Memorandum on ***Public Attitudes and Nuclear Power*** *submitted to the* ***House of Lords Science and Technology Committee*** Inquiry on **'Nuclear R&D Capabilities'.**
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BACKGROUND

1. The Committee's call for evidence requests commentary on UK 'Science and Technology' research capabilities in the light of the current government's policy to bring forward nuclear new build. Given the history of this industry it would be a mistake to overlook the very many social science questions which will bear upon any new build nuclear programme and associated nuclear waste issues. These include the public acceptability of risk, impacts upon trust and confidence in science, community engagement and equity issues, governance questions, international relations and proliferation, media handling etc. It is beyond the scope of this note to outline a complete set of research questions here – but suffice it to say they are extensive and touch upon almost all of the traditional social sciences.

2. Our own research in the Understanding Risk research group at Cardiff[1] is concerned with public responses to environmental and technological risk controversies. The work is independent of stakeholders, and funded through grants from the Leverhulme Trust, the Economic and Social Research Council, the UK Energy Research Centre, the Welsh Government, and the US National Science Foundation. We have particular expertise in public attitudes, public participation with, and the governance of climate change and energy systems.

3. Regarding nuclear the group has built up a unique empirical data set over the past 10 years through studies of British public(s) responses to nuclear energy, summarised as follows.

    - 3 major National Surveys conducted for us by Ipsos-Mori in 2002, 2005 and 2010.
    - Parallel qualitative studies (the earliest in 2002) of how the public talk about nuclear power in relation to climate change and energy security concerns.
    - A major ESRC mixed-methods study from 2003-2008 of communities 'Living with Nuclear Risk' around the Bradwell, Oldbury, and Hinkley Point stations.
    - A current project (2011-2012) for RCUK's UK Energy Research Centre investigating public acceptability of whole energy system change through to 2050 – of which new nuclear acceptability is one prominent aspect.

    Most of our early work commenced in 'blue skies' mode, but its policy relevance has risen with time. We are the only social sciences centre in the UK to have studied this issue empirically and theoretically over the past 10 years.

NATIONAL ATTITUDES TO NUCLEAR POWER

4. It is worth noting that there is much valuable learning regarding societal responses to nuclear power from studies conducted during the 70s and 80s. That research shows how

[1] Details of the *Understanding Risk* research programme and a number of the key policy and survey reports may be found at: www.understanding-risk.org

the risks of nuclear power are almost unique in their capacity to instil public concern. Worries about major accidents and radioactive waste storage, the invisible effects of radiation, and distrust brought on by the early secrecy and hubris of the nuclear industry, all combined to stigmatise civilian nuclear power.[2] One impact of the ensuing public pressure, alongside economic factors, was a failure of the nuclear industry to expand further after the 1980s.

5. The past 10 years has shown a gradual reversal in fortunes for the industry. Opinion polling indicates a reduction in opposition amongst the public in Britain over that period[3], as compared to the very high levels of opposition (up to 80%) reached after Chernobyl in 1986. In nationwide polling conducted in early 2010 we found a very balanced picture, with 46% of those questioned favouring replacement or expansion of the existing nuclear capacity in Britain as compared to 47% who wanted it closed or phased out at the end of the existing programme[4]. This softening in opposition in part reflects the arguments being advanced regarding nuclear power's possible contribution to combating climate change and to delivery of future energy security, but also the fading collective memory of earlier accidents such as Chernobyl.

6. A closer look at the national polling data shows a more complex picture, however, with a large proportion of recent national support remaining fragile – a conditional or 'reluctant acceptance' at best[5]. While many more in Britain have indeed come to support nuclear power over the past decade they do so while viewing it only as a 'devil's bargain', a choice of last resort in the face of the severe threat of climate change[6]. Given the choice individuals still show very clear preferences for renewable electricity generation.

LOCAL VIEWS IN NUCLEAR COMMUNITIES

7. The proposed new build sites are all at existing nuclear locations. What we know here is that the response of people in such communities does not always mirror that obtained from national samples. A common assumption is that people in these locations will be overwhelmingly positive about nuclear power, because of long-standing experience with the local station and local economic benefits. Once again, detailed research suggests a more complex picture and the need to look beyond headline statistics, with a wide range of views representing a diverse set of 'publics'.

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[2] See: Pidgeon, N.F. *et al* (1992). Risk perception. Ch 5 of *Risk Analysis, Perception and Management: Report of a Royal Society Study Group*, London, The Royal Society; also, Slovic, P. (2000) *The Perception of Risk*. London: Earthscan.

[3] Knight, R. (2009). *Public Attitudes to the Nuclear Industry*. London: Ipsos MORI; see also Grove-White, R., Kearnes, M., Macnaughten, P., & Wynne, B. (2006). Nuclear Futures: Assessing public attitudes to new nuclear power. *The Political Quarterly 77 (2)* 238-246.

[4] Spence, A., Venables, D., Pidgeon, N., Poortinga, W. and Demski, C., (2010b). *Public Perceptions of Climate Change and Energy Futures in Britain: Summary Findings of a Survey Conducted in January-March 2010*. Technical Report (Understanding Risk Working Paper 10-01). Cardiff: School of Psychology.

[5] Pidgeon, N.F., Lorenzoni, I. and Poortinga, W. (2008) Climate change or nuclear power - no thanks! A quantitative study of public perceptions and risk framing in Britain. *Global Environmental Change*, 18, 69-85; also Corner, A., Venables, D., Spence, A., Poortinga, W., Demski, C. and Pidgeon, N.F. (2011) Nuclear power, climate change and energy security: exploring British public attitudes, *Energy Policy*, in press.

[6] Bickerstaff, K., Lorenzoni, I., Pidgeon, N.F., Poortinga, W. and Simmons, P. (2008) Re-framing nuclear power in the UK energy debate: nuclear power, climate change mitigation and radioactive waste. *Public Understanding of Science*, 17, 145-169.

8. Geography certainly matters, as when a station contributes economically or in other ways to nearby communities, but not to others slightly further away who might also nevertheless perceive themselves to be at risk. The detailed history (for example of protest) and socio-economic location are also important in understanding current views. In this respect the existing UK sites vary enormously in social, economic and historical circumstance.

9. In our own interview research at Oldbury and Bradwell we found that many nearby local residents did express confidence in site activities. For most of the time people saw their existing local station as both a familiar and unremarkable feature of the locality, and confidence in plant activities had also built up over time. However, almost everybody we interviewed could also recount instances (news of the Chernobyl disaster, the London terrorist bombings, a friend being diagnosed with cancer) where the 'extraordinary' risks of nuclear power, and with this very real personal anxieties, had been brought home to them in a powerful way[7].

10. Members of local communities also express 'reluctant acceptance' In a questionnaire administered to residents around Oldbury and Hinkley Point in 2008 (n= 1,326) fully 40% saw drawbacks to nuclear power, but were prepared to accept it locally because of climate change and national energy needs[8].

11. Whatever their position on nuclear power, the vast majority of local people (84%) we surveyed in 2008 agreed that the industry and government should fully involve them in plans for siting new nuclear power stations locally. Many also had concerns about radioactive waste (77%).

12. We concluded that there remained the potential for polarization and conflict about nuclear new build in such communities, and with this a need for genuine and early dialogue between government, the industry and those affected.

IMPACTS OF THE FUKUSHIMA DISASTER

13. It is too early to judge the impacts of the Fukushima Disaster on public opinion in the UK nationally. Initial polling here and internationally has shown some decline in support, although not necessarily a reversal in all countries[9]. This may be due to a spatial distance effect and/or because the primary cause was an overwhelming natural disaster. Detailed empirical work with identical survey items and methodologies replicating previous studies is now needed to provide robust answers to this question.

14. The impacts on existing UK nuclear communities are likely to be very complex indeed. As argued above, anxieties always exist below the surface at such sites and external events such as Fukushima have the capability to bring them to the surface, and powerfully so, for many people. Dialogue and engagement with such communities is likely to become much more difficult – both practically and ethically - as a result. Again there is a clear need for further in-depth research with such communities, if properly framed and sensitively conducted.

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[7] Parkhill, K.A., Pidgeon, N.F., Henwood, K.L., Simmons, P. and Venables, D. (2010) From the familiar to the extraordinary: local residents' perceptions of risk when living with nuclear power in the UK. *Transactions of the Institute of British Geographers,* NS 35, 39-58.

[8] Pidgeon, N.F., Henwood, K.L., Parkhill, K.L, Venables, D. and Simmons, P (2008) Living with Nuclear Power in Britain: A Mixed Methods Study. Cardiff University School of Psychology; Understanding Risk Research Group.

[9] Views about Nuclear Energy in 47 Countries. WIN-Gallup International (March 21-April 10, 2011)

15. While the current policy focus is on the existing nuclear sites, the upper end expansion of UK nuclear power – to 38GW or more - would almost certainly require development at sites without any nuclear history. It is my personal opinion that the Fukushima events have made such development almost impossible in the short-term. The social and governance implications of attempting to site 'completely new nuclear' have received no attention to date, and yet some of the more ambitious nuclear scenarios appear to depend upon this.

CAPACITY IN THE SOCIAL SCIENCES

16. The UK is recognised as a world leader in the social studies of science and technology (STS) - sometimes also referred to as public understanding of science research. This is the natural home for work on societal aspects of nuclear power. This interdisciplinary field currently has important centres of excellence at Universities throughout the UK: including at Sussex (SPRU), London (UCL, LSE), Edinburgh, Cardiff, Lancaster, Durham, Oxford, and East Anglia.

17. The past 10 years have seen a general neglect of nuclear power within STS, I believe for three reasons. First, intellectual capacity in this field has been stretched as significant ESRC and other funding has been directed to other priority areas of technology policy: particularly in genomics, nanotechnologies, and climate change. Put simply, the relatively small pool of specialist researchers who could study social aspects of nuclear were presented with far more attractive funding opportunities elsewhere! Second, the apparent phasing out of nuclear power had given the mistaken perception that cutting-edge research and policy questions were few and far between with this topic. Third, many social scientists have traditionally taken a critical stance on nuclear power, and in particular on the institutional arrangements that it brings with it[10]. Hence many in this research community have been particularly wary of being seen to engage with attempts to revive the industry.

18. There is a challenge, then, to find mechanism through which to engage the considerable STS research capacity in the UK with the varied, often critical questions raised by new nuclear power.

19. One could also criticise past and ongoing RCUK energy investments for not mapping out more clearly the roles that the social sciences might play. Social scientists still suffer unintentional positioning as contributing a small add-on to the main engineering or natural science business (SUPERGEN is a good example) or as providers of communications support. A more considered approach in drawing the full range of social science challenges into the emerging nuclear energy research landscape is therefore warranted.

20. Work has progressed over this period to understand the politics and dynamics of nuclear waste (e.g. the *Waste of the World* project[11]), while social scientists were involved in the CORWM public engagement activities. A major RCUK Energy Programme network (InCLUSEV[12]) is also building capacity in equity and energy issues, with a work-stream dedicated to equity in the nuclear fuel cycle.

21. The UK also leads many nations in its capacity in public engagement with science and technology, as well as in attempts to link such engagement to policy. The House of Lords (2000) report on this topic was a key milestone and stimulus, while Sciencewise and the

[10] See e.g. Wynne, B. (1992) Risk and social learning. In Krimsy, S and Golding, eds. *Social Theories of Risk*. Praeger; or Welsh, I. (2000) *Mobilising Modernity: The Nuclear Moment*. London: Routledge.

[11] http://www.thewasteoftheworld.org/

[12] http://incluesev.kcl.ac.uk/

Research Councils have provided a range of funding opportunities. However, attention here has again focused on emerging rather than mature technologies[13] while some of the hard won UK consultancy capacity in this area may now be under threat because of government financial constraints.

22. The former Government did conduct a major nuclear public engagement exercise in 2007, but its methodology has been criticised by external commentators for an overly narrow framing of the issues[14].

COMMUNICATING RISK

23. Risk communication is now a very mature field of research and nuclear power and radioactive waste were again its paradigm case. The UK is again at the forefront of international activity in this field. The core lessons of this research are that: (a) to succeed such communication should encompass a dialogue rather than progress in a one-way fashion; (b) there is invariably no one public; (c) while it is important to 'get the numbers right'[15] communicating risk is about far more than this – enabling trust, exploring divergent values of varied public(s), meeting concerns about governance arrangements etc.; and (d) that the public are not irrational in their responses to risk but often concerned about wider matters. Above all (e) there is a need to continually evaluate the impacts of communications.

24. Many of the public and media statements about nuclear risk following Fukushima have failed to take account of these insights – simply preferring to contrast the very low numbers of on-site fatalities with the impacts of the Tsunami itself, or other hazards of life. Seen in such terms 'public reaction' is often then dismissed as 'illogical'[16]. To do so is mistaken.

25. Strategic capacity in risk communication is sorely lacking in the UK as elsewhere. Individual proposals for a risk information centre have been raised in the past (e.g. by the Hazards Forum) but there is no one entity in the UK dedicated to the research and communication of risk.

26. In a paper in *Nature Climate Change* with Baruch Fischhoff of Carnegie Mellon University we have argued for a strategic approach to climate risk communications[17]. As this argument is a generic one, applicable to many complex, uncertain and socially divisive risk issues, it applies equally well to nuclear risk communications as it does to climate change. We argue that the proper goal of risk communication is in supporting decisions – whether this be a government decision to proceed with nuclear power, or when local communities debate siting issues. What is communicated is then dictated by the requirements of the decision problem at hand.

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[13] See e.g. Pidgeon, N.F., Harthorn, B., Bryant, K. and Rogers-Hayden, T. (2009) Deliberating the risks of nanotechnology for energy and health applications in the US and UK. *Nature Nanotechnology*, Vol 4, Feb 2009, 95-98.

[14] Dorfman, P. ed (2008) *Nuclear Consultation: Public Trust in Government*. Nuclear Consultation Group.

[15] Fischhoff, B. Risk perception and communication unplugged: 20 years of process. *Risk Anal.*, 15,137-145 (1995).

[16] See e.g. Gilbert, D. (2011) Buried by bad decisions. *Nature*, V474, 275-277.

[17] Pidgeon, N.F and Fischhoff, B. (2011) The role of social and decision sciences in communicating uncertain climate risks. *Nature Climate Change*, 1, 35-41.

27. A strategic approach to risk communication comprises two elements: (1) strategic listening (an approach which treats communication as a genuine dialogue); and (2) strategic organisation. The range of skills needed in such an organisation would include natural scientists, decision scientists, social scientists and communications specialists, through to programme designers and evaluators. It should aim to meet basic research needs in risk and uncertainly analysis, risk perception, and risk communication as well as immediate policy goals – in effect operating as a 'boundary organisation' between academia and public policy[18]. It should be resourced so as to provide continuity of career progression for its scientists, alongside responsiveness to emerging risk communication needs. We suggest that good models for such an interdisciplinary boundary organisation might be the RAND Corporation (US), IIASA (Austria) or the Tyndall Centre (UK). If this seems challenging then we should not forget that risk communication has become central to a number of critical public policy issues, not just energy or climate change choices.

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[18] Guston, D.H. Boundary organizations in environmental policy and science: an introduction. *Sci. Tec. Hum. Values*, 26, 399-408 (2001)