

EXECUTIVE COUNCIL

PUBLIC

Title: Sand Bay Phase 3 and Mare Harbour Phase 2 Joint Renewable Energy Project

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Responsible Director: Director of Public Works

Report Author: Power Station Manager

Portfolio Holder: MLA Peter Biggs

Reason for paper: This paper is submitted to Executive Council:
For policy decision (including budgetary policy)

Publication: Redaction of the financial information and estimated costs
Yes, with redactions as highlighted

Reason for Redactions:

Under Executive Council Standing Order 23(2), Executive Council must have regard to the categories of exempt information in Schedule 3 to the Committees (Public Access) Ordinance when determining if information should be withheld

The categories which are potentially relevant to this paper are:

Paragraph 10: Information about relevant contracts and negotiations

Previous papers: Sand Bay Wind Farm Phase 3 168/23
Mare Harbour Wind Farm Phase 2 21/24

List of Documents: Annex 01- Payment Schedule and Quotation for Mare Harbour from Enercon
Annex 02 – Price adjustment mechanism from Enercon
Annex 03 - Quotation from ABB
Annex 04 - Presentation by ABB delivered to MLAs November 2023
Annex 05 - High level project plan
Annex 06 – Project Governance arrangements
Annex 07 – Letter of agreement with the MOD

1. Recommendations

Honourable Members are recommended to:

- (a) Approve the Sand Bay Phase 3 and Mare Harbour Phase 2 Joint Renewable Energy Project in full as set out in this report, utilising an engineering led approach as approved in principle in ExCO 168/23 and 21/24.
- (b) Allocate the full capital funding for Sand Bay Phase 3 and Mare Harbour Phase 2 Renewables Joint Project, acknowledging that the UK Ministry of Defence (MOD) will reimburse FIG for the full costs of the Mare Harbour Phase 2 element of this joint project.
- (c) Grant dispensation from Financial Instructions to allow the single-source procurement with Asea Brown Boveri (ABB) for the Battery Energy Storage System (BESS) and Innoven for the Power Management System for Sand Bay Phase 3, in addition to that already granted for Enercon in ExCo 168/23 and 21/24.
- (d) Authorise the Chief Executive to conclude a contract with ABB in relation to the purchase and installation of the BESS for Sand Bay Phase 3. According the quote and payment schedule attached in annex 2.
- (e) Authorise the issuing of tender documents for the Sand Bay Wind Farm Phase 3 and Mare Harbour Phase 2 wind turbine enabling works, including access roads. And for Sand Bay Phase 3 enabling works for the high voltage link and data upgrade, BESS building and all the associated enabling works with completing this joint project.
- (f) Authorise the Chief Executive to conclude all other contracts for enabling and power management works in relation to the execution of this joint project.

2. Additional Budgetary Implications

	2023/24	2024/25	Total Project
Capital Budget - Sand Bay Phase 3	REDACTED	REDACTED	REDACTED
Capital Budget – Mare Harbour Phase 2	REDACTED	REDACTED	REDACTED

- 2.1 ExCo 168/23 and 21/24 agreed initial capital expenditure of REDACTED and REDACTED respectively. The figures above are in addition. The project initiation costs and deposits at project launch for Enercon and ABB are incurred in the current capital budget year. The remaining payments and costs due are incurred in the FY 2024/25 capital budget year.
- 2.2 The costs for Mare Harbour Phase 2 are to be reimbursed by the MOD as per the Letter of Agreement.

3. Executive Summary

- 3.1 In November 2023, ExCo was presented an engineering-led approach for Phase 3 of the Say Bay Wind Farm (ExCo 168/23). This approach was approved in principle. As part of this decision, ExCo also approved funding for a non-refundable deposit for three E70 Enercon wind turbines and dispensation to allow sole-source procurement from Enercon. Contracts with Enercon have now been signed, which include a break clause after the payment of deposits.
- 3.2 Because Enercon are due to cease production of the E70 in 2024, the payment of a deposit and dispensation for sole source procurement allowed time for further development of the project plan prior to final approval of the project and avoided the need to redesign the engineering-led solution based on alternative turbines. The project plan is now developed, with more cost certainty on the wind turbines and the battery units which are the two major cost elements, though these elements are quoted and the contracts allow for variation in certain conditions e.g. steel price changes.
- 3.3 Following discussions on the Falkland Islands Energy Strategy in December 2023, the British Forces South Atlantic Islands (BFSAI) and the Falkland Islands Government (FIG) identified the opportunity to undertake a joint renewable energy project encompassing the planned Sand Bay Phase 3 and Mare Harbour Phase 2. In January 2024, ExCo was presented a proposal for this joint project in which FIG would procure an additional four E70 Enercon wind turbines for installation at Mare Harbour (ExCo 21/24). This joint project was approved in principle. At this time, ExCo also approved funding for a non-refundable deposit for the four additional wind turbines and dispensation to allow sole-source procurement from Enercon alongside the turbines for Sand Bay Phase 3. It was acknowledged that FIG's role is in enabling and project delivery, all costs associated with phase 2 Mare Harbour will be met by the MoD.
- 3.4 The joint renewable energy project has the objectives of:
- Increasing the annual renewable contribution to over 50% for Stanley, including periods with 100% renewable energy provision until the mid-2040s.
 - Providing wind turbine capacity at Mare Harbour to achieve a renewable contribution of at least 50% at the Mount Pleasant Complex, though the MOD estimate this will reach 64%.
 - Achieving significant savings for FIG and the MOD over the life of the new turbines through reduced reliance on diesel-powered generation.
 - Achieving significant CO2 emission reductions over the life of the new turbines through reduced reliance on diesel-powered generation.
 - Delivering operational resilience for power demands at our two main population centres.
 - Delivering energy security for power demand.
 - Providing a platform for potential expansion into Sand Bay Phase 4 in the future.

These goals are consistent with both FIG's and BFSAI's strategic objectives with respect to the environment.

3.5 This paper explains the history of the project as well as the engineering, strategic and financial cases for proceeding with the full joint project as designed.

4. Background [and Links to Islands Plan and Directorate Business Plan/s]

4.1 The wind farm at Sand Bay has been a multi phased project:

- Phase 1 (completed August 2007): Three x 335 kW Enercon wind turbines
- Phase 2 (completed February 2010): Three x 335 kW Enercon wind turbines.

These turbines will be at end of life in 2027 and 2030 respectively.

4.2 Mare Harbour Phase 1 was completed in December 2014 and included three 335 kW Enercon wind turbines. This was intended to be a multiphase project when initiated. These turbines will be at end of life in 2034. These Turbines only contribute less than 10% of BFSAI energy usage.

4.3 Together the two sites have generated 100,000,000 kWh of energy. This means that for an equivalent of 6 of last 16 years of energy generation in Stanley has been net zero.

4.4 Public Consultation on the Falkland Islands Energy Strategy concluded in February 2024 and the feedback is currently being analysed. The Strategy includes a draft Energy Road Map that was initially produced in late 2022.

4.5 After internal discussions on the draft Energy Road Map in February 2023, the Chief Executive requested that the Power Station Manager revisit his proposal for Sand Bay Phase 3.

4.6 It is FIG's Power and Electrical team's assessment that only Enercon wind turbines offer the opportunity for close control of the power output allowing high wind power penetration and resilience for our small, isolated power network. Given that the originally suggested and ideally sized E44 WEC was no longer available, Phase 3 required redesign. The Chief Executive requested for an updated engineering led solution that considers the context and constraints of delivering the project successfully in the Falkland Islands.

4.7 As Enercon are due to cease production of the E70 in 2024, the payment of a deposit and dispensation for sole source procurement agreed in ExCo 168/23 allowed time for further development of the project prior to final approval of the project and avoiding the need to redesign the engineering-led solution based on alternative turbines. The full project plan is now developed, with more cost certainty on the wind turbines and the battery units which are the two major cost elements.

4.8 Following discussions regarding the Falkland Islands Energy Strategy, BFSAI and FIG identified the opportunity to undertake a joint renewable energy project encompassing Sand Bay Phase 3 and Mare Harbour Phase 2.

4.9 As part of this joint project, the Falkland Islands Government intend to procure, deliver, install and commission both the Sand Bay and Mare Harbour sites, including

all ancillary electrical equipment for Mare Harbour up to an agreed demarcation point. The deposit and dispensation for sole source procurement agreed in ExCo 21/24 allowed for procurement of the additional turbines alongside those for Sand Bay Phase 3. The advantage to this approach is an accelerated delivery time schedule for BFSAI and efficiency for both FIG and BFSAI in scaling two projects concurrently, including savings in shared project costs, design and project management.

5. The Engineering Case for the Project

- 5.1 The Power Station Manager has developed a solution for Sand Bay Phase 3 that is expected to work over the long term whilst delivering value for money. The proposed solution has been informed by the Power Station Manager's 25 years of experience of working in wind energy in the Falkland Islands and delivery of three significant successful wind turbine projects over that period. There are other successful renewable energy solutions in use here in the South Atlantic and on islands in the Caribbean, Atlantic and North Atlantic Ocean, that are based on the original designs by the FIG Power Station Manager. A detailed engineering case for the project, including the suitability of the Enercon E70 wind turbines was presented in ExCo 168/23.
- 5.2 Both Enercon GmbH and ABB visited the Islands in October and November 2023 to workshop the project with the Power Station Manager to ensure we get the right solution for the Falkland Islands, maximising its value to the Falkland Islands Government.
- 5.3 Analysis of power generation of Sand Bay Phase 1 and Phase 2 and data modelling for Phase 3 demonstrates that current renewable energy utilisation is at 38%. Phase 3 is expected to deliver up to 81% utilisation and penetration (the amount of available wind captured by the turbines) will rise from 21% to up to 86% (please see slides 12 – 15 in annex 3).
- 5.4 A copy of the original engineering design for Phase 3 has been operating for over a year on the Faroes Islands, implemented by Enercon. Data for the month of October 2023 in the Faroes shows renewables contributing 84% of all power and included two weeks at 100% renewable. This work undertaken elsewhere, helps validate our design and concepts.
- 5.5 Stanley and MPC renewables have been an engineering success. Basing projects on solid engineering principles and design has resulted in significant environmental and financial gains, as well as political benefits.
- 5.6 The MoD recommended solution for Mare Harbour Phase 2 involves procurement of four Enercon E70 wind turbines, each with a 2.3MW capacity, capable of generating up to 18.2GWh of usable energy annually. The MOD have calculated this represents up to 64% of BFSAI's yearly energy needs, potentially saving 4.8 million litres of diesel and £4.2 million annually. Reducing emissions by 17.7 kt CO₂e annually, significantly contributing to sustainability and energy independence goals.
- 5.7 FIG are working with Enercon to deliver four WEC's for Mount Pleasant. Our work will be limited to all works required to install the four E70 WEC's. Access roads, crane working platforms, WEC foundations and high voltage cabling. Two interconnections for

integration by others will be formed at 11kV. A hub for the fibre optic cables for remote control will be installed.

- 5.8 Supporting Sand Bay Phase 3 ensures continuation of wind power at Sand Bay well into the 2040s. Further, we estimate that Sand Bay Phase 3 will deliver over 50% of Stanley's energy needs if the preferred option is chosen, making the contribution of renewable power to Stanley power in excess of 50% until the mid-2040s.
- 5.9 Delivering Sand Bay Phase 3 has a further time imperative based on the end of life of Phase 1 (2027) and Phase 2 (2030) and the availability and manufacture of the E70 turbines. While remedial repairs beyond these dates may be possible, planning to go beyond the end of life dates comes with significant risk to the Falkland Islands' power generation, finances and reputation.
- 5.10 Sand Bay Phase 3 essentially targets the periods of calm and storm. These are around 1500 and 500 hours respectively and together sum to one quarter of the year when little or no wind power is produced. Replacing those zero hours with stored renewable energy.

6. The Strategic Case for the Project

- 6.1 BFAI and FIG recognise that significant opportunities exist to generate mutual benefit by working closely together across a full spectrum of sectors. Following direction from UK StratCom in 2017, a co-funded Joint Programme Officer (JPO) was appointed to drive forward a programme of collaboration with the aim of both organisations benefiting from economies of scale, exploiting synergies and increasing efficiency. Sustainability and renewable energy projects are key for collaboration and meets both organisations' aims and requirements. In addition to the FIG Project Governance processes this project will have an additional layer of assurance through the Joint Programme Officer (JPO) and Joint Programme Board (JPB) which gives support at the senior levels in both organisations. This has already been tested and proven successful with the Joint Housing and Waste Projects.
- 6.2 The joint Sand Bay Phase 3 and Mare Harbour Phase 2 renewable Energy project has the objectives of:
- Increasing the annual renewable contribution to over 50% for Stanley, including periods with 100% renewable energy provision until the mid-2040s.
 - Providing wind convertor capacity at Mare Harbour to achieve a renewable contribution of at least 50% at the Mount Pleasant Complex, though the MOD estimate this will reach 68%.
 - Achieving significant savings for FIG and the MOD over the life of the new turbines through reduced reliance on diesel-powered generation. Gross savings estimated by both organisations are **REDACTED** per annum respectively.
 - Achieving significant CO2 emission reductions over the life of the new turbines through reduced reliance on diesel-powered generation.

- Delivering operational resilience for power demands at our two main population centres.
 - Providing a platform for potential expansion into Sand Bay Phase 4 in the future.
- 6.3 Both FIG and the MOD benefit from this joint venture through efficiency in scale, transportation costs, project management and delivery, design and technical evaluation, commercial process and compliance and resources. This process offers an agile delivery mechanism that saves time and cost whilst ensuring technical compliance. This is a time bound opportunity. The FIG has proven success in delivering 3 wind farms, including the existing one at Mare Harbour supplying the BfSAI MPC estate
- 6.4 This Project directly supports implementation of the Falkland Islands Environment Strategy, including the goals and objectives outlined in the draft Energy Strategy and Pollution Prevention and Control Policy. It further supports the MODs transition programme towards a Net-Zero emissions by 2050 as outlined in the "Net Zero Strategy: Build Back Greener, and aligns with the MOD and UK Government's Net Zero targets. This project has committed support from the MOD StratCom.

7.0 The Case for Sole Source Procurement

- 7.1 In redesigning Sand Bay Phase 3, it can be seen that securing Enercon WEC technology is critical to the future success of the project.
- 7.2 As described in ExCo 168/23, the Enercon WEC E70 is a Wind Class 1 turbine and the only one at this power rating (2-2.3MW) that will survive our wind conditions. The Enercon site assessment has made lengthy comment about our conditions.
- 7.3 The basic electrical design of any type of ENERCON WEC is identical. The rotor is directly connected, that means without intermediate gearbox, to the multi-pole, electrically excited annular generator. The electrical power produced by the generator is fed via a full-scale power converter into the electric network. The converter system itself consists of a rectifier, a DC link and several inverters.
- 7.4 This is the major advantage of the annular generator. In electrical terms, it is completely decoupled from the grid. This enables a high level of rotor speed variability and, in turn allows for a more mechanically robust design with fewer moving parts. In addition to this the electrical properties of ENERCON WECs are solely determined by the inverters used and the corresponding FACTS- (Flexible AC Transmission System) controller. This is perfect for our small Island grid and weather conditions.
- 7.5 Storing renewable energy which is otherwise allowed to blow on by, has been a target for the Power & Electrical Team from the beginning. The cable for Phase 3 storage was laid in February 2010 and drawings show this connection dating back to September 2008. Pursuit of the correct BESS has been a long-term exercise. A battery storage conference was attended in Washington DC in May 2009.

- 7.6 The sodium/sulphur (NaS) battery by the Japanese company NGK (best known for manufacturing motorcycle spark plugs) was identified as the preferred option in comparison to all who presented. Enercon purchased a 2 MWh unit and conducted successful trials in Germany during 2010. Following the tsunami of 2011, NGK wrote to us expressing that all their focus had understandably reverted back to their homeland. Since then we have had to change the design of Sand Bay phase three, requiring a rethink on the storage solution too.
- 7.7 A fresh search began in February 2023. It was easy to eliminate most suppliers as many do not offer the operating modes needed. Conversations were had with a couple of companies including Tesla and Siemens, though Siemens stopped their engagement early in the conversation.
- 7.8 ABB initially did not respond to our requests. This is common, as the Falkland Islands is too small a customer to be noticed by many big international companies. Where those companies do take notice, they may be put off by the difficulty of working in a remote location or are not interested in taking the time to understand the challenges faced. For companies who have the option to do business anywhere in the world, the benefits of working here often do not justify the investment of time and effort required. Something we have found time and again in recent years in international tenders.
- 7.9 In our application, we are not trying to move the battery from one place to another as in an electric vehicle. For this reason, the weight relative to power is not critical. While it is true that there are regularly advances in battery technology, these are typically related to increased power to weight ratios (in other words, batteries are becoming lighter). These advances are positive for use in a vehicle for obvious reasons. However, the weight of the battery is of little or no consequence to this project. The ABB eStorage Flex is a compact and walk-in, fully integrated, pre-engineered, state of the art, energy storage system designed to maximize the return on investment with an industrialized solution that reduces installation time and complexity as well as transportation costs. The solution is optimized for functionality featuring digital intelligence that improves solution performance and operating costs, these features and the way these units interplay with the inverter make it a very good solution for our needs. The inverter ABB use is the ECPPOWER CAB1000 unit.
- 7.10 The CAB1000 scalable platform was specifically developed to offer a straightforward and simple solution to developers of utility-grade energy storage systems. In 1 MW blocks, the CAB1000 platform offers a single modular system which is tailored to utility systems of all sizes. The scalable power conversion system also boasts high-performance controls and system redundancy. This unit offers multiple modes of elegant output control including crucially the Grid Forming and Grid Following modes. Grid Following essentially means an inverter that has an output that is a current source and depending on the load angle, it can absorb or generate active (kW) or reactive (kVAr) power. The Enercon inverter in the E33 or E70 can be considered a Grid Following inverter. If the main source of power is lost, the inverter shuts down immediately down as it has lost its reference voltage and reference frequency.
- 7.11 Grid Forming mode is essential for a stand-alone, island operation. The unit forms its own power frequency and voltage. The ABB BESS acts and performs like a conventional generator. The CAB1000 unit has advantages compared to other batteries that are highly

technical, however what may seem like minor differences in technology can mean the difference between success and failure. Grid Forming means an inverter that produces its own voltage and frequency. Can operate independently or with other sources. Can “Black start” systems and will support the network during transient events. Grid Forming inverters are essential to integrating renewables onto power systems as they assist with reliability and stability. The inverter provided by ABB by epc power can even totally mimic the characteristics of our diesel fuelled generator sets.

7.12 The remaining modes including Voltage Source Inverter and Current Source Inverter that would be useful modes depending on the final choices for Sand Bay Phase 4. This means that the ABB units and inverter would enable us to be future proofed for when we can execute Sand Bay Phase 4.

7.13 The assessment of the Power Station Manager is that the ABB BESS is not only the best storage option for us, it’s the most price competitive too. The below are given for benchmarking purposes.

Manufacturer	Rating MW	Cost	Remarks
ABB	10 MWh	REDACTED	Grid modes-Elegant Solutions
Tesla	10 MWh	REDACTED	Grid modes-Elegant Solutions
Siemens	10 MWh	REDACTED	Unclear-unresponsive

7.14 For the BESS it is the Power Station Manager’s firm belief that ABB give us the best solution whilst providing good value for money. Other systems have been researched including Tesla’s grid forming and grid following modes which has an equivalent Battery Energy Storage System and costs REDACTED. As Siemens have not responded to our requests for information, we have not been able to establish if they provide what we might need.

7.15 Since reporting in November, the originally quoted price of REDACTED for the ABB solution has been negotiated down to REDACTED as the project has been further defined.

7.16 Innoven are a German company wholly owned by ex-Enercon key decision makers. They were instrumental in deciding to deliver Sand Bay Wind Farm Phase 1. The control idea was in-house but the means of achieving it was developed by them. Our Power Management System (PMS) is based on windows XP and is being held together and has failed several times this year. Enercon today do not have the special projects team to deliver this type of solution. It can be seen that we could arrive at elegant ABB and Enercon Systems but they need to communicate with each other. ABB has recently indicated a reluctance to have project creep into this area. Innoven will provide this. The Innoven element of the project is relatively small from a cost point of view, with the estimate for this work being between REDACTED in total. However, their contribution to the overall solution will be critical.

7.17 It has become clear that the timelines for the manufacture and delivery of the wind turbines are such that a full competitive tendering process for the battery storage solution is not possible in the time available.

8.0 The Financial Case for the Project

8.1 Sand Bay Phase 3 now has an estimated cost of **REDACTED**. A breakdown of estimated and quoted project costs is as follows. Mare Harbour phase 2 has an estimated cost of **REDACTED**

Project Element	Sand Bay Cost £million	Mare Harbour Cost £million	
Wind Turbines and assembly	REDACTED	REDACTED	More Cost Certain** (quoted)
Craneage	REDACTED	REDACTED	Estimate*
Battery Units (Brno)	REDACTED	REDACTED	More Cost Certain** (quoted)
Buildings	REDACTED	REDACTED	Estimate
MV Cable Link	REDACTED	REDACTED	Estimate
Shipping and Transportation	REDACTED	REDACTED	Estimate and includes 5% management costs
Others (including civils, rental plant and equipment, power management project management)	REDACTED	REDACTED	Estimate
Contingency	REDACTED	REDACTED	15%
Total	REDACTED	REDACTED	

*Total estimated craneage costs of **REDACTED** has been subdivided between seven turbines

**Quoted in the contracts but subject to variation provisions e.g. steel prices

8.2 The quotes and estimates from Enercon for the turbines, assembly, craneage and shipping have been given in the contract in Euros. In the table above we have simply converted on a one for one basis with the UK£. At the exchange rate on the 1st March this would represent a saving on the joint project of **REDACTED** for Mare Harbour and **REDACTED** for Sand Bay.

8.3 The third WEC at Sand Bay will only really come into its own in future years as Phase 4 comes online or during the down time of another E70.

8.4 The recent events permeating from the Gaza conflict disrupting shipping routes using the Red and Black seas and drought at the Panama Canal have significantly increased the estimates for shipping.

- 8.5 Analysing our current fuel use in the power station and then, through workshopping, modelling our future use with phase 3, gives the following results.

REDACTED

- 8.6 While the capital investment seems high, as can be seen, it is forecasted that after the costs of Phase 3, a further **REDACTED** is saved over the life of the turbines, equivalent to a net benefit of almost **REDACTED** each year. This increases to **REDACTED** if one third of the new loads in the table above go ahead. The MOD have calculated the estimated diesel savings, at **REDACTED** per year with a value return of investment of 4 years.
- 8.7 The project will save fuel and additional benefit in engine hours and maintenance costs at the MPC and Stanley Power Stations until the new power stations come on line at both sites. Reduced engine hours will increase the life-span of the power stations giving a diesel contingency and resilience solution.
- 8.8 Stanley will continue to need a robust and reliable conventional source of power. The main station is nearly 20 years past its replacement date. It continues to be unreliable and both mechanically and electrically dangerous. Supporting Phase 3 does not relieve FIG any of the requirement for a new conventional power station. This requirement is long past being urgent.

9.0 Financial Instructions

- 9.1 Under FIG Financial Instructions (FI 42), a major project is one with a cost in excess of £1million. No work is to begin on any procurement without policy approval from Executive Council. This report seeks that approval.

- 9.2 If Financial Instructions are not to be followed, a dispensation will be required, normally from the Financial Secretary (FI 43). In order to waive Financial Instructions, the Financial Secretary would ordinarily need to be satisfied that:

43.2.1 The subject matter of the contract is urgently required and loss, injury or damage would be entailed by delay; or

43.2.2 The subject matter of the contract is so specialised that there would be no advantage in inviting competitive tenders; or

43.2.3 There is no effective competition for the subject matter of the contract because payment is fixed under statutory authority or because the subject matter is a patented or proprietary article or is available from only one source; or

43.2.4 There is a clear benefit to be gained from maintaining continuity with a supplier from an earlier project. However, in such cases there must be a full written explanation from the Accounting Officer to demonstrate that the benefits of such continuity must outweigh any potential financial advantage to be gained by competitive tendering.

9.3 In this case, Executive Council is asked to agree that Financial Instructions will not be followed for the reasons explained in this report, why a single-source battery solution procurement is essential.

9.4 Financial Instructions also provide that all contracts must be in writing in a form approved by the Attorney General.

11.0 Options and Reasons for Recommending Relevant Option

11.1 Option 1 (Recommended Option) - Approval of all recommendations.

Sand Bay Wind Farm has been a major success, delivering over 30% of Stanley's energy requirements. The Phase 3 design is no longer a concept as it has been validated and used elsewhere.

There is clear evidence that the ABB BESS is a very good and price competitive battery storage option for Sand Bay. Our design requires a BESS that includes the functionality offered by ABB, which is also the lowest cost of the battery storage options considered.

Securing the re-engagement of Enercon is very significant as Enercon lost a lot of confidence in FIG after previous projects were not taken forward. Approving these recommendations ensures the wind farm continues successfully into the 2040s with major and satisfying milestones along the way.

11.2 Option 2 (Not Recommended)– Seek an external agency to produce a project design against a brief and specification (the brief and specification would also need to be commissioned from an external party and paid for). Tender that design through a full open procurement process. Appoint an external contractor(s) to deliver the project. This option will push the project into the future, potentially by 18 to 36 months. It would mean we miss the opportunity to purchase the E70 wind turbine and there is no evidence the resulting specification could offer any improvement or be more cost efficient over the existing proposal developed by the Power Station Manager based on significant local experience and consultation with manufacturers. Further, this option would result in additional upfront costs and would result in the loss of good will from Enercon and ABB.

11.3 Option 3 (Not Recommended) - Do nothing. Not acting means we miss the opportunity and the wind farm closes in February 2030 when Phase 1 and Phase 2 reach their end of life.

12.0 Consultation

12.1 The Power Station Manager has consulted with Enercon, Innoven and ABB, Siemens and Tesla. Communication has included with the FIG Environment Department and various teams within PWD. Some MLAs have been briefed at Gilbert House and four MLAs have been given a full Phase 3 concept presentation at the Power Station including the outline idea for Phase 4. Five MLAs and the Chief Executive received a presentation from ABB (attached at annex 3). 7 MLAs and the Chief Executive received a presentation from Enercon Gmhb in November 2023. From August 2023 MOD BFAI and DIO have been engaged in the consultation process. ExCo reports in Dec 2023 and

Jan 2024 gave in principle support to this joint project and agreed for the deposits to be paid to Enercon.

12.0 Resource Implications

12.1 Financial Implications

- 12.1.1 The full costs of this joint project is **REDACTED** of this will be reimbursed by the MOD.
- 12.1.2 The Project funding mechanism between FIG and MOD is still to be refined but will likely be a number of stage payments broadly aligned to the FIG/Enercon contracted milestone payment plan. Linking MOD payments to FIG contracted deliveries provides a governance and assurance framework against which MOD can make payments. The MOD have committed in writing to ensuring all elements of the BFSAI strand of the project are met by the MOD
- 12.1.3 The MOD's own estimates are that this project will save BFSAI **REDACTED** in diesel costs each year. FIG estimate its own gross savings to be **REDACTED** savings in diesel each year, rising as the power loads are increased over time.
- 12.1.4 The financial due diligence done in relation to the suppliers show that Enercon UK filed a loss of £12.7M in 2021 and have yet to file for 2022 and a parent company guarantee has been agreed.

12.2 Human Resource Implications

- 12.2.1 If approved, a full-time officer would be needed to project manage implementation of Phase 3. It is expected this can be delivered through a contract for services. Project administration will be delivered from the Secretariat.
- 12.2.2 If completed, Mare Harbour and Sand Bay expansions will mean for a period there will be 16 wind turbines generating electricity and all needing repairs and maintenance. 12 of which, will place this duty on the currently under-resourced Power & Electrical Section, further consideration should be given to options for staffing prior to the completion of this joint project. This assessment has not yet been carried out. The MOD BFSAI will seek clarification on the enduring technical support and maintenance required.

12.3 Other Resource Implications

- 12.3.1 The Power Station Manager has local private sector companies interested in bidding for tenders related to this exciting project. If the full project is approved, the WEC are due to arrive in March 2025. The project requires access roads and network connections in place 3 months ahead of delivery.

13.0 Legal and Legislative Implications

- 13.1 The Falkland Islands Government will be entering into contracts with each of the suppliers. The project team need to ensure that they understand the commitments on each party. Strong project and contract management will be required to minimise the legal risks arising from the contracts – it will be particularly important to ensure that contracts and delivery are aligned between the entirely separate contracts.

14.0 Equalities and Human Rights Implications

- 14.1 None

15.0 Environmental & Sustainability Implications

- 15.1 Supporting these recommendations brings our political will and vision into alignment with our financial means and our engineering innovation to bear on tackling our part of a global problem. The approval in full of this joint project is consistent with the Islands Plan and Environment Strategy commitments to advance renewable energy to firmly boldly transition away from fossil fuels. It is expected that this joint project will result in a significant reduction in CO₂ as well as pollutants generated by combustion of fossil fuels which can negatively impact on human health and the environment. If Sand Bay Phase 3 is not undertaken, it will result in the eventual return to full diesel sourced power generation in 2030 when Phase 1 and Phase 2 reach their end of life.

16.0 Camp Implications

- 16.1 None

17.0 Significant Risks

- 17.1 The risks of not proceeding are given throughout this report. Total loss of renewables for Stanley from 2030 with no viable alternative on the horizon.
- 17.2 Geopolitical tension and supply chain shock events are seeing an exponential rise in shipping costs, reflected in the estimated costs included in this report.
- 17.3 The need to co-ordinate the two main contracts and the contracts and delivery of the enabling works and the links between the MoD and FIG separate contracts (some prices within which are dependent on both being delivered using common resources in direct sequence and/or in parallel).
- 17.4 Competing with other projects for resources during an intense period for the FIG capital programme.
- 17.5 Buying the WECs in their “last” production run could be considered a risk, particularly bearing in mind, even with spares and repairs available our inability to get a large enough crane to the Islands to repair the existing broken Mare Harbour turbine.

18.0 Publicity

18.1 Following the decision from ExCo a joint statement to be released between FIG and MoD.

19.0 Reasons for Recommending Preferred Option

19.1 Sand Bay Wind Farm has been a major success, delivering over 30% of Stanley's energy requirements. The Phase 3 design is no longer a concept, it has been validated and used elsewhere and version 2 will deliver over 50% of Stanley's energy requirements and pave the way for Phase 4.

19.2 The Power Station Manager is clear that the ABB BESS is the most viable and cost-effective solution for Sand Bay and Mare Harbour expansions. Our design requires the elegant operating modes their inverter delivers. The Enercon range of WEC's is the only turbine at this rating that will survive our average wind speeds. The Enercon range are fully controllable and offer the elegance in control we require to succeed. The ABB BESS and the Enercon WEC are a perfect match.

19.3 Approving these recommendations, ensures the wind farm continues into the 2040s which is consistent with the commitments to renewable energy and environmental protection made by this Assembly.

Sand Bay	
Mare Harbour	

[illegible]

FALKLAND ISLANDS GOVERNMENT



SAND BAY & MARE HARBOUR WIND FARM PROJECT GOVERNANCE PLAN

VERSION 0.3 18032024

APPROVAL SIGNATURES

I understand the Governance Plan describes roles and responsibilities for the Sand Bay and Mare Harbour Wind Farms Project. I have read and understood the Governance Plan and will fulfil the role identified for me.

NAME, DEPARTMENT TITLE	SIGNATURE	PROJECT ROLE	DATE
Andy Keeling		Project Sponsor -Chair	
Colin Summers		Project Executive	
Steve Dent		Senior Supplier	
Power Station Manager - tbc		Senior User	
Steve Cannon		Project Board Member - Treasury	
Davina Fiore		Project Board Member - Legal	
Sarah Browning-Lee		Joint Project Officer	
Glenn Ross		Project Manager	
Tessa Davies-Berntsen		Project Administrator	

DOCUMENT REVISION HISTORY

The following table tracks when and what changes were made to the Governance Plan. It is updated each time the document is revised during the life of the Sand Bay & Mare Harbour Wind Farm Project.

REVISION NUMBER	DATE OF RELEASE	AUTHOR	SUMMARY OF CHANGES
0.1	28/02/2024	Alexander McShane	First Draft
0.2	18/03/2024	Alexander McShane	Second Draft
0.3	18/03/2024	Andy Keeling	Reviewed and updated for Exco
3.0			
4.0			
5.0			

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1. INTRODUCTION

The Falkland Islands Government (FIG) and the Ministry of Defence (MoD), British Forces South Atlantic Islands (BFSAI) are undertaking the increase and replacement of wind turbines at both Mare Harbour and Sand Bay sites. This joint project will build on this success and help transition the Falkland Islands towards net-zero.

The project's overarching objectives for Sand Bay are:

- Increase the annual renewable contribution to over 50% for Stanley, including periods with 100% renewable energy provision until the mid-2040s;
- Achieve significant savings for FIG over the life of Phase 3 through reduced reliance on diesel-powered generation;
- Achieve significant CO2 savings over the life of Phase 3 through reduced reliance on diesel-powered generation;
- Provide a platform for potential expansion into Phase 4 in the future.

The project overarching objectives for Mare Harbour are:

- For MoD is towards a transition pathway to net-zero for BFSAI operations and Mount Pleasant Complex estate by 2050.

This Governance Plan focuses on the purchase of the turbines and associate equipment, the configuration and installation of the turbines at the site locations (Mare Harbour and Sand Bay), and the connection of the equipment to the main power supply, including the purchase, installation, commissioning of complimentary battery storage, the plan will be updated periodically and will be updated at the end of each Gateway stage.

For the project to be successful, decisions must be timely and at the right level of authority. The Governance Plan has the following overarching goals:

1. To ensure consistency, productivity, and timely decision-making
2. To support quality deliverables through best practices for governance and project management;
3. To establish a baseline for effective governance of the project

The Governance Process model depicted in Appendix C contains five key phases of project governance. They are:

1. *Initiate and Establish the Project Governance Framework*: project governance framework, roles, and responsibilities, baseline governance plan for the project;
2. *Define the Metrics*: risk and issue management, decision-making, and metrics for the baseline governance plan;
3. *Execution of the Governance Framework*: change control, decision-making, communication, meetings, reporting, and baseline plan;
4. *Monitoring & Controlling*: project management processes: Plan, Actual, Change Control Forecast; and
5. *Closing and Assurance*: ensure the project governance framework is effective.

2. OVERVIEW

The Governance Plan describes the overall governance and decision-making process for the Mare Harbour and Sand Bay Wind Turbine Project and its stakeholders. It also defines roles and responsibilities and the timeframe for decisions.

3. KEY GOVERNANCE METHODOLOGY – MARE HARBOUR AND SAND BAY WIND FARM

3.1. PROGRESS UPDATES

Governance of the Wind Turbine Project Project is through a Progress Updates process, with oversight from the Project Board (PB) and Joint Programme Board (JPB).

There are within with each stage of the progress; there will be effectively four Major Progress Updates sign-off for effective management of deliverables:

1. Scope sign-off
2. EXCO and Contract Award sign-off
3. Installation and Migration sign-off
4. Testing and sign off of each both Mare Harbour and Sand Bay elements of the joint project.

3.1.1. MOD PAYMENT PROCESS TO FIG

This payment process for the Ministry of Defence is set out in the Letter of Agreement between the MOD and FIG. The process profiles a 28-day payment process which commences with the payment application submission. Other governance meetings and milestones revolve around this milestone process, ensuring quality deliverables in exchange for investment throughout the life of the project.

3.1.2. FIG WIND TURBINE PAYMENT PROCESS

This payment process for the Falkland Islands Government will be set upon the awards of contracts and as agreed by ExCo. Milestone payment processes will be used, and upon receipt of the milestone invoice, the process profiles a 28-working day payment process which commences with the payment application submission. Other governance meetings and milestones revolve around this milestone process, ensuring quality deliverables in throughout the life of the project.

Table 3-1-1 Figure 1: PAYMENT MILESTONE for Enercon:

No.	Payment Milestone	% of Contract Price	Accu-mulated Pay-ments	Security
M1	Down Payment (Effective Date)	25	25	Employer to submit Payment Security covering the amount of the Contract Price (less advance payment) together with the Notice to Proceed

M2	Tower Section ready for transport	20	45	
M3	Nacelle ready for transport	20	65	
M4	Delivery of components at port of departure	20	85	
M5	WEC Installation Completed	10	95	
M6	Taking Over	5	100	Return of Employer's Payment Security upon receipt in full of Contract Price and Cost (if any)

3.1.1. FIG BATTERIES PAYMENT PROCESS

This payment process for the Falkland Islands Government will be set upon the awards of contracts and as agreed by ExCo. Milestone payment processes will be used, and upon receipt of the milestone invoice, the process profiles a 28-working day payment process which commences with the payment application submission. Other governance meetings and milestones revolve around this milestone process, ensuring quality deliverables throughout the project life cycle.

Payment Milestones:		
a)	On receipt of Order	20% of Supply Price
b)	On submission of drawings for approval	20% of Supply Price
c)	On the earlier of FAT or notification of readiness for delivery	50% of Supply Price
d)	On the earlier of delivery or 4 weeks after notification of readiness for delivery	10% of Supply Price

4. ROLES AND RESPONSIBILITIES

Table 4-1 identifies the roles and responsibilities of the entities that will make decisions and undertake work related to this project.

Table 4-1: GOVERNANCE ROLES AND RESPONSIBILITIES¹

ROLE	RESPONSIBILITY
Executive Council	Ultimate decision-making body for the project.
All MLA's via the MLA Briefings	Consulted by the Project Board and Joint Project Board
Strategic Command	Consulted by the Project Board and Joint Project Board at end of each stage for submission to Exco.

¹ These are not the overall R2A2 for these roles

ROLE	RESPONSIBILITY
Joint Programme Board	- Assurance body that endorses the Project Board decisions made at key progress updates and other hold points - Identify and communicate potential conflicts in proposed policies between FIG and the MOD with this joint project
Capital Programme Board	- Oversight body that endorses the Project Board decisions made at key progress updates and other hold points - Identify and communicate potential conflicts in proposed policies between department initiatives and this effort. - Ensure resources are made available to implement decisions made by this body.
Project Board (PB)	- Key decision-making body within each project stage. - Provides unified direction and guidance to the Project Manager - Provides direction on policy and scope change (from that defined at tender) that significantly impact budget/ time/ quality. - Project Advocate within and external to the FIG. - Ensure resources are made available to implement decisions and mandates. - Membership comprises: 7 members Chief Executive - Andy Keeling, Project Sponsor & Chair of Project Board Director of Public Works - Colin Summers, Project Executive Deputy Director of Development and Commercial Services – Steve Dent, Senior Supplier Power Station Manager - TBC, Senior User Head of Legal – Davina Flore, Legal Head of Finance – Steve Cannon, Treasury MoD/FIG Joint Project Officer - Sarah Browning-Lee, MoD Supporting members: Project Managers – Glenn Ross, Project Manager Meeting Secretary – Tessa Davies-Berntsen, Meeting Secretary
Project Sponsor	- Ultimate accountability for the success of the project and its delivery. - In conjunction with the rest of the Project Board, endorses decisions on policy, scope, and significant schedule or budget change within a stage. Facilitates open communication regarding the project. - Removes obstacles that could impede success. - Ensures decisions are made by PB within defined time constraints. - Ensures resources are made available to implement project decisions to programme. - Chairs the PB Meetings - Makes decisions escalated by Project Executive within the span of control. - Sets policy direction, and; - Communicates progress on the Joint Project Board & MLA's, with the Project Executive.
Project Executive	- Ultimately responsible for the success of the project and its delivery, supported by the Senior Suppliers and Senior Users of the Project Board. - Principle decision-maker, with support from the Project Board - Removes obstacles within the span of control that could impede success - Provides strategic direction and support to the project. - Escalates issues and change requests to the PB and Project Sponsor for support in decision-making, where appropriate - Makes decisions on issues/risks/change requests escalated by Senior Project Manager within the span of control. - Provides oversight and endorsement of project business case and appraisals with support as required from the Project Board, and - Communicates progress on the Project to the Steering Group & MLA's, with the Project Sponsor.
Project Manager	- Responsible for day-to-day management of the project on behalf of the Project Board - Makes daily decisions that are within the prescribed tolerances based on direction provided by the PB and Project Sponsor. - Escalates issues and Variation Orders to the PB and Project Sponsor for support in decision-making, where appropriate.

ROLE	RESPONSIBILITY
	- Manages project risks and issues within tolerance levels - Produces FIG monthly progress reports for Project Board - Manages contractor and professional advisors - Balances technical constraints with policy recommendations. - With the project administrator presents agenda items to the PB. - Meets with Senior Supplier to validate priorities, review direction, and ensure appropriate communication occurs. - Develops and implements plans to ensure appropriate data is ready when needed by the project. - Evaluate change requests in terms of their ultimate effect on project quality, scope, and timeline constraints and present them to the Project Sponsor or Senior Supplier where the value of the change request exceeds the value of £20,000.
Senior Supplier	- Meets with Project Executive to validate priorities, review direction, and ensure appropriate communication occurs. - Approval of supplier specifications – this may be by approving product descriptions - Ensure that supplier resources are made available for project work - Resolve any supplier conflicts - Monitor potential changes for impact on the quality of products from suppliers - Monitor and manage risks from a supplier viewpoint - Ensure adequate quality control procedures are adhered to by suppliers
Senior User	- Liaising with the project team on behalf of the users - Monitoring that the project's products will meet the needs - Define criteria for acceptance of the project's products - Ensure that the desired outcome of the project is specified - To co-ordinate the agreement of a set of Acceptance Criteria containing measurable and tangible descriptors - Organize and monitor user testing of project outputs, ensuring that any issues arising are adequately recorded and communicated - Monitor the project's progress from a user requirements point of view - Manage two-way communications with the users - Monitor and manage user-related risks - Conduct project assurance from the user perspective
Treasury	Financial advice to the Project Board
Legal	Legal advice to the Project Board

5. GOVERNANCE STRUCTURE

5.1. JOINT PROGRAMME BOARD (JPB)

Assurance body (Chief Executive, Commander of British Forces South Atlantic, the Projects Sponsors, and Joint Programme Board Members) that endorses the Project Board decisions made at key Progress Updates and other points throughout the project progress.

5.2. PROJECT BOARD (PB)

The PB is the official decision-making body for the project within each project stage and consists of three roles:

1. **Project Sponsor** – the final decision-maker with ultimate accountability for the delivery of the project supported by the remainder Project Board

2. **Project Executive** the principal decision-maker with accountability for the success of the project, supported by the remainder Project Board
3. **Senior User(s)** –looking after the interests of those who will use the project's outputs.
4. **Senior Supplier(s)**–looking after the interests of those involved in developing, implementing, and eventually maintaining the project's outputs.
5. **Treasury Representative** – looks after the interests of FIG from a financial perspective.
6. **Legal Representative** - looks after the interests of FIG from a Legal perspective.
7. **Joint Projects Officer** - looks after the interests of MoD and FIG joint project work.

PB members retain accountability but delegate the day-to-day management of the project to the Project Manager. To monitor progress against goals, the PB meets to establish policy, receive the project status, hold the Project Manager to account, ensure decisions align with the triple constraints (prioritization of scope, schedule, budget), and make decisions that have been escalated for resolution.

These responsibilities are carried out by performing the following functions:

- Monitoring and reviewing the project's status, as presented by the Project Manager at regularly scheduled Project Board meetings.
- Controlling scope as emergent issues force changes to be considered, and if necessary, approving budget or schedule changes consistent with the overarching objectives listed in the scope of work.
- Confirming that strategies to address significant risks to the project's success have been identified, budgeted, and executed.
- Recommend risk and contingency spending to the Sponsor;
- Resolving issues escalated from lower-level entities; and
- Aiding the project when required.

The Project Sponsor and Project Executive communicates the project's progress to external entities.

5.2.1. PROJECT BOARD TERMS OF REFERENCE

The Project Board ensures that the project can deliver the benefits and outputs specified in the Project Initiation Document and agreed ExCo reports and minutes and ensure that the project delivers value for money. Ultimately the Project Sponsor is accountable for the project, supported by the others on the PB. The following are the terms of reference for the PB:

- a) To control the level of risk exposure and to own the resolution of risks and issues. The Project Board must agree an acceptable risk profile and ensure that an appropriate approach to identifying, categorizing and escalating risks is defined and followed;

- b) To communicate with stakeholders external to the project, manage their expectations, and convey key messages that are consistent and accurate; and
- c) It is envisaged that the Project Board will meet regularly to monitor and manage the decision gateways for the project. The Project Board will not manage the project on a day-to-day basis which is the key responsibility of the Project Manager.
- d) The Project tolerances are to be set out in the Project Initiation Documentation (PID).
- e) To authorize closure of the project. The Project Board is responsible for taking the decision to close the project, as planned or otherwise.
- f) To assist with the post-project evaluation of benefits realization.
- g) The core membership should contain representation from the delivery team: Senior Executive management; Senior User; Senior Supply team; Project Management team.
- h) The Project Board will be supported by the following elements during the meeting.
 - a. Project Managers: Glenn Ross
 - b. Meeting Secretary: Tessa Davies-Berntsen

5.2.2. MEMBERSHIP

The membership is defined in Appendix B. Membership can be delegated. A delegated person must be given authority to make decisions as if the main member is attending.

5.2.3. MEETING FREQUENCY

The PB shall meet at least every six weeks, depending on any urgent requirements. In consultation with the Project Executive, the Project Manager may call an additional Project Board meeting.

5.2.4. ADMINISTRATION

5.2.4.1. THE PROJECT EXECUTIVE IS RESPONSIBLE FOR:

- Approving the Project Board agenda proposed by the Project Manager
- Approving the Project Progress Report produced by the Project Manager for presentation to the Project Board
- Approving all issue reports, risk register updates, change control requests, and other control measures to be presented to the Project Board

5.2.4.2. THE PROJECT MANAGER IS RESPONSIBLE FOR:

- Day-to-day management of the project on behalf of the Project Board
- Developing the Project Board agenda

- Developing and presenting a project progress report to the PB Members.
- Capturing and publishing meeting minutes that include decisions and action items.
- Preparing issue reports, risk register updates, and change control requests for the PB members; and
- Scheduling all six weekly project board meetings.

See Table 5.3.1 for a description of all roles and levels of authority and responsibilities.

5.3. LEVEL OF AUTHORITY

Table 5.3.1 LEVELS OF AUTHORITY

GOVERNANCE GROUP	LEVEL OF AUTHORITY
Project Sponsor	Is part of the Joint Project Board and Project Board decision-making body and approves all changes within the stage, including overall budget and changes to the schedule that impact the overall Programme duration by more than two months.
Project Executive	Approves all changes within the stage of the project's overall budget, and changes within the schedule that do not impact overall programme duration.
Project Board	Are responsible for changes that will require an increase to the overall project funding or overall project end date. All contingency is to be held at this level. Policy-related changes; contract amendments.
Joint Programme Board	Has oversight of the project and could request additional information if required.
Capital Programme Board	Has oversight of the project and could request additional information if required.
Project Manager	The Project Manager will be allocated a fixed allocation of budget to perform the installation and configuration of the application. The project can only increase this allocation board. The Project Manager has an authorisation level £20,000.00 for variation orders.

6. ISSUE ESCALATION AND RESOLUTION

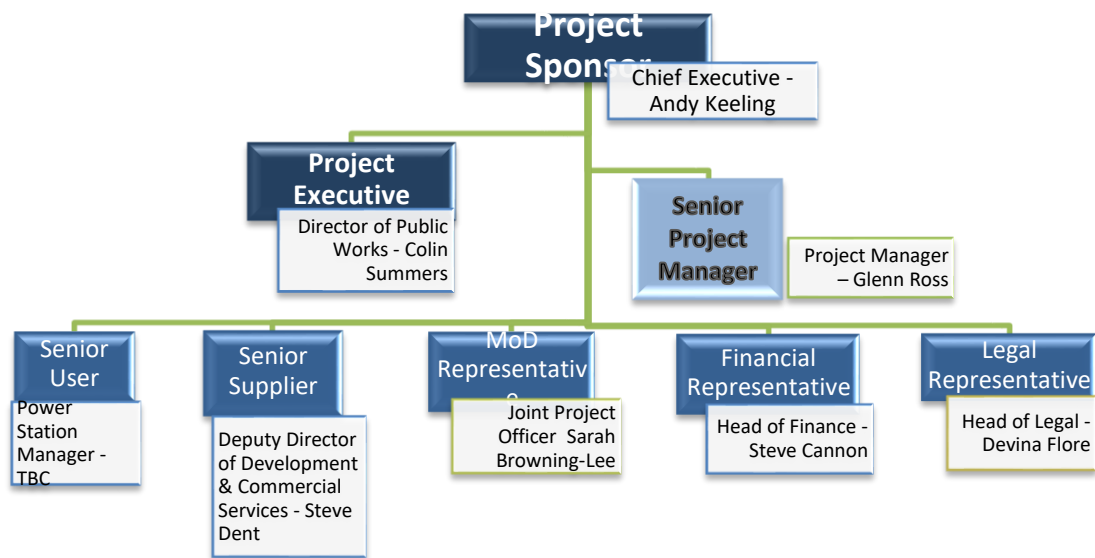
Table 6-1 below identifies the role, a trigger that could necessitate the escalation of an issue, the process to escalate issues, the timeframe in which the issue must be escalated, and the timeframe for resolution.

Table 6-1: ISSUE ESCALATION AND RESOLUTION

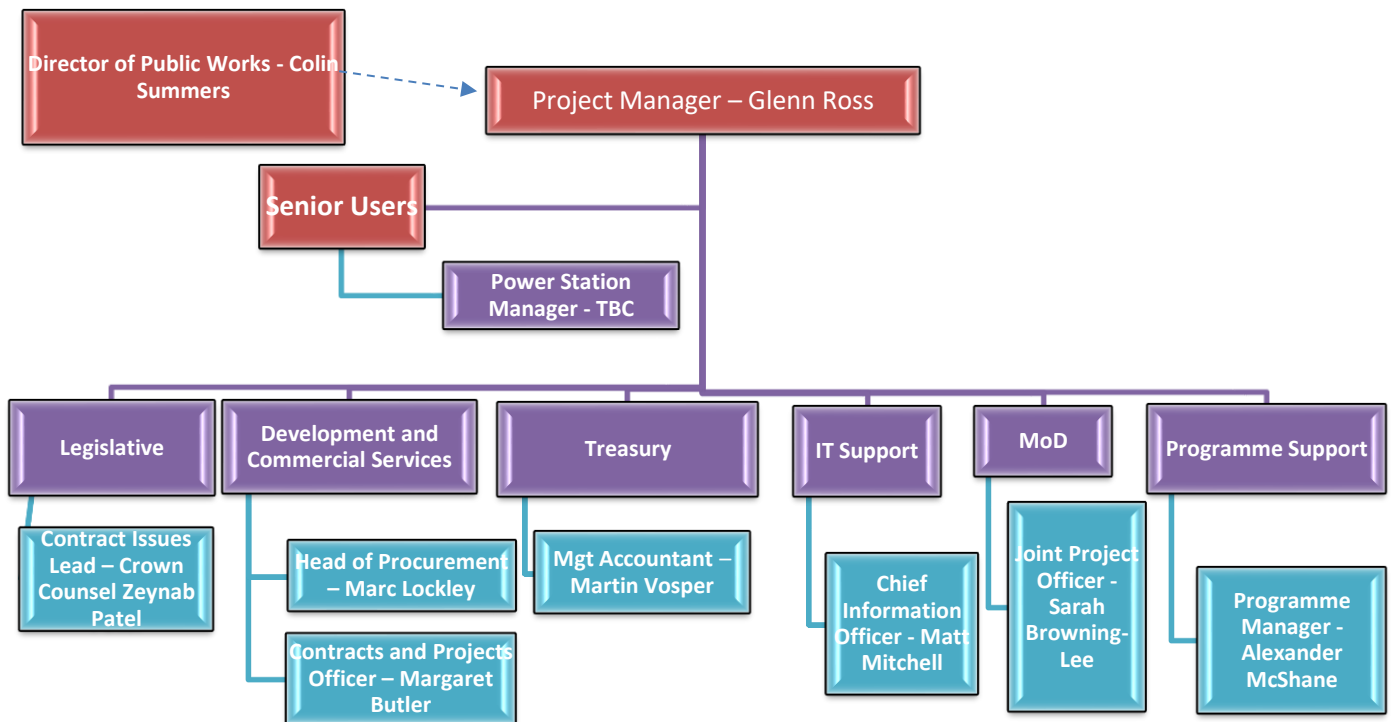
DECISION MAKER	TRIGGER	PROCESS	TIMEFRAME TO ESCALATE	TIMEFRAME TO RESOLVE
Project Manager (PM)	Issue exceeds PM's authority of £50,000.00	Bring to the attention of the Project Executive	Raise within five business days of identifying.	Expect a resolution within five business days unless referred to the PB by the project Executive.

DECISION MAKER	TRIGGER	PROCESS	TIMEFRAME TO ESCALATE	TIMEFRAME TO RESOLVE
Project Executive	Issue exceeds PE's authority.	Bring to the attention of the Sponsor to agree on further action.	Raise within two business days of identifying.	Expect a resolution within 10 business days.
Project Sponsor	The issue is to be discussed with the participation of the Project Board and/or Capital Programme Board	Bring to the attention of the Project Board and/or Capital Programme Board by scheduling a PB as appropriate.	Raise within two business days of identifying.	Expect resolution at PB or SG meeting or Capital Programme Board meeting or identify next steps to ensure resolution.
Project Board	Issue exceeds Project Board's authority	Project Board meeting to decide further course of action.	N/A	Expect resolution at the the next Project Board meeting or identify the next steps to ensure resolution.
Joint Programme Board	Issue to be discussed with the participation of Project Sponsor & Project Executive	Address at JPB meeting or decide further course of action	Raise within 5 business days of identifying.	Expect resolution at the next PB meeting, or identification of next steps to ensure resolution, and information to be fed back to JPB.

APPENDIX A. MARE HARBOUR AND SAND BAY WIND TURBINES - PROJECT BOARD



APPENDIX B. FIG PROJECT TEAM ORGANIZATION CHART



APPENDIX C. THE GOVERNANCE PROCESS MODEL

1. Initiate: Establish the
Project Governance
Framework