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Professor John O'Reilly
Director General for Knowledge and Innovation
Department for Business, Innovation & Skills

By email to: sandr.stakeholderfeedback@bis.gsi.gov.uk

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Dear Professor O'Reilly

**PRIORITIES FOR THE SCIENCE BUDGET**

I am writing on behalf of the Engineering Professors' Council which represents the majority of academic engineers in the UK, currently comprising 76 member universities and nearly 6,000 academic staff, in response to your request for feedback on the key priorities and challenges for the Science Budget.

**The role of the science and research ring fence in supporting national objectives**
Following the Autumn Statement, we joined with the President of the Royal Academy of Engineering, Sir John Parker, in welcoming the Chancellor's move towards a modern industrial strategy which makes the most of our world-class engineering and science capability. In particular, we welcomed the support announced for engineering research programmes and investment in the UK's infrastructure which will help secure the demand for highly qualified engineers and ensure continuing innovation in engineering in the decades to come.

Currently the UK produces 46,000 engineering graduates each year; a recent Engineering UK report[1] found that we need nearly to double this to help fill the near term projected demand for graduate engineers. It is therefore critical to the success of this emerging industrial strategy that demand is increased for UK university engineering programmes, at both undergraduate and particularly postgraduate level, to secure the substantial flow of both academic and commercial innovators needed to keep the UK at the forefront of technological innovation.

Thus, "ring fencing" the Science Budget is surely the minimum tangible action that can be taken to underpin this strategy: cuts to capital expenditure and the research budgets of other Government departments, combined with the effects of inflation, have significantly eroded the overall Science Budge in real terms[2], despite the introduction of substantial additional funds targeted to specific research areas.

**What is the optimum balance between resource and capital?**
Producing engineering graduates of the standard and in the numbers required by industry is an expensive business. The current maximum chargeable tuition fee for UK and EU students attending UK HEIs does not in all circumstances meet the cost of delivery and so we welcome the continued financial support of the Strategic and Vulnerable Subjects (SIVS) premium within our teaching grant as an essential contribution to this. However, employers expect engineering graduates to be well trained in the use of the latest equipment, software and techniques. And world-class researchers need such equipment if they are to continue to discover new techniques and innovative products and processes. This requires university engineering departments to generate sufficient surpluses over the basic cost of programme delivery to maintain investment in laboratories and equipment. In order to do this, engineering departments have been hugely entrepreneurial in a range of ways from collaborating with business in sharing equipment to attracting more students from overseas.

[1] Engineering UK 2013 http://www.engineeringuk.com/View/?con_id=360
[2] http://blog.sciencecampaign.org.uk/wp-content/uploads/2013/03/Public-Funding-of-UK-Science-and-Engineering-%E2%80%93-March-2013-update.pdf

But this entrepreneurial success has brought with it an increased vulnerability. Leaving aside the administrative burden inherent in the new visa regulations having a disproportionate impact on engineering departments owing to the relatively high proportion of overseas students, there is evidence that the regulations are sending a message that overseas students are not welcome in the UK. Many of our admissions tutors report that good applicants are switching their interests away from the UK to other European countries, Australia and the US. Against a backdrop of constrained research funding, re-balancing the numbers to cover programme delivery costs AND the on-going investment in high cost equipment and space to meet the needs of employers and researchers cannot easily be achieved by increasing demand from UK students, certainly in the short to medium term. This issue needs to be addressed alongside any spending decisions to ensure we have a truly "joined-up" industrial strategy. In terms of spending decisions, maintenance of the full economic cost policy of research funded by Research Councils is therefore an essential contributor to securing the continued investment needed in cutting-edge capital equipment, but additional resource and capital injections to help mitigate the further risk of this market failure will also be required.

**Should there be further concentration of funding on research centres of proven excellence and with appropriate critical mass and multi-disciplinary capacity to address national challenges and compete internationally?**

While excellence should of course be rewarded, it should be rewarded wherever it is found. Innovation is a dynamic and increasingly fast-moving phenomenon: where excellence was found three or five years ago need not necessarily be where it is found today or tomorrow. To innovate, we need to have a truly dynamic university sector and the funding system needs to facilitate this. Furthermore, universities, like all organisations, do have capacity constraints (exacerbated by any constraint in the ability to fund capital investment) which cannot easily be addressed with the immediacy that the current economic environment demands. Further concentration, while potentially attractive in administrative terms, is not therefore the solution and consideration should be given to those who have the potential to be excellent and the competence and capacity to be collaborative and fleet of foot. Two brand new engineering faculties have been established in the last five years, both of which have been outside the university groups traditionally labelled "research-intensive", and excellent research is occurring in engineering departments across the sector. Industry recognises excellence and collaborates with it in university engineering departments of all types. In the financial year 2011/12, while 74% of all research income for disciplines other than engineering was concentrated in Russell Group universities, the comparable figure was 68% for all engineering disciplines (and 57% for mechanical engineering)[3].

**What are the factors that influence the confidence and funding inclinations of bodies outside the science and research base, not least those in the innovation ecosystem?**

Indeed, it is this latter point (around capacity and collaborative competence) that is likely to be a major influence on the confidence and funding inclinations of commercial organisations within the innovation ecosystem. "Clusters of innovation" is a well-known feature of the innovation ecosystem with high-tech SMEs being spawned around universities and commercial laboratories. Commercial funders will seek to fill competence and capability gaps from organisations they know and trust and that can deliver quickly, with the minimum of bureaucracy. Minimising university red-tape and providing incentives - including support and career development recognition for academic staff to gain industry experience (and vice-versa) - would help to develop these skills and competences. Ensuring that the funding system does not introduce regional inequality will also be vital.

In summary, we very much welcome the recognition of engineering's essential contribution to our economic well-being and hope sincerely that this is backed by tangible actions, properly joined-up strategy and increased real-terms funding for engineering and science in the spending decisions for FY2015/16.

Yours sincerely

Professor Simon Hodgson
President

[3] 2011/12 HESA Finance Return Table 5b: Research grants & contracts - breakdown of income by cost centre

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