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CaSE
Campaign for Science and Engineering

CaSE response to the Lords inquiry on Scientific Infrastructure

21st November 2013

The following is CaSE's full response to the House of Lords Science and Technology Committee report on scientific infrastructure – submitted June 2013.

What role should the Government play in ensuring that there is an effective long-term strategy for meeting future scientific infrastructure needs?

A long-term strategy for meeting future infrastructure needs must be underpinned by a scientific infrastructure roadmap and accompanied by a long-term funding commitment. Such a roadmap will include the case for well-argued large facilities, in addition to the maintenance and upgrade of existing facilities and provision for international collaborations.

It is important that such a roadmap forms part of a broader strategy for research in the UK which delivers the development of a skilled workforce, sustains our world-leading universities, attracts Industries from all over the world and builds a diverse and sustainable innovation ecosystem. A framework for the UK's long term strategic interests in science and research sign-posts the UK's interests to business, charity and overseas investors.

Since the last Comprehensive Spending Review, a series of additional announcements have been made on investment in scientific infrastructure. How were the decisions on investment reached and what have been the impacts of this approach to funding scientific infrastructure?

Since the last Comprehensive Spending Review (SR10), a number of additional announcements have been made:

Project	Amount (£m)	Announced in
Large Facilities Capital Fund, UKSA and science campuses	100	Budget 2011
National Graphene Institute	50	October 2011
High performance computing	145	October 2011
Science funding including large facilities capital	175	November 2011
UK Research Partnership Investment Fund	100	Budget 2012
UK Research Partnership Investment Fund	200	October 2012
Additional European Space Agency contribution	120	November 2012
Additional Research Council capital funding	464	December 2012
Total	1354	

Following SR10, CaSE calculated that the Research Base Budget was facing a shortfall of close to £1.7bn. These additional announcements have reduced this shortfall in research capital to just over £300m.

There has not been a clear strategy behind these additional commitments with some appearing to be politically motivated – for example, the announcement of the additional funding for Graphene was made at the Conservative Party Conference in 2011. This shift towards allocating capital in media-friendly "announce-ables" has resulted in less funds being available for much-needed upgrades and ongoing maintenance and puts pressure for the Research Councils to spend money as it comes available, rather than strategically. It's crucial that funding decisions are made primarily on the basis of scientific merit and potential impact.

What impact has removing capital spend from the ring-fenced budget had on investment in scientific infrastructure and should the ring-fenced science budget be redefined to include an element of capital spend?

Following the 2010 Spending Review (SR10) and the subsequent Science Budget Allocations, capital spending on research was expected to total £1.9bn over four years. The removal of capital from the protection of the science budget's ring-fence resulted in exposure to deep cuts of over 45% – a flat-cash settlement for capital would have been a total of £3.5bn. In particular, the Research Councils were allocated £802m over the spending review period – a 49% reduction on what a flat-cash settlement of £1.57bn would have been.

In addition to the impact of extensive budget cuts, the Research Base Budget is also eroded by inflation. CaSE estimates that this will be approximately 12 per cent – or £660m – over the course of this Spending Review period.

In 2011, using figures obtained under the Freedom of Information Act, CaSE was able to demonstrate the impact of such cuts. A lack of £3m/year to pay electricity and other running costs at the Isis neutron source had forced the lab into part-time dormancy with scientists only able to use the facility for 120 rather than the anticipated 180 days that year. This is clearly very inefficient having already spent £400m building the world-class laboratory.

CaSE is calling for research capital to be re-included in the ring-fenced science budget to ensure that decisions can be made strategically and that the levels of funding available for research capital are, at least, in line with the rest of the science budget.

If the current funding level is maintained or reduced, what would be the longer term impacts on scientific infrastructure in the UK?

An increase in the current level of funding would bring positive impacts in both the short and long term. At present, many of our large facilities are underfunded and not running at full capacity.

OCTOPUS and ULTRA, two active Laser Labs at the Central Laser Facility (CLF) currently deliver approximately 50 weeks of user access each year. This is significantly below the capacity of the facilities – the major limitation being availability of funding for support staff. The result is that only one Octopus and one Ultra station can be operated at a time, operating at only 20 and 30 per cent of their capacity respectively. Full capacity could be achieved for both facilities by increasing resource spending by approximately 20 per cent. Even operating at partial capacity, use of these facilities have

provided access to 51 different user groups and supported 67 research grants with a total value of £46.8m.

To what extent do funding structures in the UK help or hinder involvement in EU and international projects, and should the level of UK involvement be improved?

In order to maximise the value of the UK of involvement in EU and international projects, it's important to ensure that we enter at an early stage to influence development. Recently, we have missed opportunities by entering collaboration at too late a stage to effectively influence a facility's design to our advantage. The European Free Electron Laser and European Spallation Source are two examples.

We must ensure that funding structures are sufficiently nimble so as to allow early engagement to deliver the greatest return on investments in international projects. CERN demonstrates that we can have the capability needed.

What impact does publicly funded scientific infrastructure have in terms of supporting innovation and stimulating the UK's economy?

Publicly-funded scientific infrastructure is one of the ways in which the research base levers additional investment from other sectors to the benefit of the UK economy. Investment in large facilities can influence private sector decisions about where to invest and where to locate. In particular, SMEs want and need to access facilities and capital equipments and as a result they tend to cluster around such facilities.

The platform for national strategic programmes and resources provided by the Research Councils could not be provided by an individual research group, university or funder. These facilities, programmes and resources are accessible to a range of sectors, often including industrial partners as well as academic and charity-funded researchers. Thus they generate significant leverage in financial contributions from a variety of sources as well as impetus for generation of knowledge and innovation. The UK BioBank is an example of a resource that is both highly valued and accessed by the medical research charity sector.

The Pirbright Institute has received significant capital and resource investment from the BBSRC for many years. It suppers sustainable capability in exotic animal viral disease research that would be impossible to replicate through shorter term project or programme funding in the university sector. This provides the UK and the world with essential experience and expertise in fighting diseases of livestock which pose enormous threats to the foodchain, to the UK and and other national economies, and to the livelihoods of farmers worldwide. Major outcomes from Pirbright include:

- Tackling Bluetongue: worth £485m to the wider economy and safeguarding 10,000 jobs
- Controlling Foot and Mouth disease: protecting an estimated 9,000 jobs, saving an estimated £244m in livestock value and £172m in export market value by mitigating an outbreak.

The UK is a world leader on research on the history and long-term evolution of ocean basins, including the Earth's crust, deep-sea sediments and their biodiversity. The UK's global lead results largely from decades of investment by the Natural Environment Research Council (NERC) in the Integrated Ocean Drilling Programme (IODP). During the current 10-year IODP programme (2003-2013), NERC has invested $47m to IODP operating costs while other nations have contributed $3bn.