



**Review of the Research, Development and Innovation Organisational Landscape (RDI
Landscape Review)**

Submission to:

BEIS: Research, Development and Innovation (RDI) Organisational Landscape Review – [invitation for views](#)

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From:

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About AIRTO

AIRTO, the Association of Innovation, Research & Technology Organisations, 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 implement innovation, and provide technical solutions to challenges and crises. Members include independent Research and Technology Organisations (RTOs), Catapult Centres, Public Sector Research Establishments, National Laboratories, and some privately held innovation companies.

AIRTO, on behalf of its members, has prepared the following response to the government's request for a written representation to give views for the current Review of the Research, Development and Innovation Organisational Landscape.

Summary of AIRTO's recommendations

- The government should undertake a formal mapping exercise of the UK's Innovation, Research & Technology (IRT) sector to acquire a clear understanding of the resources and capabilities which reside there.
- Such mapping will enable effective governmental planning, and promotion of the UK's RDI capability both within the UK and around the world.
- The government needs to refine its understanding of how the RDI system works, which can then be reflected in its strategy and planning.
- The imbalance between the public funding provision for basic research and applied research /development should be addressed.
- A programme of core funding across the IRT sector should be introduced which will allow proper capitalisation of the sector, boost generic applied research, and the delivery of increased support to industry. Such core provision will 'gear in' substantially higher levels of industrial funding.
- Public funding of collaborative research in the UK for the IRT sector must be based on a non-profit coverage of costs.
- These measures will enhance the IRT sector's work towards key national priorities such as Net Zero and goal of attaining 2.4% of GDP for R&D. Additionally, consideration should be given to specific programmes to support levelling up priorities.
- The relationship between universities and IRT sector organisations should be examined, and examples of good practice established from current collaborations. Systematic national government funding of such relationships should be considered.
- A key component of future proofing the UK's RDI landscape, involves considering – alongside the RDI infrastructure - how to continue attracting and investing in the people that comprise the highly qualified and skilled RDI workforce. This is a tremendous opportunity for UK plc to be home to the 'brightest and best'.
- All these recommendations will support the UK's objective of becoming a 'Science *and Innovation* Superpower'.

Features and characteristics of the existing ecosystem of RDI-performing organisations across the UK

1. The UK has a complex infrastructure of RDI-performing organisations.
2. There are three main groups of organisations that undertake research, development and innovation. These are:
 - a. The UK's universities.
 - b. The Innovation, Research and Technology (IRT) sector encompassing independent Research and Technology Organisations (RTOs), Catapult Centres, Public Sector Research Establishments, National Laboratories, and some privately held innovation companies.
 - c. Industry.
3. To date, most of the government's focus on RDI strategy has been concerned with universities. These receive 85% of the public funding for RDI. They are world-class organisations for undertaking basic research.
4. Numerous government reports have been commissioned to consider how to improve Interactions between universities and industry. These reports have been mainly undertaken by academics and have not resulted in major changes in the exploitation of the UK's academic base by industry.
5. The UK's reputation is relatively weak at exploiting its academic base.
6. The current model of public support is focused on university research. ~85% of government funding is spent via the Research Councils and Research England (and its Devolved Administration counterparts), with ~15% funding assigned for applied research and development. AIRTO has called for redress of the imbalance ([More D!](#)) and there are indications from government that this is recognised ([Innovation Strategy](#)). The increases in government's current investment strategy provides an opportunity to rebalance this.
7. AIRTO's considers that the current model for RDI is based around an arguably incorrect paradigm, where funding for basic research provides the feedstock for a linear 'conveyor belt' that results in the uptake of the research by industry. Whilst this does happen, for the majority of academic research outputs there remains a disconnect with industry's needs – hence, the persistent failure to affect an increase in exploitation/translation of research outputs.
8. A more realistic paradigm is required, based on a market-led view of industries' needs. Companies seek the to fulfil their innovation needs either from their own RDI facilities, or from appropriate outside organisation, only reverting to academia as far as is necessary. Such a paradigm is considered in AIRTO's recent Position Statement: [MoreD!](#). Universities providing a 'reservoir' of basic research, used by the IRT sector and industry on an as needed basis.
9. A second consequence of the government's focus on academic research has been a lack of understanding of the role of IRT sector. This sector is substantial, provides world-leading support for UK industry, and attracts investment from around the world. However, in many parts of government the sector is not understood and is under-utilised. There is no formal mapping of the sector, and some broader exercises have excluded much of the sector. This results in challenges for the government in grounding its RDI strategy.
10. The exceptions to the government's lack of core support for the sector, have been support for Public Sector Research Establishments (PSREs) and establishing Catapult Centres over the last decade. These centres currently benefit from direct government support.
11. Despite the limited understanding and support, the UK's IRT sector has a strong reputation, working with industry and government in the UK and worldwide. However, it could deliver significantly more for UK plc with development and more support from government, and this represents a tremendous opportunity for the government as it seeks to implement its' Innovation Strategy.

12. The IRT sector comprises organisations with a range of ownership and governance models, but they all have the same mission – to provide innovation support to government and industry.
13. The activities of the IRT sector are crucial to three government policies:
 - a. Net Zero: the IRT sector has the knowledge, skills and facilities to deliver innovation necessary to drive change and adoption across the range of technologies needed.
 - b. Attainment of 2.4% of GDP investment in R&D: enhanced resources of the sector will be needed to deliver this goal.
 - c. Levelling-up: IRT sector organisations are located (and deliver support to industry) throughout the UK, sited in economically disadvantaged regions, as well as in the ‘Golden Triangle’.
14. The IRT sector is focussed on these priorities but has much more to offer in meeting the government’s objectives in support of national attainment of *Science and Innovation* Superpower status.
15. The IRT sector has synergistic relationships with many universities, organised on an individual basis.
16. Current support for IRT sector organisations in UK funded collaborative projects is challenging as funding bodies often do not meet the full cost. This is in marked contrast to the funding received by universities with FEC rates and the ‘dual funding’ approach. Consequently, some organisations in the IRT sector decline to participate in collaborative opportunities.
17. Similarly, there are reports of some multinationals siting their RDI programmes in countries where government support is significantly higher than in the UK. This conflicts with the government’s ambition to attracting RDI to the UK – critical to achieving ‘Science Superpower’ status.

Learning from the best in the world

18. There are numerous developed countries that provide examples from which the UK can learn. However, comparisons must be drawn with caution as the structure of the RDI ecosystem does vary across countries, as does the industrial base.
19. Lessons from other countries have to be viewed in the light of the existing relevant infrastructure in the UK.
20. There are three underpinning funding principles that prevail in most developed countries, that differ from the UK situation:
 - a. The ratio of public support for basic research and applied R&D is typically more balanced, e.g., with ratios around 50:50 in competitor countries (such as the USA & Germany), compared with 85:15 in the UK.
 - b. Core government funding is assigned for IRT sector organisations. Currently, the UK only makes such provision to Catapult Centres and PSREs, resulting in challenges for other RTOs (of undercapitalisation and capacity to undertake generic research).
 - c. Covering the full costs of RTO participation in publicly funded collaborative projects.
21. The [Fraunhofer-Gesellschaft Institutes](#) in Germany are often cited as a comparator for the UK. Key similarities and differences are:
 - a. These institutes are centrally coordinated and branded, yielding a structured network of 70 centres, each linked to a university, that are well promoted in Germany and abroad.
 - b. The formation of the network commenced after the WWII, building a new applied RDI ecosystem.
 - c. Public funding of these institutes is significant, both from federal and state sources. States provide funding for buildings, with core funding coming from the Federal

Government via Fraunhofer Gesellschaft. In 2020, direct public funding was more than 40% of turnover.

- d. The permanent staff of each Institute typically comprise 20-30% of the total headcount. The majority of the workforce are PhD students or post-docs, typically staying at the Institute for five to six years. This provides a supply chain of qualified skilled researchers.
22. A more appropriate comparison for the UK would be the French Carnot Institutes, which are based on the existing infrastructure of IRT organisations. Commencing in 2006, the initiative has 39 Institutes with the mission of supporting businesses small and large. Existing IRT organisations apply to be Carnot Institutes, and those that are successful receive core government support for five years. Organisations can apply for subsequent five year periods of investment.

Improvements to the organisational research landscape needed to deliver the government's objective for the UK to be a science superpower

23. Improvements to the organisational research landscape require a better understanding of the current ecosystem, both in terms of how it operates and the key players.
24. The role of UK universities is well understood. Support for research at these organisations (often world-class) must continue at the current level. However, with exceptions, they are generally not geared towards directly supporting industry needs, as evidenced by the slow pace of change in advancing university/industry interactions, despite numerous reviews. Academics are charged with teaching and undertaking fundamental research, and knowledge exchange, but there is a risk that over-promoting increased interactions with industry can distract from the core mission, leaving both researchers and businesses frustrated, and impeding output of international-standard quality research.
25. As discussed above, there is a lack of understanding of the IRT sector, its role and capabilities, and the individual organisations particularly in government. A formal mapping exercise of the IRT sector should be considered.
26. The imbalance between the public funding of basic research and applied R&D should be addressed. This is a significant factor in the poor exploitation of the UK's research strengths by industry. The current boost in public funding for science and innovation provides the opportunity to do this.
27. If the UK is to both support its indigenous industry and attract funding from around the world, it must provide competitive infrastructure and financial support. There are two key parts to this:
- a. A programme of core funding applicable across all IRT sector organisations which will allow capitalisation of the sector, an increase in generic research, and the delivery of increased support to industry.
 - b. Public funding of collaborative research in the UK for the IRT sector, based on a non-profit coverage of costs. This funding must also be competitive with that offered to industry by other nations.
28. These measures will improve the IRT sector's ability to support the government's agenda for Net Zero and attaining 2.4% of GDP for R&D. Additional actions from the government are vital if the sector is to play its full role in levelling up. This involves support for organisations setting up new facilities in economically disadvantaged areas, and expanding existing facilities to form a network of technological hubs throughout the UK.
29. The relationship between universities and IRT organisations should be examined and examples of good practice established from current collaborations. Government coordination and funding of such relationships should be considered, including the funding available for IRT organisations to commission academic research.

Future proofing the UK landscape of organisations undertaking all forms of RDI

30. A crucial part of future proofing the UK's RDI landscape is to have a clear understanding of how the process of research, development and innovation actually works and who the key players are. Improved understanding can then be reflected in government strategy, planning and financial support for RDI. This will result in a more coordinated robust system, and increased support for industry.
31. A formal mapping exercise will be an important part of this. AIRTO is willing to support the government in undertaking this.
32. Such an exercise would underpin the government's promotion of the UK's RDI capability both within the UK and around the world.
33. The overall goal must be to attain a stable, well-resourced ecosystem to support the UK government's Innovation Strategy, which is joined up and operates smoothly and efficiently to support clear, coordinated strategic objectives, with the necessary agility when situations demand it. Most importantly it must adequately serve the needs of the international market for creation of innovative products which depend on R&D.
34. A key component of future proofing the UK's landscape of organisations, involves considering – alongside the RDI infrastructure - how to continue attracting and investing in the people that comprise the highly qualified and skilled RDI workforce. This is a tremendous opportunity for UK plc to be home to the 'brightest and best'.