



UKERC

EVIDENCE TO THE STERN REVIEW ON THE ECONOMICS OF CLIMATE CHANGE

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UK Energy Research Centre

Introduction

1. The UK Energy Research Centre welcomes this opportunity to provide input to the Stern Review on the Economics of Climate Change.
2. The Centre was established in 2004 following a recommendation from the 2002 review of energy initiated by Sir David King, the UK Government's Chief Scientific Advisor. It is funded by three research councils: the Engineering and Physical Sciences Research Council (EPSRC), the Natural Environment Research Council (NERC) and the Economic and Social Research Council (ESRC). We take a co-ordinated and collaborative approach to national and international energy research, and through our own interdisciplinary research activities, we intend to provide the knowledge needed to work towards a sustainable energy system and realise UK energy policy goals.
3. We are a distributed Centre operated by a consortium of eight universities and research institutions. Our work is relevant to items 1 and 4 of the Review Terms of Reference, i.e.
 - The implications for energy demand and emissions of the prospects for economic growth over the coming decades, including the composition and energy intensity of growth in developed and developing countries; and
 - The impact and effectiveness of national and international policies and arrangements in reducing net emissions in a cost-effective way and promoting a dynamic, equitable and sustainable global economy, including distributional effects and impacts on incentives for investment in cleaner technologies
4. Four of our research themes are undertaking research relevant to the Review. These are:
 - *Energy Systems and Modelling*, operated by the Policy Studies Institute
 - *Demand Reduction*, operated by the Environmental Change Institute, Oxford University
 - *Energy Infrastructure and supply*, operated by the University of Manchester and Warwick Business School
 - *Future Sources of Energy*, operated by the University of Edinburgh
5. In addition, Imperial College Centre for Energy Policy and Technology (ICEPT) operates for us a Technology and Policy Assessment function which aims to synthesise existing research evidence to cast light on difficult or controversial issues within the energy domain. The philosophy underlying the Technology and Policy Assessment function is very much aligned with the spirit of the Stern Review.
6. Detailed information about the Centre can be found at our website www.ukerc.ac.uk

UKERC and the Provision of Evidence

7. As UKERC itself is little over a year old, we have little in the way of evidence that can be presented directly as the result of UKERC research activity. However, we can offer three types of input

Evidence Based on Previous Research

8. First, those associated with the Centre have substantial track records in energy research. Three of the groups associated with the Centre have submitted evidence based on work carried out prior to and during the establishment of the Centre.
9. Professor Paul Ekins of the Policy Studies Institute is submitting evidence on the use of energy modelling techniques, specifically the MARKAL modelling system, to estimate the system-wide costs of reducing carbon dioxide emissions.
10. Dr Brenda Boardman and colleagues at the Environmental Change Institute are submitting evidence on the use of economic instruments to curb aviation emissions.
11. Rob Gross of the Imperial College Centre for Energy Policy and Technology and Terry Barker of Cambridge University are submitting evidence on the role of innovation in reducing the costs of carbon abatement.
12. We would commend each of these pieces of evidence to you.

Emerging Evidence

13. UKERC's first research outputs will begin to emerge in the first quarter of 2006. A number of these are highly relevant to the Review and may therefore be of interest to the Review Team. These include:
14. The first Technology and Policy Assessment report on the costs associated with adding intermittent renewable generation sources to the electricity system. This assessment is covering all the relevant UK work as well as key studies from European and further afield. It will highlight the importance of local and regional context in determining the cost of carbon reduction through the deployment of renewable technologies. This report will be published in early March 2006.
15. The second Technology and Policy Assessment project addresses the so-called energy efficiency rebound effect (the Brookes- Khazzoom effect) whereby energy efficiency may

reduce the cost and hence increase demand for energy services, or increase energy demand through income effects. The advisory group for the project has recommended that the work focuses on macro-economic aspects. It will hence be relevant to items 1 and 4 of the Terms of Reference. This work will be published in September 2006 but draft reports will be available from early summer.

16. Technology and Policy Assessment makes use of consultative workshops and we would be delighted if members of the Review Team were able to attend.
17. Under our Energy Systems and Modelling theme, the first UK application of the MARKAL-MACRO model will be developed by Spring 2006. This will enable the cost of carbon reduction measures to be estimated taking account of impacts at the macro-economic level. The development of this tool is being supported by DTI and DEFRA. Further expansions of the basic MARKAL model will take account of demand elasticities for energy services and endogenous technical change. Scenarios developed using these variants of the MARKAL model should be available by summer 2006.

Accessing the Energy Research Community

18. UKERC has been charged with creating an Energy Research Atlas which will provide a comprehensive account of energy research activities and capabilities in the UK. A first draft will be available on-line in April 2006. Should the Review Team wish to access the research communities and insights covered by the Atlas we would be glad to facilitate and identify competences.
19. UKERC also runs a "Research Hotel" activity at its Meeting Place in Oxford. A regular series of workshops and seminars takes place there. Should the Review Team find it helpful to meet with representatives of the research community in a structured way, we would be glad to offer both the physical facilities and the organisational resources associated with the Meeting Place.

Conclusions

20. We regret that our work programme is not 12 months more advanced. Were this the case, we would have had much more to offer the Stern Review in terms of direct evidence. Nevertheless, we hope that this short input has signalled ways in which UKERC could engage constructively and helpfully with the Review over the coming months.

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