

## **David Eyton, Group Head of Technology, BP**

### **Speech at The Foundation for Science and Technology Debate on Making Science Work held at The Royal Society on 20th June 2012**

#### **Speaking Notes**

Thank you Sir Paul and to the Foundation for Science and Technology for inviting me to respond.

Let me first say that BP has a vested interest in the success of the UK's research and higher education systems, particularly in STEM subjects. We conduct over 40% of our global research and development here, approaching £0.5bn pa. We have three out of seven major research facilities here - in Hull, Pangbourne and Sunbury. And if anything the percentage is increasing. So we care deeply about the health of UK science.

#### **How science works in BP**

In BP we define technology as the "practical application of science to manage risk, capture business value and inform strategy".

So as head of Technology in BP "making science work" is what I do - or as Sir Paul put it I am the cat herder - and there are I believe some parallels to making science work in the UK.

There are four components to BP's technology strategy:-

1. strategic alignment: we need to both inform and be informed by business strategy. Improving the safety and reliability of our operations is the first priority for every technology organisation, after which we need to compete in our chosen sectors. If our competitors are out-spending us by a significant amount then there is a risk that we will be for ever playing catch-up.
2. collaborative organisation: technology needs to be multidisciplinary and intimate with the businesses, so we have a decentralised organisation model. Applied technology is largely relevant to a single business, but science does not recognise organisational boundaries, and the brightest minds need to be able to turn their attention on the biggest problems.
3. sustainable capability: we need access to the brightest minds and the best facilities. We cannot house all of this inside BP (we don't use synchrotrons that often) and indeed roughly half of our technology expenditure is with third parties. But we do need sufficient internal capability to manage collaborations with universities and joint venture partners, undertake commercially sensitive development work and respond to the unexpected, which is in some ways when a technology organisation really comes into its own, as we saw in 2010.
4. technology management: we need a common language and process for the evaluation of R&D proposals, putting into practice lessons learned from past successes and failures, and space for independent challenge. That way we can translate ideas into practical application.

#### **UK parallels**

Given the way technology works in BP, what parallels might one draw for the UK?

- Is the level of R&D spend in the UK competitive? I could not agree more with Sir Paul when he said in his Richard Dimbleby lecture "In the future we will not be able to compete on the world stage with low labour costs or by exploiting vast reserves of mineral resources. We will have to compete with our brains and with our science". And I worry about the longer term consequences of university fees, flat nominal budgets and limitations on capital for infrastructure.
- Do we have the right balance between competition and collaboration in the research base in the UK?
- Are we still attracting the brightest minds and giving them access to the best infrastructure? Or we making it increasingly difficult for the best scientists to come here?

- Is there an appropriate strategic process in the UK which directs R&D investment and supports innovation?

### **Understanding the UK innovation landscape**

Together with Shirley Pearce, I am co-chairing the CIHE's task force on enhancing the value of UK research. We have published our first interim report, are about to publish the second and plan to issue our final report in September. Without wishing to pre-judge the outcome, I offer my own sense of the work to date:-

- Research is a competitive, global activity. It is in danger of becoming too fragmented in the UK.
- The UK's research system is both open and excellent, as evidenced by inward investment; the risks are that (a) this investment could go elsewhere as the UK's proportion of global R&D declines or (b) the UK could increasingly be viewed as providing a higher education and research service 'at cost' to the world. Developing countries are capturing market share.
- Large international companies account for the majority of the UK's business research and have the capacity to interface effectively with UK universities and funding organisations. These same companies choose where to invest where they can find the best people, leveraging national research expenditures and infrastructure. Smaller companies account for a small fraction of R&D and often struggle to leverage the university and funding systems
- Commercialisation of research is one of many ways in which value is created and it is inherently risky. Large companies are practiced at this and have the ability to manage the whole innovation pipeline and portfolio, working with public research institutions – failures occur regularly and are to be expected. Smaller companies have fewer resources and a narrower portfolio, making failure terminal, and success more dramatic.
- The impact of publically funded research is difficult to quantify, but consistently assessed as strongly positive. Innovation pathways vary by industry sector depending on for example 'clock speed', industry structure and significance of IP.
- The absence of an industrial strategy has arguably resulted in offshoring of manufacturing, fewer opportunities for local leverage of the research base and a lack of strategic prioritisation of public research funding
- Despite having a vibrant financial services industry in the UK, UK inventions often end up being funded by overseas businesses

### **What might be missing?**

1. Confidence in the value of public research, as a sustainable basis for the UK's success on a global stage, and hence the trajectory of public R&D.
2. An industrial strategy, based on greater intimacy between government, academia and business. This could result in policies targeted by sectors and company size, in order to increase UK value-added.
3. A broader notion of impact when assessing research excellence - Sir Paul mentioned quality and passion here to which I would add connections.
4. Less energy going into competing for scarce government funds and more in collaborating to compete for larger programmes and global funds
5. Encouraging the financial services sector to turn its considerable firepower on the financing of research infrastructure and SMEs.