clearance Vessel. Different equipment will be required for each activity. Weather can have a significant impact on the duration of these vessels and contributes to the overall cost.

The level of cost anticipated to be incurred for cable protection will not be fully known until a completed cable route design is finalised, including on-bottom stability study (OBSS) and cable burial risk assessment (CBRA). Upon completion of the route design these protection costs will be more firm, however the length of time to protect will not be fully known until installation takes place and confirmation attained that cable burial has been able to achieve the target design depth. Further burial passes may be required in order to meet the target depth in all locations which could result in increased costs with more vessel days on site.

Onshore

Onshore substation works will likely incur the highest cost of all onshore elements. This is due to the potential requirement to construct new substation buildings to house the required equipment and with associated land purchase costs. As noted the onshore overhead line works [REDACTED] which could require some overhead sections being changed for underground cables, which could increase cost.

[REDACTED] Additional uncertainty around cost will remain until a detailed design is produced. The current costs are based upon current SHEPD internal unit rates and works will be subjected to a competitive tender to acquire competitive prices and actual market value.

2.5. Managing cost risk

The subsea cable manufacturing, construction and vessel markets are oversubscribed and the existing supply chain with the capability to do this work is small. [REDACTED]



[REDACTED]. These factors are discussed in the following sections.

2.5.1. Areas of ongoing uncertainty

There are a significant number of risks associated with procurement for and delivery of this project. These relate primarily to our responsibilities in managing security of supply for remote and island areas, which are unique to SHEPD among DNOs.

These risks are driven by key factors including i) location of the Scottish islands, presenting various logistical, accessibility, supply chain, marine/environmental/ecological, and uncertain weather challenges; [REDACTED]

Specific areas of uncertainty which are currently prominent in the process include the following:

- Procurement process and supply chain:

- [REDACTED]

- [REDACTED]

- [REDACTED]

- Delivery:

- [REDACTED]

- Weather risk
- Unexploded Ordnances (subsea) and subsea ground conditions

These uncertainties may have a significant impact on costs incurred by SHEPD.

Stage of procurement process

We referenced in our January 2024 application that the contracting structure for the Skye – Uist subsea cable replacement project is [REDACTED]

In order to progress the project, [REDACTED]



[REDACTED]. These activities are covered by HOWSUM development funding.

[REDACTED]

Given the significance of fair offshore weather for subsea activities, delays to the programme risk us not being able to complete all required works in a given summer, [REDACTED]. We have asked for a decision before the end of calendar year 2024 to allow us [REDACTED]

[REDACTED] we have already progressed works to maintain momentum of the project to facilitate the programme, covered primarily by HOWSUM development funding. We need to be confident in cost recovery for the full solution to support our engagement and [REDACTED], to progress through internal governance, and to allow us to commit to the next phase of the project.

Market response

[REDACTED]

- [REDACTED]

- [REDACTED]

- [REDACTED]

[REDACTED]

[REDACTED]



[Redacted]

2.5.2. Risk allowance

As noted in Section 2.3.2.1, we have included a standard risk allowance of £[redacted]m in our funding request based on a quantified assessment of delivery-related risks considered 'normal' at this stage of the process. This risk allowance, developed through a formal Quantitative Risk Analysis (QRA) process and model, [redacted]

[Redacted]

Individual risks and actions will be regularly reviewed and updated in accordance with the project progression. As risks occur, are mitigated, closed or new risks identified and assessed, the probabilities and impacts will be adjusted.

[Redacted]

2.5.3. Further mechanisms to manage cost risk

[Redacted]

[Redacted]

[Redacted]



[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Subsea market exposure is unique to SHEPD among DNOs as a consequence of our Distribution licence area spanning the Scottish islands. Our exposure is comparable in principle to that of Transmission licensees managing subsea developments, who have distinct regulatory application processes to support those projects. Reflecting on the expected further subsea interventions in RIIO-ED2 and RIIO-ED3, [REDACTED] we would like to continue engagement with Ofgem on how the regulatory application process for these kinds of projects could be optimised to provide greater certainty through the various phases of development, and to manage inherent cost risk.

We therefore seek Ofgem’s approval of both our standard risk allowance, [REDACTED]
[REDACTED] we will continue to engage
with Ofgem on this [REDACTED]
[REDACTED] with the intention that a defined
proposal is available to be shared in Ofgem’s consultation later in 2024.

2.6. Allowance adjustment

Table 12 sets out the allowance adjustment sought under this re-opener application.

¹ [Eastern Green Link 2 – Project Assessment \(ofgem.gov.uk\)](https://www.ofgem.gov.uk)



Adjustment summary (£m, 2020/21)	2023/24	2024/25	2025/26	2026/27	2027/28	Total
July 2024 application						
- Skye – Uist	-	-	██████	██████	██████	██████

Notes:

All values are net of development costs already funded through RIIO-ED2 HOWSUM Development Funding.

Table 12: HOWSUM July 2024 project cost and allowance adjustment summary

Table 13 sets out all of the allowance adjustments requested through our January and July 2024 applications.

Adjustment summary (£m, 2020/21)	2023/24	2024/25	2025/26	2026/27	2027/28	Total
January 2024 application						
- South Uist – Eriskay	-	-	-	██████		██████
- Eriskay – Barra	-	-	-	██████		██████
- Pentland Firth East 3	██████	-	-	-	-	██████
July 2024 application						
- Skye – Uist	-	-	██████	██████	██████	██████
Total adjustment, Jan and July 2024	██████	-	██████	██████	██████	██████

Notes:

¹ Subject to finalisation of procurement process and treatment of costs passed through by supply chain.

All values are net of development costs already funded through RIIO-ED2 HOWSUM Development Funding.

Table 13: Total HOWSUM January and July 2024 project cost and allowance adjustment summary



2.7. Looking ahead

This section sets out our expectations and requirements of the next stages of the procurement, delivery and regulatory workstreams in order to meet the required delivery dates of our recommended option.

2.7.1. Procurement, delivery and regulatory interactions

Project delivery programme

Under the submarine cable programme, we are currently surveying the proposed marine routes for Ardmore – Loch Pooltiel and Loch Pooltiel – Loch Carnan in 2024 and [REDACTED]

More information is included in Section 2.5, and more detailed procurement activities for the Skye – Uist project are set out in Appendix 3A Addendum and Appendix 8A.

Ofgem assessment and determination

Further to our engagement with Ofgem, we understand the next steps in the regulatory process to be:

1. Consultation on a minded-to position on SHEPD's January 2024 HOWSUM application, excluding the Skye – Uist elements, in August, and
2. Consultation on a minded-to position on the Skye - Uist elements in Autumn 2024, with the target of a decision by end 2024.

We have confirmed to Ofgem that we require a determination on allowances for Skye – Uist before the end of 2024 [REDACTED]

[REDACTED] and maintain the programme [REDACTED]
[REDACTED] We need to be confident in cost recovery for the full solution to support internal governance, [REDACTED]
[REDACTED]. The key activities and dependencies are summarised in Figure 4:

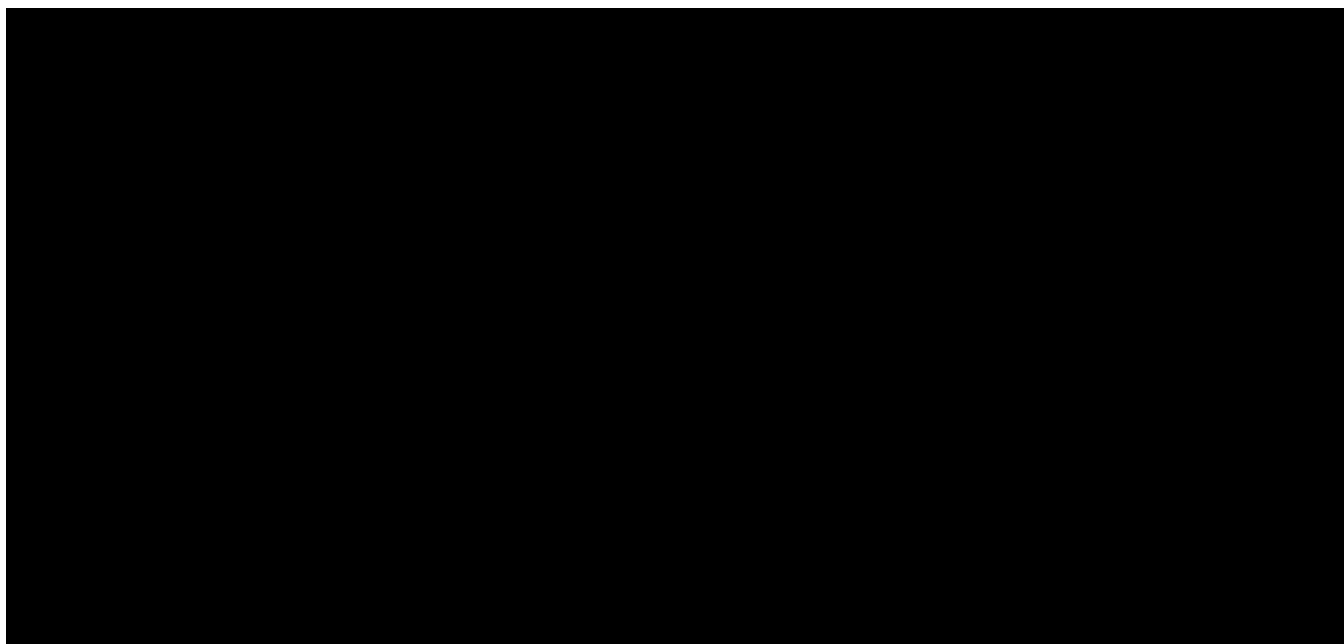


Figure 4: Skye – Uist delivery timeline

2.7.2. HOWSUM January 2025 application

We are developing our proposals for the January 2025 HOWSUM re-opener window across the Hebridean and Orkney island groups and are engaging with stakeholders from across the islands. This builds on our January 2024 application developing 'living strategic plans' of our future needs to Net Zero. Through this process we will understand the correct timing for known developments and ensure the most efficient deployment of the right long-term investment is proposed, which is why take a phased approach to implementation.

At this time, we anticipate our January 2025 application will be comprised of the following elements:

- **Orkney** - Orkney whole system solution to 2050, building on the SSEN Transmission AC link proposals and how best to support the security and export needs following the completion of the Pentland Firth East 3 circuit included within our January 2024 application.
- **Inner Hebrides** - A 2050 whole system solution for the Inner Hebridean island groups of:
 - Mainland – Islay – Jura – Colonsay to address improved security of supply to Islay and Jura, with options to reduce the reliance on Bowmore Power Station, and decarbonisation options, incorporating considerations of other renewable resources and technologies.
 - Mainland – Mull – Coll – Tiree by incorporating our planned investment in Coll – Tiree cable replacement with a wider whole system review to address options for reduction of reliance on Tiree Power Station through renewable, flexibility options or other energy storage.



- **Outer Hebrides and Skye** - Updated plans for our 2050 whole system solution for the Outer Hebrides (North Uist – Harris and Skye – Harris) building on our plans outlined in the January 2024 proposal and increasing the scope to consider the network needs on Skye.
- **For all island groups** - plans for changes to running of island stations (Distributed Embedded Generation, or DEG) to enable us to meet Science Based Target (SBT) carbon emissions, and relevant environmental regulations.

We are applying stakeholder insights from our 2023 and 2024 islands-focused engagement as we develop our proposals and are utilising our monthly engagement with Ofgem to share and gain feedback on our approach, methodology, needs cases and optioneering.



3. CONCLUSION

Further to our work to develop a market-derived view of costs for the Dunvegan – Loch Carnan project, and to more fully assess delivery optimisation options [REDACTED] to our recommended Dunvegan – Loch Pooltiel route, we have set out our proposals to enhance and improve this option by installing a new [REDACTED]

This option, with a RIIO-ED2 cost of £[REDACTED]m, and with the second-best NPV of all delivery optimisations considered - only £[REDACTED]m lower value than the best option over 55 years - will enable [REDACTED]. This will [REDACTED], implementing a robust security of supply solution for the Uists more quickly, avoiding reliance on diesel generation in the event of failure of the existing cable, and sized to meet all future scenarios contemplated under DFES. This configuration will also give us greater operational flexibility in the long-term and implements a first stage of our whole system 2050 plans for the Outer Hebrides.

The project elements are summarised in the map at Figure 5.

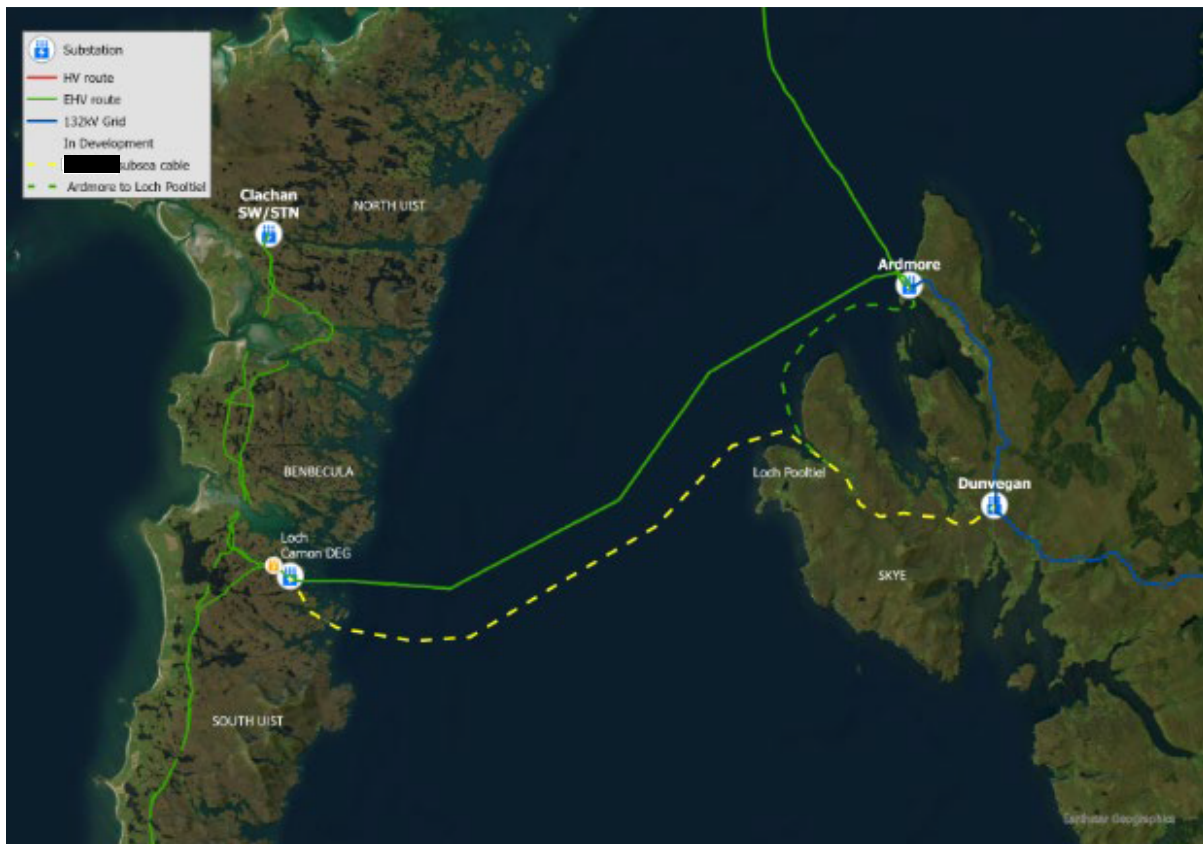


Figure 5: Augmented Outer Hebrides 2050 Whole System Proposal including Ardmore – Loch Pooltiel optimisation



Summary of funding request

Adjustment summary (£m, 2020/21)	2023/24	2024/25	2025/26	2026/27	2027/28	Total
July 2024 application						
- Skye – Uist	-	-	██████	██████	██████	██████

Notes:

All values are net of development costs already funded through RIIO-ED2 HOWSUM Development Funding.

Table 14: HOWSUM July 2024 project cost and allowance adjustment summary

Reflecting on the analysis set out in this application, our engagement with the market and with Ofgem, we request:

- for an adjustment to RIIO-ED2 allowances for Skye – Uist in ED2 of £██████m, as noted in Table 14;
- for a cost adjustment mechanism provided to enable us to manage ████████ cost uncertainty outside of our control ████████, which is unique to SHEPD among DNOs;
- to continue engagement with Ofgem on this project, ████████;
- for Ofgem to make determinations on our January and July 2024 HOWSUM applications, ████████, before the end of calendar year 2024, to enable us to ████████ our delivery programme for the Outer Hebrides.

Subsea market exposure is unique to SHEPD as a consequence of our Distribution licence area spanning the Scottish islands. Reflecting on the expected further subsea interventions in RIIO-ED2 and RIIO-ED3, and ████████, we would also like to continue engagement with Ofgem on how the regulatory application process for these kinds of projects could be optimised to provide greater certainty through the various phases of development, and to manage inherent cost risk.

We welcome Ofgem’s assessment and approval of our recommendations and look forward to continuing engagement on these projects.



APPENDIX 1 - RELATED DOCUMENTS

This July 2024 HOWSUM application should be reviewed in the context of the following documents:

Hebrides and Orkney Whole System UM January 2024 application

- **Hebrides and Orkney Whole System UM Core Narrative - January 2024**
- **Appendix 3A – Outer Hebrides 2050 Whole System Proposals EJP (Skye-Uist-Harris)**
- **Appendix 3B – Outer Hebrides 2050 Whole System Proposals CBA (Skye-Uist-Harris)**
- **Appendix 4A – Uist-Eriskay EJP**
- **Appendix 4B – Uist-Eriskay CBA**
- **Appendix 5A – Eriskay-Barra EJP**
- **Appendix 5B – Eriskay-Barra CBA**
- **Appendix 6A – Pentland Firth East 3 EJP - website corrected version**
- **Appendix 6B – Pentland Firth East 3 CBA LW**
- **Appendix 6C – Pentland Firth East 3 CBA CT**
- **Appendix 7 – Jacobs Phase 1 Optioneering Studies Report**

Ofgem Draft Determinations² including SSEN Annex

Ofgem Final Determinations³ including SSEN Annex

SSEN Business Plan⁴ including Islands Annex

SHEPD Special Licence Conditions⁵ specifically Special Condition 3.2, Part O

Application contact point

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² [RIIO-ED2 Draft Determinations | Ofgem](#)

³ [RIIO-ED2 Final Determinations | Ofgem](#)

⁴ [Home - SSEN Future](#)

⁵ [Decision on the proposed modifications to the RIIO-2 Electricity Distribution licences | Ofgem](#)



APPENDIX 2 – DEFINITIONS AND ABBREVIATIONS

Acronym	Definition	Acronym	Definition
AC	Alternating current	MVA	Mega Volt Ampere
ANM	Active Network Management	MW	Megawatt
CBA	Cost Benefit Analysis	NEC ECC 3	NEC3 Engineering and Construction Contract
CBRA	Cable burial risk assessment	NOx	Nitrogen oxides
Capex	Capital expenditure	NPV	Net Present Value
CCP	Climate Change Plan	OHL	Overhead line
CIS	Cable system, Installation and Service	OBSS	On Bottom Stability Study
CNAIM	Common Network Asset Indices Methodology (CNAIM)	Opex	Operating expenditure
CnES	Comhairle nan Eilean Siar	PFE	Pentland Firth East
CAR	Construction All Risks (CAR) insurance	PFE1	Pentland Firth East 1 cable
CT	Consumer Transformation	PFE2	Pentland Firth East 2 cable
DD	Ofgem RIIO-ED2 Draft Determinations	PFE3	Pentland Firth East 3 cable
DEG	Distributed Embedded Generation	PFW	Pentland Firth West cable
DFES	Distribution Future Energy Scenarios	PILC	Paper-Insulated Lead-Covered cable
DSO	Distribution System Operator	PLGR	Pre-Lay Grapple Run vessel service
DTS	Desk top study	PO	Purchase order
DWA	Double Galvanised Steel Wire Armour cable	PPM	Parts Per Million
EJP	Engineering Justification Paper	PSS Sincal	Simulation and analysis software for distribution and industrial planning



Acronym	Definition	Acronym	Definition
EPCI	Engineering, Procurement, Construction, and Installation contract	P2/8	Engineering Recommendation P2 Issue 8 2023
FD	Ofgem RIIO-ED2 Final Determinations	RTS	Radio Teleswitch System (RTS)
GB	Great Britain	RFI	Request For Information
GSP	Grid Supply Point	RIIO ED	Electricity distribution price control period (currently ED2 - 2023-2028)
HDD	Horizontal Directional Drilling	RIPEET	Responsible research and Innovation Policy Experimentations for Energy Transition
HI	Health Index	SBT	Science Based Target
HOWSUM	Hebrides and Orkney Whole System Uncertainty Mechanism	SCR	Selective Catalytic Reduction
HV	High Voltage	SEPA	Scottish Environment Protection Agency
HVDC	High Voltage Direct Current	SEPD	Southern Electric Power Distribution
ITT	Invitation To Tender	SGN	Scotia Gas Networks
KPS	Kirkwall Power Station	SHEPD	Scottish Hydro Electric Power Distribution
kV	Kilovolts	SSE	Scottish and Southern Energy
LCD	Large Capital Delivery	SSEN-D	Distribution company of Scottish and Southern Electricity Networks
LCPC	Large Capital Project Committee	SSEN-T	Transmission company of Scottish and Southern Electricity Networks
LCP	Large Capital Project	Sw/STN	Switching Station
LMA	Load Managed Area	SWA	Steel Wire Armoured cable
LW	Leading the Way DFES scenario	U/G	Underground
MCPD	Medium Combustion Plant Directive	UM	Uncertainty Mechanism
MPV	Multi-Purpose Vessel	XLPE	Cross-Linked Polyethylene Cable



EXTERNAL APPENDICES

APPENDIX 3A – OUTER HEBRIDES 2050 WHOLE SYSTEM PROPOSALS EJP (SKYE – UIST – HARRIS)
ADDENDUM

APPENDIX 3B – OUTER HEBRIDES 2050 WHOLE SYSTEM PROPOSALS CBA (SKYE – UIST – HARRIS)
ADDENDUM

APPENDIX 8A – OUTER HEBRIDES 2050 WHOLE SYSTEM PROPOSALS EJP (ARDMORE – LOCH
POOLTIEL OPTIMISATION)

APPENDIX 8B – OUTER HEBRIDES 2050 WHOLE SYSTEM PROPOSALS CBA (ARDMORE – LOCH
POOLTIEL OPTIMISATION)





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