



Commission for Energy Regulation

An Coimisiún um Rialáil Fuinnimh

Best New Entrant Price 2007

A Consultation Paper

By

The Commission for Energy Regulation

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1. BACKGROUND AND INTRODUCTION

The then Minister for Public Enterprise issued a Policy Direction to the Commission on 27th July 1999. This Direction set out the principles for the electricity trading system to be put in place for the transitional period leading to full market opening in February 2005.

Statutory Instrument No. 49 of 2000¹ governs the operation of this market. This transitional regime will continue until the establishment of the Single Electricity Market (“SEM”).

A regime for the provision of ‘top-up’ and ‘spill’ was to be put in place allowing the independent sector to purchase power shortfalls from and sell power surpluses to ESB Power Generation when the independent sector’s production did not exactly match the aggregate demand of the customers of the independent sector.

The trading arrangements put in place in February 2000 allow the independent energy sector to purchase “top-up” from ESB Power Generation in sufficient quantity to provide adequate back-up supplies to the independent sector at prices that average out over the year to the estimated full cost of a best new entrant.

The Commission has defined a Best New Entrant power plant (“BNE”) in terms of plant type, output, investment and operating costs. These parameters are used to quantify monies to be paid by independent operators to ESB for the provision of ‘top-up’ electricity.

It is the opinion of the Commission that an annual review of the BNE price is appropriate to account for current and expected economic conditions. However, in exceptional circumstances, such as arise when fuel prices change significantly, the Commission may undertake intermediate reviews where it deems it appropriate.

For each year that the present transitional market arrangements are in place, the Commission presents its proposed model of the BNE which derives the price to be applied from January of the subsequent year. However, for 2007, with the introduction of the Single Electricity Market (SEM) scheduled for 1st July 2007, the BNE mechanism, as set out under the Ministerial Policy Direction, will apply only for the first six months of 2007.

This paper sets out the Commission’s proposals for the revision of the BNE price to account for projected inflation and other factors affecting elements of the BNE price in 2007².

The Commission has used the services of specialist consultants to assist it in undertaking its review of the BNE price for 2007³.

¹ Electricity Regulation Act 1999 (Trading Arrangements in Electricity) Regulations, 2000

² This price influences the level of the Public Service Obligation Levy (“PSO”) and the Top-Up (and Secondary Top-Up) prices for the year to which the price applies (in this instance, 2007). Refer to CER/06/121 for the Commission’s draft decision on the PSO to apply for 2007.

³ “BNE Price for 2007” and 2007 BNE refers exclusively to the BNE price to apply for the first six months of 2007.

The configuration and size of the BNE is assumed to be a gas fired CCGT employing a single shaft, “1+1” configuration with an output of about 390-400 MW⁴. Investment and operating costs have been estimated for a BNE of this configuration.

Overall, the methodology for the derivation of the 2006 BNE price has been employed for the calculation of the BNE price for 2007 with the exception of gas costs, where no hedging has been assumed for the 2007 model, and instead a forward price used.

The fuel price is one of the key inputs into the BNE model. Because the BNE price will apply only for the first six months of 2007, the Commission has considered two methods of calculating the gas price. The Commission invites specific comment on these (separate calculations based on full gas year price and half year gas price). The proposals are presented in Section 6.7.

In summary, the combined changes contribute to a BNE price for 2007 of €85.75/MWh or €91.65/MWh, depending on which gas price methodology is applied, compared to a BNE price for 2006 of €66.10/MWh. This is an increase of 29.7% or 38.6% respectively on the 2006 BNE price. This increase on the 2006 BNE price is primarily driven by an increase in forward gas prices.

This paper now sets out the Commission’s proposals for the following aspects of the BNE model for 2007:

1. Key economic and financial parameters (price base, cost of capital);
2. Investment cost estimate (site procurement and up-front investment costs);
3. Non-fuel operation costs (operation, maintenance, Use of System costs, etc.);
4. Operational Performance parameters (efficiency, outage rates, fuel price, carbon price, etc.);

The paper concludes by presenting the overall model for the 2007 BNE and proposed prices for comment.

⁴ The Commission is aware that other options in terms of the model to use for a BNE plant are available. This matter is addressed in Section 6.2.

2. CONSULTATION

The Commission invites comment on this consultation on the BNE price for 2007 as presented in this document, together with comments on the model and inputs used for deriving that price.

Comments should be sent, preferably in electronic format, to Garrett Fitzgerald at the Commission. Comments are to be delivered to the Commission by no later than **5.00pm on Tuesday, 11th July 2006**. The contact details are:

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The Commission is planning to make these comments public and would encourage respondents to do the same. Any information that respondents wish to submit in confidence may be submitted separately, clearly marked as such. However, the Commission would prefer public comment wherever practicable.

3. ECONOMIC AND FINANCIAL PARAMETERS

3.1. PRICE BASE

Current price (nominal price) is a term used to define costs and benefits and includes the effect of general price inflation. Constant Price (real price) refers to a value from which the overall effect of general price inflation has been removed. Using constant prices ensures that the future cost and benefits are estimated in the same units as the cost and benefits measured at the time the decisions to invest in the project are made. The BNE price is calculated using constant price.

3.2. COST OF CAPITAL

The rate of return earned by a new entrant must be sufficient to cover the risk of entering the Irish generation market. The Commission proposes to continue using the weighted average cost of capital (WACC) formula as the basis for calculating this rate of return and considers that the WACC figure of 7.38% is appropriate for the 2007 BNE Price.

This rate is higher than the 7.00% used in the 2006 BNE calculation, mainly because of a rise in the real risk free rate from 2.38% to 2.76% compared with the 2006 BNE calculation. This in turn reflects a rise of about 75 basis points in 10 year German government bond yields since the 2006 BNE calculation, offset by a rise in expected inflation of 0.4 percentage points (see Table 1).

Table 1: Weighted Average Cost of Capital

	<i>Description</i>	<i>Value</i>	<i>Calculation</i>
		%	
	Cost of Debt		
A	Nominal risk free rate	5.43	
B	Debt risk premium	1.50	
C	Inflation	2.6	
D	Real cost of debt (r_d)	4.26	$B + ((1+A)/(1+C) - 1)$
	Cost of Equity		
E	Nominal risk free rate	5.43	
F	Inflation	2.6	
G	Real risk free rate	2.76	$(1+A)/(1+C) - 1$
H	Equity risk premium	5.5	
I	Expected market rate of return	8.26	$G + H$
J	Equity beta	1.83	
K	Post-tax cost of equity	12.82	$G+H \times J$
L	Tax rate	12.50	
M	Pre-tax cost of equity (r_c)	14.66	$K/ (1-J)$
	WACC		
N	Gearing (g)	70	
			<i>For methodology, see 2002 BNE Decision paper, section 2.2.1</i>
O	$WACC = g \times r_d + (1 - g) \times r_c$	7.38	$N \times D + (1-N) \times M$

3.3. PLANT LIFE

The 2005 BNE price was based on a plant life of 15 years. The Commission has not changed its view on the lifetime of a plant from an investor's perspective.

3.4. PRICE FLUCTUATIONS, CURRENCY AND INFLATION

With respect to inputs to the BNE model which fluctuate on an on-going basis (such as the gas price, exchange rate and the price of carbon), these are included at the level that they are as at 13th June 2005, unless otherwise specified.

For its final decision, the Commission will update these inputs in order that the model's inputs are current at the time of it making its final decision (expected to be the prices on a chosen date during the last two weeks of July), unless there are extenuating circumstances for not doing so. The same methodology will be used between the model presented here and the model to be used for the final decision (including the same basis and indices for determination of the gas and carbon input prices).

The Commission has used the connection and network Use of System charges (for gas and electricity) as they apply at the present time (i.e. the 2006 charges). Should any changes to these charges be announced prior to the Commission making its final decision on the BNE for 2007, the final decision will reflect any such amended charges.

All prices are expressed in Euros. The Commission has decided to use the one year forward exchange rate rather than a spot rate when converting sterling to euro (UK£ = €1.4403; This exchange rate is based on 12 month currency forward exchange rate, as at 13th June 2006; Source: Bloomberg).

The Commission has used a figure of 2.6% for the forecast increase in the Consumer Price Index ("CPI") in 2007, as reported in the ESRI Spring 2006 Quarterly Report.

4. INVESTMENT COST ESTIMATE

4.1. INTRODUCTION

In the 2006 BNE calculations, the Commission reviewed different plant configurations and decided that a configuration based on a single shaft CCGT was the appropriate BNE as it appeared to represent the most efficient plant option. The Commission has decided that this plant should continue to be adopted in the calculation of the 2007 BNE on the basis that the gas CCGT plant remains the most appropriate plant for the BNE model, given that it has high availability, a low construction time and cost, low emissions and overall low operating costs⁵.

Furthermore, the fact that the proposed large new entrants into the Irish thermal generation market in the immediate to medium term are understood to be gas CCGT plants, the Commission is of the opinion that the use of a gas CCGT plant for the BNE model continues to be appropriate, rather than coal⁶.

Based on an assessment of plant of this type available in the market, the Commission has decided that the net power output (new) should be increased from 395MW as used in BNE 2006 to 401MW.

The estimate of investment costs for this 401MW (net power output new) single shaft 1 + 1 CCGT plant⁷, built in Ireland, is €268.989 million (compared to the BNE 2006 figure of €260.850 million). The make-up of this investment cost estimate is set out in Table 2 and described below. The Commission considers this price reasonable in light of plant prices internationally in recent years.

4.2. BREAKDOWN IN INVESTMENT COSTS

Investment costs can be subdivided between:

- site procurement costs;
- pre-financial close costs;
- post-financial close costs (including the cost of interconnection, Engineering, Procurement and Construction (EPC) costs); and,
- other costs.

The estimated cost of each of these is discussed below. Investment costs are based on the cost of a plant located in the south-west region (see next section).

⁵ The Commission invited specific comment on the choice of plant for the BNE model in its consultation on the 2006 BNE and set out its decision and response to comments in its decision paper (see CER/05/088 and CER/05/110).

⁶ See Commission's Direction on Gate 2 Connection Offers published 16th June 2006 (CER/06/112)

⁷ See Section 6 which details the Output and Performance of the proposed BNE plant

4.3. SITE PROCUREMENT

For the 2006 BNE model, the Commission decided that the most appropriate location for a best new entrant plant is the south-west of Ireland, which was in accordance with the Transmission System Operator's Forecast Statement 2004-2010⁸ (which indicates that the best opportunity for the connection of new generation exists in the south-west).

As the Transmission System Operator's Forecast Statement 2005-2011 presents a similar view, the Commission remains of this view that the BNE plant should be located in the south-west.

The estimate of the cost of purchasing a suitable site has been increased in line with inflation to €7.182 million.

4.4. PRE-FINANCIAL CLOSE COSTS

The estimate for pre-financial close costs amounts to a total of €10.951 million, derived by applying an inflationary increase of 2.6% to the 2006 figure of €10.672 million.

4.5. EPC CONTRACT PRICE

The estimated cost of the EPC contract is based on the plant configuration discussed previously and budget quotations from EPC contractors with knowledge of both these machines and construction in Ireland.

The estimated cost of the EPC contract price, including contingency, for a combined cycle plant with this configuration is €202.135 million, which represents an increase on the 2006 figure (which was €196.953 million).

This price includes:

- gas turbine, steam turbine and electrical generator on common shaft
- heat recovery steam generator
- air-cooling system
- mechanical auxiliary equipment including dual fuel capability
- electrical auxiliary and control equipment (including generator step-up transformer and HV line terminal equipment)
- ancillary facilities (office, stores, etc)
- civil works.

⁸ Transmission System Operator's "Forecast Statement 2005-2011" (published on www.eirgrid.com) presents a study into the optimal location for new plant on the transmission network.

4.6. CONNECTION TO ELECTRICAL TRANSMISSION SYSTEM

The Commission has not changed its assumption that the BNE would be connected to an existing ESB 220 kV substation.

The assumptions made with respect to the costs associated with the electrical connection are:

- The capital cost of a shallow connection between the plant and the grid
- Two sets of switchgear and a 2 km single circuit will connect the power station to the grid
- BNE would pay 'Use of System' ("UoS") charges for the use of the grid
- the step-up generator transformer is included in the EPC contract as part of the BNE plant

The capital cost estimate for the grid connection, based on a 220 kV single circuit line, 2 km in length, as discussed above is €2.338 million.

4.7. GAS CONNECTION

It is assumed that the BNE plant would be located reasonably close to the gas transmission system. An allowance of €4.893 million is included to cover the cost of connecting to the system. The 2006 gas transmission UoS charges are included in the gas price (and have been inflated by the 2.6% figure for CPI to derive the 2007 BNE figure).

4.8. OTHER COSTS

There is a range of miscellaneous costs that would be incurred which have been included under this heading. Estimates calculated as percentages of the value of the EPC contract have been used, based on historical data and experience.

The methodology for calculating the level of "other costs" is the same as that adopted in the calculation of the 2006 BNE (i.e. cost as a percentage of the total EPC figure).

4.9. OWNER'S ENGINEERING COSTS

An allowance is made for project management, engineering and insurance from financial closure to commissioning of the plant. A value of 3% of the EPC contract price is used, equivalent to €6.064 million.

4.10. SPARE PARTS

In addition to the above base price, allowance has been made for a reasonable amount of spares, which would be expected to be kept on site to ensure the efficient operation of the station within a competitive market environment. These have been valued at 2.5% of the EPC contract price, amounting to €5.053 million.

4.11. PRE-OPERATION O&M COSTS

The up-front cost of O&M mobilisation is estimated to be in the region of 2% of the EPC contract price, €4.043 million.

4.12. CONTINGENCY

Contingency of 5% of the EPC contract price has been included, amounting to €10.107 million.

4.13. INTEREST DURING CONSTRUCTION

Interest during construction has been calculated based on a 2.5-year construction period and a Weighted Average Cost of Capital of 10.3%. This amounts to approximately 11.6% of the EPC price; €23.454 million. It is assumed that a disbursement schedule of 30%, 30%, 30% and 10% in the years Y_{C-3} , Y_{C-2} , Y_{C-1} and Y_C will apply (where Y_C is the year of commissioning).

4.14. TOTAL INVESTMENT COST

Based on the above, and as shown in Table 2, the investment cost estimate for the BNE generating plant is €268.989 million, compared to a figure of €260.850 million for 2006.

**TABLE 2 INVESTMENT COST ESTIMATE FOR 'BEST NEW ENTRANT'
SINGLE SHAFT CCGT 401 MW POWER STATION
(€ '000s)**

<u>Site procurement</u>	7,182
<u>Pre financial close costs</u>	
Project developer's cost	6,641
EIA	349
Engineering	629
Financial and legal costs	3,332
Total	10,951
<u>Post financial close costs</u>	
<u>E.P.C. Contract</u>	
Plant	159,060
Civil Works	15,429
Engineering	11,134
Contingency	9,281
<u>Interconnections</u>	
Electrical interconnection	2,338
Gas interconnection	4,893
Total	202,135
<u>Other costs</u>	
Owner engineering, project management	6,064
O&M mobilization	4,043
Contingencies	10,107
Spares	5,053
Cost of IDC	23,454
Total	48,721
<u>TOTAL INVESTMENT COST</u>	268,989
<u>Exported MW</u>	389
Total investment cost per MW exported	692

5. NON-FUEL OPERATION COSTS

5.1. OPERATION AND MAINTENANCE

The cost basis for operation and maintenance expenditure remain unchanged. The costs for a CCGT plant typically include the following expenditure:

- salaries and owner's maintenance costs
- Insurance
- rates
- owner's general and administration costs
- use of system charges
- servicing agreement costs for major items of the plant

5.2. SALARIES AND OWNER'S MAINTENANCE COSTS

Salaries and owner's maintenance cost includes the following items: staff wages and social costs; and other fixed cost comprising: minor service contracts for balance of plant items; routine maintenance; and plant tools & equipment. The total annual cost is estimated to be €4.725m p.a. (estimated- Salaries of €3.15 million and other costs of €1.575 million).

5.3. INSURANCE

Insurance costs are estimated to be €3.125 million (which is consistent with the 2006 BNE model) and reflects the stabilisation in the risk profile of power plants as observed by global insurance markets and insurance costs prevailing for similar power plants.

5.4. RATES

The estimate for Rates has been increased in line with inflation to €3.163 million per year.

5.5. OWNER'S GENERAL AND ADMINISTRATION COSTS

Owner's general and administration costs have been increased in line with inflation and are estimated to be €0.858 million per year.

5.6. TRANSMISSION CHARGES

ESB National Grid (ESBNG), the business unit within ESB responsible for the Transmission System Operator function, provides access to the transmission system. ESBNG levies two distinct charges, the Transmission System Maintenance Charge and the Use of System charge.

5.7. TRANSMISSION SYSTEM MAINTENANCE CHARGE

The maintenance charge is based on the principle that individual users connecting to the transmission system should pay for maintenance of the shallow connection assets.

The annual maintenance charge is estimated to be approximately €47,000 (2% of connection assets).

5.8. TRANSMISSION USE OF SYSTEM CHARGE

Under Section 35 of the Electricity Regulation Act, 1999, the Commission is required to approve the ESB statements of charges for use of the transmission and distribution systems.

Generation users should pay locational Use of System charges depending on the relative costs imposed on the system.

For a BNE plant that is located in the south-west and connected to the transmission system at 220kV, an indicative annual UoS charge is approximately €1,968 million.

5.9. SERVICE AGREEMENTS

It would be normal for the BNE owner to enter into a long-term service agreement to cover the Gas Turbine. The cost of such an agreement is estimated to be €5.643 million per annum.

6. OPERATIONAL PERFORMANCE

6.1. OUTPUT AND EFFICIENCY

'As new' output and efficiency is the starting point: they will be based on specified ambient conditions and clean heat transfer surfaces. In practice, the long-term expectation of both output and efficiency will be lower.

6.2. OUTPUT

Based on what is currently available in the market, the calculated 'as-new' net power output of this type of unit ranges between 389MW and 402MW, depending on the choice of manufacturer. For the purposes of BNE 2007, the net power output value has been raised from 395MW to 401MW, which is consistent with products offered in the market.

For a given turbine inlet temperature, the output of gas turbine plant is known to be degraded with age, owing to the formation of deposits on compressor and turbine blades, blade wear, and general leakage. Some of the performance can be recovered by measures such as blade cleaning, but there tends to be a progressive deterioration. Degradation also occurs in boiler and steam turbine plant so that the combined cycle as a whole suffers a long-term fall off in performance.

The rate of deterioration depends on many variables but ambient conditions and the type of fuel are major factors. Natural gas is recognised as being a clean fuel and has the least detrimental effect.

It is not realistic to suppose that the rate of deterioration can be predicted accurately.

A major overhaul aims to return the GT to an 'as-new' condition but in practice, this is generally not the case due to cylinder distortion, increased leakage paths, increased surface roughness to cylinder, disc and blade surfaces caused by changes in flow path resulting from erosion or rust deposits. Typically, for industrial GTs, a recovery of about 99% of the 'as-new' condition is more likely.

For a CCGT, we assume an output degradation factor of approximately 0.97. Accordingly, we take the long-term net output of the BNE plant to be $(0.97 \times 401) = 388.97\text{MW}$.

6.3. EFFICIENCY

Account has to be taken of the fact that, once in operation, a unit will not always run at full load nor will conditions always be test conditions, nor will heat exchanger surfaces stay perfectly clean. Accordingly, long-term average efficiency values are lower than the test values, owing to the 'operations factor'. The value to be assumed for the operations factor is a matter of judgement, backed up perhaps by statistical evidence.

The Commission has determined that this year the 'as-new' net efficiency shall be 55.9% which is considered to be consistent with the present-day performance of an F-technology CCGT using an air-cooled condenser. This is higher than the assumed value for BNE 2006 which was 55.2%.

For a CCGT plant, we believe a reasonable plant efficiency degradation factor to be 0.98. Thus, we employ a 'lifetime' mean operational efficiency of $(0.98 \times 55.9\%) = 54.7\%$ net. This reflects efficiency rates being currently quoted by leading manufacturers.

6.4. PLANNED OUTAGE RATE

As is consistent with previous years, we estimate annual planned outages for maintenance for this type of technology and configuration and for base load operation at 16 days. The Commission believes that this reflects current practice adopted by generators operating in a competitive market environment.

6.5. FORCED OUTAGE RATE

As in the 2006 BNE calculation, we expect a combined cycle plant of the technology and configuration adopted to have a mature forced outage rate ("FOR") of approximately 4% per annum.

6.6. CAPACITY FACTOR

As in the 2006 BNE calculation, we have assumed 99% as a reasonable utilisation factor.

As mentioned above, we estimate average annual maintenance duration of 16 days and a long-term FOR of 4%. Hence, we calculate the plant availability factor to be 91.79%.

6.7. FUEL PRICE

The Commission continues to take the view that the most realistic way to source a gas supply of the large magnitude required by a BNE plant is via the UK market.

A reasonable indicator of UK gas prices for 2007 is the forward market.

As set out in Section 1, the BNE price is to be used only for the first half of 2007. The Commission presents two options for calculating the gas price to be included in the BNE model for 2007⁹, as set out below.

Proposed Methodology A: Half Year BNE Gas

The forward gas prices for the first half of 2007 are used, to reflect the fact that the BNE will only apply for the first six months of 2007. The forward gas price for the first half of 2007 is 67.73 UK pence per therm, or €97.55/therm (source: The Heren Report.)

⁹ Gas prices taken on 13th June 2006 and converted to Euro using exchange rate as quoted on that date, see Section 3.4

On that basis, the total delivered cost of gas used for the calculation of the 2007 BNE price, including current transportation charges, using this methodology is €c106.26/therm (transportation charges are based on current BGE published rates).

Proposed Methodology B: Full Year BNE Gas

The forward gas prices for all of 2007 are used. The forward gas price for the all of 2007 is 61.81 UK pence per therm, or €c89.025/therm (source: The Heren Report.)

On that basis, the total delivered cost of gas used for the calculation of the 2007 BNE price, including current transportation charges, using this methodology is €c97.74/therm (transportation charges are based on current BGE published rates).

Comment is sought on the most appropriate option for determining the fuel cost of the BNE plant in light of the fact that the BNE price will apply for the first six months of 2007 only.

6.8. CO₂ EMISSIONS

Following the introduction of the Carbon Trading arrangements from January 2005, and as was the case for the 2005 and 2006 models, the Commission has included the cost of procurement of Carbon Credits in the 2007 BNE price calculation.

Generators have been allocated free approximately 73.7% of their requirements in the draft Irish National Allocation Plan (NAP), on an annual basis.

Based on prevailing market prices, the Commission considers €15.5/t CO₂, the forward price for carbon for 2007 (source: Bloomberg), as a reasonable rate for procurement of carbon credits.

The generation cost of carbon, being that amount of carbon which needs to be purchased, is €c0.16/kWh.

7. COMMISSION'S PROPOSAL FOR 2007 BNE PRICE

Based on the Generation Adequacy Report 2006-2012 and the Forecast Statement 2005-2011, as published by the Transmission System Operator, the Commission believes that the BNE should be located in the south-west of Ireland. This is consistent with the previous year's methodology and impacts on the Use of System charges for the BNE model.

The Commission maintained investment costs to reflect the present and anticipated market situation with respect to gas turbine plant and Irish construction costs.

The Commission is aware that, given the prevailing fuel price in the market, the choice of a gas CCGT plant for BNE may not, at this time, be the most economic model for a new plant and that a coal plant might be the most economic model to use. As stated previously, given the uncertainty of this trend in gas prices over the lifetime of a BNE plant investment and the fact that the proposed new entrants into the Irish thermal generation market in the immediate to medium term will be gas CCGT, the Commission is of the opinion that the use of a gas CCGT plant for the BNE model continues to be appropriate.

To take into account the fact that the BNE will be required for only the first half of 2007, the Commission has presented two options with respect to the methodology for the inclusion of natural gas in the BNE model.

As fuel has such a significant impact on the overall BNE price, the Commission presents the BNE prices calculated using each of the gas price methodologies. The BNE model using each of the methodologies are summarised in Table 3 below.

Table 3: BNE Component Summary

<u>Costs</u>		<u>BNE 2006</u>	<u>BNE 2007</u>
<u>Annualised capital cost</u>			
Capex	€ '000	260,850	268,989
Plant life	years	15	15
WACC	% p.a.	7.03%	7.38%
Annualised cost	€ '000	28,662	30,246
<u>Fixed costs</u>			
LTSA	€ '000	5,500	5,643
Salaries and owner's maintenance costs	€ '000	4,500	4,725
Transmission charges			
Annual use-of-system charge	€ '000	1,801	1,968
Maintenance charge	€ '000	46	47
Owner's general and admin costs	€ '000	824	858
Insurance cost	€ '000	3,000	3,125

Rates cost	€ '000	3,037	3,163
Total		18,707	19,529

<u>Capital plus fixed costs</u>	€ '000	47,329	49,775
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Generation output	GWh	3,050	3,096
Unit cost of generation	c/kWh	1.55	1.61

Gas Price Methodology A: 6 Month Gas Calc.

Variable costs

Variable O&M cost	c/kWh	0.05	0.05
Fuel cost	c/kWh	4.84	7.35
Carbon dioxide cost	c/kWh	0.17	0.16
		5.06	7.56
BNE price	c/kWh	6.61	9.17
BNE price A	€/MWh	66.10	91.65

Gas Price Methodology B: 12 Month Gas Calc.

Variable costs

Variable O&M cost	c/kWh	0.05	0.05
Fuel cost	c/kWh	4.84	6.76
Carbon dioxide cost	c/kWh	0.17	0.16
		5.06	6.97
BNE price	c/kWh	6.61	8.58
BNE price B	€/MWh	66.10	85.75

As can be seen from Table 3 above, the BNE price for 2007 (at the gate or exported) is proposed to be:

- **€91.65/MWh**, based on Methodology A (Six month gas price); or
- **€85.75/MWh**, based on Methodology B (Full year gas price).

As can be seen from the above, aside from gas and carbon costs, a comparison of the 2007 BNE and 2006 BNE prices shows minor changes in the majority of cost categories.

Comment is now sought on the BNE model as presented for the calculation of the 2007 BNE price. Specific comment is sought on the issue of the calculation of the gas price for inclusion in the model, as set out in Section 6.7.