

Commission for Energy Regulation,
 [Attention Ms Clare Beausang Renewables or Mr David Naughton Networks]
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 Tallaght,
 Dublin 24

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Letter from ESB National Grid regarding Wind Generation - System Security Issue
Report from ESB National Grid - Interim Policy on Wind Connections
Letter from Commission for Energy Regulation re ESBNG Proposal to Limit New Wind Connections

Introduction

The present use of energy in the Republic of Ireland is unsustainable. Forecasts of continuing growth in energy consumption in almost all sectors of the economy are alarming. Without a change in national energy policy a sustainable energy future with the substantially reduced levels of greenhouse gas emissions suggested by the Intergovernmental Panel on Climate Change [IPCC] and the EU would be very difficult, if not impossible, to achieve.

Failure to understand that the wrong forecasting model was used.

At the meeting on December 17 the point was made that the ESB have known for years that wind would become a new supply source. Although they knew this, they failed to understand that they were using a very simple and quite inappropriate forecasting model.

The ESB Interim Policy on Wind Connections, page 2, notes that “It was expected that there would be a steady increase in the amount of wind coming onto the system, allowing time to assess and manage system implications...Over the last seven years wind capacity has increased from 20 to 160MW, or at a moderate rate of 20 MW per year....in the past year there has been a sudden and dramatic jump in connection offers to an amount which is 5 times the amount of wind currently connected to the system.”

Any experienced energy analyst would glance at the figure displayed on page 3 and say “of course – this is a logistic curve.” Logistic [S-curve] limited growth models have been used to forecast world primary energy demand and consumption for many decades. The ESB seem to be quite unaware of the energy forecasting work carried out by the International Institute for Applied Systems Analysis [IIASA] and, in particular, work carried out by Marchetti, who placed the energy resources in their historical context and used the Volterra-Lotka equations of competition to describe the dynamics of a system by decomposing it in competing subsystems quantitatively described by the equations. This technique can be linked to the logistic [S-curve] limited growth model by a linear transformation in the form of $F/(1-F)$ on a logarithmic scale, where F is the fractional growth [or market share] achieved at any particular point in time. The growth of wind power in the world is following the same type of logistic model as nuclear power did some 30 years ago.

Other Grid problems

One of the main pitfalls in current Irish electricity generation is its centralised nature. If a resilient grid is to be achieved then power generation needs to be decentralised and have more redundancy. Reference to embedded/decentralised generation appears throughout the literature.

Photovoltaic roof tiles or facades, micro CHP generators, small scale wind, micro hydro power, biogas generators, coppiced wood-burning systems could all play a part. Planning for this should have been started years ago. Many other countries have systems in place to allow for substantial renewables input. [See for example the UK Transmission Issues Working Group papers]

Energy Prices and Planning

Energy prices must reflect the true cost of using fossil fuels. Cheap energy has been the Government mantra for many years. We need to pay for the damage caused by fossil fuels and price these energy sources accordingly.

Renewables are often dismissed as being “too expensive”. This is not necessarily true. A more sophisticated approach to pricing was shown by Awerbuch and Berger in a recent IEA Working Paper on “Applying Portfolio Theory to EU Electricity Planning and Policy-Making. They comment that the traditional “least-cost” procedures are roughly analogous to trying to identify yesterday’s single best performing stock and investing in it exclusively for the next 30 years.

Electricity Interconnector Issues

Mr O’Brien noted that the ESB were prevented by the EU from negotiating new interconnector agreements in the year 2000. Surely some Government organisation must re-examine this issue?

Closing Comments

As my personal contribution to these problems, I have been discussing with Professor Owen Lewis at UCD how we could provide more sophisticated energy information and training for Irish energy professionals. Early next year we hope to circulate preliminary details of a series of post-graduate level seminars under the general heading of “Energy, Economics and the Environment”. These will cover the issues outlined above, especially on the up-to-date position of the renewables and on various forecasting techniques and methods.