

To: Commissioner for Environmental Information
From: Pat Swords BE CEng FICChemE CEnv MIEMA
Re: Eirgrid Appeal CEI/10/0004
Date: 11-3-2010

With regard to the Poyry report of July 2009:

- http://www.poyry.com/index_cases/index_cases_12.html

As has been highlighted in previous correspondence:

- Eirgrid participated as a founding member (Section 1.1).
- The study clearly demonstrated the economic devastation that would occur if the proposed wind energy programme of 6,000 MW in Ireland was to go ahead due to spot prices that would be 200 times normal generating costs, the complete inability to fund new thermal plants to meet EU forthcoming environmental standards and the lack of justification for interconnection between Britain and Ireland that cannot be seen as a magic bullet.

To understand the technical issues and the significance of the Poyry report, an extensive engineering study that included over 20,000 hours of effort, it is first necessary to explain how the grid system works in Ireland. We have an electricity grid that will function perfectly without a single wind turbine or interconnector to the UK and mainland Europe. The only reason there are wind turbines is that when there is a strong wind they generate power which enables fossil fuel plants to be turned down or even off, thereby reducing carbon emissions. However, like nearly everything else in life if you think there is a simple answer to a complex issue you are wrong!

This is why a full engineering analysis in which the costs and benefits are assessed is so fundamental to any decision making process in advance of enormous sums in capital and operating expenses being committed. Indeed such a procedure is mandatory for the Wind Energy Programme that is Government Policy since October 2008 under the Directive 2001/42/EC on Strategic Environmental Assessment. Furthermore Directive 2003/4/EC requires the Administration to provide active and systematic information on the environment to the widest systematic availability; this includes information on energy and cost benefits and other economic analyses.

In October 2008 the Government announced:

- *Minister for Environment, John Gormley T.D. has announced a revised ambitious target for renewable penetration in the electricity sector. The new target of 40% is a significant increase from the previous goal of 33% and exceeds considerably both current EU targets of 20% and the UK's current target of 15%.*

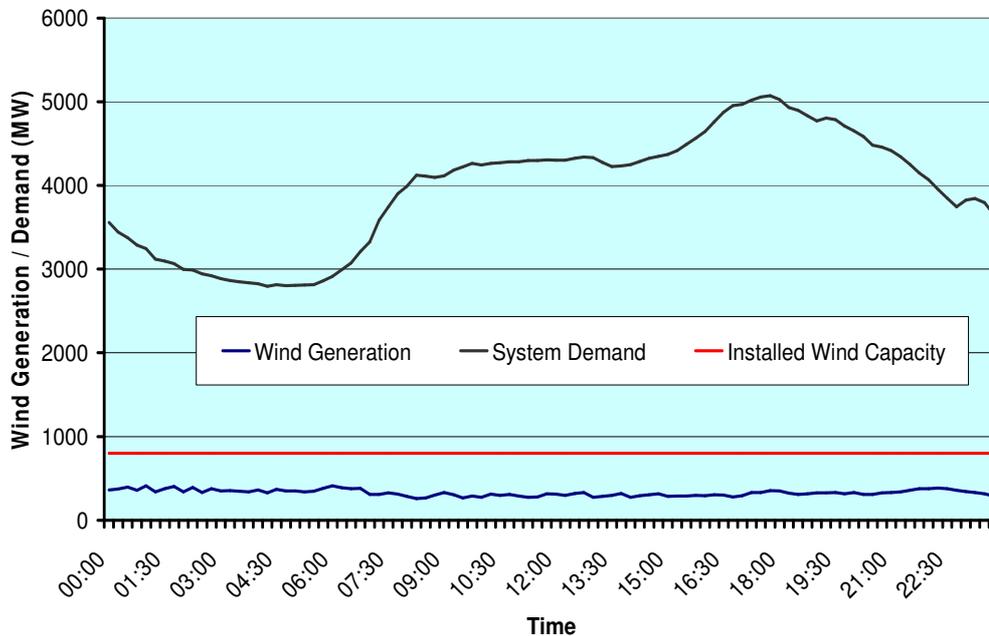
The Minister said: "One of the most effective ways of reducing our national greenhouse gas emissions is to generate as much electricity as possible from renewable sources rather than from fossil fuels. The previous Government adopted a target that 33% of electricity consumed would be from renewable sources by 2020. Today I can confirm that the Government has now agreed, on the recommendation of my colleague, the Minister for Communications, Energy and Natural Resources, Eamon Ryan, T.D. to increase this target to

40%. The target is underpinned by analysis conducted in the recent All Island Grid Study which found that a 40% penetration is technically feasible, subject to upgrading our electricity grid and ensuring the development of flexible generating plant on the electricity system.”

On all grid systems the power input has to match the demand requirement, if it doesn't there are voltage drops called 'brown outs' and even potentially 'black outs' when there is insufficient power to meet the demand. If too much power is fed to the grid in excess of demand, then surges in voltage occur, which can damage electrical equipment. Therefore the grid operator has a fine balancing act to follow.

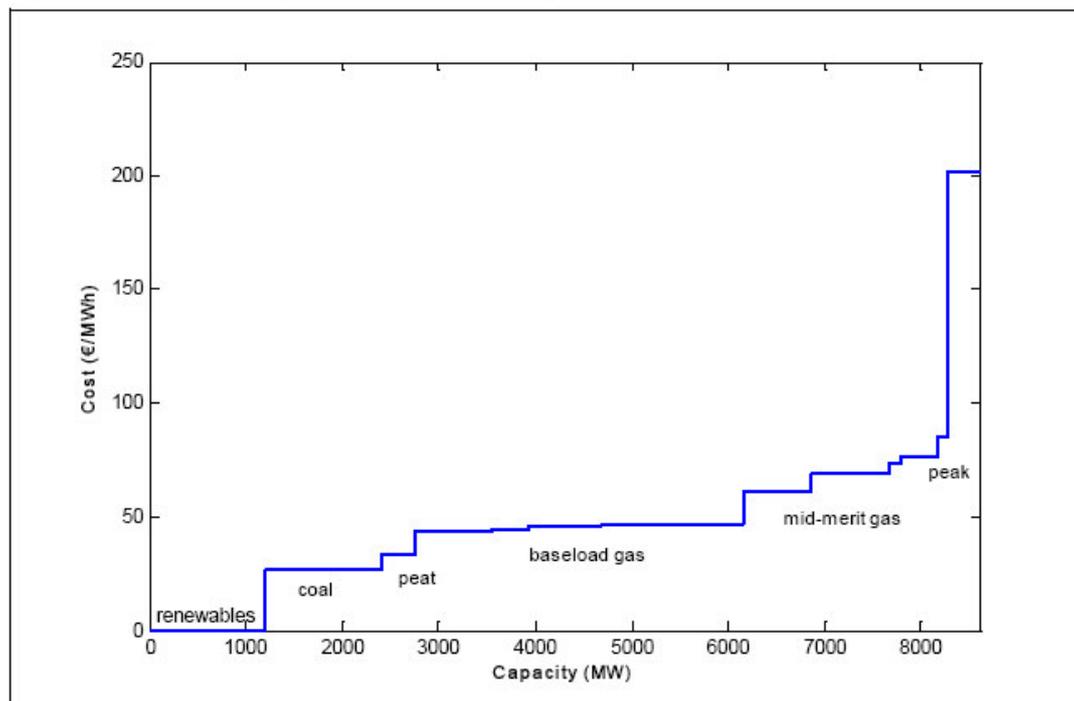
For example on the 9th January 2008 the wind was quite blustery in the morning, the system demand in the Republic of Ireland reached a peak of 5,000 MW, one of the highest ever. However, it can be seen how much power was actually contributed by the 800 MW of wind generation then installed on our grid. The rest had to be provided by conventional power generation plants.

Graph 3: System Demand and Wind Generation on 9 January 2008



If we consider a traditional grid system in which no wind energy is installed then the grid operator schedules in power plants based on merit according to the demand that arises, which in reality he is able to predict based on experience. If we look at the graph below from the ESRI Working Paper of 2009 we can see the merit curve for 2007 for the All Island Grid, which is given in cost (€/MWh). This is provided without any cost for carbon. The peak load on the All Island Grid comprising the Republic of Ireland and Northern Ireland is about 6,500 MW. If we look at the graph below and ignore the 1,200 MW attributed to renewables, then it is clear that this 6,500 MW could be dispatched for a cost basis of in or around €50 per MWh. Essentially therefore for conventional generation capacity there is a 'spot price', the power plant which can provide the electricity at the lowest price is the one that is brought on line to meet the demand. As the demand goes up so to does the spot price and the mid-merit plants and 'peakers' are then brought on-line to meet the peak demand periods.

Figure 1. Merit order dispatch curve for Ireland, end of 2007

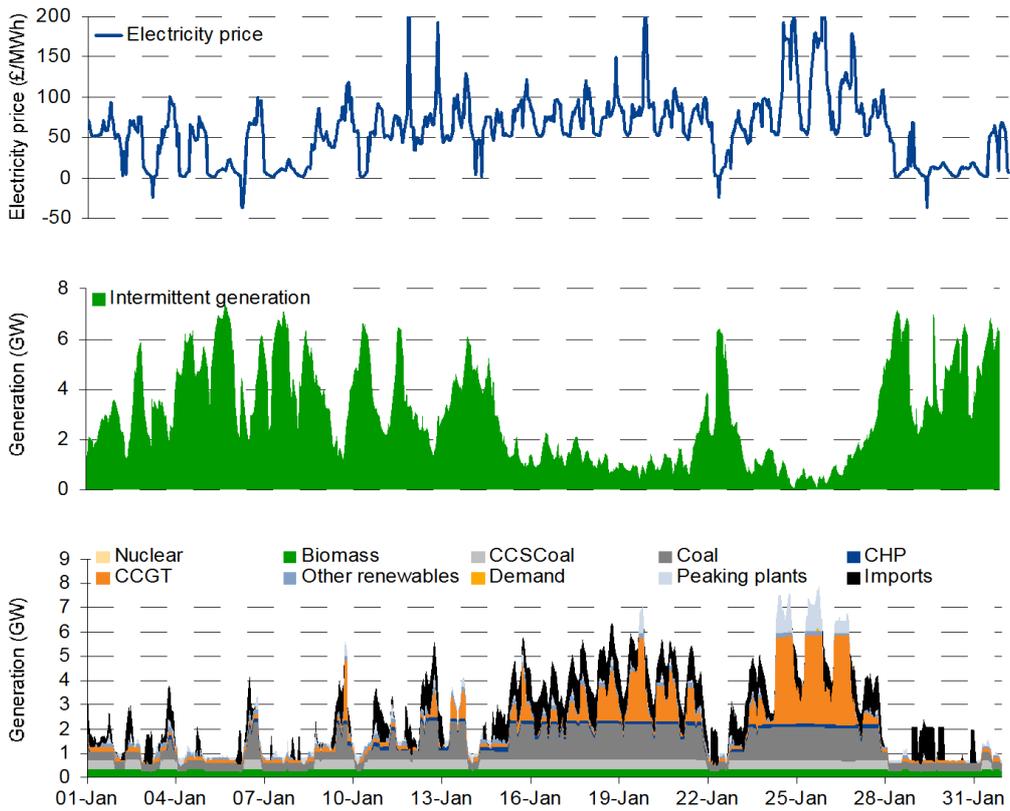


Dispatch Costs for All Ireland Grid - Taken from ESRI Working Paper No. 334 of December 2009.

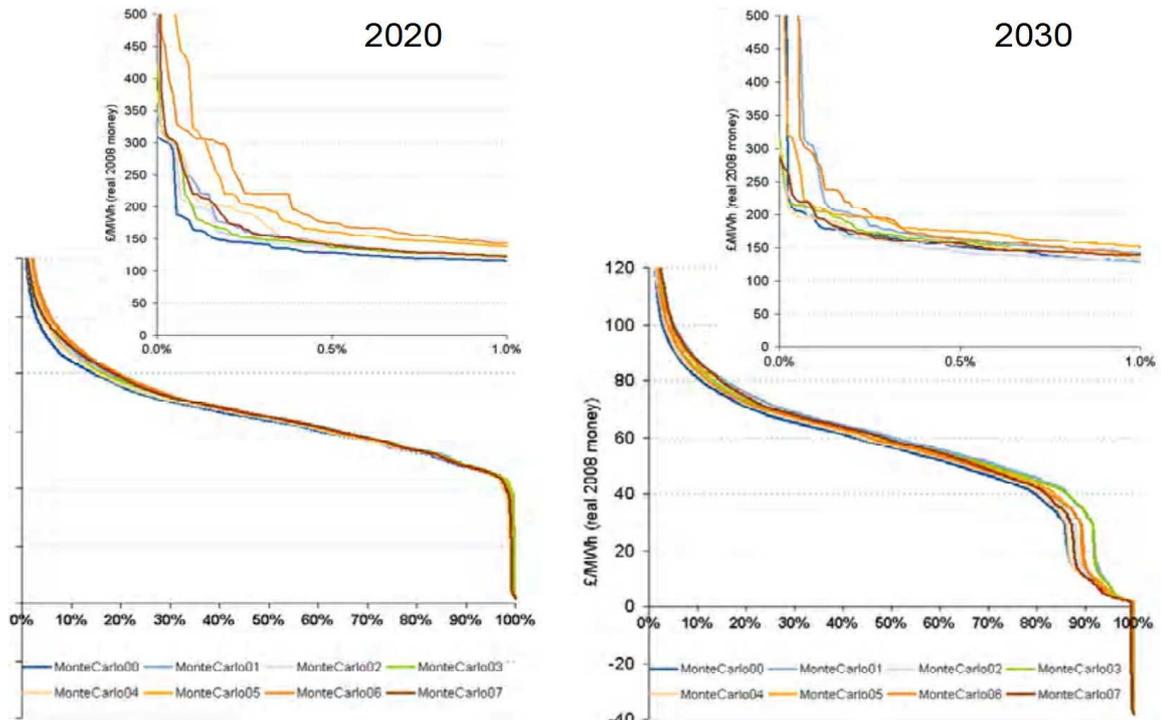
However, now we need to consider what happens when we have a non-traditional grid in which we have renewable generators that are an intermitted source, namely wind, which over a year in Irish conditions will generate 0.3 MW for each installed MW. Two things start to happen then (a) the legislation requires the grid operator to give preference to these renewable generators, in other words conventional plants have to be brought off line when the wind energy is being produced and (b) a different cost basis applies for the renewable generators. In Ireland the feed in tariff for wind energy under Renewable Energy Feed In Tariff (REFIT) 1 is currently about €67 per MWh. However, new tariffs of €140 per MWh for offshore wind were announced in January 2009.

Simply put when the wind speed picks up to about double the average Irish wind speed the wind turbines start to produce electricity and the far cheaper plants have to be taken off line. This causes huge inefficiencies in that the power plants are now operating in a variable mode rather than on a steady power output, i.e. they are less efficient and burning more fuel. Furthermore the more wind energy that is installed on the grid there is a reduction in the number of hours of electricity production that is available to the conventional power plant, so it becomes more difficult to finance and pay back the capital and operating expenses. The result the 'spot price' has to go up to cover these costs. For the consumer it is a 'lose – lose' situation. When the wind blows there is a higher renewable feed in tariff. When the wind doesn't blow the spot price is higher than it would otherwise have been. The more wind energy there is on the grid the worse the 'lose – lose' situation becomes.

This is why the Poyry report is so important as it predicts what will happen when the Government's Wind Energy Programme is completed. The graphs below from the report clearly shows the predictions for energy prices in Ireland in 2030 corrected for 2008 prices given completion of the proposed wind energy programme.



Irish Market in 2030 with weather of January 2000 - Fig 17 from the Poyry Impact of Intermittency Report of July 2009. (Note January is consistently a windy month with high wind outputs compared to other months)



2020 and 2030 – Price Duration Curve of Irish Market from Fig 12 of Poyry Report.

Clearly by 2030 when the Wind Energy programme is in place electricity prices would be consistently (more than 70% of the time) above £50 per MWh (> €57 per MWh) and regularly (10% of the time) rising to above £90 (> €100) per MWh. Figure 12 of the report is showing electricity prices that the consumer will pay will rise by about 60% above the no wind case assessed before of €50 per MWh.

Each year about 28 TWh of electricity is generated in the Irish Republic and the cost of electricity in Ireland for industrial users is about 14 cent per kWh and 20 cent per kWh for households. Using an average value of 17 cent per kWh then the amount of money we pay in electricity bills is about €4.8 billion each year. Seventy per cent of this is related to generation costs, which clearly are going to go up by about 60%. Furthermore massive grid expansions are required under the All Ireland Grid Study to double our grid capacity by an extra 5,000 km to facility this Wind Energy Programme:

- €4 billion at least is earmarked for Eirgrid:
<http://www.dcenr.gov.ie/Press+Releases/The+Green+Economy+is+here+%E2%80%93+Minister+Eamon+Ryan.htm>

This will also serve to push up transmission charges as this expenditure in capital and operational costs has to be recovered.

The Poyry report and the above are clearly demonstrating that the Wind Energy Programme is going to drive up the cost of electricity in Ireland by at least €2.5 billion each year (i.e. 60%) over the no wind situation. Further conclusions of this report relates to the complete inability to fund new thermal plants to meet EU forthcoming environmental standards and the lack of justification for interconnection between Britain and Ireland that cannot be seen as a magic bullet.

With regard to information that “*has been received by a public authority*”, clearly from the introduction to this Poyry Report it is clear in the Eirgrid participated as a founding member and despite their repeated denials to me from Michael Kelly related to the AIE request in December and early January, the documentation would have been available to them as it was to us all on the internet and highlighted in the power journals.

With regard to “*environmental information that has been produced by a public authority*”, given the significance of this report to the Wind Energy Programme and the legal obligation with regard to Directive 2003/4/EC to provide active and systematic information on the environment to the widest systematic availability, which includes information on energy and cost benefits and other economic analyses, I requested them to provide their comments and response to the report, which they refused to do so. I accept that internal written correspondence between various staff members may not represent Eirgrid’s views but within any organisation there is official correspondence and conclusions / recommendations. For instance I consider it completely unacceptable that they admitted they hosted a discussion meeting on the subject under their facilitation of renewables work yet no documentation relating to this is available under an AIE request. What other meetings and reviews were held in which the contents of the Poyry report were raised?

Fundamentally there is an enormous financial burden that the Irish electricity consumer is going to have to carry, including the €4 billion assigned to Eirgrid. It is completely shocking and a total abuse of the principles of the Aarhus Convention that there has been no dissemination of environmental information relating to cost / benefit studies, Strategic Environmental Assessment, consideration of alternatives,

economic analyses, etc associated with this Wind Energy Programme. Indeed there has been ZERO produced outside of pathetic press releases and video clips. It is simply not acceptable for Eirgrid to deny access to information and fail to comply with the procedures specified in S.I No. 133 of 2007. The public has a right to know how much their electricity is going to cost given various Government programmes related to EU Directives in the Environmental and Energy spheres, what the money is going to be spent on and what the various alternatives are. When a public body participates on a study which clearly shows that electricity prices associated with their strategic plans are going to soar by at least €2.5 billion per year – to state ‘No official Comment’ so they can deny you a justification of their position and go ahead and spend a tidy €4 billion is simply a complete abuse of the principles of the Aarhus Convention.