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GEARING UP TO 2.4%:
GROWING THE UK'S R&D ACTIVITY TO MEET THE 2.4% GDP TARGET

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The UK has a thriving Innovation, Research and Technology (IRT) sector, offering people with the right skills and expertise, and substantial resources, to deliver the UK's Industrial Strategy. The sector plays a critical independent role in helping industry cope with and share the costs and risks of innovation. By utilising this world-class asset to its full capacity in playing a central part in achieving the government's 2.4% target, we stand to gain global competitive advantage by improving the scope and productivity of UK industry.

On Monday 28 January 2019, AIRTO launched its new position statement at a reception in the Palace of Westminster hosted by Heidi Allen, the Member of Parliament for South Cambridgeshire. We were delighted to be joined by our members, parliamentarians, representatives from government, industry and allied organisations to network and discuss the role of the UK's Innovation, Research & Technology (IRT) sector in delivering the Modern Industrial Strategy.

Heidi Allen MP

Read our full position statement

The United Kingdom's departure from the European Union in 2019 marks a monumental event, and a move to transform the way that our country trades with our closest partners in Europe, and beyond.

Since the end of World War II our economy has harnessed the global technological revolution, and has led the way in sectors which are heavily reliant on scientific and engineering expertise for innovation, such as medicine, aerospace, automotive and information technology and telecommunications, to name but a few.

As we leave the European Union, the government's commitment to cultivating our national scientific and engineering capabilities through the Industrial Strategy has been welcomed widely. Measuring the level of R&D activity in the UK (both public and private) is a useful way of gauging how well the UK compares to competitor nations in fostering a supportive environment for innovation, Innovation will be fundamental to our national economic prosperity and quality of life for decades to come.

There is general consensus that in order to achieve the 2.4% R&D intensity target, both public and private sectors need to increase their respective activity. The current achieved level is 1.7% of GDP (evidenced by OECD Science, Technology & R&D Statistics), albeit there are some debates about whether this figure represents a truly accurate baseline measure. Based on other countries' experiences, the proportion of public to private investment needed to achieve this is approximately 1:2, i.e. ~one third from government sources and ~two thirds from private sources including industry. In the UK, government figures show that this ratio is currently estimated to be 1:2.6, indicating that UK private investment leverage is already at an above average level. To reach 2.4% of GDP from the current 1.7% position, therefore, needs a commensurate uplift in public sector investment (41%), coupled with either: i). a continuing level of above average investment from private sources; or, ii). a greater and dis-proportionate commitment of private funding for R&D. Ideally, a combination of both will ensue.

As such, much of the debate in our discussions with stakeholders has centred on what levers government could deploy to attract more industry investment in R&D in the UK and to create an appropriate and optimal environment for increased UK R&D activity.

AIRTO notes however that going for more R&D for its own sake should not be seen as an end in itself. To drive towards the goals of the Industrial Strategy and to obtain a return on the increased investment, the additional R&D undertaken needs to be targeted with a strong focus on delivering more to the market and supplemented with translational research that will deliver successful practical outcomes (i.e. leading to increased scope for higher productivity, leading to more return on investment, profit, jobs, & prosperity). Industry will need to be persuaded that there will be a commercial return from the R&D investment made. Strategic use of government levers is essential to achieving this. In addition, government needs to be seen as a more confident customer for increased R&D and its outcomes, to instil confidence in industry and commerce.

AIRTO proposes six levers for government to consider, as follows:

1. Incentives for business R&D

The largest investors in R&D will be industrial companies and private investors. Decisions to invest will be driven not only by competitive trends and market forces but by practical risk sharing incentives such as R&D tax credits and grants, as well as

by human behavioural factors, all of which need to be taken into account and deployed to maximum effect in support of increasing the R&D undertaken in the UK.

2. Public procurement and early adoption of novel products and services

Government procurement is potentially a powerful stimulant for innovation, and hence R&D in the UK, particularly for SMEs. To fully realise this potential, government must support innovation across the whole of the technology readiness spectrum, including through increased use of initiatives like the Small Business Research Initiative (SBRI).

3. Skills for the future

Capitalising on the UK's world class higher education system and modern apprenticeships to provide more science, technology, engineering and mathematics (STEM) qualified people is pivotal to the UK's capacity to grow R&D to 2.4% of GDP and beyond. Many training schemes including apprenticeships and spanning future leader fellowships to post-graduate level programmes with universities are supported by the IRT sector. However, there is a critical need for more multidisciplinary people skilled in the four key areas of finance, industry, government and academia, which the IRT sector is well positioned to deliver with the right support in place, e.g. via new types of appropriately resourced Innovation Management Fellowships.

4. Physical infrastructure for R&D

There is an imbalance of capitalisation in the IRT sector, which needs to be addressed if the UK is going to have the optimal facilities and the capacity to grow and apply its R&D services for industry in the decades to come. The Industrial Strategy Challenge Fund (ISCF) will need to resource broader programmes of work at higher Technology Readiness Level (TRL), such as technology demonstrators and pre-production prototyping and performance proving projects. In addition, having a clear national vision and mission for National Laboratories and RTOs (including the Catapult Centres), which comprise an essential core within a joined-up IRT sector in the UK, would increase the chances of the sector rising to the 2.4% challenge. This challenge will mean a significant expansion in these organisations if the UK is to have the necessary resource for translational research and R&D commercialisation.

5. Regulation

Appropriate regulation is an important element of an attractive UK R&D environment within which to develop new products and services, compared to other nations. Codes of practice and standards also underpin confidence to enter new markets for such innovative products and services. To remain internationally competitive in lower risk sectors, the UK should adopt light touch regulation, to create a favourable environment for experimentation and demonstration. In sectors requiring necessarily higher safety thresholds, such as pharmaceuticals, a more stringent regulatory framework is required. In achieving the right balance, the public needs to be engaged to ensure that trust, and the confidence that risks are being properly managed, are retained.

6. International R&D exports

The international footprint of the UK-based IRT sector is strong, and can provide for further growth potential in offering R&D services to overseas industrial and other clients, including those considering locating operations in the UK. As such, the IRT sector represents a significant

CALL TO ACTION – PHYSICAL INFRASTRUCTURE FOR R&D

Review the return on investments for R&D tax credits across key sectors;
Continue the commitment to public funding for research and innovation;
Deploy IRT organisations to help technology based SMEs improve productivity.

CALL TO ACTION – SUPPORT PUBLIC PROCUREMENT & SERVICES

Make it easier for the Small Business Research Initiative (SBRI) to apply to larger firms to stimulate research and innovation via private businesses;
Pilot models of procurement with National labs and government agencies acting as intelligent clients for technology procurement.

CALL TO ACTION – SKILLS FOR THE FUTURE

Trial schemes that translate academic learning to the 'shop floor' and market place, across apprentice, Masters and PhD levels;
Create fellowships for developing applied skills;
Grow the number of industry prepared graduates for the workplace via sandwich degrees.

CALL TO ACTION – PHYSICAL INFRASTRUCTURE FOR R&D

Address imbalances between research and innovation activities by deploying schemes such as the industrial strategy challenge fund;
Invest in an 'RTO+' programme to improve capitalisation of existing organisations, rather than creating 'shiny' new centres to open!
Reduce 'red tape' for existing IRT organisations.

CALL TO ACTION – REGULATION

Regulation needs to exist to give confidence of market opportunities;
Appropriate regulation can give UK competitive advantage.

CALL TO ACTION – INTERNATIONAL REACH

Set out a co-ordinated and aligned national plan around specific sector strengths.

leverage opportunity for UK as it enters the post-Brexit world in years to come. By succeeding in R&D investment in the UK, there are follow-on benefits in terms of the UK being a favoured nation for overseas based entities to trade with and invest in). Developing a co-ordinated and aligned national plan around specific IRT sector strengths is needed; where there are 'sector deals' for example, joined-up plans across the Department for International Trade and other Departments of Government will be critical to stimulating and growing R&D exports.

Further consideration of each of these six levers is contained within AIRTO's document detailing its discussions with stakeholders. However, given the large number of organisations with a variety of interests in how to deliver the 2.4% target, AIRTO is particularly seeking to highlight those elements which it considers to be most pertinent to the IRT sector and the need to translate R&D investment as rapidly and efficiently as possible into returns to the UK economy and society. These highlighted points are that:

1. The IRT sector is a national asset, which needs to be resourced to an increased capacity if it is to successfully deliver against the 2.4% target. There is an imbalance in the capitalisation of the sector, which prevents it from being able to fully realise the national ambitions to lift R&D activity to 2.4% of GDP and to ensure that the outcomes reach productive application in the economy. Industry demand for development and pre-production work frequently exceeds capacity, with many independent IRT sector organisations having limited working capital to build resources to match this demand.

2. The National Laboratories and Research & Technology Organisations (RTOs) that make up the IRT sector are independent, and this independence plays a critical role in helping industry to share the costs and risks of innovation and to raise its productivity. These organisations are well placed to develop codes and standards for industry sectors, which can provide for industry efficiency, scale, and export potential.

3. The IRT sector offers people with the right mix of skills and expertise to work effectively and collaboratively across academia, government, industry and finance – a fertile training ground for upskilling UK plc for the future. The UK is world leading in each of these four areas, but there is little cross-fertilisation of people and no common vernacular. People with experience and credibility at communicating in each of these four areas provide the multidisciplinary breadth of capability necessary for successfully translating R&D into commercial success, being able to blend expertise across these four domains.

Throughout AIRTO's consultation with stakeholders during 2018, we have sought to consider and develop understanding on some key issues which are central to R&D activities, including:

- *What things are working well to support R&D activities which the government should continue to support?*
- *What barriers exist to doing R&D in the UK?*
- *What actions are needed for the UK to successfully stimulate R&D activities?*

We conclude that to succeed in lifting R&D activity to 2.4% of GDP over the coming eight years, the government needs to 'gear up to 2.4%' to accelerate investment in the IRT sector as a critical resource for UK plc.

Left to right: William Duncan (Parliamentary and Scientific Committee), Carol Monaghan MP, Simon Andrews (Fraunhofer Research UK), Alison Thewliss MP.

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 £6.9 billion, 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 £34 billion 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.

Authored by Steve Yianni FREng (non-Executive Director), Dr Jane Gate (Executive Director), Professor Richard Brook OBE FREng (President), and Peter Oakley (Chair, Public Sector & EU Interest Group).

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