

Discussion paper - recommendations in advance of the Autumn Budget 2024

***Enabling economic growth:
Prioritising Applied Research, Development and
Innovation (RDI) for immediate and longer-term
benefits***

Submission to:

HM Treasury: Representation to Autumn Budget 2024

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STRATEGIC MESSAGE

At a time of constraints on public finances, existing public support for applied research, development and innovation (RDI) must focus primarily on activities that will achieve immediate short-term benefits through market-led innovation activities. Support for fundamental research is important for long-term national prosperity, but in the current circumstances a focus on more immediate innovation support is crucial to help the government fulfil its aims to accelerate and stimulate economic growth. AIRTO – the Association of Innovation, Research & Technology Organisations - stands ready to play its full part in supporting the new government in achieving its aims.

SUMMARY OF RECOMMENDATIONS TO IMPLEMENT AN INNOVATION-LED INDUSTRIAL STRATEGY FOR BOOSTING GROWTH

- Make closer-to-market innovation across the UK an integral part of the new Industrial Strategy: **Re-balance public funding for research, development and innovation (RDI) to provide more support for the close-to-market innovation infrastructure** (e.g. for development, demonstration and industry support) for key sectors and industries, to help reduce the cost and time to translate technologies to market. **A ‘HEIF’ (Higher Education Innovation Fund) style programme for the innovation, research and technology (IRT) sector** would play a major role in facilitating the transfer of requisite and immediately beneficial knowledge to industry.
- Build on the UK’s world-leading RDI infrastructure: Invest in the innovation ecosystem by creating **a recapitalisation mechanism for non-profit distributing IRT organisations** which do not have recourse to share holder funding for investment in buildings and facilities. This could be delivered either by extending the existing [Research and Innovation Organisations \(RIO\) Infrastructure Fund](#) or by creating a new fund for the purpose.
- Instil confidence for industry in the UK’s resilience and consistency: Give industry the confidence to make critical research, development and innovation investment in the UK by committing to **clear, consistent, and ambitious long-term government policies and funding**. This includes bolstering specific commitments to RDI aimed at advancing the UK’s path to Net Zero, signalling its commitment to addressing energy security and the climate crisis.
- Prioritise people and skills: Develop a comprehensive ‘workforce plan’ for RDI in the UK, encompassing education and skills, and involving the key players from industry, the IRT sector, and academia. This should involve **specific activities to promote the understanding of innovation processes and entrepreneurship** at a range of levels from apprenticeships and degree level learning to post-graduate and ‘on the job’ activities. With the right financial support, AIRTO Members can play a major role in giving long-term work experience of the applied research and innovation environment.
- **Achieve immediate short-term growth through targeted research and development** by maintaining current funding for public funding of research, development and innovation.
- **Ensure sustained and growing long-term investment in R&D:** By 2030, advance beyond 3% for Gross Expenditure (public and private) on R&D as a percentage of GDP to sit in the top quartile of OECD nations.

INTRODUCTION

‘Research, development and innovation (RDI) is an essential driver of productivity and sustainable growth, and has a crucial role in securing economic, societal and strategic benefits’.

(Sir Paul Nurse, [Independent review of the research, development and innovation \(RDI\) organisational landscape: final report and recommendations](#), March 2023).

The recommendations of AIRTO’s representation to HM Treasury Autumn Budget 2024 builds on this important statement by Sir Paul Nurse about the key role of RDI for the UK’s future prosperity, and how in order to deliver for the UK, this sector must be supported by HM Government’s financial strategy.

AIRTO, the Association of Innovation, Research & Technology Organisations, on behalf of its members, has prepared this written representation ahead of the Autumn Budget 2024. We are calling for a clear, consistent, innovation-led strategy that will boost growth to address the UK’s immediate economic and societal challenges, and in the long-term lead to a strong, growing energy-secure Net Zero economy. AIRTO is also advocating that HMG work with AIRTO to develop some proposed tactics and forward-thinking solutions – approaches which are already in play across the breadth of our sector, but which we believe could be scaled-up with enhanced commitment from the new government to advance innovation as a vital part of the government’s new industrial strategy, thereby driving the UK’s commercial exploitation of science and innovation.

AIRTO represents the UK’s extensive Innovation, Research and Technology (IRT) sector, which employs 57,000 highly skilled people, has a combined annual turnover of [£6.9Bn and contributes £34Bn to UK GDP](#). Organisations in this critical sector work with industry, government and academia to promote and support the introduction of innovation to the full range of industrial sectors, and to provide technical solutions to new challenges and crises. The IRT sector is a key partner for industry in delivering the support needed for innovation driven economic growth.

KEY MESSAGE – IMPLEMENT AN INNOVATION-LED INDUSTRIAL STRATEGY FOR BOOSTING GROWTH

AIRTO has welcomed the commitments to public investment in science and innovation, made in recent years aimed at boosting economic growth, and recommends that this is a central pillar of the new industrial strategy under preparation for Autumn 2024.

In the wake of the current, persisting financial pressures on government, it is critical that the new government continues to recognise and invest in **innovation as a key mechanism for stimulating the economy and supporting businesses to raise productivity, competitiveness and growth. Innovation is also a key to tackling the climate crisis and safeguarding our energy supply.**

This means continuing to honour recent public funding commitments for science and innovation in the short-term and increasing this funding in the long-term to the levels invested by the leading, competitor nations.

Public funding commitments are essential to achieve the UK’s global ambitions for science and technology. Continued investment in the science base is a vital part of playing a leading role on the global stage. In parallel there must be a better balance of support for development and innovation activities if the full economic benefit of achieving the UK’s global ambitions for science and technology are to be realised. Such an innovation-led strategy (as discussed in AIRTO’s Position Paper [‘More D!’](#)) will stimulate the UK’s commercial exploitation of science and innovation resulting in a significant and continuing boost to economic growth. Whereas this focus on applied research, development and demonstration has the

very necessary short-term goals, a more robust pathway for exploiting more fundamental research will ultimately provide longer-term benefit form and justification for continuing support of more fundamental research. The national ambition for science and technology and the ensuing economic growth is strongly supported by AIRTO and its members, but it is accepted that this endeavour will require considerable and sustained strategic investment in skills and infrastructure by all the relevant stakeholders, and especially government which must take the lead in defining and orchestrating the goal.

Clear, consistent government plans are critical to provide industry with the confidence to invest in the UK, in the necessary private funding for innovation, physical infrastructure, and expanding commercial operations. This private investment is essential for future UK economic growth. The new government needs to set a fresh goal to lift R&D intensity up to compete globally. By 2030, AIRTO is calling for the UK to advance the target for R&D intensity (public and private) beyond 3% of GDP, to sit in the top quartile of OECD nations.

Setting and achieving targets depends on reliable metrics for R&D expenditure. After recent substantial revisions to methodology for compiling data for the UK, the process should be examined to ensure it is fit for purpose.

AIRTO advocates an innovation-led strategy for stimulating the economy to address the UK's immediate economic challenges, and for the long-term development of an energy-secure Net Zero economy. A focus on activities that promote existing knowledge and innovation to industry will ensure that significant short-term economic benefits will be realised, which is crucial in the current economic environment. As discussed above, this means a change in focus of funding to applied research, development and demonstration (More D!). Additionally, a programme to catalyse the transfer of existing knowledge from the IRT sector to industry will reap immediate benefits. Such a programme (the IRT sector version of the HEI focused HEIF funding) is essential for achieving this immediate benefit, and can be achieved by extending HEIF or introducing a parallel IRT sector programme. AIRTO Members have undertaken such programmes previously, supported by national and regional funding, and have achieved very significant, measurable outputs from their work with a wide range of industry, and organisations from SMEs to large enterprises.

As part of its previously stated commitments to increase the public expenditure on research and development (which will also drive increases in private industrial investment), the government should bolster specific commitments to research, development and innovation (RD&I) aimed at advancing the UK's path to Net Zero, signalling its commitment to addressing the climate crisis. In parallel to the investment in RD&I, it essential that a comprehensive, coherent plan for the national energy infrastructure (e.g. grid and connections) is developed and implemented. This will 'join up' the current and future energy supply and demand but will also, in the short and medium term, facilitate the effective demonstration of new technologies prior to full-scale implementation.

UTILISING THE IRT SECTOR

The UK has a range of world-leading organisations that comprise the IRT sector. These are independent and trusted agents for driving innovation in industry. Some of these organisations are government owned, some are not-for-profit entities, and others are private research organisations. All are a key part of the nation's science and technology infrastructure, working closely with industry, and collaborating with academia.

The sector has huge potential for significantly increasing its support for government and industry. In the short- and medium-term this will be a key part of the plan for stronger economic growth. In the longer term it will be an integral part of the country's science and innovation infrastructure and strategy, aimed

at achieving the goal of raising the level of GDP invested in R&D and working with industry to effectively exploit the resulting technology

A major area of activity for the IRT sector operations is research, development, innovation and demonstration in the mid Technology Readiness Level (TRL), where public investment has a 'multiplier effect' due to the generic nature of the activity and its relevance across whole sectors and industries. Appropriate public funding is also significantly multiplied by industrial investment both directly and through the IRT sector. This is reinforced by the IRT sector's commitment to the transfer of knowledge to industry and its deployment for innovative activity. As discussed above, AIRTO advocates for the government to re-balance public funding for research, development and innovation to provide more mid-technology readiness level support (e.g., demonstrators) for key sectors and industries, and reduce the cost and time to translate technologies to market (as discussed in AIRTO's Position Paper '[More D!](#)').

The IRT sector can play a crucial role in ensuring the nation reaps the full benefit from increased investment in RD&I. To achieve this, there are changes needed in the government's support for the IRT sector, as recommended in Sir Paul Nurse's [Independent review of the research, development and innovation \(RDI\) organisational landscape](#). This will involve investment in the RD&I physical and digital infrastructure and skills, providing the necessary resources and capabilities to create a catalytic effect that further attracts private industrial funding, with its associated economic benefits.

Therefore, **it is recommended that the government create a recapitalisation mechanism for the non-profit distributing IRT organisations** which do not have recourse to shareholder funding (because of their ownership and commitment to mission-driven support). This will allow a significant increase in their support of and benefit to UK plc. and will complement existing government investment in the Innovate UK Catapult Network and Public Sector Research Organisations (PSREs). A key feature of this resource allocation, for it to be effective, is longevity. Support longevity is equally vital for the current funding mechanisms for the Innovate UK Catapult Network and PSREs.

At the end of 2023, the [Research and Innovation Organisation \(RIO\) Infrastructure Fund](#) was opened to non-profit distributing IRT organisations in addition to Public Sector Research Establishments. This was very welcome as a first step. However, with a comparatively modest budget (£25m) and a very short timescale to develop proposals, it is a scheme that should be further developed and expanded to fulfil IRT Organisation's needs if they are to play their full part in supporting UK industry. Alternatively, a separate, dedicated scheme could be considered.

Closer-to-market innovation across the UK is central to the UK's Industrial Strategy and achieving lasting economic growth

The new Industrial Strategy should aim to harness assets across the country, recognising the UK's geographically dispersed RD&I ecosystem as a means of maximising the benefits of innovation for national and local economies, and building on local strengths and technology clusters. The UK needs to bolster its capabilities for close-to-market RD&I to successfully accelerate the pull-through to market of products and services from research and the addressing of market driven opportunities and problems. Much of these innovation assets reside in the IRT sector which has some of the nation's most skilled scientists, development engineers and innovative business leaders working at the interface between academia and industry. This sector plays a fundamental role in driving productivity, providing centres of excellence for innovation operating across the UK in both cities and hubs of activity in non-urban areas. In considering priorities, the government should recognise these hives of closer-to-market innovation across the UK as central components to the delivery of the UK's new Industrial Strategy, and that continued investment is necessary to harness their capabilities to drive growth. Re-balancing public funding for research, development and innovation to provide more support for closer-to-market infrastructure (e.g. prototypes and demonstrators) for key sectors and industries, would help reduce the cost and time to translate technologies to market (as discussed in AIRTO's Position Paper ['More D!](#)').

FORWARD THINKING SOLUTIONS

Innovation Ecosystem – Utilise the IRT sector to capitalise on the extensive network of innovation assets and their convening power across the UK to invigorate future economic growth:

This requires the new Industrial Strategy to change the 'mix' to spread the risk, delineating between the 'R' and the 'D' of 'R&D' to invest in more DEVELOPMENT infrastructure and capabilities, balancing it appropriately against the UK's substantial investment in early-stage RESEARCH.

The new Industrial Strategy must include innovation and exploitation of knowledge as one of its core tenets. AIRTO offers its support to the government in the development of this strategy and its implementation, both in technical subjects and in the mechanisms for introducing innovation to industry.

There is a need to optimise the role of translational research organisations which make up the diverse range of organisations that comprise the IRT sector in driving innovation, productivity and growth. This will widen access and create more routes by which these national assets can be deployed in support of UK plc to enable components of the whole RDI ecosystem to pull together to deliver for businesses and help realise the new government's mission for growth. Interventions are needed to break down barriers between public and private RTOs to increase the overall efficiency of the system (for example by making it easier for different types of organisations to work together or to access common funding streams). Enabling increased collaboration is also important in leveraging the role that IRT sector organisations play in driving adoption and diffusion of new technology and innovation across the economy, helping to address the productivity challenge. Specific suggestions include:

- Exploiting the IRT sector by creating a re-capitalisation mechanism for independent research and technology organisations which do not have recourse to shareholder financing.
- Leveraging the convening power of the IRT sector to syndicate innovation capabilities that will bolster the ecosystem to drive collaboration in mission-led initiatives.

If the government can optimise and leverage the innovation ecosystem, including for garnering expert advice for its own plans for transformation of public services, it will benefit from boosting the skills of the 57,000 people employed in innovation workforce and increasing their number and resources, to fulfil the ambition to be a leading nation for science and innovation. This builds on the previous and existing, public and private, investment in the IRT sector ecosystem – which already turns over >£7bn per annum - to strengthen global competitiveness.

Building on our world-leading existing capabilities

The new Industrial Strategy must have innovation at its heart, and very importantly how industry can be supported to exploit the knowledge developed by the UK's R&D infrastructure. If the new Industrial Strategy is to achieve the economic boost it promises, it needs to build on the best of our existing capabilities to fully exploit the innovation and development assets spread across the UK. The UK government should prioritise implementation of the recommendations of Professor Sir Paul Nurse's [Independent review of the research, development and innovation \(RDI\) organisational landscape](#). This means nurturing the role of the innovation ecosystem by capitalising on the extensive network of existing innovation assets. These lie in the UK's PSREs, Research & Technology Organisations (RTOs), the Innovate UK Catapult Network¹, Science Parks and Innovation Campuses. This nurturing involves increased financial support to invest in their capabilities, expertise and infrastructure, that are complementary to academia and industry, which will invigorate future innovation based economic growth across all parts of the UK. We are therefore calling on the government to use the Autumn Budget 2024 to go further in strengthening:

- The global dimension: by leveraging the international network across the IRT sector to export innovation and world-firsts by building new collaborations and promoting British Standards around the globe. More support mechanisms are needed to foster collaborations, and steps must be taken to ensure that established and renowned UK entities continue to play their pivotal part in programmes like Horizon Europe. The UK's international standing in science and technology will be hampered if we lose ground in our relationships with key collaborators in EU member states.
- Investment in the innovation ecosystem: by investing in some of the UK's non-profit distributing organisations that underpin the innovation ecosystem's foundations, offering living labs, testbeds and demonstrators, which currently remain undercapitalised. For the UK's innovation ecosystem to be truly world-leading by 2035, this under investment must be addressed. Therefore, it is recommended that the government create a recapitalisation mechanism for IRT organisations which do not have recourse to shareholder funding (because of their ownership and commitment to mission-driven support). This will allow a very significant increase in their support of and benefit to UK plc. and will complement existing government investment in the Innovate UK Catapult Network and PSREs. A key feature of this resource allocation, for it to be effective, is longevity. This longevity of support is equally vital for current funding mechanisms for the Innovate UK Catapult Network and PSREs.
- Systematic official promotion of the UK's IRT sector assets (government owned, not for profit and private) to national and international businesses. UKRI is currently refreshing the roadmap of the UK's R&D infrastructure. As well as being a tool for government to understand current and future public investment in R&D, this roadmap could offer a powerful tool to industry to identify prospective partner organisations to drive collaboration in innovation, and to be a vehicle for promoting UK RD&I organisations worldwide. To maximise the potential of this endeavour, all the necessary resources required to achieve the wider aims, and to enable the roadmap function as an available 'live' resource.

FORWARD THINKING SOLUTIONS

Global – Leveraging the international growth of the IRT sector to export innovation and world-firsts by building new collaborations around the globe:

- This requires the new industrial strategy to commit to an aligned sector-focused international plan to leverage partnerships and customer relationships to create new initiatives that will enhance strategic national missions.
- Exporting British Innovation by leveraging the IRT sector's valuable global networks to mount an international 'collaboration drive' – this requires the new government to create more mechanisms for boosting international collaborations and, in particular, taking practical steps to ensure that UK entities play their part in programmes like Horizon Europe to enhance the UK's international standing in science and innovation.

¹ The Innovate UK Catapult Network supports businesses in transforming great ideas into valuable products and services. The Catapult Network is comprised of 9 world-leading technology and innovation centres established by Innovate UK. Catapults deliver impact across the UK economy, enabling businesses to thrive in global markets.

Instilling confidence for industry in the UK's resilience and consistency

The climate crisis and energy security crisis are, arguably two of the world's most pressing concerns. Globally we must cut emissions by 11.7% each year if future generations are to thrive. The innovations required to deal with these crises offer global opportunities for trade, with the UK's world-class expertise and international reputation for innovation and entrepreneurship leading the way. The level of innovation required to tackle these big missions is colossal and needs nurturing if it is going to be successful. **A fresh commitment to, and investment in, the UK's innovation capabilities will be critical to underpin successful economic recovery, growth and resilience.** The Covid-19 pandemic demonstrated how the UK's R&D infrastructure can effectively be employed to address national crises, but also how a co-ordinated method of invoking this support is not in place. By shaping its strategy around lessons from the Covid-19 pandemic and understanding the weaknesses that it has exposed in national resilience, the government stands to harness the power that science and technology can bring to tackling societal challenges and transforming lives.

In addition to bolstering resilience, there are some behaviours that, if instituted pervasively across government departments, would create confidence for industry and investors alike: For instance, working with greater agility and speed in decision making and deployment of resources, and ensuring better retention and stability of knowledge, know-how and experience, by attracting and retaining key personnel. Also, creating better clarity for business about the future direction of policies and strategies, will provide a stronger basis for private investment in science and innovation, which ultimately will attract high value jobs to the UK and drive economic growth.

FORWARD THINKING SOLUTIONS

Engendering industrial confidence – Specific actions to instil industry's confidence in the UK's RDI infrastructure to stimulate increased industrial investment include:

- An enhanced programme of activities to promote the UK's involvement in the EU Horizon Europe programme. This should be specifically targeted at industry and business.
- A clearer strategy on implementation of UKCA marking, including the rapid establishment of a mutual recognition agreement for UKCA/CE marking with the EU.
- A clear, ambitious strategy for Net Zero, enacting the recommendation of the [Mission Zero report](#). Particularly relevant to the UK's R&D infrastructure and its industrial partners is the call for an R&D Roadmap for Net Zero with a 2050 horizon.
- The increased investment in the development of indigenous skills for innovation, and the continued deployment of the Global Talent Visa to attract researchers, at all levels from technician to world class experts, to work in the UK's RD&I infrastructure.

Prioritise people and skills

Whilst commitments to public investment in science and innovation in the new Industrial Strategy will be welcome, the government needs to put people at the heart of its plans by investing in skills and training to develop the UK workforce and improving opportunities for talent to come to work in the UK.

Therefore, it is recommended that new government develops a comprehensive, long-term 'workforce plan' for research and development in the UK covering education and skills, and involving the key players: industry, the IRT sector, and universities. This plan must include education and training at all the relevant levels, including apprenticeships, degree apprenticeships etc., and the effective use of the apprenticeship levy from organisations in the IRT sector, and their industrial collaborators. Specifically, government should consider the value of developing and introducing an innovation apprenticeship.

IRT sector organisations are very active in the development of skills, for example identifying and delivering training linked to the needs of emerging industries. They also have significant partnerships with

universities to deliver postgraduate training targeted at developing people for future careers in applied research and industry. Much of this is delivered with ad hoc public support, or without public funding.

AIRTO would welcome a closer partnership with government in the delivery of education and skills and is willing to play a supportive role in the development of a 'workforce' plan for RD&I in the UK.

FORWARD THINKING SOLUTIONS

Talent – Prioritise people and skills for the future to power the fourth industrial revolution:

This requires the new industrial strategy to make better use of the IRT sector as a “breeding and training ground” for people skilled both in technology and in the needs and operations of industry.

AIRTO advocates leveraging the IRT sector as a catalyst to deploy a package of measures to accelerate the expansion of the UK's innovation-ready workforce by:

- Investing in skills to develop innovation leadership and capability and an innovation-ready workforce, including utilising the IRT sector to build on existing exemplars to develop a programme for work experience for new graduates to enhance employability.
- Building on successful models of collaboration between the IRT sector, industry and academia to establish the critical mass of the skills to tackle real-world technology problems.
- Creating mechanisms to retain talent in the innovation workforce and support returners.

Achieve short and medium-term growth through targeted RD&I

The 2021 UK Innovation Strategy had a goal for the UK to become a 'global hub for innovation' by 2035. AIRTO urges new government to retain a commitment to this strategy, as a mechanism for achieving short and medium-term growth through the early adoption of emerging new technologies. The new Industrial Strategy, incorporating innovation, should form an integral part of the new government's plan for long-term economic growth whilst achieving addressing the need for energy security and tackling the climate crisis. AIRTO contends that this strategy will require sustained investment in the UK's innovation capabilities to ensure business growth materialises from aspiration into reality, by placing science and technology at the heart of both the UK's economic recovery and growth, and continued advancement towards climate resilience Net Zero, energy security.

Ensure sustained long-term investment in R&D

As well as addressing short-term objectives, the Autumn 2024 Budget is a major opportunity during the current Parliament to lay the foundations for the UK's global ambitions for science and technology and to deliver on the ambitions for the UK Science and Technology Framework. It is vital that investment in research, development and innovation is sustained to ensure the UK achieves and maintains a leading position, relative to competitor nations. Therefore, we are calling on the new government to use its first budget - the Autumn Budget 2024 - to confirm the commitment to current levels of public support for RD&I in the short and medium term, and to leverage opportunities for future growth by growing investment in the longer term so that the UK keeps pace with the capabilities and performance of key competitor nations. The long-term target level for UK investment in RD&I must be an objective figure based on these comparisons, so AIRTO advocates that the UK aims to advance beyond 3% for Gross Expenditure (public and private) on RD&I as a percentage of GDP to sit in the top quartile of OECD nations. This will allow the continuing investment in the UK's world-leading academic sector together with the key increase in funding of applied research, development, innovation, and demonstration.

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