

# Investing in the future: policy priorities for STEM workforce planning, education and skills



**EngineeringUK**  
INSPIRING FUTURES TOGETHER



# About EngineeringUK

We are a not-for-profit organisation working in partnership with the engineering and technology community to inspire tomorrow's engineers. Our mission is to **enable more young people from all backgrounds to be informed, inspired and progress into engineering and technology**. We work across 4 strategic strands:

## Research and evidence

Establishing the composition of the current engineering, technology and technician workforce, future workforce needs and how to address them

## Leadership

Leading efforts to grow the collective impact of all engineering and technology inspiration and careers activities with young people of school age

## Activities for schools

Expanding EngineeringUK's engagement to encourage more, and more diverse, young people into engineering, technician and technology roles

## Advocacy

Providing advocacy and support to address policy and delivery challenges in STEM and careers education as well as workforce planning for engineering and technology



**EngineeringUK**

# Why do **engineering skills** matter?



# State of the nation

Demand for engineering skills is soaring across all sectors

But we lack the supply to meet the needs for infrastructure, decarbonisation and **growth**



Engineering jobs to grow in all UK regions between **now and 2030** – **faster than other occupations**



1 in 5 jobs in the UK are in engineering (19%), yet **engineering vacancies account for 1 in 4 of all job adverts** in UK (25%)



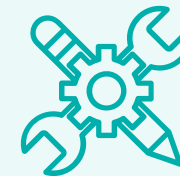
STEM subjects are popular in school, but **engineering barely features on the curriculum**. Entry to D&T GCSEs declined in England by 67% between 2011 and 2023



'Green' engineering jobs are **on the increase** – a trend likely to continue



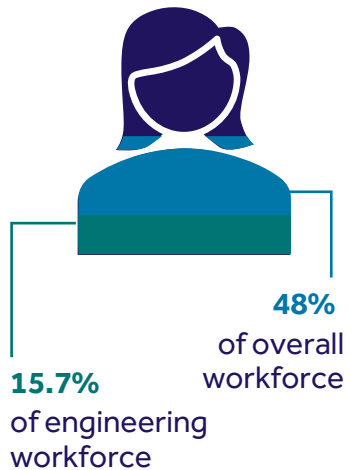
49% of businesses surveyed in 2021 experienced **difficulties in the skills available to them** in the external labour market when they tried to recruit



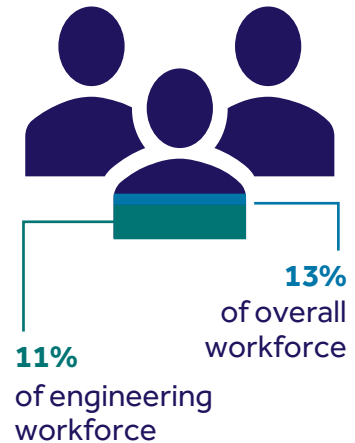
**Engineering skills needed in all sectors** from creative digital and big data to advanced manufacturing and rail transport

# Who works in engineering and technology?

Despite some improvements, a lack of workforce diversity persists



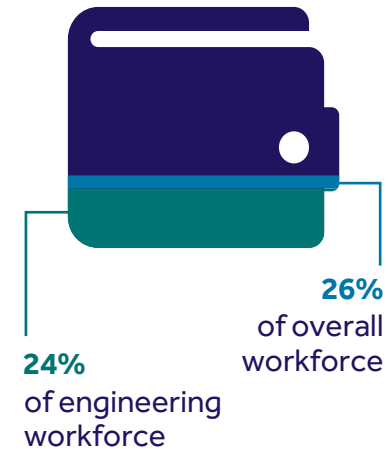
Percentage of **women** in engineering and technology workforce compared with overall workforce



Percentage of employees from **minority ethnic** groups in engineering and technology workforce compared with overall workforce



Percentage of employees with a **disability** in engineering and technology workforce compared with overall workforce



Percentage of employees from **poorer** socioeconomic **backgrounds** in engineering and technology workforce compared with overall workforce

# EngineeringUK's **policy priorities** for the next government



# We want to see **government commitment** across 2 core areas:

## Strategic workforce planning

Alongside the National Engineering Policy Centre (NEPC), we call for government to establish a National Engineering & Technology Workforce Strategy

- ✓ Ensure a strategic approach to workforce planning based on workforce needs
- ✓ Enhance diversity in the STEM workforce
  - ✓ Support international talent via appropriate immigration and visa systems
  - ✓ Link to STEM education and skills planning

## Holistic STEM education and skills plan

Across 4 critical areas:

1. Careers provision
2. Apprenticeships
3. T Levels
4. Teacher recruitment, training and retention

# EngineeringUK policy priorities

## STRATEGIC WORKFORCE PLANNING

### **Deliver a national engineering and technology workforce strategy**

Take a more strategic approach to addressing skills shortages and the UK's changing labour market needs, led by the Cabinet Office. Consolidate the work of existing skills taskforces under a new cross-departmental skills committee. Link closely with a STEM education and skills plan addressing apprenticeships, T Levels, careers provision, and STEM teacher shortages.

## HOLISTIC STEM EDUCATION and SKILLS PLAN

### **Deliver on careers provision**

Publish a long-term careers strategy and ensure schools and colleges have the funding and up-to-date knowledge of 21st century engineering careers required to deliver effective STEM careers support to young people.

### **Commit to T Levels**

Work collaboratively with STEM employers and sector bodies to grow the number of T Level industry placements. Continue to raise awareness of the benefits that T Levels can offer young people and employers.

### **Grow and sustain engineering apprenticeships for young people**

Take action to grow and sustain the number and diversity of young people taking engineering apprenticeships. Break down barriers for young people and SMEs, ensuring the apprenticeship system is fit for the future.

### **Improve STEM teacher recruitment, training and retention**

Take decisive action to address the serious STEM teacher shortages facing schools and further education providers. Ensure that teachers have the training and STEM subject specific CPD needed to deliver quality learning for young people.



# Strategic workforce planning overview

Alongside the National Engineering Policy Centre (NEPC) and the wider engineering community, we call for a **National Engineering & Technology Workforce Strategy** aimed at consolidating the work of existing taskforces that have been created in response to critical skills shortages in various engineering, technology and manufacturing sectors.

## We want:

- ✓ A more **strategic approach to workforce planning** based on a robust understanding of workforce needs, led by the Cabinet Office, to **equip the UK with the skilled workforce** needed to meet the challenges of sustainability and technological advancement
- ✓ A focus on **enhancing diversity** within the STEM workforce
- ✓ Assurance that the immigration and visa system does not hamper efforts to **attract international engineering and technology talent** to the UK
- ✓ This strategy supported and closely linked into a **holistic STEM education and skills plan**



## Evidence

There are currently numerous government-led taskforces exploring skills shortages across many STEM sectors, including the National Manufacturing Skills Taskforce, UK Shipbuilding Skills Taskforce, the Transport Employment and Skills Taskforce and the Nuclear Skills Taskforce.

# Strategic workforce planning recommendations

## FOR ACTION First 100 days

- Audit and review existing task forces
- Commit to how a single task force will work and initiate



## FOR ACTION First session within 1 year

- Task force develops and publishes workforce strategy
- Set targets/ benchmarks



## FOR ACTION Lasting change (2025 to 2035)

- Link to holistic STEM education and skills plan
- Annually report against targets



# STEM education and skills plan overview

We call for action in 4 key areas

## **Deliver on careers provision**

Publish a long-term careers strategy and ensure schools and colleges have the funding and up-to-date knowledge of 21st century engineering careers required to deliver effective STEM careers support to young people.

## **Commit to T Levels**

Work collaboratively with STEM employers and sector bodies to grow the number of T Level industry placements. Continue to raise awareness of the benefits that T Levels can offer young people and employers.

## **Grow and sustain engineering apprenticeships for young people**

Take action to grow and sustain the number and diversity of young people taking engineering apprenticeships. Break down barriers for young people and SMEs, ensuring the apprenticeship system is fit for the future.

## **Improve STEM teacher recruitment, training and retention**

Take decisive action to address the serious STEM teacher shortages facing schools and further education providers. Ensure that teachers have the training and STEM subject specific CPD needed to deliver quality learning for young people.

# Careers provision overview

## Deliver on careers provision

Publish a long-term careers strategy and ensure schools and colleges have the funding and up-to-date knowledge of 21st century engineering careers required to deliver effective STEM careers support to young people.



## Evidence

[Securing the future](#) report (2021)

EngineeringUK's research asked Career Leaders and STEM teachers about barriers to STEM careers provision:

- **Time** 70% of respondents said that lack of staff time was a barrier
- **Lack of funding** 46% of respondents said that 'lack of funding' affected their ability to deliver
- **Lack of knowledge** 26% of respondents indicated that staff not being knowledgeable enough about STEM careers was a barrier
- **Capacity and funding** The main barriers to engaging with more STEM employers included: not knowing how to engage with them (24%), limited capacity within their school (44%), and limited funding for their careers programme (34%)

## Other references

[Our careers, our future](#)

# Careers provision recommendations

## FOR ACTION

First 100 days

### Long term careers strategy

Commit to publishing a long-term careers strategy to include a clear set of actions on STEM careers provision in schools and colleges, access to parity of esteem between technical and academic pathway, and increasing diversity through these pathways



## FOR ACTION

First session within 1 year

### STEM careers leaders

Announce a pilot programme of dedicated STEM careers leaders across 5 careers hubs

### Address financial barriers

Commit to invest an additional £50 million per annum for careers provision in outreach activities aimed at schools

### Teacher training/Continuous Professional Development (CPD)

Ensure that STEM teacher training and CPD includes a comprehensive package of information and training on careers in modern engineering and technology

## FOR ACTION

Lasting change (2025 to 2035)

### Curriculum

Fully embed careers into the STEM curriculum and ensure it highlights the diverse range of roles and people in science, engineering and technology careers

### Awareness

Continue to work with the engineering, manufacturing and technology community to convey the breadth of opportunities in engineering and technology careers

**Report annually** on progress against the actions set out in the new Careers Strategy

# Apprenticeships overview

## Grow & sustain engineering apprenticeships for young people

Take action to grow and sustain the number and diversity of young people taking engineering apprenticeships. Break down barriers for young people and SMEs, ensuring the apprenticeship system is fit for the future.



## Evidence

**Fit for the future inquiry**, Lord Willets and Lord Knight with EngineeringUK (*October 2023*)

### Decline in apprenticeship starts

Since 2014/15 engineering-related apprenticeship starts have dropped by 9% (down 34% for engineering and manufacturing technologies)

### Lower-level apprenticeships

The decline in apprenticeship starts is driven by the decline in lower-level apprenticeships, particularly at Level 2. There were 63,250 starts in engineering-related apprenticeships at Level 2 in 2014/15 which more than halved (down to 30,980) in 2021/2022

### Age

Since 2016/17, engineering-related apprenticeship starts for 16 to 18 year-olds have declined 22%, while starts by 19 to 24 year-olds and those older than 25 have both fallen by 6%

### Socio-economic background

18.6% of apprenticeship starts were from the most deprived group in 2021/2022, down from 21.2% in 2016/17

### Gender

Female starts in engineering-related apprenticeships has increased 6.6% since 2014/15, yet only 14.2% of those starting engineering-related apprenticeships are female

# Apprenticeships recommendations

## FOR ACTION

First 100 days

### Levy

Improve transparency and trust in the funding framework by publishing clear and transparent data on the Apprenticeship Levy and the apprenticeship budget

### Functional skills

Announce a review of the approach taken on functional skills requirements within apprenticeships and consider proposals for increasing access for young people

## FOR ACTION

First session within 1 year

### Pre-apprenticeship support

Commit to expanding the pre-apprenticeship offer for those aged 16 to 18 by building and improving existing programmes. Continue funding BTECs as an alternative pathway alongside T Levels

### Young people

Work with local and combined authorities to develop a package of support for apprentices (and T Level students ) up to the age of 25 in entry level and low paid work that addresses barriers such as travel/ access costs

### SMEs

Enable the roll-out of more Group Training Associations to support engineering SMEs with the recruitment of apprentices, training and access to levy funds

## FOR ACTION

Lasting change (2025 to 2035)

### Rebalance education

Ensure young people have access to a broad and balanced curriculum and a careers system that truly values all educational and skills pathways

### Support young people

Provide better support for young people throughout their apprenticeship journey and take decisive action to break down barriers such as transport issues and work readiness

### Refocus funding

Ensure funding is allocated to creating apprenticeship opportunities for 16 to 19 year-olds to reverse the decline in apprenticeship starts in this age group

### Enable businesses

Enable SMEs to play an active role in apprenticeships by reforming the apprenticeship standard system to make sure it works for small and large employers, and ensuring the funding system supports the delivery of resource-heavy courses

### Employers taking action

Work with employers and encourage them to play their part in growing and sustaining apprenticeships for the future to help widen opportunities for young people



# T Levels overview

## Commit to T Levels

Work collaboratively with STEM employers and sector bodies to grow the number of T Level industry placements. Continue to raise awareness of the benefits that T Levels can offer young people and employers.



## Evidence

**Unlocking Talent ensuring T Levels deliver the workforce of the future**, EngineeringUK and Make UK (October 2022)

### Placement numbers

We estimate there needs to be a minimum of 32,000, and up to 43,500, placements by 2024/2025 in the engineering and manufacturing sector

### Understanding of T Levels (employers)

Most employers surveyed said that they'd heard of T Levels but only 28% said they understood what they actually involved. 28% of respondents hadn't heard of T Levels at all, with smaller rather than larger employers much less aware (63% versus 83%) and what's involved

### Knowledge of T Levels (young people)

EngineeringUK's 2021 Brand Monitor identified that 63% of young people did not know what T Levels are. Regional variations in awareness were also reported – young people in London were most likely to know what they are (49%) whereas just 29% in Yorkshire and the Humber had heard of them

### Barriers to offering T Levels

Staff capacity and time commitment were the main barriers reported to offering T Level industry placements (for all sizes of businesses)



# T Levels recommendations

## FOR ACTION

First 100 days

### **Provide assurance**

Confirm that T Levels will continue as an integral part of the education landscape in England

### **Leadership**

Establish a T Level industry placement taskforce co-chaired by DfE and DBT Ministers to ensure that the issue is given the priority it merits within government

## FOR ACTION

First session within 1 year

### **Awareness**

Build on existing work with the engineering community to raise awareness of T Levels amongst employers, students and parents

### **Simulated training**

Extend the number of hours that placements can run in simulated work environments such as a training centre or skills hub

### **Digital Apprenticeships Service (DAS)**

Explore how to replicate/expand the DAS to cover T Level placements

### **Support for SMEs**

Keep under review financial incentives for employers to support their engagement in industry places, particularly SMEs

### **Clarity**

Give students, parents, providers and employers confidence and clarity about how T Levels fit within the wider education and skills landscape, including progression routes on completion.

## FOR ACTION

Lasting change (2025 to 2035)

### **Further education**

Ensure that the further education sector has the funding, facilities and teaching workforce needed to deliver STEM technical pathways – including high-quality T Levels in science, engineering, construction, digital and manufacturing



# Teacher recruitment, training and retention overview

## Improve STEM teacher recruitment, training and retention

Take decisive action to address the serious STEM teacher shortages facing schools and further education providers. Ensure that teachers have the training and STEM subject specific CPD needed to deliver quality learning for young people.



## Evidence

### Recruitment targets not met

Data published by the DfE in December 2023 shows that only 54% of all STEM subject recruitment targets were met, with physics faring particularly badly at just 17% and design & technology not far behind at 25%

### Continuous Professional Development

Analysis commissioned by Wellcome has found that providing STEM-specific CPD increases the odds of STEM teachers staying in the profession the following year by 160%, from 1 in 12 leaving to 1 in 30

### Investment equals savings

The Royal Society has calculated that a 1.5% improvement in the retention rate of teachers across the profession would save £126 million per year. The same report seeks government investment of around £22 million per annum in science

### Non-specialists teaching

In 2022/2023, 80% of secondary school teaching hours for engineering were delivered by a non-specialist. Physics and D&T came in at 28% and 21% respectively

# Teacher recruitment, training and retention recommendations

Echoing the wider engineering sector's concerns, EngineeringUK want to see **decisive action taken to address the serious STEM teacher shortages** facing both schools and further education providers.



## FOR ACTION

First session within 1 year

### Invest in CPD

Invest in high-quality Continuing Professional Development (CPD) – enabling STEM teachers, especially those without the relevant STEM qualifications, to teach STEM effectively, increasing the quality of STEM teaching, teacher retention and student progression

### Update recruitment strategy

The January 2019 teacher recruitment strategy is out of step with the current challenges experienced by schools and does not reflect the wider labour market pressures facing the country today

## FOR ACTION

Lasting change (2025 to 2035)

### Better support teachers

Support recruitment and retention by improving teacher wellbeing, workload and flexible working arrangements

# Thank you

Contact us to find out more



## EngineeringUK



[engineeringuk.com](https://www.engineeringuk.com)



[engineeringuk](https://www.linkedin.com/company/engineeringuk)



[\\_EngineeringUK](https://twitter.com/_EngineeringUK)