Scottish & Southern Electricity Networks

RIIO ED2 Engineering Justification Paper (EJP)

Pentland Firth West (2) – Asset Replacement

Investment Reference No: 329_SHEPD_SUBSEA_PFW

Contents

Definitions and Abbreviations

Acronym	Definition
EJP	Engineering Justification Paper
CBA	Cost Benefit Analysis
CBRM	Condition Based Risk Management
ESA	Electricity Supply Area
EV	Electric Vehicle
FES	Future Energy Scenarios
GIS	Geographic Information System
GW	Gigawatt
kW(h)	kilowatt (hour)
MW	Megawatt
OHL	Overhead Line
PV	Photovoltaics
BSP	Bulk Supply Point
GSP	Grid Supply Point
LRE	Load Related Expenditure
LCT	Low Carbon Technology
SHEPD	Scottish Hydro Electric Power Distribution
UGC	Underground Cable

1 Executive Summary

This Engineering Justification Paper (EJP) for Scottish Hydro Electric Power Distribution (SHEPD) covers the investment required to manage the performance of the Pentland Firth West 33kV subsea cable which provides one of the main interconnections between mainland Scotland at Thurso and the Orkney Isles, in conjunction with the Pentland Firth East cable.

A number of subsea cable circuits have failed during RIIO-ED1, causing significant impact on customer interruptions, constrained generation, and have resulted in impact costs for temporary generation and CO2 emissions. There has been a review of the approach taken to attempt to identify and pre-empt the impact of subsea cable failure by using a 'monetised risk-based approach' alongside a traditional CBRM approach, which was not viewed as identifying the critical circuits for the strategic programme effectively on its own.

Delivering a safe, resilient and responsive network

Following optioneering and detailed analysis, as set out in this paper, the proposed scope of works are:

- Augment the exisiting Pentland Firth West 33kV subsea cable by laying a new 33kV submarine cable between Mainland Scotland and Hoy
- Retain the exisiting 33kV Pentland Firth West subsea cable to create an augmented solution and give a dual subsea connection to Hoy.
- Tie in the new submarine cable to the exisiting 33kV network.

The estimated cost to deliver the preferred solution is £[redacted]. The delivery programme for all subsea cables in ED2 will be determined through detailed planning and engagement with marine installation contractors and cable procurement opportunities. For simplicity, where required, the delivery year is assumed as 2027/28 in this EJP and this will be refined as our programme develops.

This scheme delivers the following outputs and benefits:

- Improves reliability and reduces the potential for customer interruptions due to a subsea cable fault.
- Reduces the risk of constrained generation impact.
- Reduces the monetised risk on the Pentland Firth West cable, forecast to be £6,148,294 by the end of ED2 with no intervention, to £1,548,343.
- Three subsea connections would be present between the mainland and Hoy, this will maintain current supply and generation levels should a single cable fail.
- This solution offers optionality for future investment once the go/no go decision is made on the Orkney Transmission connection. Currently assumed to be determined in December 2022 following CfD.

All subsea cable EJPs should be read in conjunction with the ***Scottish Islands (Annex 8.1)*** of our RIIO-ED2 Business Plan.

2 Investment Summary Table

Table 1 below provides a high level summary of the key information relevant to this Engineering Justification Paper (EJP).

Table 1: Investment Summary

Name of Programme	Pentland Firth West (2) Asset Replacement		
Primary Investment Driver	The Primary Investment Driver described within this EJP is to reduce the overall monetised risk associated with the loss of the existing subsea cable.		
Investment reference/mechanism or category	Cost Benefit Analysis reference: 329_SHEPD_SUBSEA_PFW		
Output reference/type	As above		
Cost (£m)	£[redacted]		
Delivery year	ED2 (2027/28)		
Reporting Table	CV25: High Value Project		
Outputs included within RIIO ED1 Business Plan	No		
CV25 High Value Project	Asset Category	ED2 (£m)	Total (£m)
	33kV Subsea Cable	[redacted]	[redacted]

3 Introduction

This Engineering Justification Paper (EJP) for Scottish Hydro Electric Power Distribution (SHEPD) covers the investment required to manage the performance of the Pentland Firth West 33kV subsea cable which provides one of the main interconnections between the Scottish mainland at Thurso and the Orkney Isles.

The Primary Investment Driver described within this EJP is based on reducing the overall monetised risk associated with this circuit which has been determined from the "Strategic Subsea Cable CBA Model" developed to determine the overall replacement / augmentaiton strategy for all subsea cables by mitigating the monetised risk associated with the subsea cable assets. The model evaluates the probabilty of failure, the cost of intervention and the impact cost and used this assesment across the asset population to determine the initial investment method to be considered. Further detail on the Strategic Subsea Cable CBA Model is provided in the ***Scottish Islands (Annex 8.1).***

Section 4 provides high-level background information for this subsea asset category and explains the importance of this asset for our electricity distribution network and our network customers, and the motivation for ensuring our subsea cables are in good health over the course of RIIO-ED2 and beyond.

Sections 5 and 6 provide a summary of the corresponding intervention options which can be deployed as a solution to these condition related investment drivers.

Section 7 provides a detailed analysis then describes the cost and volumes arising from the preferred intervention options as supported by the Cost Benefit Analysis (CBA) results which complements this EJP.

Section 8 provides an overview of the deliverability and risk management considerations being adopted for the transition from RIIO-ED1 in to RIIO-ED2, and the delivery of subsea cable asset replacement projects.

Section 9 provides an overview of the information presented throughout the EJP and concludes a proposed solution recommended to manage the business case presented.

4 Background Information and Analysis

4.1 How Do We Determine Our Intervention Priorities

We introduced our Condition Based Risk Management (CBRM) system in 2014 following the RIIO-ED1 Business Plan submission. However, since August 2017, we switched over fully to maximise utilisation of the Common Network Assets Indices Methodology (CNAIM) modelling for all asset classifications applicable for the RIIO-ED1 requirements with the data inputs outlined in the Information Gathering Plan (IGP).

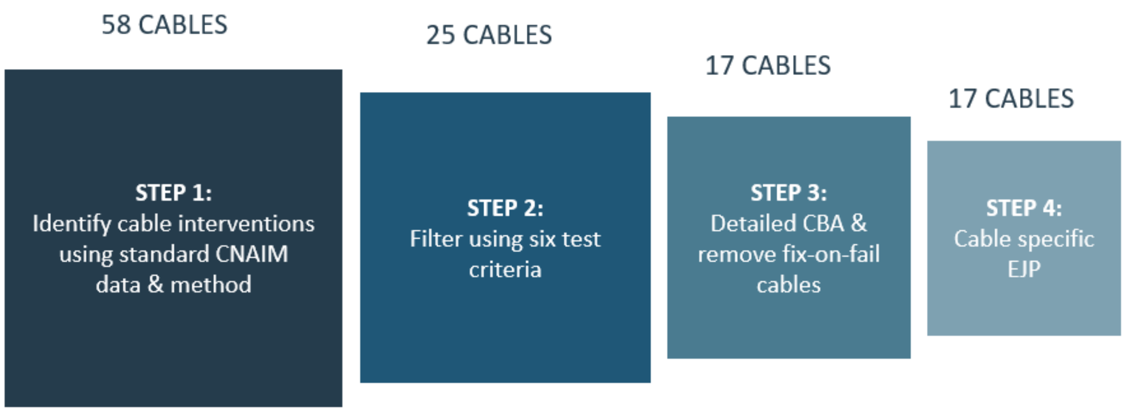
The RIIO-ED2 Business Plan submission has been based on the latest version of the industry standard CNAIM v2.1 which was approved for use in RIIO-ED2 by Ofgem in April 2021. The supporting data used in the modelling of this submission is based on the reported position of our asset condition for RIIO-ED1 Year 6 at the end of August 2021.

The full details of the Energy Network Association's NARMs Electricity Distribution Working Group (NEDWG) publication on CNAIM v2.1 is available on Ofgem's website. For further detail on our RIIO-ED2 NARMS strategy please see ***Safe and Resilient (Annex 7.1).***

Our proposed investment programme in ED2 is asset data led; refined and iterated by overlaying the industry standard risk management methodology with enhanced risk modelling and cable specific cost benefit analysis. We are proposing planned replacement of cables where the certainty of need is highest driven by high probability and impact of failure in ED2.

We have adopted a four-step funnel approach, as shown below, to determine the interventions required on the network. This approach allows us to filter from an initial examination of the complete list of subsea cables we operate to a credible and deliverable list of interventions which are supported by robust analysis. Steps 1 to 3 are set out in detail within our ***Scottish Islands (Annex 8.1).***

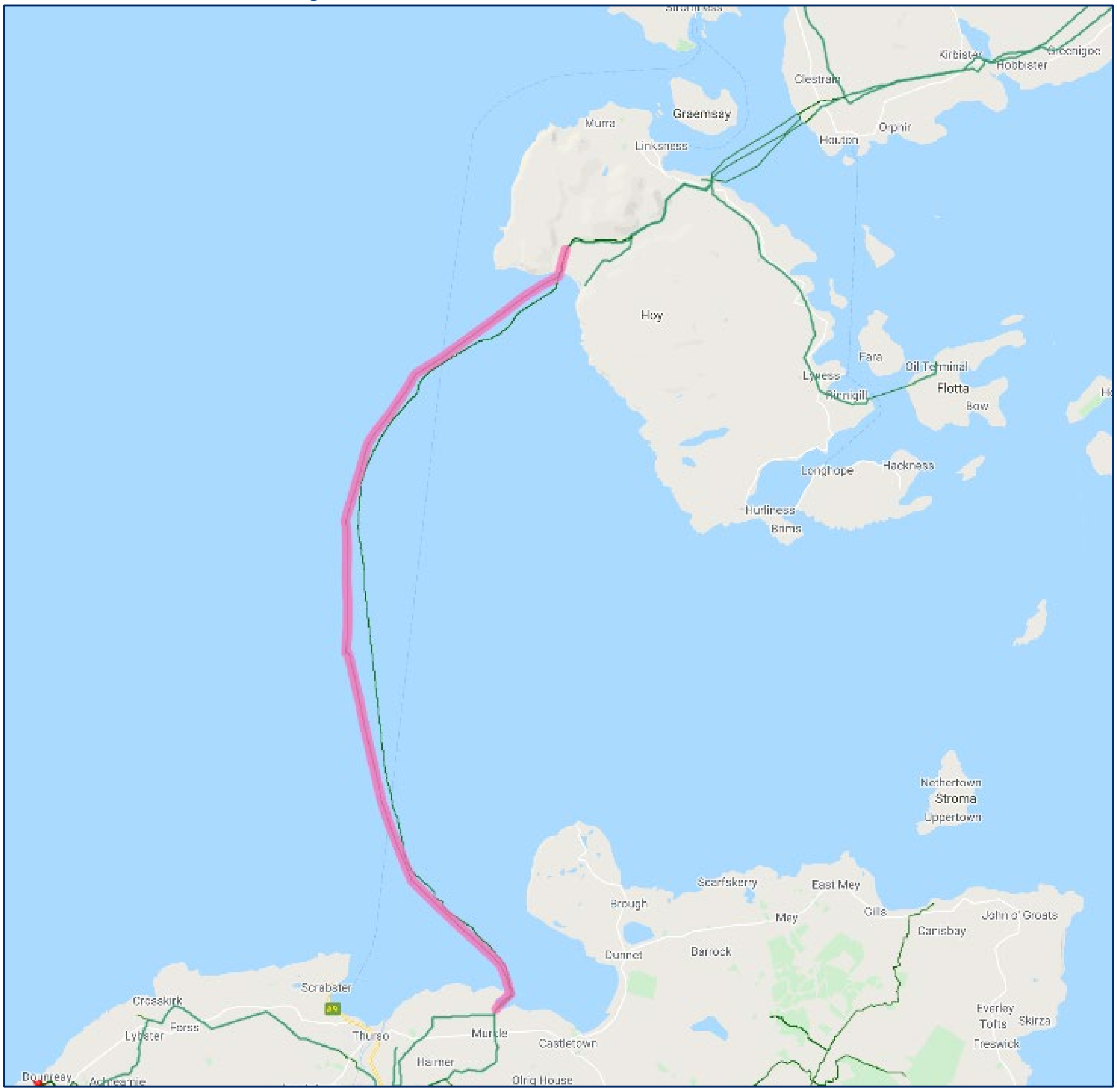
This EJP covers Step 4 for the Pentland Firth West cable which has qualified as requiring intervention. We set out here our approach to clearly justify why the circuit design approach is being proposed and associated costs are the most economic and efficient and what work would be required to deliver on these investments.



4.2 Demand and Generation Forecast for Orkney

The Pentland Firth West subsea cable is a 35.8 km 300 mm² EPR 33 kV cable from Thurso on the mainland of Scotland to Rackwick on the island of Hoy, as shown in Figure 1 below.

Figure 1 – Pentland Firth West Subsea Cable Route



The Pentland Firth West subsea cable is one of two cables that run from the mainland to the island group of Orkney. This is the only export route between the group of islands and the mainland. There is approximately 65MW of generation that would be constrained in the event of this cable faulting. The generation would be constrained off until a repair was completed, with the potential to reconfigure the Orkney ANM scheme to possibly allow some generation to export. This would be dealt with on a case by case basis and subject to detailed systems studies. As the cable is in excess of 35km, replacement would take time, as the emergency procurement of the asset – which is captured in the 'do minimal' option and securing access to an appropriate cable installation vessel will be difficult at short notice.

Currently there are speculative applications for generation connections on Orkney and the surrounding area. None of the connection applications are confirmed. Additional generation connections would increase the potential for energy exports from the Orkney isles to the mainland via this, and the Pentland Firth East cable, and there may be an advantage to installing a larger cable to accommodate exports. The potential for increased energy export that would warrant a larger cable has not been investigated at this stage as there are numerous network studies and scenarios to consider. The potential for additonal generaiton exports will be fully investigated in the next stage of review.

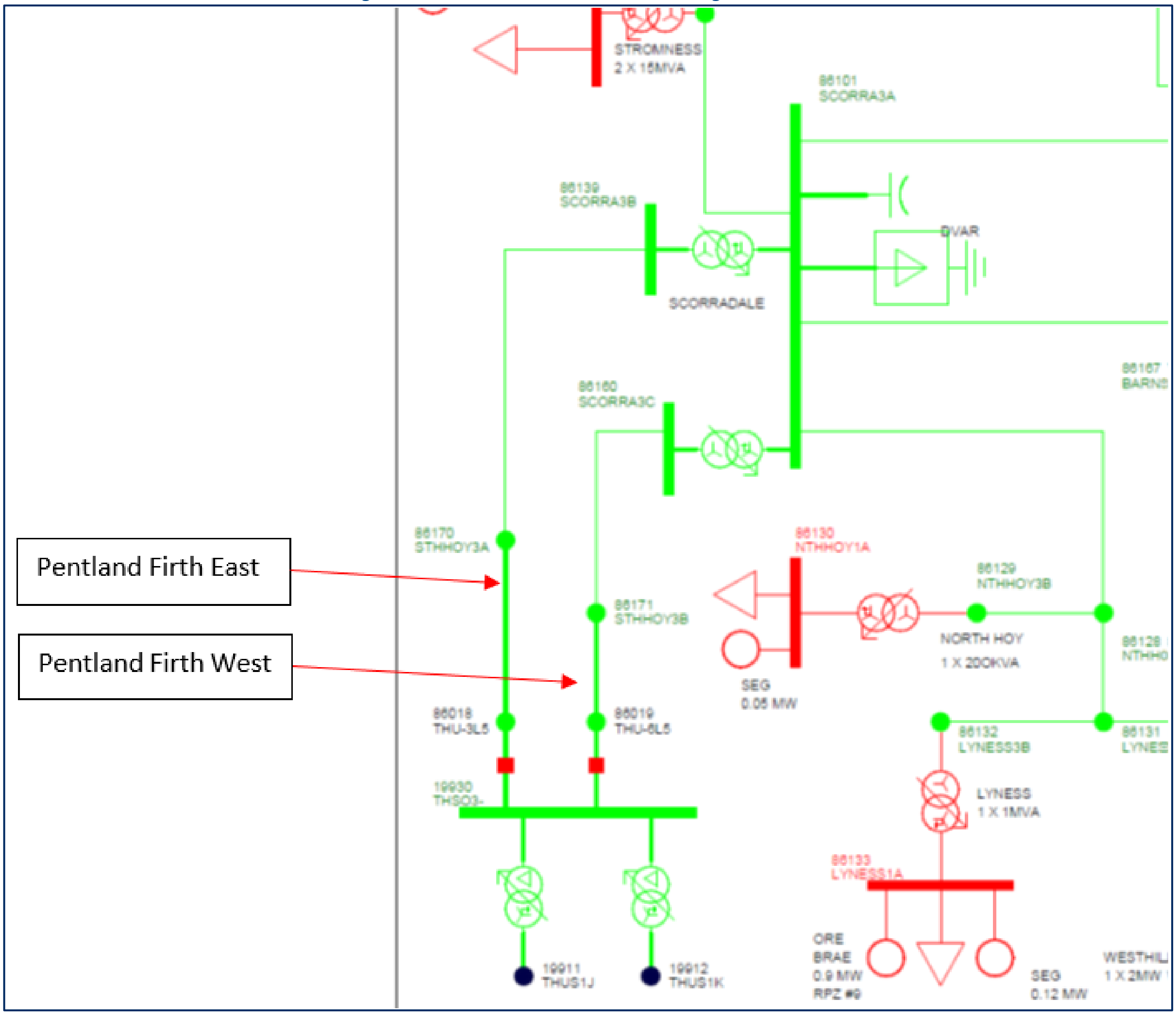
The capacity of the two exisiting circuits, plus the power station on Orkney, is sufficient to provide P2 demand security complaince. In the event of a fault on either the Pentland Firth East or Pentland Firth West circuits demand security can be maintained via a single cable, with Kirkwall Power Station (KPS) used to peak lop in periods of high demand. Therefore, n-1 demand capacity and quality of supply is not a factor in the need for replacement. The current circuit load is 52% of peak rating, and is expected to grow at 3.1% per annum over ED2. However, with the standby generation on the island, the load can be supported. It should also be noted that exporting generation may need to be constrained, or off until a repair or replacement is made, but this is dependent on the demand at the time of the fault.

Should a fault occur, there is then significant risk to customer supplies sitting on a single subsea cable supplying over 13,000 customers. Export capacity is also then limited to the capacity of a single cable. Should that second cable fail, all customers would be require to be supported via diesel generation for a prolonged period at extreme expense.

4.3 Existing Network Arrangement

The existing 33kV network configuration is shown in Figure 2 below.

Figure 2: Pentland Firth Network Arrangement SLD.



4.4 Existing Asset Condition

The existing Pentland Firth West subsea cable has been in service for 23 years and its Heath Index is currently HI2, predicted to increase to HI3 during ED2. The Probability of Failure – from the CNAIM model – is currently 0.204 at the start of ED2 but predicted to rise to 0.635 at the end of ED2.

The circuit's rate of deterioration is increasing due to its age and location and, when combined with the volume of generation that will need to be constrained, and the expected time to replace or repair the cable in the event of the fault, this presents a high risk to the customers and the business.

5 Options Considered

This section of the report sets out the investment options that have been considered to address the high monetised risk associated with this cable system. The approach taken has been to ensure investment options demonstrate best value for money for network customers.

5.1 Summary of Options

The table below provides a high-level summary of the six (6) investment options under consideration along with the advantages and disadvantages associated with each. A more detailed description of each option is then provided within the following sub-sections.

Table 2 - Summary of Options

Option	Description	Advantages	Disadvantages	Results
1. Do minimum	Repair or Replace on failure	Low initial cost High exposure to generation loss should the cable fault	Orkney generation export will be limited until the repair / replacement is completed. Increased cost & associated availability risk in cable and installation vessels due to emergency conditions. Demand security will be at risk on a single cable.	Rejected
2. Replace the existing cable with same size	Same route and same size cable, taking the existing cable out of service	Planned replacement reduces cost, also reduces supplier risk as the cable is over 35 km.	Early replacement of an asset that is 23 years old. Maintains significant risk on a single cable in the event of a fault.	Rejected
3. Replace the existing cable with a larger cable	Same route but larger size cable. Decommission existing cable	Least regret in the scenario of demand increase	Demand forecast does not warrant a larger cable	Rejected
4. Augment – same size	Installation of an additional cable along similar route, same size cable, keep existing cable energised or in service until it fails, no	Keeping the old cable in service allows for additional security (over and above P2). Will maintain 2 cable supply to Orkney should a single cable fault	Possible increase in generation exports would warrant a larger cable, currently no forecast	Recommended option

Option	Description	Advantages	Disadvantages	Results
	replacement after	over the Pentland Firth. Will allow the continued output of usual Generation should a single cable fault.		
5. Augment – larger cable	Installation of an additional cable along similar route, larger size cable, keep existing cable energised or in service until it fails, no replacement after	Keeping the old cable in service allows for additional security (over and above P2). Will maintain 2 cable supply to Orkney should a single cable fault over the Pentland Firth. Will allow the continued output of usual Generation should a single cable fault.	Larger cable not needed as the demand is not expected to increase significantly to require additional capacity	Rejected
6 – Install two cables at the same time	Install two cables in a planned approach at the same time	Provides full N-1 security and removes the impact of a failure for a single circuit increasing reliability. Improvement in security and reliability, but does not provide significant benefits	Additional cost without additional requirements. Replacing a cable which possible has a number of years of life left.	Rejected

6 Analysis and Cost

The following details of each option are described below.

6.1 Option 1: Do-Minimum

No action will be taken under this scenario until a fault occurs, at that point a repair will be made, or a replacement will commence based on the fault. For any subsea cable failure there will be a requirement to carry out a feasibility assessment of the failure and the outcome will be dependent on the location, subsea environment and the nature of the failure. Any fault on this cable would cause disruption to generation export as well as raising potential issues with demand supply, requiring back up generations from KPS as well as the likely siting of additional standby generation as mitigation against a second fault on the other Pentland Firth East cable. Coupled with the expected time to mobilise and install a new cable (i.e. over 35.5km) it is expected that the risk is very high to customer supplies and generation exports.

In the event of a cable failure no customer demand supplies would be permanently interrupted as Kirkwall Power Station would be brought on-line to secure the demand. Significant amounts of distributed generation could be constrained down or constrained off for the duration of the repair as export will be limited to a single cable. The generic model has assumed this will be for a period of six months to allow the mobilisation resources to replace the cable, in practice this will be significantly longer. The impact of lost generation costs during the outage is estimated at £9,680 k.

The emergency replacement [redacted] km of subsea cable following a similar route to the existing cable as shown in Figure 1 above has been estimated and is based on a planned replacement cost uplifted by [redacted] %, to reflect the premium which is paid when dealing with a replacement in an emergency situation. The total cost for fault replacement is estimated at £[redacted].

This option avoids any initial cost and, depending on how long the cable lasts, may defer expenditure beyond ED2. However, the cost of an emergency replacement would be higher than a planned replacement if the cable fails and it incurs the impact and environmental cost. The NPV over 45 years for this option is £56,690k

This option was rejected, as it would incur constrained generation cost and reputational damage. In addition, the replacement in an emergency would increase planned replacement costs by [redacted] %.

6.2 Option 2: Replace with same size cable

This option assumes that the existing 23-year old cable would be decommissioned as soon as the new cable is installed. It is further assumed that the landing point and existing network infrastructure would be replaced, that is, there would be no extension to the existing substations or sealing ends, rather they would be replaced with modern equivalent assets.

The planned replacement [redacted] km of subsea cable following a similar route to the existing cable as shown in Figure 1 above has an estimated cost of [redacted].

The Probability of Failure of the existing cable is currently 0.204 and will increase to 0.635 in 2028 without intervention. This will be reduced to 0.16 at the end of ED2 with a replacement. This drives the NPV calculation, which in this case is £75,680k.

The demand on Hoy and Orkney is not expected to increase significantly above the current capacity of the existing cables through ED2, therefore the replacement of the cable would be most economic with the similar sized cable. However, this option does not have the best NPV and is rejected on this basis.

6.3 Option 3: Replace with a larger cable

This option is similar to option 2, laying a new subsea cable rather than the like for like replacement in option 2. This cable has a higher initial cost than option 2 however, it would cater for additional potential growth.

The cost of this option is estimated at £[redacted].

As in Option 2, the reduction in Probability of Failure and availability of the original circuit drives the NPV calculation which in the case is £74,470k.

The demand is not expected to grow significantly to warrant a larger cable therefore, this option was rejected.

6.4 Option 4: Augmentation with same sized cable

This option is similar to option 2, laying a similar sized cable, following a similar route, but retaining the existing cable until it becomes faulty. This would incur additional costs for connection into the 33kV network on Hoy and Caithness.

This would provide enhanced security of supply with two circuits until the existing cable became faulty, at which time the supply would revert to a single circuit as in option 2. In total this option would give three cables crossing the Pentland Firth to Hoy until the original Pentland Firth West cable fails.

The cost of this option is estimated at £[redacted].

The reduction in Probability of Failure, reduced impact costs and availability of the original circuit drives the NPV calculation which in the case is £77,370k.

This is the most favourable option as the existing asset has residual life, albeit it may be short. But taking advantage of that residual life means that there is increased security of supply for the duration of dual operation. This gives three circuits crossing the Pentland firth supporting the Orkney Isles.

This option offers security for customers whilst offering optionality for future investment dependant on the outcome of a possible SHE Transmission subsea link to Orkney. Additionally, in the event of a subsea fault, KPS would not be required to maintain supplies to customers on Orkney therefore significantly reducing our reliance on diesel embedded generation. The importance of a resilient network for distributed embedded generation was emphasised multiple times during our ED2 stakeholder engagement, this is specifically referenced with the ***Scottish Islands (Annex 8.1).***

6.5 Option 5: Augmentation with larger cable

This option is similar to option 4 but utilising a modern equivalent value. The exact size will be determined at the detailed design stage. This would cater for any potential growth, however on existing growth levels this would not be necessary at this time.

This like option 4, provides N-2 security, against a subsea fault, until the failure of the existing cable.

The cost of this option is estimated at £[redacted] in 2024.

As in Option 4, the reduction in Probability of Failure, reduced impact costs and availability of the original circuit drives the NPV calculation which in this case is £76,170k.

This option would allow for larger demand or generation growth. The demand forecasts do not identify a need for additional capacity; therefore, this option was rejected.

6.6 Option 6: Installation of two new cables on the existing route

This was considered due to the improvement in reliability and security of supply provided by two new cables, which would ensure that in the event of a subsea cable fault demand would be maintained and generation exports could also be protected. This option would also avoid impact costs and constraint costs. The laying of the two cables together under the same contract is expected to allow cost saving of 10% on the second cable compared to the first. This has been costed on 300 mm² cables and would provide firm N-1 capacity against a subsea fault across the Pentland Firth.

The cost of this option is estimated at £[redacted].

As with other options, the reduction in probability of failure by replacing the existing subsea cable drives the NPV calculation, which in this case is £82,780k.

This option was rejected as the higher cost does not provide any additional benefits to justify the investment and the existing cable is believed to have residual life.

7 Summary of Cost Benefit Analysis (CBA)

This section of the report provides an overview for each option from the Cost Benefit Analysis (CBA). A detailed exercise has been undertaken to support the investment strategy that is described within this EJP for the six options, as described below:

7.1 Summary of Cost

Our RIIO-ED2 Business Plan costs are derived from our outturn RIIO-ED1 expenditure. For our Subsea cable projects, our Unit Costs have been derived from analysing costs pertaining to delivered projects completed during RIIO-ED1 and are therefore based on actual costs. For cable installation activities the delivered projects were competitively tendered utilising our Subsea Cable Installation Framework and cable costs have been benchmarked against recently completed tender events. By tying our costs back to reported, outturn, real life data this approach provides multiple data points and provides a high level of cost confidence in our Business Plan cost forecast for RIIO-ED2.

As our Business Plan has developed, project scopes and costs have been refined, especially with the input of valuable stakeholder feedback on our draft proposals. This final Business Plan submission cost forecast contains that refinement, and the changes are captured within our supporting plan documentation. The generic Unit Cost rates used in the draft Business Plan have now been revised following extensive analysis. This is further defined within ***Scottish Islands (Annex 8.1).***

A summary of the costs for each option is given in the table below.

Table 3 - Summary of Costs

Options	Unit	2023/ 24	2024/ 25	2025/ 26	2026/ 27	2027/ 28	Total
Option 1 – Do Minimum	£m					[redacted]	[redacted]
Option 2 – Replace same size	£m					[redacted]	[redacted]
Option 3 – Replace larger cable	£m					[redacted]	[redacted]
Option 4 – Augment same size	£m					[redacted]	[redacted]
Option 5 – Augment larger cable	£m					[redacted]	[redacted]
Option 6 – two cables	£m					[redacted]	[redacted]

7.2 Cost Benefit Analysis Comparisons

Although there is little difference between options 2 to 5 on NPV over 45 years of the options considered in the CBA, Option 4 has been selected as it provides the least cost and best NPV of all options, excluding option 6. Option 6 has not been selected, as although it provides the highest NPV, this option can be implemented at a later phase if required following failure of the existing cable, allowing deferred expenditure and will increase the NPV of that option.

Table 4 - Summary of NPV

Options	NPV After 45 Years (£k)
Option 1 – Do Minimum	56.69

Option 2 – Replace same size	75.68
Option 3 – Replace larger cable	74.47
Option 4 – Augment same size	77.37
Option 5 – Augment larger cable	76.17
Option 6 – Reinforcement with two cables	82.78

7.3 Volume on Preferred Option

The preferred option requires a new cable to be laid along the similar cable route and connected into the current 33 kV network.

Table 5 – Volume for Preferred Option

Asset Category	Unit	2024	2025	2026	2027	2028	Total
33 kV Subsea cable	km	0	0	0	0	[redacted]	[redacted]
33 kV switchgear	No.	0	0	0	0	[redacted]	[redacted]
33kV Switch (PM)	No.	0	0	0	0	[redacted]	[redacted]
DOEF's	No.	0	0	0	0	[redacted]	[redacted]
33kV Pole	No.	0	0	0	0	[redacted]	[redacted]
33kV OHL Conductor	km	0	0	0	0	[redacted]	[redacted]
33kV UG Cable (Non Pressurised)	km	0	0	0	0	[redacted]	[redacted]
33kV RMU	No.	0	0	0	0	[redacted]	[redacted]

8 Deliverability & Risk

Our ***Deliverability Strategy (Annex 16.1)*** describes our approach to evidencing the deliverability of our overall plan as a package, and its individual components. Testing of our EJPs has prioritised assessment of efficiency and capacity, and this has ensured that we can demonstrate a credible plan to move from SSEN's RIIO-ED1 performance to our target RIIO-ED2 efficiency.

We have also demonstrated that SSEN's in house and contractor options can, or will through investment or managed change, provide the capacity and skills at the right time, in the right locations. This assessment has been part of the regular assessment of our EJPs, IDPs and BPDTs. For the investment proposed under our subsea cable related EJPs, we have been developing our RIIO-ED2 Commercial & Deliverability Strategy and engaging with our supply chain to ensure we can deliver the solutions proposed, while identifying and managing the risks presented by the complex and challenging nature of the projects.

Our deliverability testing has identified major strategic opportunities which is relevant to all subsea EJPs.

- In RIIO-ED2, SSEN will change the way Capital Expenditure is delivered, maximising synergies within the network to minimise disruptions for our customers. This is particularly relevant for a Price Control period where volumes of work are increasing across all work types.
- The principle is to develop and deliver programmes of work, manage risk and complexity at programme level and to develop strategic relationships with our suppliers and partners to enable efficiency realisation. This potentially includes refining our contracting strategies to improve our risk profiles.
- Transparency with the supplier in terms of constraints, challenges, outage planning and engineering standards will capitalise on efficiencies, supported by a robust contracting strategy.

The delivery programme for all subsea cables in RIIO-ED2 will be determined through detailed planning and engagement with marine installation contractors and cable procurement opportunities. In addition, early stakeholder engagement will significantly de-risk project schedules and deliver value.

We are already identifying opportunities for improved efficiency and improved risk management of our projects and associated programmes. As part of the planning for our final Business Plan submission, we have explored subsea cable project 'bundling' by cable type and geographic location. Our delivery year for each EJP is based on this initial assessment, which will be further explored and then refined with our supply chain in early 2022 to identify the optimal equilibrium of project deliverability and risk management.

9 Conclusion

The purpose of this Engineering Justification Paper (EJP) has been to provide the investment justification and option selection for the 33 kV Pentland Firth West subsea cable.

Due to the number of subsea cable faults in RIIO-ED1, including the Pentland Firth East Cable, the approach taken for EIIO-ED2 has been to pre-empt failures where possible. The creation of the monetised risk CBA model allows for the circuits which are likely to have the biggest impact, should a failure occur, to be addressed. This approach considers the subsea population within the generic CBA model to help identify the appropriate circuits to be replaced.

This EJP is to cover the Pentland Firth West subsea cable which is the ranked 3rd in terms of monetised risk. The monetised risk value for the Pentland Firth West 33 kV subsea cable is £1,978,319 at the start of ED2 and, without intervention, will increase to £6,148,294 at the end of RIIO-ED2. With the intevention proposed in this EJP the value will reduce to £0, whilst three cables are in service aross the Pentland Firth.

- Option 1: Do Minimum – replace on failure.
- Option 2: Replacement with a similar sized cable.
- Option 3: Replacement with a larger sized cable.
- Option 4: Augment with similar sized cable.
- Option 5: Augment with larger sized cable.
- Option 6: Two new cables existing route

Option 4, Augment with a similar sized cable, has been selected as the preferred solution. This option will retain the existing cable until failure. By taking advantage of the residual life of the existing cable, there is an increase in security of supply which gives additional benefits to the network for the duration of dual operation.

The cost of £26.15m will be incurred in RIIO-ED2 in relation to this proposal. The delivery programme for all subsea cables in RIIO-ED2 will be determined through detailed planning and engagement with marine installation contractors and cable procurement opportunities.

CV25 High Value Project	Asset Category	ED2 (£m)
CV25 RIIO ED2 Spend	EHV Subsea Cable	[redacted]
CV25 RIIO ED2 Spend	33kV Switch (PM)	[redacted]
CV25 RIIO ED2 Spend	DOEF's	[redacted]
CV25 RIIO ED2 Spend	33kV Pole	[redacted]
CV25 RIIO ED2 Spend	33kV OHL Conductor	[redacted]
CV25 RIIO ED2 Spend	33kV UG Cable (Non Pressurised)	[redacted]
CV25 RIIO ED2 Spend	33kV RMU	[redacted]