

# ABSTRACTS

## **Ian Diamond (University of Aberdeen)**

*From Research to Societal Benefit (A Personal View)*

In the past two decades the importance of how to maximise the 'impact' of research has been an important question in UK science policy. Governments investing in research from the public purse do so not only in the curiosity driven pursuit of knowledge but because of the long term societal benefit. This lecture will first summarise the various forms in which impact can take place across the very wide spectrum of the research base. In particular it will contrast the linear model appropriate for some natural sciences with the more iterative approach common in the social sciences. The lecture will then move to discuss a number of strategies used in the UK to encourage researchers and the institutions in which they work to take on the challenge of maximising the impact of both individual research projects and the cumulative knowledge of research undertaken over a period of time. I will conclude with a personal view of future challenges for the research base in justifying continued large investment of public funds in research.

## **William Brinkman (Director, Office of Science, Department of Energy, USA)**

*Balancing Basic and Applied Research*

The government of the United States has a clearly defined role in supporting basic research in science as it is unlikely that industry will do so. The issue always is how far the government should go in applied research and encouraging private industry. The U.S. Department of Energy has taken the view that encouraging new technologies in the energy sector that will reduce our dependence on fossil fuels is one of the legitimate activities of government, since an essentially new industry must be created. The department places grants and contracts with industry and has an extensive loan program that has encouraged the solar and wind industries. We have created an applied organization that attempts to take possible applications of research further toward real products. We have also created what we call 'hubs' that pull together a large number of researchers to focus on specific possible new technologies.

At the same time we have retained our commitment to basic research in the various fields of physical sciences that we traditionally have funded. Keeping a balance between these has been one of the issues that we have had to continuously monitor.

## **Mariana Mazzucato (University of Sussex)**

*The Entrepreneurial State: moving beyond 'digging ditches' and fixing market failures*

The talk will argue that the role of the state in innovation is still misunderstood. Its role goes beyond fixing 'market failures' or providing the 'framework' conditions for innovation to happen in the market. Guided, mission oriented, state

investments have been the catalyst for some of the most important and radical innovations. Examples include DARPA's funding of the internet, the public funds behind both the biotech and nanotech revolutions, and the role of State development banks in 'pushing rather than 'nudging' the green revolution today. In all these cases it has been the state's courageous vision, 'patient' capital, and willingness to support innovation from concept to commercialisation that has allowed some of the most important innovations to occur. This is not just about 'basic' or upstream research: without the 'applied' research in National Institutes of Health (NIH) labs, or the public venture capital and equity investments from public agencies that have benefitted some of the most innovative firms (eg SITRA's funding of Nokia in Finland, or the SBIC's funding of Apple Computers in the US), investment and innovation would stop in 'death valley' – when the private finance, interested in quick returns, shies away. Lessons from these experiences are important. They force the post-crisis recovery debate to go beyond the role of the state in simply stimulating demand, or the fear of 'picking winners' in industrial policy. Instead it is a case for targeted, proactive, entrepreneurial state investments, able to take risks, creating a highly networked system of actors harnessing the best of the private sector for the national good over a medium- to long-term horizon. But equally, it requires more explicit thinking about how to make sure the state can reap a return, beyond taxes (often avoided), for its risk taking, otherwise, in innovation like in finance we end up with socialization of risk and privatization of rewards – dysfunctional capitalism. The talk will thus end with some thoughts of how the return from innovation can be better appropriated making the innovation cycle more equitable and sustainable.

### **Hans Müller Pedersen (Danish Agency for Science, Technology, and Innovation)**

#### *Knowledge and growth*

In recent years, the overriding development in Danish knowledge policies has been towards an integration of higher education, research and innovation into one political area that is expected to deliver not only in terms of cultural development and new technologies, but also in terms of economic growth. The overall political ambition is to create one coherent triangle (education, research, innovation) innovation system with the three points in the triangle cooperating in order to create a society with the knowledge and creativity needed to compete in a globalized world.

In his presentation, Hans Müller Pedersen will give a short introduction to the historical background and current trends in Danish science and innovation policies. An overview of the Danish research and innovation system will also be presented, as will the funding system and the advancements in both public and private funding of research and innovation in the past decade. On the basis of reforms in the university system, the universities' role in the knowledge triangle will also be touched upon.

The Danish government will launch a national innovation strategy in 2012 that will present a new shift of focus in innovation policies. Denmark scores highly in international innovation and research scoreboards. The transformation of knowledge into growth is, however, not an easy or straight forward process. A recent international evaluation of the Danish innovation system highlighted a number of attention points. Among the ideas in the strategy are a more challenge based approach, a new role for the public sector in innovation processes as well as better clarity in the funding systems – all with the purpose of supporting a better transformation of education and research into innovative capacity.

### **Henning Kagermann (German National Academy of Science and Engineering)**

*'Sustainable Growth through Research and Innovation'*

Innovation is widely accepted as a crucial driver of economic growth and social welfare. Industrialized and emerging countries equally rely on innovation to compete in world markets and improve the living conditions of the people.

Innovations are also an integral part of national strategies to tackle the grand global challenges, such as climate change, scarcity of resources, food security, and the global convergence of ICT. As an ever increasing knowledge base becomes more and more globally accessible, we needed to think of new ways to unleash related innovation potentials.

The lecture entitled: 'Sustainable Growth through Research and Innovation' will give an overview about the German Innovation System and deep insights into the work of and the National Academy of Science. Additional, some best practice examples will be presented:

1. The 'Innovation Dialogue' between the German Federal Government, business and science, initiated by Chancellor Angela Merkel
2. Germany's 'National Platform for Electromobility', a network with members from all societal parties
3. The 'Industry 4.0' future target project as one example the High-level advisory group for the Federal Ministry of Research & Education prioritises in order to implement and to advance the National High-Tech Strategy 2020
4. The alignment of national ICT innovation ICT programs with EIT ICT Labs, the knowledge and innovation community of the European Institute of Innovation and Technology (EIT).

### **Barry Halliwell (National University of Singapore)**

*What is a University for: The Singapore example*

The National University of Singapore (NUS) is a large and complex University that over a short period has risen rapidly up the ranks of leading research-intensive Universities. In general, research is Principal Investigator-driven and bottom up, but the research funding landscape in Singapore is swiftly changing to favour more 'top-down' research of immediate economic applicability. Indeed, we face increasing demands to justify what we do to public, donors and politicians. The research philosophy, organisation and assessment of research at NUS will be discussed in the context of its national role and the constraints facing Singapore as a country, and the need to find the 'correct' balance between blue skies ('not yet applied') and applied research in Singapore.