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Submission to:

HM Treasury.

Date:

7 October 2016

Representation for the Autumn Statement 2016 submitted by:

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Background to AIRTO

This representation is from AIRTO (the Association of Innovation, Research and Technology Organisations). AIRTO's members comprise representatives from:

- Public Sector Research Establishments (PSREs).
- Non-profit distributing member and non-member based Research and Technology Organisations (RTOs, including Catapult Centres).
- Privately held research and technology companies (including Contract Research Organisations - CROs).
- Universities (Enterprise/Technology Transfer Departments).
- R&D departments of industrial companies.
- Business support (including Access to Finance) and early stage technology-based venture capital companies.

AIRTO's members undertake translation of ideas, research and technological advances into the commercial arena, for clients in both the private and public sectors. Collectively, these bodies connect fundamental research to business and commerce (and vice-versa) and are referred to as the Innovation, Research and Technology (IRT) sector. AIRTO members and the IRT sector turnover £8 billion per annum, employ 57,000 people and contribute £32 billion per annum to the UK economy. Exported services are significant, with more than twice as much going to the rest of the world as to the EU.

Executive Summary

The Prime Minister has set out the over-arching goal for the government to deliver *“a country that works for everyone”*. Within this, AIRTO wants to see *‘an innovation eco-system and infrastructure that works for everyone’*, because innovation is a bedrock for the UK's future prosperity and success in free global markets. AIRTO identifies four key innovation priorities for the Autumn Statement:

1. **Placing innovation at the heart of industrial strategy.**
2. **Mitigating aspects of Brexit that risk constraining the UK's capacity to innovate and grow business in global markets, particularly markets beyond Europe (availability of skilled STEM, innovation and commercialisation professionals is key).**
3. **Investing in skills development for the future by creating a national innovation skills training initiative.**
4. **Strengthening national innovation infrastructure and capacity by investing further in Innovate UK and fully capitalising non-profit distributing translational Research and Technology Organisations and Public Sector Research Establishments.**

An innovation eco-system and infrastructure that works for everyone

The Innovation, Research and Technology (IRT) sector plays a pivotal role in driving economic growth and innovation, aggregating scientific and technological demand from businesses and markets, and co-ordinating this demand with current or future research. Britain's large and thriving IRT sector contributes significantly to UK national capabilities, innovation skills development, exports and inward investment¹. The economic impact for UK plc estimated to be £32-36 billion per annum. AIRTO's members represent a significant part of the UK's innovation ecosystem and infrastructure, but differ from universities in their primary objectives, strengths and capabilities, which are centred on commercial translation of applied research. In its 2011 'Innovation and Research Strategy for Growth', the Department of Business, Innovation & Skills recognised the sector as an 'under-utilised asset'². Universities and AIRTO members have vital and complementary roles to play. The best outcomes for the UK will be achieved by supporting these two crucial sectors to work alongside each other and, in partnership with industry, to drive innovation into the economy and exporting enterprises, while also enhancing the UK skills base and raising competitiveness and productivity.

Priorities for the Autumn Statement 2016 should:

1. Place innovation at the heart of industrial strategy:

- 1.1. AIRTO welcomes the government's plans to implement a new industrial strategy. A robust, effective industrial strategy – with innovation at its heart - is essential to stimulate productivity and growth for the UK. With uncertainties surrounding the future trading relationship with the European Union, it is extremely important that the government sets out a bold vision with a clear, strong and cohesive roadmap for supporting and enhancing our industrial base. The strategy should provide an action plan for investment in the infrastructure and skills needed to enable the UK to keep pace with, and ideally outperform, competitor nations, rendering the UK an attractive place for technology intensive industries in the global economy from which to do business. The national industrial strategy for the UK should:
 - 1.1.1. Facilitate access to the resources essential for successful innovation and economic growth, particularly skills and finance, recognising that innovation:
 - 1.1.1.1. is an integral part of a successful industrial strategy;
 - 1.1.1.2. underpins the national 'bigger picture' for the success of the UK economy;
 - 1.1.1.3. involves four key players - the IRT sector, universities, industry and the government itself operating in a complementary four way dynamic.
 - 1.1.2. Set out consistent long- and short-term priorities and provide for the supporting measures and interventions needed to enable industry to take on the more challenging and riskier aspects of innovation and commercialisation in developing and highly competitive global markets.
 - 1.1.3. Outline government priorities for challenge-led innovations that are needed to improve the UK's economy and societal security and well-being.
 - 1.1.4. Support and influence other major government policy agendas which drive actions and behaviour of key departments (e.g. BEIS, Defra, DFT, etc.), avoiding conflicting policies that may otherwise hinder industry's capacity to contribute to economic prosperity.
- 1.2. A 'hands-off' approach to industrial strategy is insufficient for a country with such a strong knowledge-based economy that depends heavily on driving innovation to achieve growth. Knowledge - particularly scientific and technological know-how - can be better and more efficiently directed and channelled towards industrial benefit across supply chains in key industrial sectors and regions if there is an appropriate level of focus and intervention by the government.
- 1.3. The sectoral approach to industrial strategy adopted by the recent coalition government (setting out priority sectors and the 'Eight Great Technologies' in a somewhat 'standalone' context) did not completely meet the challenge of stimulating economic growth. However, having such a framework was better than

none, providing some key areas for focusing investment and policy interventions, and encouraging industry and public sector to coalesce around particular strengths of national importance for future economic development. This strategy was largely discarded after the 2015 General Election, much to the detriment of achieving positive co-operation between government and industry. Its absence has also hindered the communication of clear messages to regions, industrial sectors and the general public alike about the goals and intentions of government in purposefully working to stimulate long-term, sustainable growth. The Prime Minister has set the over-arching goal for the government to deliver “*a country that works for everyone*,” but the apparent simplicity of such a statement disguises the complex and very necessary challenge of aligning industrial strategy successfully to cater for public attitudes and perceptions as well as the differing needs of the UK’s various regions, while also working to secure the commitment of business.

2. Mitigate aspects of Brexit that risk constraining the UK’s capacity to innovate:

- 2.1. The national industrial strategy must anticipate, account and plan for the UK leaving the European Union by:
 - 2.1.1. Ensuring retention of established partnerships across supply chains and with key innovation partners.
 - 2.1.2. Ensuring retention of access to people and skills and that the UK is able to attract inward talent simply and cost-effectively.
 - 2.1.3. Ensuring access to current levels of innovation funding.
 - 2.1.4. Providing access to new sources of innovation funding. Loss of schemes like Horizon 2020 will have a negative impact unless compensated elsewhere. The government should create a replacement fund for innovation that would encourage collaboration with other non-EU nations, centred on driving new international challenge-led strategic alliances in key sectors where the UK is world-leading, e.g. space, aerospace, materials, transport, future cities, life sciences, construction, agri-food, etc. Such a programme could support UK innovation centres of excellence in developing, with industry, new supply chains overseas, an important prerequisite for driving exports, as well as providing an immediate catalyst for driving new innovation with a clear business-lead purpose.
 - 2.1.5. Providing alternatives to European Structural Funds for large strategic infrastructure investments in regional economies is also a priority. EU Structural Funds will disappear, so other means of boosting regional infrastructures will be required in order to continue attracting industrial investment.

3. Invest in skills development for innovation:

- 3.1. The government should invest in the skills base needed for innovation and commercialisation, where there is a clear shortage of the multi-skilled people needed to deal with the many critically important innovation challenges for the UK. Particular shortages are being experienced in sourcing innovation leaders with the vital ‘soft/people’ skills needed for good management, but also the sound capabilities in business planning, supply chain operation, finance and familiarity with relevant technologies and new product and service development. An apprenticeship programme to develop innovation leaders could be a solution to this challenge. Ideally, such a programme would comprise a series of secondments, each for a period of six to eighteen months, to academia, the finance sector, departments of government (such as BEIS) and commercial industry, much along the lines of a traditional fast-track graduate development scheme in a large enterprise. Such a scheme, or a suitable variation on the concept, would require financial support, but would quickly produce a younger generation of multi-skilled practitioners ready to take up the challenge of capitalising on the UK’s strong research and innovation base. The IRT sector would be very well placed to host this kind of programme, working in conjunction with networks of commercial enterprises, universities and government departments. This would capitalise on the vital role that the IRT sector already plays in contributing to the development and retention of the UK’s skills base by providing scientists, engineers and technologists with:

- 3.1.1. professional development of talented graduates and PhDs.
 - 3.1.2. training through apprenticeships and internships.
 - 3.1.3. defined career pathways.
 - 3.1.4. job mobility.
- 3.2. Engaging the IRT sector as a training partner at apprenticeship level and recognising the role the sector plays in employability of the graduate workforce should be a central component of the government's strategy for better utilising the UK's assets for accelerating innovation and commercialisation.

4. Strengthen national innovation infrastructure and capacity:

- 4.1. The UK has sought to emulate competitor nations, like Germany where investment in their IRT sector has been very strong (via Fraunhofer-Gesellschaft for example). The UK established Research Associations after both World Wars and, more recently, has established the similarly structured Catapult Centres (a concept now being copied in France). However, more should be done to invest in and strengthen our existing innovation infrastructure in support of the government's industrial strategy. The UK still under-invests in translating the outcomes of its excellent research into commercial enterprise, a challenge which the IRT sector is well able to tackle given better and more appropriate access to financial capital. Earlier in 2016, AIRTO welcomed the announcement of UKRI, and sees value for UK plc in having a closer working framework to connect Innovate UK with the Research Councils. However, retaining a strong and differentiated emphasis on the distinctive mission of Innovate UK is vital if the UK is to continue to compete globally. The government should increase its investment in our national innovation capacity by giving prominence to:
- 4.1.1. Processes for stimulating innovation and embedding the results in industry as a key driver of productivity.
 - 4.1.2. Directly supporting innovation, including Innovate UK, to generate new opportunities, stimulate competition and initiate new supply chain relationships.
 - 4.1.3. Working with the full span of the UK's infrastructure for supporting innovation, which is a national asset extending beyond the Catapult Centres, to harness the expertise and thought-leadership of the IRT sector in shaping strategy and policies.
 - 4.1.4. Seamless innovation - creating funding incentives for challenge and business-lead applied research collaborations across Research Council interfaces, Innovate UK, the IRT sector and industry partners, aimed at developing innovative solutions to complex regional and national socio-economic problems.
 - 4.1.5. Supporting the new ideas and innovations originating outside of the university research base, supporting them also to bridge the 'valley of death'.
 - 4.1.6. Improving access to risk finance for the innovation community and its industrial partners.
 - 4.1.7. Improving the capitalisation of non-profit distributing RTOs and PSREs, as key contributors to the UK technological infrastructure for supporting innovation.
 - 4.1.8. Driving innovation and improved productivity in public services to drive costs down, as an alternative to further cuts. A key aspect is the public procurement on an early adopter basis of innovative products and services, particularly from SME suppliers with export growth potential.

Declaration of interests

This submission is made by the Association of Innovation, Research and Technology Organisations (AIRTO). The organisation represents research and technology organisations operating in the space between the academic research of universities and the commercial needs of industry. AIRTO members undertake research and development, and knowledge and technology transfer. This submission does not necessarily represent the views of individual member organisations. AIRTO currently comprises organisations employing more than 40,000 scientists and engineers¹, with a combined annual turnover in excess of £5 billion (AIRTO Ltd. is a company limited by guarantee registered in England No. 1217006 Register office address: National Physical Laboratory, Hampton Road, Teddington, Middlesex, TW11 0LW. AIRTO is a not-for-profit organisation funded by membership subscriptions, and managed under contact by NPL). The members of AIRTO currently are:

Advanced Forming Research Centre	FloWave TT Ltd	Offshore Renewable Energy Catapult
Advanced Manufacturing Research Centre (AMRC) with Boeing	Fraunhofer UK Research Ltd	Organic Research Centre
Agrimetrix	Fripp Design and Research	PA Consulting
APHA	Future Cities Catapult	Patent Seekers
Axillium Research	Health & Safety Laboratory	QinetiQ
BCIS	High Value Manufacturing Catapult	Rothamsted Ltd
BHR Group	HORIBA MIRA Ltd	Satellite Applications Catapult
BMT Group	HR Wallingford Group Ltd	SATRA Technology Centre
BRE Group	Institute for Environmental Analytics	Science and Technology Facilities Council
BSRIA Ltd	LGC	Smith Institute
C-Tech Innovation Ltd	Lucideon Limited	Stockbridge Technology Centre
Campden BRI	MTC	Thatcham Research
CIRIA	NCC	The European Marine Energy Centre
City University London	NIAB	The Scotch Whisky Research Institute
CPI	National Nuclear Laboratory	Transport Systems Catapult
DG Cities Limited	National Physical Laboratory	TWI Ltd
Digital Catapult	Northern Automotive Alliance	University of Greenwich
Fera	NNFCC	University of Surrey
	Nuclear AMRC	WMG HVM Catapult

References

¹ The impact of the Innovation, Research and Technology Sector on the UK Economy; Oxford Economics, November 2014.

² Innovation and Research Strategy for Growth; BIS, December 2011.