

Written evidence from the Institution of Mechanical Engineers to the UK House of Commons Science, Innovation and Technology Committee inquiry on 'Innovation, growth and the regions'

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About the Institution of Mechanical Engineers

The Institution of Mechanical Engineers (IMechE) represents 110,000 engineering professionals and students in the UK and across the world. The Engineering Policy Unit (EPU) of the IMechE informs and responds to UK policy developments by drawing on the expertise of our members and partners. This response has been prepared by the EPU with input from the IMechE's Manufacturing Industries Division.

1. How does the Government drive research and innovation in our regions?

- **How effective are the government's policies in supporting the innovation ecosystem across the UK's nations and regions, particularly through commercialisation initiatives?**
 - o **How should devolution be harnessed to support innovation across the regions and nations, and what role should local government play in supporting research and development?**
- **How do factors such as the tax system, regulatory frameworks and standards influence the success of start-ups, spin-outs, and other innovation-driven businesses?**
 - o **What challenges do innovation-focused researchers and businesses face in spinning-out or scaling-up, such as accessing venture capital, infrastructure and intellectual property rights.**

The government's policies have had a mixed impact on fostering an innovation ecosystem across the whole of the UK. While initiatives such as the Catapult network have been effective in translating research into commercial success by providing infrastructure and expertise, and facilitating the evaluation and growth of technology start-ups by fostering relationships with private sector investors and industry partners, there is still room for improvement. A particular focus should be placed on understanding the impact of innovation investments from the government over the last 10-15 years. This should include analysis of economic growth, technological breakthroughs, job creation, and societal benefits. This will provide critical insights into the return on public investment and its broad impacts.

Despite the efforts of government policies, regional disparities in access to venture capital, public funding, and skilled labour persist. London and the South East continue to dominate innovation investment, while other regions remain under-resourced. Addressing these imbalances is critical to creating a thriving innovation ecosystem across the UK.

Devolution offers an opportunity to align regional strengths with national goals, for example, Scotland's renewable energy sector, Wales' advanced manufacturing expertise, and Northern Ireland's life science and aerospace capabilities. Local governments have a critical role to play in identifying regional priorities and collaborating with central government to design responsive policies. Establishing forums for consultation and information-sharing between ministers, officials, and stakeholders could ensure that these policies address both regional and national objectives.

Skills development should be closely aligned with the specific needs of local industries to enhance workforce readiness to scaling and deploying innovative products and services, and support growth. Simplifying frameworks for businesses to operate skills programs, such as apprenticeships, across borders is also essential. These programs should be adaptable to the specific requirements of local industries while allowing businesses to access talent across the UK and support continuous

professional growth. Collaborative efforts between devolved and central governments could address these challenges and promote smoother workforce development.

Factors such as the tax system, regulatory frameworks, and standards significantly influence the success of start-ups, spin-outs, and other innovation-driven businesses. Many engineering-driven innovations, particularly in sectors like advanced manufacturing, require significant upfront investment and long development timelines. However, the UK consistently ranks below other G7 nations in business investment, and traditional 10-year venture capital funds are often insufficient for these sectors.^[1] There is a pressing need for 15- to 20-year patient capital to support long-term innovation. The lack of such capital presents a significant barrier to scaling engineering and manufacturing innovations throughout the UK.

While sectors like life sciences have evolved financing models to support high-potential returns, heavy engineering and manufacturing face unique challenges. These include limited Initial public offering (IPO) opportunities and a reliance on corporate acquisitions for exits, which deter venture capital. In contrast, sectors like semiconductors have benefited from demand driven by increased investment and opportunities in artificial intelligence (AI). Addressing these gaps will require the government to support extended finance cycles through initiatives like the British Business Bank and by co-investing with permanent capital investors to bridge market inefficiencies.

Regional disparities in access to venture capital and infrastructure create an uneven playing field, driving investment to London and the South East, while leaving other regions under-resourced. Expanding regional funding schemes and providing targeted support for under-represented areas could help address these disparities. Furthermore, many investors lack the technical expertise to evaluate engineering-driven innovations effectively. This gap in understanding can, and does, lead to innovative products and services with long term value being overlooked due to a lack of understanding of the potential and feasibility. Government interventions could help bridge this gap by fostering initiatives that encourage knowledge-sharing between technical experts and investors to ensure a more balanced investment decision.

Finally, there is a critical need for a long-term strategy to remain competitive globally, and the upcoming publication of the 'Invest 2035' industrial strategy will go some way in supporting this. A cohesive long-term strategy will be vital in fostering innovation and encouraging investment throughout the UK.

¹ Institute for Public Policy Research. (2024). *Rock bottom: Low investment in the UK economy*. [https://ippr-org.files.svdcdn.com/production/Downloads/Rock_bottom_June24_2024-06-18-081624_arsv.pdf](https://ippr.org/files.svdcdn.com/production/Downloads/Rock_bottom_June24_2024-06-18-081624_arsv.pdf)

2. How does research and innovation in our regions drive growth and prosperity in those regions?

- **How effective are regional innovation hubs and clusters in supporting regional growth and prosperity for local communities?**
- **How regional Cluster growth can best be measured, mapped, and monitored to help inform local leadership and evidence-based policymaking in Whitehall.**
- **Would unlocking investment at scale for innovative science and technology companies support regional growth, and how could this be done?**
- **Should there be region-specific innovation and growth policies, and what should local government's role be in this?**

Research and innovation drives regional growth and prosperity and a key factor in this process is proximity, as geographically close partnerships facilitate more effective collaboration. Regional innovation hubs and clusters have been instrumental in building these connections and supporting economic growth. However, engineering development often requires substantial facilities, particularly at the TRL 4-7 range, which cannot be easily duplicated in every locality. National facilities, such as the Catapult Network and the National Measurement Laboratories, play a critical role in this context but can often leave remote regions such as Plymouth, Belfast, or Norwich without local facilities. Addressing this imbalance through initiatives such as Catapult satellites in Liverpool and North Wales has shown promise, but more needs to be done to ensure that all regions benefit from innovation investment and not just those with the existing absorptive capacity to do so.

Economic analyses of innovation funding have consistently demonstrated high private and social returns, albeit with variability between projects.^[2] These findings underline the importance of sustained investment in innovation at scale. Unlocking large-scale investment for innovative science and technology companies would significantly enhance regional growth. This could be achieved through patient capital mechanisms, expanded venture capital access, and public-private co-investment models.

² Frontier Economics (2023) *Rate of Return to Investment in R&D – A report for the Department for Science, Innovation and Technology*. <https://www.frontier-economics.com/media/015adtpq/rate-of-return.pdf>

3. How is research and innovation diffused or supported to drive productivity and growth in the regions, wherever it may come from?

- **What more can be done to ensure that innovation investments deliver tangible outcomes for both local and national economies, in terms of productivity and growth, and how should this be assessed?**
- **To what extent do Catapults support technology diffusion, and drive both national and regional growth?**
- **How well are universities and businesses coordinating efforts to develop and commercialise research, including the role of spin-outs and collaborative R&D projects?**

Engineering serves as a cornerstone of local economies across the UK, driving productivity and delivering high-skill job opportunities. For example, in Yorkshire and the Humber, engineering contributes over £44 billion GVA annually and supports over half a million jobs across nearly 49,000 engineering businesses.^[3] Additionally, many engineers are employed in other industries, underscoring the broad impact of engineering skills. Investing in engineering talent and innovation infrastructure directly strengthens local economies and communities.

Additionally, engineers are pivotal in translating innovative ideas into real-world applications, bridging the gap between research and commercialisation. Their expertise in validation, scale-up, and deployment ensures that cutting-edge technologies reach the marketplace. However, challenges such as insufficient financing, perceived risks, and long return on investment timelines hinder progress. These barriers are particularly acute in advanced manufacturing and clean energy sectors, which are essential for driving national growth and productivity, and yet are represent some of the most exciting opportunities for investment.

Connectivity between urban and rural areas is crucial for ensuring that innovation benefits entire regions rather than concentrating in city centres.

Developing a skilled workforce is equally vital. Establishing regional training hubs tailored to local industrial needs would align workforce development with employer requirements. Collaboration with Local Skills Improvement Plans would further ensure that training programs address regional priorities, creating pipelines of talent that attract investment and foster economic growth. There should be consideration into subsidising technical training that would add to the competitiveness of the UK and can be tailored to the regions.

Partnerships between schools, businesses, and research institutions can raise local employment aspirations and develop future talent pipelines. Encouraging collaboration among SMEs would also drive regional innovation by leveraging diverse expertise and fostering collective growth. Programs like 'Made Smarter' demonstrate how targeted support for technology adoption, digitalisation, and skills development can enhance productivity and competitiveness.

To drive technology adoption and diffusion, a combination of supportive regulatory frameworks, reduced bureaucracy, and strategic government decisions on technology investments is required. Simplified approval processes, technology standards, and tax incentives can lower barriers to entry for emerging technologies. A culture of risk-taking, supported by robust public-private partnerships and well-structured funding mechanisms, is essential for advancing high-capital sectors.

³ Royal Academy of Engineering (2022) *A hotbed of innovation: New research reveals engineering adds up to an estimated £645bn to the UK's economy*. <https://raeng.org.uk/news/a-hotbed-of-innovation-new-research-reveals-engineering-adds-up-to-an-estimated-645bn-to-the-uk-s-economy-annually>

Government-backed initiatives must prioritise late-stage R&D and scale-up funding to bridge critical gaps in the commercialisation pipeline. Strengthening existing infrastructures like the Catapult Network and research and technology organisations would further enhance national and regional growth. Collaboration between Innovate UK and the British Business Bank could address the financial challenges faced by SMEs, particularly through long-term patient capital mechanisms.

Co-designed industry-government partnerships aligned with growth sectors have proven effective in accelerating innovation. Initiatives like the Aerospace Growth Partnership and Advanced Propulsion Centre highlight the potential of coordinated planning to drive industrial growth. Workforce upskilling initiatives, particularly in AI and automation, would empower businesses to integrate new technologies and foster regional competitiveness

Fostering community support and local engagement is critical for long-term sustainability. Site specific skills training and local employment initiatives build sustainable labour sources while strengthening economic ties within communities. Strategic investments should prioritise sites that align with regional and national growth sectors, ensuring immediate and long-term economic impact.