The Irish Academy of Engineering

Irish Energy Policy

Update on Electricity Price Competitiveness

December 2009

1.0 Introduction

In June 2009 the Irish Academy of Engineering published a review of Ireland's energy policy. This review was carried out in the context of the major changes currently taking place in Ireland's economy and focussed especially on energy price competitiveness. In particular the review drew attention to the growing lack of competitiveness of Irish electricity prices when compared to EU averages and strongly suggested a re-examination of current policies in light of the urgent need to restore the country's international competitiveness.

The data used in the report was based on Eurostat statistics which, at the time, were available up to the year 2008. This data is updated by Eurostat during the first semester of each calendar year. Data for 2009 is now available and the Academy has updated its analysis. This bulletin shows the updated data[1] and focuses on the emerging trends.

2.0 Summary

Relative to EU average prices the general competitiveness of the Irish electricity industry has considerably worsened over the year. A composite "Price Competitiveness Factor" (PCF) based on weighted averages of industry and household prices[2] shows an alarming deterioration from a 40% to a 50% premium over corresponding EU average prices (see Fig 2.1 below.)

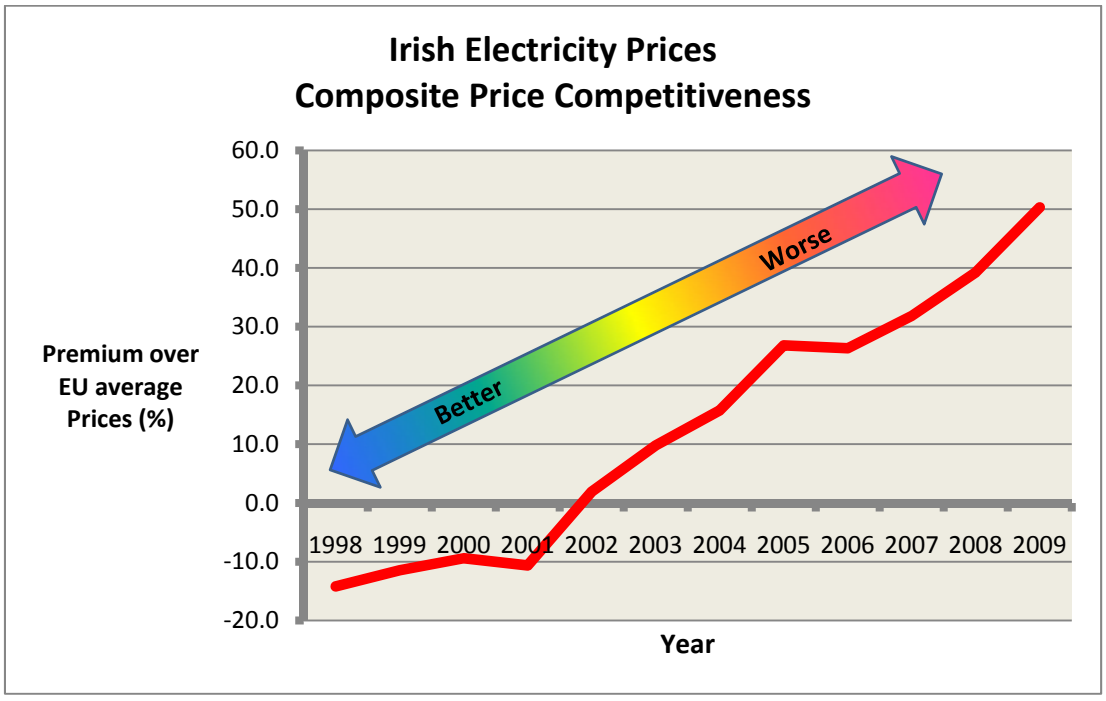

Fig 2.1

[1] Data definitions are provided in appendix 1
[2] See Appendix 1

3.0 Results

The data available for 2009 consists of the prices for both medium size industries and medium size households. Twenty four of the EU27 countries have reported industrial data and twenty five have reported household data. The Academy is satisfied that the small amount of unreported data will not materially affect the conclusions reached below.

All data excludes taxes[3] and, as such, provides a direct comparison of the relative prices charged by the Irish electricity industry compared to the corresponding EU average. This reflects the Academy's focus on international competitiveness[4]. It should be noted that EU average prices are calculated by weighting national prices in proportion to national consumption.

While the exposed sector in the economy will generally focus on industrial prices, it should be understood that regulators and policy makers may (and often do) rebalance tariffs so as to assist the exposed sector at the expense of households. From the point of view therefore of the overall competitiveness position of the Irish *electricity industry* it is important to compare household[5] as well as industry prices. A *composite* price has been established based on a combination of both industry and household prices using weightings based on consumption in accordance with standard Eurostat methodology

The parameter chosen to measure competitiveness is the deficit / excess of Irish prices over the EU average expressed as a percentage. This is termed the Price Competitiveness Factor (PCF)[6]. A PCF of 30% for example indicates that Irish prices are 30% higher that the EU average while a PCF of -20% indicates that Irish prices are 20% lower than the EU average. A positive trend in this parameter indicates a deteriorating competitive position.

The updated data indicates that industrial competitiveness has improved marginally in 2009 with the PCF reducing from 48% to 44%. However Irish household competitiveness has deteriorated dramatically with the PCF increasing from 31% to 48%.

Overall the Irish electricity industry continues to perform badly in European competitiveness terms. The view of the Academy remains unaltered: the deteriorating competitiveness of Irish electricity is primarily due to Irish energy policy. The Academy recommends that a major review is necessary. Such an energy policy review should be supported by credible techno-economic analyses.

The basic conclusions to be drawn from Fig 3.1 are:

- In 2001 Irish industrial prices were close to the EU average
- Between 2001 and 2008 Irish industrial electricity prices have become almost 50% higher than the EU average.

[3] See appendix 1
[4] Corrections for Purchasing Power Parity (PPP) have not been applied as this methodology would not be appropriate from the point of view of a competitiveness analysis.
[5] Traditionally referred to in Ireland as "Domestic" prices or tariffs
[6] Technically the PCF is the Irish Price less the EU average price expressed as a percentage of that EU average

- There has been a marginal improvement from a PCF of 48% to one of 44% for industrial prices during the past year.

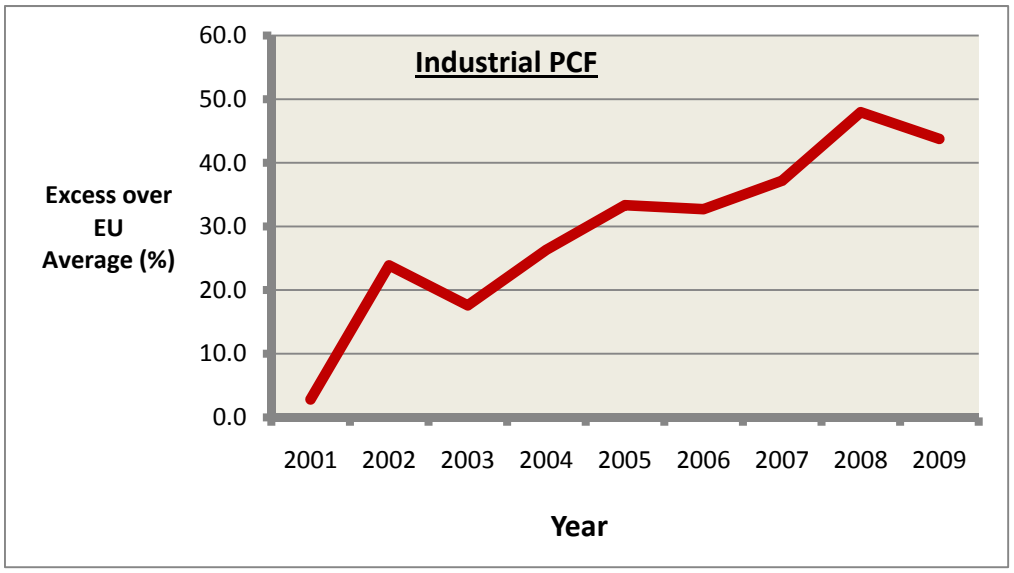

Fig 3.1

Over the past year the household PCF has increased dramatically from 31% to 48%.

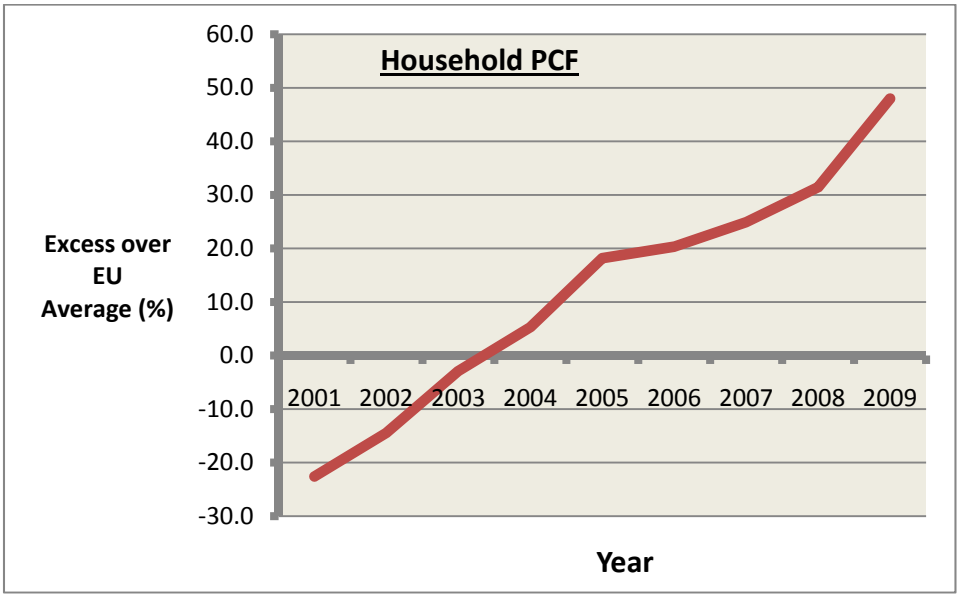

Fig 3.2

The basic conclusions to be drawn from Fig 3.2 are:

- In 2001 Ireland's household PCF was -20% indicating that Irish household prices were 20% below the EU average
- Between 2001 and 2008 there has been a rapid decrease in competitiveness when Irish household electricity prices were approximately 30% more than the EU average.
- There has been a dramatic worsening in household electricity competitiveness over the past year from a PCF of 30% to one of 48% over a period of twelve months.

The composite price competitiveness factor is established by combining the price data to produce an average weighted by consumption[7]. The trend in this data provides the best indication available of the overall competitiveness of the Irish electricity industry with respect to EU averages. Not only does this trend show an alarming deterioration since 2001 but the deterioration over the past twelve months shows a clear acceleration of this highly unfavourable trend.

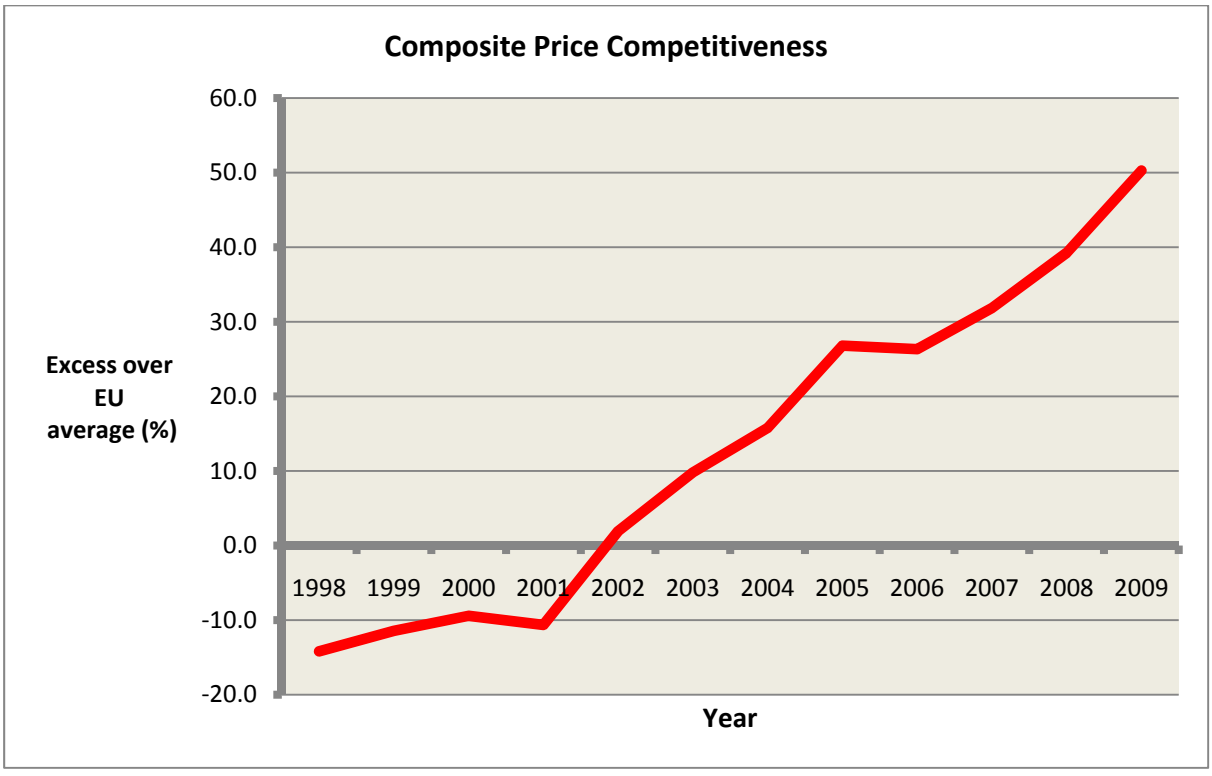

Fig 3.3

The relative position of Ireland in the price histogram for Europe provides important extra information. This data is shown in Figs 3.4 and 3.5.

In the case of industrial prices Ireland's are double those of countries like Sweden, Finland and France probably reflecting the cheap production in those countries from nuclear and hydro sources.

[7] Following Eurostat methodology

Of the countries which have reported data only Malta and Slovakia have industrial prices exceeding Ireland's. Clearly Malta's prices must suffer from scale effects and it is possible that the recent sudden disruption of Russian gas supplies to Eastern Europe impacted on Slovakian prices as it has traditionally been a cheaper producer than Ireland.

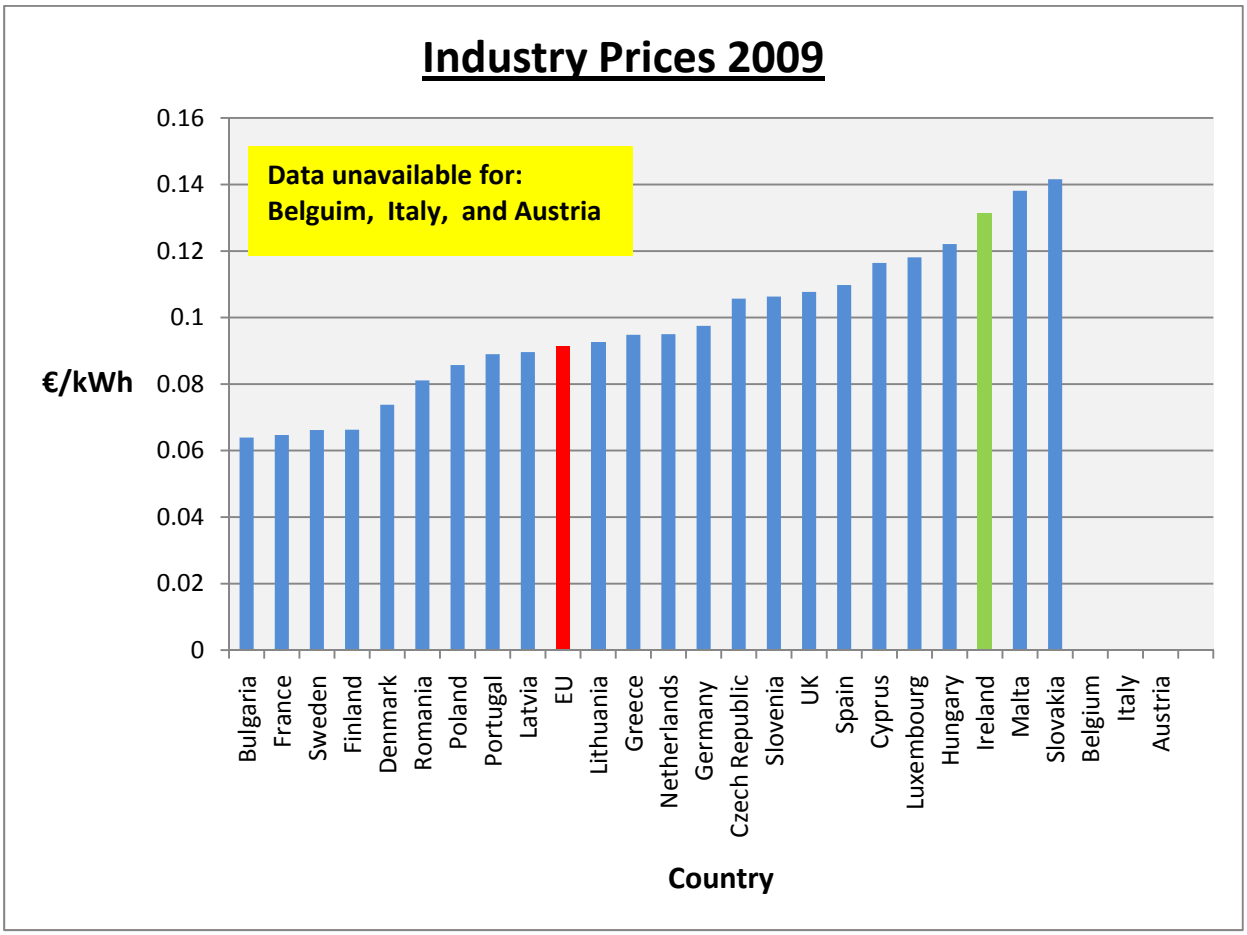

Fig 3.4

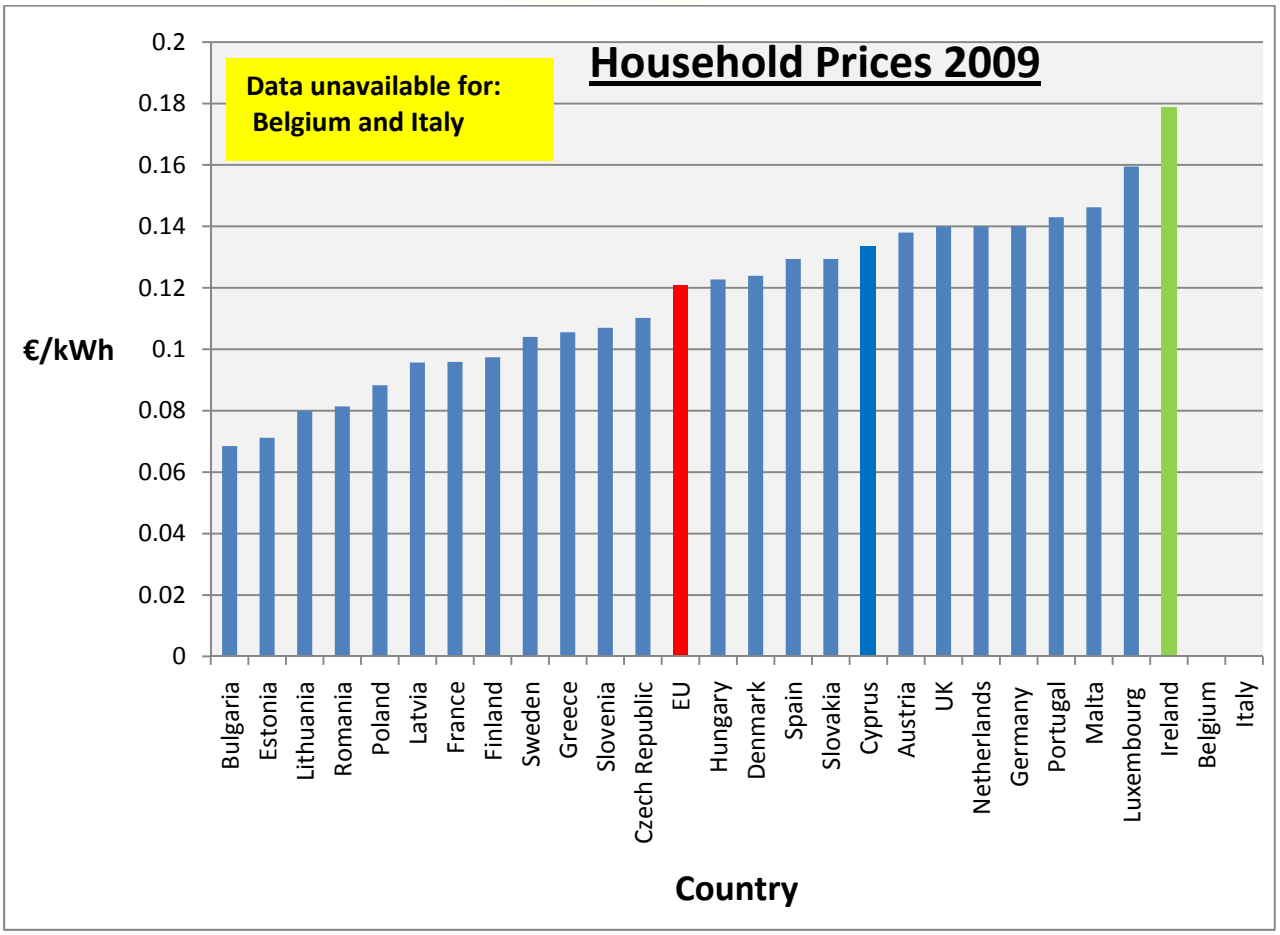

Fig 3.5

4.0 Price drivers

A number of drivers can be identified for electricity prices generally:

1. Primary generation mix (technology and fuel)
2. Capital investment levels (particularly in networks)
3. Economic efficiency – particularly so called allocative efficiency[8].

While none of the above drivers can be discounted in the Irish case, the key driver for Irish electricity prices at present is generation cost (see fig 4.1) as this typically makes up over 70% of the value chain. This in turn depends directly on the technology mix used for generating electricity in the

[8] Allocative efficiency refers to the efficiency with which markets are allocating resources. A market will be allocatively efficient if it is producing the right goods for the right people at the right price. An allocatively efficient market is therefore one which has no imperfections. This will be true when marginal cost is equal to average revenue in the market.

country. It is essential that the technology mix be optimised for price subject to meeting Ireland's international carbon abatement obligations.

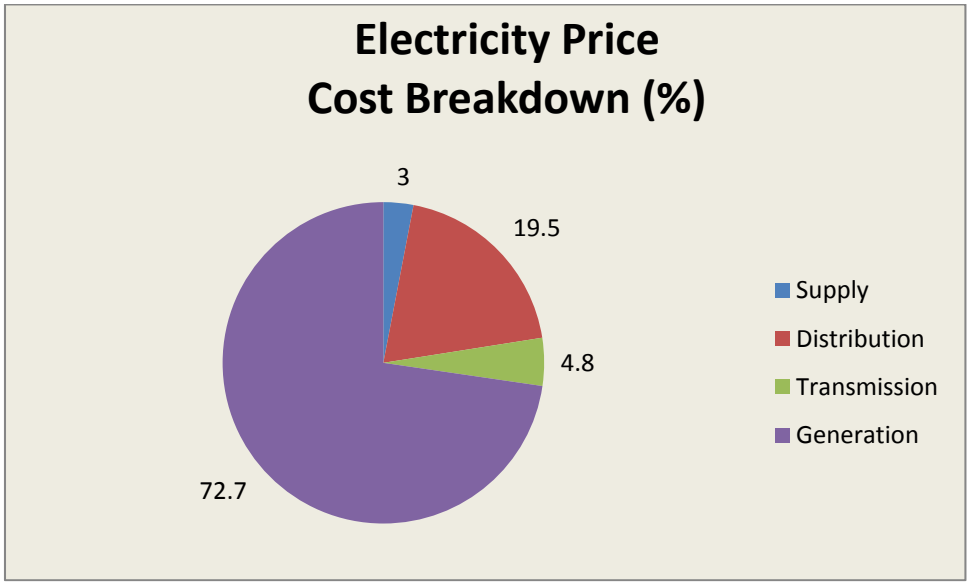

Fig 4.1

Energy policy stands on three supports:

- Security of supply
- Environmental impact
- Cost and competitiveness

The data presented significantly strengthens the Academy opinion that a major energy policy review should be carried out, based on up to date data and current economic conditions with the objective of radically reducing the "competitiveness gap" between Irish and EU average electricity prices. This will involve the consideration of a number of generation mix scenarios aimed at minimising Irish production costs subject to meeting Ireland's international carbon abatement obligations.

4.1 New generation requirements

EirGrid has recently published its Generation Adequacy report[9] (GAR) for the years 2010 to 2016. The key conclusion of the report is that no new generation is required for the next seven years.

> *"The adequacy situation is strongly positive for the next seven years. A surplus of at least 700 MW is observed for all scenarios studied for each of the seven years. This is due to new*

[9] http://www.eirgrid.com/media/Generation%20Adequacy%20Report%202010-2016.pdf

generation commissioning, increased interconnection, improved generator availability, as well as a reduction in demand."

Contrast this with the following statement from last years GAR:

"Additional generation of the order of 500MW will be required by 2012 when Great Island and Tarbert are assumed to decommission"

This rapid and dramatic change in outlook:

- Reflects the depth of the economic recession
- Provides an opportunity to re-examine policy
- Indicates that new generation should only be added to the system if it either reduces production cost or is required as part of a minimum cost carbon abatement strategy.

4.2 Natural Gas

At present Ireland is one of the countries in the EU most dependent on natural gas fired generation, with 55% of the country's electricity being produced from this source. This is ten times larger than that produced from oil .Yet the very rapid increase in electricity prices in recent years has been attributed to rising oil prices. This is due to the fact that, to date, natural gas prices in Europe have been closely linked to oil prices but, with a time lag of approximately nine months. Ireland's electricity and gas customers should, in 2010, benefit from the substantially lower gas prices now obtaining on the international market.

Of course such reductions will also benefit other EU consumers but given Ireland's disproportionate use of natural gas for generation, this price drop should also benefit the country's electricity price *competitiveness*. It remains to be seen if this can be realised.

In its most recent World Energy Outlook (WEO, November 09) the International Energy Agency (IEA) predicts that the European natural gas market should enjoy a gas supply surplus through to 2015, due to the number of new supply sources now coming on stream and the downturn in demand. There is already some evidence of a move to "gas-on-gas" competition and a lessening of the link between oil and natural gas prices in the EU. This link has practically disappeared in the US where natural gas prices, currently approximately $4.50 per MBTU, equate to an oil price of less than $30 per barrel.

It is no longer acceptable to lump all fossil fuels together in energy planning. Oil and natural gas prices are likely to follow significantly different trajectories for the next decade where oil as the virtual monopoly transport fuel will continue to be subject to significant price pressure whereas natural gas as a fuel primarily used for power generation in regional markets will have to compete with coal, nuclear and renewables.

The strong message from these recent market developments is that natural gas supplies and price have recently changed significantly (over the past year oil prices have approximately doubled and gas prices in Europe have approximately halved) and these changes must be factored into new studies and scenarios developed to support Irish energy policy.

4.3 Renewables

It is also essential that Ireland's policy of accelerating the development of renewable sources of generation does not result in a further loss of competiveness in coming years. Ireland has an excellent onshore wind regime and can indeed capitalise on this. In addition the fall in demand for wind turbines in the past year, coupled with the fall in raw material prices and the explosive growth in wind turbine manufacturing capacity in China has resulted in a significant reduction in wind turbine prices and a shortening of delivery lead times.

However we must minimise wind generation development costs that are within our own control. In particular the total costs of connecting wind generation to the network must be reduced by focusing development on suitable sites that can be most easily connected to the grid, at relatively low cost. This will almost certainly require a Ministerial direction to that effect.

Certain geographical areas where grid connection can most speedily, predictably and cost effectively be delivered must be identified and prioritised. Within those prioritised areas projects can be further prioritised based on the date of application.

In the absence of such a policy direction and the continued prioritisation of wind farm grid connection on the basis of date of application it is inevitable that Ireland's renewable targets will be compromised. The cost of wind power development will be unnecessarily high and will impact unfavourably on the country's competitiveness.

4.4 New Techno-Economic studies

Major changes have taken place since the analyses that sought to underpin current Irish energy policy were last carried out.

In particular:

- There has been a dramatic drop in energy demand in line with the country's economic contraction. This is likely to have a permanent effect for at least the next decade. EirGrid does not foresee a requirement for additional generation capacity until 2017 at the earliest.
- New and more rational carbon abatement targets have been adopted by the EU. This applies particularly to the renewables sector where targets are now expressed as a percentage of the total annual energy consumption.
- The natural gas market has changed considerably with much more benign projections for supply and price in the medium term.

- Many countries have committed to an expansion of nuclear energy facilities leading to the so called “nuclear renaissance”
- Major energy conservation and energy efficiency programmes are being put in place which are likely to further depress demand.

Against this background it is imperative that Ireland re-examines the basis for current energy policy and that it does this using professional evidence-based research with the objective of restoring price competitiveness subject to compliance with international carbon abatement obligations.

The Irish Academy of Engineering will continue to review current energy policy and expects to produce further information bulletins on a number of relevant topics over the coming months.

Appendix 1 – Definitions

The Eurostat price data is available at:

http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tsier040&plugin=1

This indicator presents electricity prices charged to final consumers.

Medium size industries

Electricity prices for industrial consumers are defined as follows: Average national price in Euro per kWh without taxes applicable for the first semester of each year for medium size industrial consumers (Consumption Band Ic with annual consumption between 500 and 2000 MWh). Until 2007 the prices are referring to the status on 1st January of each year for medium size consumers (Standard Consumer Ie with annual consumption of 2 000 MWh).

Medium size households

Electricity prices for household consumers are defined as follows: Average national price in Euro per kWh without taxes applicable for the first semester of each year for medium size household consumers (Consumption Band Dc with annual consumption between 2500 and 5000 kWh). Until 2007 the prices are referring to the status on 1st January of each year for medium size consumers (Standard Consumer Dc with annual consumption of 3500 kWh).

EU Average prices

EU aggregates are calculated by weighting the national prices with the latest available national consumption for either the household sector or the industrial sector.

Domestic prices are weighted by the final energy consumption of gas/electricity in households recorded annually by Eurostat. Industrial prices are weighted by the final energy consumption of gas/electricity in industry recorded by the same survey.

Since price data is available for 2008s1 and 2008s2 but consumption data is not, the prices for 2008s1 and 2008s2 have been weighted by 2007 consumption; this should have only a small effect on the EU average.

EU averages in this report have been weighted using 2007 data.

Price Competitiveness Factor (PCF)

PCF is the amount by which Irish prices exceed or fall short of EU average prices.
PCF = 100*(Irish Price – EU average Price)/ EU average price.
Examples: A PCF of 40% indicates that Irish prices are 40% greater than EU average prices
A PCF 0f -20% indicates that Irish Prices are 20% less than EU average prices.

Composite PCF

This is established by combining the industry and household prices for both Ireland and Europe using weighting factors based on the consumption. Such weighting methodology reflects the standard approach used by Eurostat.

The composite price of itself is not very meaningful but the *trend* of such a composite price relative to its corresponding EU statistic provides the best available single measure of the competitiveness of the Irish electricity industry.

Appendix 2 — Irish Academy of Engineering

Academy Members of the Energy Standing Committee:

Chairman: Kieran O'Brien, Acting Director General of World Energy Council

Dr Anthony Barry, former Chief Executive of CRH plc, Past President of IBEC

Dr. Gerry Byrne, Professor of Mechanical Engineering, UCD

Michael Hayden, President of The Academy

Brian Sweeney, former Chairman and Chief Executive, Siemens Ireland

Frank Turvey, former Deputy Chief Executive of the Radiological Protection Institute

Dr. Ed Walsh, Founding President of the University of Limerick

The Academy is grateful to the following who provided information, insights and analysis of data to facilitate compilation of the Report: Their participation and cooperation does not imply their agreement with the findings and recommendations, which are the sole responsibility of the Academy Energy Standing Committee.

Gerry Duggan, Chairman of the Energy & Environmental Division of Engineers Ireland

Colm McCarthy, Economics Lecturer, University College Dublin

Don Moore, C. Eng., Executive Consultant to The Academy of Engineering

D G Nolan, C. Eng., FIEI

Tom Reeves, former Commissioner, Commission of Energy Regulation

The Irish Academy of Engineering

The Irish Academy of Engineering has a membership of just over 115 experienced Irish engineers drawn from a wide range of disciplines. Using the experiences and knowledge of its members, the Academy focuses on issues where the engineering profession can make a unique contribution to economic, social and technological development.

Its aim is to facilitate communication and dialogue on engineering related matters and with this in view it publishes reports, some of which are listed below:

- Engineering a Knowledge Island
- A Vision of Transport in 2050
- Ireland's Environment
- The Government's Technology Investment Fund
- Infrastructural Spatial Development for the Island of Ireland
- Creating Europe's most attractive environment for intellectual property

The Academy is an all Ireland body. Its membership includes Irish engineers of distinction, who are resident in other countries.

22 Clyde Road

Ballsbridge

Dublin 4

Tel: **+353 1 6651337**

Email: academy@engineersireland.ie

Web: www.iae.ie