

Introductory questions

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- Responding on behalf of an organisation.
- a. Organisation: Association of Innovation, Research and Technology Organisations (AIRTO)
b. Type of organisation: Other – representative body for the Innovation, Research & Technology (IRT) sector.
- AIRTO's office is in London. However, AIRTO members are in all regions of the UK and also have overseas facilities and representation.
- Would you like your response to be confidential? No.

Introduction

AIRTO's members are crucial to the UK's innovation infrastructure, working with industry, academia and government to exploit the results of research and development to provide economic and societal benefit. Their work includes supporting UK industry, attracting overseas investment and exporting research and development (R&D) services to the rest of the world.

Members are involved in international research and innovation through the following mechanisms:

- Participating in European Union (EU) Framework Programmes.
- Undertaking project work for European and international organisations, programmes and initiatives including for the European Space Agency (ESA), Iter, Galileo and Copernicus.
- Undertaking contract research and development for companies, and on occasion government agencies, worldwide.
- Licensing of technology, quality standards and codes of practice.
- Participating in European and international standards research and development.
- Operating overseas subsidiaries, research facilities and representation.

A survey of AIRTO members shows that overall 67% of their income comes from UK customers and funders, 10% from within the EU and 23% from the rest of the world beyond Europe¹. There was a range in the responses with some organisations reporting up to 50% of income being non-UK, with the majority of this from outside of Europe.

It should also be noted that income from the rest of the world has a much lower level of public funding, i.e., it is substantially from industry and other private sources.

AIRTO members' international activities result largely from individual organisations' own initiatives, with little or no reliance on UK government support. However, the scale of this international activity could be significantly increased with the catalytic effect of UK government support. As well as funding

schemes, this includes the mapping, marketing and promotion of the UK's "innovation sector" and its R&D services exports.

Such an increase in activity will support two UK government priority targets:

- The increase of national expenditure on R&D to 2.4% of GDP by 2027.
- The UK positioning itself globally as the "go to place" for research, development and innovation.

Areas of Interest in the Call for Evidence and AIRTO responses

1. Methods by which new funding arrangements can:

- Support research discovery of outstanding quality in all disciplines through international partnerships

Early stage development of new ideas is often dependent on academic collaboration, particularly if those ideas are to have a significant impact. Further collaboration is then necessary if the ideas are to yield economic, environmental or societal benefit.

Successful international collaborative funding will therefore depend on identifying those ideas that merit research and innovation because of their potential impact, and which need international collaboration rather than indigenous activities.

Government and industry can provide the funding for programmes at the different stages at appropriate levels, but need advice on where that support should be targeted. This is currently undertaken at the European level by the European Research Council and the relatively new European Innovation Council. The UK does benefit from the work of these councils through its involvement in the Framework Programmes. Whether the UK has continuing access to the Framework Programmes after Brexit or not, its influence on these councils will be diminished. Therefore, it is proposed that the UK set up equivalents to identify the key areas for R&D programmes, which should include where international collaboration is important. This is discussed further in section 4.

- Attract to the UK researchers of outstanding capability from around the world

The UK's research, development and innovation (RD&I) infrastructure already has the world-class status that attracts researchers on either a temporary or permanent basis. However, it is essential that this ability to attract researchers is exploited, if the UK is to have the resources to meet the 2.4% target.

There are two current impediments to this increased exploitation:

- The loss of the Marie Skłodowska-Curie Fellowships if the UK does not have a continuing involvement in the EU Framework Programmes. Even if continuing involvement is achieved, there is some uncertainty over whether it will include the Fellowships. If they are not available to the UK, a national funding programme will be needed to ensure continuity in the flow of key researchers. The new UKRI Future Leaders Fellowship scheme does address this, but only for researchers at a particular

stage in their career who want to settle permanently in the UK. This is too restrictive and will hamper UK efforts to sustain global research competitiveness.

- New restrictions to migration, to the UK, such as the £30K salary cap, could limit the numbers of early stage researchers being allowed to move to the UK to fill vacancies and provide the feedstock for subsequent progression to leadership in research. A simple, fast track process for temporary and permanent appointments is needed, without any minimum salary constraints.
- Attract further R&D investment to the UK, thereby contributing to the government's 2.4% agenda

As discussed in the introduction, AIRTO members are very successful in attracting R&D investment to the UK. However, there are several government actions that could significantly enhance this incoming investment into the UK's R&D capacity and outcomes, namely:

- Mapping and co-ordination of the UK's innovation infrastructure and its promotion worldwide.
- An effective sign-posting and support network for companies looking to fund R&D in the UK.
- Financial support to capitalise the UK's innovation infrastructure in order to underpin expansion. Currently, this is only partly achieved through the support to the Catapult Centres. Extending such support, where justified, to the whole innovation infrastructure will benefit UK companies, attract increased overseas investment in UK R&D and the UK's export of R&D services.

2. The optimum balance of emphasis for any new funding arrangements in each of the following dimensions:

- European collaboration, Overseas Development Assistance and global collaboration

Future funding arrangements for Europe will be defined by whether the UK has access to the continuing Framework Programmes, and what the terms of that access are. If access is not available to UK organisations post 2020, a major national funding programme for bilateral collaboration with EU countries will be important in order to continue with existing activities and to foster new mutually beneficial projects.

Global collaboration and Overseas Development Assistance are part of a continuum for UK support: for global challenges in less developed countries, technology support for developing countries, and partnership with developed countries where there is complementary expertise. Even in the latter case there will be situations where collaboration will be one-way - investing in the UK, or vice versa. In addition, both ODA and R&D activities are subject to government targets. There are clear political decisions to be made, but there must also be guidance from what benefits result from the funding. This steers the funding to an effective, supporting level of underpinning research, but an increase in applied RDI funding which will result in economic, environmental and societal benefits will also be needed.

- Support for outstanding individuals, blue-skies research, business innovation and research impact, and research facilities and infrastructure

As discussed above, there is a balance between the funding for underpinning research and more applied research, development and innovation. The UK has a world-class research infrastructure in its universities, and this must continue to be supported; this will include blue skies research, which is often the subject of strong, established international collaborations. Some programmes are already in place to support outstanding individuals in particular areas such as Ser Cymru in Wales and the UKRI Future Leaders Fellowship programme. As discussed elsewhere in this document, programmes with a wider scope will be needed, particularly if the UK no longer has access to Marie Skłodowska-Curie Fellowships. There is also an opportunity to widen the support for outstanding individuals to the innovation sector for more applied research activities.

However, a big opportunity also exists in targeting funding programmes in applied research, development and innovation. As well as resulting in more immediate impact for the UK, such support will gear in higher levels of industrial investment in R&D, both from UK and overseas organisations, contributing to the target for increasing the UK's R&D activity to 2.4% of GDP.

International Programmes that fund facilities and infrastructure are important where they can be used to fill gaps in UK resources, which would otherwise restrict international collaboration and industrial investment.

- Research and innovation domains (research disciplines, business sectors etc.)

In recent years, the UK's direction for science, technology and support for industry has been rationalized into eight great technologies, key industrial sectors, industry sector deals, grand challenges and key UKRI technologies. All these are valid in their own right, but do lead to some confusion.

The overall scope for future programmes must incorporate these groupings into one coherent framework, identify what the stage of development is, and whether there is a benefit/need for international collaboration. This framework needs to address ideas for challenge led funding, and also support for cross-cutting technologies. It must also be subject to a continuous review process. It is a key role for the UK equivalent of the European Research Council and European Innovation Council discussed elsewhere in this document.

In addition to the framework, which will provide the context for funding plans, there is also the need for flexibility to recognize new technical areas, and for "open" programmes where new ideas and innovations can be proposed, justified and funded.

3. Methods and timescales for introducing any new funding arrangements for international collaboration, including those that:

- Reflect the ambitions of small and large businesses

The ambitions of business must be a vital part of international collaboration on research and innovation if the full benefits are such activities are to be achieved. There a number of subsets of business to be considered:

- UK companies (SMEs and LEs) whose RD&I needs can be provided by the UK infrastructure. These companies will be less likely to have meaningful direct participation in international collaboration.
- UK companies (SMEs and LEs) who need support from RD&I from outside the UK, which could be from universities, research organisations or complementary businesses. New funding arrangements for their involvement in collaborations should be a part of the design of any future funding programmes, particularly if UK organisations do not have continuing access to European Framework Programmes.
- Overseas businesses who want to access UK RD&I support. This “inward investment” in the UK’s RD&I infrastructure is a government target. Indirect support for the development of the UK’s infrastructure to meet the demands of overseas businesses (and UK businesses) will be important in future funding programmes, with a clear justification for what “inward investment” will be attracted. Funding support for the actual activities being undertaken will need to depend on clear evidence of the benefit to the UK, such as dissemination of knowledge or commercial collaboration with UK organisations.
- Overseas businesses who want to access UK RD&I support and invest in their own facilities in the UK. A different, enhanced justification will be needed for support from UK government funding programmes in such situations.

The design of funding programmes to address these different categories, and their speedy implementation, will play a crucial part in achieving the government’s target of 2.4% of GDP for R&D by 2027, as the majority of the increased expenditure for RD&I will have to come from industry, but this can be encouraged by the catalytic effect of government funding.

- Foster new systems of international peer review and funding

The UK has a well-developed peer review system, particularly at the project proposal level for the Research Councils. This peer review system does use international experts on occasion. For international collaborations, opening up the proposals, project progress and overall, programmes to international peer review will give a wider perspective with clear benefits.

New systems of funding can either be under UK control, and are discussed elsewhere in this document, or can be the subject of bilateral or multilateral agreements with overseas funders. In this latter case, programmes where the total funding, from all the governments participating, is held and administered by the programme are proposed. This avoids the situation where international partnerships are disrupted by the funding from different governments not being coordinated.

4. The roles of Government, UKRI, National Academies and other organisations in defining the agenda for European and international collaboration and administering any new funding arrangements for such activities.

For future success in International Collaboration on Research and Innovation, key organisations will need well defined and coordinated roles:

- Government should set the overall national strategy, promote the UK’s capabilities, provide high level guidance to potential collaborators on accessing the RD&I infrastructure, and provide catalytic funding.

- UKRI with its role of championing and administering the funding for research and innovation, should do this for any new schemes and programmes. There is a benefit of having programmes with different targets and objectives to deliver the government's strategy, but also a significant benefit of having one organisation "running" all the UK's programmes.
- A range of organisations need to provide the government with advice and guidance in setting the overall strategy, and individual government departments and UKRI on the technical areas and methodologies for intervention. This should involve the national academies, but also other research and innovation organisations, and representatives of business such as CBI and MakeUK. Consideration should be given to having a UK equivalent of the European Research Council and European Innovation Council to provide expert advice to government.

5. Existing evidence on the efficiency and effectiveness of funding for international collaborations.

A key example of the efficiency and effectiveness of funding for international collaborations are the EU Framework Programmes, which are now in the eighth iteration with the ninth Framework Programme in preparation (Horizon Europe from 2021 for seven years with a budget in excess of €100bn). These Framework Programmes have significantly benefitted UK research, development and innovation, both with the funding and with the collaborations engendered by the range of programmes and projects. Although necessarily bureaucratic, the Frameworks have provided UK's universities, research organisations and industry with long-term opportunities for collaboration with complementary organisations. Success can be seen in the development of lasting collaborations, the over-subscription of calls with fundable proposals, and for the UK the net financial benefit of participating in the Framework Programmes (the UK receives more than it contributes). This is before assessing the economic benefits of utilising the results of the research and development and the further exploitation of partnering relationships by UK industry.

As discussed earlier, continuing involvement for the UK in the Framework Programmes should be a high priority in the current Brexit negotiations. It should be noted that the involvement of the UK in future Framework Programmes is also supported by current and potential collaborators in Europe who see the benefit of working with the UK.

In parallel, other European research and development programmes and organisations have provided stable, long-term opportunities for UK organisations to collaborate across Europe, and on occasion further.

Measuring the efficiency and effectiveness of smaller, UK led or bilateral programmes is more limited with such programmes being of shorter duration and often ad hoc. Recent UK programmes such as the Fund for International Collaboration, the Global Challenge Research Fund and the Newton Fund are too recent to take an overall view on their success.

6. Any other issues relating to this work that you wish to bring to our attention.

Key to a future framework for international collaboration in the areas of applied research and innovation will be the recognition that innovation organisations form a key UK "industrial

sector” that creates economic growth and productivity for the UK, collaborates on equal terms with its international peer group, attracts significant overseas investment to the UK and exports its services globally.

Plans to develop and exploit this sector as a UK asset need to be developed if its potential benefit to the UK is to be raised.

Concluding Remarks

AIRTO believes that there is significant opportunity for increased levels of international collaboration in the areas of applied R&D, where its members operate. This could involve joint activities with leading international research organisations where expertise is complementary, and also attracting investment in research, development and innovation activities from overseas governments, agencies, research organisations and, perhaps most importantly, industry.

UK government actions can be the catalyst to realising these increased levels of international collaboration.

General views have been given in this response to the call for evidence, and AIRTO is willing to support the enquiry with more detailed analysis as required.

References

1 [Oxford Economics 2014: The impact of the innovation, research and technology sector on the UK Economy](#)

About AIRTO

AIRTO is the representative body for the innovation sector in the UK. Its membership comprises sixty of the principle organisations operating in the UK's Innovation, Research and Technology (IRT) Sector. The IRT sector has a combined turnover of £6.9 billion per annum, employing over 57,000 scientific and technical staff. The sector contributes £34 billion to UK GDP per annum¹. AIRTO's Members interface with industry and academia, working for both private and public sector clients. Members include not-for-profit and private sector Research and Technology Organisations (including Catapult Centres), government laboratories and some university enterprise offices. Members are an essential part of the UK's infrastructure for innovation, accelerating research outcomes and the exploitation of new products and services, and training significant numbers of staff at a wide range of educational levels.

Declaration of Interests

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