

**AES KILROOT POWER LIMITED / MOTT MACDONALD**

**AIP / SEM FIXED COST OF A BEST NEW ENTRANT (BNE)  
PEAKING PLANT FOR THE CALENDAR YEAR 2009**

**CONSULTATION PAPER AIP/SEM/08/083 DATED 4 JULY 2008**

**DUE DILIGENCE ON THE COSTS INCLUDED IN TABLE 6**

**AND OPERATION AND MAINTENANCE**

**5 August 2008**

**1.1 INTRODUCTION**

At the request of AES, Mott MacDonald Pettit (MMP) have carried out a Due Diligence on the itemised costs as listed in Table 6 of the above Consultation Paper.

Mott MacDonald Pettit is a wholly independent international company based in Ireland and is a member of the Mott MacDonald Group which has a turnover of over €1 billion, over 13,000 staff and global experience spanning 130 countries

Mott MacDonald's experience in the energy sector is second to none amongst the world's major engineering consultants. We have played a leading role in the power sector and electricity market for over 100 years, with assignments undertaken for power utilities, independent producers and industrial companies. This experience covers all aspects of power generation from preliminary economic studies, through conceptual development, design and specification, environmental considerations, project engineering and management, site supervision and commissioning to plant operation and maintenance.

Throughout our long history, we have always been at the forefront of technology associated with many pioneering plants in the field of power generation. For example, we engineered the world's largest gas turbine power and water desalination plant in the 1970's at the 950MW Ras Abu Fontas plant, Qatar. In the mid 1980's we engineered the first 900MW nominal capacity combined cycle power plant to enter commercial service at Paka, Malaysia;

Over the last ten years Mott MacDonald Pettit have completed the following works for Open Cycle (OCGT) and Combined Cycle (CCGT) plant in Ireland as follows:

- 1997 MMP completed the feasibility studies, technical studies, the Environmental Impact assessment, tender documents and award of contract for the Phase 1 360MW CCGT at Huntstown in Dublin. The Client was Viridian Power Limited.
- 2006 MMP completed the feasibility studies, technical studies, Eirgrid application, the Environmental Impact assessment, tender documents and award of contract for the Phase 1 450MW CCGT at Whitegate in Cork. The Client was Bórd Gais Éireann.

- 2007 MMP completed the feasibility studies, technical studies, Eirgrid application, the Environmental Impact assessment, tender documents and planning application for the Phase 1 450MW CCGT at Toomes in Louth. The Client was Quinn Energy.
- 2007 MMP completed the feasibility studies, technical studies, Eirgrid application, the Environmental Impact assessment and will soon submit the planning application for a 180MW OCGT also at Toomes in Louth. The Client is confidential.
- 2007 MMP completed the feasibility studies, technical studies, Eirgrid application, the Environmental Impact assessment and are currently preparing a planning application for the Phase 1 450MW CCGT at Tobberroe in Galway. The Client is confidential.
- 2008 MMP completed the feasibility studies, technical studies, Eirgrid application, the Environmental Impact assessment, IPPC application and are currently preparing a planning application for the 180MW OCGT at Cashla in Galway. The Client is confidential.
- 2008 MMP completed the feasibility studies, technical studies, Eirgrid application, the Environmental Impact assessment, IPPC application, and are currently preparing a planning application for the 450MW CCGT at Derrygreenagh in Offaly. The Client is confidential.
- 2008 MMP completed the feasibility studies, technical studies, Eirgrid application, the Environmental Impact assessment, IPPC application and are currently preparing a planning application for the 170MW OCGT at Derrygreenagh in Offaly. The Client is confidential.

From the above MM have the recent worldwide and more particularly Irish related experience to carry out the Due Diligence of the cost estimates noted in Table 5.

MMP's assessment of the costs included in Table 6 is outlined below:

## **1.2 SITE PROCUREMENT**

MMP have prepared and have included with this Due Diligence the following drawing:drawing

243413/C/SK-100-P1          Typical Plot Plan

This shows a layout for a 168MW(ISO rated) OCGT (Siemens SGT5 2000E) plant together with all auxiliary plant and equipment.

The estimated plan area required is 1.2ha or 12,000 m<sup>2</sup>, rather than 4,500 m<sup>2</sup> as suggested in the consultation paper. Using the unit prices suggested, this would result

in a cost of **€5,620,000** for Northern Ireland and **€3,360,000** for the Republic of Ireland (RoI). The RoI cost is used given that this is the assumed location of the BNE plant.

### **1.3 PRE FINANCIAL CLOSE COSTS**

#### **1.3.1 Owner's Manpower**

A typical Owner's manpower level for this development stage of the project would be three (3) people on average employed on a fulltime basis for the initial 12 month pre-financial period. The associated costs would amount to **€450,000**.

#### **1.3.2 Pre- Engineering**

MM have assessed that the costs for pre-engineering studies, ground investigations, topographical surveys, planning applications, environmental impact assessment, IPPC licence application, accident modelling, tender documents, grid application fees, planning application fees, tendering, negotiating and award of a single EPC Contract would be **€1,800,000**.

#### **1.3.3 Financial, legal, etc**

The cost associated with employing financial and legal specialists to negotiate the following Agreements; (i) Land Purchase, (ii) Fuel Supply, (iii) EPC Contract, (iv) O+M contract, (v) Loan Agreements, (vi) Connection Agreement, (vii) Authorisation to Construct, (viii) Grid Code, and (ix) Market Registration would be approximately **€2,000,000**

### **1.4 POST FINANCIAL CLOSE COSTS**

#### **1.4.1 EPC Contract (incl. contingency)**

The amount included for the EPC Contract amount including contingency does not reflect the current buoyant state of the power generation market. For the purpose of this Due Diligence Siemens have been contacted who have advised that **€97,000,000** would be a more realistic estimate for an EPC Contract and for this it has been assumed that no unusual ground works nor any special noise attenuation measures will be required.

Even in this case the specific costs amounts to €577/kW. A cross check with other suppliers and of our in-house database would indicate a specific cost of €690/kW. The amount included in the consultation paper of €59,531,000 would correspond to a specific cost of €354/kW, including contingency.

However, it would be MMP's normal practice to issue a brief scope of work document to various EPC contractors to obtain current and more accurate price

information to test this price. This process would normally require up to four weeks to complete.

#### **1.4.2 Electrical Interconnection – shallow works**

MMP have estimated a cost for this to be approx. **€7,000,000**. This is based upon running 3 x XLPE cables over 2km underground and with a 110kV substation included in the power station and at the tie-in to an existing 110kV overhead line but not through city streets or built –up areas where the associated cost would be substantially higher.

#### **1.4.3 Distillate Facilities**

A 5 day continuous storage capacity for Ultra Low Sulphur Diesel Oil has been assumed. The storage facilities would include 2 x 2,600m<sup>3</sup> vertical cylindrical storage tanks situated inside a concrete bund with fuel oil unloading and a fuel oil transfer pump system.

The associated cost has been estimated to be **€900,000**.

#### **1.4.4 Workshops and Stores**

An estimate for the provision of workshops (including crange), stores and a small office building is **€2,000,000**.

These facilities would normally be required for such a power plant.

#### **1.4.5 Spare Parts**

An estimate of **€1,000,000** has been included for spare parts. The investment in spare parts would be kept to an absolute minimum considering the possible location of the site and that the largest single item would be a spare burner.

### **1.5 OTHER COSTS**

#### **1.5.1 Owner’s Manpower During Construction**

A typical Owner’s manpower level for this stage of the project would be four (4) people on average employed on a fulltime basis for the final 24 month post-financial close period. The associated costs would amount to **€1,200,000**.

#### **1.5.2 O/E Services**

Usually Owner’s employ an engineering company to act as the Owner’s Engineer for project management, engineering management and site supervision of the EPC Contract. An overall estimate of **€1,500,000** has been included in the following table.

### **1.5.3 Taxes, Insurance during construction**

Based upon estimates received from insurance companies for other similar projects an estimate of **€1,000,000** has been included to cover for insurance.

The estimated total investment cost excludes VAT.

### **1.5.4 Purchased electricity, fuel during construction**

Most contractors will provide their own site electrical generator and so the amount of imported electricity will be negligible. For the associated fuel used in a site generator an estimate of **€100, 000** has been assumed.

The amount of ULSD fuel oil used during construction is also very small, but there will be an appreciable amount of fuel used during commissioning and testing. Based upon a current Platts Index price (CIF) of \$1,141/tonne for ULSD fuel oil and assuming that the plant will operate for 5 continuous days during the reliability trial and performance test periods, the total fuel cost is €3,390,000. During this period the unit is exporting power onto the system and using a SMP price of €93.7/MWh (average for June 2008), then the revenue stream to the Owner is €1,888,000. Therefore, the net cost amounts to €1,502,000.

When this is added to the €100,000 noted above the total cost amounts to **€1,602,000**.

### **1.5.5 Trading and Settlement Code Fees**

The cost associated with this item is considered negligible and has not been considered any further.

### **1.5.6 Contingencies**

See Item 1.6 below.

### **1.5.7 Interest During Construction (IDC)**

AES provided MMP with its analysis of the interest charges due during the construction period. Using a pre-tax WACC of 7.24%, the same disbursement schedule of 90% in year one and 10% in year two and an investment cost of €122,312,000 (excl. contingency the resultant IDC amounts to €12,028,570.

### **1.5.8 O+M Mobilisation**

Based upon similar type projects an estimate of **€1,500,000** has been considered to cover for the initial presence of the O+M contractor at site to include for training, witnessing of tests, site familiarisation, etc. This is based on fifteen [15] O+M personnel on site for 12 months before commercial operation.

## 1.6 CONTINGENCIES

Normally, MMP include for a 10% contingency on the overall project cost estimate.  
(total estimate €13,434,000)

## 1.7 SUMMARY

Item	Description	Table 6Estimate	MM Estimate
		€ x 1000	€ x 1000
<b>1.2</b>	<b>Site Procurement</b>	<b>1,343</b>	<b>3,360</b>
<b>1.3</b>	<b>Pre Financial Close Costs</b>		
1.3.1	Owner's Manpower	893	450
1.3.2	Pre-Engineering		1,800
1.3.3	Financial, legal, etc.	1,191	2,000
	<b>Total Pre Financial Close Costs</b>	<b>2,084</b>	<b>4,250</b>
<b>1.4</b>	<b>Post Financial Close Costs</b>		
1.4.1	EPC Contract (incl. contingency)	59,531	97,000
1.4.2	Electrical Interconnection – shallow works	2,550	7,000
1.4.3	Distillate Facilities	906	900
1.4.4	Workshop/stores		2,000
1.4.5	Spare Parts		1,000
	<b>EPC Total</b>	<b>62,987</b>	<b>107,900</b>
<b>1.5</b>	<b>Other Costs</b>		
1.5.1	Owner's Manpower During Construction	1,191	1,200
1.5.2	O/E Services		1,500
1.5.3	Taxes, Insurance during construction	298	1,000
1.5.4	Purchased electricity, fuel during construction	298	1,602
1.5.5	T&SC Fees	6	negligible
1.5.6	Contingencies	930	See below
1.5.7	Interest During Construction	2328	See below
1.5.8	O+M Mobilisation		1,500
	<b>Total Other Costs</b>	<b>5,051</b>	<b>6,802</b>
	Sub-Total of all Cost	<b>71,465</b>	<b>122,312</b>
	Interest During Construction		<b>12,029</b>
	Sub-Total of all Cost plus IDT		<b>134,341</b>
1.6	<b>Contingency at 10%.</b>		<b>13,434</b>
	<b>TOTAL INVESTMENT COST</b>	<b>71,465</b>	<b>147,775</b>

## **2. OPERATION AND MAINTENANCE/LONG TERM SERVICE AGREEMENT**

Under the Operation and Maintenance section on page 27 of the AIP paper a value of €1.1786 million per annum has been included for the 15-year of the plant life for a Long Term Service Agreement (LTSA).

MM consider this figure to be too low based on a typical LTSA. In our experience the value of a typical LTSA is around 4.5% of the overall EPC contract price per annum. Based on the figures for the EPC contract estimate of €63 million this would equate to €2.835 million per annum. Using the €97 million estimate noted above this would become €4.365 million per annum.

MM would therefore question the value set aside for the LTSA and seek clarification regarding the equipment covered and scope of services being offered under such an agreement.