

Government Publications Autumn 2023 IOP Perspective

Introduction

Alongside the Autumn Statement, the government has published a selection of reviews, responses and plans each of which have some bearing on physics - either in physics education, research or physics-based business. The combined length of these releases is 330 pages, so we have summarised the documents below and made comments where appropriate.

Publications

[Government response to Nurse Review](#)

[Sir Paul Nurse's review](#), published in March 2023, provides a detailed analysis of the UK's complex RDI (research, development and innovation) system and identifies "significant" problems with the RDI landscape, some of which are described as "long-standing and serious". It identifies 10 important attributes for a successful RDI landscape, including financial sustainability, high research quality and agility, cross-sector permeability, a skilled workforce, good research culture and strong international collaboration.

The government response recognises the need for long-term reforms of the organisational structures of UK RDI systems. It sets out a vision for the future of the RDI organisational landscape based on three principles:

1. **Dynamic and Diverse.** The government will incentivise a greater diversity of organisational models, while continuing to support the UK's excellent universities. The government will explore more sustainable sources of funding for PSREs and will publish a national plan for RDI infrastructure. They will also pursue opportunities to host new international RDI infrastructure and launch a further £25 million funding round for Research and Innovation.
2. **Resilient.** The response mentioned the following as vital to the UK's scientific ambitions:
 - assessing financial sustainability challenges,
 - securing international RDI talent,
 - fostering international innovation and
 - improved flow of ideas, talent and technology between academia and industry
3. **Investable.** The government is keen to boost investment in RDI alongside the increase of public investment by promoting private sector investment, philanthropic partnerships and leveraging clusters to increase investment.

IOP response: The findings and recommendations in the Nurse Review are closely aligned with the IOP's [Physics R&D Blueprint](#), so we welcome the government's stated intention to take forward his recommendations, even though this doesn't appear to be backed up by concrete investment.

Quantum Strategy Missions

Building on the £2.5 billion ten-year National Quantum Strategy, the government has published an ambitious set of quantum missions. These long-term missions, to be delivered over the next decade, are that:

- By 2035, there will be accessible, UK-based quantum computers capable of running 1 trillion operations and supporting applications that provide benefits well in excess of classical supercomputers across key sectors of the economy.
- By 2035, the UK will have deployed the world's most advanced quantum network at scale, pioneering the future quantum internet.
- By 2030, every NHS Trust will benefit from quantum sensing enabled solutions, helping those with chronic illnesses live healthier, longer lives through early diagnosis and treatment.
- By 2030, quantum navigation systems, including clocks, will be deployed on aircraft, providing next-generation accuracy for resilience that is independent of satellite signals.
- By 2030, mobile, networked quantum sensors will have unlocked new situational awareness capabilities, exploited across critical infrastructure in the transport, telecoms, energy, and defence sectors.

IOP Response: The first recommendation of our '[A Vision for Quantum Technologies in the UK](#)' report last year, was for the government to set long-term ambitions for quantum technology development in the UK. The quantum strategy missions are an important part of achieving this, so we welcome the strategic direction to set the ambition for how the significant government funding for quantum technologies should be best spent in the coming decade.

University spin-out review

The government has accepted all the recommendations of the [spin-out review](#), which ran from March to October 2023.

The review gives a comprehensive study of university spin-outs, from their inception to IPO, and sets out recommendations to ensure that the right incentives are in place for the UK to lead the world in turning university research into commercial success. The recommendations include:

- Greater transparency in spin-out deals.
- Spin-out deals on market terms, avoiding unnecessary negotiations and time-consuming approvals processes.
- Better integration of spin-outs in REF reporting.
- Reforms to how Technology Transfer Offices (TTOs) are operated including funding sources and shared facilities between universities.

Government is working up proposals to take forward the recommendations and providing a new £20 million proof-of-concept fund to support universities and future founders to de-risk technology. More details about the government response can be found [here](#).

IOP Response: There has been much discussion about how universities can best support spin-out companies, but with little analysis and evidence brought to the discussion. We welcome this thorough review and hope that the clarity it offers will help universities and founders spin-out more successful companies that can drive new technologies into the UK economy.

[Harrington Review of Foreign Direct Investment](#)

The government has responded to the [Harrington Review of Foreign Direct Investment](#), which it commissioned in March 2023.

The review looked at the government's approach to attracting foreign direct investment, and aimed to provide options for improving the UK's investment promotion operation in the face of increasing competition from overseas.

The Harrington Review made 6 headline recommendations:

1. Government should set out a clear Business Investment Strategy by 2024.
2. Investment should be prioritised across central government from reactive to proactive.
3. Government should drive regional growth and expand its place-based offer to investors.
4. A newly established Investment Committee should work with government to propose further improvements to the business environment.
5. Government should build on the success of the Office for Investment, and make it globally competitive.
6. Government should ensure that the Office for Investment has access to a Business Investment Facility that would support it to initiate proactive discussions with potential investors.

Government has accepted these recommendations 'in principle', and has set out in more detail its next steps [here](#).

IOP response: Research commissioned by the IOP on FDI highlighted that physics-based startups and scaleups are an important attractor of foreign direct investment into the UK. Overall, they account for 10% of the UK's high-growth business population, but they represent a greater share of the UK's equity investment (18.8%) and a greater share of the investment that comes from abroad (FDI) (15.5%). The IOP therefore welcomes these recommendations that seek to secure the investment needed to achieve the UK's its ambitions to meet Net Zero, Level Up, and fuel the growth of future technologies.

[Advanced Manufacturing Plan](#)

The Advanced Manufacturing Plan's top line is the government's ambition for 'the UK to be the best place in the world to start and grow a manufacturing business', and is backed up by £4.5 billion of funding to unlock investment in strategic manufacturing sectors. The plan's three priorities for supporting advanced manufacturing are:

1. **Investing in the future of manufacturing by building on existing programmes and partnerships with businesses to support market-led investment in innovation and research and development.** Exemplified by the targeted subsidies announced in the Autumn Statement.
2. **Cooperating internationally and building supply chain resilience to boost economic security and ensure access to the goods that drive prosperity.** Encompassing trade deals, the critical minerals strategy, specific industries – chemicals, batteries and semiconductors – that are upstream of many critical industries, and foreshadowing a Critical Imports and Supply Chains Strategy.
3. **Reducing costs and removing barriers to boost competitiveness and ensure the UK retains its attractiveness to international investors in the long term.** Which includes tax announcements such as full expensing, measures to speed up grid connection, reducing planning permission timelines, and a range of measures to address the skills gap in manufacturing.

The plan also suggests that a resurgence of advanced manufacturing in the UK could be a tonic for the country's lagging productivity growth, as manufacturing productivity growth (3.9% per year) has outperformed the whole economy (1.1% per year) from 1997-2022.

IOP Response: One of the key findings of the IOP's [Physics R&D Blueprint](#) was that the UK needs a clear, comprehensive vision for R&D and a stable policy environment to build confidence among potential investors. The publication of the advanced manufacturing plan is therefore to be welcomed as a step towards achieving this.

The recognition that the sector faces skills challenges and that these need to be addressed is important: progress and innovation can only be made if there are enough people from all backgrounds and with the right skills. Of UK physics innovation firms polled for our [Paradigm Shift](#) report, two thirds (66%) reported suspending or delaying R&D/innovation activity in the past five years due to skills shortages. This represents a big, missed opportunity and a major challenge for the future.