

IChemE

Institution of
**MECHANICAL
ENGINEERS**

Reskilling in engineering

Roundtable summary



Background

Engineers work in, and will continue to work in, a rapidly changing world. Artificial Intelligence, digitalisation, automation and sustainable energy are transforming the engineering landscape, and coming years will doubtless see new technologies and trends that we cannot yet predict. The skills and expertise that engineers will need to draw on will change over time, and many of the skills that will be needed in the future are not widespread in the workforce. Yet the reality is that 80% of the 2030 workforce is already employed today.

This means that reskilling will be vital to ensure that individuals are able to continue to be productive, and to ensure that the economy more generally is able to draw on the widest pool of talent as its needs change. Without effective reskilling, individuals risk having their skills become obsolete, and the workforce will not be able to meet the demands of future industries. Successful reskilling requires a range of cultural, institutional and policy support.

In April 2025, The Institution of Chemical Engineers and the Institution of Mechanical Engineers convened an expert roundtable to explore these issues. This document provides an anonymised summary of the key themes from that discussion.¹

Executive summary

- The need for an effective reskilling system in the UK is clear – without it we will not be able to meet the workforce challenges of the future, particularly with the demographic challenges facing the engineering workforce.
- For reskilling to happen at scale, it needs to be simple and attractive for individuals and companies to engage with.
- At the moment the barriers to engaging with reskilling (cost, complexity and time) are often too high, particularly for all but the largest companies.
- There are significant cultural barriers to reskilling including a reluctance to recognise transferable skills.
- A continuous and expansion of outreach campaigns to make engineering careers known and attractive to those currently not in the sector.

We call on the government to:

- Produce a *National Engineering and Technology Workforce Strategy* to support its forthcoming industrial strategy, as called for in the *National Engineering Policy Centre's 2024 report* on key policy asks for the newly elected UK parliament.ⁱⁱ
- Simplify the system through a review of the apprenticeship and CPD systems to ensure that they are easier to navigate and access – or, alternatively, provide individuals and smaller companies with support in navigating through the system.
- Consider providing tax breaks to incentivise SMEs to spend on training and reskilling.
- Reinstate its long-term funding for STEM teaching in schools and ongoing teacher CPD.
- Introduce greater flexibility into how apprenticeship levy money can be accessed.
- We call on Skills England to conduct a specific piece of work looking at how it can support engineering in delivering the industrial strategy.

Workforce shortages and challenges

Participants agreed that the UK was facing a significant shortage in its engineering workforce and that simply training new engineers would not be a sufficient response to the problem. It was noted that engineering is experiencing a demographic shift in its workforce, with significant numbers of the older generations in the profession having retired, moved abroad or into other professions. It was agreed that reskilling and upskilling would have to be part of the solution to these workforce challenges, particularly of people who were not currently engineers.

Changing approaches to learning

Participants noted that the way people train and reskill is changing and will continue to change, with a greater emphasis on flexibility, micro-learning and modularity. Learning styles were seen to have shifted, particularly among younger generations, with a decreased emphasis on consuming large chunks of content through reading, and a greater emphasis on flexibility and small modular units of learning. It was noted that traditional approaches to curriculum design did not yet reflect these changes, and that even the smallest courses provided by established education providers were very large when viewed in the context of an increasing desire for smaller units of training. Due to the unpredictability of the future skills needs, we need to have flexible systems in place for upskilling that can change as the skills needs change and offer the right 'size' of learning.

Artificial intelligence was seen to present significant opportunities for the creation and delivery of training, for instance through allowing the rapid creation and iteration of new instructional materials in response to changing needs, and new digital trends such as gamification were seen as presenting new ways to encourage engagement.

Changes in the skills needed in engineering

There was a discussion of the skills that should be emphasised in the training and retraining of engineers in the future, and although there was reluctance to try and characterise exactly how the mix of skills needed by engineers would change in the future, there was a general consensus that there would be a greater emphasis on digital and green skills. Participants felt that the skills most likely to be 'future-proof' would be more general skills such as critical thinking and soft skills.

Critical thinking was seen as crucial for enabling people to engage effectively with new forms of knowledge, and to allow people to be sophisticated users of artificial intelligence who could be more likely to spot misinformation or confused results. Soft skills were also

seen as having a central role to play in engineering, with adaptability, collaboration and communication being seen as more important than learning tasks in a rote fashion.

Attendees noted that cognitive diversity was crucial for the engineering workforce of the future, to ensure that it would continue to be able to respond to a variety of challenges, and that reskilling people from a wide variety of backgrounds to become part of the engineering workforce would help improve this.

Both the importance of soft skills in engineering and the requirement to draw people into the sector from a variety of backgrounds were highlighted in a 2021 report by the IMechE and IET. The report, *The Future Manufacturing Engineer: Ready to Embrace Major Change?*, was based on a survey of over 300 engineers.ⁱⁱⁱ

There was also a discussion of the need for reskilling of many people in senior leadership positions, with a recognition there is a need to upskill managers and leaders to develop their understanding of the critical skills that new graduates and apprentices are bringing to the business like AI and data science, which may not be recognised through traditional hiring methods.

Need for cultural shifts among employers to promote reskilling

Participants felt that a number of shifts in the mindset of employers would provide a better environment for effective reskilling, including: being less rigid about the requirements for particular jobs (and more open to look for people's transferable skills) and being more accepting of 'squiggly' careers, which are nonlinear, with frequent shifts and re-entries. There was agreement that common job requirements such as numbers of years of experience in a particular sector were seen as unnecessary in many cases, and as overlooking relevant skills that people could have from other fields. There was also some discussion of whether employers too often looked for qualifications that were unnecessary (eg asking for chartered engineers when this might not be required).

It was noted that many engineers leave the field temporarily (especially women), and that employers should be accepting and accommodating of this. Support systems like STEM Returners (who do important outreach work and provide a support network for individuals and companies) were seen as vital in helping people in returning to the engineering workforce.

Participants felt that it was crucial to ensure that the skills of the workforce of sectors that are seen as more traditional/declining were seen as a valuable resource, and that people in these industries were supported into applying those skills in newer sectors. (For example, it was noted that many of the same fundamental skills and ways of thinking were shared between oil and gas and CCS/hydrogen, and that people from the former could usefully apply their skills in the latter).

There was a discussion of 'deep verticals' as an approach to reskilling, where someone might train in and attain a competency in a very specific area of work, without having to take the time to build a full spectrum of technical expertise. This specific skillset would allow someone to be productive much more quickly than if they took the time to complete a wider programme of study (which would traditionally involve multiple years of study at a university).

The complexity of the apprenticeship and wider reskilling landscape

The complexity and inflexibility of the apprenticeship and CPD landscape was noted by a number of attendees, with particular attention being given to the time, effort and knowledge needed to navigate the various systems involved. This was seen to be true for individuals, providers, and for all but the largest companies. It is particularly true for SMEs who find it difficult to navigate and administratively burdensome due to having limited time and resource. This complexity (and the time and effort required) was seen to present a significant barrier for reskilling, and in many cases prevented people and organisations from engaging with the system at all. It was felt that only the largest corporate players had the resources needed to understand these opportunities, and that they were able to exploit them effectively.

Other challenges faced by businesses in engaging with the reskilling agenda

The upfront cost of reskilling (both time and money) was acknowledged to be a significant barrier to engagement by employers and individuals seeking new skills, however underinvestment in reskilling was seen as a clear false economy. There was a consensus that government should provide additional support in this area.

Participants observed a number of other challenges experienced by SMEs in engaging with reskilling, including difficulty in identifying what skills they need when recruiting new staff, or in developing their teams; a recurring fear about investing in staff training, only to see them be 'poached' by competitors; and challenges in attracting talent due to not having the type of name recognition that attracts people to work at larger firms.

Policy challenges and opportunities

Attendees noted a challenging but changing policy landscape for reskilling. It was agreed that policies were insufficiently aligned across government, and that certain changes were particularly concerning such as the general decrease in government funding for skills (down £1 billion since 2010) and the cuts to funding for level 7 programs. There was some optimism expressed regarding the potential impact of the upcoming Lifelong Learning Entitlement, but it was felt that the systems associated with this would need to be simplified and streamlined if it was to be successful. It was also noted that two pots of money were currently being underspent (in the form of the immigration skills charge and £800 million of the employer contributions from apprenticeship levy). There was some feeling that the industrial strategy could provide an opportunity to address these issues.

Collaborative approaches to apprenticeships and graduate scheme could reduce the hiring risk to SMEs and build links along supplies chains. Large multinational could pair up with SMEs in the provision on on-the-job training.

Government could also work with industry to provide portals to help maintain skills in key sectors with surplus job applicants for large companies directed toward SMEs with opportunities.

Need for long term national focus and strategy

There was a clear consensus that the Government has a central role to play in developing the workforce, and that it should do so through a properly resourced, long-term strategy which would promote the development of the workforce from a number of different angles simultaneously. Encouraging new students to study courses at school and university was seen as important, but as part of a package of measures including an emphasis on reskilling and upskilling, a clear focus on ensuring an attractive visa regime, adequate funding for further education, additional support for STEM teacher CPD, and efforts to ensure a culture of lifelong learning. Attendees agreed that this approach should integrate individual areas of activity which had previously been siloed across government (eg green and nuclear), and that it should involve local government playing a key role – particularly combined authorities.

Conclusions and recommendations

- The need for an effective reskilling system in the UK is clear – without it we will not be able to meet the workforce challenges of the future, particularly with the demographic challenges facing the engineering workforce.
- For reskilling to happen at scale, it needs to be simple and attractive for individuals and companies to engage with.
- At the moment the barriers to engaging with reskilling (cost, complexity and time) are often too high, particularly for all but the largest companies.
- There are significant cultural barriers to reskilling including a reluctance to recognise transferable skills.
- A continuous and expansion of outreach campaigns to make engineering careers known and attractive to those currently not in the sector.

We call on the government to:

- Produce a *National Engineering and Technology Workforce Strategy* to support its forthcoming industrial strategy, as called for in the *National Engineering Policy Centre's 2024 report* on key policy asks for the newly elected UK parliament.^{iv}
- Simplify the system through a review of the apprenticeship and CPD systems to ensure that they are easier to navigate and access – or, alternatively, provide individuals and smaller companies with support in navigating through the system.
- Consider providing tax breaks to incentivise SMEs to spend on training and reskilling.
- Reinstate its long-term funding for STEM teaching in schools and ongoing teacher CPD.
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- We call on Skills England to conduct a specific piece of work looking at how it can support engineering in delivering the industrial strategy.



About IChemE

The Institution of Chemical Engineers (IChemE) is the qualifying body and learned society for chemical, biochemical, and process engineers in the UK and worldwide, with over 30,000 members. Our mission is to champion the input of chemical engineers to create a sustainable future. We are the only organisation permitted to award Chartered Chemical Engineer status and Professional Process Safety Engineer registration. Find out more about IChemE and our strategic vision of Engineering a Sustainable World at www.icheme.org

About IMechE

The Institution of Mechanical Engineers (IMechE) represents around 110,000 engineering professionals and students in the UK and across the world. Our mission is to improve the world through engineering, and our Vision 2030 Strategy set out our plan to be a global, inclusive, and digitally enabled engineering community. 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.



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- i The Prince's Responsible Business Network (2022) Rebooting Lifelong Learning for a Skilled Workforce.
- ii <https://nepc.raeng.org.uk/policy-priorities-2024>
- iii <https://www.imeche.org/policy-and-press/reports/detail/the-future-manufacturing-engineer-ready-to-embrace-major-change>
- iv <https://nepc.raeng.org.uk/policy-priorities-2024>