EXECUTIVE SUMMARY

Introduction

The Department of Communications, Marine and Natural Resource (DCMNR) engaged Fingleton White & Co Ltd (in association with Electrotec Ireland Ltd and DKM Economic Consultants) to carry out a feasibility study into the possibility of bringing gas to the North West of Ireland from an offtake at the Mayo-Galway pipeline, via Sligo to Donegal. The DCMNR issued a brief setting out the parameters within which the study was to be carried out, as follows:

- Part A - Consider the technical and economic feasibility of three alternative pipeline route corridors
- Part B - Assess the capacity for potential power generation at seven given locations and their potential to contribute to the economic viability of the pipelines considered
- Part C - Conduct a cost benefit analysis taking into account the economic analysis of the alternative pipeline routes and options for gas fired power generation in Parts A and B

Part A - Analysis of Pipeline Routes

A detailed vantage point survey was conducted of each of the 3 no. route options (individual routes from the Mayo-Galway Pipeline to Sligo with a single common route from Sligo to Donegal Town).

- Route A incorporates Castlebar
- Route B incorporates Castlebar, Claremorris and Knock (Ind Estate)
- Route C incorporates Claremorris, Ballyhaunis and Ballaghadereen

A preliminary environmental assessment was then carried out, with the major route constraints associated with each of the route options being identified. In general the routes were found to have ranges of 2-3km through Special Areas of Conservation and 23-37km through Peatlands.

In order to establish the optimum pipeline size for the various route options, an estimate of the overall design load for each of the towns was made based on a survey of the potential gas users.

A budget estimate was established for the various pipelines, with an accuracy of +/-15%, utilising databases of costs developed from previous pipeline projects carried out, resulting in the following estimates:

- Route A €77.0M
- Route B €77.9M
- Route C €82.5M

The BG Networks New Towns Analysis Phase 1 report concluded that all of the towns to be analysed in this feasibility study, with the exception of Ballaghaderreen, could be supplied via distribution feeder mains (i.e. 4 bar g). Arising from that report, eleven towns in total along the route of the Mayo-Galway pipeline were found to be viable, five of which are included in this study Ballina, Ballyhaunis, Castlebar, Claremorris and Crossmolina. The final decision with respect to connecting Castlebar and Claremorris will be taken in light of the findings of this study.

It was therefore decided not to proceed with the evaluation of route B as all of the towns on the route are already included in the BG analysis. Therefore the financial evaluation, at this stage, was confined to routes A and C only.

The individual pipelines are evaluated based on the Net Present Value (NPV) of the stream of cash flows (transmission revenues less capital expenditure less operating costs) over 25 years[1], using a 5.74 per cent pre-tax real discount rate, based on BGE's current regulated rate of return. A negative NPV indicates that a shortfall arises, in other words, extending the network to the town in question is not commercially viable.

The model computes the Internal Rates of Return (IRR) associated with the series of cashflows and the results show that none of the pipelines are commercially viable based on current projections for gas consumption in the towns along each route. Both routes return substantially negative net present values (NPVs). For the full pipeline corridor to Donegal:

- Route A produces a negative NPV of -€77 million
- Route C produces a negative NPV of -€80 million

Thus the pipelines would need subventions of almost 100%[2] and 97%[3] respectively, to proceed.

Terminating the pipeline routes at Sligo, whilst increasing the NPV, still remains significantly negative at -€41 million and -€44 million respectively.

The issue of ranking the projects according to their economic viability does not arise here as both routes generate substantial financial shortfalls. The gas volumes are almost 30% higher on Route C, due to the inclusion of a single potential large industrial load in the town of Ballaghaderreen. If we exclude this load from Route C as part of a sensitivity analysis, it returns a more negative NPV of -€83 million and an IRR of -20%.

Part B Analysis of Gas Fired Electricity Generation

In considering any site as a possible location for a power station the key parameters that need to be evaluated are:

- Proximity to a natural gas supply
- Proximity to the electricity national grid and the transmission voltage at that point on the grid

The initial evaluation of the 7 no. nominated sites led to Ballina, Sligo and Ballyshannon as being the 3 most suitable locations for further analysis.

The power station capacity which can be considered for a particular location is determined by the electrical grid service available in that vicinity and the simple rules are:

- a 220 kV grid connection can accommodate a station of up to 400MW
- a 110kV grid connection can accommodate a station up to circa 100 MW

Due to the electricity grid in the Northwest, a 400MW station only be accommodated at Sligo.

When power station options are examined, only two options return a very positive economic NPV. These are the two routes ((i) via Ballina and (ii) via Claremorris and Ballyhaunis) to Sligo with a theoretical 400MW power station located at Sligo. However, under the current gas connection policy, both options require an independent power producer to be willing to make a considerable contribution to the capital costs of the transmission pipeline to Sligo. Thus, it is unlikely, from the point of view of Ireland Inc, that an independent power producer

[1] Although the annual cash flows are assumed to remain constant from Year 10 onwards.
[2] Derived by taking the NPV of €77.4m. as a percentage of the total capital cost of €78m. (99%).
[3] Derived by taking the NPV of €80.3m. as a percentage of the total capital cost of €83m. (97%).

would choose to locate at Sligo when there are other more suitable and less costly locations across the country which are adjacent to the gas grid.

A 50/100MW power station at Ballina has no impact on the pipeline size or capital costs. The incorporation of a 50/100MW power station at Ballyshannon, results in an increase in pipeline diameters and AGI capacity size, with associated increase in capital costs of €5.4M and €15.5M respectively.

Similarly, a 400MW power station at Sligo results in increased pipeline capital costs of €12.4M.

The highest net present values (NPVs) are derived on both routes when a theoretical 400MW CCGT power station is built at Sligo and each route terminates at Sligo. The NPV is similar on both routes (+€152m.).

Capital Investment –v- Benchmark €M						
50 MW Peaking		100 MW Peaking			400 MW Baseload	
Benchmark 50 MW	Ballina 50 MW	Benchmark 100 MW	Ballina 100 MW	Ballyshannon 100 MW	Benchmark 400 MW	Sligo 400 MW
30.1	34.2	34.9	40.7	65.6	247.9	295.4
	12% increase		*14% increase*	*47% increase*		*16% increase*

The corresponding internal rates of return (IRR) are substantially positive, assuming the pipelines terminate at Sligo, although it is marginally higher on route A (33% vs. 30.7%).

With the exception of the theoretical 400MW power station at Sligo, and associated pipeline, all other power station sizes and associated pipelines evaluated, return substantially negative NPVs. Taking the full corridor to Donegal, the least negative NPV (-€36M) is derived for Route C with a 100MW OCGT power plant located at Ballyshannon. The corresponding IRR is still negative (-2.2%).

The Commission for Energy Regulation, in their gas connection policy (CER/06/032 April 2006), state that a capital contribution for large industrial loads with annual consumptions of greater than 260GWh and a connected pressure of 16 bar g or above, is required. In accordance with this policy the power station makes substantial capital contributions towards the pipeline e.g. for the 400MW station at Sligo a capital contribution of €39.3M is required.

In considering the power station economics, a comparison between the capital cost of constructing the various power station sizes at each of the 3 no. locations (Ballina, Sligo, Ballyshannon) to what would be considered a benchmark site in close proximity to both an existing gas and electricity network, was carried out. This comparison led to the conclusion that the capital cost of building a 400MW power station in Sligo is considerably more expensive than the benchmark, having an increased capital cost of €30.6M, leading to an increased generating cost of 0.2c/kWhr over that of the benchmark site.

However, the consideration of potential gas fired peaking plants (50MW and 100MW) at Ballina offer significantly better economic results when compared with their benchmark sites, and when compared with the economic results of the theoretical 400MW station.

A further cost for consideration are transmission loss adjustment factors (TLAF's), the mechanism used by the Transmission System Operator (TSO) to recoup the cost of electricity losses incurred in the electricity transmission network, via charges to power station operators. These are difficult to estimate since the charges fluctuate with each new generator connected to the electricity grid. However with relatively small amounts of power flowing into the North West region at present, it is likely that a small power station in this region would attract a favourable TLAF while a larger power station would almost certainly incur an unfavourable TLAF.

Part C - Cost Benefit Analysis

The cost benefit analysis (CBA) involves moving from a private assessment of each pipeline (the financial appraisal) to a full socio-economic assessment. This requires an assessment of whether or not the economic and social benefits associated with each pipeline project are greater than its economic and social costs. The general principle of CBA is that a project is desirable if the economic and social benefits exceed the economic and social costs. However, the guidelines note that meeting this test may not necessarily show that a project should proceed, since other projects competing for the same limited funds may have a higher net present value[4].

The key findings of the North West CBA analyses are as follows:

There is no economic justification for building gas pipelines to capture non-power loads in the towns along the corridors considered as the level of investment for transmission lines far exceeds the revenues generated in the towns along the pipeline routes. This is particularly evident in the case of building a transmission pipeline than extends to Donegal from Sligo. The economic net present value (NPV) of the pipeline to Donegal, without a power station, is -€96 million (Route A). This is after taking into account the environmental benefits of using gas as opposed to oil.

The CBA analyses for all of the other pipeline options with smaller power stations (50MW and 100MW) concluded that Ireland Inc. would be poorer if any of these projects were to proceed. We would point out that there are other infrastructure projects competing for the same limited funds that would have positive rates of return.

We fully acknowledge that infrastructure, in its broadest sense (e.g. electricity, roads, telecoms, waste, water supply) is an important prerequisite for regional economic development but it is essential that investment is made in infrastructure that makes a positive return.

The CBA requires the consideration of non-quantifiable benefits such as:

- The role of energy infrastructure in the National Spatial Strategy;
- The role, if any, of the provision of advance natural gas and enhanced electricity infrastructure in facility regional development;
- The need to enhance competition and security of supply in the power generation and gas distribution and supply sectors.

However, the NPVs on these projects are so substantially negative that it is difficult to argue how these non-quantifiable benefits could bridge the gap. We have no doubt that there are many infrastructural projects that could be undertaken in the North West that would generate positive socio-economic NPVs and these should be considered before projects that have negative NPVs.

[4] Department of Finance February 2005 Guidelines, Page 39.

The gas experience is not uniform in towns that have already been connected around the country. The pattern of build up will vary depending on the location of the town and the level of new housing development. In the commuting towns around Dublin for example, the very high level of housing development has been a key factor driving gas demand. A number of the commuting towns in the outer Leinster counties have also recorded strong growth in the number of connections. However the pattern of growth is very uneven. This raises an important issue which is the prospects for new housing development over the next decade. A slowdown in the level of new housebuilding from current unprecedented levels would adversely impact on the economics of any planned transmission gas pipeline which relies on new housing development.

We do not believe the construction of transmission pipelines to the towns in question would make a critical difference to the pace of economic growth they would experience going forward. A case in point is the City of Galway, which for many years, has been the fastest growing urban centre in the country and which, until recently, had no natural gas supply. A more important factor at this juncture for generating economic growth would be a reliable electricity supply.