

**Technical Submission to the Malta Environment and Planning Authority as part of the process of consultation prior to the issue of an IPPC Permit to enable Enemalta to operate the new power station extension at Delimara.**

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**Preamble.**

This document is being submitted as a response by the Marsaxlokk Local Council as part of the consultation process for the issue by Mepa of an IPPC permit that would enable enemalta to operate the new generating plant extension constructed at Delimara Power Station.

Following publication by MEPA at the end of August 2011 of application for an for an IPPC permit submitted by Enemalta and received by MEPA on the 8th of February 2011, MEPA has allowed a comparatively limited time frame (some 30 days) for submissions.

In view of this constraint, this report focuses on the factors that determine the choice of Fuel , ie between Heavy Fuel Oil and a residual of the oil Industry, and Gasoil a refined product, to be used by the new plant installed at Delimara Power Station.

This report is to be read in conjunction with previous report submitted by the Marsaxlokk Local Council to MEPA in response to the Environmental Impact Assessment, Document ref 03.02 dated the 2nd October 2009 and Document 03.03 dated the 7th December 2009

**Introduction.**

Much of the industrial activity associated with the economic development of our Country is concentrated in the southern end of the Island. This however has resulted in environmental effects that are more pronounced in this area.

The Marsaxlokk Local Council understands that the extension of the Power Station is essential both for further economic development and also to enable the Marsa Power Station, now an aged plant, to be shut down.

The Council however seeks to preserve the local environment in Marsaxlokk within the limits prescribed by the relevant EU environmental Directives.

The applicant, Enemalta, intends to operate the extension on Heavy Fuel Oil. The utilisation of this fuel type was considered at the outset, as one which is not compatible with the move towards cleaner fuels which has been encouraged by the EU.

The Council maintains that some of the pollutants that under present conditions, without the power station extension in operation, already exceed the limits imposed by the Clean Air Directive 2008/50/EC. This concern regards specifically Particulate Matter PM<sub>10</sub> and PM<sub>2.5</sub> both considered to endanger human health, and particularly the latter being regarded by the same Directive as responsible for significant negative impacts on human health.

The Council, in its previous submission had specifically requested MEPA to establish Air Quality Monitoring Stations in Marsaxlokk and to determine, through precise measurements taken from air quality monitoring stations that had to be established in Marsaxlokk and Birzebbugia, the level of pollutants particularly PM<sub>2.5</sub>, PM<sub>10</sub>, NO<sub>2</sub>, SO<sub>2</sub> and Heavy Metals and to determine if these fall within acceptable limits. (Appendix A1)

Once more, despite that the attention of MEPA was drawn by the Marsaxlokk Local Council, no long term measurements were made by MEPA in this respect, although 24 months from the request made by the Council have since elapsed.

Only measurements taken over a 4 week period as part of the process to establish the second air dispersion model are available. These indicate unequivocally, that the levels of PM<sub>2.5</sub> and PM<sub>10</sub> exceed significantly, the limits established in the Clean Air Directive 2008/50/EC.

The situation is one where MEPA is being asked to grant a permit for the operation of new power station plant, utilising Heavy Fuel Oil as a primary fuel source, in an environment that is already polluted beyond established limits.

This report :

1. Analyses the results of the measurements made by ESS Gmbh & Ecoserve, that show that the present pollution levels particularly for particulate matter PM<sub>2.5</sub> in Marsaxlokk and Birzebbugia exceed significantly the limits stipulated by Directive 2008/50/EC – The clean air Directive, and that MEPA is obliged by the same Directive to take all actions necessary to reduce the levels of this pollutant below that stipulated in the Directive. This means that MEPA can only permit the combustion of Gasoil a much cleaner fuel than the polluting Heavy Fuel Oil.
2. Compares the prices of generation of electrical energy at the Marsa Power Station operating on Heavy Fuel Oil with that generated at the Delimara Power Station Extension (DPSE) utilising Gasoil, and shows that if Gasoil were to be used to fuel the Delimara Extension Plant the price of electrical Energy will be actually cheaper than that currently produced at Marsa.
3. Interprets the report by Cubed Consultants and shows that also this report indicates that the operation of the plant on Gasoil other than Heavy Fuel Oil offers under present conditions the best performance.

4. Comments on the Stacks that have been constructed by Enemalta without the requisite permission from MEPA, and states that in view of the fact that the emissions from the Stacks which are 65m high contribute to a significant degree to the atmosphere in Marsaxlokk, which is already overloaded with Particulate Matter pollution if Heavy Fuel Oil were to be burnt , then MEPA has in this case also no other alternative but to permit Enemalta to operate the plant of Gasoil.

This report concludes, that in view of the excessive PM 2.5 levels in Marsaxlokk and Birzebbugia, that the unit cost of electrical energy generated at DPSE utilising Gasoil will actually be cheaper than the unit cost of energy currently generated at Marsa Power Station, and that also the report by Cubed Consultants concludes that Gasoil over a better performance over Heavy Fuel Oil , than MEPA is left with no other option but to permit the Delimara Power Station Extension DPSE to operate only on Gasoil.

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Ing. Arthur Ciantar.  
Resident and Consultant to  
The Marsaxlokk Local Council

**SECTION A**  
**AIR QUALITY**

## Air Quality.

### **1.0 Background.**

The Marsaxlokk Local Council (MLC) in its submission refer 03.02 dated the 2<sup>nd</sup> October, had presented an analysis of the Air Quality Assessment presented as part of the Environment Impact Assessment.

The Marsaxlokk had already presented at the time, early in the process, a number of concerns and had requested MEPA to investigate and determine: ( Appendix A1)

1. That all analysis shall satisfy the stipulations of Directive 2008/50/EC that came into force on the 11th June 2010.
2. The validity of the extrapolation of information from the Zejtun monitoring station to estimate the final conditions in Marsaxlokk once the plant is in operation, taking into account also the relative position of the monitoring station with respect to the plant and the prevailing winds.
3. The levels of all pollutants particularly PM<sub>2.5</sub>, PM<sub>10</sub>, NO<sub>2</sub>, SO<sub>2</sub> and heavy metals particularly on the populations of Marsaxlokk and Birzebbugia based on the actual current background levels in both locations, and to determine if these fall within acceptable limits.

It is to be mentioned that MEPA has categorically stated that quote

*“MEPA is particularly concerned about the PM issue, since this pollutant is a major air quality concern for Malta.”* ( Appendix A2)

Unquote.

Additionally the Marsaxlokk Local Council had requested the establishment of an Air Quality Monitoring Station in Marsaxlokk

4. The emissions and the environmental impact if the proposed plant is fuelled with Gasoil / Light distillate instead of Heavy Fuel Oil.

It is pertinent to indicate that the values PM<sub>2.5</sub> measured at the Zejtun Monitoring Station in 2008 and presented in the report by AIS Environmental already exceeded the limit values stipulated in the Clean Air Directive now in force.

It is to be mentioned here that pollutants PM<sub>2.5</sub> and PM<sub>10</sub> were not taken into account in the Stack Height Determination, and this will certainly have a significant influence on the concentration of these pollutants in the area.

An important point on the issue of Air Quality was raised by the Council is that BWSC had submitted emission limit related figures that it refused to Guarantee, and

that there remain strong doubts on the operation of the “prototype plant “ and the effectiveness of flue gas cleaning systems.

The Marsaxlokk Local Council gave notice both to MEPA and AIS Environmental that since the Air Quality Assessments is based on emission values that are not guaranteed by BWSC at the time of submission of their Tender for the Plant, the Council considers the Air Quality Assessment to be seriously compromised if not also invalid.

It is also evident from the report presented by the Auditor General that the issue of emissions remains a point of contention.

## **2.0 Particulate Matter PM<sub>2.5</sub>**

The Air Quality Assessment presented as part of the EIA showed in Table 4-2 Background Concentrations – Real Time Station , that the annual average of PM<sub>2.5</sub> measured in 2008 at Zejtun was 22.8 µg/m<sup>3</sup>. (Appendix A3)

The values of PM<sub>2.5</sub> at the Zejtun Monitoring Station in 2008 and presented in the report by AIS Environmental already exceed the upper assessment threshold of 17µg/m<sup>3</sup> as stipulated in Annex II , A.3 of Directive 2008/50/EC ( Appendix A4)

Furthermore with respect to PM<sub>2.5</sub> Article 15 of the Clean Air Directive stipulates (Appendix A6):

*1. Member States shall take all necessary measures not entailing disproportionate costs to reduce exposure to PM<sub>2.5</sub> with a view of attaining the national exposure reduction target laid down in Section B of Annex XIV by the year specified therein.* (Appendix 5.1)

The article continues under point 2

*2. Member States shall ensure that the average exposure indicator for the year 2015 established in accordance with Section A of Annex XIV does not exceed the exposure concentration obligation laid down in Section C of that Annex. ( ie 20 µg/m<sup>3</sup> by 2015). This is an exposure concentration obligation.*

Also, regarding the same emission (PM<sub>2.5</sub>) Article 16 of the same directive stipulates ( Appendix A6):

*Member States shall take all necessary measures not entailing disproportionate costs to reduce exposure to PM<sub>2.5</sub> with a view of attaining the national exposure reduction target laid down in Section B of Annex XIV by the year specified therein, ( ie 18 µg/m<sup>3</sup> by 2020). This is the target value and limit value for the protection of human health.*

MEPA therefore has an irrevocable obligation to see that the stipulations set by Directive 2008/50/EC for PM<sub>2.5</sub> met within the time limits specified.

As the annual mean concentrations of  $PM_{2.5}$  at the Zejtun Monitoring Station recorded in 2008 and presented in the report by AIS Environmental, recorded at  $22.8 \mu\text{g}/\text{m}^3$  exceeded the upper assessment threshold of  $17 \mu\text{g}/\text{m}^3$  ( Appendix A6), the Marsaxlokk Local Council in its submission ref 03.02 October 2009 placed a number of questions to MEPA . ( Appendix A7)

The questions regarding this issue are

1. (What led to this unusual , disparate and diverging result ??)- *refers to AIS*
2. Were actual long term  $PM_{2.5}$  levels measured both at Marsxlokk and Birzebbugia.
3. If these measurements were made what are the results ?
4. How will the present measured levels at Marsaxlokk and Birzebbugia be affected once the new plant is put in service operation.
5. Will the  $PM_{2.5}$  levels particularly those in Marsaxlokk and Birzebbugia exceed permissible limits once the proposed plant burning heavy fuel oil is put in operation.
6. How will the  $PM_{2.5}$  levels particularly those in Marsaxlokk and Birzebbugia decrease if the height of the exhaust stacks is higher than 50m as proposed, with the plant burning heavy fuel oil.
7. What will be the optimum Stack height that will result in the minimum possible  $PM_{2.5}$  levels from the exhaust gas stream in Marsaxlokk and Birzebbugia.

It appears that at the time the questions were submitted, MEPA may not have been in a position to answer the questions raised above.

On the basis that the Air Quality Assessment carried out in the first instance was based on data obtained from the Air Monitoring Station at Zejtun, the Marsaxlokk Local Council requested the installation of an Air Quality Monitoring Station in Marsaxlokk and possibly in Birzebbugia with the purpose of obtaining a precise measurement of the level of pollutants particularly of  $PM_{2.5}$  levels.

More over the Marsxlokk local Council had requested MEPA to investigate and determine ( amongst others); (Appendix A1.2)

*“the levels of all the pollutants particularly of the  $PM_{2.5}$ ,  $PM_{10}$ ,  $NO_2$ ,  $SO_2$  and heavy metals particularly on the populations of Marsaxlokk and Birzebbugia, based on the actual current background levels in both locations, and to determine if these fall within acceptable limits.”*

*Despite that approximately 2 years have elapsed since the requests submtted by the Marsaxlokk Local Council were placed, MEPA has not yet provided any answers on this pivotal question.*

### **3.0 PM<sub>2.5</sub> concentrations measured by ESS GMBH and Ecoserv.**

Following a call for tenders issued by MEPA on the 1<sup>st</sup> April 2010, MEPA commissioned ESS Gmbh and Ecoserv Ltd to carry out Air Dispersion Modelling of NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, Metals and Benzo-a-pyrene, from Delimara Power Station.

As part of the exercise within their remit, ESS Gmbh and Ecoserv established two air monitoring stations, one in Marsaxlokk and one in Birzebbugia with the scope of obtaining accurate measurements of the pollutants under study. These measurements were then to be used as actual measured data together with data gathered from other sources to establish the mathematical models.

The values measured at Marsaxlokk and Birzebbugia for PM<sub>2.5</sub> shown in Table 9 ( page 17) ( Appendix A8) of the report by ESS and Ecoserv are reproduced hereunder.

<b>PM<sub>2.5</sub> daily</b>	<b>annual average target value (20100101) : 25µg/m<sup>3</sup></b>				
Monitoring Station	Avg. µg/m <sup>3</sup>	max. µg/m <sup>3</sup>	N of obs	From	To
Marsaxlokk	<b>52.70</b>	<b>149.00</b>	29	18/04/2011	16/05/2011
Birzebbugia	<b>34.70</b>	<b>61.00</b>	29	18/04/2011	16/05/2011

The measured values show that over a period of nearly one Month, the average daily value of the concentration of PM<sub>2.5</sub> in Marsaxlokk is 52.70 µg/m<sup>3</sup>, which represents an excess of over 100% over the present annual average target value of 25µg/m<sup>3</sup>

The peak value is by the same measure even more alarming in that the value measured, 149 µg/m<sup>3</sup>, represents an excess of nearly 500% over the present target value of 25µg/m<sup>3</sup>

The same may be said, to apply, albeit at a lesser degree of the respective values measured at Birzebbugia.

The magnitude of the results of the samples taken at random over the period indicated show in the most irrefutable manner, that not only do the values not fall within the stipulations of the Clean Air Directive but that the stipulated target values are exceeded by several orders of magnitude.

Under such circumstances Article 23 of Directive 2008/50/EC stipulates that (Appendix A9):

*“Where, in given zones or agglomerations the levels of pollutants in ambient air exceed any limit values or target value, plus any relevant margin of tolerance in each case, Member States shall ensure that air quality plans are established for those zones and agglomerations in order to achieve the related limit values or target value specified in Annexes XI and XIV”*

This obligation falls on MEPA , one that has as yet to materialise.

#### **4.0 Description of the situation.**

The situation may be best described as a scenario where Enemalta wishes to operate an extension to the Delimara Power station utilising Heavy Fuel Oil as the primary fuel source in an environment, in which the limits for at least PM<sub>2.5</sub>, today without the extension plant in operation, have been exceeded.

It is pertinent to quote the description covering Particulate Matter PM<sub>2.5</sub> given in the Clean Air Directive:

Regarding PM<sub>2.5</sub> emissions Directive 2008/50/EC preamble para 11. States (Appendix A10):

Fine particulate matter (PM<sub>2.5</sub>) is responsible for *significant negative impacts* on human health. Furthermore, there *is as yet no identifiable threshold below which PM<sub>2.5</sub>, would not pose a risk. As such this pollutant should not be regulated in the same way as other air pollutants.* The approach *should aim at a general reduction* of concentrations in the urban background *to ensure that large sections of the population benefit from improved air quality.* However to ensure a minimum degree of health protection everywhere, that approach should be combined with a limit value, which is to be preceded in a first stage by a target value.

The description clearly encompasses the following principles:

1. Particulate matter (PM<sub>2.5</sub>) is responsible for significant negative impacts on human health
2. That there is no identifiable threshold below which PM<sub>2.5</sub>, would not pose a risk
3. That this pollutant should not be regulated in the same way as other air pollutants.
4. **That the approach should aim at a general reduction of the concentrations in the urban background to ensure that large sections of the population benefit from improved air quality.**

Of the four principles, it is the fourth that is determinant, by the fact that the Directive itself that the approach should be to aim at a general reduction of the concentrations in the urban background.

The fact that it may be assumed that the greater part of the pollution related to particulate matter may in fact be related to other sources such as vehicle emissions, and not to the operation of the Power Stations does not diminish in any way the aim of this principle, but quite on the contrary, reinforces the purpose of the same objective. For if the environment is polluted beyond limits stipulated in the directive, then the aim of achieving a general reduction of the concentration in the urban background should include also, amongst other measures, the imperative that Enemalta should use the best available technology coupled with the cleanest fuel that may, under present circumstances be delivered to Delimara Power Station.

The use of Diesel Engines with an average efficiency of 46% represents what is possibly one of the most efficient combustion technologies available today. The issues that arise do not concern the plant itself but rather the fuel that shall be used to operate it.

Enemalta is proposing to utilise Heavy Fuel Oil as the primary fuel source, and also Gasoil as a secondary fuel. Gasoil is required during the starting phase and even more during the shutdown phase of the plant, as otherwise the heavy fuel oil, which on cooling down would be very viscous, would as a result block the fuel delivery lines.

The Marsaxlokk local council had in its submission 03.02 dated the 2<sup>nd</sup> October, presented a table comparing the increases in the emissions resulting from the proposed plant fuelled with Heavy Fuel Oil.

The data is extracted from Table 5.3– presented in the EIS as shown in Appendix A11, and is being reproduced hereunder from page 13 ( Appendix A12) of report 03.02 presented by the council.

Table 5.3 in particular shows the following increases:

Pollutant	Phase 1	Phase 2a Light Distillate	Phase 2b Light Distillate	Total Present Emission	Proposed	Increase in Emission
Fuel	HFO				HFO	
PM2.5 (g/s)	4.9	0.7	0.7	6.3	4	<b>63.49%</b>
Pb (mg/s)	1.8	1.5	1.5	4.8	1.5	31.25%
Cd (mg/s)	0.5	0.5	0.5	1.5	0.4	26.67%
Hg (mg/s)	0.2	0.3	0.3	0.8	0.1	12.50%
As (mg/s)	1.6	0.4	0.4	2.4	1.3	54.17%
Cr (mg/s)	1	1.2	1.2	3.4	0.8	23.53%
Cu (mg/s)	2.1	0.6	0.6	3.3	1.8	54.55%
Ni (mg/s)	102.5	0.3	0.3	103.1	84	81.47%
Se (mg/s)	0.8	1.6	1.6	4	0.7	17.50%
Zn (mg/s)	35.3	0.4	0.4	36.1	28.9	80.06%
PaH (mg/s)	2.6	0.2	0.2	3	2.1	70.00%
V (mg/s)	922.2	2.8	2.7	927.7	755.4	81.43%

The table shows that the utilisation of Heavy Fuel Oil (HFO) to fuel the new extension will result in a further increase of **63.49%** in PM<sub>2.5</sub> emission over those from the plant presently in operation ( Phases 1, 2a,& 2b).

For the sake of comparison, let it be assumed that the new plant will be fuelled with Gasoil / Light Distillate utilising the same values quoted for Phase 2a and 2b Gas Turbines, as follows;

Each of the Gas Turbines installed on Phase 2a and 2b each have a rating of 37 MW. Estimating the output of the extension with a basis of 132 MW ( 12 MW being due to the heat recovery steam turbine),

Pollutant	Phase 1	Phase 2a	Phase 2b	Total Present Emission	132MW Extension	Increase in Emission
Fuel	HFO	Light Distillate	Light Distillate		Light Distillate	Estimated
PM2.5 (g/s)	4.9	0.7	0.7	6.3	2.49	<b>39.52%</b>

The value of 39.52% increase in PM<sub>2.5</sub> emission represents a decrease of 37.75% when compared to the resulting PM<sub>2.5</sub> emission resulting from the combustion of heavy fuel oil.

In reality the efficiency of the Diesel Engines installed is quoted at some 46% while that of a Gas Turbine is approximately 33% and therefore the actual increase in PM<sub>2.5</sub> emission will be lower than that indicated above.

The above estimate is in agreement with the reply received from Enemalta to a question raised by MEPA on the same subject, during the process leading to the issue of the full development permit. ( Appendix A13)

To the question raised by MEPA asking;

“ the emissions that would result if the proposed plant were to be fuelled with Gasoil / Light distillate which has significantly lower sulphur content, instead of the 1% Sulphur heavy fuel oil”

Enemalta replied:

“SO<sub>2</sub> emissions shall be reduced by half of the values above with operation on gasoil. This is because the emission limit values specified are equivalent to operating the plant on fuel containing 0.2% sulphur while gasoil contains 0.1%. Thus the annual SO<sub>2</sub> emissions shall be 435 Tonnes for base load operation and 300 Tonnes for 2 shifting operation (same conditions as above).

NO<sub>x</sub> emissions are not expected to be affected. Dust emissions are also expected to decrease by approximately 40%. CO emissions are between 0.02 and 0.09% by volume. This value also includes THC VOCs. No further information is available on CO emissions.” ( Appendix A13)

Even Enemalta accepts that the utilisation of Gasoil instead of Heavy Fuel oil will result in a significant decrease in dust/particulate matter emissions.

### **3.0 PM<sub>10</sub> concentrations measured by ESS GMBH and Ecoserv.**

The measurements of the of the PM<sub>10</sub> concentrations at Marsaxlokk and Birzebbugia, as with PM<sub>2.5</sub>, show clearly exceedances over the limits stipulated in Directive 2008/50/EC.

<b>PM<sub>10</sub> daily</b>					
Monitoring Station	Avg. µg/m <sup>3</sup>	max. µg/m <sup>3</sup>	N of obs	From	To
Marsaxlokk	54.10	154.00	29	18/04/2011	16/05/2011
Birzebbugia	70.00	250.00	29	18/04/2011	16/05/2011

Section 3 of Annex II of Directive 2008/50/EC establishes upper assessment threshold for PM<sub>10</sub> concentrations as follows.( Appendix A6/1)

24-hour average : 35 µg/m<sup>3</sup> not to be exceeded more than 35 times in any calendar year.

Annual average : 28µg/m<sup>3</sup>

The PM<sub>10</sub> concentrations obtained within the sample period, even when one considers that 29 samples over a practically a month is only 6 samples short of the 35 in a calendar year, clearly show that the values measured exceed significantly the threshold levels.

Furthermore section B of Annex XI of Directive 2008/50/EC establishes the following PM<sub>10</sub> concentration limit values for the protection of human health (Appendix A14)

One day: 50 µg/m<sup>3</sup> not to be exceeded more than 35 times in any calendar year.

Calendar year: 40µg/m<sup>3</sup>

These limit values have been in force since 2005.

Article 23 clause 1 of Directive 2008/50/EC ( Appendix A9/1) stipulates that:

*“Where, in given zones or agglomerations the levels of pollutants in ambient air exceed any limit values or target value, plus any relevant margin of tolerance in each case, Member States shall ensure that air quality plans are established for those zones and agglomerations in order to achieve the related limit values or target value specified in Annexes XI and XIV”*

MEPA is obliged to respect this directive with respect to PM<sub>10</sub> also.

It is somewhat strange that the Marsaxlokk local Council has to emphasise the obligation regarding the application of the Directive 2008/50/EC in the reduction of PM10 levels. (Appendix A14).

Indeed in 2010 MEPA had prepared an Air Quality Plan for the Office of the Prime Minister, with the precise scope of achieving reductions in the daily average levels of PM<sub>10</sub> for which exceedances have been recorded since 2004. ( Appendix A14)

The precise scope of the Action Plan was “aimed at ensuring compliance with the PM<sub>10</sub> daily limit value by June 2011” ( Appendix A15/2).

At the time of writing of this Document, now October 2011, 4 months after the deadline stated in the Air Quality Plan, significant exceedances in the levels of PM<sub>10</sub> are still being recorded at least in Marsaxlokk and Birzebbugia as measured by ESS Gmbh and Ecoserve. Clearly the aim of the Air Quality Plan has not been achieved.

Moreover, in this same scenario, Enemalta is requesting permission from MEPA to operate the Delimara Power Station Extension (DPSE) on Heavy Fuel Oil thereby further generating substantial amounts of PM<sub>10</sub> particulate matter.

This state of affairs allows MEPA to permit Enemalta to operate the plant on Gasoil only, as a measure to reduce the exceedances in the recorded levels of PM<sub>10</sub>.

### **Conclusion.**

Whereas

1. the Clean air Directive 2008/50/EC states; “ *that particulate matter PM<sub>2.5</sub> is responsible for significant negative impacts on human health. Further, there is as yet no identifiable threshold below which PM<sub>2.5</sub>, would not pose a risk. As such this pollutant should not be regulated in the same way as other air pollutants. The approach should aim at a general reduction of concentrations in the urban background to ensure that large sections of the population benefit from improved air quality. However to ensure a minimum degree of health protection everywhere, that approach should be combined with a limit value, which is to be preceded in a first stage by a target value.*”

2. The measurements taken on 29 separate occasions at the Marsalokk air monitoring station, established by MEPA, independently verified the extremely high levels of PM<sub>2.5</sub> particulate matter which exceed the average annual level stipulated by the Clean air Directive,

3. That despite the fact the the levels of PM<sub>2.5</sub> exceed the the target values established in Directive 2008/50/EC no Air Quality Plans as stipulated in Directive 2008/50/EC, preamble clause 18, and Article 23 , and further more that no short term action plans have been prepared to reduce the levels of PM<sub>2.5</sub> to a reduce the risk or duration of the exceedance as stipulated by Article 24 of the same Directive, this being the the sole responsibility of MEPA,

4.The utilisation of Gasoil instead of Heavy Fuel Oil to fuel the extension, will result in a decrease of approximately 37.75% in PM<sub>2.5</sub> emissions.

5.The measurements taken on 29 separate occasions at the Marsxlokk air monitoring station, established by MEPA, independently indicated that the levels of PM<sub>10</sub> exceed the average annual level stipulated by Directive 2008/50/EC.

6.That despite the fact the the levels of PM<sub>10</sub> exceed the the target values established in Directive 2008/50/EC no Air Quality Plans as stipulated in Directive 2008/50/EC,

preamble clause 18, and Article 23 , and further more that no short term action plans have been prepared to reduce the levels of PM10 to reduce the risk or duration of the exceedance as stipulated by Article 24 of the same Directive, again the sole responsibility of MEPA

7.That the Air Quality Plan prepared by MEPA in line with Directive 1999/30/EC to achieve a reduction in the levels of PM<sub>10</sub> , with which levels of exceedances have been recorded since 2004, has not achieved its target, and that exceedances in the levels of PM<sub>10</sub> are still being recorded today.

8.That the samples taken during the latest study by ESS Gmbh and Ecoserv Ltd at the Marsaxlokk and Birzebbugia were limited to 29 just 6 samples less than those mentioned in the Directive is certainly no fault of the Marsaxlokk Local Council, which had previously called at the permitting stage for long term measurements of the pollutants in the environment at Marsaxlokk and Birzebbugia. It was MEPA that issued the tender, and therefore it was the sole responsibility of MEPA to see to this matter.

9.That Marsaxlokk Local Council in October 2009 had requested to MEPA to investigate and determine ( Appendix A1/2)

The levels of the pollutants particularly of PM<sub>2.5</sub>, PM<sub>10</sub>, NO<sub>2</sub>, and SO<sub>2</sub>, and heavy metals particularly on the populations of Marsaxlokk and Birzebbugia, based on the actual current levels in both locations and to determine if these fall within acceptable limits.

The levels of NO<sub>2</sub> and SO<sub>2</sub> at Marsaxlokk and Birzebbugia were not measured. This inspite of the fact that the Clause 4.4.2 Para 2 ( Appendix A16) from the Environment Impact Assessment presented by AIS Environmental in 2008 stated that:

“...it is evident that the baseline concentrations for NO<sub>2</sub> and SO<sub>2</sub> vary widely across the study area from the urban background locations to roadside locations. Monitoring of NO<sub>2</sub> indicates exceedences of the limit value at some urban areas in the study area”

In view of the results obtained from the Environmental Impact Assessment together with the number of observations raised by the Marsaxlokk local Council and other entities and individual, should have investigated the matter more deeply, with the aim of establishing a firm picture of the background air pollution prior to the operation of the extension.

Again the sole responsibility for this state of affairs lies with MEPA.

Then MEPA, for the reasons mentioned above and under the present circumstances, is left with no other alternative but to permit Enemalta to operate the extension on Gasoil alone.

It is to be reiterated that absolutely no change will be required to the plant as constructed, to use Gasoil as a fuel.

**SECTION B**

**COMPARATIVE COSTS OF GENERATION**

**Cost Comparison based on fuel between generation of power at  
Marsa Power Station and its replacement ; the Delimara Power  
Station Extension ( DPSE)**

<b>MARSA POWER STATION FUEL – HEAVY FUEL OIL -HFO</b>			
Fuel Rate	Kg/kWh	0.314	Enemalta Annual Report 2009(Appendix B1/2)
HFO – 1 %	USD / mt	663.5	Platts end of day 21/09/2011
Cost of HFO/kg	USD/kg	0.6635	
<b>Cost per Unit</b>	<b>USD/kWh</b>	<b>0.208</b>	

<b>DELIMARA POWER STATION EXTENSION FUEL – GASOIL</b>			
18V46 Engine heat rate	kJ/KWh	7732	Value quoted in data published by Wartsila. (Appendix B2/2)
Calorific Value of Gasoil 0.1% Sulphur.	kJ/kg	42,730	Net Value
Fuel Rate	Kg/kWh	0.181	
Gasoil 0.1%	USD / mt	953.25	Platts end of day 21/09/2011
Cost of Gasoil/kg	USD/kg	0.95325	
<b>Cost per Unit</b>	<b>USD/kWh</b>	<b>0.1724</b>	

**The generation of electrical power from the Delimara Power Station Extension using Gasoil as a fuel will result in a price per kWh that is approximately 17% cheaper on the basis of fuel alone when compared to the generation from the existing Marsa Plant operating on heavy fuel oil.**

Comparison between the price of energy between the new Delimara Power Station Extension Plant and the old Marsa Plant is being made on the following basis:

1. Enemalta has repeatedly stated that once the new DPSE plant is commissioned the Marsa Power Station will be closed down. The DPSE plant will effectively replace generation capacity now only available at Marsa Power Station. It is therefore reasonable to compare the cost of generation of the New DPSE plant with the cost of energy derived from the Marsa Plant.
2. It had been claimed during the Public Consultation leading to the issue of a building permit that the utilisation of Gasoil instead of Heavy Fuel Oil will give rise to a substantial increase in the cost of electrical energy.
3. Spot prices as at closing on the 21st September 2011, have been used as these represent actual and realistic market prices of the respective fuels. The prices indicated are CIF Mediterranean Port.

The calculations detailed above prove :

1. That the price of energy generated from the new DPSE plant utilising Gasoil 0.1% Sulphur, is substantially cheaper than that produced at Marsa Power Station which utilises Heavy Fuel Oil.
2. The fact that the energy generated at the new DPSE Plant is cheaper should not cause any increase whatsoever in the tariffs of electrical energy provided to the consumer.
3. If Enemalta is contemplating an increase in the tariffs of electrical energy, then this is due to some other factor or factors other than fuelling the Delimara Power Station Extension with Gasoil.

It is to be stated for clarity that the price comparison presented above is made on the basis of fuel costs alone. The fuel costs determine to a very large extent the cost of production of energy.

Ammortisation of the capital cost of the investment is usually spread over an appropriate period of time typically 12 -15 years, in such a way that the impact of the cost of ammortisation per unit energy generated is a minimum.

If the ammortisation costs were to cover the price difference between the utilisation of Gasoil and Heavy Fuel Oil, then the only interpretation available is that Enemalta wishes to pay off the plant in the shortest term possible to reap the greatest profits thereafter. Even this measure *would not* bring about an increase in tariffs charged to the consumer.

In addition, the operation of the DPSE on Heavy Fuel Oil will require :

1. Additional maintainance costs, due to the fact that when operated on Heavy Fuel Oil the engines will require more frequent maintenance operations.
2. The cost of Hazardous waste disposal which also is an additional running cost covering the export to specialised sites and disposal of some 30 Tonnes of waste generated daily. This toxic waste resulting from the desulphurisation process of HFO is not generated by the the utilisation of Gasoil. This is attested by the data sheet taken from the IPPC application presented by Enemalta ( Appendix C4.1 & C4.2).

These two additional costs are associated with the operation of the plant on Heavy Fuel Oil and therefore the price differential in the cost of generation per unit will increase further.

The end result is undeniable:

**The cost of running the new Delimara Power Station on Gasoil is CHEAPER than the cost of running the existing Marsa Power Station on Heavy Fuel Oil.**

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**SECTION C**

**COMMENTS ON THE ECONOMIC ANALYSIS**  
**PRESENTED BY**  
**CUBED CONSULTANTS.**

## **Comments on the Economic Analysis Presented by Cubed Consultants.**

### **Introduction.**

In the considerations on the selection of new generating plant and the choice of the respective fuel, economic considerations within the constraints imposed by environment protection legislation assume paramount importance. It is reasonable to expect that efficient use is made of the fuel resources available to produce electrical energy, while respecting the statutory environment Directives.

This is the basic take off point of any plan to establish a new generating plant. Such studies would inevitably consider operation of the plant under the load profiles characteristic to the system to which power shall be delivered.

The fact that our Nation is an Island, imposes further the criterion : that our nation should be self sufficient in the production of electrical energy.

This does not mean that Malta should not be connected to the European network. Such an interconnection could prove beneficial to our economy. The argument to be raised here is:

*Should the generation system be developed in a manner that will eventually lead to dependence on the interconnection with mainland Europe or;*

*While maintaining the ability to generate electrical energy independently, facilities to enable the sourcing of electrical energy from the european network, under commercial terms that prove to be economically convenient, be introduced.*

Both scenarios are different both in terms of the technical and economic standpoints.

The following article dicusses in the first section various aspects that formed the basis of the economic analysis presented by Cubed Consultants, and highlight different points of view.

## **The Economic Analysis .**

The application for the issue of an IPPC permit presented by Enemalta includes an economic analysis titled “ The estimation of economic costs of operation of the Delimara Extension Power Station using different fuel types. This work was prepared by Cubed Consultants Ltd and is dated May 2011.

The study compares the cost of utilising HFO, Gasoil and Gas to fuel the Delimara Power Station Extension. Scenarios 1 and 2 which consider fuelling the extension with HFO and Gasoil respectively, involve no relevant changes to the infrastructure of the extension itself. However fuelling the extension through the exclusive use of Gas will require considerable investment and changes to the present plant including a conversion of the engines and also the installation of appropriate gas delivery systems, including the laying of a submarine pipeline.

The economic analysis covers a 20-year period from 2012 to 2031, the period over which the extension plant is expected to be in service.

A number of criteria form the basis of the analysis . These include:

- The projected growth rate and demand forecast for electrical energy.
- The operational set up of the generating system.
- Assumptions regarding the fuel costs up to 2031.
- Assumptions regarding the costs of waste disposal.
- Shadow prices of emissions.

The following is a commentary on each of the above mentioned points.

### **The projected growth rate and demand forecast for electrical energy.**

Article 3.1 ( Appendix C1) states “ *The demand for electrical power in Malta for the time period used for the analysis, is based on an estimated demand of 2,135,000MWh in 2010, with a projected growth of 0.5% per annum thereafter. The relatively subdued rate of growth takes into account:*

- *The increase in the price of energy in recent years which is likely to be protracted in the future, and which is leading to more efficient energy use;*
- *The reliance on alternative sources of energy, also in view of Malta’s international commitments in this regard;*
- *The changing structure of Malta’s productive base, which is tending to shift towards less energy intensive service activities.*

There is agreement in that the growth rate being assumed is as mentioned “*relatively subdued*”. In fact it may be too low indeed for the following reasons:

- Regarding the increase in the price of energy mentioned above, consumers are tending to be more lean in the use of electrical energy by way of the sudden and appreciable increases in the prices of electricity exacerbated by the reduced purchasing power of the same consumer due to inflation.

Expressed differently consumers are *economising* the use of electrical energy because of its relatively high cost which is not matched by an increase in income. This is indicative of a restrained economic situation no doubt an effect that may also be attributed to the general economic downturn worldwide, that once overcome will result in renewed growth in the demand for electrical energy.

- Alternative sources of energy compared to fossil fuelled stations are due to their variable nature soft forms of energy which on solar radiation or else wind energy. Photovoltaic panels have a high capital investment cost and even with the financial incentives offered by Government remain out of reach of the average consumer, leading to a relatively small market penetration.

Regarding wind or other alternative energy sources one can safely say that to date no progress has effectively been registered in these areas. Let it however be assumed for the sake of argument, that a wind farm of a substantial rating were to be developed. The capacity of the wind farm has to cover by at least the same capacity at the power station. If this were not the case, then in the event when the wind speed is not high enough to enable the wind turbines to generate power, will result in an increased demand on the interconnector. Should the interconnector is operating near its rated capacity, as is common practice in the interests of efficiency, or is out of service, then this situation will inevitably lead to a situation where the load will have to be maintained by spare generating capacity installed at Delimara Power Station.

From the technical point of view, any analysis regarding power station plant capacity should not include the inputs of sources derived from alternative energy.

- The third point regards the tendency toward service activities and away from manufacture. To assume that this tendency be maintained in the long term up to 2031 is not considered to be reasonable. Indeed every administration, past and present, has endeavoured to secure foreign investment. When planning for generating capacity, the plan should optimistically cover future energy demands. One question that any investor will evaluate before making an investment, is the availability and the security of supply of electrical energy. This was a lesson that the administration that held Government between 1987 and 1992 had come to know all too well. Have these lessons been forgotten ??

Will the present economic situation effectively remain static from now up to 2031 with a projected overall increase of a mere 10.8% between 2010 and 2031, a span of 21 years !

The choice of an increase in demand of only 0.5% per annum is considered to be rather pessimistic and hopefully does not reflect the expected future economic development of our Nation.

Would a revision of the demand estimate based more realistic growth in demand, coupled by the fact that over the time period under consideration up to 2021, indicate that Enemalta should have already started to consider the installation of additional generating plant , over and above the Delimara Power Station Extension that has just been installed ?

### **The operational setup of the generating system and the Interconnector.**

The economic analysis is based on three operating preferences (Appendix C1) expressed by Enemalta, as follows:

First preference: the utilisation of the interconnector to the European Grid

Second preference: the utilisation of the Delimara Power Station Extension plant.

Third preference: the utilisation of the existing Delimara Power Station plant.

The report presented arrives at the conclusion on page 8 ( Appendix C2), that:

*“ The DPSE will also account for around a third of the power generation in 2012, and for an even large proportion, close to half in 2013. With the full availability of the interconnector facility from 2014 onwards, the DPSE will be generating around one-fourth of the electrical energy sold by Enemalta. Thus , the interconnector facility will be responsible for close to three fourths of electrical power supplied by the Corporation. The existing Delimara plant, which is expected to produce one-third of electrical power in 2012 and one fourth in 2013 , will be accounting for no more than 2% of all electrical power supplied by Enemalta from 2014 onwards. This information is provided in numerical form for selected years in Table 1.”*

This conclusion shows that the supply of electrical energy will depend heavily on energy imported over the interconnector with Sicily.

With the existing Delimara Plant accounting for no more than 2% of all electrical power supplied by Enemalta from 2014 onwards unequivocally means that the existing plant will be effectively made redundant. The report continues on page 9 ( Appendix C3) that “ *the existing Delimara Power Station Infrastructure will be in use for between 569 and 1,338 hours in the period 2014 and 2031” as shown in Table 2.*

This projected plan of operation shows an excessively heavy dependence on imported Energy from just one single source – Sicily. This factor may compromise the

independence of our Nation, possibly exposing future administrations to external political pressure.

However inspite of the planned heavy dependence on the submarine interconnector to Sicily, nowhere in the study is the price of energy purchased over the interconnector and also the related terms and conditions indicated.

Furthermore although the complete link will have a capacity of 200MW, in the first instance only one of the two circuits which are planned, will be installed. This reduces the overall capacity to just 100MW. The study fails to take consideration of this fact.

The fact that neither proper consideration of the price and commercial conditions covering the purchase of energy over the interconnector nor the fact that in the first instance only a maximum of 100MW may be transferred over the link to Sicily, changes the basis of the study altogether.

How can a study an analysis of the the different economic scenarios be undertaken without consideration of the unit price, availability and commercial conditions of energy purchased over the link ?

Furthermore how can the study consider different plant operating scenarios without taking into consideration that the link shall be limited to 100MW of its 200MW planned capacity ?

On the basis of these facts alone, the study may perhaps best be viewed as a cursory overview of the situation, but is certainly not representative of definite alternative generating scenarios.

### **Projected utilisation of existing Delimara Plant.**

Another important point regards the very low utilisation , projected at 2% of the existing Delimara Plant. The low load factor of the existing plant will result in the production of electrical energy at a relatively low efficiency together with a low return on the recovery of the capital cost of the same plant

Even if , as is being projected, the existing Delimara Plant, is utilised exteremely sparingly, it will none the less have to be maintained to deliver its maximum capacity to cover unexpected situations such as:

- Failure of the submarine link leading to reduced capacity or complete loss of the link.
- Reduced capacity or failure on the Italian network.

Moreover the costs of maintainance of the plant will have to be recovered over a substantially lower output.

The operation of the existing plant at low utilisation factors , the cost of maintainance of the plant to deliver maximum capacity when called for, together with the higher capital recovery cost rates, will result in a relative significantly higher cost of energy production from the existing plant. The factors mentioned above are not reflected in the analysis presented.

### **Assumptions regarding fuel prices up to 2031**

The economic study presented by Cubed Consultants includes a projection of fuel prices up to the year 2031.

When one considers the rapidly changing geopolitical balances, highlighted by the Arab Spring, with revolutions in Tunisia, Egypt, Libya, Syria and even in Bahrain which had started much earlier than May 2011 the date of the report, the estimation of fuel prices over the coming 20 years is considered at least presumptuous.

The study does not seem to take into account other factors that will definitely influence the price of fuel resources in the immediate future including:

- The effect of the efforts America will be taking to reduce the 14 trillion US Dollar national debt on the value of the Dollar.
- The effect on the value of the Euro as a result of the as yet unsettled Euro Crisis, highlighted by the bailout of Greece , Ireland and Portugal, and also what at the time of writing of this response seems to be an increasing probability of a Greek default on repayment of loans.
- The combined effect of the rising Asian economies including China and the consequent demand on energy resources.
- The availability of fossil fuels as a resource.
- The decision by the German Government to move away from Nuclear power to conventional Gas fuelled generation plants.

These are but a few of the many political and economic factors that will have a significant influence on the prices of fossil fuels in the immediate future. The estimation of possible fuel price trends over a 20 year range can in the present circumstances only be treated as mere conjecture.

Finally one must ask in what manner and to what extent will the Scenarios presented change if Heritage Oil currently prospecting for oil in Maltese territorial waters were to Strike oil or Gas.

Similarly what effects will result of Pancontinental Oil Company were to be granted a licence to drill into identified prospects in close vicinity of the, TAMA 1 then claimed to be a dry well ?

Is our nation going to spend the next 20 years attempting to identify oil prospects without ever extracting oil or gas ??

### **Assumptions regarding the costs of disposal.**

The study presented by Cubed Consultants makes assumptions on the costs of waste disposal without quoting precise costs that Enemalta is incurring today to dispose of flyash and other solid residues.

One will understand the the cost of variables effecting the disposal process as proposed; ie

- Trucking the waste to the freeport as proposed by Enemalta.
- Port handling and shipping charges, bearing in mind that such waste is shipped by special charters.
- Transportantion from the port of destination to the site of disposal.
- Handling , processing and disposal of the waste at the treatment facility

are difficult to estimate over a period of 20 years. Any such estimates would be mere assumptions that may fluctuate unpredictably over 20 years.

The only certainty in this regard is that the utilisation of Gasoil will result in the generation of no solid waste ( Appendix C4) when compared to the amount of between 6,916 and 9880 tonnes per annum that would result from the utilisation of Heavy Fuel Oil. Footnote 8 Appendix C4.2 emphasises this fact. This would effectively mean that the cost of disposal of any resultant waste resulting from the combustion of Gasoil would be NIL.

### **Shadow Prices of Emissions.**

In the considerations pertaining to the Shadow Prices of Emissions refer to values obtained from “ The Handbook of Shadow Prices – valuation and Weighting of Emissions and Environmental Impacts (2001).

Cubed Consultants state in a most explicit manner ( Appendix C5) that :

*“ It is furthermore important to clarify at the outset that any methodology aimed at the estimation of shadow price effects is subject to considerable estimation variations and critical assumptions. The monetary values of damages per unit of the specific pollutnats presented in the Handbook are no exception to this rule. The estimates presented in the Handbook use a variety of assumptions and models. There is thus a degree of uncertainty in the value of the estimates, particularly with regards to the valuation of health damages and the wide variation in published estimates of dose-effect relationships and monetary valuation of impacts.”*

*It is to be noted that there is no scientifically exact methods to measure shadow prices of emissions. Values of shadow prices may furthermore change over time in the light of shifting political, social, and economic priorities.*

Cubed Consultants therefore concede that any calculations that are presented in the report are at best indications of future values which are however subject to wide variations.

The utilisation of these estimates in the estimation of the Economic Costs of Operation of the Delimara Extension Power Station equipment using different types of fuel is therefore drawn into question.

### **Conclusion of the report presented by Cubed Consultants.**

The conclusion of the report by Cubed Consultants highlights a set of important time variant factors that will influence the dynamics of the comparison submitted in the same report. These include:

- Prices of fuel , in absolute and relative terms;
- Values placed on emissions, depending also upon political, economic, and social priorities;
- The growth in the demand for electricity produced and /or supplied by Enemalta;
- Costs of investments in Gas and other infrastructures;
- The availability and feasibility of the use of different energy production technologies in future.
- The Shadow Prices of Emissions.

The report continues ( Appendix C6)“ *that all these factors are bound to have a significant impact on the country’s energy performance. This also implies that there can be no single unequivocal answer as to the cheapest cost solution regarding the type of fuel which the country should be utilising over the forthcoming 20-year period. It will therefore be essential for the country to be in a position to choose between different types of energy sources from time to time and not commit to any single source for a protracted period. At the same time, it will be essential for such technology to be operated in the most efficient manner possible, to optimise financial and economic performance and minimise any attendant risks.*

This is indicative of an Energy Policy which is incoherent, particularly with the real necessity to recover plant capital costs.

The report from Cubed Consultants (on page 28 Appendix C7) also makes an observation of paramount importance namely:

*It may be commented that from a wider economic perspective, it is important to ensure that emissions are kept within the expected limits.*

This is certainly one of the most important observations of the report, and reflects the opinion expressed in article 4.2, Emissions values and Costs (Appendix C8) namely:

As expected, Gas has the best performance in terms of emissions minimization, followed by Gasoil, with HFO having the worst performance. There is thus an immediately apparent trade-off to be made between the low financial costs of using HFO and the relatively high costs of emissions which this would entail.

The report therefore acknowledges that a trade off has to be made between the fuel to be utilised and the cost of emissions. The fact that the use of HFO will bring about substantial costs that are emission and waste related, and that comparatively the utilisation of Gasoil offers the best price performance ratio is also confirmed.

This is of particular significance when one considers that the current background pollution level of PM<sub>2.5</sub> and PM<sub>10</sub> significantly exceed the limits stipulated by the Clean Air Directive 2008/50/EC as reported earlier above.

In the present circumstances the best fuel would be Gas. The infrastructure to deliver this fuel to DPSE does not exist and will take some time to establish.

HFO has the worst performance and therefore this fuel cannot be considered as a primary fuel for DPSE, in an environment where the pollution level of PM<sub>2.5</sub> and PM<sub>10</sub> significantly exceed the limits stipulated by the Clean Air Directive 2008/50/EC.

Taking these points into consideration;

the present circumstances permit only one fuel that may be utilised to fuel the Delimara Power Station Extension Plant : GASOIL.

**SECTION D**  
**STACK HEIGHT.**

## **Stack Height.**

### **Pollution levels and emissions.**

The Marsaxlokk Local Council , in the Document reference 03.03 dated the 14th December 2009, ( Appendix D1.4) , had requested MEPA as follows;

*The Marsaxlokk Local Council reiterates its request to MEPA for the stack height determination to be revised utilising guaranteed data from BWSC and also utilising the actual background pollutant concentrations measured at Marsaxlokk and Birzebbugia, the zone that will be most affected by the prevailing North Westerly winds.*

In view of this request MEPA issued a call for Tenders which resulted in the Dispersion Model Study which was carried out by ESS GmbH and Ecoserve Ltd. The study is based on a Chimney/Stack height of 65 metres.

As already mentioned in Section A of this document , measurements taken during the study show that the concentrations of PM<sub>10</sub> and PM<sub>2.5</sub> are significantly above the limits stipulated by Directive 2008/50/EC. Air Quality Standards are being breached.

MEPA recognises this fact as MEPA itself recorded exceedances in Particulate Matter concentrations since 2004, and that the concentrations remain high despite actions that have been taken. This is evidenced in the Action Plan presented to the Office of the Prime Minister in 2010.

It is to be mentioned that the study presented by ESS GmbH and Ecoserve does not include a study covering vanadium a heavy metal constituent in Heavy Fuel Oil. Vanadium is practically absent in Gasoil as this is a refined product unlike Heavy Fuel Oil which is a residual Oil, ie the residue produced by refineries once other petroleum products have been extracted in the process of fractionation.

As shown in (Appendix A11 and A12 ) if the Delimara Power Station Extension were to be operated with Heavy Fuel Oil, the emission of Vanadium would increase by 81.43% .

Refereing to the same table in ( Appendix A12 ) one will note the great difference in Vanadium emissions between the various plants at Delimara Power Station.

The Phase 1 plant emits 922.2 mg/s while the proposed extension plant will emitt 755.4mg/s if this is operated on Heavy fuel oil.

The Phase 2A and Phase 2B which incorporate Gas Turbines utilising Gasoil as a fuel only emit a mere 2.7 and 2.8mg/s respectively.

These values are based on data provided by Enemalta itself as submitted in the Environment Impact Assessment carried out by AIS Environmental

As already mentioned in the submission made by the Council ( Appendix D1.1) , a lower stack height would result, as one would expect in higher ground level concentrations of PM<sub>10</sub> and PM<sub>2.5</sub> and metal constituents nearer to the base of the Stack itself. In fact combustion plants burning heavy fuel oil have Stack Heights which on average exceed 120 meters. The Stack of Delimara Phase 1 which burns heavy fuel oil is in fact 150m high.

It is to be mentioned that the other stacks present on site which are of similar height are associated with the Combined Cycle Gas Turbine Plant burning Gasoil.

### **The construction of the stacks / chimneys.**

During the Public Hearing held by MEPA when the building permit of the new extension plant was being considered, MEPA understood the point of view forwarded by the Marsaxlokk Local Council. It had in fact at the time declared this issue as “ a reserved matter “ which was to be considered during the IPPC process permitting the issue of licence to operate the plant by MEPA. Correspondence exchanged between the Local Council, MEPA, and Enemalta demonstrates clearly that Enemalta had received no permission from MEPA to undertake the construction of the chimneys.

Enemalta has of its own accord, without permission from MEPA and in full knowledge that the issue was still to be considered at the IPPC processing stage, erected the chimneys . The constructions are complete. (Appendix D2)

As the issue regards the eventual height of the chimneys, it would have been wiser had Enemalta chosen to at least leave the erection of the final exhaust sections until after the IPPC permit has been processed and an operating licence granted.

Enemalta however chose otherwise claiming that the emissions from the plant contribute to a lesser degree to an environment in which the pollution exceeds significantly levels stipulated in the Clean Air Directive.

Instead of respecting the Authority vested in MEPA, and the right of the Marsaxlokk Local Council , an democratically elected body representing the interests of all the residents within its boundary , a boundary which also encompasses the site of the Delimara Power Station, Enemalta chose to finish off the chimneys.

Through its actions Enemalta unilaterally decided to override the Authority vested in MEPA, and also overridden the right of the Marsaxlokk Local Council to present its views in front of MEPA, in a hearing which is free and impartial.

## **Conclusions.**

Whereas:

- The pollution levels of PM<sub>2.5</sub> and PM<sub>10</sub> in Marsaxlokk as measured by ESS Gmbh and Ecoserve Ltd exceed by a significant degree the maximum level stipulated in the Clean Air Directive 2008/50/EC.
- MEPA itself recognises in its Action Plan that Particulate Matter exceedances have been recorded in Malta since 2004 and that despite all actions these levels still exceed the limits stipulated in the Clean Air Directive 2008/50/EC.
- The burning of Gasoil instead of heavy fuel oil will result in a decrease of 40% in dust emissions ( Appendix A13)
- The burning of Heavy Fuel Oil will result in an increase of 81% in the emission of the heavy metal Vanadium in the atmosphere, an metal which is practically absent in Gasoil as evidenced in Appendix A12
- The height of the Stacks and built by Enemalta without the requisite permission from MEPA will result in a significant additional impact on the Environment in Marsaxlokk, if Heavy Fuel Oil were to be utilised instead of Gasoil.

Then MEPA is left with no other alternative but to permit the operation of the Delimara Power Station Extension Plant complete with the chimneys as constructed unilaterally by Enemalta , without the requisite permission from MEPA, on GASOIL.