

Submission

by

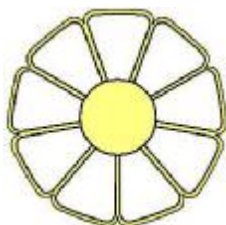
**The Centre for Renewable Energy at Dundalk
Institute of Technology (CREDIT)**

to

**The Department of the Marine, Communications and
Natural Resources**

in relation to

**THE GREEN PAPER – TOWARDS A
SUSTAINABLE ENERGY FUTURE FOR
IRELAND**



November 2006



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1. Introduction – Dundalk Institute of Technology and Renewable Energy

Established in 1971, Dundalk Institute of Technology (DKIT) is the main provider of Third Level Education in the North-East and border region. With a student population of 5,000 and a staff of 450, the Institute provides higher education programmes ranging from Level 6 (Higher Certificate) to Level 10 (Ph.D.) in a range of programmes. The majority of the students study at Level 8 (Honours Degree) and are organised into four Schools or Faculties viz., Business and Humanities; Engineering; Informatics, Music and Creative Media and Nursing, Midwifery and Health and Applied Science.

The Institute has been at the forefront in developing and providing a range of support services and programmes for industry, particularly regional industry, and through its Regional Development Centre (RDC) offers a range of Enterprise Development, Applied Research and Technology Transfer services. The Centre was the first in the Institute sector to establish a Technology Business Incubator on the campus and has since 1989 supported over 50 innovative start up enterprises and over 250 entrepreneurs that have generated businesses. The Centre, in co-operation with partners in Northern Ireland and throughout Europe and the World, is also involved in the development and implementation of a range of innovative programmes and projects aimed at promoting the growth of new economic activity, most notably in the promotion of the Renewable Energy (RE) sector.

Through the establishment in 2001 of the Centre for Renewable Energy (see below) and the development of the worlds first large scale urban campus based Wind Turbine, the Institute has boldly demonstrated its visible commitment to the Renewable Energy agenda. In 2005 the Institute established a Renewable Energy Installer Academy to address the growing skills requirements for industries operating in the RE sector. Also in 2006 one of the first M.Sc. programmes in Renewable Energy was started with 25 participants drawn from industries and sectors throughout the country. Through CREDIT the Institute is involved with a growing range of technology transfer services that support local and indeed national industries of all scales to come to terms with the role of RE in their day to day activities and in their future development.

More recently the Institute is introducing module and programme content onto undergraduate programmes that is raising the awareness of students as our future skills resource to RE issues. Through the RDC the first Enterprise Development Programme addressing the needs of start up enterprises and entrepreneurs in the RE sector (REEP) will be launched in recognition of the role that new renewable industries and services will play in the development of economic activity over the coming decade and beyond.

In summary, DKIT is well placed to support the DCMNR and Government in the implementation of a range of RE priority areas most notably in:

- Higher Education, Lifelong Learning and Training Programme development and delivery to support the skills needs of an economy where RE will play a more significant role;
- Research, most notably in the area of Wind Energy and BioEnergy;
- Related Technology Transfer and Applied Research services to industry;
- Enterprise development and Incubation support programmes for start up enterprises in the RE sector, and
- In continuing to popularise and promote the benefits and advantages of RE to the regional and national economy and to the community and society as a whole.

The Institute therefore welcomes the publication of the Green Paper and is delighted to offer this submission as part of the consultation process in support of the range of measures proposed and to offer some additional views for consideration by the Energy Planning Division at the Department of Communications, Marine and Natural Resources.

2. The Centre of Renewable Energy at DKIT (CREDIT)

Founded in 2001, the Centre for Renewable Energy at Dundalk IT (CREDIT) mission statement is “to assist Ireland’s transition to a renewable energy-based economy”.

CREDIT is focused in three main areas of renewable energy: educational programme development, renewable energy research and development and commercial activities. In the area of education there is the new MSc in Renewable Energy Systems Technology, the Renewable Energy Installer Academy, and evening courses for the general public (starting in October 2006). The MSc is aimed at graduate engineers who want a strong grounding in renewable energy, the details of which are given on our website www.credit.ie. The Installer Academy is to train and certify tradesmen to install renewable energy systems such as solar hot water systems and ground source heat pumps.

Other activities to date include:

- The development of the world’s first large wind turbine on a college campus
- Research into the value of electricity storage, particularly in conjunction with wind turbines
- Consultancy services to a number of industrial and institutional clients
- Project management of the SEI/LEADER “Community Energy Initiative” small-scale renewable energy pilot programme
- The development of a small grid-connected wind turbine
- Ongoing development of the ECCO model of the Irish economy, simulating its transition toward renewable energy
- Technical advice to the Dundalk 2020 programme to create a zone of energy sustainability in Dundalk

- Active involvement with the Irish Renewable Energy Council (IREC), Irish Wind Energy Association (IWEA) and the Tecnet Sustainable Energy Network

The Centre for Renewable Energy is located in the Regional Development Centre on the campus of Dundalk Institute of Technology.

The Centre regards the recent Green Paper on Renewable Energy as an important landmark in placing RE at the forefront of not only Energy policy but also policies that will impinge on the economy and on society as a whole. The Centre through its Strategic Plan is committed to supporting the aims and objectives of the Green Paper.

3. Centre for Renewable Energy at Dundalk IT (CREDIT) Comments on the Green Paper on Sustainable Energy

The following general comments and suggestions are offered. Comments on the “Questions for Consultation” follow below.

- a) The role of Higher Education and Training (including Lifelong Learning) in supporting the measures outlined throughout the document needs to be emphasised. A dedicated section should perhaps be inserted dealing with this important area. The range of programmes and support services offered from Institutes such as DKIT as outlined above, ranging from the craft to the postgraduate level, are critically important in supporting the RE strategy being presented through the Green Paper.
- b) The work being undertaken by the Irish Energy Research Council needs to embrace all the players in RE Research. An Institute of Renewable Energy Research and Development, established on an all Ireland basis, could harness and co-ordinate the various pockets of expertise in all aspects of RE and establish a virtual Institute to strategically focus ongoing R&D efforts in RE to support the priorities indicated in the paper. This Institute would deal with all aspects of RE research at policy, basic and applied levels and across the RE technologies of most relevance to the island of Ireland, ie. Wind, Wave and Wood/Biomass. For example, the area of economic Energy Storage solutions for Wind Turbines as a means of balancing supply/demand and to assist in wider demand management applications is an area of particular research interest and focus for CREDIT and DKIT and one this Institute is keen to pursue and develop with a range of research and industrial partners.
- c) The opportunity for new start up (or diversification of existing) enterprises in the RE sectors needs to be highlighted in the Green Paper. Through RE products and services new exciting enterprise activities and careers and employment opportunities will emerge and this needs to be highlighted and recognised so that the relevant organisations and agencies are prepared to develop and support programmes as required.
- d) CREDIT has been centrally involved with the development of the ECCO model of the Irish economy (www.energyscenariosireland.com). This is a tool to simulate the response of the Irish economy during its transition to renewable energy. We offer this tool in evaluating future energy options.

A. Ensuring the security of energy supply

1. Reducing dependence on oil and gas

We have a huge wind energy resource available at low cost¹. The Best New Entrant (BNE) price for combined cycle gas turbine generation in Ireland in 2007 will be 8.64c/kWh, while wind is being offered 5.7c/kWh in the REFIT programme, suggesting that fossil fuel generation is 50% more expensive than wind – and the gap will rise. Electricity storage will facilitate higher penetrations of cheap but variable wind power. This will effectively add to the cost of wind energy, and the added cost will rise as wind penetrations increase. However even at high penetrations, wind-plus-storage will be less expensive than fossil fuels. Therefore it is suggested that **electricity storage** should be availed of on a large scale to reduce dependence on oil and gas. **Electric vehicles** and **heat pumps** (see 10 below) will also have an important role to play in this regard.

2. Addressing generation and transmission adequacy

Electricity storage has the effect of deferring the need for new generation and new transmission. It allows for shipping power to load centres at night when lines are relatively lightly loaded. It will also help address our current inappropriate generation mix (an excessive amount of baseload plant)².

3. Strategic gas storage capacity

No comment.

4. Greater participation in the generation market

No comment.

5. Interconnection

It is crucial that we **immediately pursue substantial interconnection with the UK and Europe**. This will facilitate competition in the market, and create a mechanism for exporting our inexpensive green electricity to European markets. It will have the added benefit of stabilising our grid frequency, allowing greater penetration of inexpensive wind energy.

6. Fossil fuel exploration

No comment.

7. Contingency measures for fossil fuel supply disruption

No comment.

8. Does the Green Paper set the right policy directions for security of energy supply?

The items mentioned are important and the direction suggested generally correct. However these are not put in the context of *where we are going* in an energy sense. It

¹ Sustainable Energy Ireland *Updating the Renewable Energy Resource in Ireland (2004)*, Report No. 4P305A-R5, November 2005

² O'Connor, *Generation Mix – Securing Future Supply*, IWEA Annual Conference Proceedings, March 2006

needs to be clearly stated that a renewable energy future is desirable, possible and inevitable, and that producing (and exporting) our own clean energy is the final goal.³

B. Promoting the sustainability of energy supply

9. Improving the pace and range of RE development for electricity.

We might look at German renewable energy law, which, rather than looking at limits for renewable electricity, simply requires the connection of renewables. This is in recognition of the principle that renewable energy is the final solution, and that present grid topologies and operating methodologies will have to change, and as more RE is connected to the grid it is up to the grid to figure out how to deal with it. If we force RE plant to “look like” conventional fossil plant, this will ultimately result in a non-optimal RE-based grid. Therefore, **we propose that all renewables be allowed to connect to the grid (as in Germany)**, and that through a PSO-like mechanism, the means are put into place to deal with the variable nature of renewables (which will be necessary in any case in the long run).

10. RE in the transport and heat sectors.

Ireland’s main RE resources are wind, wave and biomass. Biomass is already making headway in the transport and heat sectors, but can ultimately only provide a rather small percentage of Ireland’s needs. Therefore if we want low cost pollution free native energy for heat and transport, we will have to ultimately look to electricity. The obvious answers are heat pumps and electric vehicles. If these devices were controllable by the grid (i.e. made to participate in demand-side management) this would facilitate 1 and 9 above. **Incentives for electric vehicles and heat pumps should be put in place.**

11. New initiatives for energy efficiency.

Building energy performance regulations need to be vastly improved, and based on actual performance. Motor vehicle registration fees for large-engine cars should be increased.

12. Expanding energy RTDI

Present initiatives (e.g. Energy Research Council) are welcome, however given the magnitude of the energy transition we are facing, funding should be increased in all areas. **Funding should be focused on Ireland’s most significant RE sources: wind, wave and bioenergy, as well as grid integration of renewables.**

13. How to radically expand energy research capacity

Given that practical, commercial energy solutions will be needed, energy R&D in the EI Innovation Partnership programme should be facilitated. Applied research through Institutes of Technology should be facilitated.

14. Bioenergy supply and demand

No comment.

15. Mandatory targets and other incentives

³ Staudt, *Ireland’s Energy Future*, June 2005 edition of The Engineers Journal

A combination of mandatory policies and incentives is desirable. However, given the urgency and precariousness of the national energy (and emissions) situation, mandatory targets should become more prominent.

16. Does the Green Paper set the right policy directions for energy sustainability?

What is needed is a vision of what energy sustainability is in a practical sense. To us it means a transition to renewable energy as fossil fuels decline (see footnote 3). Without a statement of the goal (e.g. energy sustainability by 2050), it is difficult to define a policy direction. The Paper needs a frank assessment of a) the long-term goal, b) where we are and c) an outline of the steps needed to achieve that goal. As it stands, there are a variety of reasonable policies suggested in the Paper, but no context, no overall framework.

C. Enhancing the competitiveness of energy supply

17. Developing competition

See 5. above re: interconnection

18. Reform of institutional arrangements and market structure

No comment.

19. Reducing the cost of gas and electricity to consumers.

No comment on gas. For electricity see 1 above.

20. Role of state-owned enterprises

In the past they would have taken a lead role, but with competition law it is hard for them to take visionary action, which is what is needed now.

21. Fuel poverty

No comment.

22. Does the Green Paper set the right policy directions for energy competitiveness?

Ireland has the opportunity to create a renewable energy based economy which, due to our excellent renewable energy resources, will give us a competitive advantage. This is not clear from the Green Paper.