Statement on Energy

October 2009

Forfás

National Competitiveness Council

Chairman's Preface

Ireland's economic circumstances are serious and challenging. National income has declined rapidly, living standards are falling and unemployment has risen sharply. Given the severity of our current economic position, it is now time for Ireland to achieve a swift improvement in competitiveness. Achieving competitive reductions in the cost of energy for Irish businesses will be essential.

Energy policy for Ireland has to address a number of formidable challenges. Firstly, we have the responsibilities of global citizenship – reflected in the need to make a responsible and proportionate contribution to meeting the challenges posed by global warming. Secondly, we need to improve our energy security; at present we are excessively dependent on energy imports. Thirdly, energy costs and usage need to be constrained in line with the essential need to improve the competitiveness of Irish enterprises.

Policy implementation should strive to meet all the challenges – notwithstanding the difficulties in doing so. Sustained actions will be required over the long term in order to successfully address the challenges of climate change and energy security. These actions need to be consistent with the urgent need to enhance the competitiveness of enterprises based in Ireland. This is the perspective which informs the analysis and recommendations put forward by the Council in this paper.

I would like to thank the Council members and the advisors for their valuable contributions throughout the development of this report. I would also like on behalf of the Council to acknowledge the Forfás Secretariat for the work that they have done in preparing material for consideration by the Council.

Don Thornhill

Chairman, National Competitiveness Council

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Executive Summary

The Irish economy is currently facing enormous challenges. National income is declining rapidly, living standards are falling and unemployment is rising. Targeting export led growth is the only sustainable route to maintain living standards and secure long term prosperity. As highlighted in the Council's recent publication, *Getting Fit Again*, restoring the competitiveness of our exporting sectors is critical to ensure that Ireland can take advantage of a global recovery[1].

A reliable and competitively priced supply of energy is vital for business and its ability to compete successfully in international markets. From a national competitiveness perspective, the challenge facing Ireland is to reduce energy costs while delivering on our security of supply and environmental sustainability objectives. As an exporting economy, Ireland also has opportunities to develop domestic companies in energy and related areas.

A number of factors that affect Ireland's energy performance are outside our direct control, such as global fuel price volatility and our reliance on imported fuels. However, there are a number of areas where Ireland can act to improve its performance in terms of:

- restoring cost competitiveness;
- improving security of supply; and,
- moving to a lower carbon economy.

Restoring Cost Competitiveness

In the second half of 2008, Irish industrial electricity costs were the fourth highest in the EU-27 and were 35.5 percent above the Eurozone average *(latest data available*). Although prices are currently moderating somewhat as international fuel prices fall, recent reductions in electricity and gas prices are welcome but are not sufficient to improve Ireland's comparative position.

A number of initiatives have been announced recently to reduce electricity prices for Irish businesses, particularly large energy users in sectors such as food, pharmaceutical and ICT. These include continuing the temporary rebate introduced in 2008 to reduce prices for large energy users, the proposed introduction of legislation to recover the carbon windfall gains to 2012, and reducing the capacity payments to generators[2]. The NCC welcomes these developments which are important steps on the path to more competitive electricity prices for businesses in Ireland. However, further policy action is required to bring the cost of electricity for Irish businesses into line with their

1 The report is available at http://www.competitiveness.ie/publications/2009/title,4252,en.php
2 The capacity payments mechanism is designed to ensure adequate electricity supply to meet demand. For further details see page 14.

European counterparts. In particular, the NCC believes that the following actions should be progressed without delay:

- The sharp increases in fossil fuel prices during the first half of 2008 resulted in significant electricity price increases last year. While the NCC welcomes the falls in regulated prices to date, it remains vital to ensure that regulated electricity and gas prices fully reflect the decrease in international fossil fuel prices.
- The successful creation of the all-island wholesale Single Electricity Market (SEM) and the closing of inefficient legacy plants are improving efficiencies in electricity generation. Regulation needs to prioritise bringing the differential in controllable domestic costs (i.e. non-fuel costs) into line with costs in our main competitor countries.
- Given the introduction of the single electricity market in November 2007, it is timely to review the market rules to ensure that the market is functioning optimally. In particular, we need to further reduce the level of capacity payments (€551 million in 2010) to reflect the fall in capital costs for new plants as well as the decline in electricity demand.
- Significant investment in the transmission and distribution networks is planned over the period to 2025, which will be financed through higher electricity prices. This investment is essential to enable renewable technologies to connect to the grid and to ensure that key regional centres can support energy intensive investment projects. Given reduced levels of economic activity, potential may exist to extend delivery over a longer period of time and/or delay projects which are no longer justified by projected demand growth. In view of the cost implications, the NCC also supports the view that high-tension transmission lines should continue to be placed overhead.
- Electricity generated from renewable sources and peat receives a guaranteed price. These subsidies (€64 million in 2009/2010 for wind and €93 million for peat) help reduce Ireland's dependency on imported fuel, and in the case of renewables help Ireland to meet its renewables and climate change targets. While public subsidies can play a key role in supporting emerging sectors, the NCC is concerned about the cost implications for electricity customers. As highlighted by the International Energy Agency, policy support mechanisms for renewables should be designed to be transitional as they are for other technologies, with decreasing support levels over time. Given that Ireland is likely to have to close its peat plants in future (to comply with EU legislation); there is merit in phasing out the subsidies due to the cost implications, especially now that the amount of spare electricity capacity has increased significantly.

Improving Security of Supply

Ireland currently imports approximately 90 percent of its energy (electricity, heat and transport) needs. Unlike other countries, Ireland has limited hydro resources and no nuclear. Ireland's ability to access significant natural energy resources such as wind, wave and tidal energy offers significant potential to improve Ireland's security of supply as renewable energy technologies develop and as costs fall. Ireland has already made strong progress with respect to the share of renewables in electricity generation. As of August 2009, 12 percent of Ireland's electricity was produced from renewable sources (wind - 10 percent; hydro - two percent).

Nonetheless, Ireland is expected to remain largely reliant on imported fossil fuels for its total energy needs until at least 2020. This presents a range of challenges in terms of adapting our fuel mix to ensure a cost-effective, secure and diverse fuel mix. The NCC believes that the following actions are required:

- Greater interconnection can support security of supply, assist the achievement of our renewable targets and potentially enhance competition in the Irish electricity market. The timely delivery of the East-West and second North-South interconnector is essential. It is welcome that Eirgrid is also undertaking a feasibility study of interconnection to mainland Europe.
- Given Ireland's growing dependence on gas, we need to diversify our sources of gas supply. The development of strategic fuel storage should be prioritised given the lack of adequate storage facilities on the island.
- It is vital that the development of Ireland's considerable renewable energy resources is progressed in a fashion which improves energy cost competitiveness. Onshore wind is significantly more cost competitive than offshore. A range of planning and regulatory barriers need to be addressed to allow Ireland to diversify its fuel mix in the longer term.
- ESB's coal-fired Moneypoint generation plant is due for decommissioning in 2020-2025. The options for replacing this source of baseload electricity need to be carefully examined, including analysis of the potential of clean coal technologies, nuclear power and pumped storage.

Moving to a Lower Carbon Economy – the Opportunities and the Challenges

Ireland's energy challenges also present significant opportunities for the enterprise base. The global environmental goods and services sector is hugely diverse and is expected to be worth $800 billion by 2015 – energy goods and services are a major component.

Capturing the strong growth potential of the environmental goods and services sector will require a coordinated strategy of ensuring policy and regulatory certainty, continuing public commitment to investment in environmental and energy-oriented R&D, and development of sector-specific skills. A High-Level Action Group on the 'Green Economy' will launch an action plan in Autumn 2009 to realise the clean technology opportunities for enterprise in Ireland and the potential to increase Ireland's share of foreign direct investment in this sector.

A carbon tax presents an important tool to encourage a shift to a lower carbon economy and society. Ireland needs to proceed carefully on the introduction of a carbon tax given the already high cost of doing business. In view of the relatively high costs of energy for business in Ireland, the NCC believes that a carbon tax should be introduced at a relatively low rate and phased in over a sufficiently long adjustment period. The NCC supports the Commission on Taxation's recommendation to exempt firms already engaged in EU-ETS or alternative binding energy-efficiency agreements (such as IS-393).

Energy efficiency is one of the most effective tools to jointly address cost competitiveness, security of supply and environmental sustainability objectives. While some progress has been made to reduce energy use, significant scope exists for further savings, including:

- Setting stricter building standards with the ultimate aim of reaching zero-energy buildings, in conjunction with schemes to support investment in retrofitting existing buildings; and
- Supporting Irish industry to become more energy efficient. There has been a strong take-up of Sustainable Energy Ireland initiatives by large energy users in particular. In 2007, it took less than half the amount of energy to generate a euro of value added than it did in 1990. However, there is a need to improve take-up of energy efficiency programmes by SMEs. Potential exists to reduce costs by developing a more unified approach to the delivery of advisory and support services to business across a range of related natural resources (e.g. energy, water and waste).

The sharp nature of the current recession means that Ireland is now broadly on course to meet its current Kyoto commitment to reduce greenhouse gas emissions for the period 2008-2012. The current downturn represents an opportunity to ensure that Ireland chooses a smart long-term policy mix to reduce emissions at least possible cost to society. Much of the focus to date has concentrated on reducing the carbon emissions of the electricity generation and industrial sectors. However, the agriculture and transport sectors are responsible for almost half of all greenhouse gas emissions. Specific measures are required for the transport (e.g. congestion pricing, improved urban land use and land planning) and agriculture (e.g. utilisation of nutrients and reduced reliance on nitrogen applications) sectors to meet internationally binding targets to reduce Ireland's emissions by 20 percent by 2020.

1. Introduction and Background[3]

Promoting energy production and consumption patterns that are secure, environmentally sustainable and economically competitive is a major global challenge. This report assesses Ireland's energy competitiveness and challenges, and sets out priority areas for policy action. The report also highlights that in addition to energy being a key input to all businesses, Ireland has significant opportunities to develop domestic companies in energy and related areas (e.g. ICT hardware, software, business services) that can export overseas and reduce our dependency on imported energy sources.

Energy competitiveness is vital for Ireland's key exporting sectors. Although energy costs account for a relatively small share of total production costs for many firms, the energy intensity of production varies significantly across sectors[4]. The largest consumers of energy in Ireland are the engineering products sector and the food and drink sector, each accounting for a fifth of industry's energy consumption in 2007[5]. In the current environment, many firms in these labour intensive sectors and others are facing tight margins or are loss making. Energy costs comprise a large component of their non-wage costs. More broadly, high energy prices increase the costs of transporting people and goods, and also dampen domestic demand.

While the cost of energy is an immediate concern from an enterprise perspective, we also face serious challenges in ensuring security of energy supply and meeting our environmental targets as we move towards a lower carbon economy and society. Ireland's ability to maintain our existing export base, to continue attracting high levels of foreign direct investment and to provide a supportive environment for Irish enterprise generally is dependent on our capacity to deliver a more secure and sustainable energy supply while quickly addressing the serious loss in price competitiveness of recent years.

The remainder of this section reviews Ireland's performance across the three pillars of energy policy (i.e. cost competitiveness, security of supply, and environmental sustainability)[6] and highlights future challenges.

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3 In preparing this report the NCC consulted with a range of bodies including the Department of Communications, Energy and Natural Resources, the Commission for Energy Regulation, Eirgrid, IDA Ireland, Enterprise Ireland , ESRI, International Energy Agency, the Competition Authority, McKinsey, Deloitte and Airtricity. Many of the initial recommendations were presented at a roundtable event organised by DCENR on July 16th 2009, which included a wide range of large energy users, power generators and transmission and distribution operators. The NCC would like to thank these bodies for their assistance.

4 Fewer than three percent of industrial enterprises spend over six percent of their direct costs on energy, and these account for just two percent of industry's contribution to GDP and three percent of industrial employment. Source: SEI, Energy in Industry Report, 2007.

5 SEI, Energy Statistics Databank – Fuel Consumption by Sector, Year and Fuel Type, November 2008: http://www.cso.ie/px/sei/database/SEI/Energy%20Balance%20Statistics/Energy%20Balance%20Statistics.asp

6 Appendix 2 provides additional information on Ireland's energy performance across key indicators.

1.1 Cost Competitiveness

In spite of recent price reductions, energy cost competitiveness remains a key concern for Ireland:

- Irish industrial electricity costs were the fourth highest in the EU-27 in the second half of 2008 *(latest data available*). This represents an improvement on the second half of 2007, when Ireland was ranked second most expensive (See Appendix 2, Figure A.1). However prices in Ireland are 37.8 percent above the EU-27 average and 35.5 percent above the Eurozone average.
- Industrial gas prices in Ireland were the tenth highest of the EU-27 in the second half of 2008 compared to third highest in 2007. As a result, Irish gas prices are at the EU-27 average and slightly below the Euro area average (Figure A.3).
- Petrol and diesel prices (excluding taxes) in Ireland and other European countries tend to be broadly similar as they are driven by international crude oil prices.

Despite finite resources, oil, gas and coal are likely to remain the world's leading source of energy for the foreseeable future. The medium-term trends for global oil and gas consumption foresee a continued increase in demand, particularly from developing countries. At the same time, declining reserves and spare production capacity are becoming increasingly concentrated in a few countries[7]. Volatility on oil and gas markets in recent years reflects these trends. The latest International Energy Agency (IEA) forecasts are for global energy demand to increase by 45 percent by 2030. While the current global recession has resulted in sharp decreases in the price of fossil fuels since their record peaks in mid-2008, the IEA maintains that this phenomenon is temporary. The era of cheap oil is ending and upward price pressure on fuel sources is likely to intensify once the global economic crisis eases.

1.2 Security of Supply

Ireland's position in terms of security of supply is improving though challenges remain:

- Ireland has made strong progress with respect to the share of renewables in electricity generation. In 2007, the share of renewables in total energy use, which includes electricity generation, transport and heating, was 2.9 percent and the share of renewables in electricity generation was 9.4 percent. The share of renewables in electricity generation had increased to 12 percent in August 2009 (wind 10 percent, hydro two percent)[8].
- Although most countries have a high dependency on fossil fuels for transport (petrol/ diesel), Ireland is also highly dependent on fossil fuels for electricity generation unlike many of our competitors (Appendix 2: Figures 4 and 5).
- The low level of spare capacity in electricity generation has been a particular concern in recent years. However, the combination of falling demand and increased new electricity generation capacity means that Ireland's position has improved considerably and the

7 IEA, World Energy Outlook, 2008
8 Eirgrid website (August 2009): http://www.eirgrid.com/renewables/

outlook for the medium term is positive. Eirgrid estimates that there will be a 4-5 percent fall in demand for electricity in 2009 which will result in significant spare generation capacity[9].

Ireland's ability to access significant natural energy resources arising from wind, wave and tidal energy offers significant potential to improve Ireland's security of supply as renewable energy technologies develop and as costs fall.

Globally, the immediate risk to energy supply is not a lack of resources, but rather a lack of investment to extract resources. Massive investment in energy infrastructure is required to maintain the current level of supply capacity, as much of the world's current infrastructure for supplying oil, gas, coal and electricity will need to be replaced by 2030. Given that oil production has already peaked in most non-OPEC countries, OPEC countries are expected to account for most of this increase in production. The IEA has emphasised the risk that under-investment could cause a supply crunch in coming years as large proven reserves may not be fully exploited and the supply of oil and gas constrained. Ireland is a peripheral nation particularly dependent on oil and increasingly gas for energy consumption; in this scenario of global under-investment Ireland would be vulnerable to security of supply threats.

1.3 Environmental Sustainability

Ireland position in terms of environmental sustainability is mixed:

- Between 1990 and 2006, greenhouse gas emissions in Ireland increased by 25.6 percent, compared with a decline of 2.2 percent in the EU-15. The strong growth in emissions in Ireland was largely driven by the transport sector, where emissions increased by 165 percent; far in excess of the EU-15 average of 25.8 percent (Appendix 2: Figure 7).
- Between 1990 and 2007, the value added of industry grew by 278 percent, while industrial final energy consumption grew by only 56 percent. This resulted in the energy intensity of Irish industry declining by 59 percent and was driven by improvements in energy efficiency and the closure of some energy intensive firms[10].
- Based on revised EPA/ESRI figures from March 2009, the expected overshoot of Ireland's Kyoto target is substantially lower than previously budgeted for, due to the severe downturn in economic activity[11].

9 Eirgrid, 2009, Update on Generation Adequacy Report 2009-2015

10 Sustainable Energy Ireland, Energy in Ireland 1990-2007, December 2008.
http://www.sei.ie/Publications/Statistics_Publications/Energy_in_Ireland/Energy_in_Ireland_1990-2007.pdf

11 The overshoot looks likely to be in the region of 1.5m tonnes – this means Ireland will have to spend significantly less than the €300million set aside over the years 2008-2012 to buy emissions allowances. Environmental Protection Agency, Ireland's Greenhouse Gas Projections 2008-2012, Press Release March 12th 2009.

Globally, the consequences of inaction on implementing credible policies to tackle climate change are severe. The IEA projects that global energy-related emissions of CO_2 will increase by 45 percent between 2006 and 2030 - an average rate of increase of 1.6 percent per year, with coal accounting for more than a third of the overall rise. While three quarters of this increase is expected to come from China, India and the Middle East, per capita emissions from developing countries are expected to remain much lower than those from the OECD. The growth forecasts may be subject to downward revision given the dramatic nature of the global economic downturn since mid-2008. However, the scale of the increase in CO_2 emissions remains an enormous global challenge.

1.4 Key Policy Areas

The remainder of this report examines the challenges and opportunities, and sets out priority areas for policy action under the following headings:

- Restoring cost competitiveness (Section 2)
- Ensuring diverse sources of supply (Section 3)
- Moving to a lower carbon economy – the opportunities and the challenges (Section 4)

2. Restoring Cost Competitiveness

The escalation in energy prices, particularly electricity and gas prices, over recent years has acute implications for all energy users. In the view of the NCC, improving cost competitiveness in a way that also promotes our security of supply and environmental goals is the major challenge facing Irish energy policy.

While Ireland is particularly exposed to today's energy challenges due to our geography, demography and a high dependence on imported sources of energy, there are a number of actions that we can take to reduce the difference between prices here and in our competitor countries[12]. It is vital that actions to improve our cost competitiveness are progressed as a matter of urgency to mitigate the impact of the recession on enterprise and the ability of firms based in Ireland to compete in export markets.

2.1 Actions to Reduce Energy Prices

The sharp increases in fossil fuel prices during the first half of 2008 resulted in significant electricity price increases last year. Crude oil import prices are now below the level they were at when the sharp increases in international fossil fuel prices began in early 2007. Gas prices have also fallen but not as quickly as oil prices. About half of large energy users are on variable tariff pricing plans[13]. Reflecting trends in international fuel prices, they have seen their electricity prices come down by an average of 20 percent in recent months[14].

However, most SMEs and households are on regulated tariffs. Earlier this year, the Commission for Energy Regulation (CER) undertook an interim price review so that they too could benefit from falling international fuel prices – electricity prices were reduced by 10 percent from the 1st May, and gas prices declined by 12 percent. Following the CER's annual review of electricity tariffs for SMEs and households, there will be no change in residential tariffs and SMEs will benefit from price reductions of up to 9 percent from 1st October 2009 depending on usage[15]. Gas prices are to decline by 9.8 percent for domestic customers and SMEs. While these reductions are positive, it remains vital to ensure that the regulated electricity and gas prices fully reflect the decrease in international fossil fuel prices.

12 It is useful to understand the component parts of retail electricity prices. Fuel makes up the largest component of retail prices in Ireland, accounting for 56 percent of the average price (Appendix 2, Figure A.2). This will be higher for heavy users and lower for lighter users, such as domestic users. For large industry customers, fuel is estimated to be 70-80 percent of the final price.

13 An overview of the structure of the Irish electricity market is provided in Appendix 1.

14 Irish gas prices are set by UK gas prices. UK gas prices spiked in 2008, reaching a high of £0.80 per therm in late October 2008. Since the end of January 2009 prices have fallen substantially and have been fluctuating at just below £0.30 per therm in recent months

15 The more electricity the SME uses, the greater the decline in its electricity costs. The CER estimates average reductions of 0.4 percent for small users and 5.5 percent for medium users. These changes are effective from the 1st October 2009. For further details see http://www.cer.ie/en/electricity-retail-market-current-consultations.aspx?article=0398d6dc-b24a-4c48-84f4-2ed88c1ef947&mode=author

There have been a number of initiatives announced recently to reduce electricity prices for Irish businesses, particularly large energy users such as food, pharmaceutical and ICT companies. These include continuing the temporary reduction in electricity prices introduced in 2008 for large energy users until the end of September 2010[16], the proposed introduction of legislation to recover the carbon windfall gains to 2012, and reducing the capacity payments to generators. The NCC welcomes these developments which are important steps on the path to more competitive electricity prices for businesses in Ireland.

Although Irish energy prices are moderating somewhat as international fuel prices fall, recent reductions in electricity and gas prices were necessary but are not sufficient to improve Ireland's comparative position.

2.2 Efficiency Gains in Electricity and Gas Markets

Given that recent reductions in energy prices are mainly due to falling fossil fuel prices internationally, it is crucial that the structural measures highlighted in this report are progressed as a matter of urgency to ensure a long term improvement in energy cost competitiveness.

The NCC believes that there is further scope for the CER to drive efficiencies in the energy market and reduce the cost of electricity to end users. Prioritising national economic and cost competitiveness objectives in all regulatory decisions is central to achieving this. The recent commitment by the CER to have regard to enterprise competitiveness considerations in its regulatory decisions is a positive development.

While no analysis of the factors contributing to the significant difference between electricity prices in Ireland and elsewhere has been conducted since the introduction of the all island electricity market in November 2007, Deloitte estimated that domestic *controllable costs* accounted for 30 percent of the difference between Irish and average EU electricity prices in 2004[17]. They found that labour costs for generation were above the EU average and that electricity transmission and distribution charges were also higher than in benchmarked countries. The NCC and others have argued that these controllable costs can only be reduced through further efficiency gains within domestic generation, transmission, distribution and supply. To this end, the NCC welcomes the successful creation of an all-island wholesale Single Electricity Market (SEM) and the closing of inefficient legacy plants which are improving efficiencies in electricity generation. An updated assessment of the factors that contribute to the differential between Irish and international energy prices would be welcome. Regulation needs to prioritise bringing the differential in controllable costs in regulated markets into line with international best practice.

16 In 2008, the CER announced a rebate of €315 million (funded by ESB from its carbon windfall gain) to mitigate the impact of the very high global fossil fuels prices at that time for all users. The rebate is to continue for the 2009/2010 tariff year for large users, funded by ESB, in an effort to reduce the effect of the higher electricity prices in Ireland on their competitiveness. It is intended that rebate for large users will be gradually phased out over the two years from October 2010.

17 Deloitte, 2005, Review of the Electricity Sector in Ireland, Report to Department of Communications, Energy & Natural Resources.

A transparent and stable regulatory framework is critical for the effective functioning of the electricity and gas markets. The review of energy prices and tariff methodologies currently underway by the CER needs to ensure that electricity and gas prices are fully cost reflective and are passed on to consumers in a fair and transparent manner. Among the actions required are:

- **Benchmarking non-fuel costs against relevant international best practice:** We need a clear process to bring operating, maintenance and capital costs, particularly for networks (transmission and distribution), into line with international best practice. Every five years the CER reviews the non-fuel costs allowable for networks and supply. As part of its forthcoming review, the CER needs to benchmark the costs allowed against our main competitor countries and ensure that all necessary steps are taken to bring non-fuel costs in Ireland into line with best international practice.
- **Review the use of the correction factor (k-factor):** The correction factor (k-factor) compensates generators for adverse movements in fuel prices[18]. There may be scope to alter this correction mechanism to allow the ESB and Bord Gáis to take more risk (and potentially profits) – as they are better positioned to assess these risks and mitigate them. The CER's current review of the k-factor needs to ensure that ESB and Bord Gáis bear at least some of the risk of international fuel price fluctuations and are incentivised to optimise their hedging strategies and overall efficiency.
- **Transparency of pass through on fuel prices:** Concerns have been expressed that the CER is overly reliant on forecasts from ESB and Bord Gáis of the impact of changes in fossil fuel prices on retail energy prices. The NCC believes that the CER needs to undertake more independent analysis of international fuel price movements and ensure that the way in which changes to tariffs are determined is clearly communicated to energy users.
- **Clear communication of regulatory proposals and decisions:** The Council welcomes the CER's publication of an information note on the recent measures to reduce prices, in addition to its detailed consultation papers. Communicating its proposals and decisions in relation to costs in simple and clear terms to energy customers is important to ensure transparency and confidence in the regulatory process.

The introduction of the single electricity market (SEM) in November 2007 has led to greater efficiencies in electricity generation. However, it is timely to review the market rules to ensure the optimal functioning of the market in the following areas:

- Under the SEM, power generators receive **capacity payments** (€641 million in 2009, €551 million in 2010)[19]. The capacity payments mechanism is designed to incentivise market entry and exit,

18 Regulated tariffs are based on forecasts of fuel prices for that year, and subject to a correction factor (k) if the actual fuel prices turn out to be different over the tariff year. K is the difference between previous fuel cost forecasts and the actual out-turn. This difference is heavily influenced by international fuel price fluctuations and success of suppliers' hedging strategies. Where costs are under-estimated in a tariff year, "k" results in a step-increase in tariffs in the next tariff year. Where costs are over-estimated (e.g. in the event of a collapse in fossil fuel prices), "k" results in a tariff drop in the following tariff year.

19 The regulators' decision document on the determination of the capacity payments pot for 2010 is available at: http://www.allislandproject.org/en/capacity-payments-decision.aspx?article=1f746bf0-6b09-4495-ba36-f68bbbf3d9ee

encourage generators to be available in order to ensure security of supply (i.e. pay generators to be ready to produce power in case of a sudden increase in demand or a drop in other supply) and encourage an efficient mix of plant types (e.g. flexible plants to meet peak demand needs). In the short term, the level of capacity payments needs to be reduced further to reflect the fall in capital costs for new plant as well as the decline in electricity demand[20]. It is important that the capacity payments mechanism is kept under review to ensure it is delivering on its longer term objectives of incentivising investment in new, efficient plant, especially flexible plant while also encouraging the closure of old inefficient plant[21].

- Subject to constraints arising from the small size of the market, **hedging instruments** should be developed by the regulators (north and south) to make it more attractive for alternative electricity suppliers to offer a wide range of competitive pricing options to customers.

2.3 Recovering the Carbon Windfall

In August 2008, the Government announced it would use the carbon windfall accruing to the ESB to offset some of the price increases arising from increasing fuel prices[22]. The ESB agreed to a rebate of €315 million (for the 2008/09 tariff year) which is benefitting all electricity customers. Prices would be about 10 percent more expensive without this rebate of charges to consumers. As windfall gains will accrue until 2012, future gains should also be returned to customers to mitigate the impact of the high electricity costs for businesses and householders.

Although the impact of future rebates will be significantly lower because of the substantial decline in the cost of carbon to circa €15 per tonne, the recovery of the carbon windfall from all generators should be passed through to electricity users through lower prices, on an annual basis to 2012. The NCC welcomes the recent announcement that Government intends to introduce legislation to recover carbon windfall gains from all electricity generators until 2012.

2.4 Ensuring Cost Effective Transmission and Distribution

Significant investment in Ireland's transmission and distribution infrastructure is planned over the period to 2025 which will be financed through future increases in electricity prices. This investment is essential to enable renewable technologies to connect to the grid and to ensure that key regional centres can support energy intensive investment projects. Given reduced levels of economic

20 The capacity payments mechanism is determined by multiplying the cost of a best new entrant peaking plant (determined by the regulators) by the generation capacity requirement (determined by Eirgrid). While the regulators have decided to reduce the capacity payments pot to €551 million for 2010 (from €641 million in 2009), this is largely due to a lower capacity requirement for 2010 (6,832MW as compared with 7,356MW in 2009). According to a recent report by the International Energy Agency, the unit investment and equipment costs of building new plant have fallen by 20-30 percent since 2008. See: http://www.iea.org/textbase/Papers/2009/G8_FinCrisis_Impact.pdf. The NCC would therefore have expected the capacity pot to have fallen by more for 2010.

21 Flexible generation capacity will be needed to ensure supply when wind generated electricity is unavailable. It is important that the market sends out the appropriate price signals to attract investment in flexible plant.

22 This windfall arises as under the Single Electricity Market (SEM), the full cost of carbon is being passed through to electricity customers since January 2008. However, electricity generators receive significant carbon credits free of charge under the Emissions Trading Scheme, thereby resulting in windfall gains for the generators.

activity, the NCC believes that potential exists to extend delivery over a longer period of time and delay projects which are no longer justified by projected demand growth.

Other European countries allow firms other than the incumbent network company to design, build, and operate new distribution lines subject to agreed regulatory standards. Consideration needs to be given to introducing fully competitive tendering for new power lines in Ireland to ensure the most efficient delivery of new energy infrastructure.

An efficient and responsive planning system is essential to ensure that investment in the transmission and distribution system is achieved in a cost effective manner. Upgrading the network to deliver a system capable of accepting large amounts of new renewable and conventional generation is a major challenge – particularly as Ireland's best wind resources are on the west coast while highest demand is on the east coast. The Strategic Infrastructure Act can play an important role in fast-tracking planning and it is important that its effectiveness is carefully monitored.

There is a view that high-tension cables should be placed underground, primarily driven by concerns over health and the integrity of the rural landscape. However, Eirgrid estimates the incremental cost of using underground cables to strengthen the transmission grid (circa 650 km of transmission cables and 100 km for the North-South interconnector) would be €6 billion — costs that would be borne by all customers[23]. These costs are prohibitive and underground cables would be technically inferior from the perspective of guaranteeing security of supply. High-tension transmission lines should continue to be placed overhead.

2.5 Cost Implications of Price Supports

Electricity generated from peat and renewable sources receive a guaranteed price. These supports help to reduce Ireland's dependency on imported fuel, and in the case of renewables help Ireland to meet its renewables and climate change targets. When the guaranteed price is greater than the wholesale price of electricity, all electricity customers are required to pay a subsidy through the Public Service Obligation (PSO).

While public subsidies can play a key role in supporting emerging sectors, the NCC is concerned about the cost implications for electricity customers. As highlighted by the IEA, policy support mechanisms for emerging renewables should be designed to be transitional as they are for other technologies, with decreasing support levels over time. Regular reviews of the mechanisms in place and of the progress achieved are crucial to ensure that renewable energy penetration and deployment occurs smoothly and effectively[24].

23 Ecofys, 2008, Study on the Comparative Merits of Overhead Electricity Transmission Lines versus Underground Cables, Report to Department of Communications, Energy & Natural Resources, July.
24 International Energy Agency, 2008, Deploying Renewables: Principles for Effective Policies. Paris.

- **Onshore wind:** Onshore wind in Ireland receives a guaranteed price of €64 per megawatt hour over a 15 year period. In 2008/2009, this did not add to final consumer electricity costs as the wholesale price was higher (due to the high fossil fuel prices) than the guaranteed price at the time. However, in recent months the wholesale price for electricity has declined significantly and the gap between it and the fixed price for wind will have to be paid by the consumer. The PSO cost for 2009/2010 to cover supports to wind is €64 million[25]. The NCC believes that there is scope to enhance the effectiveness of Ireland's support mechanisms to facilitate the development of a competitive renewables market and improve Ireland's cost competitiveness by periodically reviewing the level of support and allowing for progressive reduction of supports as technologies mature (onshore wind is regarded as a mature technology). At a more general level, standard guaranteed price supports (such as that operating in Ireland), isolated and protected from the risks and competition in the rest of the energy sector, are not economically sustainable as a support scheme in the medium to long-term when renewable energy reaches very large-scale deployment.
- **Offshore Wind:** Price supports provide for a guaranteed price of €140 per megawatt hour for electricity produced by new offshore wind plants for 15 years. Offshore wind is prohibitively expensive given the availability of suitable sites for onshore wind in Ireland. The NCC recommends that the price subsidies in place for offshore wind be reviewed in light of the negative implications for cost competitiveness and the ample on-shore opportunities available.
- **Emerging technologies**: As technologies for wave and tidal power are currently at the pilot phase and are not yet commercially viable, it is important that Ireland offers attractive incentives to help develop this sector here. Emerging technologies (e.g. wave and tidal) benefit from significant price supports[26]. As is the case currently, the cost of supporting the research and development for wave and tidal energy should continue to be funded directly through existing funding mechanisms for research and development, rather than by energy customers through guaranteed prices. As wave and tidal electricity generation becomes commercially viable, the NCC considers that the terms and conditions for price supports for these technologies need to be carefully considered. The International Energy Agency has argued that a premium on the wholesale price is a more appropriate mechanism for supporting renewable technologies than guaranteed price supports as it forces energy producers to track market development and manage costs while guaranteeing a high level of investor certainty. As the technologies mature, similar principles to those proposed above for onshore wind should be applied.
- **Peat**: The PSO cost for 2009/2010 to cover the subsidies for peat generated electricity is €93 million[27]. While Ireland is likely to have to close its peat plants in future (to comply with EU

25 Each year PSO costs are estimated for the following year based on assumptions about fuel, carbon and exchange rates. There was an over-recovery of PSO costs in 2008 because electricity prices, and therefore the income earned by peat plants, were greater than expected. This over-recovery has been offset against the 2009/2010 PSO cost, which means the PSO levy for customers will be zero in 2009/2010. CER, PSO Levy 2009/2010 Decision Paper, July 2009.

26 Price supports for renewable electricity generation provide for a guaranteed price of €220 per megawatt hour for wave and tidal energy. This compares with a fixed price of €64 per megawatt hour for onshore wind generation. The average wholesale price of electricity in Ireland since the establishment of the SEM in November 2007 is €78 per megawatt hour.

27 See footnote 24.

legislation[28]), there is merit in phasing out the subsidies due to the cost implications, especially now that the amount of spare electricity capacity has increased significantly. Potential also exists to replace some of the peat with biomass materials if this proves cost effective.

2.6 Increase Policy and Regulatory Certainty

Competition is improving in the Irish electricity market as evidenced by the entry of Scottish and Southern Electricity, Endesa and Quinn. In addition, the recent entry of Bord Gáis and Airtricity to the domestic electricity market is a positive step for competition in the electricity supply market. While Bord Gáis and Airtricity have been offering electricity to business users for some years, the publicity around their entry to the market may lead to greater awareness across the enterprise base of the choice of electricity suppliers available to them. The CER stopped regulating prices for large energy users a number of years ago as the market was deemed to be competitive. In the longer term as competition develops in the SME and residential supply markets, the desired market outcome is one where price regulation will no longer be required.

There are already 2,000 MW of wind energy contracted to access the grid. There are 9,000 MW of renewable electricity generation and over 6,000 MW of conventional generation and interconnector applicants seeking to connect to the Irish electricity network. However, access to finance is a serious concern for many of the remaining applicants and may prevent some of this new plant being delivered.

A regulatory framework that supports transparent and predictable decisions and reduces barriers to entry is essential. The introduction of the all island electricity market has made the Irish market more attractive to new entrants. Developing the energy supply sector will depend on continued policy commitment and actions in areas such as improving the liquidity of the SEM, increasing interconnection, upgrading the transmission network, facilitating new generation investment and promoting the take-up of energy efficiency initiatives. Reviewing progress on the implementation of the white paper on energy is important. Transferring the transmission network from ESB to Eirgrid remains contentious. A process has been established by the Department of Communications, Energy and Natural Resources to engage with the relevant stakeholders. It is important that this process results in regulatory certainty.

28 EU Member States are legally committed to protect habitat types of Community interest, including raised and blanket bogs. A range of regulatory burdens currently limit peat power generation including the EU Directive on ambient air quality, the EU Habitats Directive and the pending Soil Directive. For more information see http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm

3. Improving Security of Supply

Ireland currently imports approximately 90 percent of its energy (electricity, heat and transport) needs. Unlike other countries, Ireland has limited hydro resources and no nuclear. Reducing our dependence on imported fossil fuels is a significant competitiveness challenge for Ireland in the longer term.

Ireland has ambitious plans to increase the use of renewable energy sources and progress to date has been strong. It is expected that 40 percent of electricity will be generated from renewable sources by 2020, and that 16 percent of our total energy needs will be met by renewable sources. Nonetheless, Ireland is expected to remain largely reliant on imported fossil fuels for its total energy needs until at least 2020. This presents a range of short and long term challenges in terms of adapting our fuel mix to ensure a cost-effective, secure and diverse fuel mix.

3.1 Greater Interconnection with Other Markets

Many small countries that perform better than Ireland in terms of cost competitiveness have significant interconnection, notably Denmark and Finland, which are part of a regional electricity market, the Nordic pool. One of the key actions identified in the 2007 *Energy White Paper* is a 500MW east-west interconnector linking the Irish and British transmission systems by 2012. The timely delivering of the East-West and the second North-South interconnectors is important. Their delivery can support greater security of supply, assist the achievement of our renewable targets and potentially enhance competition in the Irish electricity market. Progress to date is positive.

It is welcome that Eirgrid is also undertaking a feasibility study of interconnection to mainland Europe - several commentators have highlighted the risk that Great Britain will face an undersupply of electricity and potential price spike over the next decade as existing plants age and need to be replaced. It is important to establish the potential benefits and costs of connecting to locations such as France or Scandinavia, which have very different fuel mix profiles to our own and different peak demand times.

3.2 Managing Our Increasing Reliance on Gas

Ireland's reliance on gas as a primary fuel source is increasing as gas powered electricity generation plants are relatively cheap, clean, easy and fast to build. The fact that wind requires significant conventional back-up generation increases Ireland's reliance on gas further. Gas has been closely linked to oil markets in terms of price, demand and availability – high oil prices and supply

constraints tend to result in increased demand and higher prices for natural gas[29]. Although gas performs much better than other fossil fuels in terms of its impact on climate change, it is a difficult fuel to store.

While it is crucial that indigenous gas reserves, in particular Corrib, are realised, Ireland is expected to continue to import the vast majority of the natural gas supply. In its review of the Irish energy market, the IEA stressed the need for diversity of source in terms of gas supply. The UK has become a net importer of natural gas and this lengthening of the supply chain means Ireland will become increasingly dependent on natural gas sourced from more distant and politically unstable regions.

Ireland's growing dependence on gas highlights that strategic fuel storage is an area of priority concern. The NCC is concerned about a potential lack of adequate storage facilities on the island. If the current storage facilities at the depleted Kinsale field cease and a new storage facility in Larne in Northern Ireland is not developed, this prospect may threaten security of supply[30]. Access to liquefied natural gas (LNG) opens different market sources and supply pathways for gas. LNG is natural gas that has been converted temporarily to liquid form for ease of storage or transport by sea and road rather than by pipeline. Enhanced storage facilities for LNG have the capacity to partially shield customers from volatile spot-prices and enhance security of supply. However, there are still uncertainties over security of supply, as LNG tankards can be quickly re-directed towards where the highest bidder is located. Increasing oil reserves as an alternative to increasing gas storage also merits consideration as part of the solution to address our reliance on gas[31].

3.3 Meeting Renewables Targets in a Cost Effective Manner

The development of a range of renewable resources will be important to ensure that Ireland takes advantage of its geographic location and moves towards its target of 40 percent of electricity generation from renewables by 2020. Ireland is on schedule to meet its EU target of producing 15 percent of its electricity needs from renewable sources by 2010, which will improve the diversity of the fuel mix and our carbon performance.

While the fuel cost of wind and other renewables is zero, meeting the 2020 target of 40 percent will require substantial investment in renewable generation capacity (addressed in section 2.5), in addition to substantial investment in the electricity grid and back-up power generation. Ensuring that the grid can accommodate additional onshore wind capacity is essential if Ireland is to progress towards the ambitious 2020 renewables target.

29 This may be changing. In late 2008 when oil prices dropped sharply, gas prices did not fall as quickly.
30 There is uncertainty surrounding the longer-term viability of Kinsale storage as a standalone facility. A number of project developers are looking at the technical and commercial viability of developing salt-cavity storage in the Larne in Northern Ireland – however these projects are at the preliminary stage of development. CER,2009, Gas Capacity Statement, Dublin.
31 Most gas fired generation plants are equipped to run on oil in the event of an interruption to the gas supply. It is cheaper to store oil than gas.

Studies of the Irish electricity market show that the net benefits or costs of increased wind penetration essentially depend on projected fuel costs, carbon costs and the capital costs of constructing interconnection, wind and conventional plants (for back-up when the wind does not blow)[32]. These key variables are subject to huge uncertainty. As highlighted in a recent study by the regulators, further analysis is required to determine the full cost implications of higher levels of renewables in our electricity fuel mix, and in particular the long term effects on retail electricity price levels[33].

The timing of the roll-out of wind farms to meet our renewable targets is an important factor in assessing the cost implications. The capital cost dominates the cost of building wind turbines. There is a concern that Irish wind turbines may not have achieved the lowest possible cost per unit installed - for example due to the long lead time between specifying the required equipment and receiving a grid connection/taking delivery of the equipment. It is not clear that there is any first mover advantage in ramping up construction of wind farms and it may be better to time investment to achieve better value in terms of the cost of the capital equipment. It will also be important to ensure that as Ireland moves towards our ambitious renewable targets that the cost of installing wind turbines is carefully monitored for any evidence of inflation in installation costs.

It is vital that the development of Ireland's considerable renewable energy resources is progressed in a fashion which improves energy cost competitiveness. Energy policy and progression towards our targets for renewable penetration should be informed by the available evidence with a strong focus on the cost implications for energy consumers. Any additional renewable targets should only be introduced in the future following rigorous ex ante analysis which includes all relevant technical and economic considerations.

3.4 Reaching Consensus on Ireland's Optimal Fuel Mix

There is widespread agreement that a basket of renewable energy sources will be an increasingly important part of Ireland's fuel mix. The development of a cost-effective basket of renewable sources of energy and the technology to harness our considerable endowments of wind and wave power can play important roles in reducing Ireland's dependency on imported fossil fuels in future. However, Ireland will have to continue to rely on a range of other fuel sources and it remains critical that they receive an equal policy focus.

32 CER and Northern Ireland Authority for Energy Regulation, 2009, The Impact of High Levels of Wind Penetration in 2020 on the Single Electricity Market. Work under way by the ESRI to analyse the costs and benefits of different levels of renewables on the Irish electricity system in 2020 is due to be completed later this year.

33 CER and Northern Ireland Authority for Energy Regulation, 2009, The Impact of High Levels of Wind Penetration in 2020 on the Single Electricity Market. While the study found that the wholesale electricity price would be 15 percent lower for a portfolio with a high wind penetration (6,000MW or 38 percent of electricity capacity) than for a low wind scenario (2,000 MW) the authors urged caution in interpreting the findings in light of the assumptions underpinning the analysis. For example, the model does not consider the additional network investment required to support higher levels of intermittent wind nor does it take into account the implications of actions required to ensure security of supply such as dealing with system constraints.

There is a need to reach consensus on the optimal profile for our future fuel mix, underpinned by analysis, to determine the benefits and cost implications of policy decisions. Ireland's reliance on gas for heat, electricity and potentially transport (if electric cars become widely used in the future) is growing. We have limited additional opportunities for hydro generation, nuclear generation is not currently permitted under legislation and very little of Ireland's municipal waste is converted into energy (compared to approximately half of Danish and Swedish waste). Policy decisions on how we replace baseload electricity generation at Moneypoint will shape Ireland's security of supply for decades to come[34]. ESB's coal-fired Moneypoint generation plant, which accounts for 21 percent of ESB's generation capacity, is due for decommissioning in 2020-2025. The options for replacing this source need to be carefully examined, including analysis of the potential of clean coal technologies and nuclear power. The potential for pumped storage to improve the stability of wind in a cost effective fashion also requires consideration.

Clean Coal Technologies

As fossil fuels are likely to play a key role in Irish energy for many decades, it is important to support efforts to make them cleaner and more efficient. Coal is currently the cheapest source of energy in the Irish energy mix, and the supply of coal internationally remains abundant and secure, and is forecast to remain relatively inexpensive. The use of coal in the longer run is only compatible with climate change objectives if highly efficient plants predominate and carbon capture and storage (CCS) technologies for power stations become widely available[35]. While the technical processes for CCS are largely established, the cost effective commercialisation of the available techniques is yet to be demonstrated. Irish energy policy should fully exploit any potential to utilise CCS technologies as soon as they become commercially viable[36].

Nuclear Energy

While there is currently a statutory prohibition on the production of energy from nuclear technology in Ireland, the NCC believes that the opportunity to replace the coal-based Moneypoint facility with nuclear should be at least explored. In light of the need to enhance security of supply and diversify to sustainable low-carbon energy sources, a technical study on the feasibility of nuclear generation should now be conducted. For nuclear energy to remain an option within the envisaged timeframe of Moneypoint closure, action on technical assessment and planning/legal considerations would be required imminently, as any decision to progress would have a long lead-time to commissioning of a plant of suitable scale for Ireland.

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34 Baseload plants are used to meet some or all of continuous energy demand, and produce energy at a constant rate, usually at a low cost relative to other production facilities available to the system. Baseload plants typically run at all times through the year except in the case of repairs or scheduled maintenance. Peaks in demand are handled by peaking plants, which are smaller and more flexible.

35 Coal currently performs very poorly in terms of CO2 emissions. However if as much as 85 percent of emissions can be captured, the fuel would become by far the cleanest fossil fuel.

36 The capital cost of a 900 Megawatt clean coal plant at the Moneypoint site in County Clare has been estimated at €2.9billion – this includes the cost of carbon capture, compression, pipelining, injection and storage at Kinsale. Research indicates that a 900MW CCS plant at Moneypoint could deliver power to the grid at €91.60 per MWh based on coal at $90 per tonne with a carbon price of €35 per tonne. This price is competitive in the current Irish context – the wholesale price averaged €78 per MWh in 2007/2008. Source: An Assessment of the Potential for Geological Storage of CO2 for the Island of Ireland, 2008, Prepared by CSA Group for Sustainable Energy Ireland, Environmental Protection Agency, Geological Survey of Northern Ireland and Geological Survey of Ireland.

Nuclear energy offers the potential to deliver a more competitive source of energy relative to renewables and lower carbon emissions relative to fossil fuels. The capital costs of nuclear would be high (including the cost of decommissioning plant at the end of the life cycle and disposing of nuclear waste), however the marginal costs of generation are low and uranium is more widely available from politically stable countries than other fuel sources. Nuclear fuel creates no significant carbon emissions at the point of generation. It would require the development of nuclear safety regulations and the careful location of any potential site to mitigate against the risk of rising sea levels over the long term.

Pumped Storage

Wind power is intermittent and cannot be despatched (switched on and off easily so that supply meets demand) by the grid operator as demand varies. As Ireland increases the share of wind energy in the electricity generation mix, the ability to store wind capacity would be highly desirable in order to capture the full benefits of investment in wind farms and associated grid enhancements. The Spirit of Ireland group is proposing that energy from wind farms is used to pump water into specially built reservoirs which can then generate hydroelectric power when it is required. There are concerns that the capital cost of pumped storage technology is very high and that it has not yet been commercially viable on a large scale in other countries. Spirit of Ireland has committed to publishing a detailed technical and financial plan in Autumn, 2009. It is yet to be demonstrated that this project can enhance our cost competitiveness. The implications of the proposal for Ireland's future energy policy objectives, particularly in terms of cost competitiveness and security of supply, need to be carefully considered as part of a comprehensive analysis of Ireland's optimal long term fuel mix profile.

4. Moving to a Lower Carbon Economy – the Opportunities and the Challenges

4.1 Realising Enterprise Opportunities

Increasing legislative pressures, greater corporate social responsibility, rising energy costs, growing consumer awareness of sustainable environmental practices and the cost savings on offer from adopting sound environmental policies are driving strong growth in the global environmental sector.

Forfás and InterTrade Ireland conducted an assessment of the all-island enterprise opportunities in this emerging sector. The global environmental goods and services (EGS) sector is hugely diverse, growing rapidly and is anticipated to be worth $680 billion by 2010 and $800 billion by 2015[37]. Emerging and transition economies such as China and those in Eastern Europe offer the highest growth potential as they continue to invest in environmental infrastructure, particularly in areas such as waste management and water/waste water treatment[38]. Significant investment is also happening in developed countries, where the focus is largely on the development of new high value-added technologies and innovative solutions to address environmental issues - particularly in the ICT and clean-technology sectors[39].

In light of the strengths of the existing enterprise base in Ireland a number of EGS sub-sectors offer significant opportunities. Some of these sub-sectors have high export potential (e.g. renewable energies, clean technologies and processes and energy efficiency products and services) while others are sub-sectors with strong potential for growth in domestic activity (waste management, water supply and wastewater treatment and environmental consultancy). Potential exists to attract FDI in niche environmental goods and services areas such as renewable energies[40] and clean technologies and processes[41]. ICT, finance and nanotechnology are enabling technologies with applications across the energy supply chain – Ireland already has established excellence in several key areas and has growing expertise in nanotechnology[42].

A High-Level Action Group on the 'Green Economy' will launch an action plan in Autumn 2009 to realise the clean-technology opportunities for enterprise in Ireland detailed in the Forfás/InterTrade study, and also the potential to increase Ireland's FDI share in this sector. IDA

37 For further information see Forfás, 2008, Environmental Goods and Services Sector on the Island of Ireland.
38 Kim, A., 2006, "Opportunities and Challenges in liberalizing the environmental good and services market: The case of developing countries in Asia," in Journal of World Trade 40(3), pp 527-548.
39 Such as the UK where Department for Business, Enterprise & Regulatory Reform projections suggest that investment in the EGS sector is expected to grow by nearly 100% to £46 billion (€58 billion) by 2015.
40 Including wave, wind and solar (silicon technology)
41 A broad term for clean technology goods and services. For example: the interface between ICT and advanced manufacturing, energy efficiency, energy/environmental consultancy/auditing, goods that lower energy use or carbon emissions.
42 Forfás, 2009, Energy-Related Goods and Services, Dublin.

Ireland and Enterprise Ireland have also established 'clean technology' units to attract overseas investment and grow Irish exports in these sectors.

Capturing the growth potential of this sector will require a coordinated strategy of ensuring policy and regulatory certainty in the various environmental sub-sectors, continuing public commitment to investment in environmental and energy-oriented R&D, and development of sector-specific skills.

Box 1: Ireland's Energy and Climate Change Targets – National and International Commitments

Kyoto Protocol

- Limit the increase in Greenhouse Gas (GHG) emissions to 13% above 1990 levels by 2012
- New targets may emerge from UN Copenhagen Conference in November 2009

EU Commission Post-Kyoto Target for 2020

- Reduce emissions in the non-trading sectors (agriculture, transport, residential, commerce, waste) by 20% from 2005 base
- Reduce emissions in the ETS sector by 21% from 2005 base

National and EU Targets

- Renewable sources to contribute 16% of final energy consumption (electricity, heat and transport) in 2020
- 15% of electricity generation from renewable sources by 2010; 40% by 2020

Related National Targets (by 2020)

- 20% increase in energy efficiency
- 30% biomass co-firing at peat plants in Ireland
- 10% renewable energy in transport

4.2 Delivering a Lower Carbon Economy

The decoupling of economic activity and carbon emissions is an urgent global priority. In order to avoid dangerous climate change consequences, global emissions need to be reduced to below 80 percent of current levels[43]. The IEA has stated that a halving of energy-related CO2 emissions is needed by 2050 to limit the expected temperature increase to less than three degrees Celsius[44].

Ireland must contribute to addressing this challenge by meeting our binding international commitments to reduce carbon emissions. The sharp nature of the current recession means that Ireland is now broadly on course to meet its current Kyoto commitment to reduce greenhouse gas emissions for the period 2008-2012.

Negative economic growth is not a sustainable or desirable means of meeting climate change obligations. The current downturn represents an opportunity to ensure that Ireland chooses a smart long-term policy mix to reduce emissions at least possible cost to society[45].

43 Stern Review (2006) It is widely accepted that stabilising greenhouse gas emissions at between 450-550 parts per million CO2 will be required to avoid dangerous climate change consequences.
44 IEA, 2008, CO2 Capture and Storage: A key carbon abatement option. Paris.
45 For a discussion of the pros and cons of alternative policy instruments to tackle climate change see Legge, T and Scott, S. 2009, Policy Options to Reduce Ireland's Greenhouse Gas Emissions. ESRI, July 2009.

The UN Copenhagen conference in December 2009 will seek agreement as regards 'effort-sharing' of environmental targets between developed and developing nations for the post-Kyoto Protocol period. The magnitude of action by developing countries will largely depend on the effective delivery of finance and clean technologies through international co-operation. If an agreement is to be struck, developed countries are likely to have to contribute significant financial resources in order to help developing countries both limit the growth of their emissions and adapt to the effects of climate change. If an agreement is struck, the likely impact for Ireland will be increasingly stringent environmental emissions targets, renewable energy targets, and potentially higher compliance costs, assuming a predicted increase in carbon prices in the medium to long term. A variety of actions are required to enable Ireland to meet its targets while protecting competitiveness.

4.3 Achieving Climate Change and Competitiveness Objectives

In January 2008, the EU Commission announced a set of policy proposals to counteract climate change for the post-2012 period. The announcement set a precedent by allocating highly ambitious targets for greenhouse gas emissions reductions for both the trading sectors (those engaged in EU Emissions Trading Scheme (ETS)) and, for the first time, the non-trading sectors in the EU. The European Commission's post-Kyoto climate change package sets a target of a 20 percent reduction in greenhouse gases compared to 1990 levels for the EU as a whole - equivalent to a 14 percent reduction on 2005 levels[46]. There are two primary policy tools to achieve the ambitious targets set by the EU – the emissions trading scheme and the introduction of carbon taxes.

EU Emissions Trading Scheme

The EU ETS applies to 120 industrial installations in Ireland and each firm is given an allocation of emissions permits based on their historical emissions levels. The next phase of emissions trading will have a range of competitiveness implications. Irish plants subject to ETS currently receive 99.5 percent of emissions permits free of charge (in the period 2008-2012). The European Commission plans to move to 100 percent auctioning (i.e. buying and selling) of permits for the power generation sector in 2013 and for industrial sectors by 2027. Industry sectors covered by the ETS will have to purchase 20 percent of emissions permits in 2013, 70 percent by 2020 and 100 percent by 2027[47].

46 The cap on emission allowances for the sectors covered by the EU ETS – power generation, energy-intensive manufacturing industry and, from 2012, aviation – will be cut in a linear fashion every year from 2013, with the result that the number of emission allowances available in 2020 will be 21% below 2005 levels. Emissions from these non-ETS sectors will be cut by 10% of 2005 levels by 2020, however Ireland faces a stringent 20 percent reduction target along with some other wealthy member states.

47 Each installation engaged in EU ETS (circa 100 in Ireland) is given an allocation of emissions permits which is based on their historical emissions levels. In Phase I of EU ETS (2005-2007), these permits were given for free (grandfathered) to all installations by the EU Commission through a set of verified National Allocation Plans (NAPs). In Phase II (2008-2012), installations continued receiving permits under the grandfathering arrangement, but their emissions targets (ceilings) were set lower than previously so as to incentivise more carbon-efficient production processes. While the power generation sector still receives permits free of charge, the sector has been required to pass through the cost of carbon emissions permits to consumers since 2008. Phase III (from 2013) sees a much heavier use of auctioning (buying and selling) of emissions permits than previously.

While electricity customers have been paying a carbon-inclusive price since late 2007, the carbon windfall rebate is insulating customers from the full impact. As mentioned in Section 2.3, electricity prices would be about 10 percent more expensive without the rebate. In addition to higher direct costs from electricity when full auctioning of permits commences in 2013, the progressive introduction of emissions permits will increase the costs facing firms in Ireland and other EU markets. This is likely to have implications for a range of sectors including aviation (Box 2.3).

Box 2: Aviation under EU Emissions Trading Scheme

If European Commission proposals are implemented, aviation will be included in the EU ETS scheme from 1 January 2012. ETS rules will apply to emissions from all domestic and international flights between EU airports. This will cover all international flights from and to anywhere in the world that arrive or depart from an EU airport.

European Commission research suggests that air fares will increase by between €5 and €40 depending on the journey length. This assumes coverage of all departing and arriving flights and a carbon price of €30 per tonne. The available evidence suggests the effect on air travel demand is unlikely to be significant at the EU level[48]. Given Ireland's status as a peripheral island which implies a disproportionate reliance on air travel for both tourism and trade, there is a concern that the impact on tourism[49] and trade will be disproportionate for Ireland. Some concessions to island nations may need to be considered in finalising the Commission proposals for aviation.

Carbon Tax

A carbon tax presents an additional tool to encourage a shift to a lower carbon economy and society. Ireland needs to proceed carefully on the introduction of a carbon tax given the already high cost of doing business. Businesses are already facing higher energy costs than other EU countries and are making significant progress in reducing their energy and carbon intensity. Furthermore, the nature of the demand for energy is price-inelastic, meaning that the reductions in carbon emissions arising from a carbon levy are likely to be small. In fact, it is estimated that a €30/tonne carbon tax[50] would yield savings of just 1.7 percent of aggregate CO_2 emissions in Ireland[51].

The Commission on Taxation has recommended that a carbon tax on fossil fuels should be introduced with the rate applied per tonne of CO_2 emitted, ensuring fuels generating the greatest amount of carbon are taxed proportionately more than cleaner fuels. The Commission recommended that the rate should be set at the level equal to the futures carbon price in the EU ETS for the next calendar year. Given the volatility of carbon prices under EU ETS, the Commission

48 EU Commission (2006). Staff Working Document – Summary of the Impact Assessment: Inclusion of Aviation in the EU Greenhouse Gas Emissions Trading Scheme (EU ETS){COM(2006) 818 final}; and Indecon (2007). Assessing the Competitiveness Implications of the EU Emissions Trading Scheme on Industry in Ireland. Report for Forfás (mimeo).
49 In a 2007 study by the ESRI the EU island nations (Cyprus, Malta and Ireland) were forecast to have the largest reductions in tourist numbers given their reliance on air travel. ESRI (2007). Airline Emissions of Carbon Dioxide in the European Trading System, ESRI: Dublin
50 Estimated as equivalent to 7 cent on a litre of petrol, and 8 cent on diesel.
51 Unpublished research, Competitiveness Implications of the Introduction of a Carbon Levy, Forfás.

also recommended a floor price of €20 per tonne to ensure certainty for businesses and in terms of revenue yield for the Exchequer. In view of the relatively high costs of energy for business in Ireland, the NCC believes that a carbon tax should be introduced at a relatively low rate and phased in over a sufficiently long adjustment period. The NCC supports the Commission on Taxation's recommendation to exempt firms already engaged in EU-ETS or alternative binding energy-efficiency agreements (such as IS-393).

While the NCC has advocated the principle of revenue neutrality for CO_2 taxes, the current fiscal environment may dictate that this principle may not be viable in the short-term. However, at least some of the revenues should be used to offset potential income tax and social insurance increases and also to fund State-backed energy-efficiency and 'green economy' initiatives to promote the development of firms and sectors in newly emerging markets for environmental goods and services. If the tax were to be introduced, it would also be important that the tax be broad-based and include all fuels, thereby encouraging a shift away from high-carbon-emitting fuels. Excluding, for instance, petrol from the CO2 tax, would reduce the revenue yield significantly, increase administration costs and distort the energy market.

Box 3: Quantifying the impact of a Carbon Tax[52]

- If a carbon tax were introduced at a rate of €20/tonne), the fiscal measure would raise €480 million in 2010 across all sectors excluding those firms in the EU ETS that should be exempted given that they are already paying for the carbon price through EU ETS.
- The impact of the €20/tonne CO_2 tax on petrol and diesel prices would be relatively small (4.7 cent and 5.4 cent per litre respectively), while a bale of peat briquettes would increase by 48 cent, and 1,000 litres of home-heating oil would rise by €53.67.
- Forfas research indicates that the inflationary impact on the CPI of a €15/tonne CO_2 tax would be relatively modest, increasing it by 0.4 percentage points.

4.4 Improving Energy Efficiency

Energy efficiency is one of the most effective tools to jointly address cost competitiveness, security of supply and environmental sustainability objectives. Improving energy efficiency can account for a quarter of the required global CO2 emissions reduction and represents the most economical method of meeting this target[53]. However, the IEA highlights that energy efficiency gains in OECD countries in recent years are modest. Since 1990, the rate of energy efficiency improvement in IEA countries has been less than one percent per year – much lower than in previous decades and only half the average rate in the 1970s and 1980s during previous oil crises[54].

The Government recently published a National Energy Efficiency Action Plan (NEEAP) for the period 2009 – 2020. As highlighted in the Action Plan, additional initiatives will be necessary to meet the

52 This section draws on ESRI research on the impact of a carbon tax set at €20 per tonne of CO_2. See Table B1, ESRI, 2009, Recovery Scenarios for Ireland, May 2009 or section 9 of the Report of the Commission on Taxation, 2009.
53 IEA, 2008, Energy Technology Perspectives; IEA, 2007, World Energy Outlook.
54 Source: IEA, 2007, Energy Use in the New Millennium. Paris.

national target to reduce energy demand by 20 percent through efficiency savings by 2020. While the last decade has seen an improvement in the aggregate energy efficiency of the Irish economy, significant scope exists for further savings in terms of the following:

- Setting stricter **building standards and codes** with the ultimate aim of reaching passive energy houses and zero-energy buildings, in conjunction with schemes to support investment in retrofitting existing houses, offices and other buildings. The launch of the National Insulation Programme with a budget of €100 million in 2009, €49 million of which has been allocated to the SEI's Home Energy Saving Scheme, is welcome in this regard. The collapse of construction employment also provides an opportunity to retrain people to take advantage of these opportunities;
- **Supporting Irish industry to become more efficient**. Sustainable Energy Ireland initiatives, aimed at large energy users have been particularly successful and have resulted in significant cost savings for business. In 2007, it took less than half the amount of energy to generate a euro of value added than it did in 1990[55]. However, the take up of programmes by SMEs has been relatively low. There is a need to broaden the base of SMEs benefitting from more efficient energy use and SMEs need to be aware of the significant potential for cost savings. Potential exists to reduce costs by developing a more unified approach to the delivery of advisory and support services to business to improve resource efficiency in a number of areas such as energy, water and waste.
- Potential exists to **reduce costs by developing a more unified approach** to the delivery of advisory and support services across a range of related natural resources. Given that many organisations are already working with companies on a range of waste prevention and/or water conservation initiatives, the opportunity to develop a more integrated approach across a range of related resource/environmental issues should be exploited;
- Energy suppliers are well placed to assist consumers to improve their energy performance and awareness. The CER should **incentivise energy producers to improve energy awareness** and efficiency among their clients. However, supports and technical advice that improves performance (rather than awareness) of industry (and potentially households) should continue to be State-funded. Further improvements in energy efficiency require access to specialised expertise – as provided by bodies such as SEI. In addition to supporting the competitiveness of existing businesses, these schemes promote the development of 'green economy' employment.

4.5 Tackling Ireland's Key Carbon Emitting Sectors – Agriculture and Transport

Much of the focus to date has concentrated on the electricity generation and industrial sectors as targets for carbon reduction. As large individual carbon emitters, their initial prioritisation was justified. However, the agriculture and transport sectors together are responsible for 48 percent of total greenhouse gas (GHG) emissions (Appendix 2, Figure 5). While the agricultural sector has stabilised greenhouse gas emissions, emissions from the transport sector have tripled since 1990.

55 This is due to structural changes in eth economy such as the closure of energy intensive businesses as well as improvements in energy efficiency. SEI, Energy in Ireland 1990-2007, December 2008.

Given that the European Commission is seeking a 20 percent cut in domestic (non ETS) emissions for Ireland by 2020, the NCC believes that sector specific measures are required to meet targeted emissions reductions[56].

Shifting to a Lower Carbon Agricultural Sector

Despite the stabilisation of emissions over the past decade, the agricultural sector remains the largest source of greenhouse gases in Ireland[57]. The competitiveness of the agriculture sector is important to Ireland – it contributes €3.8 billion to Ireland's gross value added, employs over 119,000 people and is regionally dispersed[58]. Reform of the EU Common Agricultural Policy resulted in GHG emissions reductions from the agriculture sector as a by-product of decoupling farm payments from production. Although there are very few cost-neutral options available to the agricultural sector, significant efforts are required to improve the greenhouse gas performance of the sector[59]. A number of steps are essential, including the better utilisation of nutrients and reduced reliance on nitrogen applications.

Shifting to a Lower Carbon Transport Sector

It is vital that more sustainable patterns of transport are developed. Transport accounts for 36 percent of energy used in Ireland[60]. Current consumer habits and infrastructure in the transport sector in Ireland is almost completely reliant on oil for energy consumption. As road transport accounts for 97 percent of the transport sector's emissions, a paradigm shift is required in this sector in order to reverse the current trends in greenhouse gas trajectories. There are a number of policies that could be used to reduce greenhouse gas emissions from this sector, such as:

- Greater investment in sustainable public transport (e.g. continued electrification of rail, hybrid buses, etc.);
- Renewable energy sources (e.g. bio-fuels) for transport;
- Promotion of electric and hybrid vehicles using both hard and soft policy instruments (e.g. fiscal policy and information/awareness campaigns).
- Initiatives to promote car-pooling and other mobility management schemes;
- Encouraging flexibility in working patterns (e.g. individuals to work from home) and the infrastructure required to enable this (e.g. high quality broadband);
- Information and awareness campaigns (e.g. eco-driving and training); and

56 These measures should be based on the varying marginal costs of abatement across sectors - particularly in sectors where the relatively inexpensive emissions reductions have already occurred and where further abatement is likely to be high-cost at the margin. In other sectors it is likely that there remain relatively painless opportunities to improve energy efficiency and curb emissions of greenhouse gases. SEI have begun to investigate the marginal abatement costs for Ireland based on research commissioned from McKinsey.

57 Greenhouse gases other than CO2 accounted for 32 percent of Ireland's total emissions in 2007 with methane accounting for 19 percent and nitrous oxide 12 percent of total emission. Methane, the main emission from the agricultural sector, is much more environmentally pernicious than for example CO2.

58 CSO, 2009, *Quarterly National Accounts*, 2008Q1-Q4. This figure includes agriculture, forestry and fishing.

59 A cross-industry group established by the Institute of International and European Affairs is currently examining the challenge of carbon reduction across the entire Irish food chain. The first report of this group is due to be issued through the IIEA in October 2009.

60 Thermal heating accounts for 33% of primary energy consumption, and electricity generation accounts for 31%. Transport energy use grew by 180% over the period 1990 – 2007 (6.3% per annum). SEI, 2007, Energy in Ireland 2007. Dublin.

- Development of rail freight services.

Many of these measures were outlined in the Department of Transport's *Smarter Travel* document; however concrete measures to support more sustainable travel patterns were not set out in detail. The experience of cities like London and Stockholm indicates that fiscal instruments, such as road pricing (a congestion charge), can play a role in reducing commuting by car and thereby reducing congestion and greenhouse gas emissions from this sector. Care would have to be exercised in the introduction of such fiscal instruments as they may add to Ireland's cost base. Revenue recycling measures may need to be considered in certain sectors (e.g. road haulage) to avoid adverse cost competitiveness impacts.

Improving Public Transport

The Government has set a target to reduce the modal share of cars for work-related commuting from 65 percent currently to 45 percent by 2020. This will require up to 600,000 commuters to abandon cars in favour of other modes of transport[61]. The Department of Transport has highlighted that this will require more radical traffic management measures (for example, making some urban streets car-free and giving priority to buses), a major overhaul of existing bus routes in urban centres (including more orbital routes), and the introduction of technologies to improve the punctuality and accessibility of bus services and the efficiency of fleets (real-time bus information and integrated ticketing). Progress to date on implementing these technologies across existing public transport services has been inexplicably slow. These problems have contributed to the inability of bus services to provide an attractive alternative to car transport for passengers for many years. New policies are now urgently required to make progress towards this ambitious target.

Improving Urban Land Use and Planning Policy

Good land use planning can play a key role in terms of supporting sustainability and competitiveness[62]. Ireland has opted for a policy of land-use planning which has resulted in the sprawl of low-density housing developments. This approach, while socially popular, is not sustainable from an energy, environmental, climate change or quality-of-life perspective.

A more integrated approach to land use and transport policies in our cities is critical to ensure an efficient and sustainable transport system, with levels of service comparable to other international locations with which we compete. The enactment of the Dublin Transport Authority Act, 2008, which will facilitate a more coordinated approach to planning and transport policy across the Greater Dublin Area local authorities, is a positive development. Its effectiveness in terms of delivering a coherent and effective approach to land use policy by local authorities and transport policy by the Dublin Transport Authority needs to be monitored and kept under review to ensure the

61 Department of Transport, 2009, Smarter Travel; A Sustainable Transport Future.
62 Cities are increasingly seen as the drivers of national competitiveness and of economic and social development. For further information see NCC, 2009, Our Cities: Drivers of National Competitiveness. Dublin.

new arrangements are enabled to operate as intended. Similar provisions need to be put in place in the other Irish cities.

The NCC supports higher residential density in Irish cities and advocates the implementation of the Planning Guidelines on Sustainable Residential Development in Urban Areas published in 2008[63]. The NCC specifically recommends prioritisation of the following elements of the Guidelines:

- Provision of adequate public transport to meet existing demand and provision of new public transport services in tandem with proposed developments. The operations of The National Asset Management Agency can support greater coordination of land use and transport planning;
- Development or Local Area Plans must encourage more efficient use of energy and a reduction in greenhouse gas emissions; and
- Sustainable patterns of urban development should be promoted, particularly higher residential densities in locations which are, or will be, served by public transport of high quality and frequency.

63 Department of Environment, Heritage and Local Government, "Sustainable Residential Development in Urban Areas, Guidelines for Planning Authorities", December 2008.

Appendix 1: Overview of the Electricity Market in Ireland

The three main segments of the electricity market are: generation, networks (transmission and distribution) and supply. While licences in the generation market are closely regulated, the sale of electricity in the competitive market is no longer regulated, nor is the supply market for large energy users. The networks and SME/domestic supply markets are regulated by the CER.

Table 1: Overview of the Electricity Market

Segment	Regulated/Competitive Market
Generation	Competitive market *(since introduction of SEM in 2007),* with technical licensing for grid access
Networks	Regulated *(and will always be as it is a natural monopoly)*
Supply	Large customer market is competitive but SME/domestic markets are still regulated *(likely to change in future given the recent entry of* Bord Gáis *and Airtricity)*

These changes have had implications for the pricing options available to businesses:

- Since the introduction of the SEM, large energy customers can choose between a range of flexible, partially flexible and fixed prices. The flexible price option tracks the wholesale electricity price which means that the fifty percent or so of large customers on this type of contract will have seen price reductions of 20-30 percent in the last six months.
- Large customers on fixed contracts will be renegotiating them in the autumn. In the past, a lack of spare generation capacity meant suppliers did not offer competitive prices. This year there are significant amounts of spare capacity available which should result in competitive tariff offerings from suppliers.
- Most SMEs are on the regulated tariff from ESB. However, SMEs (like households) do have the option to switch suppliers and benefit from more competitive price offers.

Appendix 2: Ireland's Energy Performance

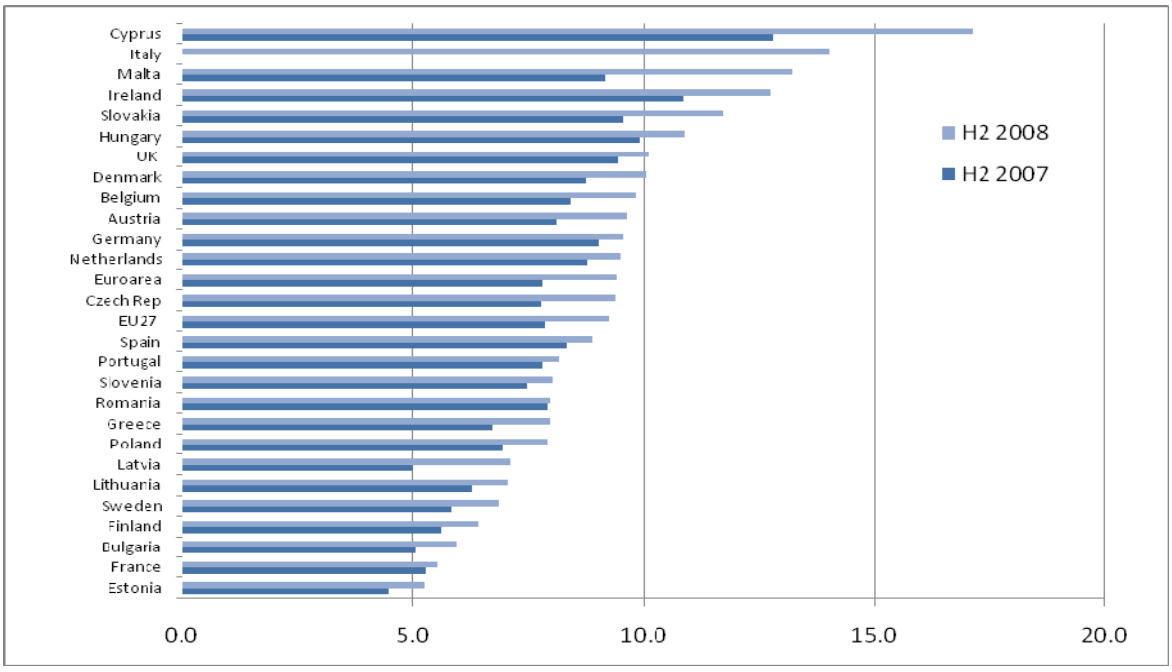
Ireland's performance across the key pillars of energy policy, namely cost competitiveness, security of supply and environmental sustainability, remains poor relative to competitor countries.

A2.1 Cost Competitiveness: Electricity

Energy cost competitiveness has been deteriorating for a sustained period - Irish prices increased by 70 percent between June 2000 and June 2007, which is more than twice the average rate of increase across the EU-15 (32.4 percent)[64].

Industrial electricity prices increased significantly in most EU countries between the second half of 2007 and the second half of 2008, reflecting the substantial increases in international gas, oil and coal prices in summer 2008. In the second half of 2008, Irish industrial electricity costs are the fourth highest in the EU-27, this represents a slight improvement on the second half of 2007, when Ireland was ranked second most expensive (Figure A.1). However prices in Ireland remain out of line with competitor countries - they are 37.8 percent above the EU-27 average and 35.5 percent above the Euroarea average.

Figure A.1: Industrial Electricity Prices (Euro cent/kWh, excluding VAT but including all other taxes), H2 2007 versus H2 2008[65]



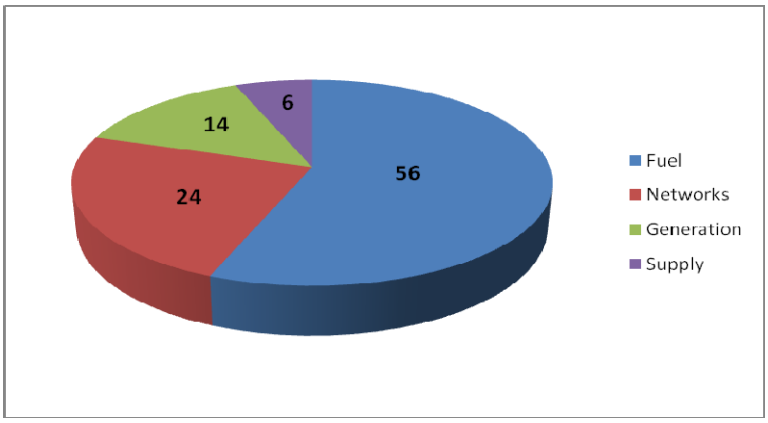
Source: Eurostat

64 Due to changes in Eurostat's methodology, it is not possible to compare energy prices for 2008 with earlier years.
65 Industrial electricity prices are based on an annual consumption of 2,000MWh – 20,000 MWh, which is the most relevant band for the enterprise base. Data for Luxembourg was not available.

High electricity prices in Ireland are driven by a number of factors, including our reliance on imported fossil fuels — particularly gas, as well as limited interconnection, the small size of the market, the low population density and a legacy of underinvestment in the grid network during the 1980s and 1990s.

It is also useful to understand the component parts of retail electricity prices. Fuel makes up the largest component of retail prices in Ireland, accounting for 56 percent of the average price (Figure A.2). This will be higher for heavy users and lower for lighter users, such as domestic users. For large industry customers, the fuel is estimated to be 70-80 percent of the final price. Networks (transport of power) are the next biggest element, making up almost a quarter of the average retail cost. The other components are the costs of generation (e.g. labour, plant maintenance) and supply (metre reading, billing etc).

Figure A.2: Components of Average Retail Electricity Prices, 2008



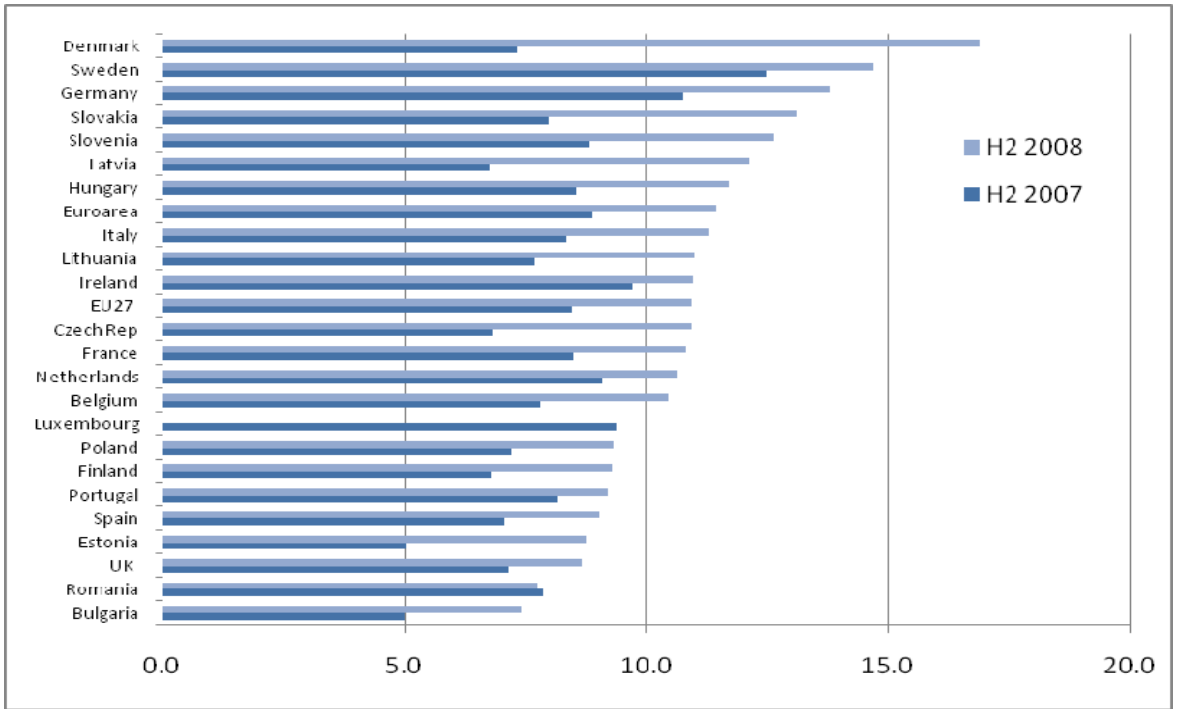
Source: Commission for Energy Regulation

A2.2 Cost Competitiveness: Gas Market

UK gas prices have increased significantly relative to other European countries since 2000 – this is a particularly important trend as Ireland imports over 90 percent of its gas through the UK and the Irish price is effectively set by the UK price.

Industrial gas prices increased significantly in most EU countries between the second half of 2007 and the second half of 2008, reflecting the substantial increases in international gas prices in summer 2008. Industrial gas prices in Ireland were the tenth highest of the EU-27 in H2 2008 compared to third highest in H2 2007. As a result, Irish gas prices are at the EU-27 average and slightly below the Euroarea average in the second half of 2008 (Figure A.3).

Figure A.3:Industrial Gas Prices (excluding VAT, including other taxes) €/GJ, June 2008[66]



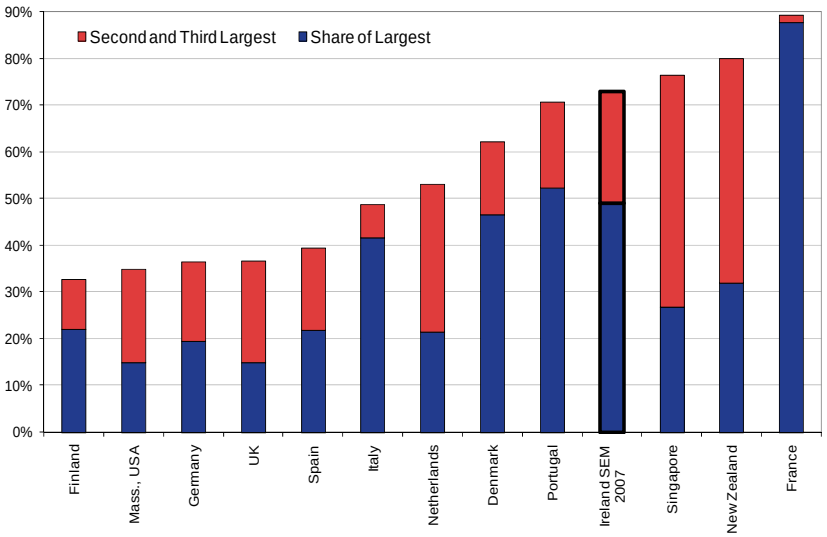
Source: Eurostat

66 Industrial gas prices are based on an annual consumption of 10,000 GJ – 100,000 GJ, which is the most relevant band for the enterprise base. No data was available for Austria, Cyprus, Greece and Malta.

A2.3 Competition

Competition in the electricity market in Ireland has been limited compared to the benchmark countries (Figure A.4).

Figure A.4: Market Concentration in Generation, Share of Largest Three Generators, 2006



Source: Forfás, Energy Policy and Competitiveness Report, 2008.

However, the electricity generation market in Ireland has become less concentrated in recent years, particularly since the introduction of the SEM in November 2007.

In 2007, ESB accounted for 49 percent of the all island electricity generation market[67]. ESB's share of the generation market will be further reduced (to approximately 42 percent of installed SEM capacity) following Endesa's purchase of just over a 1,000MW of divested ESB generation capacity[68].

Similarly, in the electricity supply market, the top supplier in Ireland accounted for 51 percent of the market in 2006. The entry of Bord Gáis and Airtricity earlier this year to the domestic electricity market (they are already in the business market) is a positive development and should lead to greater competition in the electricity supply market.

A2.4 Security of Supply

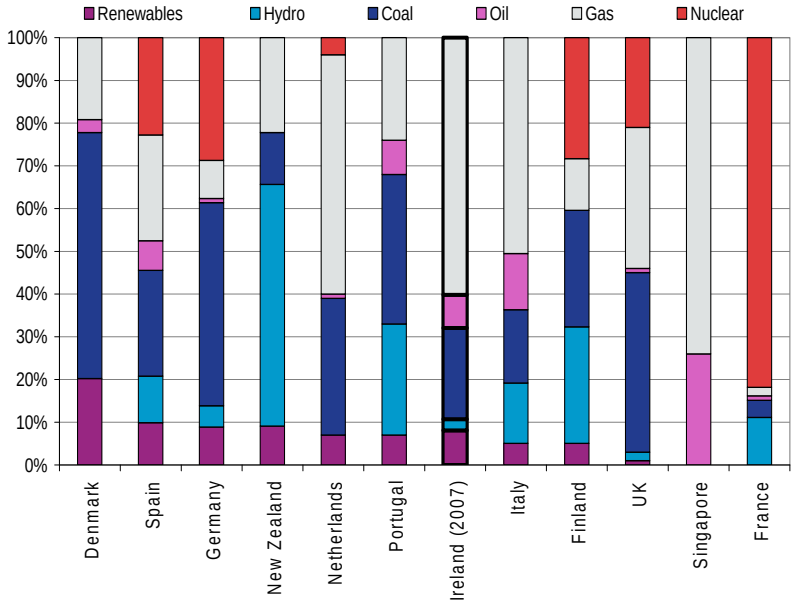
Security of energy supply is critical to supporting enterprise development. An unreliable electricity supply can result in additional costs for business, through reduced output or through investment in back-up sources. As more than half of Ireland's electricity is generated from gas, security of gas supply is particularly important.

67 ESB's share Includes Coolkeeragh generation plant in Northern Ireland which is operated by ESB International. The all-island generation capacity includes wind farms, the Moyle Interconnector and conventional plant.

68 For further detail see Single Electricity Market, Market Monitoring Unit, Public Report, April 2009. Note that in this paper, the portfolio of Endesa plants, recently acquired from ESB Power Generation, is allotted to the ESB PG portfolio because these plants were owned by ESB PG during the study period. CER press release re-Endesa purchase of ESB plants: http://www.cer.ie/en/information-centre-newsroom.aspx?article=c25a1f5a-0f5e-4be3-a47f-d968145284e8&mode=author

Ireland remains highly dependent on fossil fuels for electricity generation (Figure A.5)[69]. Diversifying the electricity generation fuel mix, and in particular reducing Ireland's reliance on imported fossil fuels, is critical for security of supply. While continued progress on meeting our ambitious renewables targets is vital, we will remain relatively dependent on imported fossil fuels for the foreseeable future. Ireland has been making good progress with regard to the share of renewable in electricity generation (including hydro), which has increased from 2.4 percent in 2003 to 12 percent in 2008.

Figure A.5: Electricity Generation Fuel Mix, 2006

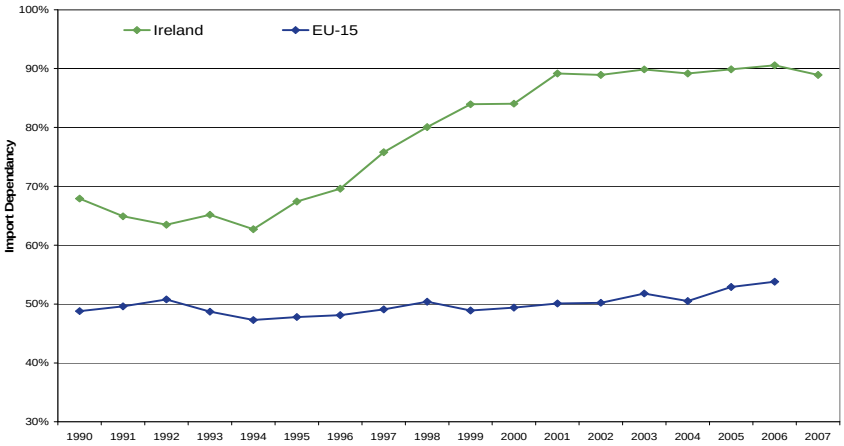


Source: Forfás, Energy Policy and Competitiveness Report, 2008.

69 There are differing estimates of renewables' share of electricity generation in Ireland. For this benchmarking analysis, IEA data is used to ensure consistency across comparator countries.

Since the mid 1990s import dependency has grown significantly in Ireland due to an increase in energy use, a decline in indigenous natural gas production and a decrease in peat production (Figure 6). Ireland's overall import dependency reached 91 percent in 2006 but decreased slightly to 89 percent in 2007. Indigenous gas resources at Corrib coupled with increasing renewable energy should help reduce our reliance on imports over the coming years.

Figure A.6: Import Dependency: Ireland and the EU-15, 2007



Source: Sustainable Energy Ireland; Eurostat

The level of spare capacity in electricity generation has been a particular concern in Ireland in recent years. However, the combination of falling demand and increased new generation capacity means that Ireland's position has improved considerably in recent months and the outlook for the medium term is positive[70].

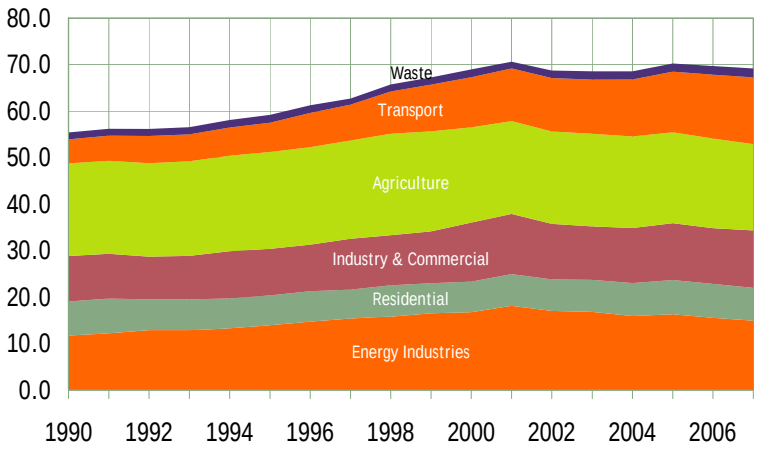
Many other European countries have significant interconnection to other markets, notably Denmark and Finland which are part a regional electricity market, the Nordic pool. Currently, Ireland's interconnection is limited, accounting for only 6.4 percent of total installed capacity. The delivery of the East-West interconnector to the UK and the second North-South interconnector will significantly improve Ireland's interconnection in the medium term.

70 Eirgrid, Update on the Generation Adequacy Report 2009-2015, July 2009.

A2.5 Environmental Sustainability

A sustained period of energy demand growth and a reliance on fossil fuel accounts for Ireland's poor environmental performance. Emissions from the transport sector have been increasing rapidly since 1990 and accounted for 21 percent of total emissions in 2007 (Figure A.7). In 2007, industry's share was 18 percent, energy's was 22 percent and the residential sector's was 10 percent.

Figure A.7: Greenhouse Gas Emissions (M/tCO2e), 1990-2007



Source: Environmental Protection Agency, March 2009

Based on revised EPA/ESRI figures from early 2009, the overshoot of the Kyoto target looks likely to be in the region of 1.5m tonnes due to the exceptional nature of the current economic crisis – this means Ireland will not have to spend approximately €300 million set aside over the years 2008-2012 to buy emissions allowances. Nonetheless, policymakers must focus on the 2020 targets set by the EU which state that Ireland's emissions in the ETS sector must fall by 21 per cent and by 20 per cent in the non-ETS sector (both based on their 2005 levels). This is based on an EU-wide package to reduce total EU greenhouse gas emissions by 14 percent compared to 2005 levels.

Appendix 3: Providing Adequate Regional Capacity

One of the main objectives of Grid 25 is to support enterprise development growth in regional locations. Its timely implementation is critical to ensure that key regional centres can support energy intensive investment projects. For example, a large energy user (such as a food or biopharma company) would need approximately 20 MW of electricity.

In October 2008, Eirgrid published its Transmission Forecast Statement 2008-2014 which shows that most regions will be able to accommodate new demand over the period to 2013, with the exception of Dublin and the south east. Eirgrid is considering additional network developments to address this issue and improve the availability of spare capacity for new demand in the medium to long term.

Table A.1: Capability (MW) for Additional Electricity Demand at 110 kV Stations, 2007

Region	110 kV Station	2008	2010	2013
North-East	Drybridge	100	110	100
	Mullagharlin	30	20	20
	Shankill	<10	90	80
North-West	Carrick-on-Shannon	90	70	90
	Castlebar	20	10	50
	Letterkenny	60	60	50
	Moy	20	20	40
	Sligo	80	40	30
East	Carrickmines	**<10**	**<10**	**<10**
	College Park	**<10**	**<10**	**<10**
	Mullingar	40	20	20
	Newbridge	50	30	**<10**
	Portlaoise	50	30	**10**
	Thornsberry	10	30	20
West	Athlone	30	<10	40
	Cashla	50	100	90
	Galway	<10	40	20
	Ennis	**10**	**<10**	**<10**
South-East	Arklow	**<10**	**<10**	**<10**
	Carlow	70	70	**<10**
	Kilkenny	**<10**	**<10**	**<10**
	Killoteran	60	60	**<10**

	Wexford	**<10**	20	**<10**
South-West	Barnahely	30	30	20
	Cahir	20	20	**<10**
	Cow Cross	70	70	70
	Kilbarry	130	110	60
	Limerick	10	70	20
	Tralee	**<10**	60	40

Source: Eirgrid