UK industry's call to government

Presented by

ADVANCED ENGINEERING & LAB INNOVATIONS

Contents

All contributors were consulted independently and views expressed do not necessarily reflect the views of all.

Contributors

Simon Farnfield

Event Director,
Advanced Engineering

Dr. Mark-Paul Buckingham

Managing Director,
Xi Engineering Consultants Ltd

Scott Wilkins

Industry manager,
City & Guilds

Natalie Dickens

Manager for ecosystem challenges,
Royal Society of Chemistry

Raj Patey

Business development director,
My Green Lab

David Zaborowski

Group marketing manager,
SLS

Laurence Dawkins-Hall

Independent science communicator, award-winning STEM educator and core support technician,
University of Leicester

ChatGPT-4o

Generative artificial intelligence chatbot developed by **OpenAI**

Foreword

The UK's engineering and manufacturing sector stands at a crossroads. The challenges across a variety of industries — and its vast potential — have never been more apparent.

The future sector hinges on how effectively we can address the growing skills shortages, invest in supercomputing facilities, integrate emerging technologies like AI and adapt to supply chain disruptions.

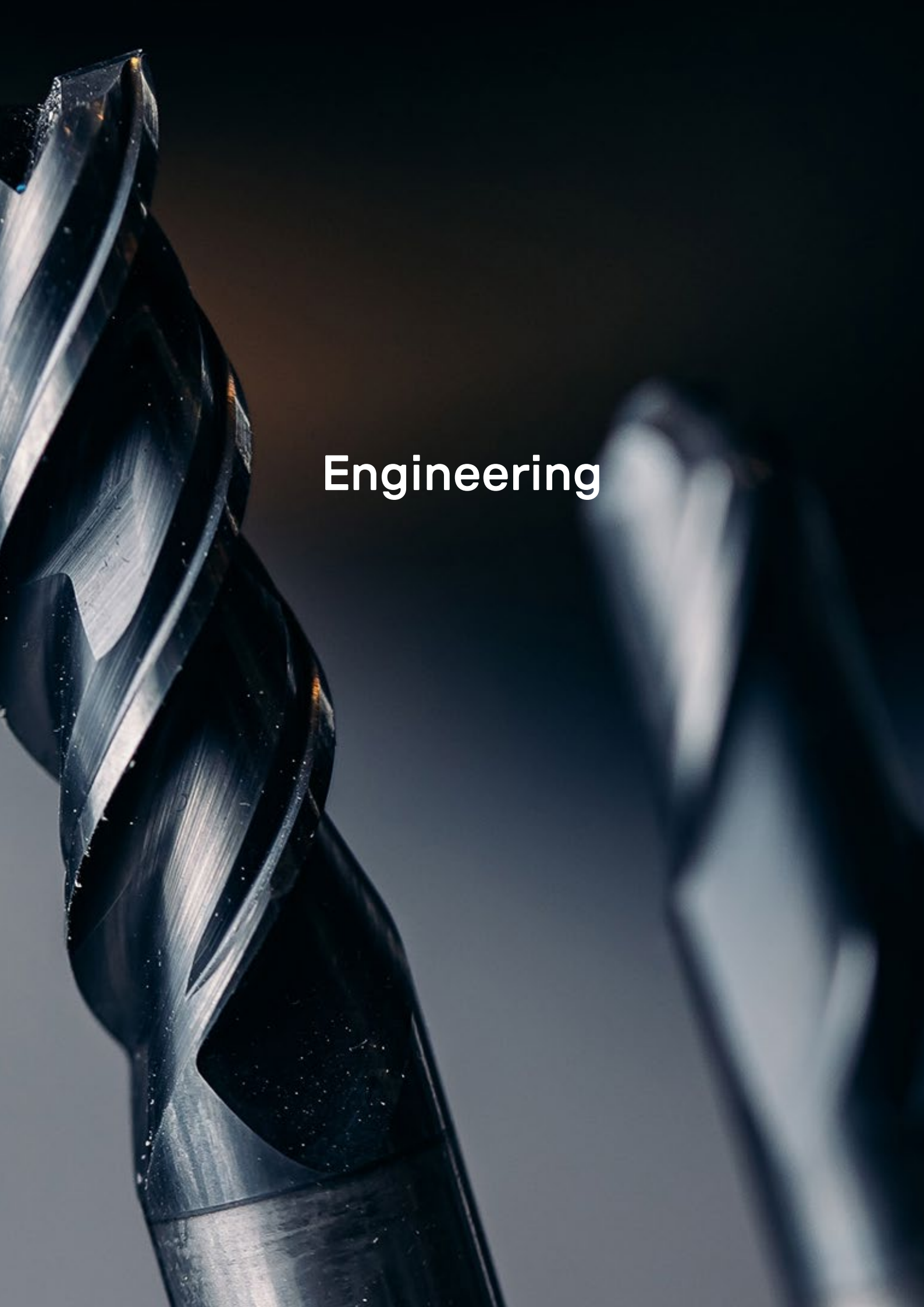
As a result, the UK risks lagging behind international competitors if critical investments are delayed.

This report captures insights from leaders across industries who, drawing from their expertise and experience, shed light on the most pressing issues facing their sector today.

The insights offer a candid assessment of what needs to be done — and how the new government can help in this crucial period.

From closing the skills gap to encouraging industry collaboration and making strategic investments in technology, the solutions put forward in this report highlight two important factors.

Firstly, the urgency of action and, secondly, the opportunity for growth so that the UK can remain a global leader in engineering and manufacturing for years to come.



Engineering

Tackling UK's supply chain challenges

By Simon Farnfield, Advanced Engineering

Manufacturers are currently facing product shortages, rising costs and inflation, leading to a shift from a 'Just In Time' to a 'Just In Case' inventory strategy. This is where companies are needing to keep large inventories on hand because of demand or lead times being hard to predict and suppliers becoming less reliable. Additionally, there is a lack of visibility into supply chains beyond immediate suppliers, making it difficult to anticipate disruptions and manage inventory effectively.

The biggest impact on the challenges is the combination of geopolitical tensions and the lingering effects of the COVID-19 pandemic. Brexit has also introduced regulatory complexities and trade barriers, further complicating the sourcing of materials and components, resulting in heightened uncertainty and inflationary pressures across the industry.

In light of these issues, the 'Prosperity through Partnership: Labour's Industrial Strategy' document has laid out the new government's mission for the UK's economy, with the fourth goal aiming to 'strengthen the resilience of supply chains in key sectors.'

The Labour Party plans to establish a supply chain taskforce that will evaluate the vulnerabilities of critical supply chains to extreme risks, such as economic shocks and geopolitical tensions. This taskforce will identify tailored solutions for different supply chain challenges, focusing on interventions that can alleviate specific issues, especially across critical sectors like defence, energy, construction, medicine and food.

One key area of focus is reducing reliance on hostile states for critical resources. The party suggests that increasing the resilience of the energy system can be achieved by accelerating the transition to renewable energy sources and decreasing dependence on imported gas.

Labour also acknowledges the importance of international collaboration, aiming to align capacities in essential sectors with global allies to bolster resilience. This includes advancing international standards to facilitate supply chain diversification, ensuring that UK companies can operate effectively in a global market.

However, addressing the skills gap is equally important, as a report by Dell Technologies demonstrates that 85 per cent of the jobs that will exist in 2030 haven't even been invented yet. Despite the manifesto mentioning initiatives like the establishment of a youth guarantee to find work for all 18 to 21-year-olds, focus must be on ensuring the future workforce is equipped with necessary skills.

This involves investing in training programs that focus on advanced, digital manufacturing techniques and sustainable practices. Collaborations between educational institutions, industry leaders and government agencies in creating curricula that align with current market needs is also required, followed by prioritising upskilling and reskilling initiatives to meet the demands of modern supply chains.

Hands-on experiences, like those offered at events such as Advanced Engineering, provide aspiring professionals with the opportunity to connect with industry leaders, gain practical knowledge and understand the skills required for future roles.

By laying the foundation for these partnerships to thrive and initiating engagement in education and training, it's efforts like these that build a resilient workforce capable of driving innovation and adapting to today's supply chain challenges.

Simon Farnfield

Event Director, **Advanced Engineering**

Simon is an event director at Easyfairs, an events company. He's a strategic leader with a track record of launching successful commercial initiatives, including trade shows, digital products, experiential events, magazine brands and new editorial content for a national newspaper.

UK behind the technological curve

Dr. Mark-Paul Buckingham, Xi Engineering Consultants Ltd

Dr. Mark-Paul Buckingham

Managing Director,
Xi Engineering Consultants Ltd

Mark-Paul holds a PhD in Mechanical Engineering and has successfully founded multiple technology companies, including Reactec Ltd and Xi Engineering Consultants Ltd, a specialist engineering consultancy. With expertise in vibration and noise reduction, he works across diverse sectors such as renewable energy and manufacturing, and regularly speaks at international conferences on these topics.

The UK technology sector is at a crossroads. At a time when tech is advancing at a rate we've not seen before, along with global reliance increasing, the UK risks falling behind due to insufficient investment in critical infrastructure and a widening skills gap.

The government recently decided to halt the upgrade of the UK's supercomputing facilities, as it was recently announced that £1.3 billion worth of funding has been shelved for tech and AI projects. This includes £800 million earmarked for the creation of an exascale supercomputer at Edinburgh University, which would have positioned the UK as a global leader in high-power computing.

Additionally, £500 million designated for the AI Research Resource, which funds computing power crucial for AI development, has also been withdrawn. These funds were announced less than a year ago, and their cancellation represents a critical blow to the UK's ambitions in staying competitive in the fast-paced tech sector.

Without this investment, the country risks falling behind in AI and other cutting-edge technologies in a world that is, and will become even more, technology driven. Simultaneously, this will also worsen the existing challenges related to talent shortages across STEM sectors.

Today, we are seeing the exodus of top talent from the UK to other European tech hubs, a trend made worse by Brexit. Cities like Copenhagen and Amsterdam, for example, have become attractive destinations for tech companies, offering both a high quality of life and easier visa requirements. This migration of talent has left the UK with fewer of the "best minds" in Europe, making it increasingly difficult to compete.

Though, this is not to say that great efforts are being done elsewhere. For instance, the government announced a record number of renewable energy projects following its latest auction round, aiming to support its target of delivering clean power by 2030.

Crucially, success in these initiatives depend on ongoing investment in advanced technologies. Innovations like advanced wind turbines, more efficient solar panels and tidal energy, for example, will drive sustainable growth and attract further investment.

Companies, like Xi Engineering, push the boundaries of technology. Through advanced multi physics simulation techniques, data analytics and machine learning, Xi Engineering creates digital twins. These are virtual prototypes that allow for computer-based optimization, meaning that clients, like Linn — an engineering company that manufactures hi-fi and audio equipment — can stay ahead in highly competitive markets.

This proved to be a more cost-effective innovation compared to traditional physical prototyping methods, as the collaboration with Linn demonstrates the technological leap in high computing that requires more supercomputing facilities and a skilled workforce to operate them.

However, those two key ingredients are currently being overlooked. To secure the UK's place as a leader in technology and ensure long-term competitiveness, we must address the skills gaps urgently and strategically invest in the future of tech and STEM education — because, as of today, we are lagging behind the technological curve.

Closing the gap between academia and industry

By Scott Wilkins, City & Guilds

Scott Wilkins

Industry manager,
City & Guilds

Scott is an industry manager who oversees the UK & International Engineering, Manufacturing & Construction Portfolio for City & Guilds Group. He sets the strategy for future skills development in these sectors, working closely with key stakeholders, industry, education and government.

In your opinion, what are the main challenges facing the UK's engineering and manufacturing sector right now?

Almost half of engineering companies are having difficulty finding skilled workers — and this situation is likely to worsen over the coming years with many of the current workforce set to retire by 2026.

The UK has put a lot of work into encouraging young people to consider careers in engineering. In fact, engineering is being advertised as a career opportunity in schools to children as young as nine. However, this alone isn't enough to close the growing skills gap.

What do you think is having the biggest impact on these challenges?

For the majority of qualifications, such as apprenticeships and T-Levels, work placements are required for students to gain the experience necessary to pass. The availability of these placements is greatly lacking.

Last year, we conducted a survey that found most engineering companies were approached by at least one student in the two years prior for a work experience placement. However, the majority of the same group of companies did not take a student.

The lack of work experience placements also varies depending on the student's location. For example, a future engineer wanting to work in aerospace might have a better chance of securing an opportunity in Bristol, but would struggle in rural Norfolk.

How do you think the new government can support in helping overcome them?

Businesses need more initiatives to support students, whether it's by offering work experience placements more regularly, or supporting with assessments in high education facilities. Perhaps the new Labour Government could help by offering some kind of collaboration grant to businesses that give a certain number of days per year to training.

The Apprenticeship Levy also needs to be revisited to ensure that it is flexible enough to support the employer as there are restrictions on what employers can spend it on.

There also needs to be encouragement for the existing workforce to transfer their skills to the next generation of engineers. Technology and sustainable practices are changing so quickly, we need teachers entering the profession at a younger age, rather than just at the end of their physical engineering career when some of their teaching or mentoring knowledge might not be up-to-date with today's practices.

Can you tell me a little bit more about your organisation and how it supports UK engineering and manufacturing?

City & Guilds is a leading awarding organisation for work-based qualifications. We offer more than 500 qualifications through 8,500 colleges and training providers in 81 countries worldwide. We employ over 1,000 people and award 1.9 million certificates every year.

We are supporting UK engineering and manufacturing by supplying the next generation of engineers with the experience and qualifications they require to enter the industry.

Integrating AI into engineering

Written by ChatGPT-4o

Since the launch of ChatGPT at the end of 2022 generative models have become commonplace and few people are strangers to AI anymore. According to McKinsey, generative AI could add £2-3 trillion to the global economy annually. But what can we gain by adopting AI into UK engineering, and how can the new government help?

For example, generative AI systems can support various aspects of the engineering industry by automating design processes, optimising resource use or enabling more innovative solutions. However, several challenges face the adoption of AI models into UK engineering.

First, there's the issue of the data used to train models. For instance, data from real world manufacturers could be used to train a machine vision model to spot defects, but this data is often protected intellectual property or proprietary information, so companies must be willing to collaborate and share data.

Here, Labour could promote industry collaboration. Encouraging collaboration between academia, industry and government can help to bridge the gap between proprietary research and practical application. This might involve creating platforms for knowledge exchange, joint ventures and pilot projects to test and refine AI technologies in real-world engineering scenarios.

Another challenge is regulation and ethical considerations. As AI is increasingly integrated into engineering processes, questions about accountability, transparency and AI's role in making decisions must be addressed. It's up to the Government to develop clear guidelines and regulatory frameworks that foster innovation while ensuring safety and fairness.

Finally, skills and training are significant challenges. There is a growing need for engineers who are not only experts in their specific fields but who also understand AI and data science. Bridging this skills gap is essential to getting the most out of AI.

When investing in education and training within engineering courses, the Government could prioritise funding for educational programmes that focus on AI and data science. Be it grants, scholarships and partnerships with industry to ensure that the future workforce is well-equipped to handle AI technologies.

AI technologies, like Generative AI, can help the UK's engineering sector become more innovative, efficient and sustainable. By automating routine tasks and providing new tools for exploration and design, AI allows engineers to push the boundaries of what is possible, leading to breakthroughs that could have a significant impact on both the industry and society as a whole.

ChatGPT-4o

Generative artificial intelligence chatbot developed by **OpenAI**

ChatGPT is an AI language model created by OpenAI, designed to assist with tasks across various topics. Its goal is to help users communicate, solve problems and boost productivity by providing accurate and useful information.


Science

Laying the ground for innovation

By Natalie Dickens, Royal Society of Chemistry

The United Kingdom's capacity for scientific R&D has been among the world's best for many years. Today, scientific breakthroughs and technology development continue to happen across the country, enabling scientists to tackle global challenges like net zero, food waste, and health equality.

This is somewhat supported by public spending: in 2022, the UK Government spent around 3 per cent of GDP in research and development; that's £15.5 billion. This increased ten per cent from the previous year and puts the UK fourth in the G7.

However, top level spending does not necessarily represent the nuance of the challenging landscape in which start-up and spin-out companies are operating. The academic scene has many talented, ambitious people ready to commercialise and scale novel technologies.

They need a supportive ecosystem and suitable infrastructure to be successful.
The Royal Society of Chemistry, through our Change Makers initiative, has understood the challenges faced by these start-up companies. Specifically, we've focused on deep-tech chemistry ventures.

These are businesses that use chemistry as the core of their intellectual property and scientific advancement. These might focus on nanomedicine, graphene-based electronics or many others.
We found that accessing adequate laboratory space is one of the biggest barriers these companies face on their commercialisation journey.

Given the intense, specific nature of R&D chemistry, the lack of suitable facilities stifles these innovators' potential innovators because they can't access the correct environment.

We looked at the issue in a holistic way to understand why it has persisted for decades. The reasons for the shortage are complex.

Financial cost plays a large part - chemistry labs are more complex with higher specifications and are therefore more expensive to build and operate. Property developers are less likely to invest because the value case is not immediately clear.

Other factors exacerbate the issue too. There is surprisingly little demand data available and, without detailed analysis of what types of labs are needed in which areas and quantities, deep-tech advocates lack the demand mapping that would help make the case for investors.

Finally, deep-tech chemistry does not feature prominently in strategic narratives or government agendas. Without this state-led encouragement, it's difficult to see where the motivation for advancing this promising sector will come from.

One of the new Labour Government's flagship policies is reform of the planning system. Making it easier for developers to build chemistry labs is an obvious obstacle removed. Some incentivisation of investment into deep-tech R&D labs would also accelerate the process of bringing forward early-stage innovations.

On the highest level, alongside unearthing data on demand and unlocking investment, there needs to be a place in national narratives and government strategy.

Shining a brighter light on this cutting-edge science would filter down into broader conversations and platform its potential for everyone from academics to property investors to FTSE 100 CEOs.

Harnessing our dynamic academic researchers will help the country to retain our position among the world's leading lights; but we must provide the stage for them to flourish. The RSC has launched More ChemLabs, a collaborative cross-sector initiative seeking to build a supportive landscape and unlock investment into more chemistry labs.

Natalie Dickens

Manager for ecosystem challenges, **Royal Society of Chemistry**

Natalie Dickens is an ecosystem challenges manager within the Change Makers tem at the Royal Society of Chemistry. The report, 'Unlocking Innovation: A systems approach to addressing the shortage of chemistry labs for startups' is available now.

Upskilling a nation

By Laurence Dawkins-Hall,
University of Leicester

Nobody involved in STEM industries would be surprised to hear about a dearth of skills and concerns about the next generation of scientists, engineers and technicians in the United Kingdom. The Institute for Engineering and Technology (IET) estimates that there is a shortfall of over 173,000 qualified workers. But how did we get here?

For some years now, the scientific community has lost invaluable knowledge with no replacement when experienced professionals leave to seek alternative work or retire. Take the example of academic laboratory technicians. Poor retention of skilled personnel, due to a lack of fulfilling progression, sees their experience pass to nothing and impacts training for professionals in earlier stages of their career.

One reason for this is the shift in teaching responsibilities in academic laboratories. Where once seasoned technicians would have passed on their experience to new graduates, now older PhD researchers take up that role.

An over-emphasis on theoretical knowledge at the expense of practical skills also damages training at the national level. Too regularly, new graduates will arrive in a new role, or even struggle to find an appropriate position, with little applicable skill set(s). While employers expect to invest in training new graduates, there must be more focus on preparation for industry. The individualistic nature of universities is another fundamental issue that contributes to tougher financial conditions. A widening gap exists between prestigious Russell Group universities and other higher education institutions in terms of the quality of infrastructure and investment in the modern equipment used in industry.

Fortunately, there are already examples of successful programs in operation that can provide inspiration to the new government in realigning the UK's skills and training strategy.

The Institute for Apprenticeships and Technical Education (ifATE), for example, standardises apprenticeship training in terms of required knowledge, skills and behaviours. This is implemented by Training Providers programs, fostered through real workplace experience and assessed by End Point Assessment Organisations (EPAO).

The government sets the standards for these programs, but they are matched to needs in real world workplaces, such that apprentices arrive equipped with the skills that employers currently wish to see in university graduates.

The Technician Commitment from the Institute of Technical Skills and Training is also providing participating personnel and institutes training and networking opportunities. Its principal mission is to reverse the outflow of technical personnel from the higher education, further education and the industrial sectors.

Laurence Dawkins-Hall

Independent science communicator, award-winning STEM educator and core support technician, **University of Leicester**

LDH's commitment to skills and technical training is underpinned by his own experiences: 35+ years as a life sciences technician with an international CV and eight years working to improve UK technicians' opportunities in line with the "Technician Commitment"

My recommendations for the future of the UK's laboratory skills and training, particularly in a non-academic, technician focused context, are therefore simple. Firstly, the strengthening of the apprenticeship framework should continue, providing applicable, practical laboratory skills to apprentices to prepare them for the demands of the industry.

Secondly, further supportfor and expansion of the Technician Commitment will boost morale, improve CPD opportunities and address the current unsustainable exodus of technical staff.

Finally, the success of University Procurement Consortia points to the potential of regional networks to empower academic institutions with economies of scale. Greater investment in modernising infrastructure combined with more unity among universities, for example regional sharing of courses and equipment, could ensure more equal training opportunities.

Advancing laboratory sustainability in the UK

By Raj Patey, My Green Lab

The good news about laboratory sustainability in the UK is that the community has made significant progress. A recent Royal Society of Chemistry report found that 79 per cent of researchers agree that they know how their actions in the laboratory impact the environment. Huge private funding bodies like Wellcome and Cancer Research UK have announced that financial support to organisations will be conditional on certification by independent green lab accreditation programmes.

The bad news is that much more work is needed. There are no mandates as above on receiving public funding, nor are any on the way. Although lab behavioural change has progressed well, the culture of sustainability that My Green Lab and the greater scientific community seek to build around procurement has some way to go.

For example, lab purchasing decisions are taken largely on upfront cost alone and little thought is given to the total cost of ownership (TCO) across a product's lifetime.

The lack of a cohesive, collaborative and standardised approach slows the industry's journey towards holistic sustainability. Unnecessary duplication of efforts, such as organisations setting their own ESG criteria for suppliers, rather than collaborating on common demands, drains resources that could be spent on improving other processes.

Attitudes of compartmentalisation and competition between departments, sectors and countries slow progress, as does a lack of properly directed funding and legislation.

Finally, the fundamental concern that sustainability-oriented change is somehow at odds with scientific and research ambitions must be dispelled. Multiple organisations, such as AstraZeneca, and Henkel, have evidenced through case studies that a sustainably run lab is a safer, lower-cost and lower-carbon lab.

Making this financial case will be crucial to continuing the good work done by British labs in the last decade. As such, a way to engender meaningful change is to put sustainability front and centre of science funding and the way it's distributed.

Requiring participation from independent green lab certification programmes, such as the My Green Lab Certification programme, to qualify for funding is a great start.

Similarly, making it conditional to use transparent, standardised and third-party-verified identifiers, like the ACT Ecolabel, will empower procurement staff and facility managers to select more sustainable suppliers and products.

To achieve a transition to a greener supply chain, it's essential that innovative, sustainable products are available from the start. Our ACT Ecolabel Program facilitates manufacturers in demonstrating transparency in product-level sustainability while driving continuous improvement and innovation to reduce the carbon impact of the lab supply chain.

Sustainability education must be integrated into STEM education at all levels, contributing to that environmentally responsible culture that feeds into everything from the lab to the manufacturer, and on to end users.

The My Green Lab Accredited Professional program provides education, resources and support to help professionals understand and implement sustainable practices across their lab operations.

In summary, sustainable decisions should be incentivised at sector, organisation and individual levels. Preferential funding for independently verified greener practices and providing attractive and sensible options based on true TCO are two essential ingredients for this.

Why shouldn't science lead the way for UK sustainability?

Raj Patey

Business development director, My Green Lab

Raj Patey is a business development director at Impact Laboratories, a subsidiary of the non-profit My Green Lab. Its mission is to build a global culture of sustainability in science through advocacy, education and certification in both the lab user and lab supplier communities.

Fuelling the flames of innovation

By David Zaborowski, SLS

In 1963, Harold Wilson delivered the speech that inspired the scientific community, and much of the country, by promising to forge a new Britain in the 'white heat' of a scientific revolution. Now, 61 years later, another historic modernisation is underway. The new UK Government has an opportunity to harness rapidly advancing technologies, powered by artificial intelligence and the industrial internet of things (IIOT).

However, multiple challenges stand in the way of UK laboratories' progression to automation world leader status. The very pace of technological development sees labs struggle to keep up. Procurement and management personnel invest in costly, cutting-edge equipment only to be behind the times three to five years later. This is especially true for smaller businesses and laboratories, amplifying disparities in technical capabilities and throughput rates compared to larger organisations.

Additionally, both public and private investment into advanced technologies, such as nanotechnology and robotics, has been limited so far. Encouraging examples exist, such as the AI for chemistry hub at the University of Liverpool and Imperial College London, funded to £12 million by the Engineering & Physical Sciences Research Council (EPSRC) and a further £19 million by consortium partners. However, this type of institution is in nascent stages of development and will require ongoing support to deliver results.
A shortage of adequate lab space and skilled personnel is also limiting the advance of technical disciplines across British and Irish STEM sectors. This is perhaps more true in new fields like applied AI and smart technologies than elsewhere.

The sources of these challenges are also complex. The economic challenges of the post-COVID-19 pandemic years have seen budget constraints and the bite of inflation restrict progress across the board. Neither CFOs nor funding agency directors have had the freedom to invest in advanced lab technologies that would have allowed them to take full advantage of recent leaps forward.

Navigating regulatory compliance obstacles for developing technologies has also slowed the uptake of game-changing innovations, like bioinformatics or reaction data analysis tools. Brexit divides opinion, but the loss of EU research funding, talent retention difficulties and increased bureaucracy and supply chain delays have undoubtedly harmed the UK's laboratory sector's development.

Plainly, there's lots to do. The first place for the new Labour government to start is funding. R&D investment is vital to equip UK scientists with the tools for complex and emerging fields, such as advanced neurological medicine, next-generation renewable energy and synthetic biology.

Public-private partnerships and grants specifically targeted at smaller labs should help to reduce the inequality between institutions of different size and spending power. As this report addresses elsewhere, frameworks for training and investment in facilities that support start-ups, such as incubators and science parks, are also crucial.

Any conversation concerning the future of science must include sustainability. Prioritising R&D programmes that centre sustainable products, consumables and operations should be key to the government funding distribution.

Ultimately, public and private investment, focused on technology that sets laboratories up to succeed in the long-term is how the UK can maintain its status as a science superpower. Grants, tax credits, private equity and other financial support will fuel the heat of the UK's next scientific revolution.

David Zaborowski

Group marketing manager, SLS

David Zaborowski is the group marketing manager for Scientific Laboratory Supplies. He coordinates the marketing machine for one of the lab industry's most recognisable names, ensuring laboratories up and down the country have what they need to push scientific innovation forward.

What AI means for the science world

Written by ChatGPT-4o

The application of AI in science is transforming research and innovation across multiple disciplines, enabling breakthroughs in fields from drug discovery to climate modelling. However, for the UK to remain competitive in this rapidly evolving landscape, several significant challenges must be addressed, especially around infrastructure, skills and funding.

For example, generative AI
The biggest hurdles currently include limited access to high-performance computing (HPC) systems, a critical shortage of AI-trained talent and insufficient investment in both hardware and research funding.

Although the UK government has taken steps to address the former — such as the £300 million investment in the AI Research Resource (AIRR) — the capacity still lags behind global competitors.

The AIRR initiative, which includes cutting-edge supercomputers at Cambridge and Bristol, is designed to increase the UK's AI computing power by thirtyfold. However, with increasing global competition, this may not be enough to position the UK as a leader in scientific AI.

Beyond infrastructure, the shortage of skilled AI professionals is a significant hurdle. The rapid development of AI tools in scientific research demands a workforce that can not only develop AI models but also apply them in specialised fields like biology, chemistry and physics.

Currently, many UK scientists lack the technical training to design or interpret complex AI models. That's why, for example, The Alan Turing Institute, UK's national institute for data science and artificial intelligence, aims to "contribute to training people across sectors and career stages in data science and AI to match the UK's growing industrial and societal needs."

The UK government has recognised these challenges and made significant policy announcements. In the 2024 spring budget, former Chancellor Jeremy Hunt outlined plans to double the size of the AI incubator team to foster the Government's in-house expertise. This included £500 million toward AI infrastructure over the next two years.

In addition to infrastructure and skills, the quality and availability of data present a major challenge. AI's effectiveness depends on the ability to train models on large, high-quality datasets.

In scientific research, this is often hindered by fragmented, incomplete or poorly organised data. Efforts are underway to improve data sharing across institutions, but the lack of standardised data protocols remains a bottleneck. By facilitating better data integration and collaboration, the UK could unlock much greater potential from its AI research infrastructure.

Therefore, the UK could see substantial growth in AI-driven scientific research across the next five years, but this will depend on strategic investments in both computational infrastructure and workforce development.

Without significant investment and policy reform, we risk watching this technological revolution pass us by, leaving the UK lagging in both innovation and economic growth. AI will define the future of science — and we must not be left out of it.

ChatGPT-4o

Generative artificial intelligence chatbot developed by **OpenAI**

ChatGPT is an AI language model created by OpenAI, designed to assist with tasks across various topics. Its goal is to help users communicate, solve problems and boost productivity by providing accurate and useful information.

Conclusion

The insights gathered in this report make it clear that the UK's engineering and manufacturing sector faces significant challenges that require both immediate attention and long-term strategic action.

Ultimately, the UK's ability to maintain its global leadership in engineering and manufacturing will depend on how swiftly and effectively these challenges are met.

Through strategic investments in skills, technology and infrastructure, the government and industry have the chance to not only overcome current obstacles but also to lay the groundwork for a stronger, more resilient future too.

Collaboration, innovation and decisive action will be key to ensuring success across sectors in an increasingly competitive world.

UK industry's call to government

Presented by

ADVANCED ENGINEERING & LAB INNOVATIONS

Contact us

Advanced Engineering

e: sonia.diaz@easyfairs.com

For press enquiries contact:

e: jess@stonejunction.co.uk

Lab Innovations

e: nicole.hawkins@easyfairs.com

For press enquiries contact:

e: greg@stonejunction.co.uk