

Proposed Local Generating Capacity at Delimara Powerstation

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1. The Proposed Development

1.1 General introduction

Today, electricity contributes directly to the standard of living and economic growth of the nation. With the exception of transport and heating purposes; all economic activities are directly powered by electrical energy produced at the two power stations operated by Enemalta Corporation. Moreover, electricity generation is a significant contributor in the local environmental dynamics in particular in terms of air quality.

Enemalta Corporation is authorised by its constituting legislation – the Enemalta Act, Chapter 272 of the laws of Malta and is currently the sole electricity utility and the major provider of the nation's electrical energy. As long as the current situation remains, Enemalta Corporation has the de facto responsibility of meeting current and anticipated electricity needs and to provide electrical services to electrical consumers in Malta and Gozo. This is currently achieved by operating two power plants at Marsa and Delimara which are both fossil-fuel powered.

Enemalta Corporation continuously faces new challenges in meeting environmental standards, heightened by the more recent European Union Directives. Moreover, in line with the Large Scale Combustion Plant Directive, it has committed itself to decommission the Marsa Power Plant by not later than 31 December 2015 or until the Marsa Plant has operated for 20,000 hours since January 2008, whichever comes first. Considering that a year has 8,766 hrs and that the Marsa Power Plant is currently active for most of the time the allocated operational hours are expected to run out some time in April 2015. Whilst on the one hand the practice of generating 245MW in a highly inefficient manner will stop, this will create a shortage in generating capacity. The current power output of the Delimara Power Plant of 295 MW will not be able to meet the demand for electrical energy.

In order to partly address this shortage in generating capacity, Enemalta seeks to build a 144MW extension to its existing power plant in Delimara. This document, referred to as the Environmental Impact Statement (EIS) is part of the Environmental Impact Assessment (EIA) carried out by the independent consultancy firm AIS Environmental Limited.

1.2 Justification for the Development

The principal objectives and justification for the proposed development are:

- To comply with EU Directives on emissions
- To comply with National Emissions Ceiling Directive
- To comply with Greenhouse Gas Trading Scheme
- To address the increased demand of electrical energy
- To enable the closure of the Marsa Power Station

1.3 Proposed timing

The construction is expected to follow a two year timeframe.

1.4 Alternative sites

The proposal is for an extension to the existing power plant located at Delimara. The site selection process therefore focused on the site suitability. In order for the site to be deemed suitable, various criteria of requirements needed to be satisfied. These included:

- 1 The proposed development must be close to the sea to provide for plant cooling requirements and berthing/transportation requirements; both in terms of fuel transportation and the transportation of the plant itself. Therefore the site needs to be within a sheltered harbour area.
- 2 Close proximity to existing transmission facilities.
- 3 The site is located in an area such that the north-westerly prevailing winds disperse any stack emissions away from land and inhabited areas.
- 4 The site suitability process took also into consideration that the site is free of archaeological deposits, agricultural activity and sensitive ecological areas
- 5 The area is free of industrial activity and is well away from defined and established touristic zones.

Whilst within the Marsa Power Station a site could have been identified to accommodate the proposed new electrical generation plant, providing spatial area to accommodate the new plant would require major alterations with long hours of power cuts. It also does not satisfy criteria 3 above. Additionally the Marsa site is problematic in terms of public nuisance as it is located in a heavily residential area and major traffic zone. When considering all these factors, including the technical limitation associated with linking the Marsa facilities to the Marsa Distribution Centre by excavating trenches causing major traffic interruptions, the Marsa option creates far too many problems than locating the proposed extension at Delimara.

When considering the environmental, social, economic and technical issues, Delimara is seen as the only possible site for developing the proposed project.

2. Planning policies and Legislation

The main legislative provisions are: EU Council Directives; Maltese main legislation: Acts of Parliament; Maltese subsidiary legislation: Legal notices including those which transpose EU Directives into Maltese law. These include the structure plan for the Maltese Islands and various legislation covering the Marine Environment, Solid Wastes, Noise, Disposal of Waste Oils, Air Quality, and Large Installations.

3. Land and Sea Use

The proposed site for the 144MW project lies within the Delimara Power Station complex. Access to the said site is through a separate road network through Powerhouse road. This road leads directly to the Delimara Power Station Complex, which has an apposite internal road network, intended to support the proper and safe operation of the plant.

Since the proposed development is to be situated at a location that is already presently serving as part of the Delimara Power Station site, the addition of the proposed development shall not alter the land use of the site itself.

As the site is earmarked for significant construction activity, the potential for impact on surrounding land uses through nuisance caused by noise and vibration and dust emissions exists.

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 traffic increase in the area, especially on arterial and nearby roads, due to the use of vehicles associated with the construction phase of the proposed development.

The proposed development is not anticipated to have any further impact on the bathing sites in its vicinity. This is because cooling water required for this plant is to be taken from the existing sea cooling water inlet and shall be discharged to the existing outfall.

There is likely to be an increase in marine traffic in the area as a result of the waste export by sea during the operational phase of the project. This is considered to be a moderate impact.

4. Geology and Hydrology

One of the main impacts as a result of the construction phase of the development is expected to be the production of substantial quantities of waste stone material during the excavation of the site to the required invert level.

Another primary concern during construction would be the potential instability of the walls of the excavation. This is considered of being of moderate impact, as the excavation cannot be more than about 2m deep. It is the original excavation which has a high instability risk.

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 has destroyed the geomorphology of I-Inginier.

In terms of hydrogeology, including pollution through spillage of oil fuels associated with a normal construction site, the possibility exists – though it is considered unlikely – of silting of the coastline and pollution of the sea level aquifer. These are considered as having a minor impact.

Likewise the impact in terms of removal of soil is also considered as being insignificant, due to the fact that there are no soils present on site.

5. Landscape and Visual Appraisal of the Proposed Site

The area under consideration is considered as an Area of High Landscape Value. The Visual Assessment showed that the development has a significant impact from almost all chosen viewpoints in spite of the fact that part of it is partly sunken into the sloping landscape. This assessment recommends the mitigation of visual impacts through landscaping and use of natural earth colours and textures. This does not imply that the development will become invisible if all the recommended mitigation measures are taken on board, however, such measures will render it less conspicuous.

6. Air Quality

An assessment of the air quality impacts associated with the Proposed Development at Delimara Power Station has been undertaken. The assessment has focussed on the principal emissions to air, including:

- Dust emissions during the construction phases;
- Air Quality Strategy Pollutants and other trace emissions from Combustion Processes; and
- Greenhouse gas emissions arising from the operation of the proposed plant.

A qualitative dust assessment has been undertaken and required mitigation measures determined. The residual effects after application of the mitigation measures is considered to result in a low risk of adverse dust impact, limited to the local area within 100m. The risk of impacts would be temporary and short term and reversible.

The assessment of combustion emissions from the proposed plant has found:

- that for all pollutants the maximum predicted long-term and short term impacts would be below Air Quality Standards limit values and other Environmental Assessment Levels;
- the impact of combustion emissions from the proposed plant on sensitive ecosystems are predicted to lead to a very small increase in nitrogen deposition and acid deposition loads; and
- Greenhouse gas emissions are predicted to remain within limits specified with the National Allocation Plan under the EU Emissions Trading Scheme.

7. Noise and Vibration

An environmental noise and vibration survey was carried out around the Delimara Power Station, Delimara to evaluate the noise impacts arising from construction works and during operation of the proposed plant.

The assessment concludes:

- The off-site noise levels measured were within the range of values expected for such locations.
- Construction noise levels at all sensitive receptors will be lower than the chosen day-time criteria (75 dB (A)) and evening criteria (65 dB (A)) for dwellings. However, noise levels will be above the night-time criteria (45 dB (A)).
- Due to the temporary construction works, the increase in noise levels increases the likelihood of complaints.
- The magnitude of vibration is below the threshold of cosmetic or structural damage in all classes of buildings.
- These vibrations would also be barely perceivable to humans in the buildings.

8. Quality of the Marine Environment

The predominant impacts of the power plant operations at Delimara are those of the thermal effluent at Hofra z-Zghira and the hydrodynamic changes resulting from the quay and breakwater construction along the eastern side of Marsaxlokk Bay. With the proposed plant extension, thermal effects on marine benthic communities at Hofra z-Zghira will be aggravated in view of higher volumes of thermal effluent being discharged.

With careful thermal outfall design considerations being implemented, most of the assumed impacts can be mitigated, although a number of residual impacts are expected to persist.

An extensive seagrass-specific monitoring programme should be adopted at Hofra z-Zghira and contingency plans for major oil spills within Marsaxlokk Bay should be adopted.

9. Infrastructure and Utilities

The site of the proposed development is already committed to the generation of electricity. The site already benefits from all the required utilities and infrastructure including potable and cooling water supply, the required drainage systems, and adequate road access including an internal road network. The current infrastructure and utilities shall sustain the proposed development without the need of upgrading. Only minor, previously planned, road network upgrades shall be required.

10. Land and Water Contamination

The measurements of various chemical and physical parameters were conducted around the Delimara Power Station, in order to evaluate the contamination that may have resulted over the past twenty odd years of its operation. The measured pollutants included heavy metals, solvents and hydrocarbons. These parameters are directly related to possible mineral oil spillages and emissions that may have resulted from the PS, contaminating the soil, ground water and sea in the process.

All the measured levels were considered to be within the acceptable limits.

It is expected that the proposed development will generate a range of by-products during its operation. Various operational provisions are being proposed to limit the potential of contamination by such substances to land and water exists. The provisions cater for the supply, storage and final disposal of chemicals and process by-products.

11. Waste Management

Minimal excavation works are being proposed and limited materials are expected to be generated during construction.

It is the intention of Enemalta to operate the plant on Heavy Fuel Oil (HFO) having a maximum sulphur content of 1% by weight. It is believed that when the proposed plant is operated in this manner the waste arising will be:

- Solid waste generation from the flue gas purification will be some 10,000 tonnes/yr;
- Sludge oil approximately 1,000 tonnes/yr;
- Discharge of treated oily water to sea around 10,000m³/yr;

- Sea water cooling system will increase the current discharge by some 50% (an increase of 13,500 m³/hr on the current flow of 29,500m³/hr);
- Sludge generated from the Boiler Wash Down treatment facility will generate 8m³/yr of sludge.

The bulk of the wastes will be exported for treatment abroad as no facilities exist in Malta to treat the hazardous wastes generated by the plant.

12. Risk Assessment

An independent Risk Assessment examined the environmental risks from the storage, handling and use of potentially hazardous materials such as fuels, chemicals and hazardous wastes. The study found that with the mitigation measures that are already in place or are proposed to be put in place; environmental risks would generally be low to moderate and therefore acceptable.

The most significant risks were the same as those for the existing development and namely:-

- Prevention of spillage during quayside oil offloading and transfer through training and equipment selection and use and the maintenance of a spill response capability.
- Catastrophic incident such as fire and loss of containment with application of substantial quantities of firewater. The likelihood of such an incident occurring is very small and current measures for control are generally appropriate to the risk.

Other risks requiring a high standard of management and control were the storage and handling of bulk chemicals and hazardous waste residues, and the design and operation of site drainage and the Effluent Treatment Plant.

Recommendations for updating risk management measures and contingency plans include the development of a major accident prevention policy and safety management system that includes organisation and responsibilities, procedures, training, equipment, actions, contacts, location drawings, sensitivity plans, etc.

13. Public Health

This Health Impact Assessment looks at those areas which historically have been noted to impact on factors which may have a temporary or permanent health effect namely:

- 1) Impacts of particulate and gas emissions on ambient air quality;
- 2) Impacts of solid waste created during the construction and operational phases;
- 3) Impacts of noise and vibration during the operational and construction phases;
- 4) Impacts on bathing water quality;
- 5) Impacts on health due to increase in light production at the Delimara Plant;
- 6) Impacts caused by any increased traffic during both the construction phase and the operational phase.

The analysis concluded that the proposed development shall not constitute any negative significant impacts on public health. The major concern was related to noise impacts during the construction phase; these can be limited through the suggested mitigation measures. The Health Impact Assessment makes reference to the closure of the Marsa Power Station and identifies this as a significant beneficial outcome.

14. Impacts on Human Populations

A general lack of trust in public authorities and in the scientific studies associated with various developments, such as those undertaken for this EIA was observed. The local community is increasingly becoming disillusioned about the whole permitting process since whilst the development conditions cites high standards, there is lack of enforcement of such standards once the development occurs.

The envisaged and perceived impacts from the construction phase were associated to traffic, dust, and noise. The analysis of the operational phase of the proposed power plant on the other hand resulted in both beneficial and adverse impacts. These included: improvements in energy efficiency and environmental standards, better security of supply, air quality impacts, waste generation impacts, and visual impacts.

15. Secondary, Indirect and Cumulative Impacts

The failure to export in a timely fashion the solid wastes generated could cause a disruption to the provision of electricity supply. The complete or partial switching off of the plant due to a failure to export the wastes in a timely fashion is considered to have a significant cumulative effect with multiple secondary impacts.

During operation, it is expected that there will be an increase in vessel movements in the Marsaxlokk harbour. This increase in marine traffic is expected due to oil tankers providing fuel to the power plant, ships supplying the station with flue abatement chemicals and vessels exporting the waste by-products for treatment abroad. This increase of movement could have cumulative and secondary impacts on the fish farms around the area and interact with the Malta Freeport vessel movements. The impact significance of the increase in vessel movements is however believed to be of minor.

The closure of the MPS is seen as a positive cumulative impact with multiple secondary positive impacts such improvement in the air quality, removal of outdated unreliable plant and allowing the possibility for the rehabilitation of a sizeable area within the inner harbour region.