

Energy Research, Development and Demonstration

Consultation Paper



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

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1. Introduction

- 1.1 Meeting the needs of the economy in terms of economic development and competitiveness, maintaining security of supply, and ensuring that energy use is environmentally sustainable will present Ireland and the EU with difficult challenges and choices in respect of energy policy over the next decade and beyond. For Ireland, the changing orientation of market structure will also overlay these choices with additional complexity. We believe it is possible to meet both our economic and environmental goals, but to do so means that we must be more focussed on research in the energy field generally, both from a technology and policy perspective and in particular in the areas of renewable energy, energy efficiency and other supporting technologies. We also need to ensure that the research enriches undergraduate and postgraduate training and education helping to develop the necessary capacity and capability within the economy.
- 1.2 From an energy perspective, the Department of Communications Marine and Natural Resources wishes to see a more coordinated and structured approach taken to the creation and maintenance of Research, Development and Demonstration (R, D & D) capacity on the island as a whole, including establishing opportunities for collaboration on research and innovation north and south, in order to meet the objectives set out above.
- 1.3 The Department's Chief Technical Advisor (Energy) has recently undertaken a desktop study of the current activity and investment levels in energy R, D & D in Ireland. This is an overview of the current state of affairs and is not being presented as a detailed and comprehensive evaluation and assessment of the area. The process is being repeated for 2004 and the Department would welcome any additional information that might not have been captured in this exercise. The study also presents some possible options in terms of how the Department might better structure and organise activity in the future. The document is attached in Appendix I.

2. The Policy Context

- 2.1 The current Programme for Government¹ stresses the critical role which research, development and innovation plays in terms of underpinning sustained economic progress and acknowledges that ongoing action is required in the area. The Government recognises the importance of encouraging a dynamic research and innovation culture. Research needs to be supported on the basis of recognising the distinct, but also inter-connected roles of different programmes, from individual grants up to more targeted support for areas of national strategic interest. There will also need to be sufficient supply of appropriately skilled students entering our third level institutions.
- 2.2 In its review of Irish energy policy in 2003, the International Energy Agency (IEA) noted the Government's commitment to research capacity and a dynamic research culture and, in relation to the energy sector, recommended that the Government should
- Prioritise activities on a limited number of projects and concentrate resources on them with a view to meeting national energy policy objectives;
 - Engage in active participation in R, D & D activities at the international level, including participation in EU and IEA programmes;
 - Stimulate cooperation between the public and private sectors in R, D & D.
- 2.3 More recently, the World Alternative Policy Scenario² set out in the IEA's World Energy Outlook 2004, focused on the effect which energy efficiency, development of renewable energy sources and lowering of carbon emissions could have on total energy demand over the period to 2030. The challenge of implementing these policies emphasises the need to concentrate effort on innovation by coordinating and supporting the R, D & D community aligned with policy goals focussed on energy efficiency, development of renewable energy sources and lowering of carbon emissions.
- 2.4 The review of energy R, D & D which quantifies and characterises activity in this area during 2003 and the related capacity for undertaking such work, (Appendix I) makes a number of recommendations notably:
- That a structure for enhanced coordination and support (including relevant capital funding and long-term programmatic support) should be established.
 - That the new structure be charged with positioning Ireland's energy R, D & D community to optimise participation in the new EU Framework Programme, relevant IEA activities and opportunities that will arise in the context of the new national science policy agenda.
 - That the new structure be mandated to pursue relevant all-island work in association with relevant parties in Northern Ireland.

¹ http://www.taoiseach.gov.ie/attached_files/upload/publications/1480.rtf

² World Energy Outlook 2004 IEA, Paris. ISBN 92-64-10817-3

- 2.5 This paper seeks to develop these core recommendations and present the Department's view of the possible options for establishing a coordinating framework for R, D & D, from fundamental research through to demonstration, in the energy sector.

3. Institutional and Governance Options

- 3.1 The Department is aware that some of the energy R, D & D currently carried out in Ireland is commissioned by bodies under State control. It is not clear whether this work could be coordinated more effectively. The Department would favour a competitive approach where public funds are concerned. The Department supports the idea of a central body to oversee and coordinate energy R, D & D.

- 3.2 The primary aims of the Department are to ensure that such a body

- can be established or mobilised quickly and effectively,
- has the capacity to oversee and coordinate activities across a diverse range of topics and actors,
- is acceptable to the R, D & D community, in particular the academic and engineering institutions,
- has the necessary attributes to assist in leveraging public and private funding and
- has adequate resources to fulfil its mandate.

- 3.3 The Department is considering the following options:

1. Establish a R, D & D coordination function within the Department to liaise with existing bodies carrying out research. This would require additional financial and human resources within the Department.
2. Establish an energy research coordination council, served by a small secretariat, which would meet on a quarterly basis to identify needs and priorities in energy research, set a balance between short-term or responsive research and long term opportunities and which would arrange the coordination of projects on a domestic level as well as ensuring that Ireland's position is represented on an EU and international basis.
3. Establish an energy research agency or institute with the ability to disburse funding and co-ordinate R, D & D in the energy sector. The establishment of such an agency would require further consideration of a policy remit, taking particular account of the existing remit of Sustainable Energy Ireland (SEI). In all likelihood primary legislation would be required to give such a body a sound statutory foundation.

- 3.4 We wish to see a light-handed approach adopted to any institutional arrangements and, bearing in mind the administrative burden involved, have a preference for avoiding the necessity to establish a statutory body. The Department favours an energy research council (option 2 above), as it would be possible to put such a structure in place quickly and

effectively and because the Department believes that the emphasis should be on the coordinating role of such a body which would require periodic active participation from the stakeholders involved. This is a function which can be carried out without the need for a new dedicated State body.

- 3.5 If this option was to be pursued, the question of how best to service such a body arises. The logical option is to assign responsibility to an existing body with a R, D & D focus - for instance, SEI³ and Science Foundation Ireland (SFI)⁴, are both existing bodies with a R, D & D remit. The Department is conscious that SEI's R, D & D mandate is aimed at the sustainable energy agenda and that a wider focus might be necessary to capture the full benefits of a coordinated and streamlined energy R D & D sector. The option of positioning energy R, D & D under the aegis of SFI, if available, could be attractive to interested parties and possibly to SFI itself. The Department is open to considering opportunities for other existing agencies to engage in this area.
- 3.6 It will be necessary to maintain an appropriate balance between technical and policy research. While energy policy research is currently carried out mainly by the ESRI, the Department considers that there is sufficient synergy to bring all aspects of energy R, D & D under a single coordinating body.

The Department has expressed a preference for the approach to be adopted but is interested in the views of stakeholders.

4. All Island Perspective

- 4.1 The Development Framework for an All Island Energy Market⁵ published by Minister Noel Dempsey TD and Minister Barry Gardiner MP sets out the commitment of both Governments to the creation of an All-island Energy Market. The development programme identifies cooperation on energy research and innovation as one of the strategic goals and envisages the possible establishment of a formal mechanism to progress such cooperation.
- 4.2 The Department considers it desirable that collaboration on an all-island basis in energy R, D & D programmes would support the development and consolidation of an all-island energy market. Collaboration in terms of research resources or coordination of effort will improve the effectiveness of effort and outcomes

The Department is particularly interested in the views of stakeholders in Northern Ireland on the strategic goal of cooperation on energy R, D & D on an all-island basis and how the goal could be addressed most effectively.

³ http://www.sei.ie/content/content.asp?section_id=540&language_id=1

⁴ http://www.sfi.ie/content/content.asp?section_id=207&language_id=1

⁵ http://www.dcmnr.gov.ie/media/files/energy/All_island_Energy_Market_Development_Framework.pdf,

5. EU Perspective

5.1 The European Commission communication on future European Union policy to support research⁶ introduced its proposals for strengthening research and development on a European basis saying

- Scientific research, technological development and innovation are at the heart of the knowledge-based economy, a key factor in growth, the competitiveness of companies and employment.
- In this context, to attain the Lisbon Agenda objectives, increasing research efforts at the overall European level is indispensable.

5.1 The Department is conscious that an important facet to the development of policy in R, D & D lies in collaboration and exerting influence at the European level. Energy participation from the Irish perspective in the previous Framework Programmes has been less effective than might have been the case.

5.2 A public consultation process is currently being conducted by the Irish Council for Science, Technology and Innovation⁷ in relation to FP7. It is therefore timely for us to consider how best to maximise the benefit of Framework Programme funding for energy R, D & D and enhance our ability to influence EU policy developments and decisions which bear on energy R, D & D.

Due to the timeframe for Framework Programme 7, the Department is interested in views on this topic in advance of general responses to the other points raised in this paper.

6. Links with Environment

6.1 Reference has already been made to the increasing importance of environmental factors in the energy sector. The Department is conscious that there may be certain elements of energy-related environmental R, D & D which would benefit from closer co-ordination with mainstream energy projects.

6.2 In this context, the Department is holding open the option of including some elements of environmental research in the energy R, D & D arena, seeking to capture any synergies which may be available.

The Department welcomes any views on the energy/environment interface from a R, D & D perspective.

⁶ *Science and Technology, the key to Europe's future – Guidelines for future European Union policy to support research* (COM(2004) 353 final) http://europa.eu.int/eur-lex/en/com/cnc/2004/com2004_0353en01.pdf

⁷ <http://www.forfas.ie/icsti/fp7/>

7. Long-term vs. short-term goals

- 7.1 The Department considers that, with notable exceptions, much of the current R, D & D is in response to short term or immediate information requirements. While it will always be necessary to commission research to solve today's problems, it is essential that a structure be put in place to facilitate the development of proper institutional and funding arrangements for longer-term research and innovation.
- 7.2 This approach should enable foreseen research requirements to be met as well as building a base to create possible economic opportunities in the energy and environmental sector for Ireland in the long run. In this context, the Department recognises the importance of certainty of funding for long term research projects and the need to develop sufficient capacity and capability through the education system.

The Department invites views on the short term/long term balance and the role which R, D & D might play in positioning the energy sector to meet future challenges.

8. Funding

- 8.1 While SEI has a specific budget line allocated to renewable energy, funding of R, D & D in the broader energy area from the State sector's point of view could be described as haphazard, and certainly does not compare well with the marine, forestry, biotech or ICT sectors. The Department is aware that State bodies commission research to meet ad hoc needs and considers that there is scope for organising this in a better way. Of particular concern is whether an appropriate competitive approach is brought to bear on opportunities for energy R, D & D. While the existing State Agencies use competitive processes, we consider that more strategic co-ordination and innovative competitive processes are required to establish and maintain appropriate capacity.
- 8.2 The question also arises whether the State should be directly devoting public funding to research in this area, in addition to funds already in play from State agencies. It is recognised that long range research requires the kind of continuous investment which can usually be provided by the State. However, the Department considers that funding from the public and private sector should be combined – ultimately the benefit of the commercialisation of new technologies pays dividends to both sectors. It is necessary also to consider appropriate arrangements for the intellectual property rights arising from research.

- 8.3 The Department is aware of the importance of privately funded R, D & D, and acknowledges that some of this work is primarily devoted to gaining competitive advantage for the investors involved. The Department considers that there are synergies to be captured in common aims between the public and private sector, and that more efficient and effective outcomes could be achieved by combined effort and coordination of public and private sector funding of energy R, D & D.

The Department welcomes views from stakeholders on the measures that could influence better coordination between public and private funding of energy R, D & D.

9. Capacity Building

- 9.1 Appropriate research capacity and activity in third level institutions is a critical component for sustainable R, D & D in the energy sector and for the supply of appropriate skills into the sector. Concern has been expressed by some stakeholders that a scarcity of top quality post-graduate opportunities, particularly in electrical engineering, may be a limiting factor. This has wider implications for the education and training supply chain.
- 9.2 The Department is conscious that the ability to innovate depends on our ability to attract and retain graduates with the interest and capability to carry out R, D & D across a diverse range of disciplines and recognises that it is necessary to ensure that the critical mass of capacity to carry out appropriate R, D & D is available and appropriately supported in the short to medium term.
- 9.3 This implies a need to focus on the potential to improve the profile of appropriate skills at secondary level, ensure that sufficient numbers enter the supply chain and ensure that standards of teaching reflect state of the art knowledge in the sector. We are also aware that capacity to demonstrate innovative energy technologies is necessary on the path to commercial operability and that points to the need to ensure that there is also a supply of appropriate non-academic skills in the energy sector.

The Department invites views on what steps can be taken to improve and expand the critical mass of the R, D & D community building capacity to meet future needs and any other issues which arise about necessary skills in the energy sector.

10. Conclusion

- 10.1 Views and reactions are sought to this paper (including Appendix I). Written responses, preferably in electronic form, should be submitted by **Friday 20th May 2005** to:

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- 10.2 The Department is considering holding a public seminar to discuss the background and material in this paper and present a summary review of the inputs to the consultation paper, facilitating a sharing of views and experiences by stakeholders. Expressions of interest in attending such a seminar are also invited.