Financial and Economic Costs of Running the Delimara Power Station Extension on Different Fuels

HFO, Gasoil, Gas

Cubed Consultants Ltd

December 2011

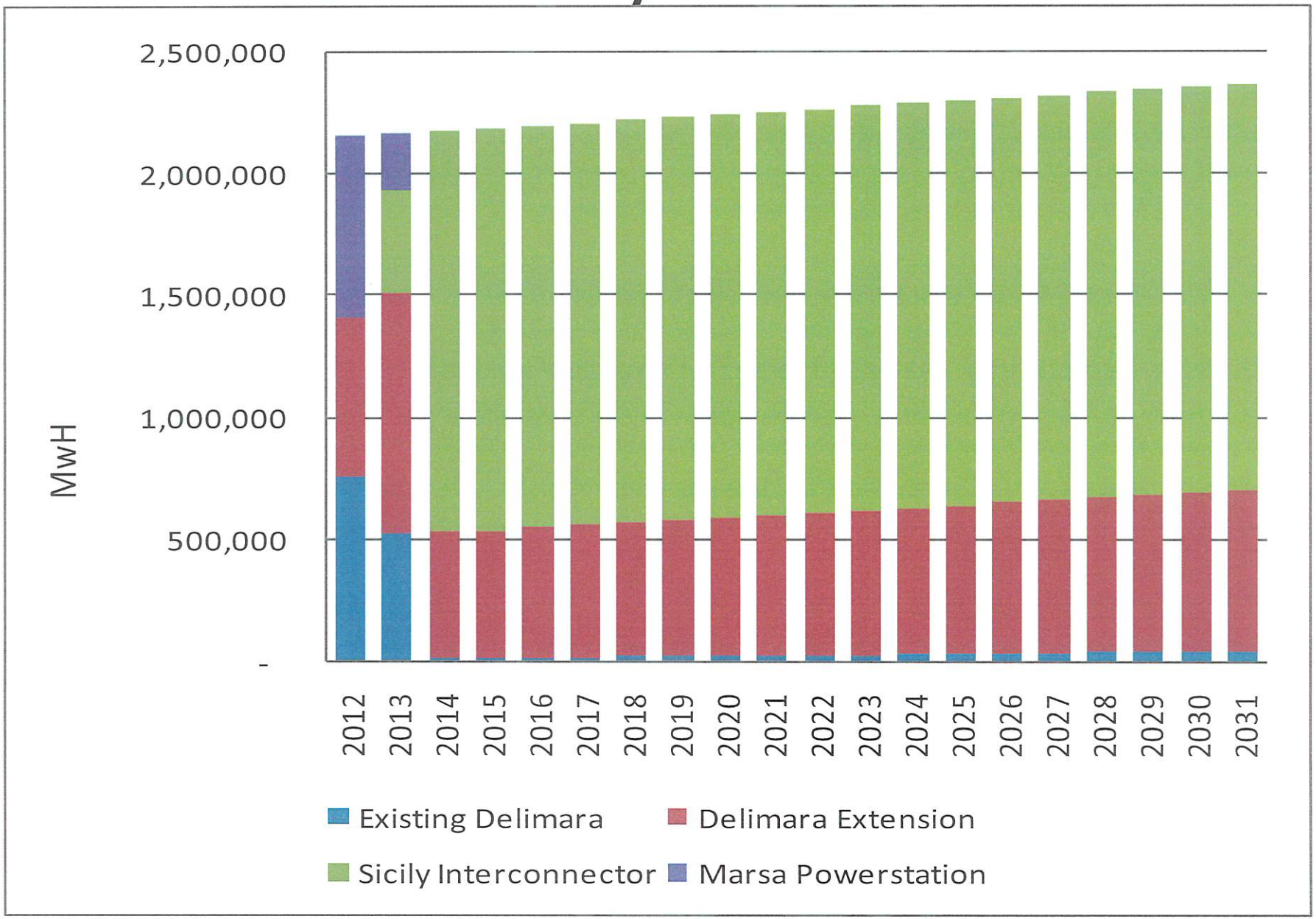
Contents

- Elements of the study
  - **Financial costs** under three types of fuel
  - **Economic costs** (including financial costs and costs of environmental emissions) under three different types of fuel

- This analysis is incremental on the **basis of the plant already purchased for the Delimara extension and the existing plant** - only additions and modifications, not alternatives, to such plants are considered in this study.

FINANCIAL MODEL

Electricity Generation



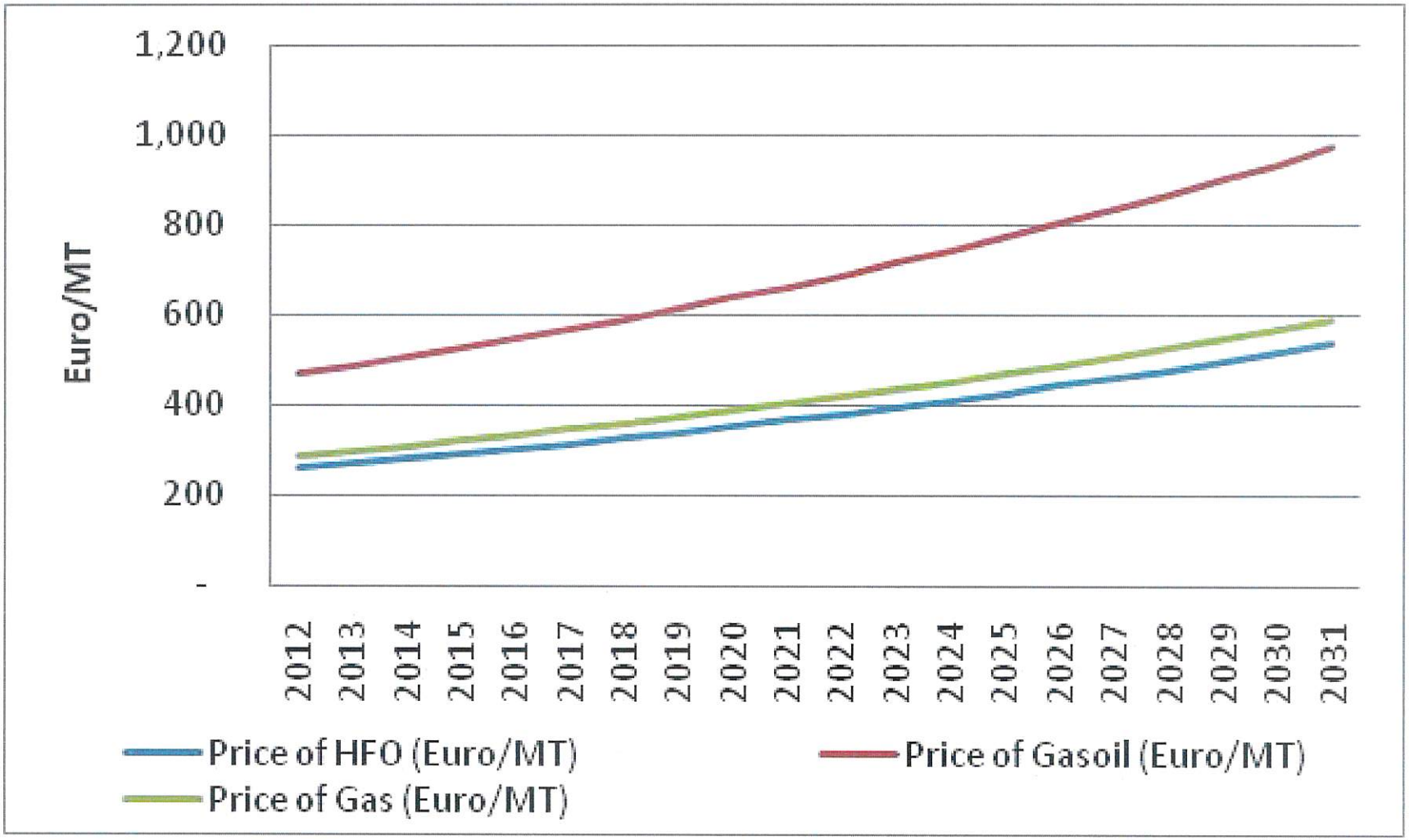
This baseline case assumes a 0.5% annual growth rate in demand

Utilisation of Generation Sources

Hours in a year	Inter-connector	DPS Extension	DPS Existing
2013	8757	6900	569
2020	8757	7128	809
2031	8757	7437	1338

These estimates are on a baseline case of a 0.5% annual growth in electricity demand and assuming the patterns of hourly demand fluctuations during the year which occurred during 2010.

Projected Fuel Prices



This assumes: an annual growth of 4% of base crude price

price of Gas is 10% higher than HFO

price of Gasoil is 81% higher than HFO

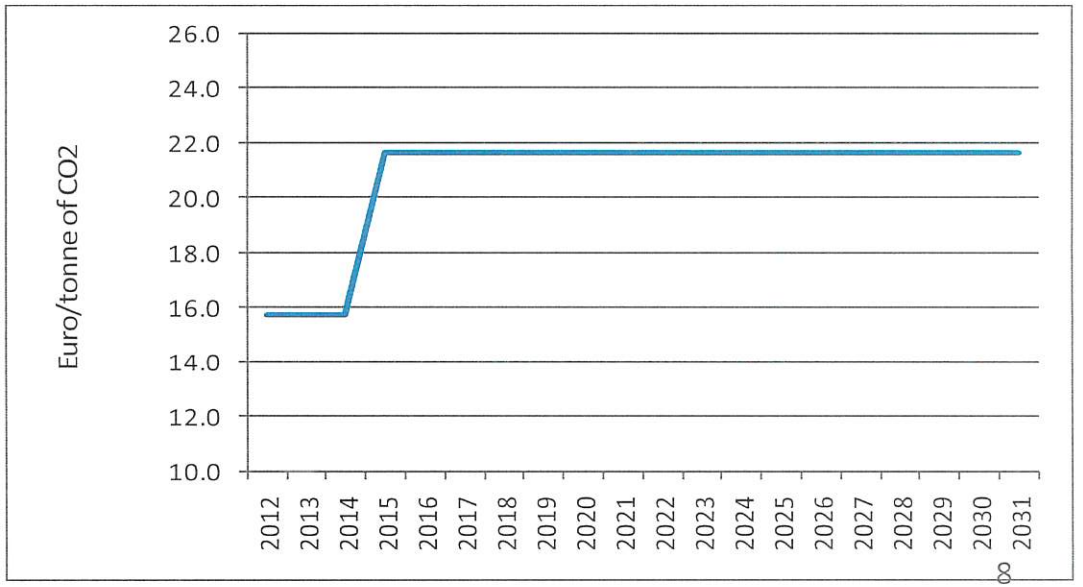
Other Cost Elements in the Financial Model

Variables	
Lubricant oil cost	Varies with Fuel Expenditure
Urea Cost	Varies with Volume of Fuel
Desox Reagent Cost	Annual growth of 2%
Maintenance Agreement	Fixed+Variable element which varies with electricity generated
Maintenance personnel	Fixed
Waste Disposal m3/MT	Varies with Volume of Fuel
Operational Personnel	Fixed
Electricity to plant	Varies according to Price of Fuel
Steam	Varies according to Price of Fuel
SCR Regeneration disposal	Incurred every fifth year based on average of fuel consmption in the previous five years

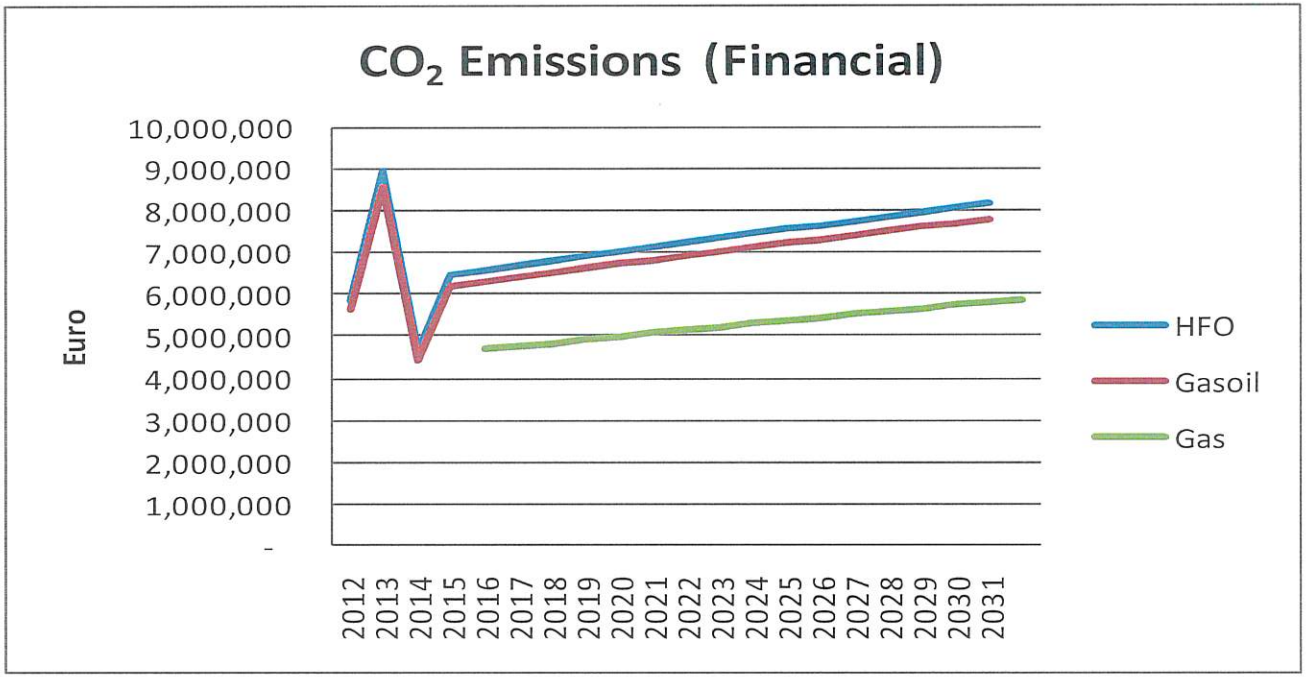
Financial implications of CO_2 emissions

Carbon price projections annual average in Euro/tonne of CO_2	2010-2014	2015-2019
Euro in (2005)	13.6	18.7
Euro in (2008)	14.5	20
Euro in (2012) - based on an average annual price inflation rate of 2%	15.7	21.6

Source: Guidance document on the optional application of Article 10c of Directive 2003/87/EC (2011/C 99/03)



Financial Implications of CO_2 emissions



Financial Costs

(including incremental investment and operational costs over a 30-year period)

	HFO NPV	Gasoil	Gas
Infrastructural Costs	-	-	**223,949,834**
Operations and Maintenance Costs			
Fuel Costs	521,368,130	899,272,477	523,431,995
Lubricant oil cost	15,497,799	15,491,457	13,232,255
Urea Cost	16,023,729	16,016,307	14,116,474
Desox Reagent Cost	23,916,568	2,279,117	0
Maintenance Agreement	42,196,154	42,196,154	37,138,442
Maintenance personnel	7,337,650	7,337,650	6,638,080
Waste Disposal	23,662,988	2,254,949	0
Operational Personnel	11,346,157	11,346,157	10,264,417
Electricity to plant	668,516	637,015	454,324
Steam	440,005	419,272	299,028
SCR Regeneration disposal	106,871	101,843	119,394
Fabric Filters	2,492,442	2,492,442	
CO_2 Emission Allowances	87,818,204	84,006,650	58,478,261
Operations and Maintenance prior to set off Gas operations	752,875,214	1,083,851,490	725,520,280
Savings in Operations and Maintenance Costs in runnning existing Delimara			26,001,921
Total Operations and Maintenace	**752,875,214**	**1,083,851,490**	**699,518,359**
Total Costs	752,875,214	1,083,851,490	923,468,193

Financial Costs (NPV)

(including incremental investment and operational costs over a 30-year period)

Proportion of NPV	HFO	Gasoil	Gas*
Capital Costs			24.3%
Operational and Maintenance			
Fuel Costs	69.3%	83.0%	56.7%
Lubricant oil cost	2.1%	1.4%	1.4%
Urea Cost	2.1%	1.5%	1.5%
Desox Reagent Cost	3.2%	0.2%	0.0%
Maintenance Agreement	5.6%	3.9%	4.0%
Maintenance personnel	1.0%	0.7%	0.7%
Waste Disposal	3.1%	0.2%	0.0%
Operational Personnel	1.5%	1.0%	1.1%
Electricity to plant	0.1%	0.1%	0.0%
Steam	0.1%	0.0%	0.0%
SCR Regeneration disposal	0.0%	0.0%	0.0%
Fabric Filters	0.3%	0.2%	-
CO_2 Emission Allowances	11.7%	7.8%	6.3%
Operations and Maintenance prior to set off Gas operations	100.0%	92.0%	78.6%
Savings in Operations and Maintenance Costs in runnning existing Delimara			2.8%
Proportion of NPV	100.0%	100.0%	100.0%

*Gas option refers to existing and extension running on Gas with savings in costs on operations and maintenance of existing plant taken as a separate variable

Summary Results

Net Present Value of Costs (€)	
	Baseline
Scenario I (HFO+Gasoil)	752,875,214
Scenario II (Gasoil)	1,083,851,490
Scenario III (Gas)	923,468,193
Proportion of GDP	
Scenario I (HFO+Gasoil)	0.6%
Scenario II (Gasoil)	0.9%
Scenario III (Gas)	0.8%
GDP (NPV)	122,190,125,467

Prime Dynamic Cost

(financial costs per Mwh of energy produced)

	Financial (a) PDC: Incremental Costs/Total Units (Existing and Extension)	(b) PDC: Incremental Costs/Incremental Units
HFO	82.94	99.31
Gasoil	119.40	142.97
Gas	101.73	121.81
% Change from HFO		
Gasoil	44.0%	44.0%
Gas	22.7%	22.7%

This indicator is relevant for the setting of consumer tariffs, but is only one element within the cost recovery approach currently being adopted.

ECONOMIC MODEL

Shadow Prices

Shadow Prices	
Emission	**Price of emissions Euro/kg pollutant (EU27) (2012 prices)***
CO2	0.0265
SO2	9.8
NOX	10.2
PM2.5	35.8
PM10	24.0
Dust	30.1
Nh3	18.6
Arsenic	771.8
Cadmium	121.9

Source: Handbook of Shadow Prices (2010) Table 16

*Prices used in the economic model have been adjusted to 2012 prices based on euro area inflation rate and a predicted inflation rate of 2%.

The study uses data on shadow prices obtained from the Handbook of Shadow Prices which are comparable with or higher than values which are found in other sources. This ensures a prudent approach in the valuation of shadow effects.

Emissions (Extension)

Emissions from Delimara Extension				
	Gas	HFO	Gasoil	Unit
CO2	415	576	551	g/KWh
SO2	nil*	0.73	0.365	g/kWh
NOX	0.49	0.97	0.97	g/kWh
Dust[1]	0.09	0.33	0.198	g/kWh
Nh3		101		g/MT
Arsenic		0.0005555		g/kWh
Cadmium		0.0000257		g/kWh
[1] contains trace metals				

* It is assumed that there is no sulfur content in the gas fuel.

** There are conflicting figures regarding the emissions on NOX from gas fired diesel engine plant with Best Reference document quoting a range from 0.13g/kWh to 0.49g/kWh as translated to our plant. However, other sources in the same document also state a higher figure of 0.97g/kWh.

*** The figures available between the three fuels are only for dust. Such figures do not discriminate between PM2.5 and PM10. The price of dust emissions has been taken as the relative Predicted Environmental Concentration of PM10 and PM2.5 noted in the EIA required for the planning extension of the Delimara Power Station.

Emissions (Existing)

Emissions from Delimara Existing				
	Gas	HFO	Gasoil	Unit
CO2	498	N/A	658	g/KWh
SO2	nil*	N/A	0.134	g/kWh
NOX	0.102	N/A	1.41	g/kWh
Dust[1]	0	N/A	0.0051	g/kWh
Nh3	0	N/A	0	g/MT
Arsenic	0	N/A	0	g/kWh
Cadmium	0	N/A	0	g/kWh

[1] Contains trace metals

There is no scenario where the Existing Delimara Extension is fuelled by HFO.

Total Economic Costs (NPV)

(including incremental investment and operational costs over a 30-year period)

	HFO NPV (Euro)	Gasoil	Gas+
Infrastructural Costs	-	-	**224,042,911**
Operations and Maintenance Costs			
Fuel Costs (HFO)	497,093,980	857,403,429	427,051,812
Lubricant oil cost	14,776,244	14,770,193	10,795,783
Urea Cost	15,374,439	15,367,313	11,566,960
Desox Reagent Cost	22,873,223	2,179,691	0
Maintenance Agreement	40,476,033	40,476,033	30,453,927
Maintenance personnel	7,036,290	7,036,290	5,447,768
Waste Disposal	22,704,151	2,163,577	0
Operational Personnel	10,880,166	10,880,166	8,423,846
Electricity to plant	637,294	607,265	371,265
Steam	419,456	399,691	244,360
SCR Regeneration disposal	101,907	97,112	97,112
Fabric Filters	2,384,261	2,384,261	
Initial Operations and Maintenance Costs running on HFO			132,855,261
Net Savings in Operations and Maintenance Costs in runnning existing Delimara			23,447,905
Total Operations and Maintenance Costs	**634,757,444**	**953,765,021**	**603,860,189**
Economic Costs			
CO2 emissions	111,055,019	106,234,923	58,666,194
Nox emissions	52,076,321	72,114,811	26,709,941
Sox emissions	72,114,811	26,038,160	
Dust emissions	72,250,389	43,350,233	14,447,505
Nh3	2,616,775		
Arsenic	3,118,826		
Cardmium	22,793		
Total Economic Costs - Prior to set up of Gas Operations			99,823,641
Savings in Economic Costs			3,389,866
Economic Costs	**313,254,934**	**247,738,127**	**180,007,321**
Total NPV	**948,012,377**	**1,201,503,148**	**1,007,910,421**

Economic Costs

	HFO	GASOIL	GAS
Capital Costs		0.00%	22.24%
Operational and Maintenance			
Fuel Costs (HFO)	52.44%	71.50%	42.39%
Lubricant oil cost	1.56%	1.23%	1.07%
Urea Cost	1.62%	1.28%	1.15%
Desox Reagent Cost	2.41%	0.18%	0.00%
Maintenance Agreement	4.27%	3.38%	3.02%
Maintenance personnel	0.74%	0.59%	0.54%
Waste Disposal	2.39%	0.18%	0.00%
Operational Personnel	1.15%	0.91%	0.84%
Electricity to plant	0.07%	0.05%	0.04%
Steam	0.04%	0.03%	0.02%
SCR Regeneration disposal	0.01%	0.01%	0.00%
Fabric Filters	0.25%	0.20%	0.00%
Total Operations and Maintenance Costs prior to set up of gas operation			62.27%
Savings in Operations and Maintenance Costs in runnning existing Delimara			2.33%
Economic Costs			
CO2 emissions	11.71%	8.86%	5.82%
Nox emissions	5.49%	6.01%	2.65%
Sox emissions	7.61%	2.17%	0.00%
Dust emissions	7.62%	3.62%	1.43%
Nh3	0.28%	0.00%	0.00%
Arsenic	0.33%	0.00%	0.00%
Cardmium	0.00%	0.00%	0.00%
Total Economic Costs - Prior to set up of Gas Operations	0.00%	0.00%	18.21%
Savings in Economic Costs			0.40%
NPV	**100%**	**100%**	**100%**

Economic Costs

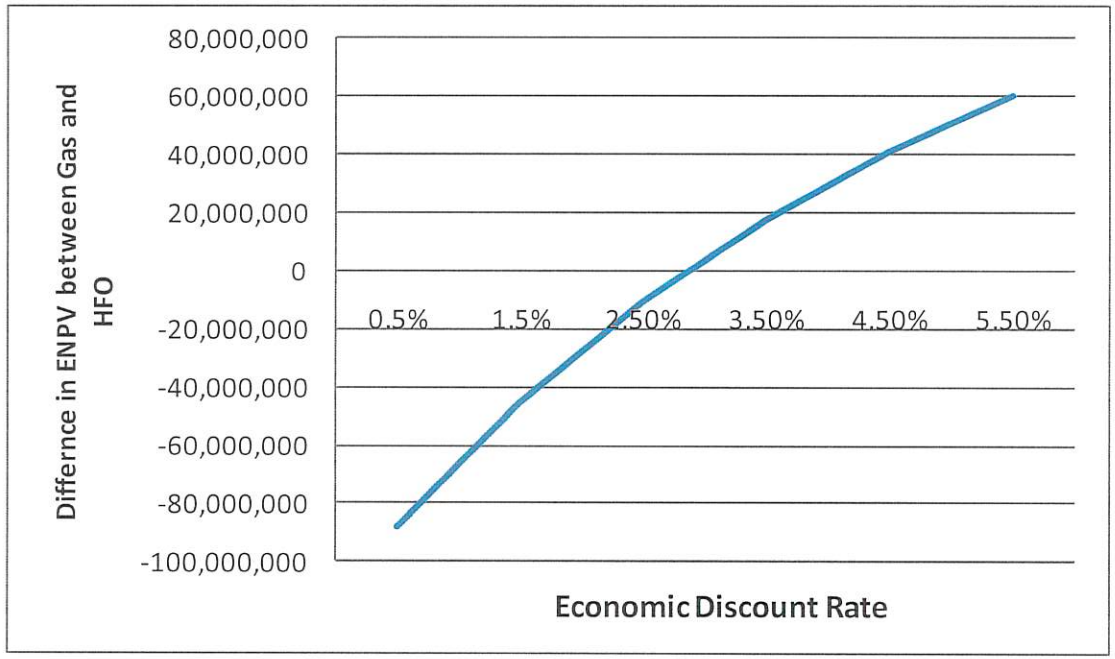
Net Present Value of Costs (€)			
	Total Costs	Economic Costs	Financial Costs
Scenario I (HFO+Gasoil)	948,012,377	313,254,934	634,757,444
Scenario II (Gasoil)	1,201,503,148	247,738,127	953,765,021
Scenario III (Gas)	1,007,910,421	180,007,321	827,903,100

- Scenarios I and III present, on aggregate, quite similar levels of costs, with Scenario I involving the use of HFO, showing some advantages over the other on account of its financial performance.
- Gas has the lowest costs from an emissions perspective, but this is not sufficient to outweigh its financial disadvantage compared to HFO in terms of aggregate cost performance.
- Gasoil, on the other hand, has a poor financial performance and an intermediate emissions performance, and emerges on aggregate to be almost 27% more expensive than the lowest cost scenario.

Economic PDC

	Economic (a) PDC: Incremental Costs/Total Units (Existing and Extension)	(b) PDC: Incremental Costs/Incremental Units
HFO	104.43	125.05
Gasoil	132.36	158.49
Gas	111.03	132.95
% Change from HFO		
Gasoil	26.7%	26.7%
Gas	6.3%	6.3%

Economic Discount Rate



- The discount rate is the rate at which future values are discounted to the present value. A lower discount rate implies that future values are discounted by a lower value thus rendering a lower valuation to the present value.
- The difference in the economic net present value between HFO and Gas would be completely eroded with an economic discount rate of about 3% in real terms.

Sensitivity Analyses

1. Demand increases by 1% rather than 0.5% per annum
2. Demand for electricity remaining flat for the period of analysis
3. Price of crude oil rising by 10% per annum in real terms rather than the 4% assumed in the baseline model
4. The relativity between the price of Gasoil and that of HFO widening by 50%
5. The relativity between the price of Gas and that of HFO widening by 50%
6. The investment cost in the Gas infrastructure rising by 10%
7. The shadow prices of emissions rising by 10%
8. A higher load of electricity demand being satisfied through interconnection facilities from 2020 onwards.
9. A higher load of electricity demand being first and foremost met by the DPS extension as opposed to the interconnector.
10. The market price of CO2 emission allowances

Sensitivity Analyses

- The economic advantage of HFO relative to Gas may be eroded by any one of the following conditions (everything else remaining the same):
  - a 1% per annum increase in electricity demand;
  - a 64% annual increase in crude oil prices;
  - the relative price of gas to HFO declining from 110% to 95%;
  - the investment in gas infrastructure being cheaper by 26%;
  - a 46% increase in the shadow price of emissions.

Sensitivity Analyses

- A higher load of electricity demand being satisfied through interconnection facilities from 2020 onwards
  - HFO: Economic PDC: -3.2%
  - Gas: Economic PDC: +17.3%
- A higher load of electricity demand being first and foremost met by the DPS extension as opposed to the interconnector
  - HFO: Economic PDC: -1.2%
  - Gas: Economic PDC: -11.4%

Demand increases by 1% rather than 0.5% per annum

	Baseline: Demand increasing by 0.5% per annum		Scenario: Demand increase by 1%		Percentage Change	
	Financial	Economic	Financial	Economic	Financial	Economic
Scenario I (HFO+Gasoil)	752,875,214	948,012,377	839,191,602	1,066,643,148	11.46%	12.51%
Scenario II (Gasoil)	1,083,851,490	1,201,503,148	1,217,878,014	1,356,967,305	12.37%	12.94%
Scenario iIi (Gas)	923,468,193	1,007,910,421	988,339,272	1,080,683,036	7.02%	7.22%

Financial	(a) PDC: Incremental Costs/Total Units (Existing and Extension)	(b) PDC: Incremental Costs/Incremental Units
HFO	72.16	87.99
Gasoil	109.02	132.93
Gas	88.74	108.20
% Change from HFO		
Gasoil	51.1%	51.1%
Gas	23.0%	23.0%

Economic	(a) PDC: Incremental Costs/Total Units (Existing and Extension)	(b) PDC: Incremental Costs/Incremental Units
HFO	102.55	125.05
Gasoil	130.53	159.16
Gas	104.10	126.93
% Change from HFO		
Gasoil	27.3%	27.3%
Gas	1.5%	1.5%

Demand for electricity remaining flat for the period of analysis

	Baseline: Demand increasing by 0.5% per annum		Scenario: Flat Demand		Percentage Change	
	Financial	Economic	Financial	Economic	Financial	Economic
Scenario I (HFO+Gasoil)	752,875,214	948,012,377	664,560,529	826,119,645	-11.73%	-12.86%
Scenario II (Gasoil)	1,083,851,490	1,201,503,148	946,769,726	1,042,032,842	-12.65%	-13.27%
Scenario III (Gas)	923,468,193	1,007,910,421	844,119,975	917,595,824	-8.59%	-8.96%

Financial				Economic		
	(a) PDC: Incremental Costs/Total Units (Existing and Extension)	(b) PDC: Incremental Costs/Incremental Units			(a) PDC: Incremental Costs/Total Units (Existing and Extension)	(b) PDC: Incremental Costs/Incremental Units
HFO	72.11	86.75		HFO	103.44	124.44
Gasoil	108.02	129.96		Gasoil	130.55	157.06
Gas	97.53	117.33		Gas	115.18	138.56
% Change from HFO				% Change from HFO		
Gasoil	49.8%	49.8%		Gasoil	26.2%	26.2%
Gas	35.2%	35.2%		Gas	11.3%	11.3%

Price of crude oil rising by 10% per annum in real terms rather than the 4% assumed in the baseline model

	Baseline: Price of Crude Oil increasing by 4%		Scenario: Price of Crude Oil increasing by 10%		Percentage Change	
	Financial	Economic	Financial	Economic	Financial	Economic
Scenario I (HFO+Gasoil)	752,875,214	948,012,377	1,174,575,184	1,341,434,019	56.01%	41.50%
Scenario II (Gasoil)	1,083,851,490	1,201,503,148	1,801,738,466	1,871,249,525	66.23%	55.74%
Scenario III (Gas)	923,468,193	1,007,910,421	1,352,764,130	1,408,448,179	46.49%	39.74%

	Financial	Economic
Baseline value	Price of Crude Oil increases by 4% per annum	
Switching value	Relative Price of 1.43	Relative price of 1.59
Notes:	Gas has a high fixed cost element. A substantial increase in the price of crude oil is needed to make it financially preferable. Also, a 59% increase per annum in the price of crude oil would erode the economic advantages of the gas option. To be noted that when the price of crude oil increases, the price of gas also increases.	

The relativity between the price of Gasoil and that of HFO widening by 50%;

	Baseline: Relative Price of Gasoil to HFO: 1.81		Scenario: Relative Price of Gasoil to HFO increases by 50% to 2.7		Percentage Change	
	Financial	Economic	Financial	Economic	Financial	Economic
Scenario I (HFO+Gasoil)	752,875,214	948,012,377	752,875,214	948,012,377	0.00%	0.00%
Scenario II (Gasoil)	1,083,851,490	1,201,503,148	1,526,035,195	1,623,099,309	40.80%	35.09%
Scenario III (Gas)	923,468,193	1,007,910,421	901,438,933	987,219,810	-2.39%	-2.05%

	Financial	Economic
Baseline value	Relative Price of Gasoil to HFO increases by 50% to 2.7	
Switching value	Relative Price of 8.5	Relative price of 4.4
Notes:	Relative price of Gasoil to HFO would have to increase substantially for the financial feasibiltiy of Gas to match that of HFO. This is due to the fact that elements of Gas operations are fixed to Gasoil. In terms of the economic feasibility, the relative price of Gasoil to HFO woud need to increase more than four times , for HFO to lose its economic advantageous position.	

The relativity between the price of Gas and that of HFO widening by 50%;

	Baseline: Relative Price of Gas to HFO: 1.1		Scenario: Relative Price of Gas to HFO increases by 50% to 1.65		Percentage Change	
	Financial	Economic	Financial	Economic	Financial	Economic
Scenario I (HFO+Gasoil)	752,875,214	948,012,377	752,875,214	948,012,377	0.00%	0.00%
Scenario II (Gasoil)	1,083,851,490	1,201,503,148	1,083,851,490	1,201,503,148	0.00%	0.00%
Scenario III (Gas)	923,468,193	1,007,910,421	1,163,810,165	1,234,831,532	26.03%	22.51%

	Financial	Economic
Baseline value	Relative Price of Gas to HFO increases by 50% to 1.65	
Switching value	Relative price of 0.58	Relative price of 0.92
Notes:	Price of gas would have to be 42% lower than HFO for the gas option to be as financialy feasible as HFO. Also, price of gas would have to be 8% lower than HFO for the option to be as economically advantageous as HFO.	

The investment cost in the Gas infrastructure rising by 10%

	Baseline: Investment Cost		Scenario: A 10% increase in the investment cost of Gas		Percentage Change	
	Financial	Economic	Financial	Economic	Financial	Economic
Scenario I (HFO+Gasoil)	752,875,214	948,012,377	752,875,214	948,012,377	0.00%	0.00%
Scenario I (HFO+Gasoil)	1,083,851,490	1,201,503,148	1,083,851,490	1,201,503,148	0.00%	0.00%
Scenario I (HFO+Gasoil)	923,468,193	1,007,781,479	945,863,177	1,030,185,770	2.43%	2.22%

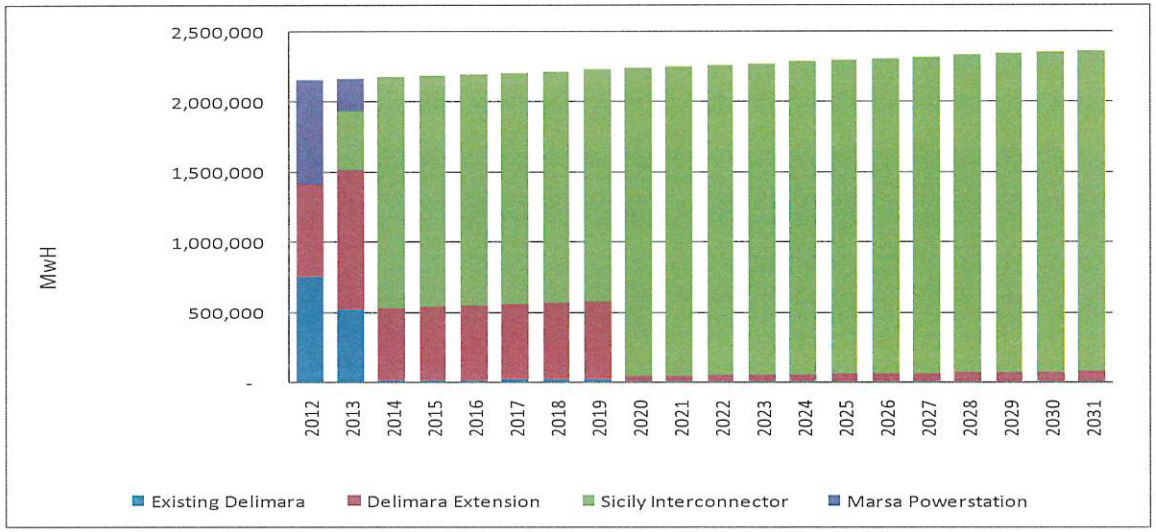
	Financial	Economic
Baseline value	Investment Cost of Euro 297.621 million	
Switching value	Investment Cost lower by 76%	Investment cost lower by 25%

The shadow prices of emissions rising by 10%

	Baseline: Price of emissions		Scenario: A 10% increase in the price of Emissions		Percentage Change	
	Financial	Economic	Financial	Economic	Financial	Economic
Scenario I (HFO+Gasoil)	752,875,214	948,012,377	752,875,214	979,337,870	0.00%	3.30%
Scenario II (Gasoil)	1,083,851,490	1,201,503,148	1,083,851,490	1,226,276,961	0.00%	2.06%
Scenario III (Gas)	923,468,193	1,007,781,479	923,468,193	1,025,782,211	0.00%	1.79%

	Financial	Economic
Baseline value	Baseline Price of Emissions	
Switching value	NA	Price of emissions increases by 41%

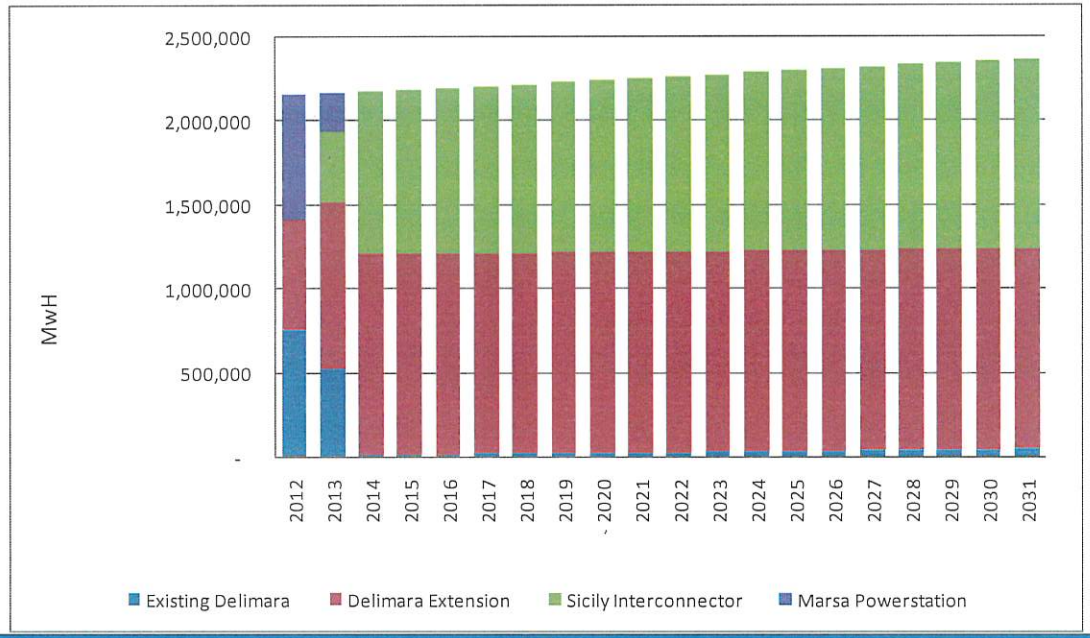
A higher load of electricity demand being satisfied through interconnection facilities from 2020 onwards



Baseline					
	Financial (a) PDC: Incremental Costs/Total Units (Existing and Extension)	(b) PDC: Incremental Costs/Incremental Units		Economic (a) PDC: Incremental Costs/Total Units (Existing and Extension)	(b) PDC: Incremental Costs/Incremental Units
HFO	82.94	99.31	HFO	104.43	125.05
Gasoil	119.40	142.97	Gasoil	132.36	158.49
Gas	101.73	121.81	Gas	111.03	132.95

Higher load on interconnector from 2020					
	Financial (a) PDC: Incremental Costs/Total Units (Existing and Extension)	(b) PDC: Incremental Costs/Incremental Units		Economic (a) PDC: Incremental Costs/Total Units (Existing and Extension)	(b) PDC: Incremental Costs/Incremental Units
HFO	70.95	92.06	HFO	93.30	121.06
Gasoil	99.06	128.53	Gasoil	114.25	148.24
Gas	106.20	137.79	Gas	120.17	155.92

A higher load of electricity demand being first and foremost met by the DPS extension as opposed to the interconnector.



Baseline					
	Financial			Economic	
	(a) PDC: Incremental Costs/Total Units (Existing and Extension)	(b) PDC: Incremental Costs/Incremental Units		(a) PDC: Incremental Costs/Total Units (Existing and Extension)	(b) PDC: Incremental Costs/Incremental Units
HFO	82.94	99.31	HFO	104.43	125.05
Gasoil	119.40	142.97	Gasoil	132.36	158.49
Gas	101.73	121.81	Gas	111.03	132.95

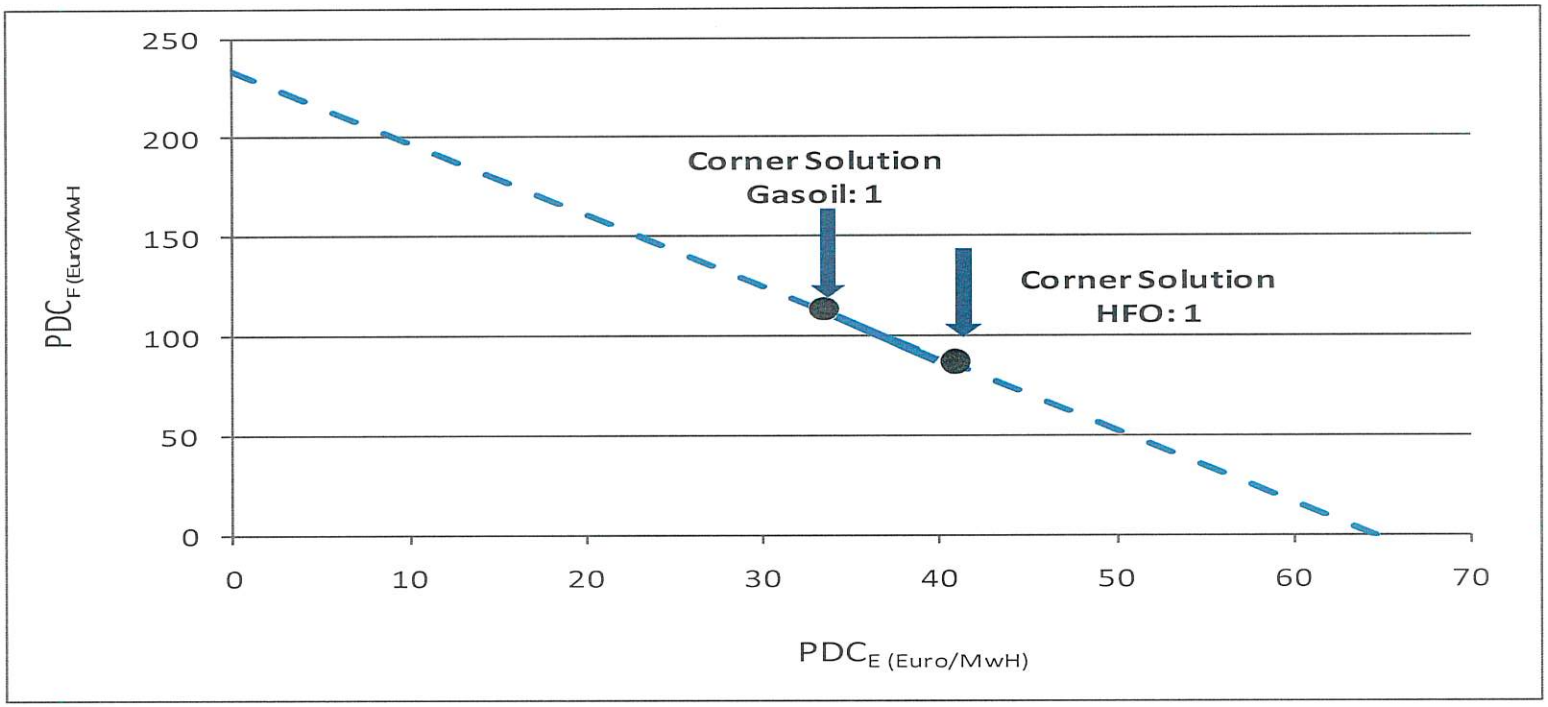
Demand being met first and foremost by the DPS extension					
	Financial			Economic	
	(a) PDC: Incremental Costs/Total Units (Existing and Extension)	(b) PDC: Incremental Costs/Incremental Units		(a) PDC: Incremental Costs/Total Units (Existing and Extension)	(b) PDC: Incremental Costs/Incremental Units
HFO	88.78	98.22	HFO	111.64	123.51
Gasoil	128.96	142.67	Gasoil	142.51	157.66
Gas	98.21	108.65	Gas	106.48	117.80

The market price of CO_2 emission allowances

	Baseline: Price of CO2 allowances		Scenario: 10% increase in the price of CO2 allowances		Percentage Change	
	Financial	Economic	Financial	Economic	Financial	Economic
Scenario I (HFO+Gasoil)	752,875,214	948,012,377	761,657,034	948,012,377	1.17%	0.00%
Scenario II (Gasoil)	1,083,851,490	1,201,503,148	1,092,252,155	1,201,503,148	0.78%	0.00%
Scenario III (Gas)	923,468,193	1,007,910,421	930,176,663	1,007,910,421	0.73%	0.00%

	Financial	Economic
Baseline value	Price of CO2 allowances as established through Commission forecast	
Switching value	Price of CO2 allowances would have to increase almost nine fold.	

Derivation of a Formula to allow for varying components of HFO and Gasoil use in the DPS Extension



- This implies that as one moves from the corner solution of 100% dependence on gasoil to a varying proportion of dependence on HFO, the PDC of the externality increases by €1/MwH while the financial PDC falls by €3.61/MwH.
- Similarly a decrease in the pure externality cost of €1/MwH through higher dependence on Gasoil as opposed to HFO implies an increase of €3.61/MwH in the PDC from a financial perspective.

Conclusions

- The DPS Extension is projected to generate around 25% of Malta's energy requirements over the next twenty years, and will be required to supply energy for 85% of the time during a typical year.
- Its operation will be critical to the country's energy performance, from the financial and economic viewpoints

Conclusions

- The operation and context of the energy market will be subject to important dynamics over the period, affecting conditions such as:
  - Price of fuels, in absolute and relative terms
  - Values placed on emissions, depending also upon political, economic and social priorities
  - Growth in demand
  - Investment costs
  - Future production technology

all of which will have a significant impact on the country's energy performance.

Conclusions

- 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 necessarily to 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.

Conclusions

- The gas operation is in practice not operable prior to 2015.

- A comparative assessment of total economic costs between HFO and Gasoil refers to the following:
  - the economic PDC of Gasoil is 26% higher than HFO
  - incremental replacement of HFO by gasoil would entail an increase in the financial PDC of €3.61/MwH as the costs of the externality drops by €1/MwH

- These conclusions are based on a twenty year time frame using data from a long run trend perspective.

Conclusions

- Financial costs may be furthermore assessed from a short term perspective , to assess the implications of the currently-prevailing unusual situation where the differential between gasoil and HFO prices is at some 40%

- This is relatively low by historical standards, when it used to be as high as 100%.

- For this reason, a separate study has been undertaken to determine the financial implications of using gasoil instead of HFO on the basis of prices prevailing at this point in time.