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**From:**

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## **Introduction**

This document has been prepared in response to the Commons Science and Technology Select Committee inquiry: 'Science Budget and Industrial Strategy', launched 18 October 2017.

It is a response prepared by the Association of Innovation, Research and Technology Organisations (AIRTO) on behalf of its member companies, who operate in the innovation sector in the UK and overseas, with links to industry and academia. AIRTO members number more than 60 organisations, employing over 57,000 scientific and technical staff. These organisations work across a wide range of industrial sectors and are based across the UK, with some clustering in London and the South East.

A brief description of AIRTO, together with relevant contact details, is given at the end of this document.

## **Preface**

AIRTO welcomes the government's plans for the Industrial Strategy White Paper (and did previously [welcome and comment on the Green Paper in April 2017](#)), the current increase in funding for science and innovation, and the target of increasing such funding in the longer term to a level comparable with other industrial nations.

This Commons Science and Technology Select Committee inquiry provides an opportunity to share views on the current funding of science and innovation, and on how the use of future funding can be targeted at effectively supporting the Industrial Strategy. This should ensure that the maximum benefits are engendered for UK industry and its productivity.

AIRTO is willing to provide more detail on its views on these topics, should the Select Committee require such information.

## **The coherence and links between the Industrial Strategy Challenge Fund and the 'sector deals'**

The Industrial Strategy Challenge Fund and sector deals are key parts of how the Industrial Strategy will be delivered. Although the terms are recognised and high level principles obvious, the coherence and links between the Industrial Strategy Challenge Fund (ISCF) and the sector deals are not well understood by the three key communities: industry, innovation and research.

In the absence of clear guidance from the instigators of the ISCF (BEIS, Innovate UK and the Research Councils), the relevant communities are struggling to piece together the information they have in order to make a coherent picture.

This absence of guidance should be addressed by a single, short, official note explaining the key features of the two initiatives, examples of where each is the appropriate vehicle, and how it is intended that they operate together.

In each case, planning and shaping of many of the individual programmes and the dissemination of resulting detailed proposals are being handled exclusively within government bodies, rather than involving and informing the other relevant stakeholders, and particularly industry; this in spite of the desire to stimulate industry led activities. Whereas this is understandable to some degree for efficient formulation of propositions to government, particularly as things are being done at pace, a 'them and us' situation must be avoided where key stakeholders are excluded and do not feel ownership of the desired joint activities as a result. This appears to be largely a problem of communication. Workshops scheduled at short notice, seeking to consult with industry and academia, are far from an effective means of engagement, particularly when the resulting conclusions adopted are seemingly being withheld.

### **The model adopted by the Faraday Challenge and its suitability for future investments in other sectors under the Industrial Strategy Challenge Fund**

The Faraday Challenge is a good example of a model for investing in technologies of national importance, where a future vision for the UK's role has been clearly illustrated and a plan put in place to achieve this vision.

This type of 'vision', together with effective monitoring to assess its achievement, should be a prerequisite for any large scale project proposed under the ISCF.

The defined challenge is funded at a scale that is large enough to have impact, and involves significant private sector support, as well as public funding. It combines the underpinning of existing research in UK universities with ongoing development and a real industrial need. Funding for research, innovation and industrial exploitation is included, together with some open calls for collaborative projects. This goes some way to address the 'exclusive' nature of proposal preparation, provided that there is the opportunity for any organisation to compete for individual projects on merit.

The Faraday Challenge does provide a model for future investments under the ISCF, where existing research and development (R&D) knowledge and skills can be matched with a clear, quantifiable industrial need and vision.

Many potential topics for such funding will meet these criteria. However, consideration should be given to how disruptive technologies can be accommodated, either as 'standalone' projects or as part of bigger activities.

## **The rationale and coherence for the distribution of funding**

The UK has excelled in its fundamental research activities and is home to some of the top universities in the world. However, it is widely recognised that its exploitation of this research base is not world-class. Too often major inventions and research from our universities are exploited by industry outside the UK.

This excellence in UK science is achieved in spite of relatively low public funding of science and innovation in the UK compared to that of other industrial nations.

By putting these two scenarios together, it can be inferred that UK does invest in its science community, but the applied R&D in the innovation sector that leads to industrial exploitation of our research is under-funded.

The current increase in government funding for science and innovation presents a real opportunity for going some way towards correcting this imbalance.

A reflex reaction to this imbalance is often to give increased funding to universities to encourage them to become more 'industry facing'. Numerous reports on university/industry interaction and knowledge transfer have recommended such a solution, but it should be noted that many of these reports are the result of university-led initiatives.

This default position of increased funding for universities has not proved to be wholly successful, and risks deflecting our academics from the research at which they excel. There are certainly some parts of some universities that work well in the world of applied R&D but, more importantly, operating in this innovation space is the Innovation, Research & Technology (IRT) sector which specialises in the skills required for applied R&D and its adoption in industry and diffusion across the wider economy. This community has been recognised in government reports as being under-utilised by the UK because of lack of investment of public funds. This has been partially corrected by the setting up of the new Catapult Centres, but these form a relatively small part of the totality of the UK's innovation community. This community could be brought to bear on the problem of commercialising more of the UK's research, given the right measures to underpin the resources needed to take on the risks involved.

## **The relationship between the Industrial Strategy Challenge Fund (and its individual schemes) and the rest of the Science budget**

The overall rationale of using the ISCF to support science and innovation is valid, and it is difficult to be prescriptive about the breakdown of the funding to cover all ISCF schemes. The exact breakdown must be decided for each scheme. However, given the aims of the ISCF, the default position for any scheme must be that it is limited only to funding the focused work programme necessary for the achievement of each scheme's

objectives. Alternative funding mechanisms are already in place for other wider scientific programmes which go beyond the core objectives of each ISCF scheme.

### **Between the various initiatives to financially support innovation and commercialisation of research**

As stated above, the key principle must be to support those organisations already experienced in innovation and the commercialisation of research. This is the province of the innovation sector and includes Research & Technology Organisations (RTOs) (including the new Catapult Centres), Public Sector Research Establishments (PSREs), and private sector research organisations. Some universities operate successfully in this space, but there is the two-fold danger of promoting innovation as a mainstream activity of all universities. Firstly, on past track record, this policy will have limited success because universities and industry have a very different culture and hence it will not always be an efficient use of public money. Secondly, again as described above, there is a real risk of subverting our world-class academics into a role that they do not aspire to, and are not specialised in or fully supported to deliver.

### **Between the two arms of the 'dual support' system — funding via the research councils and funding via Research England**

The current funding of universities through the dual support system seems arcane to the outside world. Lack of coordination of funding sources for capital, core research and bids for projects, can lead to a mismatch of resources, and overbidding to compensate.

Rewarding excellence is to be encouraged, but the heavy skewing of the funding to the top, richest universities limits the potential for rising “stars”, whether they are individual researchers, departments or universities.

The incorporation of the Research Councils and HEFCE (as Research England) in UKRI has the potential for bringing better coordination to university funding, and hence more effective, efficient use of public money.

### **Between innovation and research**

As discussed above, the increased government funding of science and innovation presents the opportunity to address the imbalance between the funding for science and that for applied R&D.

This does not imply a reduction in the current levels of science funding (which is important for maintaining the UK's universities in their world ranking), but increased support for the organisations that provide direct benefit to industry.

**The balance between different parts of the country in government funding of research/innovation, the effectiveness of such place-based financial support, and how planned place-based funding might affect that balance in future**

It is important to decouple the location of the UK's research and innovation assets from the effect that they have on industry across the UK. It is this industry that will ultimately bring the big economic benefits to the UK.

In geographical terms the UK is relatively small, and our world-class research and innovation assets will be used by industry throughout the UK wherever they are located. Even SMEs have stated that they do not recognise the emphasis on 'place', but go where they can find the best support.

Government funding of research and innovation should be built on our existing world-class assets, irrespective of where they are located.

'Place' should only become a consideration where the required research or innovation assets do not exist, and a new facility is required. In this case, many factors (including place) have to be considered before deciding upon the best location.

Some caution is needed when setting up regional innovation hubs similar to those being introduced across Europe with European Council funding. Decisions must be made on whether such hubs need to perform identical functions with a regional mandate, or whether each should have a distinctive technical footprint or niche.

**Further measures the government should take to use its spending and facilities to strengthen innovation, research and associated 'place'-based growth**

Further measures that would improve the use of government spending and facilities in order to enhance the performance of UK industry include:

- Better recognition and understanding of the IRT sector, its scope in the UK, and its resources to undertake applied R&D. Addressing the boundaries between research and innovation, and between innovation and industry is important for the efficient, effective UK exploitation of new technology.
- The systematic support and exploitation of RTOs in the innovation sector.
- Recognition that the IRT sector is an 'industrial sector' in its own right, which promotes UK science and technology and attracts substantial overseas investment into the UK.
- An Innovation Sector Deal, which will co-ordinate the activities of the sector and promote innovation throughout the UK. Such a Sector Deal should work in coordination and collaboration with the newly formed UK Research & Innovation (UKRI).

- Improvements to the State Aid Rules, after the UK leaves the European Union. It is already recognised in Europe that the current State Aid Rules inhibit innovation. Bespoke rules for the UK could promote rather than inhibit the benefits for industry from innovation. This is particularly the case for disruptive technologies, where the current levels of funding under State Aid do not take account of its specific nature, risks, and funding needs for industrial exploitation.
- The provision of funding for the innovation sector that is equivalent to the HEFCE Connecting Capabilities Fund. It is ironic that this fund has been given an extra £100m funding in 2017, whereas no such funding is available for the organisations much better equipped to support UK industry, and in particular UK SMEs.

## **About AIRTO**

AIRTO is the Association of Innovation, Research and Technology Organisations. Its membership comprises approximately sixty of the principal organisations operating in the UK's Innovation, Research and Technology (IRT) sector. The IRT sector has a combined turnover of £6.9Bn, employing over 57,000 scientific and technical staff (equivalent to the academic staffing of the Russell Group of universities) and, for comparison, it is significantly larger than the network of Fraunhofer Institutes in Germany both in size and its scope of activities. The sector contributes £34Bn to UK GDP. AIRTO's members work at the interface between academia and industry, for both private and public sector clients.

Members include independent Research and Technology Organisations, Catapult Centres, Public Sector Research Establishments, National Laboratories, some university Technology Transfer Offices and some privately held innovation companies.

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