Commission for Energy Regulation

An Coimisiún um Rialáil Fuinnimh

Best New Entrant Price 2006

A Decision and Response Paper
By
The Commission for Energy Regulation

CER/05/110
26th July 2005

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1. Introduction

On 20 June 2006 The Commission for Energy Regulation (the Commission) published a consultation paper on the Best New Entrant (BNE) price for 2006 (reference: CER/05/088). The paper set out the Commission's proposals on the cost of BNE generator into the Irish market, as well as the methodology for calculating those costs and arriving at the "BNE price", i.e. the price at which a BNE would be expected to produce electricity.

The consultation closed on 6th July 2005. The Commission received a substantial response on this matter and thanks all respondents for their submissions.

In its consultation paper, the Commission invited comment on all aspects of the model for calculating the BNE price. The methodology for calculating the fuel cost of the BNE was identified as being a key issue and specific comment was invited on this.

The Commission has considered all of the responses received and has made some changes to the BNE model. This paper sets out the Commission's final decision on the BNE for 2006, describes the revised model for the BNE and sets the price for 2006. The paper concludes with a review of the comments received (the most significant of which have been summarised) and also details the Commission's response to those comments[1] (see Section 9).

2. Background

The 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 2000[2] 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*.

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[1] For the purposes of this paper, the Commission has considered only those responses directly related to the BNE and its revision and none of the comments received which were outside the scope of this review.

[2] Electricity Regulation Act 1999 (Trading Arrangements in Electricity) Regulations, 2000

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, e.g. 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 model of the BNE which derives the price to be applied from January of the subsequent year. This paper sets out the Commission's decision on the BNE price for 2006 together with the model for deriving that price[3].

The Commission has used the services of specialist consultants to assist it in undertaking its review of, and making its decision on, the BNE price for 2006.

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 MW. Investment and operating costs have been estimated for a BNE of this configuration.

3. Decision on BNE Price 2006

This paper sets out the methodology which has been employed to set the 2006 BNE price. This is broadly similar to the methodology used in the BNE models for the last number of years, with the following two main changes:

- A revised method has been used to determine the gas price that a BNE would face. This in turn sets the fuel cost of the BNE. This is detailed in Section 7 of this paper.
- The method used to arrive at the carbon cost that would be faced by a BNE has also been revised to be consistent with the revised method used for calculation of the gas cost.

In summary, the combined changes result in a BNE price for 2006 of €66.10/MWh compared to a BNE price for 2005 of €53.6/MWh and the price in the original consultation paper on BNE 2006 of €72.86/MWh.

This paper now sets out the Commission's decision on the following aspects of the BNE model for 2006:

a) Key economic and financial parameters (price base, cost of capital);

b) Investment cost estimate (site procurement and up-front investment costs);

c) Non-fuel operation costs (operation, maintenance, Use of System costs, etc.);

[3] 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, 2006).

d) Operational Performance parameters (efficiency, outage rates, fuel price, carbon price, etc.).

4. Economic And Financial Parameters

4.1. 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 is calculated using constant price.

4.2. 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 has decided to continue using the weighted average cost of capital (WACC) formula as the basis for calculating this rate of return and considers that a WACC figure of 7.00% is appropriate for the 2006 BNE Price.

This differs from the WACC proposed in the consultation paper which was 6.49% because the Commission has revised the estimate of the equity risk premium element of the WACC (see Table 1). This final figure is marginally lower than the 7.03% used in the 2005 BNE calculation.

Table 1: Weighted Average Cost of Capital

	Description	*Value*	*Calculation*
		%	
	Cost of Debt		
A	Nominal risk free rate	4.63	
B	Debt risk premium	1.50	
C	Inflation	2.20	
D	Real cost of debt (r_d)	3.88	*B+((1+A)/(1+C) – 1)*
	Cost of Equity		
E	Nominal risk free rate	4.63	
F	Inflation	2.20	
G	Real risk free rate	2.38	*(1+A)/(1+B)-1*
H	Equity risk premium	5.5	
I	Expected market rate of return	7.88	*G+H*
J	Equity beta	1.83	
K	Post-tax cost of equity	12.44	*G+H*J*
L	Tax rate	12.50	
M	Pre-tax cost of equity (r_c)	14.22	*K/(1-L)*
	WACC		
N	Gearing (g)	70	
O	WACC = g x r_d + (1 - g) x r_c	7.0	*For methodology, see 2002 BNE Decision paper, section 2.2.1*

4.3. 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.

4.4. Price Fluctuations, Currency and Inflation

All prices are expressed in Euros. The Commission has decided to use the annual average forward exchange rate rather than a spot rate when converting sterling to euro (UK£ = €1.407; This exchange rate is based on currency forward exchange rates for 12 months, from 20th July 2005; Source: Bloomberg).

The connection and network Use of System charges (for gas and electricity) are those that apply at the present time (i.e. the 2005 charges).

The forecast increase in the Consumer Price Index ("CPI") is 2.2%.

The methodology used to determine the price for gas and carbon is set out in Section 7.

5. INVESTMENT COST ESTIMATE

5.1. INTRODUCTION

In the 2005 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 2006 BNE.

The estimate of investment costs for this 395MW (net power output new) single shaft 1 + 1 CCGT plant[4], built in Ireland, is €260.850 million (compared to the BNE 2005 figure of €260.146 million). This figure has increased marginally from the figure in the consultation model due to the changes in the WACC calculation.

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 the reduction in plant prices internationally in recent years (see Section 9.2 for further comment on this).

5.2. 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 Section 4.2.1).

5.3. SITE PROCUREMENT

The 2005 BNE model assumed that the BNE plant would be located close to Dublin.

For the 2006 BNE model, the Commission has decided that the most appropriate location for a best new entrant plant is the south-west of Ireland, which is in accordance with the findings of the Transmission System Operator's Forecast Statement 2004-2010[5].

The estimate of the cost of purchasing a suitable site has not been increased and remains at the 2005 BNE model level of €7 million.

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[4] See Section 5.1.1 which details the Output and Performance of the proposed BNE plant
[5] Transmission System Operator's "Forecast Statement 2004-2010" (and update published in July 2005) on www.eirgrid.com which presents a study into the optimal location for new plant on the transmission network.

5.4. Pre-financial close costs

The estimate for pre-financial close costs amounts to a total of €10.673 million, derived by applying an inflationary increase of 2.2% to the 2005 figure of €10.443 million.

5.5. 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 €196.952 million, which represents a small increase on the 2005 figure (which was €196.801 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)
- interconnection to electrical transmission system
- gas connection
- ancillary facilities (office, stores, etc)
- civil works.

5.6. Interconnection 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 €2.28 million.

5.7. Gas Connection

It is assumed that the BNE plant would be located reasonably close to the gas transmission system. An allowance of €4.77 million is included to cover the cost of connecting to the system. The 2005 gas transmission UoS charges are included in the gas price (and have been inflated by the 2.2% figure for CPI to derive the 2006 BNE figure).

5.8. 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 2005 BNE (i.e. cost as a percentage of the total EPC figure).

5.9. 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 €5.908 million.

5.10. 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 €4.924 million.

5.11. 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, €3.939 million.

5.12. Contingency

Contingency of 5% of the EPC contract price has been included, amounting to €9.848 million.

5.13. 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 7%. This amounts to €21.606 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).

5.14. TOTAL INVESTMENT COST

Based on the above, and as shown in Table 2, the investment cost estimate for the BNE generating plant is €260.850 million, compared to a figure of €260.561 for 2005.

TABLE 2 : INVESTMENT COST ESTIMATE FOR 'BEST NEW ENTRANT' SINGLE SHAFT CCGT 400 MW POWER STATION (€ '000S)

Site procurement	**7,000**
Pre financial close costs	
Project developer's cost	6,472
EIA	340
Engineering	613
Financial and legal costs	3,247
Total	**10,672**
Post financial close costs	
E.P.C. Contract	
Plant	154,980
Civil Works	15,033
Engineering	10,849
Contingency	9,043
Interconnections	
Electrical interconnection	2,279
Gas interconnection	4,769
Total	**196,953**
Other costs	
Owner engineering, project management	5,908
O&M mobilization	3,939
Contingencies	9,848
Spares	4,924
Cost of IDC	21,606
Total	**46,225**
TOTAL INVESTMENT COST	**260,850**
Exported MW	383
Total investment cost per MW exported	681

6. Non-fuel Operation Costs

6.1. Operation and maintenance

The cost basis for operation and maintenance expenditure remain unchanged from those set out in the consultation document. 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

6.2. 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 €4.5m p.a. (estimated - Salaries of €3.0 million and Other costs of €1.5 million).

6.3. Insurance

Insurance costs have been reduced to €3.0 million (from the figure of €3.715 million used in the 2005 BNE model) reflecting the stabilisation in the risk profile of power plants as observed by global insurance markets and insurance costs prevailing for similar power plants.

6.4. Rates

The estimate for Rates has been increased in line with inflation to €3.037 million per year.

6.5. Owner's general and administration costs

Owner's general and administration costs have been increased in line with inflation and are estimated to be €0.824 million per year.

6.6. 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.

6.7. 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 charge is estimated to be approximately 2% of the capital cost of the connection assets, in this case €2.279 million. This gives an annual maintenance charge of approximately €46,000.

6.8. USE OF SYSTEM CHARGE

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

Generation users should pay locational UoS 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 €1.801 million

6.9. SERVICE AGREEMENTS (LTSA)

It would be normal for the BNE owner to enter into a long-term service agreement (LTSA) to cover the Gas Turbine. The cost of such an agreement is estimated to be €5.5 million per annum.

7. Operational Performance

7.1. 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.

7.2. Output

Based on what is currently available in the market, the calculated 'as-new' net power output of this type of unit ranges between 382MW and 395MW, depending on the choice of manufacturer. For the purposes of BNE 2006, the net power output value has been raised from 391MW to 395MW, which is consistent with products offered in the market.

For a given turbine inlet temperature, the output of gas turbine plant (GT) 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 x 395) = 383.2MW.

7.3. 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 55.2% which is considered to be consistent with the present-day performance of an F-technology CCGT using an air-cooled condenser. This is lower than the assumed value for BNE 2005 which was 57.1%.

For a CCGT plant, we believe a reasonable plant efficiency degradation factor to be 0.98. Thus, a 'lifetime' mean operational efficiency of (0.98 x 55.2%) = 54.1% net is employed. This reflects efficiency rates being currently quoted by leading manufacturers.

7.4. PLANNED OUTAGE RATE

As is consistent with previous years, the Commission estimates 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.

7.5. FORCED OUTAGE RATE

As in the 2005 BNE calculation, a CCGT of the technology and configuration adopted is expected to have a mature forced outage rate ("FOR") of approximately 4% per annum.

7.6. CAPACITY FACTOR

As in the 2005 BNE calculation, it is assumed that 99% is 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 91.6%.

7.7. 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 is via the UK market.

The Commission proposed in its consultation paper that a reasonable indicator of UK gas prices for 2006 was the year-ahead market. The year-ahead price at the time of the consultation was 49.125 UK pence per therm, or €c71.68/therm (source: The Heren Report)[6]. The swing percentage was maintained from the previous year at 5%.

It was noted that the above gas price calculation was a substantial increase in the cost of fuel on last year's BNE where the price was 30.15 UK pence per therm, or €c44.02/therm.

The Commission invited specific comment on the matter of determining the gas price, and gas cost, for inclusion in the BNE model for 2006. Section 9 of this paper sets out the comments received and the Commission's response to those comments.

[6] Year-ahead gas, for the purposes of this model, refers to the arithmetic average price for gas quoted for each of Quarters 1-4 for 2006.

The Commission agrees with comments made that:

- Taking the forward price for 2006 gas on a particular day is, in current circumstances, not necessarily a reliable indication of what a BNE's fuel costs would be in 2006;

- A more realistic approach would be to assume that a BNE would have bought 50% of its requirements forward, while relying on the day-ahead and month-ahead markets in 2006 for the rest of its requirements; and

- This could be achieved by calculating a BNE closer to real time in 2006, perhaps on a monthly basis.

However, real time calculation is considered impractical, for a number of reasons and instead the Commission has decided to continue with the current approach of calculating the BNE price six months in advance of the year to which the price applies.

Furthermore to smooth out the effect of the recent volatility in year-ahead forward gas prices, it has been decided to use the average year-ahead gas price in the forward markets for the months March, April, May and June 2005. The Commission has calculated that the average price of year-ahead gas for 2006 over March, April, May and June 2005 to be 43.99 UK pence per therm (Source: The Heren Report).

The total delivered cost of gas used for the calculation of the 2006 BNE price, including current transportation charges, is €c69.15/therm. Transportation charges are based on current BGE published rates for 2005.

Section 9 of this document details the Commission's rationale for determination of the gas price as set out above.

7.8. CO_2 EMISSIONS

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

Generators have been allocated free approximately 73.7% of their requirements in the Irish National Allocation Plan (NAP). In its consultation model, the Commission proposed that the carbon price should be €19.66/t CO2, which was the forward price for carbon for 2006 at the time of the consultation (source: Bloomberg). The Commission considered this to be a reasonable rate for procurement of carbon credits. As was noted in the consultation paper, this methodology was consistent with the calculation of the fuel cost that was proposed at that time.

In light of the amended methodology for the calculation of the gas price, and given that the same arguments hold against remaining with the previous methodology for determining the price of carbon for BNE (standard year-ahead price), the Commission has decided that carbon cost should be determined in the same manner as the gas price. Therefore, the Commission has calculated that the average price of year-ahead carbon for 2006 over March, April, May and June 2005 is €16.73/t CO2 (Source: Bloomberg Quotes for EU ETS).

The generation cost of carbon, being that amount of carbon which needs to be purchased, is €1.70/MWh. The price of carbon in the 2005 BNE model was €10/t (€1.10/MWh).

8. 2005 BEST NEW ENTRANT PRICE

The Commission has decided that, based on an analysis of the latest data, the BNE price for 2006 is **€ 0.06610/kWh or €66.10/MWh**. The costs are summarised in Table 3 below.

The following are the key points in relation to the calculation of the BNE for 2006:

- Based on the Generation Adequacy Report 2005-2011 and the Forecast Statement 2004-2010, as published by the Transmission System Operator, the Commission has decided that the BNE should be located in the south-west of Ireland. This differs from previous years, where the BNE model accounted for the plant to be located in Dublin. This impacts on the UoS 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 BNE price for 2006 of **€66.10/MWh** (at the gate or exported) is an increase on the 2005 BNE value by €12.50/MWh (23%).

- In its consultation, the Commission had proposed a figure of €72.86/MWh. The Commission revised its model in light of the comments received. The majority of the costs remained unchanged but the amendment of the methodology for determining the gas and carbon prices resulted in a significant change in the BNE price for 2006 (compared to the figures used in the consultation, resulting in a drop of €6.76/MWh or 9.3%).

- Despite the revision of the gas and carbon credit pricing methodology, leading to their inclusion in the final model for 2006 at a lower price, the main reasons for the €12.50/MWh increase between the BNE prices for 2005 and 2006 is the overall increased costs of gas and carbon credits. The Gas price represents an increase of 39% on the previous year's fuel price (using a different methodology, as indicated previously). Carbon costs increased by 54% on the previous year's figure.

- Gas and Carbon costs account for 75.8% of the overall BNE cost.

Table 3: BNE Component Summary

Costs		***BNE 2005***	***BNE 2006***
Annualised capital cost			
Capex	€ '000	260,561	260,850
Plant life	years	15	15
WACC	% p.a.	7.03%	7.00%
Annualised cost	**€ '000**	**28,662**	**28,622**
Fixed costs			
LTSA	€ '000	12,600	5,500
Salaries and owner's maintenance costs[7]	€ '000	-	4,500
Transmission charges			
Annual use-of-system charge	€ '000	3,158	1,801
Maintenance charge	€ '000	45	46
Owner's general and admin costs	€ '000	798	824
Insurance cost	€ '000	3,715	3,000
Rates cost	€ '000	2,972	3,037
Total		**23,286**	**18,707**
Capital plus fixed costs	€ '000	**51,948**	**47,329**
Generation output	GWh	3,019	3,050
Unit cost of generation	c/kWh	1.72	1.55
Variable costs			
Variable O&M cost	c/kWh	0.05	0.05
Fuel cost	c/kWh	3.48	4.84
Carbon dioxide cost	c/kWh	0.11	0.17
		3.64	5.06
BNE price	c/kWh	5.36	6.61
BNE price	**€/MWh**	**53.60**	**66.10**

[7] Included in LTSA figure of €12.6 million for 2005.

9. SUMMARY OF COMMENTS RECEIVED AND COMMISSION'S RESPONSE

The Commission received 18 responses to its consultation on the BNE 2006. Comments were received from a variety of parties including industry participants, consumers/consumer representative bodies and government agencies.

The majority of comments received were on the issue of gas cost – how this is determined and the overall methodology of applying the gas cost to the BNE model. The Commission also received comments on other issues relating to the calculation of the various inputs into the model.

Below, the respondents' comments have been summarised and the Commission's response provided (the Commission's response appears in italics).

9.1. COMMENTS ON GAS AND CARBON COST

Gas Cost

The Commission invited specific comment on the issue of the methodology and treatment of gas cost in the BNE model for 2006 due to the substantial increase in gas costs year-on-year (when applying the same methodology as used in previous years) and the volatility of gas prices in the market. The Commission received extensive comment on the issue of the appropriate gas cost was to be incorporated into the BNE model and most specifically, on the likely behaviour of a BNE generator in the prudent procurement of gas for its plant.

Most respondents were in favour of a change of the methodology used for deriving the gas cost. Proponents cited the following reasons for the change:

1. The Commission's methodology was appropriate in more stable price environments with well traded forward gas prices indicating a market-reflective cost. However, in the current climate of high volatility, it is no longer suitable (due to the inbuilt risk premium, delivered prices will be consistently lower). This is particularly so given that there is negligible liquidity in the year ahead forward market. Year ahead gas and carbon prices are therefore not reflective of a true market price and use of an alternative to year-ahead should be considered.
2. A BNE generator would not be exposed to such high forward prices as their gas position would be hedged. Particularly given recent movements in market, it is most likely that a prudent IPP would fix a suitable proportion of their 2006 gas when this trend was observed.
3. Respondents stated that somewhere in the region of 50-60% of a BNE's gas would be hedged (it was suggested that such arrangements would have been put in place before March this year (at prices of less than 35p/th)).
4. Extraordinary changes in price in 1 year would not lead to substantial change in 15 year average costs – therefore, using once-off, potentially unreliable forward price not reflective of the lifetime costs of a BNE.
5. Previous market trends/collapse in prices close to delivery period

Two parties commented that the existing methodology remained appropriate, as:

1. It is suggested that a BNE is unlikely to have gas hedging contracts (all previous consultations have appeared to approach the plant as either a merchant or tolling plant);
2. To include presumed hedging contracts raises 3 issues: regulatory uncertainty, the risk of increased top-up prices when presumed hedging is "out of money" and increased cost of capital to incorporate gas risk into the WACC.
3. Generators cannot forward "hedge" fuel contracts, unless there is a fixed price exposure on off-take. Given that wholesale prices and tariffs are still to be issued as decisions by the Commission, any "hedging" undertaken in advance of such decisions is speculation, not hedging. The results of individual company's speculative trading should not be included in the calculation of either BNE or tariffs.

Commission's Position

It is noted that there has been considerable volatility in the year-ahead price for gas since the BNE consultation was released on June 20th (with prices varying from 49p/therm at the time of the consultation and peaking at 63.5p/therm before reducing to the present levels of 53-56p/therm).

The Commission has considered the above comments and taken into account the recent price movements in making its decision on how the gas price should be derived for inclusion in the BNE 2006 model.

The Commission had invited comment on the possibility of the model reflecting the behaviour of a BNE's gas purchasing. Several respondents suggested that a BNE would have hedged somewhere between 50-60% of its gas for 2006 with the rest purchased as a combination of month-ahead and day-ahead products. Others suggested that hedging would not have taken place.

The objective of the BNE model is to provide a best estimate as to the likely costs faced by a new entrant generator corresponding to the parameters set in the model (plant type, specification, location, etc.). One of the key issues in today's generation environment is the cost of gas. With respect to the BNE model, the Commission's aim is to provide a best estimate of the likely costs faced by a CCGT generator.

Some respondents called for a move to a more variable BNE model whereby the BNE would vary per quarter or month, depending on the prevailing prices at the time of it being set. The Commission sees this as an impractical solution as it would not provide market participants with any certainty and would cause other difficulties with market mechanisms (system changes, impact on Public Service Obligation (PSO) levy, etc.).

In the absence of moving to a variable model, and as the BNE is set 5-6 months in advance of the period to which it will apply, it is not possible to now determine a price for the other 50% unhedged proportion of the gas other then using an unreliable proxy.

Hence, the Commission is of the view that the gas price should be determined for the BNE model 2006 based on the average price of gas for Quarters 1-4 of 2006 over the last four full months (March, April, May and June). This has been calculated to be 43.99p/therm (Source: The Heren Report).

The Commission believes this to be a more reasonable indicator of gas prices for 2006 as, in the absence of actual-time data, it provides a smoothed estimate for the cost of gas over the timeframe concerned – therefore removing some of the effect of variability/volatility of the price by calculating it as an average over the previous four months.

This methodology is considered to be a variant of to the methodology previously employed and therefore provides for some consistency with the BNE models over recent years, whilst also addressing the concerns of the market with respect to the recent forward gas market price volatility.

Respondents suggested that up to 60% of a BNE's gas would be hedged – while the Commission has no reason to disagree with this view reliable methods of predicting actual prices (within-day, day-ahead and month-ahead prices throughout 2006) are not available.

Carbon Cost

The following comments were received on the issue of carbon cost as included in the Commission's proposed BNE model:

1. Concern was expressed over potential distortions to trade which may arise by only allocating 26.3% of carbon costs to the BNE plant. It was noted that in the UK and international markets, power prices tend to reflect 100% of carbon costs. It should be the case that the Irish regime aligns with the international markets. Such differential treatment in BNE will lead to distorted and sub-optimal trade flows.

   Furthermore, the key concept of the newly introduced carbon regime is to reduce C02 emissions. Not including the full cost of carbon mutes the incentive. The cost of 100% of the carbon emitted by the plant should be incorporated (gradually) to provide a smooth transition to SEM.

   Commission's Position
   The Commission's present policy with respect to the treatment of carbon is to pass through only the incremental cost of the introduction of the carbon emissions trading regime. In the transition to SEM, the Commission recognises that consistency with the market in Northern Ireland will have to be considered. The treatment of carbon will be further considered in that context.

2. The carbon price is overstated as the market is new and illiquid and has shown considerable volatility..

   Commission's Position
   The Commission has decided to use the same methodology for the determination of the price of carbon credits for the BNE as it has used for the determination of the price of gas for the model. This is calculated to be €16.73/tonne (Source: Bloomberg Quotes for EU ETS), that being the average price of carbon credits for 2006 over the period 1st March – 30th June 2005. The Commission believes that this addresses, as best as can be, the concerns stated above.

9.2. Comments on Other Issues

Financial Aspects of BNE

1. The Capex figure is too low and would not incentivise IPPs into the market (the rise should be in the region of 10% to reflect increases in steel costs).

   Commission's Position
   EPC prices for CCGT plant have not changed significantly in nominal terms over the past twelve months. At the time of writing this report, it was observed that manufacturers have generally had to absorb the higher cost of metal prices due to there being greater competition for far fewer power projects in development.

   Furthermore, the BNE is not intended to set an incentivised level of costs for IPPs to beat.

2. Further detail requested behind the decrease in real cost of debt and also the benchmarks used.

   Commission's Position
   Two elements are required to determine a BNE's cost of debt: the risk free return and the debt premium (reflecting the company's debt rating). The former takes the same value as for the risk free component of the equity return. The Commission's estimate of the real risk free rate – at 2.4% - has not changed since the BNE 2005 calculations were done.

   International evidence suggests several approaches can be taken to calculating the debt premium. These include actual or benchmark costs, embedded costs or forward looking values. In general terms, the most reliable approach is to consider the cost of debt of comparator companies that have the same credit rating as that assumed for the BNE.

   A second key issue is the maturity of the debt to be considered. The Commission takes the view that this should be consistent with the terms on which the risk free rate is determined; that is, based on a 10 year horizon. Evidence from benchmark data suggests that for companies with an investment grade credit rating (i.e. BBB or better), the average debt premium across a range of maturities (up to 10 years) is between 1 per cent and 1½ per cent above the risk free rate. The Commission believes that the debt premium should be set at 1.5 per cent

   This, combined with the risk free rate of 2.4 per cent, gives a real cost of debt of 3.9 per cent.

3. The figure for WACC significantly under-estimates the real cost of capital in generation (appropriate figure is 7.5%).

   Commission's Position
   Please refer to commentary on points 2 and 3 above which explain the changes that have contributed to the WACC figure of 7%.

4. There may be further potential ways to reduce WACC through further analysis of tax optimisation through project finance structures.

   Commission's Position
   The Commission is of the opinion that this matter is addressed through the level of gearing it has set for the BNE, which is at a level of 70%, which is considered to be a prudent level of gearing for such a project as the BNE model.

5. It would appear, to obtain financing on the terms outlined, it is unlikely that the BNE would retain any gas market risk.

   Commission's Position
   The WACC calculation has been derived from market figures and peer analysis, reflecting the typical risk profile of a plant such as the BNE.

Recurring Costs

6. How were the TUoS charges derived as they seem low?

   Commission's Position
   The BNE 2006 assumes that the best opportunities for connecting new capacity (circa. 400 MW) to the transmission system are located in the south-west. A 'Network Capacity Charge' of €350,000 per MW per month was estimated to be an appropriate level of charges which a new entrant generator would pay if it chose to locate its plant in the south-west.

7. Shallow connection cost for interconnection to 220kv system is low in comparison with similar plant in Ireland – provide more detail of these calculations.

   Commission's Position
   Electrical interconnection is dominated by the cost of the 220 kV line bays (2-off) which are estimated to cost of about €1 million each. The Commission is satisfied that a cost of €2.3 million is appropriate for the purposes of setting the BNE 2006.

8. LTSA, Salaries and Owner's Maintenance costs should have risen by 6% in line with labour costs as per Central Bank Report. Why has there been a marked decrease year on year?

   Commission's Position
   The LTSA cost was revised on the basis of prevailing market data. The cost employed in BNE 2006 is considered to be a realistic estimate of the costs which would actually be incurred by an IPP in today's market.

9. Variable O&M costs should have risen circa 5% from 2005 figure.

   Commission's Position
   The Commission is satisfied that, on balance, the total cost of operation and maintenance is consistent with those costs which would be incurred by an IPP

in today's market. In this regard, the variable component of operation and maintenance costs has remain unchanged for BNE 2006.

10. Gas Transportation Costs - More detail requested on how this figure was derived (UK Variable, ROI Fixed and Variable). The information given in the paper for the cost of gas and transportation is in £p/Therm which when BNE efficiencies etc. are used, it does not translate into the €c/KWh price in the make up of the total BNE price of €7.286/KWh

    Commission's Position
    The Commission has re-examined the gas transportation costs employed in the Draft BNE 2006 and has updated these values to reflect the indicative charges proposed by Transco, which are due to come into effect from 1 October 2005.

11. UCOP has been introduced – this introduced new potential penalties and this additional cost should be included.

    Commission's Position
    The Unified Code of Operation (UCOP) was introduced in Ireland in April 2005 and is intended to introduce increased flexibility into the gas market. In the event of a plant trip it is possible that the gas shipper could be left significantly out of balance, and the cost of this imbalance could be passed on to the BNE.

    The Commission has taken a pragmatic view of the additional imbalance charge that might arise from an unforeseen plant trip. It notes that the UCOP makes provision to increase the tolerance level upon which the imbalance charge is calculated, therefore mitigating most of the costs associated with an unforeseen plant trip.

Operational Performance

12. The capacity factor of a future BNE at 91.6% would appear to be very optimistic – this real figures would be likely to be lower than this due to large amounts of wind generation, with priority dispatch, and the requirement to have a minimum number of thermal units on the system, for security reasons, meaning that there is likely to be many hours when the output of CCGT plant will be curtailed (due to lack of load to supply). Also, with so much CCGT on the system, competition for base-load running will be intense (among the CCGT and coal fired units, will be particularly intense in Ireland as Wind , Peat and CHP plant have an economic/market advantage). The 99% utilisation factor is high.

    Commission's Position
    The Commission believes that the above comment is not applicable to the BNE 2006 price as, if plant load factor is considered to be at anything less than baseload, the entire basis for BNE might need to be changed, perhaps to a different technology such as OCGT, for a given load factor assumption.

Location

13. Use a weighted basket of locations to accommodate potential new supply infrastructure (an East-West interconnector, for example).

Commission's Position
The BNE location assumption was predicated by comments published by ESB National Grid in respect of its view of the best opportunities for (400 MW) new capacity, given the limits of the existing transmission network.

Comments on proposed BNE methodology and its implications

14. Annual review insufficient – if it occurs at time of peak in prices, this is not fair. Also, move to quarterly review (which would also take into account how prices moved the previous quarter and adjust accordingly (k factor)

Commission's Position
Please refer to the Commission's response to comments received on the Gas Cost.

15. Has the use of a coal burning plant been considered as a more economic alternative?

Commission's Position
It is noted that some respondents commented 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 costs and that it is therefore the most suitable plant for the purposes of modelling a base-load BNE plant.

The Commission had mentioned in its consultation paper the use of a coal burning plant as an alternative plant for the BNE model. However, as stated in the consultation paper, 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 remains of the opinion that the use of a gas CCGT plant for the BNE model continues to be appropriate.

16. Increases in tariffs have followed similar path to BNE in the past (BNE pricing impacts on ESBPES tariffs which effectively set the benchmark for independent suppliers). Therefore, this level of BNE poses real problems for competitiveness in Ireland.

Commission's Position
The Commission acknowledges that increasing energy costs would impact upon business in Ireland. However, it is important to note that the setting of the ESB PES (Customer Supply) tariffs is a separate exercise to the setting of the BNE. The Commission will publish its consultation paper on its tariff review in September and comments pertaining to end user tariffs should be submitted at that juncture, for the Commission's consideration.

The objective of the annual review and revision of the BNE model is to determine a price for top-up energy to be purchased by IPPs and independent suppliers during the course of the following year. This price must be determined in accordance with the methodology as specified in the 1999 Ministerial Direction concerning the electricity trading regime in Ireland. This price is a wholesale energy price which is cost-reflective price whereby the independent energy sector can avail of top-up energy at prices which reflect *the likely cost of generation of such energy by a new entrant, efficient plant – the aim thereby being that this transfer would not operate as a subsidy by the independent sector to ESB Power Generation or vice versa.*

17. It is considered important that the BNE is fully incorporated into setting of ESB tariffs.

Commission's Position
The review of the BNE model and its determination is a wholly separate exercise to the setting of the ESB tariffs. However, the BNE (as in, the resultant revenue from top-up) is incorporated into the annual ESB Power Generation revenue review exercise carried out by the Commission.