EPSRC Responsible Innovation Workshop, April 30th 2010, University of Westminster: Summary

Delegates from academia, research councils, industry and beyond convened in London to review and discuss the results of a pilot study which aimed to operationally implement the concept of responsible innovation within EPSRC research funding activities. EPSRC is the largest public funder of innovation research in the UK, with an annual budget of approximately £800M per year across many sectors.

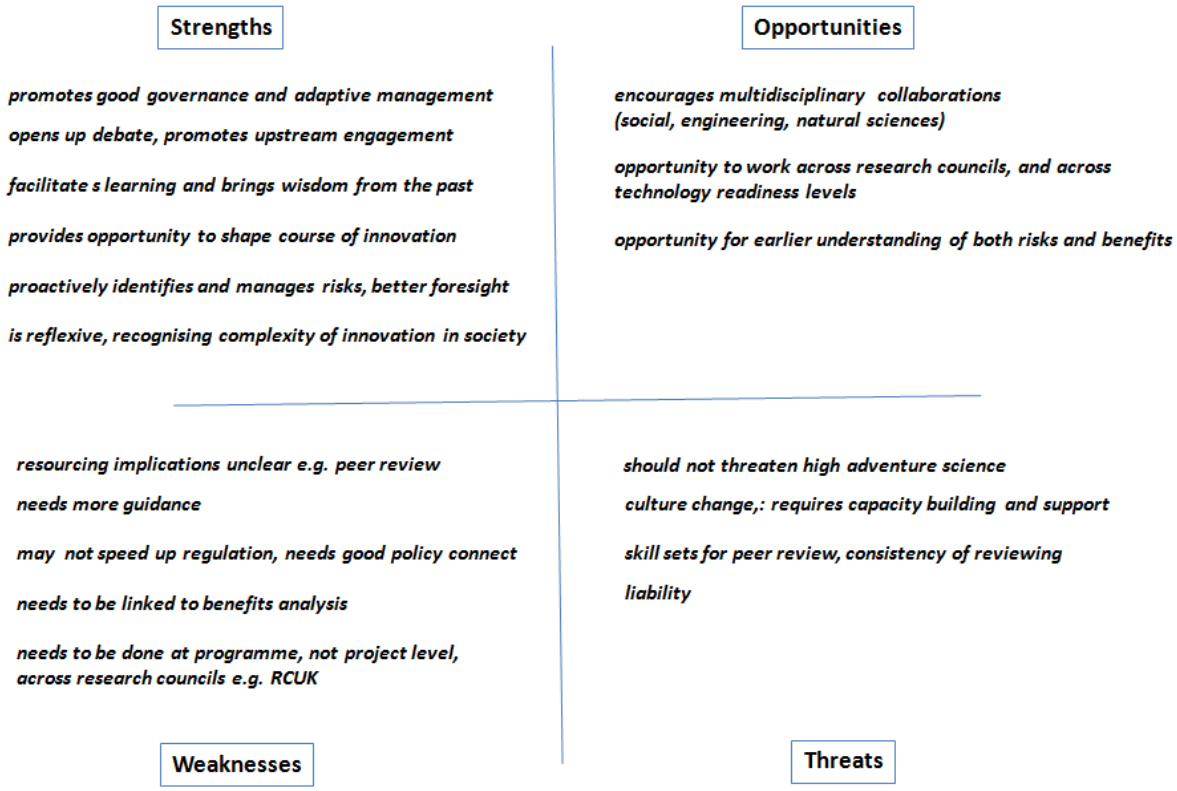
In the study, EPSRC included a specific section on responsible innovation within a major funding call (nanoscience for carbon capture and utilisation). As such, this was a call at the convergence of two emerging science and technology areas (nanoscience and geoengineering), both of which have been identified as having large uncertainties in terms of their potential wider impacts and associated risks. Within this call applicants were asked to consider the wider implications of their proposed research (on society, environment and health) and qualitatively assess the level of risk and uncertainty associated with potential impacts within the proposal itself. Applicants submitted a 'risk register' which was subsequently peer reviewed and considered by the funding panel as a secondary criterion. The objective was to equip both the applicants and research councils with tools to identify and manage wider risks associated with innovation in an upstream, proactive and participatory manner, building on recommendations made by the Royal Commission on Environmental Pollution in 2008 and the Royal Society and Royal Academy of Engineering in their 2004 Nanotechnologies report and the Royal Society 2009 Geoengineering report. ESRC stated they would make funds available for high quality social science embedded within the project proposals.

A presentation by Richard Owen highlighted the results of the study. This showed that risk registers were completed conservatively, focusing on researcher health impacts associated with nanomaterials synthesis, manipulation and prototype device manufacture: i.e. impacts that could be identified with a reasonable level of certainty. Few impacts on the environment and no societal impacts were identified. However, some of the applicants proposed additional activities that helped address the often unpredictable nature of disruptive innovation, proposing mechanisms to identify impacts as these emerged during the innovation process. These were intended to inform risk and benefit analysis and decisions about the trajectory of the innovation itself in an iterative way, promoting learning and adaptive management. Others went further to frame such 'technology assessment' approaches with engagement activities to understand how such impacts would be received and whether they were acceptable. Proposals that were underpinned by a strong commitment to responsible innovation were characterised by strong multidisciplinarity (engineering, natural and social sciences), deploying an integrated set of complementary tools (risk and benefits analysis, technology assessment, engagement) to inform the innovation process in a reflexive and participatory manner.

Delegates were asked to consider the **S**trengths, **W**eaknesses, **O**pportunities and **T**hreats associated with the approach, and in particular the risk register. These are summarised in Figure 1.

The approach was considered to present a number of strengths and opportunities to promote good governance, adaptive management and proactive identification of risks. It offered an opportunity to embed a reflexive learning process within innovation through multi disciplinary collaborations, presenting a mechanism for research councils to work together to develop early on a culture of responsible innovation. Delegates also felt it was important that it should consider benefits as well as risks, underpinning and not hindering high adventure science. As a culture change it would require some resourcing, capacity building and consistency (e.g. in peer review) and a clear link into policy development to support timely regulatory strategy development. An important consensus was that this approach should be done at programme, not project level, and involve other actors in addition to EPSRC, such as sister research councils, RCUK and the Technology Strategy Board.

Figure 1: Collated SWOT analysis of Responsible Innovation pilot with EPSRC



Two sessions then broadened the discussions to explore what tools could be deployed in addition to risk analysis as part of a complementary approach to responsible innovation within multidisciplinary proposals. Malcolm Eames made a presentation describing the technology assessment approach in its various forms, emphasising its potential to promote interdisciplinary analysis and stakeholder engagement, enhance reflexivity and societal learning and enable feedback and modulation of innovation pathways. An open plenary session then considered how engagement approaches could be best deployed as part of a complementary approach. The delegates were asked to consider how such tools (risk analysis, technology assessment, engagement) could be embedded within future funding calls (e.g. on geoengineering if this occurred) in a practical way. A number of approaches were discussed, including one where core innovation projects were followed 6 months later by a cross cutting and interlinked project whose membership would incorporate people from the core innovation projects and others from a multidisciplinary background and whose outputs would include engagement, technology assessment, benefits and risk assessment. A key message from this session was that this was as much about science as it was about innovation.

Delegates were finally asked whether this approach, with necessary modification, was worth pursuing further with EPSRC and others. There was general agreement that it was moving in the right direction, but that there were a number of outstanding areas that needed addressing. Principle amongst these was the need for the approach to be extended beyond EPSRC as a cross council activity working with others such as TSB. Others also felt there were considerations of scale (project vs programme),proportionality (i.e. ensuring creativity was not

hindered but supported through the approach), monitoring and evaluation and peer review that needed further thought.