Joint Submission

in response to

Green Paper on Energy

To:

Energy Planning Division

Department of Communications, Marine & Natural Resources

December 2006

INTRODUCTION

Energy is now at the top of the national economic and social agenda. Issues relating to security of supply, sustainability and competitiveness will have a profound impact on living standards and employment. This submission is made jointly on behalf of Engineers Ireland, the Irish Academy of Engineering and the Energy Institute (Irish Branch). Together, these bodies represent professionals in all of the key energy sectors of Ireland. This submission supports and complements submissions made in response to the Green Paper by the Irish Academy of Engineering early in November, and by Engineers Ireland in response to the National Climate Change Strategy Review in September 2006.

There are serious challenges ahead in terms of energy pricing, investment, security of supply, and sustainability of energy delivery which must be addressed both at a European and national level. In addition, they are inextricably linked with measures to reduce the impact of carbon emissions on the earth's atmosphere.

The publication of the Energy Green Paper could not be more timely. In addition to the well-documented exposure of Ireland to energy imports, and its comparatively higher dependence on oil in the energy mix, there are specific challenges in terms of improving Ireland's energy costs and of introducing effective competition, given the small scale of the market. The movement towards an all-island energy market is welcome and offers opportunities to achieve economies of scale.

In view of Ireland's peripheral location, it is particularly important to ensure that our natural resources of gas, oil, wind, biomass are exploited, and that emergent technologies such as tidal and wave energy are investigated. The issue of nuclear power must be comprehensively studied and debated. It will be no less important to allocate resources to keeping the demand side as low as economically feasible consistent with the needs of a rapidly expanding economy.

The Green Paper emphasises Ireland's obligations under the Kyoto protocol for Climate Change to limit Carbon Dioxide emissions to 13% above the 1990 level by 2012. This

is a daunting target, and together with diversification of supply sources, can only be achieved by measures such as:

- Greater efficiency in the use of energy in buildings, and more use of renewable energy in buildings as now required by some local authorities.
- Greater efficiency in the use of energy in transport through reducing congestion, promoting public transport and switching to biofuels and more fuel-efficient vehicles.
- More emphasis on renewable energy resources for power and heat generation, and use of best technology to achieve optimum energy conversion (efficiency) of fossil fuel generating plant.

There is increasing international concern about the impact of greenhouse gases. Last month the President of the European Commission urged the use of low carbon technologies to cut greenhouse gases emissions. Following the Stern report, the British Government is currently proposing a cut of 30% in greenhouse gas emissions by 2020 to the European Union. In the context of security of supply and environmental sustainability, a Swedish Government Commission recently published a report aimed at bringing Sweden close to an oil free economy by 2020.

Monitoring Progress towards Targets

It is essential that delivery structures should be put in place to ensure that adopted targets are met and that specific agencies are made responsible and accountable for delivering the appropriate conditions to achieve intermediate milestones en route to the targets. An annual monitoring progress report should be published.

1. EXPLORATION AND PRODUCTION OF INDIGENOUS RESOURCES:

Discovery of new indigenous gas or oil supplies has the potential to dramatically improve our energy supply security. In relation to indigenous gas supply, the first step must be to bring the gas that was discovered offshore ten years ago in the Corrib field onshore as quickly as possible. This would reduce our vulnerability to a disruption of international supply caused by technical factors or by an event similar to that which occurred in the Ukraine some months ago. Ireland is at present over 80% dependent on imported gas.

Success in drilling for hydrocarbons in Irish waters has been modest by international standards. A review by the Minister for Communications, Marine & Natural Resources and the Minister for Finance of the fiscal terms for exploration and production is currently underway. This review must recognise that the discovery and development of additional indigenous resources of oil and gas is a crucial issue. There is intense competition for scarce exploration resources from countries with a much higher success ratio than Ireland, some of whom carry a significant proportion of the well costs in the event of a dry hole.

It is essential that a timetable for the permitting and approval process is defined and a commitment given by Government that the necessary resources are put in place to deliver the timetable.

RECOMMENDATIONS:

1 (a) The lead-time between discovery and production for newly discovered fields must be reduced substantially by eliminating the uncertainty and delays associated with the present licensing and permitting process.

1 (b) An immediate review of the comprehensiveness of the data available regarding the prospectivity of Irish offshore areas should be conducted. Additional Government support should be provided for seismic exploration and other measures to reduce the exploration risk and to maximize the value of data already available with a view to attracting more exploration activity.

1 (c) A period of two years should be allowed from the announcement of a new Licensing Round to the submission of licence applications. This will give applicants time to assess more thoroughly the data available and the risks involved and to undertake additional seismic or other investigations which now take significantly longer than in the past, due to competition for scarce personnel.

1 (d) In view of the very high cost of drilling an exploration well in Irish waters, consideration should be given to an appropriate risk-sharing model.

2. NATURAL GAS SUPPLY:

Irelands overall dependence on natural gas is broadly in line with the rest of Europe. However our very high dependence on gas imports from a single source of supply, our very low levels of gas storage and the extremely high proportion of gas fired generation in Ireland makes the Irish economy uniquely vulnerable to gas supply shocks. In these circumstances it is vital that measures be introduced immediately to ensure Ireland's gas supply security.

RECOMMENDATIONS:

2 (a) Complete the development of the Corrib gas field.

2 (b) Address the potential for critical gas transmission system failures, such as the onshore interconnect system in Scotland and the pipeline hub at Ballough.

2 (c) Provide additional storage measures. For example using the depleted Ballycotton field, Carrickfergus salt mines, aquifer storage, or expanded LNG.

3. TRANSPORT:

The transport sector has been the fastest growing contributor to national greenhouse gas emissions levels. Effective implementation of the National Spatial Strategy is vital for the coordination of regional planning activity and the timely development of both public and private transport routes.

3.1 Motor Cars:

Fuel use in motor cars in Ireland has more than doubled since 1990 due to the increase in the size of the fleet, a rapid increase in the engine size of newly registered cars and increasing congestion**.** Although there has been a sharp annual increase in the number of cars on Irish roads, total car mileage has increased less rapidly, as the mileage travelled per car has fallen.

But there are very large variations between the specific fuel consumption and emissions across the range of private motor vehicles used in Ireland, due to differences in engine size and design. Diesel engines are much more efficient than petrol engines. Since 2000, mileage by diesel-fuelled vehicles has increased at a rate twice as fast as that of petrol-fuelled vehicles. This trend needs to be accelerated, as Ireland lags considerably behind European practice in this area. In addition the trend to larger engine sizes needs to be reversed.

As the number of cars per capita in Ireland is still about 15% below the average in the EU15, and the average vehicle life is just over 6 years there

is an opportunity to bring about a significant improvement in motor car fuel consumption and carbon emissions in a relatively short time span if appropriate policies are pursued. Reductions in urban congestion can also have a significant impact.

RECOMMENDATION:

3.1 (a) Vehicle Registration Tax and Motor Taxation should be restructured to provide much greater incentives for people to purchase vehicles with lower energy consumption and CO2 emissions and act as a disincentive to the purchase of larger engine vehicles than is absolutely necessary. Target to achieve a 1.5% improvement in efficiency per annum. This would require an improvement of approx 10% in the fuel consumption of new vehicles each year.

3.2 Buses:

The bus fleet increased at a rate similar to that of motor cars in the period 1990-2005. But there was little or no modal switching from private motor cars to buses over the period. Typically buses are three times more energy efficient per passenger than cars. This ranges from ten times more energy efficient at peak hour to a similar efficiency at off peak efficiency for cities, and almost two times more efficient for interurban traffic.

RECOMMENDATIONS:

3.2 (a) It is recommended that there should be a significant acceleration in the rate of increase of the bus fleet in order to achieve a modal shift from private cars to public transport of 1% of passenger traffic per annum. Bus licences should be awarded by public /regulatory authorities in a manner which makes the greatest contribution to reducing congestion, with the allocation of PSO subsidies where necessary. Quality Bus Corridors should be introduced where feasible to further improve bus efficiency and should be operated with an appropriate number of buses to ensure effectiveness.

3.2 (b) With the 'school run' widely seen as a major source of urban congestion, a comprehensive school bus service should be introduced to help reduce congestion

3.3 Road Freight:

Road freight traffic tonne km has increased by 250% between 1991-2005. In the same period the number of goods vehicles has increased at half that rate. Thus the average payload has increased significantly. However overall fuel efficiency, measured in ktoe/tonne km, has remained constant as the benefits of increasing vehicle size were offset by increasing congestion. A notable feature of the increase in freight volumes was the contribution of the construction sector. Indeed

construction related traffic now accounts for 50% of HGV traffic in urban areas.

The lack of improvement in overall energy intensity must be seen in the context of improving engine efficiency, in ktoe/ tonne km, for all engine sizes and also the fact engine efficiency improves as engines get larger. The key issues therefore relate to reducing road congestion and gridlock in urban areas and to the capability to reduce both urban and interurban journeys, through improved logistics planning.

More than half the total tonnage of freight traffic in Ireland is carried on journeys of less than 25km. It is recommended that an urgent detailed examination of the possibilities for improving road freight distribution in urban areas should be conducted as has been done with considerable success in Bristol and Newcastle. Furthermore consideration should be given to delivering building materials, particularly aggregates by rail or water to city centre areas as is the norm internationally.

RECOMMENDATIONS:

3.3 (a) Considerable investment must be made in modern technology traffic control systems in order to improve traffic flow management in urban areas.

3.3 (b) An investigation should be conducted into integrating road freight movements with the use of QBC's at off peak times in order to optimise lane usage and improve overall traffic flow.

3.3 (c) The opportunities to reduce the number of road freight vehicles in congested urban areas by grouping of loads from different suppliers, and improved logistical planning should be investigated.

3.4 Rail Freight:

Rail freight requires less than half the energy per tonne km of goods transported by road. Rail freight in Ireland has been declining by about 2% per annum since 1990. Rail accounts for a much smaller % of freight traffic in Ireland than is the case on average in European countries. Rail is particularly suited to the carriage of bulk materials over long distances or to the heart of urban areas.

RECOMMENDATION:

3.4 (a) Opportunities for conveying bulk materials by rail should be investigated in order to secure the optimum balance for society, taking full account of the increased costs to society of energy and carbon emissions and of time loss, due to congestion.

4. HEATING:

4.1 CHP Development.

Although improved energy generation efficiency (through the combined use of heat and electricity from its process and the avoidance of transmission/distribution losses) represents its most obvious benefit, CHP also offers a means of improving security of supply, by decreasing dependence on the national grid and reducing peak demands from the electricity network. Penetration of CHP in Ireland is low by European standards, due to the lack of process industries and our very low urban housing densities, which did not favour district heating. We are now seeing much higher rise developments in urban areas which favour CHP development but the long-term investment potential is uncertain.

RECOMMENDATION:

4.1 (a) Review European incentives with a view to encouraging greater uptake of CHP schemes in Ireland.

5. REDUCING ENERGY CONSUMPTION AND INCREASING USE OF RENEWABLE ENERGY IN RESIDENTIAL SCHEMES:

The most recent building regulations regarding energy use in buildings were issued in 2002. Compliance became mandatory from 1 January 2003, but where planning had been granted before that date, dwellings could be built to the earlier 1995 regulations until January 2005 providing the walls of the buildings were substantially completed.

RECOMMENDATIONS:

5 (a) Current building regulations should be strictly enforced, with adequate resources provided to carry this out (either directly through local authority resources or through self-certification by building professionals, including Chartered Engineers). The proposed revision of the Building Regulations in 2008 should be brought forward as a matter of urgency and the lead-time to full implementation reduced significantly from current practice.

5 (b) The large number of one off houses being built in rural Ireland makes the use of renewable heating sources particularly feasible and the planning system should be used to maximise the use of renewable energy in these dwellings, to offset the higher transport fuel use associated with these developments.