PROJECT DESCRIPTION STATEMENT

INSTALLATION AND COMMISSIONING OF A BATTERY ENERGY STORAGE SYSTEM (BESS) AT DELIMARA POWER STATION

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INTERCONNECT MALTA

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1.0 General Introduction

This document is being compiled by Interconnect Malta Ltd. (the Applicant) being the organisation tasked with implementing the Battery Energy Storage System within the Delimara Power Station in collaboration with Enemalta plc and International Energy Services Centre Ltd (IESC).

This Project Description Statement (PDS) is a detailed document requested by the Environmental Resources Authority (ERA) to provide the necessary information for screening in the Environmental Impact Assessment (EIA) process and is aimed at describing the scheme, the site of the development and its surroundings and planned activities during the construction and operational phases of the development. It also indicates the main expected environmental impacts.

1.1 Definitions and Abbreviations

a.c.	Alternating Current
d.c.	Direct Current
DC	Distribution Centre
HVAC	High voltage alternating current
EU	European Union
IC1	Malta – Sicily Electrical Interconnector No.1 (Also known as ‘MASI’)
IC2	Malta – Sicily Electrical Interconnector No.2
ICM	Interconnect Malta Co. Ltd.
IESC	International Energy Services Centre
IEC	International Electro-Technical Commission
MW	MegaWatt
MWh	MegaWatt Hour
OCGT	Open Cycle Gas Turbine
S.L.	Subsidiary Legislation
TM	Transport Malta

1.2 Contents of the Project Description Statement

This Project Description Statement is being compiled in line with Regulation 12 and Schedule II of the Environmental Impact Assessment Regulations 2007 (S.L.549.46). The document describes the proposed scheme, the objectives of the scheme, the site characteristics and its surroundings, potential impacts and mitigation measures, indicative duration for the implementation of the scheme, alternatives considered in terms of technology and locations, indication of the existing services on site, number of employees in the scheme's different phases.

1.3 Details of the Applicant Proposing Scheme

The proposed schemed is being presented by InterConnect Malta Ltd (ICM), a 100% government owned company that falls under the responsibility of the Ministry for the Environment, Energy and Enterprise.

The company was originally established as Melita TransGas Co Ltd in 2018 and changed its name to Interconnect Malta Ltd on the 4th of August 2021.

ICM has been entrusted by the Maltese Government to develop and implement energy infrastructure projects for increasing the island's electricity interconnectivity, increasing the island's renewable energy potential and ending Malta's isolation from the European gas network:

- 2nd Electricity HVAC Cable link from Malta to Sicily
- Melita TransGas hydrogen-ready Pipeline – Project of Common Interest
- Concession for an Offshore Renewable Energy Supply

Additionally, ICM is being tasked with the responsibility of implementing other projects and schemes including, but not limited to, Battery Energy Storage Systems (BESSs) connected to the Maltese National electric grid network (the Project) and will be the Applicant for EU funds.

1.4 Funding

In order to implement two distinct Battery Energy Storage System projects ICM will be applying for EU funding through the Recovery and Resiliency Fund ("RRF") and the European Regional Development Fund ("ERDF") of the Multi-Annual Financial Framework (MFF)[1] programme 2021-2027, targeting 2024 as the year by when all the necessary inputs for the latter ERDF application will need to be finalized. Further information on the MFF programme is provided under sub-section 4.13.

[1] https://fondi.eu/wp-content/uploads/2023/01/ERDF.CF_.JTF-Programme.pdf

2.0 Description of the Project and its General Objectives

Malta, an EU member since 2004, is an island state in the Mediterranean Sea and lies 93km south of Sicily, 288km east of Tunisia and 300km north of Libya. Malta derives its supply of electricity from local generating plant, from local renewable energy sources and from a 200MW electrical submarine interconnection (IC1) with the Terna grid in Sicily, Italy, operated by Enemalta plc, the Maltese Distribution System Operator (DSO).

Local conventional generating plant in Malta is almost entirely based in Delimara Power Station. The base generating plant with an output of approximately 363MW is fuelled by natural gas. The emergency units have an output of approximately 180 MW and operate with diesel fuel.

The renewable sector is based almost entirely on PV systems where the current peak output has reached 224 MW. Currently, there is only one electrical interconnection (IC1) with another country (Italy) and the nominal capacity is 200MW. In 2017, Malta has also introduced natural gas as the main fuel for electricity generation through an LNG Floating Storage Unit and an onshore regasification unit. The introduction of natural gas in Malta in 2017 and the interconnection in 2015 have contributed to a significant lowering in emissions, and the interconnector has facilitated the integration of high proportions of RES generation and provided continuous supply in case of local generating plant failure.

Following the European Parliament elections in 2019, the European Union strengthened its policy towards limiting climate change caused by anthropogenic activities as detailed in the European Green Deal. Priority has now been shifted in achieving carbon emission neutrality by 2050.

Malta is experiencing a high increase in electricity demand, meaning that a new source of power is needed. The decision was taken by the Government of Malta to lay a second electrical interconnector (IC2) between Malta and Sicily to cater for this increased electrical demand particularly due to economic progress as well as the electrification of road transport.

Additionally, this second interconnection is also aimed at providing a means for Malta to attract more renewable energy by improving the connection to a large stable grid thus offsetting the instability caused by the intermittencies of large amounts of renewable electricity generated from solar or wind farms.

To ensure that offshore renewable energy can help the EU reach the ambitious energy and climate targets for 2030 and 2050, the European Commission published a dedicated EU strategy on offshore renewable energy (COM(2020)741) on 19 November 2020 which proposes concrete ways forward to support the long-term sustainable development of this sector. The Offshore Renewable Energy Strategy highlights the need to reach at least 300 GW of offshore wind and 40 GW of ocean energy by 2050 in the EU as a key means to reach climate neutrality, providing a major opportunity to ramp up renewables, develop a resilient industrial base in the whole EU and creating quality jobs, benefiting both coastal and landlocked Member States.

As part of Malta's forward outlook and ambition in increasing the share of renewable energy, the Maltese Government is also focusing on the development of its offshore (floating) renewable potential. This is being done with a view of establishing the necessary administrative and regulatory frameworks, which will enable the future deployment of larger-scale projects.

In parallel, pursuant to article 14(1) of the TEN-E Regulation (EU) 2022/869, in January 2021, Malta has entered into a non-binding agreement on goals for offshore renewable generation in 2050 for 400MW capacity, with intermediate steps in 2040 and 2030 of 400MW and 50MW respectively, within the priority offshore grid corridor South and West offshore grids. The Low Carbon Development Strategy also highlights offshore renewable energy as one of the strategies to enable Malta to reach its environmental targets towards achieving carbon neutrality by 2050 and has since been studying offshore areas that can be dedicated to offshore renewables.

In tandem with the interconnection project and in order to strengthen and widen the electricity distribution network, enhance the resilience of the grid, reduce grid bottlenecks and handle wider intermittence from RES, Malta is looking at Battery Energy Storage Systems ('BESS') to complement the Interconnector 2 Project in order to accelerate the penetration of more RES.

BESS presents an important potential contribution for Malta to achieve its EU decarbonisation commitments. The Project will help manage the intermittency associated with renewable energy generation, thereby facilitating further development of renewable energy production capacity, helping the country to meet international commitments in this regard and reducing its dependence on imported fossil fuels for electricity generation as it will provide a way how to capture energy from RES during low demand and use it during peaks, displacing the utilisation of CO2 emitting gas engines during peak hours. BESS will also contribute to more efficient grid balancing and black-start capability, which is an essential process that ensures a stable and reliable electricity supply to meet consumer demand. In fact, grid-scale Energy Storage Systems feature in the Malta Low Carbon Development Strategy (June 2021)[2] and Malta's 2030 National Energy and Climate Plan (December 2019)[3].

2.1 General Objectives and Justification for the Development

The overall objectives and purpose of the Battery Energy Storage Systems at Delimara Power Station are to:

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[2] Malta Low Carbon Development Strategy, June 2021, available at: https://meae.gov.mt/en/Public_Consultations/MECP/PublishingImages/Pages/Consultations/MaltasLowCarbonDevelopmentStrategy/Malta%20Low%20Carbon%20Development%20Strategy.pdf

[3] Malta's 2030 National Energy and Climate Plan, December 2019, available at: https://energy.ec.europa.eu/system/files/2020-01/mt_final_necp_main_en_0.pdf

a) Provide a source of secure supply in cases of plant outages in order to enhance the grid's resilience and balancing the distribution grid.

b) Store energy generated by renewables during hours of maximum delivery and use that during peaks, thus flattening the variance between day and evening on conventional generation plant output. This in turn is expected to increase the efficiency of the conventional plant in operation and thus reduce its emissions as excess RES generated will be stored and then used to displace the starting up/ramping up of CO2 emitting plants.

c) Reduce the effect of the variability and intermittency caused by renewables, in periods of variable cloud cover or variable winds, and thus permit the operation of conventional plant in a more stable manner, with inherent gains in plant reliability, plant emissions, and CO_2 emission savings, thus enabling the ingress of further RES power generation thereby reducing the use of fossil fuel for electricity generation. Limited interconnectivity, lack of battery storage and restrictions in the local distribution system, are all currently considered major bottlenecks for the country to accelerate the penetration of RES (both onshore and offshore) due to its inherent intermittency.

d) Provide black start facility capable of restarting the power station and grid in the event of a total shutdown and supplying power to part of the network. Presently black starting of the Delimara power station is done using OCGTs burning gasoil.

e) Address grid bottlenecks to accelerate the penetration of RES and offer solutions to alleviate congestion in the distribution network.

f) Provide fast frequency and voltage stabilisation to the Maltese grid in case Malta is isolated from the Entso-e grid because of maintenance or faults.

One of the targets of REPowerEU aims on strengthening and widening the electricity distribution network, through investments in the grid, distribution services and battery storage.

3.0 The Site of the Project Scheme and Surroundings

3.1 Scheme Location and Characteristics of the site

The proposed development is sited within the boundary of the Delimara Power Station (DPS). The DPS is situated in close proximity to agricultural land at Marsaxlokk Harbour in the south-eastern corner of Malta. It is located between Marsaxlokk Bay and Ħofra ż-Żgħira. Ħofra ż-Żgħira Bay is a sensitive location due to the presence of protected species of marine life.

The town of Marsaxlokk is situated at the head of the bay to the north of the Delimara Power Station. Marsaxlokk is a traditional fishing village. In addition, it is a tourist and recreational destination with the local beach being utilised for swimming and water sports.

Marsaxlokk Bay also is home to the Freeport, Malta's main and international trans-shipment hub/port located on the west shore of the bay adjacent to Birżebbuġa.

***Figure 1**: Map of the Maltese Islands showing the south-eastern location of the Delimara Power Station (DPS)*

Delimara Power Station is located within an area that was excavated into the cliff face on the west side of the Delimara Peninsula, with the excavated material being utilised to reclaim land from the bay and provide an even surface on which to situate the construction and operation of the power station facility in 1992.

Delimara Power Station was commissioned in three phases between 1992 and 1999 (Phase 1, 2a and 2b). A third extension to the power station was completed in 2012 to increase the power output into the electrical network. The extension was within the original IPPC boundary. The latter diesel engine plant was converted to run on natural gas, instead of heavy fuel oil, in 2017. A 205 MW natural gas-fired CCGT system was also commissioned in 2017.

Figure 2*: Delimara Power Station during the initial phases still under construction.*

The site is located at an elevation of between 1.8m and approximately 6.0m metres above local sea level (ALSL). The majority of the installation boundary comprises relatively flat topography ranging from approximately 1.85m to 3.4m ALSL, the exceptions being the bunded storage tanks and adjacent area in the south of site which are located on a manmade platform at approximately 5.6m ALSL and the residual fuel oil (RFO) tanks 1 to 3 located in the east of site which are elevated on the Peninsula at approximately 15m ALSL.

The site comprises operational plant in the centre and south of site, and a workshop, administration buildings and a medical centre in the north of site. Enemalta plc and various other operators operate the facility which consists of the following units:

Units	Phase	Commissioned
2x 35MW Open Cycle Gas turbines	Phase 2A	1994
1x 110MW Combined-Cycle plant consisting of 2x 37MW GTs, 2x HRSG, 1x 36MW steam t/a (0.2% sulphur gas oil)	Phase 2B	1999
DECC power plant consisting of 4x Wartsila 18V50SG and 4x Wartsila 18V50DF, 4 stroke medium speed diesel engines, 8x HRSGs, 1x12.5MW steam turbine	Phase 3	2012
CCGT power plant, an LNG floating storage unit an onshore regasification unit Electric generators: Three gas-turbine driven generators. 50.5 MWe Siemens SGT-800, 64.97 MVA Siemens generators, generating at 11 kV and stepped up to 132 kV. Steam turbine: 66.0 MWe Siemens SST-900, 88.1 MVA Siemens generator, generating at 11 kV, stepped up to 132 kV. Steam generators: Three Aalborg Dual Pressure Boilers at 64.5 t/h, 81.4 bar at 511 °C (HP Steam) and 11.7 t/h, 6 bar at 285 °C (LP Steam)	Phase 4	2017

The geographical location (35°49'57.1"N 14°33'16.9"E) of the Scheme, measuring approximately 4,990m^2, is a portion of reclaimed land within the Delimara Power Station on the Delimara peninsula, accessed directly from Triq il-Power Station, beneath Triq Delimara.

The site in question is located to the Southeast of the D4 (combined cycle gas turbine) power generation plant, directly off the vessel mooring quay and is surrounded by ancillary plant and equipment used for operation of the same power station. The scheme will not require any land reclamation and will not alter the land use of the site itself since the proposed development is within an existing part of DPS.

There are no important features on the site.

Figure 3*: Delimara peninsula, location of Delimara Power Station*

Figure 4: Proposed scheme location

3.2 Site History and Planning History

The table below shows the site history pertaining to the proposed land within Delimara Power Station. The referred planning applications mentioned in this table were extracted from the Planning Authority's mapserver and do not specifically refer to any development as having been implemented within the proposed site.

No	Application No	Description	Decision
1	PA 00084/22	Photovoltaic installation over existing roof	Approved
2	PA 04297/18	To sanction retention of cabins approved by construction management plan, with minor modifications, and proposed installation of mezzanine floor in an approved building within the approved power station.	Approved
3	PA 04118/18	Installation of cabins in the re-gasification area together with storage containers in approved power station	Approved
4	PA 08757/17	Construction of Melita TransGas pipeline EU Project of Common Interest. The proposal includes a terminal station at Delimara Power station to be constructed partially on reclaimed land with revetment, a Micro-tunnel route through Delimara Peninsula, and the laying of an offshore pipeline up to the median line between Delimara, Malta and Gela, Sicily	Approved
5	PA 09335/17	Proposed landscaping works at the Delimara Power Station to address the requirements of condition number 5 of development permission PA 4854/09	Approved
6	DN 00166/17	Demolishing of chimney and two (2) boilers at Delimara power-station	Approved
7	PA 00021/14	Combined cycle gas turbine and liquified natural gas receiving storage, and re-gasification facilities	Approved
8	PA 02298/14	Demolition and re-location of fire station and laboratory facilities	Approved
9	DN 01054/14	Demolishing of chimney at Delimara power station	Approved
10	DN 00146/14	Relocation of cesspit	Approved
11	PA 02053/10	Boiler conversion for emission reduction at Delimara Power Station	Approved
12	PA 04854/09	To erect new electrical power generating station	Appealed
13	PA 02933/09	Soil investigation at Delimara Power Station Block 4 (through removal of a layer of material).	Approved
14	PA 03154/08	Boiler conversion for emission reduction	Approved
15	PA 03152/05	Proposed local generating capacity at Delimara Power Station	Approved
16	PA 05166/93	Phase IIA Phase IIB Fuel Tanks	Withdrawn

***Table 1**: Planning applications history on site [extracted from PA mapserver, 14 April 2023]*

Apart from the planning perspective, the site is also covered by an Integrated Pollution Prevention and Control (IPPC) permit, as per below:

Application Number	Name	Activity	Location	Status
IP 0002/21	Delimara Power Station	Large Combustion Plant	Delimara	Granted

The latest version of permit IP 0002/21 can be accessed from the following link: https://era.org.mt/era_ippc_installations/delimara-powerstation/. The permit holders of this IPPC permit are ElectroGas Malta Ltd. (IP 0002/21/i), D3 Power Generation Ltd. (IP 0002/21/ii) and Enemalta plc (IP 0002/21/iii). This permit was issued under Regulation 7 of the Industrial Emissions (Framework) Regulations, (S.L. 549.76) ("the Industrial Emissions (Framework) Regulations").

This permit is valid until the expiry of the permit which is 4 year/s from the 'permit granted' date (10/05/2022).

In accordance with section 1.6 of the IPPC permit, ERA shall be officially informed of this operational change as defined by S.L. 549.77 and its amendments.

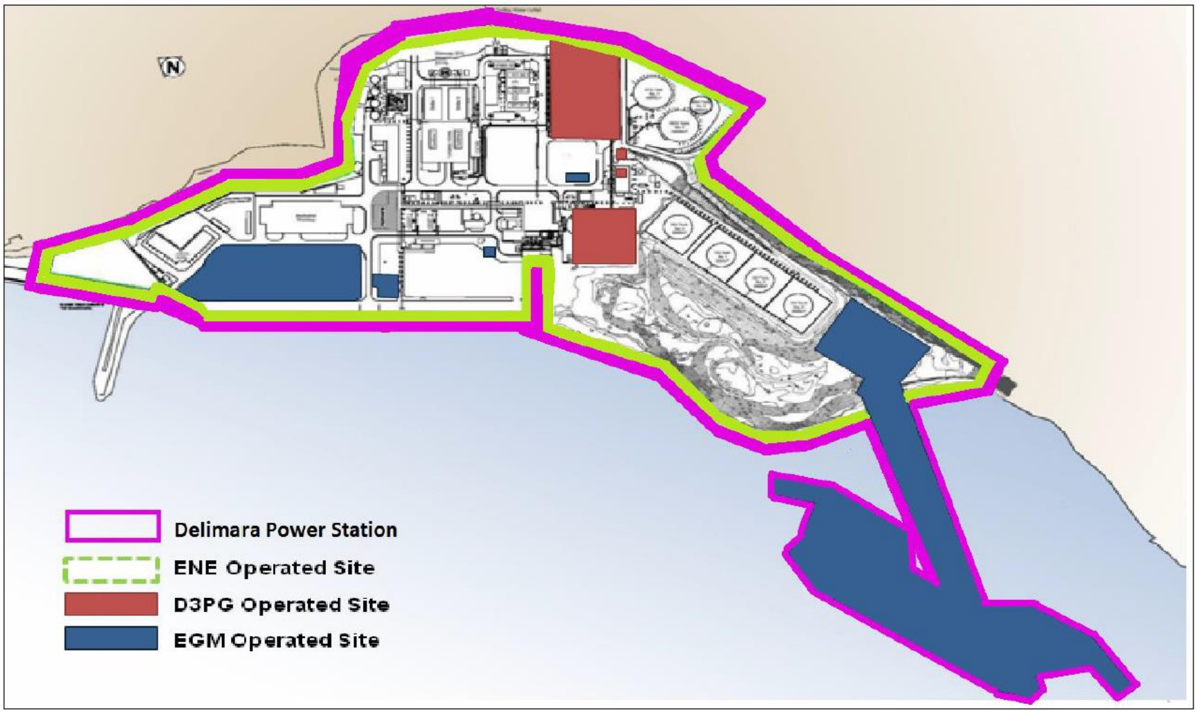

***Figure 5**: Site Boundary and operators, IPPC permit number IP 0002/21*

3.3 Land Uses

Access to the site is through a *Triq il-Power Station*, which leads directly into the Delimara Power Station complex, which has an internal road network itself, intended to support the proper and safe operation of the plant.

Since the proposed development is situated at Delimara Power Station, an area that was already serving as part of the power generation of the Maltese islands, the land use of the area is not expected to change.

Direction	Description	Distance
To the North	Agricultural land and agricultural-type properties	Immediately north

To the South	Agricultural land and agricultural-type properties	Immediately south
To the East	Agricultural land	Adjacent to site
	Residential house	40m south-east
To the West	Marsaxlokk Bay	Immediately west

***Table 2**: Surrounding Land Uses*

Most of the impact on land use is expected to be generated from activities related to construction only.

Further impacts on land use related to the development of the site will not significantly affect neighbouring land uses, though there is also expected to be a minor traffic increase in the area, especially on the arterial and nearby roads, due to the vehicles associated with the construction phase of the proposed development.

The development will not require sea water for cooling purposes, and hence, it will not influence the quality of the sea water on either side of the peninsula since the existing sea water cooling inlet and outfall shall not be affected.

The land measures circa 4,990 meters squared and is currently unused. The area for the proposed scheme was used as a laydown area by Electrogas during the construction phase of the D4 power plant.

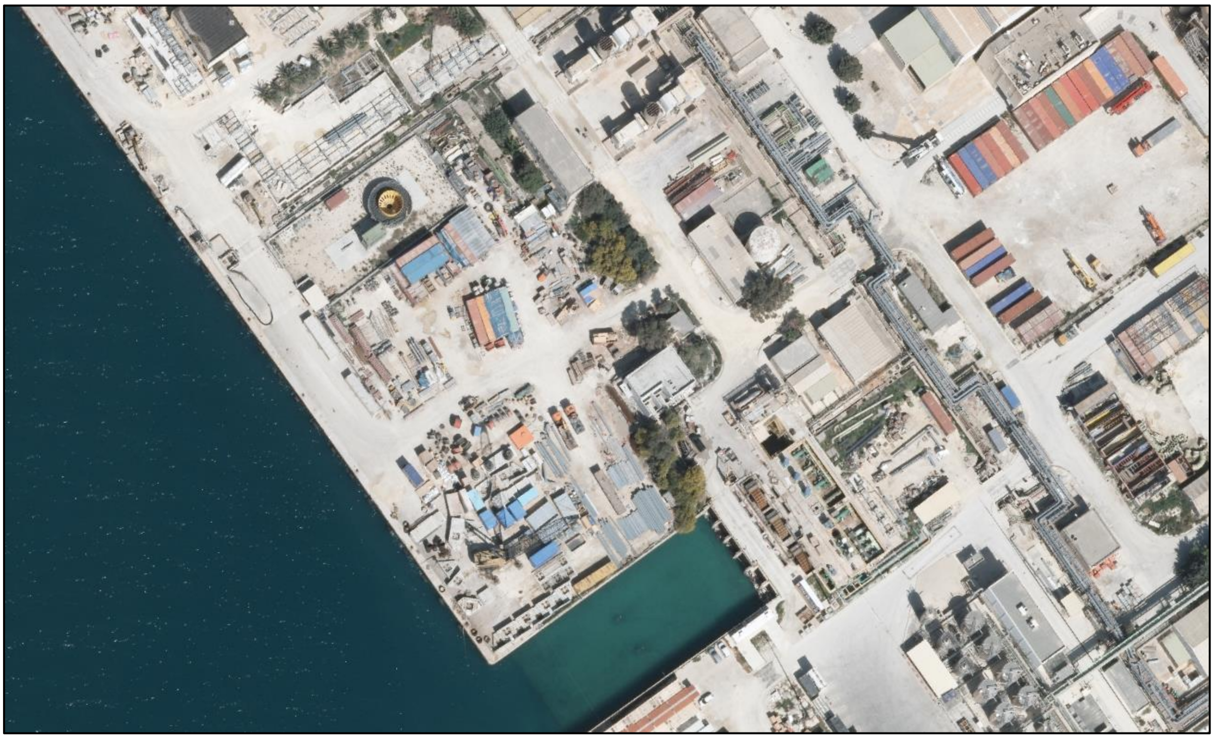

***Figure 6**: Location of proposed scheme used as as Laydown Area in 2016.*

3.4 Environmental Characteristics

The area is predominantly industrial in nature. No particular environmental characteristics are present on site.

3.5 Geology and Geomorphology

According to the soil geology map (Geological Map of the Maltese Islands, Sheet 1 Malta, 1:25,000), the central portion of DPS orientated north to south is directly underlain by solid geology of Middle Globigerina Limestone Member, the thickness of which ranges from 15m to 38m. The description states that the limestone comprises a planktonic foraminifera-rich sequence of massive, white, soft carbonate mudstones locally passing into pale-grey marl mudstones.

The western and central portions of site located closest to the coast line, on which several of the operational plant are situated, is constructed on a man-made platform reclaimed from the sea by cut and fill activities.

The eastern portion of the site is underlain by the natural Delimara Peninsula formed from Upper Globigerina Limestone member comprising a tripartite, fine grained planktonic foraminiferal limestone sequence comprised of a lower cream coloured wakestone, central pale grey marl and an upper pale cream coloured wakestone.

In terms of impact on geology and geomorphology in terms of loss of rock strata and replacement of rock strata with a built development, these are both considered as being of insignificant impact due to the fact that previous excavation and land reclamation has altered the geomorphology of the area.

The impacts in terms of removal of soil is considered to be insignificant due to the fact that there is no agricultural soil present on site.

3.6 Hydrogeology

According to the Malta Resources Authority (2004), the Globigerina Limestone functions as an aquifer where it is highly fractured.

The groundwater body underlying the site is classified as Malta Main Mean Sea Level Groundwater Body, sustained in the Lower Coralline limestone aquifer which is present beneath the Globigerina Limestone. The aquifer is in free contact with sea-water, and is described as ‘a lens-shaped body of freshwater floating on more saline water, with a thickness of freshwater below sea level approximately thirty-six times its piezometric height above sea level’. The Malta Main Mean Sea Level Groundwater Body is classed as ‘waters used for the abstraction of drinking water’.

Where the land has been reclaimed from the sea in the west of site, the groundwater is likely to exist as a sea-level aquifer.

According to the PA's report Establishing Drinking Water Protection Areas under the Water Policy Framework Regulations 2004, the site is not located in a Groundwater Protected Zone. Groundwater Protection Zones have a radii of approximately 300m from a potable abstraction point in order to preserve the quality of the drinking water obtained from the Lower Coralline Limestone aquifer.

3.7 Infrastructure and Utilities

The site of the proposed development is already committed to the generation of electricity. The site of Delimara power station already benefits from the required utilities and infrastructure including potable and cooling water, the required drainage systems, and adequate road access including an internal road network.

The current infrastructure and utilities are deemed sufficient to sustain the proposed development without the need to upgrade the existing systems. However, additional infrastructure to cater for stormwater runoff directly over the proposed Scheme site may need to be installed and connected with the available stormwater management system of the station.

3.8 Cultural Heritage Features

No known cultural heritage features are located within the Scheme site or in the immediate surrounding area, particularly in view that the site is an industrial site used for power generation and distribution. Additionally, there are no archaeological remains or historical features documented within the footprint of the proposed site.

In a wider context, in the immediate vicinity of the Delimara Power Station and within a distance of 500m from the scheme site, the SCH GIS interface shows the presence of the following Cultural Heritage discoveries:

Site Code	Locality	Type	Feature	Co-ordinates
FHVL29	Marsaxlokk	Military	Pillbox	35°50'06.6"N 14°33'24.4"E
FHVL72	Marsaxlokk	Military	Wolseley Battery	35°50'07.9"N 14°33'28.0"E
FHVL67	Marsaxlokk	Military	Wilga Battery	35°50'10.2"N,14°33'7.8"E

***Table 3**: Cultural Heritage discoveries, as listed in the Superintendence of Cultural Heritage GIS interface, accessed on 14 April 2023*

Therefore, it can be safely said that the proposed scheme will have no effect on the Cultural Heritage features or interests.

4.0 Regulatory Framework: Legislative, Planning and Strategy Context

4.1 Policy and Planning Context

The development site lies within the Delimara Power Station which falls within the Marsaxlokk Bay Local Plan. The site is located within an area already dedicated for industrial use and features other plants related to electrical generation and distribution systems.

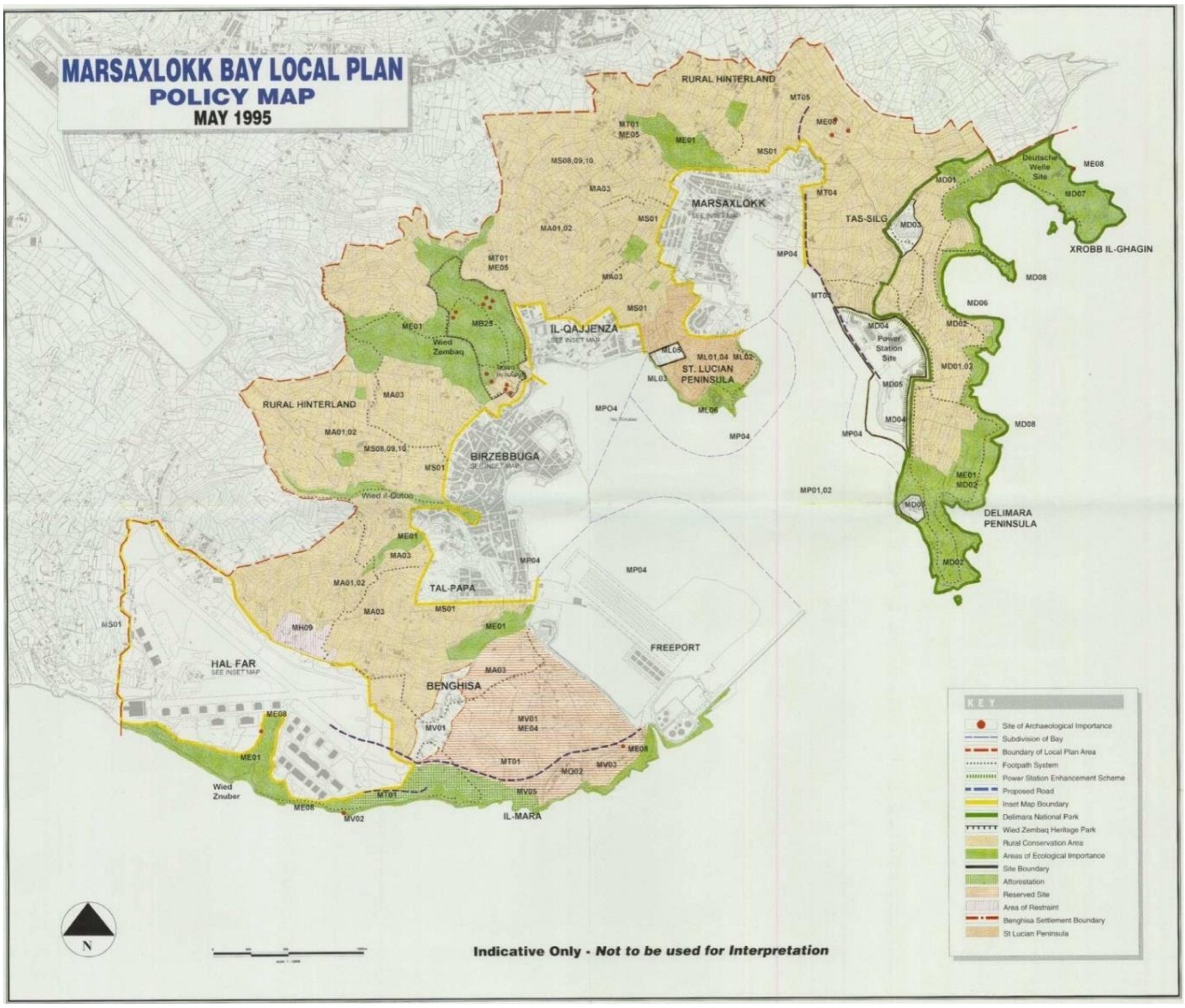

***Figure 7**: Marsaxlokk Bay Local Plan - Policy Map*

The original Structure Plan for the Maltese Islands adopts an area-based approach. Figure 8 show the Policy Map of Delimara Peninsula.

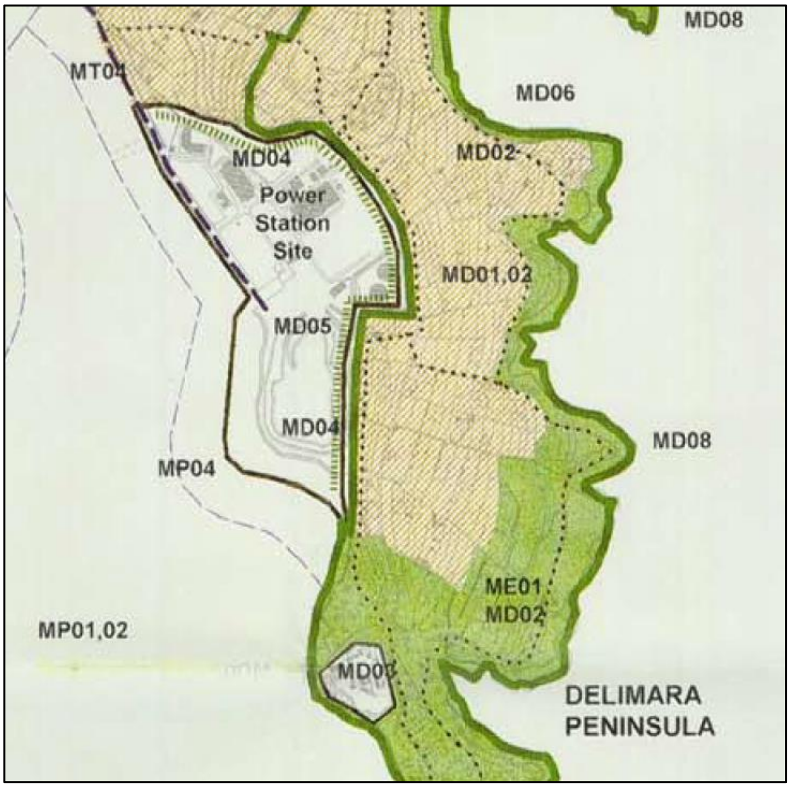

Figure 8*: Policy Map of Delimara Peninsula, Marsaxlokk Bay Local Plan, Policy Map*

Policy MD04 of the Marsaxlokk Bay Local Plan, which refers to the scheme site and "Power Station Industrial Site", specifies that any proposed new buildings or structures within the site must take into account, in their design and layout, the need to reduce their visual impact from the western shore of the Bay.

Policy MP01 states that further industrial development of the Port itself, and the areas around it, will not be granted development permission beyond what is committed, and the specific provision made in the area policies. Industrial development will therefore be limited to Delimara Peninsula on the Power Station site, and in the Freeport area.

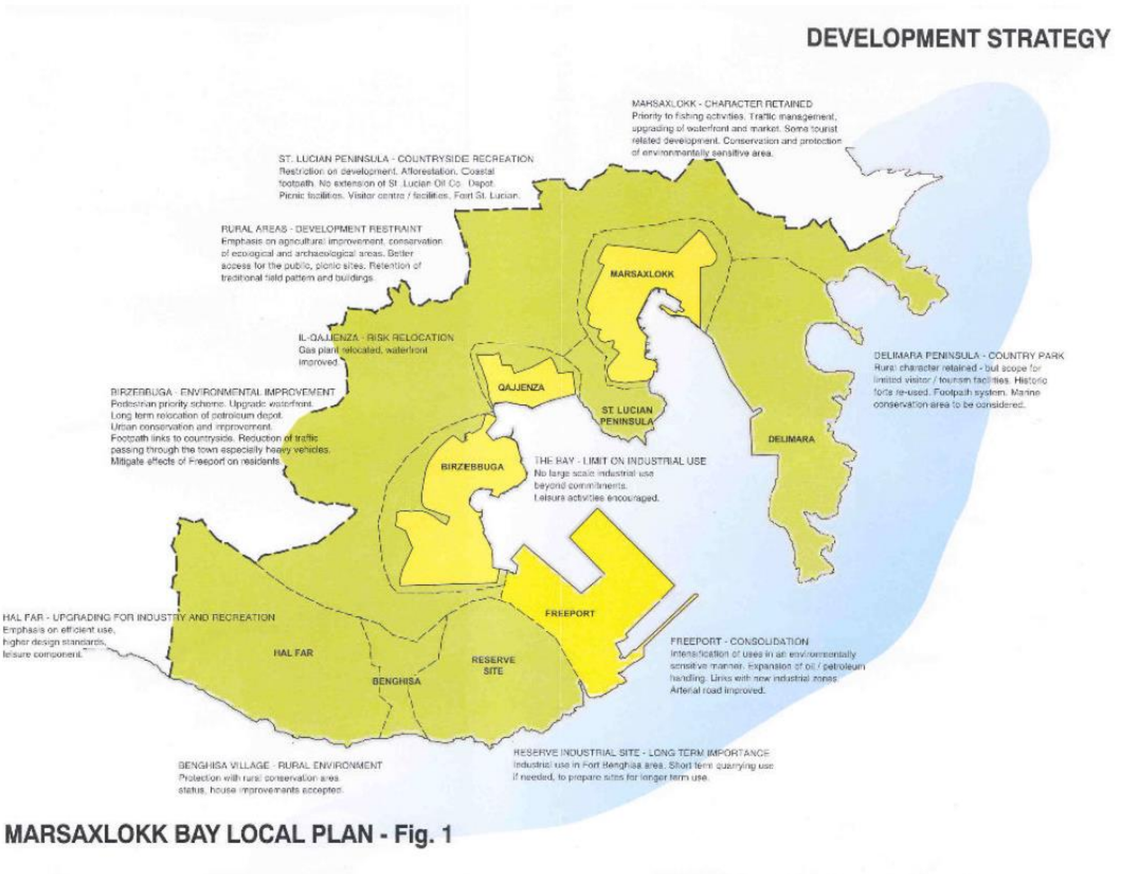

Figure 9*: Marsaxlokk Bay Development Strategy*

4.2 Special Area of Conservation and Nature 2000 sites

There are no Special Areas of Conservation directly within the Delimara Power Station site or within the immediate vicinity. The closest Special Areas of Conservation is MT 0000014 *Il-Ballut ta' Marsaxlokk*, located at a distance of approximately 600m. Refer to table and Figure 10 below for details about this SAC.

Country	Malta (MT0000014)
Type	Protected under the Habitats Directive
Area	23.34 ha
Established date	April 2004
EU protected species	0
EU protected habitats	4

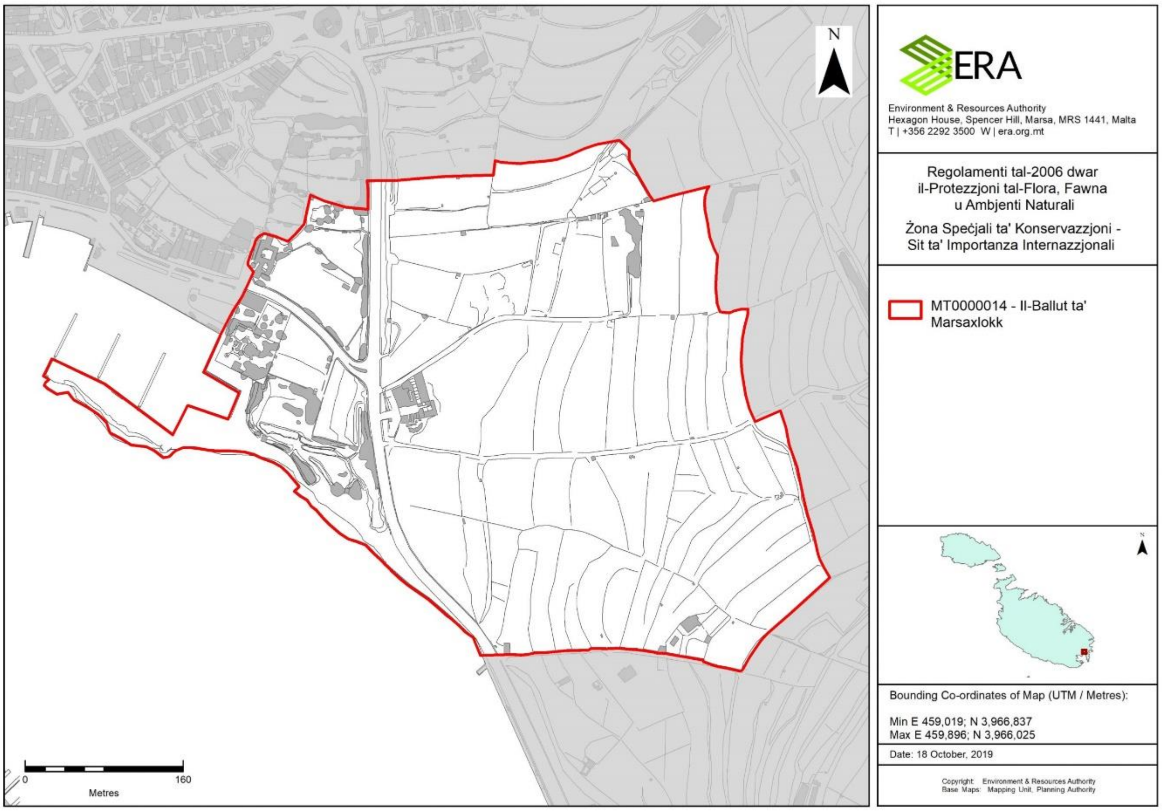

Figure 10: *Special Area of Conservation MT0000014 Il-Ballut ta' Marsaxlokk*

Furthermore, the proposed scheme site is not located within any areas designated as Natura 2000 site. The closest Natura 2000 sites to the project's scheme are two marine Special Protection Areas: MT0000111 (*Żona fil-Baħar fil-Lbiċ*) and MT0000108 (*Zona fil-Baħar fil-Lvant*) protected by the Flora, Fauna and Natural Habitats Protection Regulations, 2006 (S.L.549.44), located at a distance exceeding 2km from the project site. The scheme is not expected to impact any of these SPAs.

4.3 EU Legislative Context

Council Regulation (EU) 2022/2577 issued on 22 December 2022 lays down a framework to accelerate the permitting procedure in view of the urgent and exceptional energy situation. Hence, this regulation lays down exemptions from certain assessment obligations set in Union environmental legislation for renewable energy projects, for energy storage projects and electricity grid projects that are deemed as necessary for the integration of renewable energy into the electricity system.

4.4 Development Planning (Procedure for Applications and their Determination) Regulations (Subsidiary Legislation 552.13)

The scope of these regulations is to include clarity in legal provisions to ensure that the results of consultations and information gathered during the Environment Impact Assessment Process shall be duly taken into account in the development consent procedure. Additionally, these regulations describe the procedure adopted by the Planning Authority to the various development application types submitted for evaluation by developers to the Authority.

Schedule 1 of these regulations list the instances where a project is classified as a "Major Application" and hence, would or may require and Environmental Impact Assessment, and Appropriate Assessment or a Traffic Impact Assessment.

The proposed scheme has an area of approximately 4,990 meters squared, and hence, falls within the definition of a major application in accordance with Schedule 1(a)(v).

4.5 Construction Site Management Regulations (Subsidiary Legislation 623.08)

The scope of these regulations is to limit environmental degradation through appropriate construction management practices that cause the least nuisance to neighbours, to minimise the risk of injury to the public, to protect the property belonging to the Government and the local councils, and as much as possible to reduce the harm to the environment. These regulations shall have no bearing on the responsibilities related to construction sites emanating from other legislative instruments.

4.6 Assessment and Management of Environment Noise Regulations (Subsidiary Legislation 549.37)

These regulations provide the framework for the avoidance, prevention, or reduction of the adverse effects and annoyance resulting from exposure to environmental noise. These regulations transpose into Maltese Law the Environmental Noise Directive (END) (Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise).

4.7 Environmental Impact Assessment Regulations (Subsidiary Legislation 549.37)

These regulations transpose into Maltese Law:

(i) the EIA Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (codification), as amended by Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014;

(ii) the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) of the United Nations Economic Commission for Europe, and its First and Second Amendments; and

(iii) provisions of Regulation (EU) No. 347/2013 of the European Parliament and the Council on guidelines for trans-European energy infrastructure, with regard to the co-ordination of environmental assessment procedures arising from the requirements of Council Directives 2014/52/EU, 92/43/EEC and other related Union legislation.

Section 3 of Schedule I of these regulations describes projects related to Energy Infrastructure which are deemed as requiring an Environmental Impact Assessment. A review of this Schedule does not show that Battery Energy Storage System facilities fall within the remit of either Category I or II of this Schedule. Nonetheless, it is clarified that projects shall not be exempt from the provisions of these regulations on the premise that they are not explicitly or precisely specified, or that their title or description is different from that contained in this Schedule. Thus, in this instance and to avoid any doubt as to whether a project is covered by this Schedule, the precautionary principle shall be adopted and consultation with the competent Authority will be sought as clarification.

Further to the above, this section should be read in conjunction with Council Regulation (EU) 2022/2577 in section 4.3 above.

4.8 Ambient Air Quality Regulations (Subsidiary Legislation 549.59)

These regulations provide the framework, among other things, for the assessment of air quality, the ensuring of the accuracy of measurements, and the analysis of assessment methods. They transpose into Maltese Law Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air and the Air Quality Directive (Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe).

4.9 Industrial Emissions (Integrated Pollution Prevention and Control) Regulations (Subsidiary Legislation 549.77)

These regulations provide for the implementation in part of Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on Industrial Emissions (Integrated Pollution Prevention and Control). They also provide for the implementation of the Industrial Emissions (Framework) Regulations (S.L.549.76).

The proposed scheme site is covered by an Integrated Pollution Prevention and Control (IPPC) permit. Refer to section 3.2 above.

4.10 Standards commonly applied to battery energy storage systems

The following is a non-exhaustive list of technical standards, codes, and guidelines, which are concerned with the design, installation, and operation of BESS facilities:

Code	Description
IEC 63056:2020	Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium cells and batteries for use in electrical energy storage systems
IEC 62932-2-2:2020	Flow battery energy systems for stationary applications - Part 2-2: Safety requirements
IEC TS 62933-5-1:2017	Electrical energy storage (EES) systems - Part 5-1: Safety considerations for grid integrated EES systems - General specification
IEC 62933-5-2:2020	Electrical energy storage (EES) systems - Part 5-2: Safety requirements for grid-integrated EES systems - Electrochemical-based systems
IEC 62984-2:2020	High-temperature secondary batteries – Part 2: Safety requirements and tests
IEC 62281	Safety of primary and secondary lithium cells and batteries during transport
IEEE 519	Recommended practice and requirements for harmonic control in electric power systems
IEEE 1547	Interconnection and interoperability of distributed energy resources with associated electric power systems interfaces
IEEE P2686	Recommended Practice for Battery Management Systems in Energy Storage Applications
IEEE 2030.2	Guide for the Interoperability of Energy Storage Systems Integrated with the Electric Power Infrastructure
IEC	International Electrotechnical Commission
UL 1642	Standard for Lithium Batteries
UL 9540	Energy Storage Systems and Equipment
UL 9540A	Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems
UL 1741	Standard for Static Inverters and Charge, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources
UL 62109-1	Safety of power converters for use in photovoltaic power systems – Part 1: General requirements
UN 38.3	Certification for Lithium Batteries" (Transportation)
NFPA 855	"Standard for the Installation of Stationary Energy Storage Systems"

4.11 Malta's Low Carbon Development Strategy

Malta's Low Carbon Development Strategy4 also acknowledges that as renewables are intermittent in nature, some backup supply is required. It highlights that backup possibilities are that the existing interconnector (or an additional one) could be used, the existing CCGT

[4]https://meae.gov.mt/en/Public_Consultations/MECP/PublishingImages/Pages/Consultations/MaltasLowCarbonDevelopmentStrategy/Malta%20Low%20Carbon%20Development%20Strategy.pdf

plants could have their operating lifetimes extended if their capacity factors are reduced, and/or battery storage technology could be used. Regarding the latter, the storage period is still not particularly long and so currently would be better suited for daily / weekly fluctuations in solar resource, rather than monthly or seasonal fluctuations in wind resource. However, battery technologies are improving consistently and at a fast pace, and so longer storage times that may suit the specific renewable energy systems could be implemented in future. The LCDS also highlights that the existing support for battery storage technology is unlikely to be of an adequate level for large-scale roll-out of battery storage systems, and Malta shall be seeking EU funds to bridge the gap.

4.12 Malta's 2030 National Energy and Climate Plan

This NECP document[5] states that, currently, Malta has no utility scale battery storage facilities, and keeping large spinning capacity is highly inefficient and may not be technically viable at all times.

Additional electricity generation from RES shall also be aligned with the exigencies of a stable grid. Hence, this plan promotes the options which facilitate the integration of battery storage in view that these promise to provide several benefits, including better voltage regulation on the distribution network, peak shaving, increased self-consumption and demand management.

4.13 Multi-Annual Financial Framework[6] (MFF) 2021-2027 Programme

Battery Storage is specifically listed under the Specific Objective RSO2.3. "*Developing smart energy systems, grids and storage outside TEN-E"* under Priority 2*: "Promoting clean and fair energy transition, green and blue investment, the circular economy, and sustainable urban mobility"* of the 2021-2027 Programme.

Under the Specific objective: RSO2.3. Developing smart energy systems, grids and storage at outside TEN-E (ERDF), energy storage solutions are considered essential for the further deployment of large-scale RE including PV capacity, and for the optimization of the power system by providing for demand management and peak demand shaving. In this regard the programme states that to reduce carbon dependency, leading to energy and power autonomy that sustains a resilient economy and society, initiatives to support the enhancement of energy storage will be supported. Thus interventions under the programme will aim to further stabilise fluctuations in energy demand and supply.

The MFF document justifies the potential interventions of funds for "Investment in energy storage and campaigns" as follows:

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[5] https://energy.ec.europa.eu/system/files/2020-01/mt_final_necp_main_en_0.pdf
[6] https://energy.ec.europa.eu/system/files/2020-01/mt_final_necp_main_en_0.pdf

- The electricity demand profile is characterised by two daily peaks, one around mid-day, and another more pronounced peak, in the evening. The peaks determine the capacity of the required power system, and the larger the gap between the peaks and the troughs, the less cost efficient the power system is, as more capacity would be required to meet the peak for a short interval. Over the past decade the daily power demand profile has evolved, with the significant increase of distributed generation by PVs, which have attenuated the mid-day peak in summer but contribute marginally towards the winter afternoon peak and none towards the evening peaks which occur after the sun sets. This increase in demand which is now mainly reflected in higher evening peaks has a negative impact on the optimization of the power system.

- One effective way to mitigate such a situation is to deploy battery storage which would be charged during times where either "excess" RE is available, which happens at times when it is not deemed practical or efficient to turn down conventional generators, or else during times of low demand such that generators are kept running at near optimal levels. The stored energy can then be discharged during peak demand, thus shaving off part (or all) of the peak. This allows the power system to operate more efficiently and can also replace the need for additional peaking generation capacity which is generally operated using fossil fuels.

- An important effect of the large-scale deployment of intermittent PV installations concentrated within a small geographic footprint is the rapid fluctuations in output caused by cloud cover. The present situation, with over 200MW of installed PV capacity is already proving to be challenging. Stability can already be jeopardised during those instances when the interconnector is out of service. The risk is expected to increase as more PV installations are installed, with a target of 266MW set for 2030 in the NECP, and the intention to increase this further in the updated NECP due in 2024, in line with the increased ambition of the Fit for 55 package. Unless mitigation measures are in place to stabilize the effect of PV intermittency, additional PV installations shall lead to grid issues and possible curtailment or limitation on further RE installations. Battery storage is considered as an effective solution to provide the necessary rapid response to inject energy during sudden drops in PV electricity output, thus smoothing the generation profile.

- Utility scale battery storage can therefore contribute towards the optimization of the power system configuration and daily operation and enable the addition of more intermittent PV installations. This investment is key to Malta's capacity to meet RE and decarbonization targets in line with the EU's targets for 2050 under the Green Deal. Such investment is also in line with the priorities outlined in Malta's Smart Specialisation Strategy including the need for investment in energy storage solutions. Initiatives supported will be complemented by an awareness raising campaign targeting energy savings and efficiency, and the promotion of energy storage solutions and their related benefits as key enablers for the transition towards climate neutrality.

5.0 Technical Description of the Project

A Battery Energy Storage System (BESS) is an "electric storage resource capable of receiving electric energy from the grid or other electric resource and storing it for later injection of electric energy back to the grid." When referring to a BESS facility in relation to renewable energy, the system would be capable of storing power generated from renewable energy sources (such as solar or wind-generated power considered to be as variable generation sources which increases uncertainty and variability on the grid) in order for this stored power to be utilized at a later time.

The role of BESS will continue to play an integral role in today's realities in view that EU member states are shifting away from the reliance on fossil fuels.

Lithium-ion batteries remain the dominant resource used in BESS facilities. Developments for larger-scale applications have already seen this technology becoming an integral feature in powering electric cars. BESSs are now also being connected with electricity grids to provide power for residential and industrial uses.

The primary purposes of BESS facilities are the reduction in use of fossil fuel plants and the replacement of their backup power supplies using energy generated from renewable technologies stored in batteries. The advantages of integrating BESS systems include:

(i) Store energy generated by renewables during hours of maximum delivery and use that during peaks, thus flattening the variance between day and evening on conventional generation plant output. This in turn is expected to increase the efficiency of the conventional plant in operation and thus reduce its emissions as excess RES generated will be stored and then used to displace the starting up/ramping up of CO2 emitting plants.

(ii) Protect the environment and relieve the stresses caused by growing demands for energy.

(iii) Address grid bottlenecks to accelerate the penetration of RES and offer solutions to alleviate congestion in the distribution network.

(iv) Reduce the effect of the variability and intermittency caused by renewables, in periods of variable cloud cover, and thus permit the operation of conventional plant in a more stable manner, with inherent gains in plant reliability, plant emissions and CO2 emission savings, thus enabling the ingress of further RES power generation thereby reducing the use of fossil fuel for electricity generation. Limited interconnectivity, lack of battery storage and restrictions in the local distribution system, are all currently considered major bottlenecks for the country to accelerate the penetration of RES (both onshore and offshore) due to its inherent intermittency.

(v) Promote a continuous flow of renewable energy by utilizing power reserves when the natural energy sources experience a dip – flattening the daily variations on the energy demand curve.

(vi) Energy Demand Management – balance loads between on-peak and off-peak times.

(vii) Provide a source of secure supply in cases of plant outages in order to enhance the grid's resilience and balancing the distribution grid for the BESS/s situated outside DPS precincts.

(viii) Provide a reliable backup source of energy in case of an electricity grid failure until complete power restoration that does not rely on local power generating plants. In this instance, BESS is operated as an uninterruptable power supply (UPS).

(ix) Black-Start capability provided the fast response time of such a system reduced the recovery period for power generation plants.

(x) preventing congestion in transmission systems by temporarily storing excess energy.

(xi) Provide fast frequency and voltage stabilisation to the Maltese grid in case Malta is isolated from the Entso-e grid because of maintenance or faults.

5.1 How BESS work

A Battery Energy Storage Systems is a compound system made up of various hardware modules along with control software low-level and high-level software. The main BESS components include:

a. Batteries which are used to convert chemical energy into electrical energy and vice-versa,
b. battery management systems (BMS) which are used to monitor the condition of battery cells and ensure that they are operated safely, and avoid the possibility of failure developing into fires and other hazards,
c. power conversion systems (PCS) that convert and control energy flow to and from the batteries,
d. energy management system (EMS) that monitors and controls the energy flow within a BESS
e. auxiliary systems such as temperature control systems, fire detection and suppression systems,

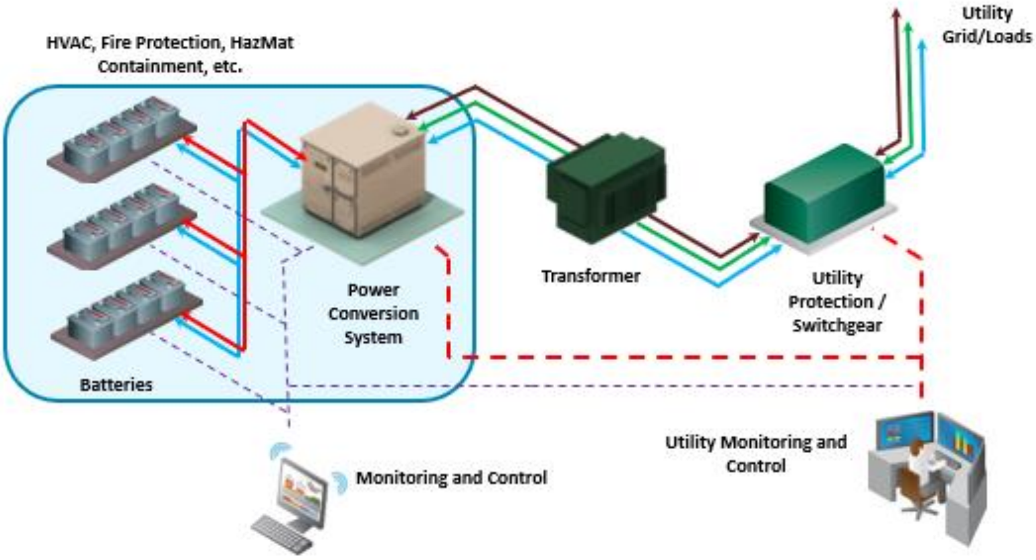

Figure 11*: The components of energy storage systems connected with the electricity grid (Source: EPRI)*

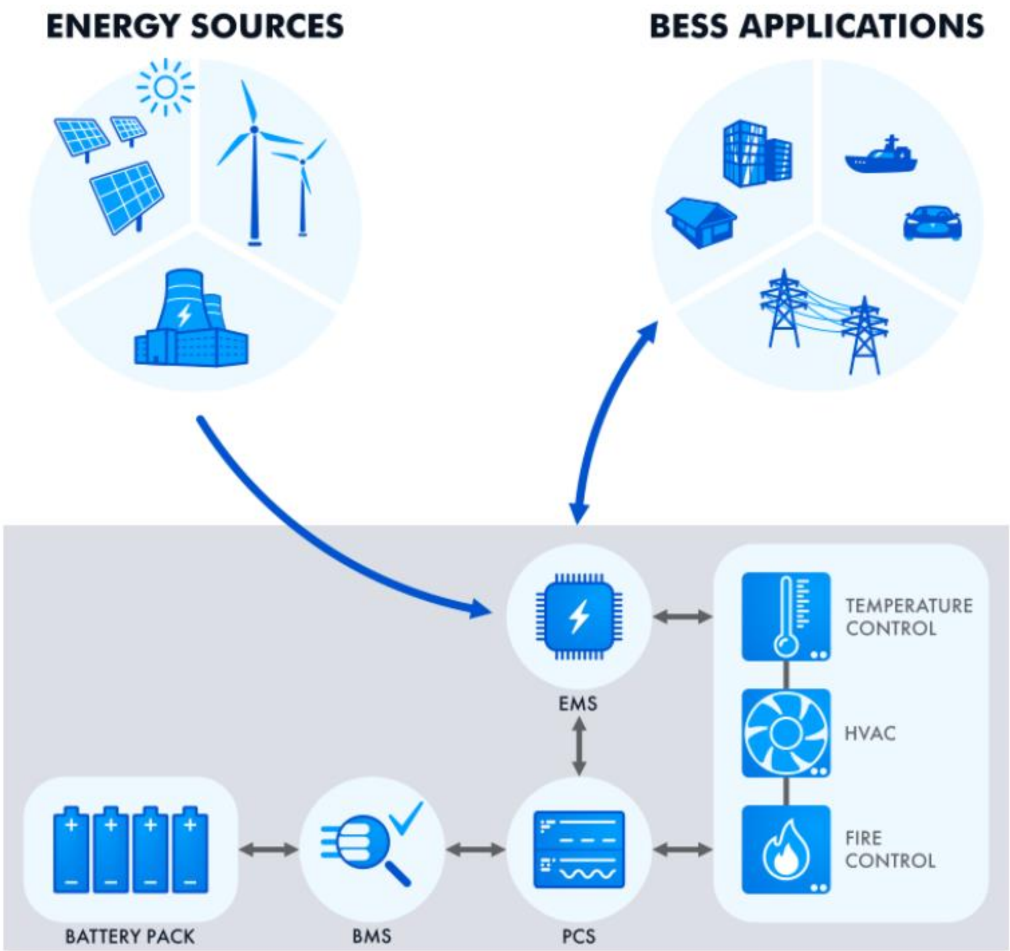

Figure 12*: Infographic showing how BESS systems work*

For the purposes of this BESS facility at DPS, off-the-shelf battery energy storage system solutions are being considered – these offer a cost-effective and modular way to store energy, are readily available, less time-consuming and can also be easily transported and deployed in different locations. Modular construction considered in this report includes batteries inside 20ft or 40ft containers, provided by various economic operators in the industry.

Typical approximate dimension of containers are the following:

- 10ft container: 3.05m by 2.45 by 2.90m (L x W x H)
- 20ft container: 6.10m by 2.45m by 2.90m (L x W x H)
- 40ft container: 12.20m by 2.45m by 3.00m (L x W x H)

Adopting a modular component approach ensures minimisation of the impacts of such an installation on the available land, also keeping in mind the eventual ease of decommissioning of such a facility. By installing outdoor type installations, housing of the various components within new permanent structures is not envisaged. In this regard, such an installation is considered as easily reversible to its original condition.

Typical BESS facilities for energy storage connected with the national electricity grid include the following components: battery racks, power conversion systems (PCSs), converters, auxiliaries, step-up transformers, switchgear, control systems, cooling systems for thermal management, fire detection and suppression systems, intra system cabling and other ancillary equipment.

5.2 Size, Scale and Design of the Project

The overall size of the project site measures approximately 4,990 meters squared.

Part of the site is at a distance of less than 30m away from the quay. In accordance with S.L. 499.12, such area is designated as a Danger Area[7] – hence, that falls within this envelope will have no permanent components forming this BESS facility.

Based on the available space for this BESS facility, and on initial market research of such battery energy storage systems, the system is estimated to generate approximately 30MW, 60MWh.

Stacking of battery containers is also possible. This will allow an increase in capacity without increasing the footprint.

The above data is subject to change upon detailed analysis and system design, based on the available market solutions that can be adapted to the DPS site.

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[7] Any area contained within an envelope enclosing a distance of thirty metres from any part of a ship engaged in the operations specified in regulation 33(16), shall be regarded as a danger area. (Article 34, S.L. 499.12, Laws of Malta)

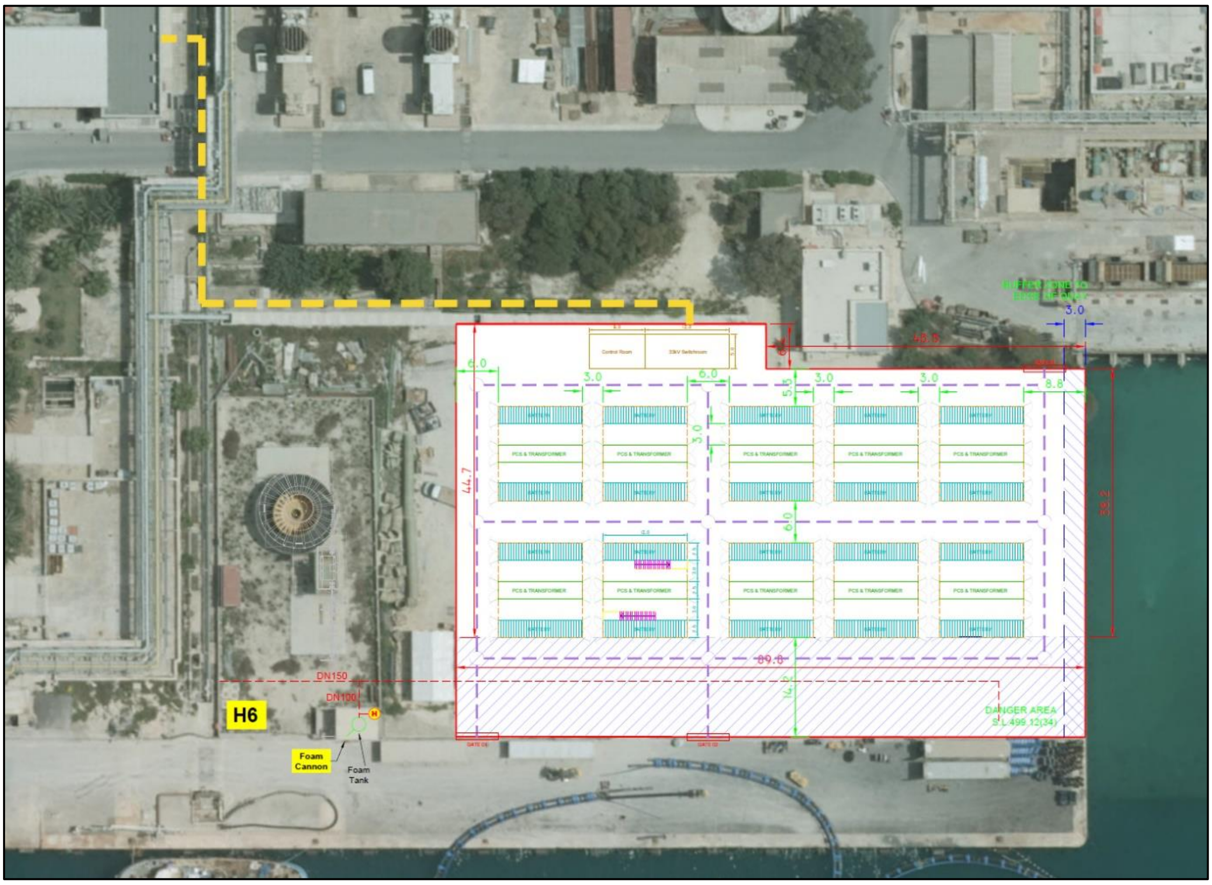

***Figure 13**: Preliminary schematic layout of the scheme site (to be updated)*

The final solution for the design and layout of the BESS will be determined in due course, once the detailed analysis and design of the BESS facility are concluded following the completion of the Cost Benefit Analysis and the feasibility study of such project. Additionally, more detailed surveys and field investigations are to be undertaken in order to provide necessary design data.

The various components making up the BESS facility will be connected with each other within the site extents through cables, which can either be located in trenches/culverts or supported overhead through cable ladders and cable trays – the choice of methodology will depend on the type of proprietary equipment deemed suitable and feasible for this site. Furthermore, the BESS facility will be connected with the existing 33kV switchgear rooms (PA 00144/16) within the same power station through a combination of existing or new culverts and trenching within the existing internal road network. The proposed route will follow the indicative route marked in yellow in Figure 13.

5.3 Technology adopted

The technology to be adopted shall be studied by the Consultant to be employed by ICM (a call for offers through an open tender procedure has been issued recently) who will consider the state of technology and future trends, costs and market availability. The evolving nature of the technology means that a definitive optimum battery type and converter technology will be decided at a later stage and before a competitive call for tenders of the EPC project is issued.

Currently the preferred battery technology available is Li-Ion. These batteries are used widely as an energy storage technology because of their high energy density and charge/discharge cycle fatigue resistance. Li-Ion cells consist of one positive electrode (e.g. Lithium Cobalt Oxide, Lithium Iron Phosphate, Lithium Nickel Manganese Cobalt Oxide and other chemistries) another negative electrode (e.g. Carbon), a separator which keeps the electrodes apart while conducting ions, and an electrolyte to conduct the ions (usually Ether, an organic compound derived from hydrocarbons). Li-Ion batteries have a fast response time which makes them preferable for power application in grid-scale deployment, especially when RES penetration is high, and if the Maltese network is islanded.

The final selection of the appropriate battery chemistry and arrangement will consider:

a. Performance:
    (i) Power rating
    (ii) Optimum state of charge range – considering number of cycles per day and depth of discharge likely to be needed
    (iii) Self-discharge rates
    (iv) Cell losses – through heat generated which affects system efficiency and cooling considerations
    (v) Rest periods required after the cycles, and
    (vi) End-of-life condition
b. Safety:
    (i) Mechanical integrity
    (ii) Fire-risk assessment considering likelihood of thermal runaway and specific fire safety requirements
    (iii) Emissions – no process emissions are envisaged (air or water leakage), however some noise is generated from the cooling systems and transformers.

A BMS suitable for the type of battery chosen will be provided to ensure battery longevity and safe operation.

There are various types of PCS technology that could be adopted for the BESS project. The call for competition will specify the requirements of the quality (magnitude and harmonic content) of the voltage generated by the converter at its point of connection with the Maltese grid, operational requirements and performance, and the bidders are expected to offer their most cost-effective topologies meeting the specification whilst taking into account various considerations including the number of components (semiconductors and wound components), overall conversion efficiency, switching frequencies, filtering, battery characteristics, and cooling requirements. BESS manufacturers offer various solutions that could be used for this Project and the final choice of converter type will only be made at a later stage.

5.4 Work life of the project

5.4.1 Commissioning and Operation phase

Training for personnel working on BESS facility shall cover mechanical and electrical operation and maintenance training topics.

5.4.2 Inspection and Maintenance phase

The required maintenance works will be carried out according to the recommendations brought forward by the suppliers/manufacturers, ensuring good engineering practices. This will result in a cost-effective strategy that will ensure the BESS facility's optimal energy efficiency performance.

Use of maintenance records that integrate maintenance management programmes is a requirement at the facility. Common and fundamental replacement parts should be ordered and stored to ensure a reduced downtime of operations when any engineering system breaks down.

Regular service checks and upkeep of the facility components and associated equipment shall be carried out in accordance with good housekeeping practices for such energy storage systems.

Adopting a predictive maintenance approach which involves the monitoring of the various BESS components for changes in operating parameters that may be indicative of a pending fault. Such changes indicate the need for maintenance while the fault is still recoverable and prevent potentially catastrophic failures from occurring. Hence, predictive maintenance prompt intervention.

Predictive maintenance will be adopted along with routine maintenance.

Preventive and predictive maintenance are mature concepts for operational systems in the industry. Operators are to complete preventive maintenance on a routine basis (weekly, monthly, annually, etc.) based on average or expected lifetime statistics for BESS components.

5.4.3 Decommissioning and End-of-Life phase

The proposed BESS facility project has an estimated lifespan of 10 to 15 years. Although the proposed development does not envisage any permanent works on site except for the construction of the foundation and associated cable trenching. All other components are demountable or removable, a decommissioning plan will be prepared in the eventuality that the BESS facility is considered for complete termination. However, in view of the componentized nature of battery energy storage systems, it may be considered that only the parts of the system that reach their end of lifespan need to be replaced.

In the eventuality that the BESS facility operator decides to terminate the operations, a decommissioning plan will be prepared, describing how to dismantle the infrastructure and restore the site to a condition suitable for future land use. Normally, much of a plant is recyclable, minimising waste to landfill.

The decommissioning plan will include an outline for the following activities:

a) Shutting down and removing system from service.
b) Disassembling, removing, and transporting off-site system components.
c) Disposal, reuse, and/or recycling of BESS facility components.
d) Site restoration and remediation, if necessary.

6.0 Indicative Timing of the Project

The current indicative project timelines are shown below:

Description	Indicative Timeline
Geotechnical Sampling and Analyses:	Q2 2023
Preliminary BESS Design and Configuration Layout	Q2 2023
Submission of Development Permit Application	Q2 2023
BESS facility Detailed Design	Q1 2024
Publication of EPC Tender	Q2 2024
Award of EPC tender	Q3 2024
EPC Design of BESS facility	Q4 2024
Civil Works	Q2 2025
Manufacture of Equipment	Q4 2025
Delivery and Installation	Q1 2026
Testing and Commissioning	Q1 2026
Start of Operation of BESS facility	Q2 2026

7.0 Alternative uses, technologies and locations for the project.

7.1 Alternative Technologies Considered

The most important energy storage technologies are:

7.1.1 Pumped hydro

Pumped hydro storage constitutes c.96% of total energy storage and power capacity and is commercially mature technology but is site specific and not applicable to Malta.

7.1.2 Thermal

Thermal energy storage applications are, at present, dominated by CSP plant, with the storage enabling them to dispatch electricity into the evening or around the clock. Molten salt technologies are the dominant commercial solution deployed today and they account for three-quarters of the globally deployed thermal energy storage used for electricity applications. CSP plants require vast areas of land and thermal energy storage on a grid-scale is not currently practical in Malta.

7.1.3 Electromechanical

The most important technologies used are compressed air and flywheel storage. A small number of installations worldwide have been installed, some of which utilise underground (e.g. salt) caverns and possess large values of stored energy.

7.1.4 Electrochemical

This is the most rapidly growing market segment although its current penetration worldwide is still small. Lithium-ion (Li-Ion) batteries account for the largest share of operational capacity and there are small contributions from NaS and flow batteries. The cost of Li-Ion batteries has fallen substantially in the last 10 years and have made them attractive for use in stationary grid-scale applications. Their efficiency, modularity, improvements in battery management and electrical conversion equipment have made batteries the most applicable technology for this project. Although a final decision has not yet been taken on the choice of battery technology to be used at DPS, it is likely that Li-Ion batteries will be employed.

7.2 Alternative Locations Considered

ICM has explored and analysed alternative locations around the Maltese Islands that have the potential to allow for the installation of a BESS facility in the short term, with a view of enhancing the choice of sites in a bid to eliminate potential risks and delays in the timely implementation and commissioning of the same BESS facility.

Risks identified include:

- Sites not close to major electrical infrastructure where bottlenecks are to be addressed.
- Sites not already planned for electrical infrastructure thus compromising further land.
- Procurement and implementation delays.
- delays in securing rights and/or titles over potential sites.
- delays in obtaining permitting for the installation and operation of the installation.

In an attempt to expediate the choice of adequate sites and use areas already earmarked for energy infrastructure, ICM in consultation with Enemalta, explored already Enemalta owned sites and analysed their potential in allowing for a BESS installation within their site extents.

For the purposes of site analysis, the following criteria were deemed to be relevant:

- Addressing bottlenecks
- Accessibility to the electrical infrastructure and transmission facilities
- Site extents and size
- Zoning of the area – site should be away from residential and touristic areas, and free from archaeological deposits, agricultural activity and sensitive ecological areas
- Local Plan policies
- Location vis-à-vis other site installations
- Site Limitations
- Visual Impact
- Known structural capabilities and/or limitations
- Ease of accessibility
- Technical limitations and restrictions
- Adequate circulation space
- Interference with known existing infrastructure

A high-level analysis of a number of Enemalta owned sites was performed including (i) existing power generation sites, (ii) existing Distribution Centres, (iii) sites within decommissioned power stations.

The proposed scheme site was deemed as the most suitable site and selected for this project in view that it fulfils the main criteria outlined above, and provides a number of advantages, mainly the following:

- **Size**: the size of the alternative sites did not have adequate space for the installation of the numerous components needed within a BESS facility

- **Ownership**: Enemalta, as the local DSO, already has a title over this site
- **Nature of Site**: being within the Delimara Power Station, the site is already committed for industrial use, particularly energy related.
- **Layout**: the layout of the site being considered is adequate for the installation of modular components

Considering the environmental, social, economic and technical issues, the proposed Scheme site within Delimara power station is deemed to satisfy the abovementioned criteria and an adequate location for the development of the proposed project.

8.0 Description of the Services Available on Site

8.1 Sewage, Energy and Water

It is envisaged that, once commissioned, the BESS facility will remain largely unmanned during the whole lifetime of the project with control being undertaken remotely from the Control Centre.

No new sewer connection points are deemed as necessary.

8.2 Surface Water Run-off and Storm Water Drainage

Currently, upon reaching the ground at the project site, rainwater is partly led to the sea as run-off through surface drainage. Part of the rainwater percolates into the ground and goes to recharge the mean sea level aquifer, whilst a proportion of the water is returned to the atmosphere by evaporation. Owing to the long, hot and dry season of the Maltese Islands, this process is very high and is taken as an average of 60% evaporation. However, as the site lays on Middle Globigerina Limestone, an impermeable rock, it is likely most of the rainfall will end up as surface run-off which will be discharged into the sea.

Modern BESS typically use a dry-type technology and are normally stored in containers as to cover the system from the natural elements and environment. It is not envisaged that there shall be changes in the present surface water run-off and storm water drainage systems due to this project.

It will be ensured that the site remains adequately clean, thus no contaminants will be taken up by the rainwater and transported into the sea. If considered necessary for the proper stormwater management of the site, a stormwater runoff management installation may put in place to collect water and pass it through the station's stormwater management system prior to discharge into the sea.

The following table provides a calculation of average surface water run-off expected to be produced by the proposed development:

Average annual rainfall	550mm
Evaporation	60%
Recharge	0%
Run-off	40%
Area of the proposed development site	4,990m^2
Average Annual Run-off (40%)	1,995m^3
Average Annual Run-off (60%)	2,995m^3

Table 4*: Average surface water run-off expected.*

Run off from this development will not impact the existing adjacent DPS facilities.

9.0 Number of employees in Each Phase of Development

9.1.1 Construction Phase

At this early stage, it is not possible to give details of the number of contractor employees who shall be engaged during the construction and testing phases of the project. This shall be determined at a later stage.

9.1.2 Operational Phase

There shall be no employees permanently manning the BESS facility within Delimara Power Station during the operations phase. Operations shall be carried out remotely from the existing control room at Delimara or the national Network Control Centre at Marsa. However, maintenance and repair and occasional switching operations shall be carried out on site.

10.0 Nature and Quantities of Raw Material, Energy, Waste and Machinery used during the Construction and Operation Phases

10.1 Waste Management

Excavation is expected to be minimal in order to reduce the excavation waste generated by this project. Quantities of inert construction and excavation material are expected to be minimal minor excavation works are only expected during possible trenching to connect the various project's components with each other. Additional excavation may be required during the implementation phase of the structural foundations of the site – however, in view that the project is still in its initial phases, this is not yet determined.

Given that the various units will be manufactured off-site and only brought to the site in a finished or semi-finished manner, it is expected that on-site procedures will only involve assembly. Thus, it is expected that there will be very little waste generated on-site.

There will be no waste generation during the operational phase of the scheme.

10.2 Odour emissions

No odour emissions are expected as a result of this BESS installation.

10.3 Noise emissions

Temporary and short-term noise generated during construction phase. To mitigate these impacts, the construction phase will abide with the Environmental Management Construction Site Regulations.

During the operation stage, the BESS facility is not expected to generate any type of noise disturbance. Nonetheless, in view that the proposed BESS facility will be located within the site boundaries of IPPC 0002/21, the operators will abide with the conditions set out in the permit, mainly not to exceed the background noise level by 5dB at the noise sensitive receptors.

In the case that any part of the BESS equipment and components are causing unexpected high levels of noise, the operator will be responsible to take the necessary actions to reduce the noise impact including fixing the machinery as soon as possible or provide necessary noise abatement equipment.

10.4 Operational Phase

No machinery is deemed as necessary during the normal operation phase of the BESS facility. In cases of repair and/or replacement of failed components within the site, machinery expected to be used are cranes, trucks and fork lifters.

10.5 Raw Materials

The raw materials that will be used for the construction and operation of this BESS facility are highlighted in the following table.

11.0 Access and Parking Requirements

11.1 Access

Access to site shall be attained through the main gate at Delimara Power Station using the internal road network and quay within the station.

As per IPPC 0002/21 conditions for the Delimara Power Station, site security systems are implemented at all times to prevent access which is not authorised either by the Permit Holder(s) or under legal powers of entry.

During the construction phase, access shall be required for the construction, installation, testing and commissioning.

Following the construction and installation of the project, access requirements to the BESS station within Delimara Power Station shall be limited to authorised personnel only for maintenance and inspection purposes. The BESS facility itself shall be unmanned, however, it is located within the Delimara Power Station whereby operations of the various components are carried out by different operators.

The proposal does not warrant alternative arrangements in terms of transport.

Furthermore, no visitors are expected to visit the site except for educational purposes. The existing access arrangements will remain unchanged.

11.2 Parking

No additional parking requirements are considered necessary with the construction and commissioning of this installation. The existing parking facilities within the Delimara Power Station or the vicinity are deemed sufficient.

11.3 Effect on Road Network

The existing infrastructure can adequately accommodate the construction vehicles and the delivery or equipment on site.

No significant additional traffic is being anticipated to and from the site. Thus, the scheme will not cause capacity issues or any noticeable impact on the existing road network leading to the site. In view of this, this development does not require a Traffic Impact Assessment (TIA).

12.0 Long Term Developments

It is being assumed that the proposed BESS facility would be operational for at least 10 to 15 years. During its lifetime, this BESS facility may be further enhanced and upgraded with additional components, subject to space availability or new technology.

After the operational period, the proposed installation will be either decommissioned or upgraded with up-to-date technology:

12.1 Scenario 1: Decommissioning of the project

The proposed development does not envisage any permanent works on site except for the construction of the foundation and associated cable trenching. All other components are demountable or removable.

As indicated in section 3.2 above, the proposed scheme falls within the site of IPPC permit IP 0002/21. Thus, the decommissioning of the BESS facility will be discussed with the relevant authorities to comply with the decommissioning requirements at that stage.

However, it is understood that, in the eventuality of the decommissioning of the proposed BESS facility, the IPPC permit will not require surrendering at this stage and the boundary of the permit will not change. For this reason, no requirements at the decommissioning stage would be deemed as necessary for remediation of the site area; remediation will be undertaken as part of the whole site when the IPPC permit is surrendered in full.

Furthermore, it is being anticipated that no sub-surface ground excavation will be undertaken during the decommissioning works. However, should the decommissioning works involve excavation of the sub-surface, then in accordance with best practice guidance, a ‘watching brief’ should be implemented during the programme, whereby unusual or ‘out-of-character’ materials (if identified) can be assessed or stockpiled/contained until such assessment can be undertaken. If hazardous materials are identified, these should be subject to site contingency plans, health & safety risk assessment and outline method statements/procedures for their identification, handling, removal and disposal.

12.2 Scenario 2: Upgrading of the Project

The battery energy storage system industry can provide a scenario were upgrading of the system may be possible and feasible due to future technological developments. In this regard, the proposal foresees for this eventuality and the supporting infrastructure is easily demountable and can be reconfigured as dictated by future technological requirements.

13.0 List of major environmental impacts and mitigation measures

Notwithstanding the fact that the proposal is deemed to be an acceptable use, the proposal would only be considered favourably if it does not give rise to overriding adverse impacts.

The potential for adverse environmental impacts associated with similar Battery Energy Storage Systems are being identified in this report. Adequate mitigation measures to address such impacts will also be listed.

13.1 Impacts and Mitigation Measures

A preliminary list of the potential environmental impacts arising from the project is shown in table below.

Features Potentially Impacted	Description of Potential Impact	Mitigation Measures
Land cover and land use	Existing land use on reclaimed land is not expected to be heavily impacted. This process will not involve heavy construction practices are not envisaged in this scheme. Type of installation allows ease of reversibility. Thus, effects on land use are minimal to none.	None required.
Sea use	No sea use impacts are expected to be generated with the proposed project	None required.
Marine Environment	No impact to the marine environment is foreseen given that works will be carried out on a terrestrial site already earmarked for electrical infrastructure and no offshore activities will be carried out.	None required.
Terrestrial Ecology	No impact to terrestrial ecology expected since all works shall be carried out within an area allocated for industrial uses. The light and noise pollution generated from the BESS facility operations are expected to be negligible, even more when compared to the current situation at Delimara Power Station. Therefore, it is not	None expected.

Features Potentially Impacted	Description of Potential Impact	Mitigation Measures
	expected to impact the respective vertebrate and invertebrate communities.	
Agriculture	No impact on agriculture from the proposed development.	None required.
Cultural Heritage	No impact to known onshore cultural heritage objects is expected from the proposed development.	None expected. Superintendent of Cultural Heritage (SCH) to be informed of the project.
Geology, Geomorphology, Hydrology, Hydrogeology	The proposed development will not be having any significant impact on the geo-environment of the area, since no heavy construction and excavation works are required. The project involves the use of a circa 4,990m^2 area which has been allocated by Enemalta for future expansion. No contamination of groundwater is expected as a result of the operation of the BESS installation.	
Landscape character and visual amenity	Slight increase in the industrial elements within the Delimara peninsula, caused by the placement of BESS facility within DPS. No significant impacts on the landscape and visual amenity of the area are expected. All works will be carried out within an already industrial site dedicated to energy generation and distribution. No added buildings are envisaged.	None expected.
Agricultural Land	No direct impacts from the proposed development.	None required.
Air quality	Minor negative impact on air quality and possibly dust emitted during the construction/ installation phase only.	Abiding with the Environmental Management Construction Site Regulations.
Noise	Temporary and short-term noise generated during construction phase.	Abiding with the Environmental

Features Potentially Impacted	Description of Potential Impact	Mitigation Measures
		Management Construction Site Regulations.
	During the operation stage, the BESS facility is not expected to generate any type of noise disturbance.	Abiding with the conditions set out in IPPC 0002/21: (i) not to exceed the background noise level by 5dB at the noise sensitive receptors (ii) noise monitoring
Waste Management		Compliance with all relevant waste management regulations and the adoption of best practice in relation to both construction and operational waste management
Health, Safety and Explosion Risks		Ensure that all safety measures are in place.
Wastewater	No wastewater is expected to be generated during operations phase. Any waste water generated in operation phase shall be collected in a cesspit and disposed of through appropriate manner.	
Transport	Additional trips on the local transportation network during construction and commissioning phase.	
Artificial External Lighting	It is likely that the new facility will be furnished with exterior lighting fixtures during the operational phase, details of which are not yet available. This is deemed to have a direct, adverse impact of moderate significance on avian species.	If lighting is required, downward facing luminaires should be installed within the facility to reduce light pollution during the operational phase and shall be limited to the safe operation of the facility. Avoiding floodlights, where possible.

Features Potentially Impacted	Description of Potential Impact	Mitigation Measures
		Lights facing seaward should be avoided as much as possible. If deemed feasible, intelligent lighting solutions may be considered.

ANNEX 01: Delimara Power Station site limits, as per IPPC permit