The Institution of Engineering and Technology

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UK Engineering and Technology Skills

YouGov®

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Approach and respondent profile

We commissioned YouGov, an independent research agency, to conduct research with UK employers of engineering and technology staff. An employer was eligible to participate if they employ at least one engineering or technology employee and work in a business with at least six employees or more. There was no upper limit on the number of employees a business could have, so the research includes views from organisations with at least six employees through to those who employ thousands.

This research aims to explore the current understanding and challenges around digital skills and this sector's workforce needs, as well as retention of skills, and where sustainability goals and Artificial Intelligence (AI) fit into this.

YouGov collaborated with us to develop the survey, which was delivered via an online panel to senior decision makers in engineering employers. The fieldwork was conducted between 10th February to 17th March 2025. All of the professionals who responded were selected from the YouGov panel of over 2.5m people in the UK.

A total of 1,316 respondents from engineering or technology employers completed the survey. All professionals who responded on behalf of the organisation they work for had managerial responsibility. The final achieved sample was weighted to be representative of UK engineering employers by size and region. The sample provided coverage across the following target sectors, size of organisation, and nation.

Figure 1: Breakdown of achieved sample by industry, organisation size and nation.

	Unweighted base	Weighted base
Industry		
IT & Communications	212	184
Transport	141	145
Construction	284	263
Electrical & electronics	81	105
Aerospace & Defence	31	26
Manufacture	485	526
Energy	40	26
Other	42	39
Size		
Micro (6-9)	83	118
Small (10-49)	360	263
Medium (50-249)	244	224
Net: SME (6 to 249)	687	605
Large (250+)	629	711
Nation		
England	1050	1167
Scotland	155	82
Wales	79	42
Northern Ireland	32	26

Guidance on analysis

The data in this report represents the views of a sample of employers who employ at least one engineering and technology employee in the UK. The demographic make-up of the sample closely matches that of the UK employer population by organisation size and location (region). Therefore, when looking at data at the total population level, inferences can be made that the views of the sample collected here represent the views of the wider UK engineering employer population. Throughout the report, the results at the total sample level are described using the term 'engineering employers'.

A number of industries are covered by the sample however the views of these individual industries should be interpreted as the views of the employers that responded to this survey. The achieved samples are not necessarily representative of the wider employer population in those industries. A number of industries have response numbers under 50, the aerospace & defence industry and Northern Ireland, and as such responses should be treated with caution. Figures based on fewer than 30 responses are too small to be considered statistically reliable and have not been included.

Key findings

Current business context and workforce needs

Six in ten (61%) engineering employers feel the current engineering and technology workforce is fit for purpose, while just over a third (35%) do not.

Three-quarters (76%) struggle to recruit for certain skills, with technical/specialist sustainability skills (30%) ranked as most difficult to recruit for.

When looking ahead, innovative thinking (42%) is considered the most important skill for business growth over the next five years, though closely followed by technical/engineering and specialist digital skills & knowledge (both 39%).

Upskilling/reskilling and skills transfer

Half (50%) of engineering employers identify a lack of time as a barrier to upskilling/reskilling employees, while 46% cite employees leaving the company.

A strong majority feel they share knowledge and skills effectively between individual internal employees (80%), compared to 57% who say the same for retiring individuals.

Education & apprenticeships

About three in five (59%) say more than half or all of their apprentices remain employed after training.

Nearly half (48%) of engineering employers use Apprenticeship Levy funding.

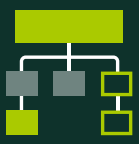
Employing apprentices (51%) is the most common way engineering employees engage in educational initiatives, most often in large organisations (66%).

Digital Skills

The most important digital skills for growth over the next five years include automation (38%), cyber security (38%), data engineering (34%), and software engineering (33%).

Around three in ten say senior leaders foresee future application of quantum technologies for their business (32%) or believe their workforce will be adequately prepared for its use (28%).

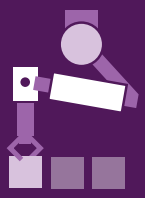
Automation ranks highest as the area in which engineering employers feel they do not have the necessary digital skills (30%).



The digital skills most difficult to recruit for include data engineering, software engineering, and cyber security (all 17%).

Artificial Intelligence (AI)

Six in ten (58%) engineering employers currently use AI – with 18% of these doing so regularly – and the most common type of AI used is data analysis. A further 23% do not currently use it but plan to in the future.



Improved productivity (61%), enhanced problem solving (50%) and improved profitability (40%) are the top three ways AI is expected to benefit businesses in the next five years.

Sustainability/decarbonisation

More than a third (36%) of engineering employers do not feel their organisation has the skills needed to decarbonise by 2050.

The top barriers to meeting decarbonisation goals focus on cost – a third cite increased operating costs (34%), while three in ten cite investment costs (29%).

Technical/specialist sustainability skills/knowledge are considered the most necessary skills to decarbonise by 2050 (39%) and are also cited as the top necessary decarbonisation skill missing (35%).

Introducing new technologies (39%), upskilling/reskilling existing employees (36%) and hiring new employees with those skills in the UK (34%) are the most cited responses to meet demand for decarbonisation skills.

Equality, diversity and inclusion

A large majority of engineering employers offer flexible work in some form (83%). Of those who do not offer flexible work (14%), three in five (59%) attribute this to the job not being able to be done at home or elsewhere.

Seven in ten (70%) are interested in improving the diversity of their workforce, while 52% have recently taken some kind of action to do so.

Nation spotlight

While data was collected for the UK as a whole, this section provides particular highlights across England, Scotland, Wales, and Northern Ireland.

Figures for Northern Ireland are based on a small sample size and should be considered with caution. For example, Northern Irish employers may have a larger or smaller percentage than other nations, but this is not noted in the text if it is not statistically different based on the sample sizes concerned. Figures based on fewer than 30 respondents have not been included.

Current business context and workforce needs

Those in England are the most likely to say their education system is fit for purpose (54% England, 47% Wales, 44% Scotland, 35% Northern Ireland).

Engineering employers in Northern Ireland are the most likely to say they struggle to find certain skills when they recruit, while those in Scotland are the least likely to say so (76% England, 72% Wales, 68% Scotland, 94% Northern Ireland).

Engineering employers in England and Wales are more likely than those in Scotland to say they struggle to recruit technical/specialist sustainability skills (30% England, 30% Wales, 19% Scotland, 35% Northern Ireland).

In terms of what is most important for growth over the next five years, those in England are the most likely to cite commercial skills (24% England, 14% Wales, 19% Scotland, 17% Northern Ireland).

Upskilling/reskilling and skills transfer

Engineering employers across the UK tend to say they do share technical skills/knowledge. However, those in Scotland are less likely than English or Welsh employers to say they are effective at transferring knowledge from retiring employees (58% England, 59% Wales, 47% Scotland, 46% Northern Ireland).

Education and apprenticeships

Those in Scotland are almost twice as likely than those in Wales to say they sponsor STEM programmes in secondary schools (23% Scotland, 17% England, 12% Wales).

Engineering employers in England are also the most likely to use the apprenticeship levy to employ/recruit apprentices (35% England, 29% Wales, 23% Scotland, 35% Northern Ireland).

Digital Skills

When asked about key digital technologies for growth over the next five years, those in England are more likely than engineering employers in Scotland to cite the Internet of Things (28% England, 23% Scotland, 30% Northern Ireland) or data visualisation (26% England, 22% Wales, 23% Scotland, 10% Northern Ireland).

Those in England and Northern Ireland are more likely than those in Wales and Scotland to struggle with recruiting digital skills (57% England, 46% Wales, 46% Scotland, 65% Northern Ireland).

Digital Skills

Engineering employers in Scotland are the least likely to identify automation as a skill they struggle to recruit for (15% England, 12% Wales, 8% Scotland, 26% Northern Ireland).

Those in Scotland are the least likely to foresee future applications of quantum technologies for their business (33% England, 34% Wales, 21% Scotland, 44% Northern Ireland).

Engineering employers in Scotland are also the least likely to say their workforce is adequately prepared for the use of quantum technologies (29% England, 30% Wales, 19% Scotland, 25% Northern Ireland).

Artificial Intelligence

Engineering employers in England are the most likely to be currently using AI to optimise their products/services (59% England, 51% Wales, 47% Scotland, 58% Northern Ireland). Those in Scotland are the least likely to be using AI on a regular basis (18% England, 22% Wales, 10% Scotland, 24% Northern Ireland).

Those who use AI in England are the most likely to be using it for route planning (25% England, 10% Wales, 14% Scotland).

Artificial Intelligence

When thinking about the perceived benefits, Welsh engineering employers who use AI or plan to in the future are the most likely to cite an improvement in profitability (41% England, 44% Wales, 28% Scotland). English engineering employers who use or plan to use AI are the most likely to cite engineering innovations as a key benefit (36% England, 31% Wales, 25% Scotland).

Sustainability

Engineering employers in Wales and Scotland are more unsure than those in England about what skills they will need to decarbonise by 2050 (19% England, 28% Wales, 26% Scotland, 18% Northern Ireland).

Equality, diversity, and inclusion

There is broadly no difference by nation for taking action to improve workforce diversity (53% England, 51% Wales, 49% Scotland, 35% Northern Ireland).

However, those in Scotland are the most likely to say their diversity efforts have focused on sex/gender identity (54% England, 61% Wales, 67% Scotland).

Current business context and workforce needs

Key findings

Six in ten (61%) engineering employers **feel the current engineering and technology workforce is fit for purpose, while just over a third (35%) do not.**

Three-quarters (76%) struggle to recruit for certain skills, **with technical/specialist sustainability skills (30%) ranked as most difficult to recruit for.**

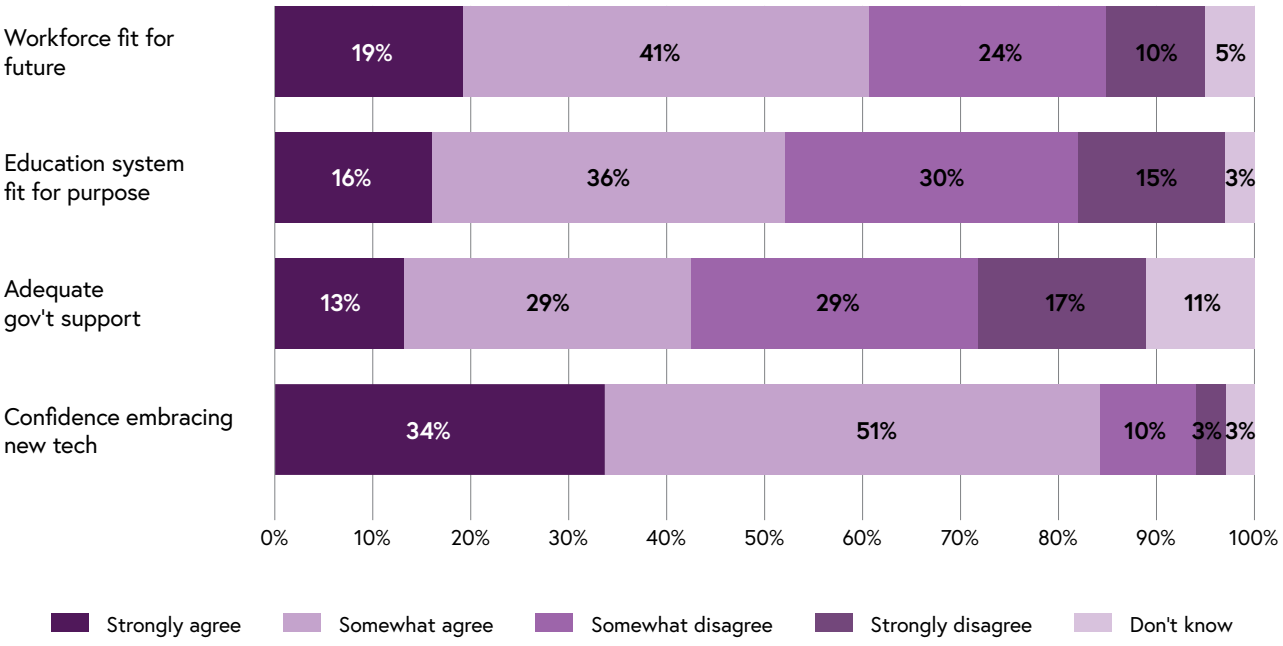
When looking ahead, innovative thinking (42%) is considered the most important skill for business growth over the next five years, though closely followed by technical/engineering and specialist digital skills & knowledge (both 39%).

Is the current engineering environment fit for purpose?

Overall, six in ten (61%) engineering employers feel that the current engineering and technology workforce is fit for purpose, with one in five (19%) who strongly agree with this. This is more likely among those in London (84%), in medium sized organisations (70%) and in the IT & communications industry (79%). However, around one in three (35%) engineering employers disagree that it is fit for purpose.

Further, around half (52%) feel that the education system is fit for purpose, with those in England (54%) more likely to say this than those in Scotland (44%) and Northern Ireland (35%), while slightly fewer (42%) believe there is adequate government support. That said, a strong majority (84%) feel that their organisation is confident embracing new technologies. This also follows a similar demographic pattern to those who feel the current workforce is fit for purpose.

Figure 2: Current aspect of field fit for purpose.



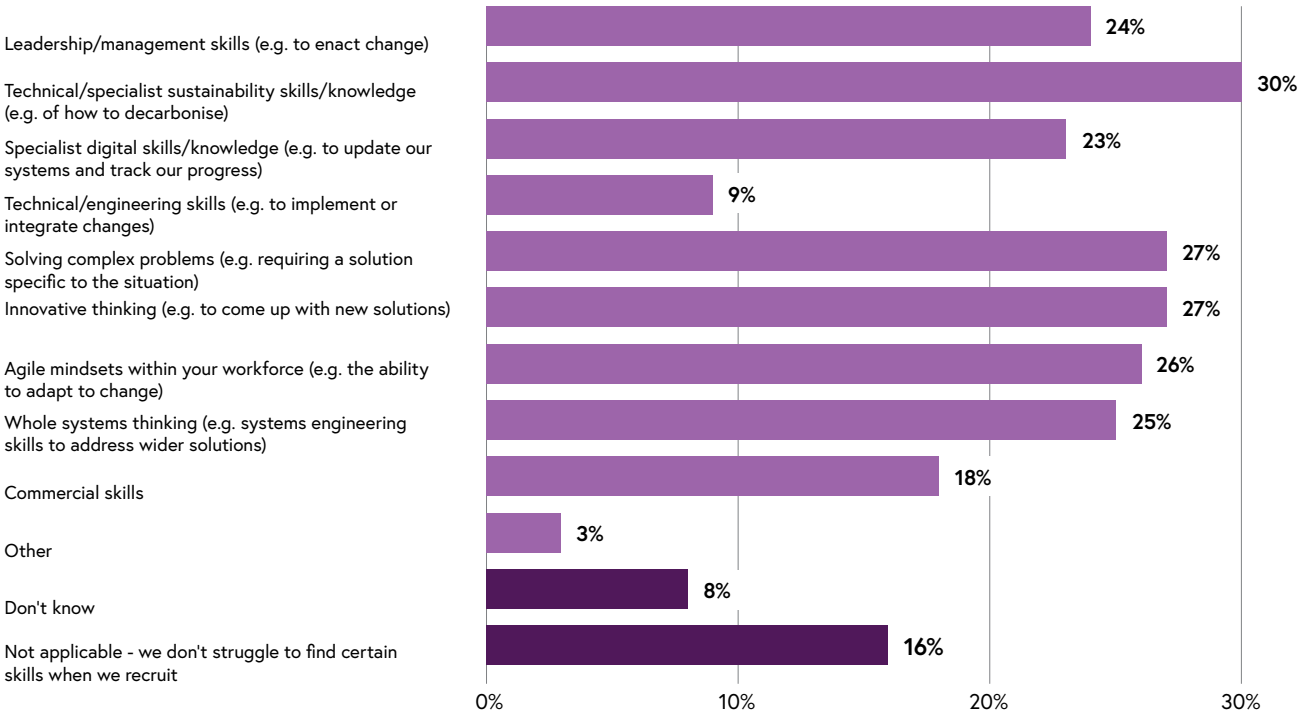
To what extent do you agree or disagree with the following statements?
Base: All respondents (1,316)

Skills employers are struggling to find

Three-quarters (76%) of engineering employers report struggling to find certain skills within the external labour market during recruitment. This is an increase since 2021, when around half of respondents reported struggling to find certain skills – representing a growing challenge for employers to find the skills they need in the current workforce.

When asked which specific skills are difficult to find, the most cited (30%) is technical/specialist sustainability skills (such as how to decarbonise). This is closely followed by 'soft' skills, such as complex problem-solving (27%), innovative thinking (27%), agile mindsets (26%), and whole systems thinking (25%). Some additional technical skills that are difficult to recruit for include specialist digital skills/knowledge (23%) and technical/engineering skills (9%).

Figure 3: Skills engineering employers struggle to find during recruitment.



Q **In general, which, if any, of the following skills do you struggle to find within the external labour market when you try and recruit? Please select all that apply.** *Base: All respondents (1,316)*

Likelihood to struggle recruiting for specialist digital skills/knowledge increases as business size does, as 29% in large organisations (250+ employees) report struggling to recruit for these skills compared to 9% in micro business (6-9 employees) and 17% in small businesses (10-49

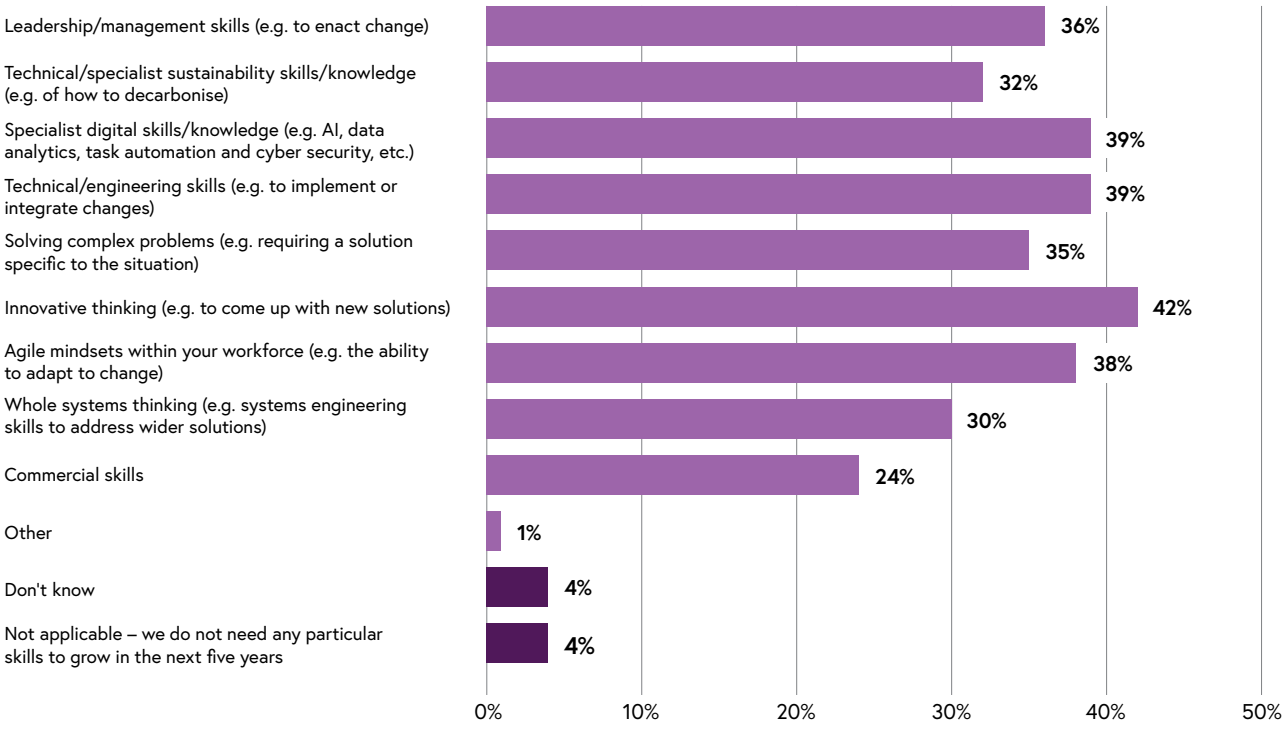
employees). Large organisations are also more likely to report struggling to find whole systems thinking (28% vs 22% SMEs) and leadership/management skills (27% vs 21% SMEs). Additionally, those working in the energy industry (22% vs 9% overall) and aerospace/defence industries (23% vs 9% overall) are more likely to report struggling to recruit technical/engineering skills.

There are also some differences by nation. Engineering employers in England are more likely than those in Scotland to cite technical/specialist sustainability skills and knowledge (30% vs 19%), while those in Northern Ireland are more likely to say they are struggling to recruit any skills overall (94% vs 76% in England, 72% in Wales, 68% Scotland).

Most important skills for the next five years

Of the same list of skills, innovative thinking ranks as the most important for business growth over the next five years (42%). This is closely followed by technical/engineering and specialist digital skills and knowledge (both 39%), while around a third (32%) cite technical/specialist sustainability skills and knowledge.

Figure 4: Most important skills for business growth in next five years.



Q **Thinking about the next five years... What skills do you think will be most important for your business to grow?** *Base: All respondents (1,316)*

Engineering employers in England are more likely than those in Wales to cite commercial skills (24% vs 14%), while those in large organisations are more likely than those in SMEs to cite several skills as important for business growth, including specialist digital skills/knowledge (45% vs 31%) and technical/specialist sustainability skills (35% vs 28%). Those working in the energy industry are also more likely to cite both these skills (57% vs 51%, respectively).

Sector-shortages of manual-based skills

Respondents were asked to identify in their own words which particular manual-based skills their sector has a shortage.

Some generally report that 'all' manual-based skills are needed. Of those who gave a more specific response, there is a demand for people at a technician level, particularly related to installation as well as servicing and maintenance. Many specifically outline the need for these in relation to renewable energy systems, such as heat pumps, solar panelling and electric vehicles. Additionally, there is a general demand for both wiring/electrician roles as well as a variety of engineering roles (particularly mechanical and electrical). Some of the more specific roles/industries that are often highlighted include fitters, painters, welders, plumbers, builders, bricklayers, carpenters and those in construction.

Figure 5: Manual-based skills which there is a shortage of.

Q **For the following question, by manual-based skills, we mean skills such as welding, plumbing, installation for things like solar panels/heat pumps/ electric vehicle charging points, etc... What, if any, manual-based skills do you think your sector has a shortage of? Please type your answer(s) in the box below or select 'Not applicable - our sector does not have a shortage of these types of skills'.** *Base: All respondents (1,316)*

Upskilling/reskilling and skills transfer

Key findings

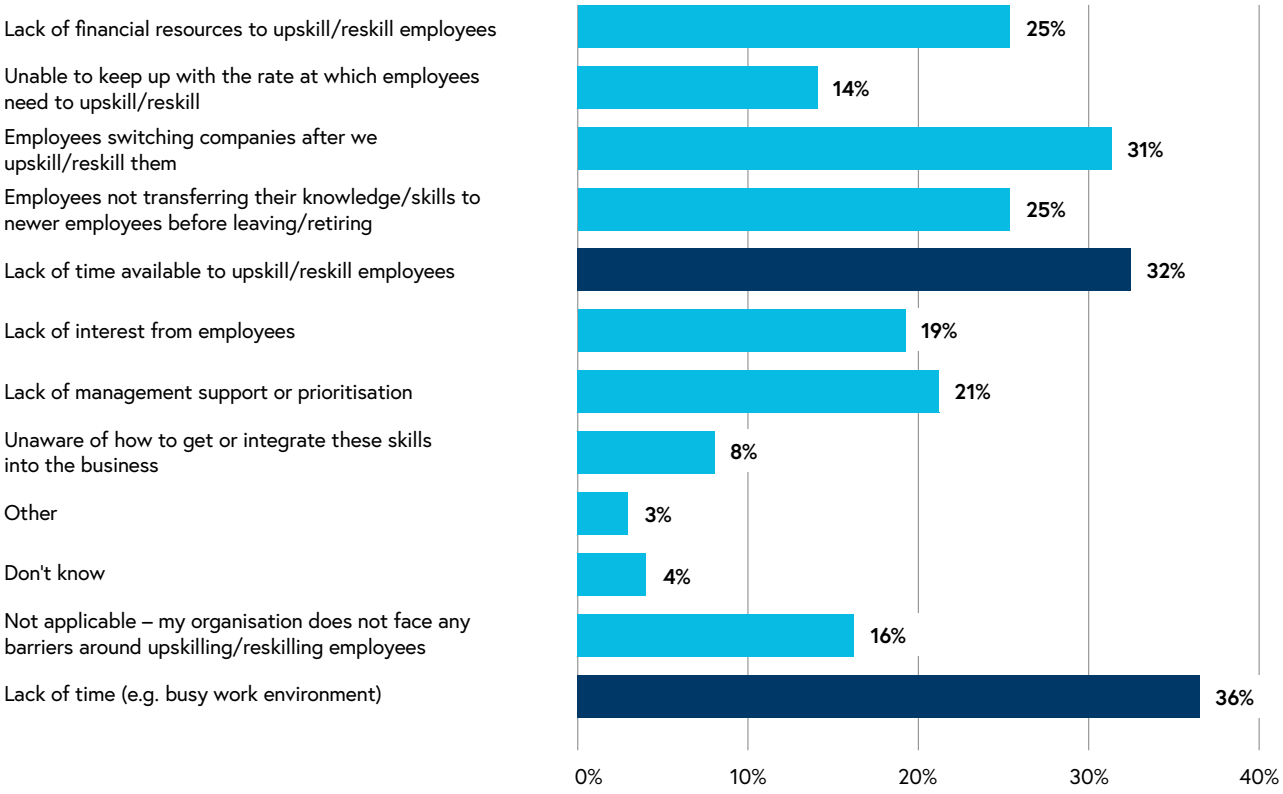
Half (50%) of engineering employers identify a lack of time as a barrier to upskilling/reskilling employees, while 46% cite employees leaving the company.

A strong majority feel they share knowledge and skills effectively between individual internal employees (80%), compared to 57% who say the same for retiring individuals.

Barriers to upskilling/reskilling employees

The most identified barriers to upskilling and reskilling employees include a lack of time (50%) and employees leaving the company (Net: 46%). The latter can be broken down into around three in ten (31%) saying employees switch companies after being upskilled/reskilled or a quarter (25%) that identify those who do not transfer their knowledge or skills before leaving or retiring.

Figure 6: Barriers to upskilling and reskilling.



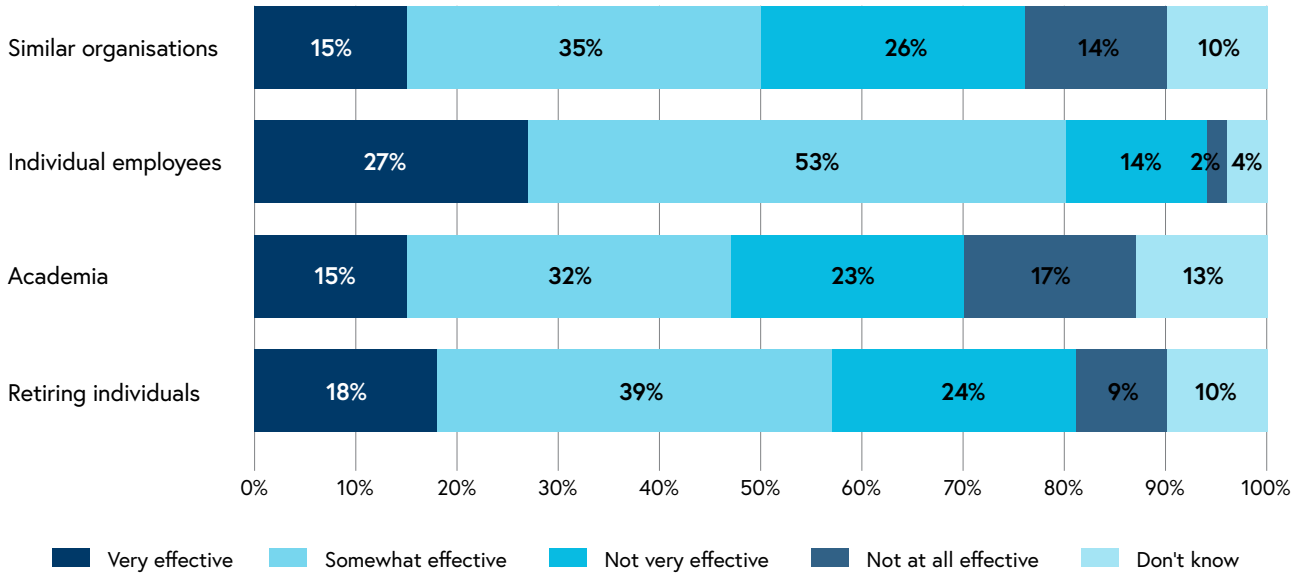
What barriers, if any, does your organisation face in upskilling/reskilling employees? Please select all that apply. *Base: All respondents (1,316)*

Engineering employers in large businesses are more likely than SMEs to cite employees not transferring their knowledge or skills before leaving or retiring (30% vs 19%) as a barrier, as well as a lack of management support or prioritisation (24% vs 16%). SMEs are more likely to report a lack of interest from employees (22%) as a barrier, compared to 17% of large businesses.

Effectiveness of organisations at retaining or transferring skills

When asked how effective their organisation is at sharing technical skills and knowledge, four in five (80%) engineering employers say they are somewhat or very effective at sharing knowledge between individual employees within their organisation. However, this drops to 57% who say the same for sharing knowledge from retiring individuals, and around half between organisations similar to theirs (50%) and with academia/universities (48%).

Figure 7: Effectiveness of sharing skills and knowledge.



Q **How effective, if at all, would you say your business is at the following? Sharing technical skills/knowledge between...** *Base: All respondents (1,316)*

Responses were broadly similar across the nations, with engineering employers in England being more likely than those in Scotland to say they effectively share knowledge from retiring individuals specifically (58% vs 47%).

In sharing knowledge from retiring individuals specifically, those from medium organisations are the most likely to say they do so effectively (71%), compared to those from micro (56%), small (58%), and large (53%) organisations. This trend continues for effectively sharing skills and knowledge between individual employees, with nine in ten (90%) medium organisations reporting this compared to 78% of micro, 80% of small, and 77% of large organisations who say the same.

Those in the IT and communications industry are more likely to say they share skills and knowledge effectively, particularly in comparison to other industries such as transport and manufacturing, as those in IT & communications report sharing effectively between similar organisations to theirs (68% vs 54% in transport and 44% in manufacturing) and with academia (62% vs 47% in transport and 44% in manufacturing).

Engineering employers who currently use AI software or equipment are more likely than those who do not to report that they effectively share technical skills and knowledge between all groups listed. This includes effective sharing between individual employees within their organisation (85% who use AI vs 76% who do not), from retiring individuals (63% vs 49%), between similar organisations to theirs (63% vs 35%), and with academia/universities (63% vs 26%).

Education and apprenticeships

Key findings

Employing apprentices (51%) is the most common way engineering employees engage in educational initiatives, most often in large organisations (66%).

About three in five (59%) say more than half or all of their apprentices remain employed after training.

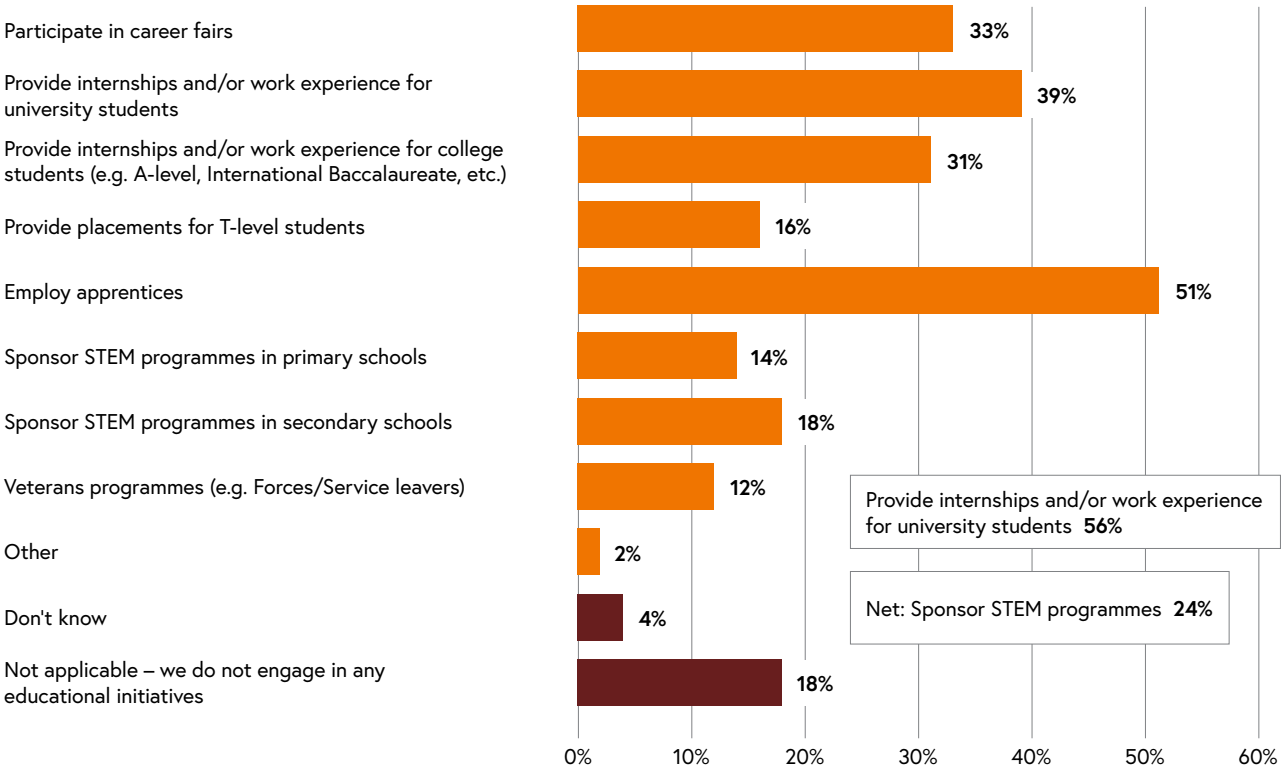
Nearly half (48%) of engineering employers use Apprenticeship Levy funding.

Engagement with educational initiatives

Around half (52%) of engineering employers agree that the education system is fit for purpose. When asked about their engagement in educational initiatives, over half (56%) report that they provide internships/work experience for university or college students, or placements for T-level

students. Around half (51%) say they employ apprentices to work at their organisation, while nearly a quarter (24%) sponsor STEM programmes in schools (18% in secondary schools and 14% in primary schools). Just under one in five (18%) say they do not engage in any educational initiatives.

Figure 8: Engagement in educational initiatives.



Q **Now, in which, if any, of the following ways does your organisation engage in educational initiatives? Please select all that apply.**
Base: All respondents (1,316)

Likelihood to engage in educational initiatives correlates with business size, with large organisations being the most likely to engage in at least one educational initiative (89%), followed by medium (76%), small (63%), and micro (49%) businesses.

This distinction is particularly visible in the two-thirds (66%) of large businesses who say they employ apprentices, compared to one third (33%) of SMEs who say the same.

Similar proportions of large and medium organisations say they provide internships and/or work experience for college students (37% and 32%, respectively) or placements for T-level students (20% and 15%).

Micro engineering employers are most likely to say they do not engage in any educational initiatives, with 48% reporting this compared to 34% of small, 19% of medium and 6% of large engineering employers. Those in Scotland are more likely than those in Wales to say they sponsor STEM programmes in secondary schools (23% vs. 12%).

Use of the apprenticeship levy funding

When asked whether their organisation currently uses Apprenticeship Levy funding, nearly half (48%) of engineering employers say they do. A slightly higher proportion use it to employ or recruit apprentices (34%) than to upskill existing employees (28%). Around a quarter (26%) say they do not pay/use the levy, while a similar proportion are unsure (27%).

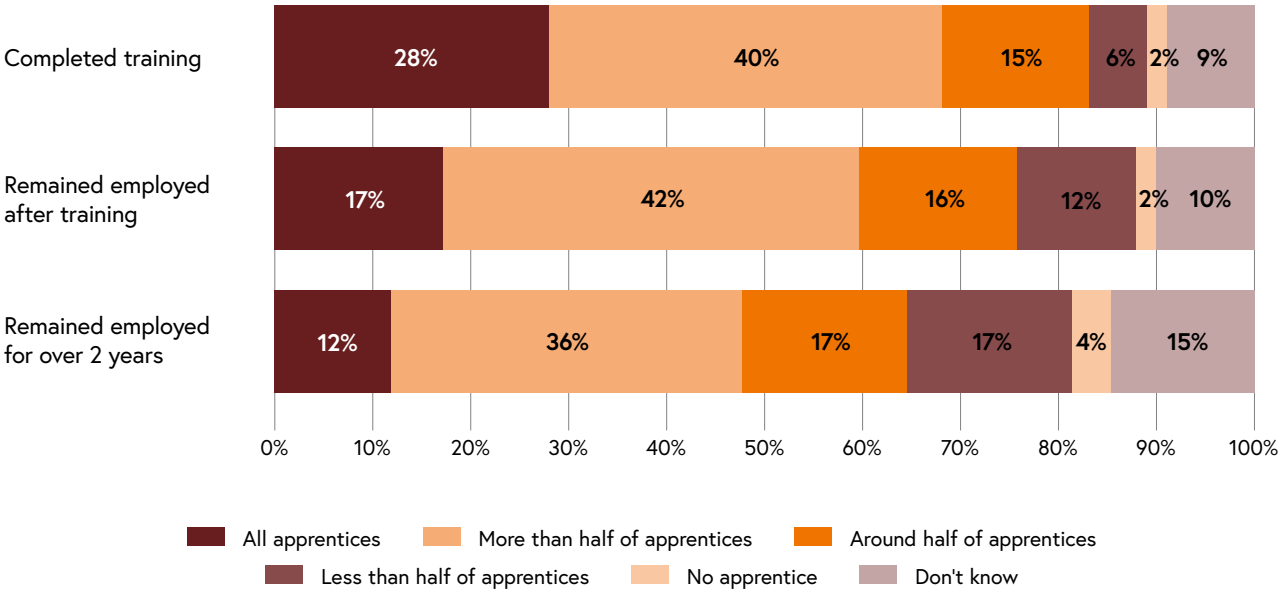
Engineering employers in England (35%) are more likely to say they use the levy to employ/recruit apprentices than those in Scotland (23%). While a similar proportion of employers in Wales (49%) and England (48%) say they use the levy in some capacity, those in Wales are more likely to say they do not know whether they use it (38%) compared to those in England (25%).

Large organisations are more likely to use the apprenticeship levy than SMEs (58% vs 35%), roughly in line with the proportion of those who employ apprentices. Large businesses are more likely to use the levy to employ/recruit apprentices than upskill existing employees (46% vs 33%), while SMEs are just as likely to use it for upskilling existing employees as they are to employ/recruit apprentices (both 21%). Those in the aerospace/defence industry are the least likely to say they use the levy to upskill existing employees (6%), compared to 34% in IT and communications, 30% in transport, and 28% in manufacturing.

Retention rate among apprentices

Of the 51% of engineering employers that employ apprentices, a strong majority of nearly seven in ten (68%) say more than half or all their apprentices complete training. Around three in five (59%) say more than half or all their apprentices remain employed after training, and a slightly lower 48% say that more than half or all remain employed for over two years.

Figure 9: Apprentices in the last 12 months.



Q **Thinking about the apprentices who have worked with your organisation in the last 12 months, approximately how many of them.**
Base: All who employ apprentices (654)

Large organisations are more likely than SMEs to say that over half of apprentices completed training (43% vs 32%), remained employed after training (48% vs 28%), and remained employed for over two years after completing training (42% vs 23%). Those in the electrical/electronics industry are more likely to report that less than half of apprentices remain employed with their organisation for more than two years after completing their training (39%), compared to 14% in manufacturing who reported this.

Digital Skills

Key findings

The most important digital skills for growth over the next five years include automation (38%), cyber security (38%), data engineering (34%), and software engineering (33%).

Around three in ten say senior leaders foresee future application of quantum technologies for their business (32%) or believe their workforce will be adequately prepared for its use (28%).

Automation ranks highest as the area in which engineering employers feel they do not have the necessary digital skills (30%).

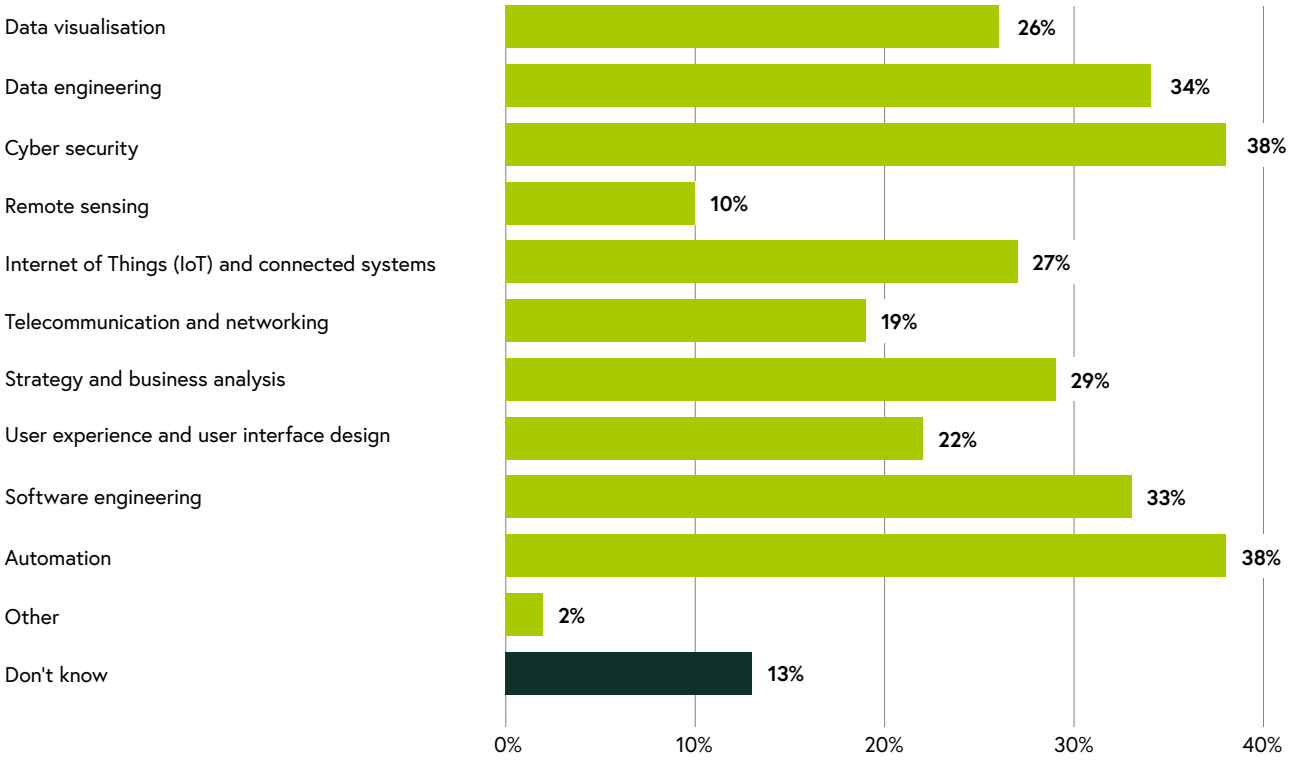
The digital skills most difficult to recruit for include data engineering, software engineering, and cyber security (all 17%).

Most important digital skills for the next five years

Looking to the next five years, the digital skills ranked most highly for industry growth are automation and cyber security (both 38%). This is followed by around a third citing data engineering (34%) or software engineering (33%).

Looking to the next five years, the digital skills ranked most highly for industry growth are automation and cyber security (both 38%). This is followed by around a third citing data engineering (34%) or software engineering (33%).

Figure 10: Most important digital skills for business growth in next five years.



Q **Thinking about the next five years... Which of the following digital skills areas do you anticipate being the most important areas for growth for your industry? Please select all that apply.**
Base: All respondents (1,316)

Overall, there are minimal differences between nations on which digital skills engineering employers anticipate will be the most important areas for growth, with automation and cyber security topping the list for all four. That said, those in England are more likely than those in Scotland to name Internet of Things (IoT) and connected systems (28% vs. 16%) as an important skill for growth. Those in Northern Ireland are the most likely to say automation (57% vs. 38% in

England, 31% in Wales, and 35% in Scotland), and the least likely to say data visualisation (10% vs. 26% in England, 22% in Wales, and 23% in Scotland).

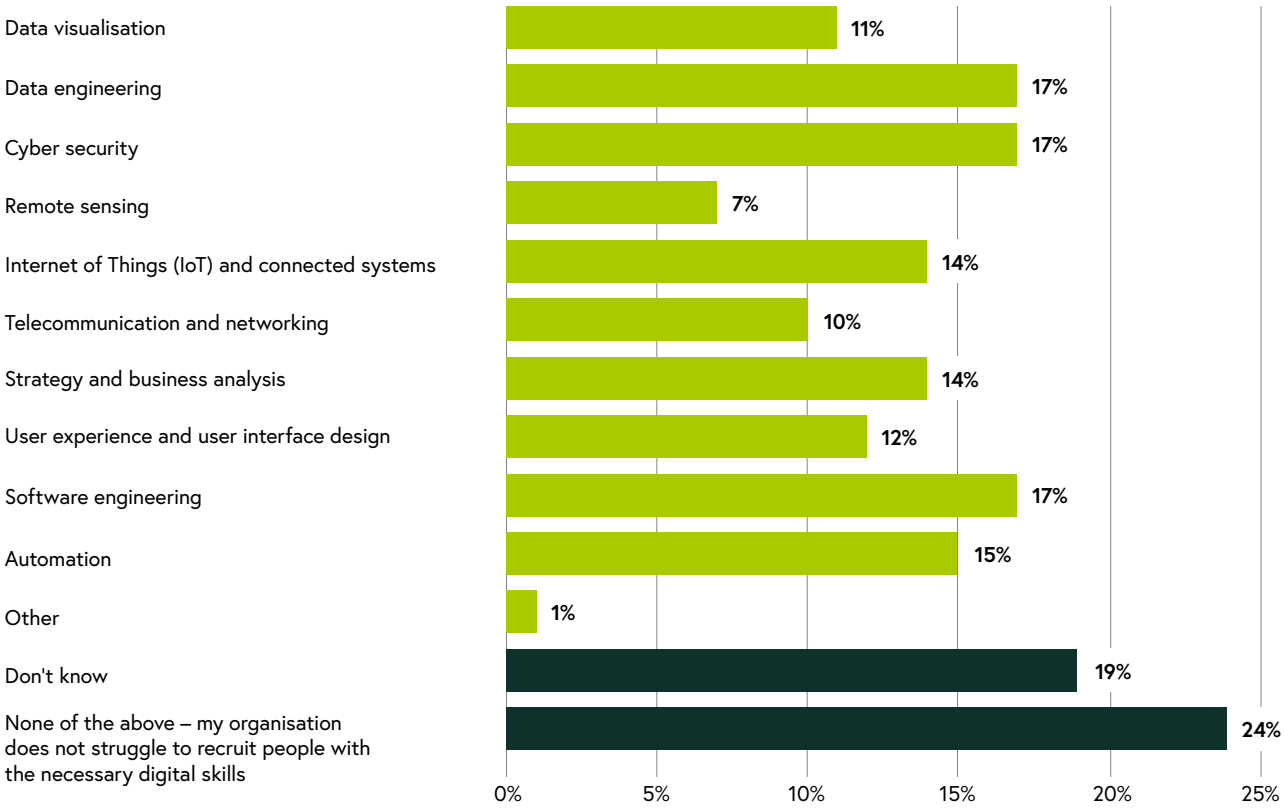
SMEs are more likely than large organisations to say telecommunication and networking is an important digital skill for growth over the next five years (22% vs 17%), though they are also more likely to say they do not know (16% vs 10%). Conversely, large organisations are more likely than SMEs to cite many of the listed skills, including automation (46% vs 29%), cyber security (45% vs 31%), and data engineering (41% vs 25%).

Within the aerospace/defence industries, half (50%) say that data engineering represents a key digital skill for growth, while slightly fewer say the same about automation and software engineering (both 44%).

Digital skills employers struggle to find

From the same list of digital skills, respondents were asked which they struggle to find within the external labour market when they try and recruit. While around a quarter (24%) say they do not struggle to recruit for the necessary digital skills and a fifth (19%) say they do not know, over half (56%) cite at least one digital skill. The most likely to be cited include data engineering, software engineering, and cyber security (all 17%).

Figure 11: Digital skills engineering employers struggle to find during recruitment.



Q **Which, if any, of the following digital skills do you struggle to find within the external labour market when you try and recruit? Please select all that apply.** *Base: All respondents (1,316)*

Large organisations are more likely than SMEs to say they struggle to recruit for cyber security (20% vs 14%), Internet of Things and connected systems (16% vs 11%), and data visualisation (13% vs 9%). SMEs however are more likely to say they do not struggle to recruit people with the necessary digital skills, with three in ten (31%) saying this compared to one in five (19%) large organisations.

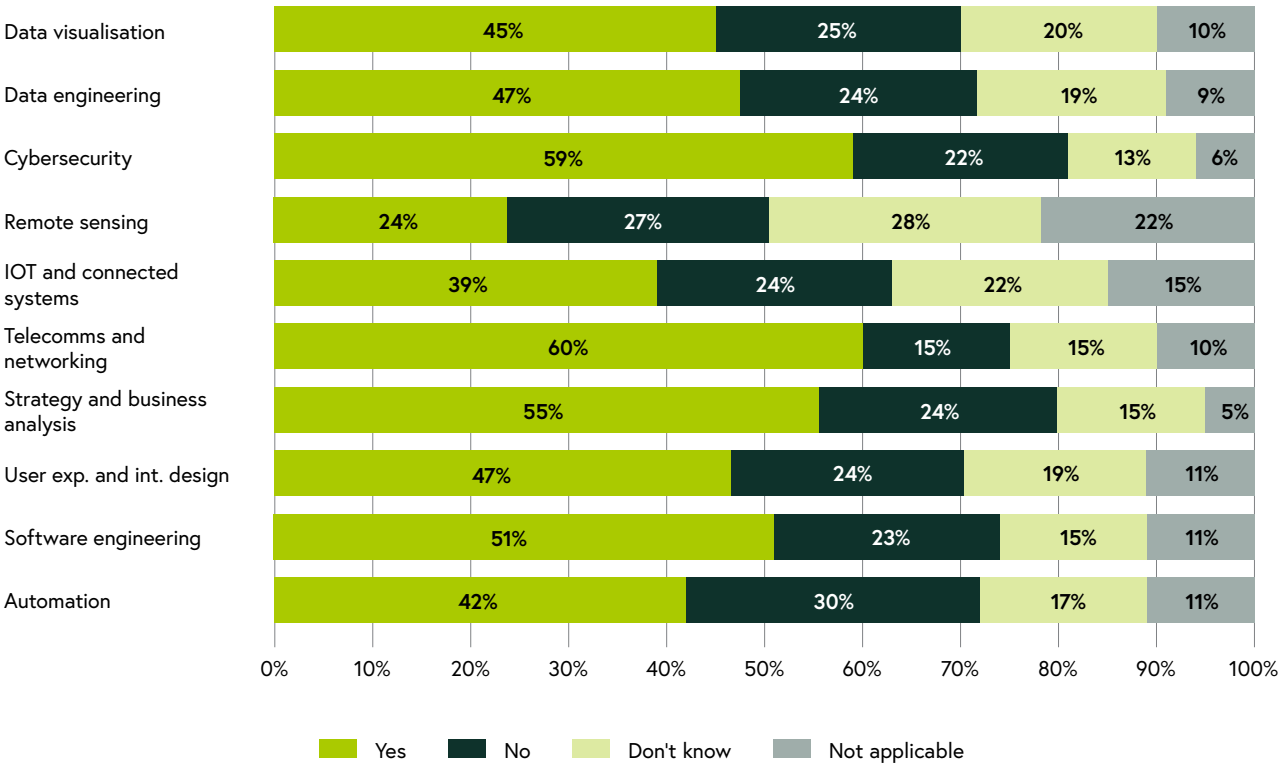
Automation is ranked fourth in the list of difficult skills to recruit for, with 15% saying this overall and organisations in Northern Ireland (26%) and England (15%) more likely than those in Scotland (8%) to cite it. Additionally, those in Northern Ireland (65%) and England (57%) are more likely to cite any skill overall compared to Scotland (46%).

Areas and levels with digital skills shortages

Engineering employers were asked to identify in which areas their organisation has the necessary digital skills, and in which they are lacking. Automation, despite having been flagged as the most important digital skill for growth over the next five years, is also the most cited as lacking (30% say they do not have the necessary skills in automation). Remote sensing is the least cited digital skill in terms of importance, and the second most cited in terms of a digital skills shortage (27%).

Other areas see approximately a quarter of engineering employers saying they do not have the necessary digital skills, including data visualisation (25%), Internet of Things and connected systems (24%), and data engineering (24%). On the other hand, three in five (60%) say they do have the necessary digital skills in telecommunication and networking and a similar proportion say the same for cyber security (59%). SMEs are more likely than large organisations to say that all areas/digital skills listed are not applicable.

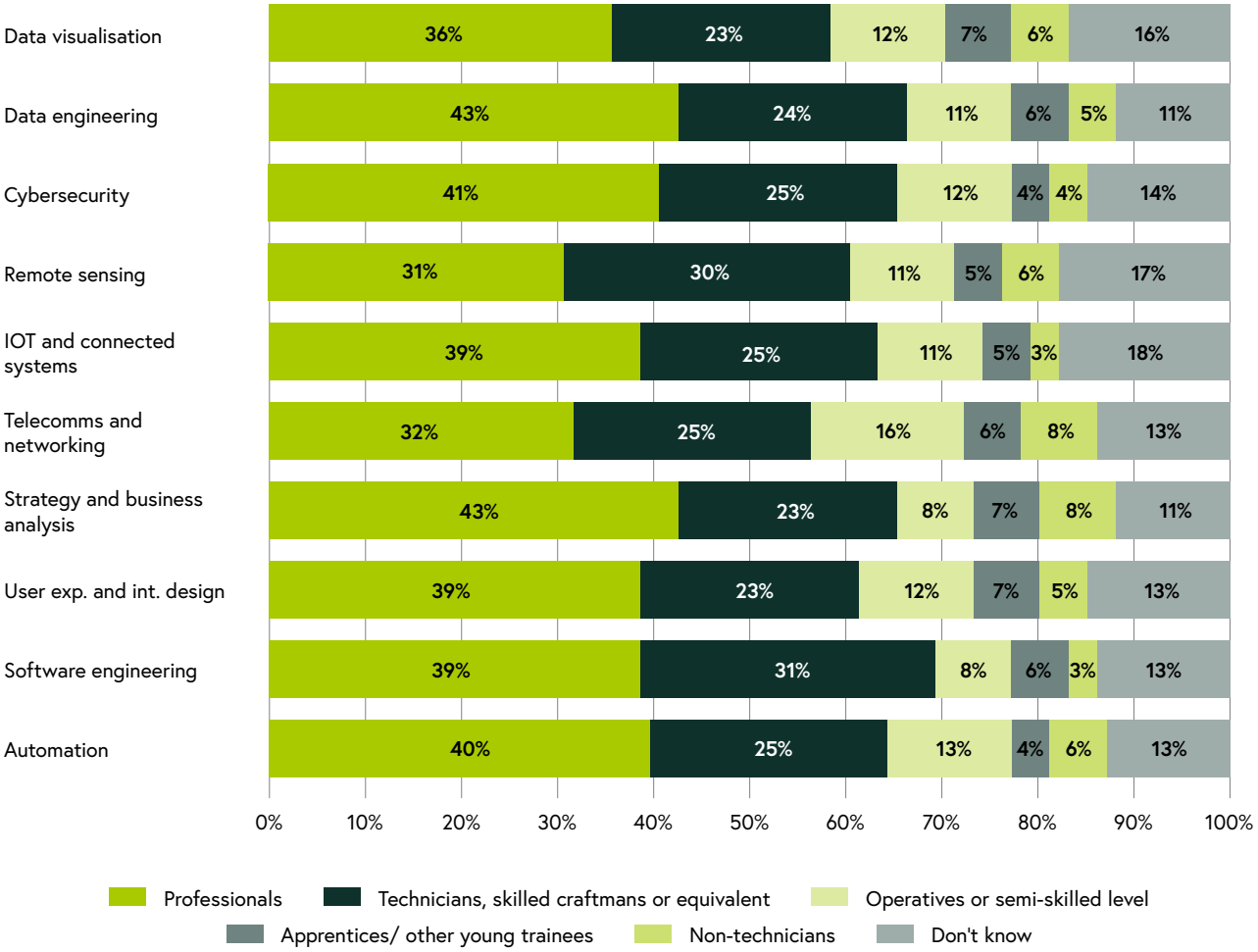
Figure 12: Areas with the necessary digital skills.



Q **Do you think your organisation currently has the necessary digital skills in each of the following areas?** *Base: All respondents (1,316)*

Most engineering employers see the biggest shortage at a professional level (which includes those with a qualification in engineering or related technical subject at HND/degree level or above), followed by those at a technician, skilled craftsmen, or equivalent level.

Figure 13: Level at which there is the biggest shortage of digital skills.

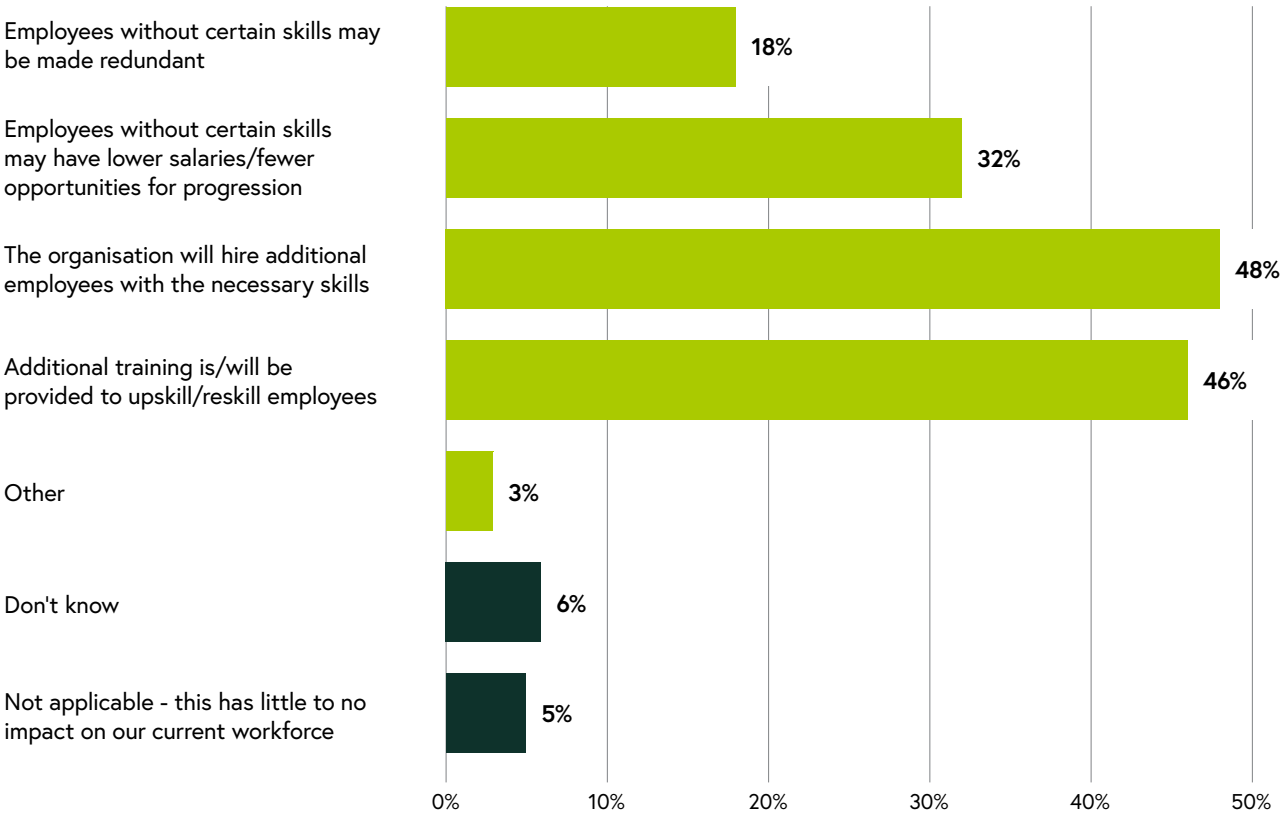


You've stated your organisation does not have all of the necessary skills in the below area... At what level does your organisation see the biggest shortage? *Base: All who do not have the necessary skills in each area (198 – 400)*

Impacts of a digital skills shortage

Nearly half (48%) of engineering employers with a digital skills shortage say that their organisation will hire additional employees with the necessary skills as a result of their digital skills shortage. Slightly fewer, 46%, say additional training will be provided to upskill/reskill employees and a third (32%) say those without certain digital skills may have lower salaries/ fewer opportunities for progression. Nearly one in five (18%) report that, faced with a digital skills shortage, the employees lacking the necessary digital skills may be made redundant.

Figure 14: Impact of digital skill shortage on the organisation.



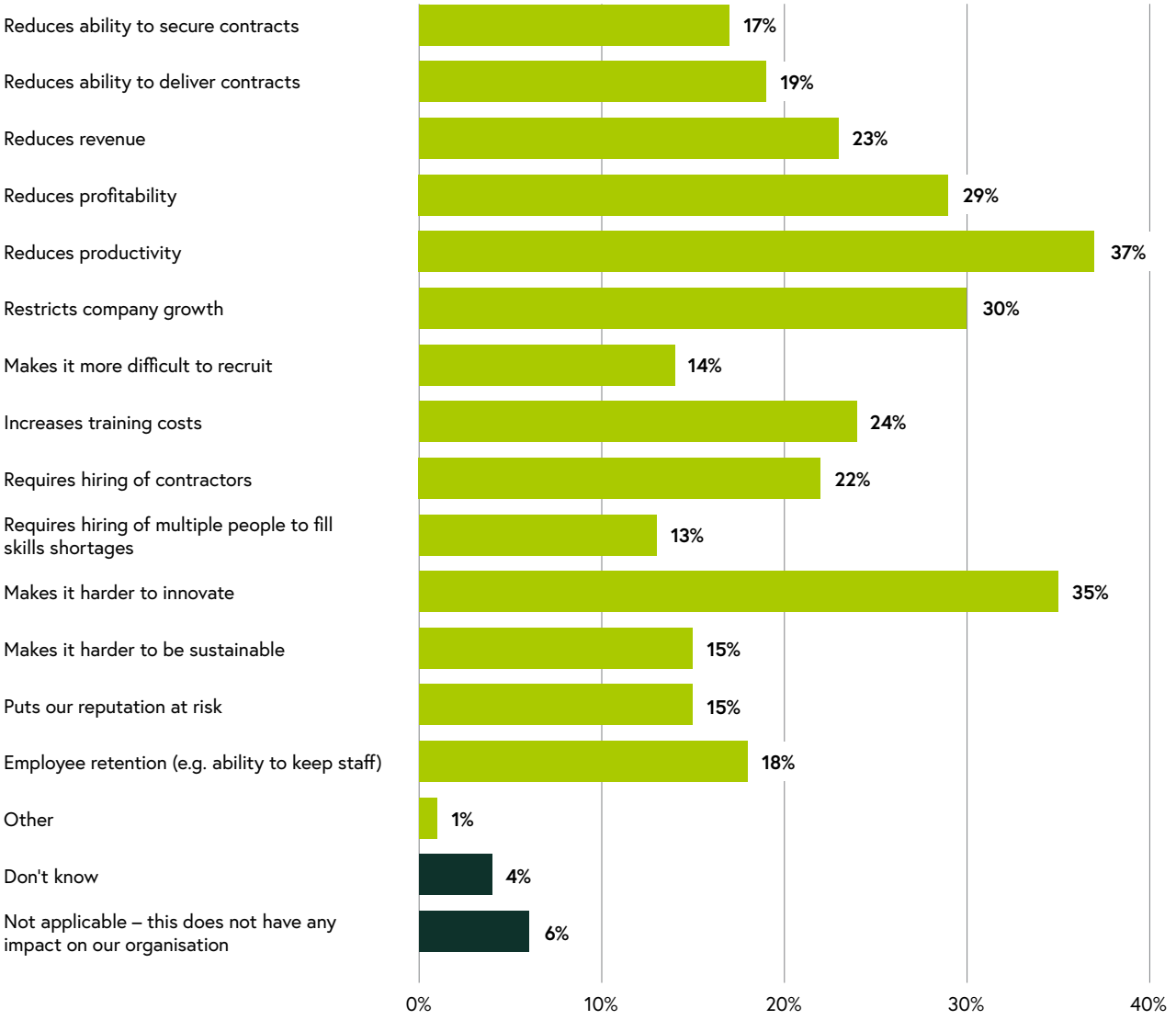
Q

You said your organisation currently has a shortage of skills... How does this skills shortage affect your current workforce (either now or in the future)? *Base: All who do not have the necessary skills in at least one area (834)*

Over half (52%) of large organisations say that a digital skills shortage would lead to hiring additional employees with the necessary skills, compared to the 43% of SMEs that say the same. SMEs are more likely than large organisations to say that lacking certain digital skills has little to no impact on their current workforce (8% vs 3%).

Thinking about the impact on the wider organisation, the highest proportion say a shortage of digital skills reduces productivity (37%), followed by those who say it makes it harder to innovate (35%) and restricts company growth (30%). Nine in ten (90%) cite at least one impact of the digital skills shortage on their wider organisation, and three in five (61%) cite at least one impact related to income or cost (revenue, profitability, growth, or training costs).

Figure 15: Impact of digital skill shortage on the workforce.



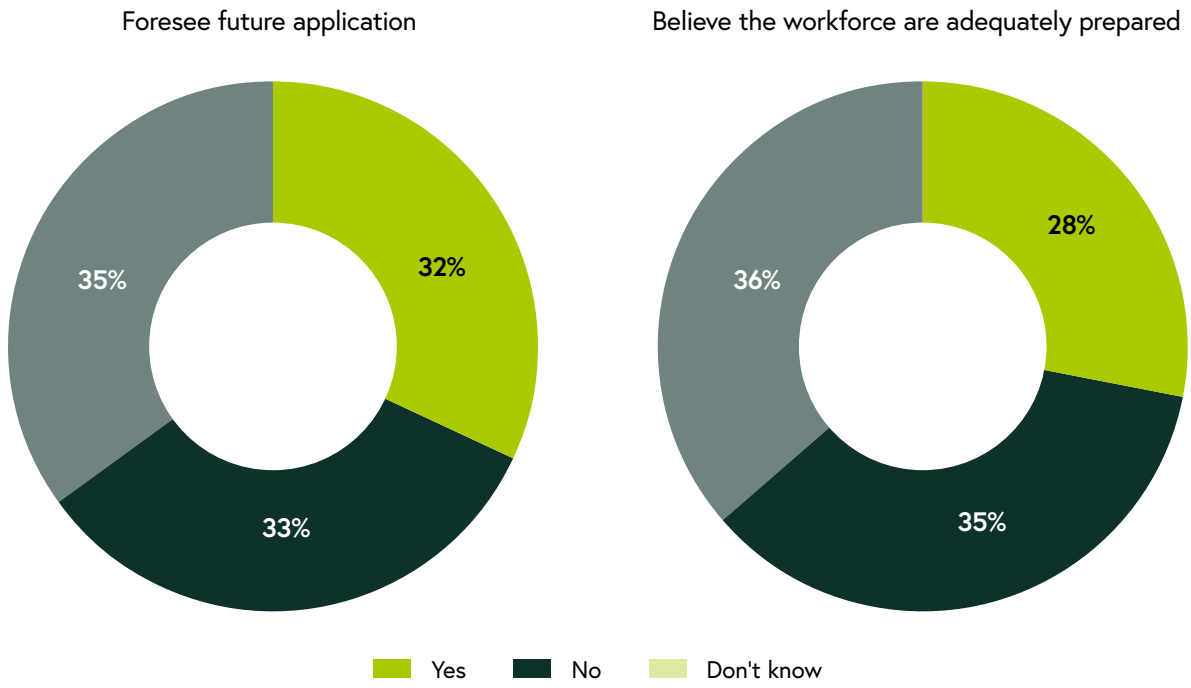
Q **Still thinking about your organisation's current shortage of digital skills... Which, if any, of the following impacts does this have on your organisation? Please select all that apply.** *Base: All who do not have the necessary skills in at least one area (834)*

Large organisations are more likely than SMEs to say their current shortage of digital skills reduces productivity (43% vs 30%), makes it harder to innovate (40% vs 28%), increases training costs (27% vs 21%), and makes it harder to recruit (17% vs 11%). Similarly to the impact on their workforce, SMEs are more likely than large organisations to say that their current digital skills shortage does not have any impact on their organisation (9% vs 3%).

A future with quantum technologies

When asked about senior leaders' perspectives on quantum technologies, responses are relatively equally divided. Around a third (32%) say their senior leaders foresee future applications of quantum technologies in their business, while a similar proportion say they do not (33%) and slightly more say they are not sure (35%). Just under three in ten (28%) say their senior leaders believe their workforce will be adequately prepared for the use of quantum technologies, while 35% say they believe they will not be and 36% say they are not sure.

Figure 16: Perspectives on the future use of quantum technologies.



Q **Thinking about quantum technologies, do the senior leaders in your organisation...** *Base: All respondents (1,316)*

Looking across nations, engineering employers in Scotland (21%) are the least likely to say they foresee future applications of quantum technologies for their business, compared to those in England (33%), Wales (34%), and Northern Ireland (44%).

A similar trend is seen when asked if their workforce will be adequately prepared for the use of quantum technologies, with engineering employers in Scotland (19%) being less likely to say this than those in England (29%). However, those in Scotland are more likely to report being unsure about both the future application (47% vs 34% in England) and being adequately prepared (48% vs 35%).

Artificial Intelligence (AI)

Key findings

Six in ten (58%) engineering employers currently use AI – with 18% of these doing so regularly – and the most common type of AI used is data analysis. A further 23% do not currently use it but plan to in the future.

Improved productivity (61%), enhanced problem solving (50%) and improved profitability (40%) are the top three ways AI is expected to benefit businesses in the next five years.

Current and future use of AI

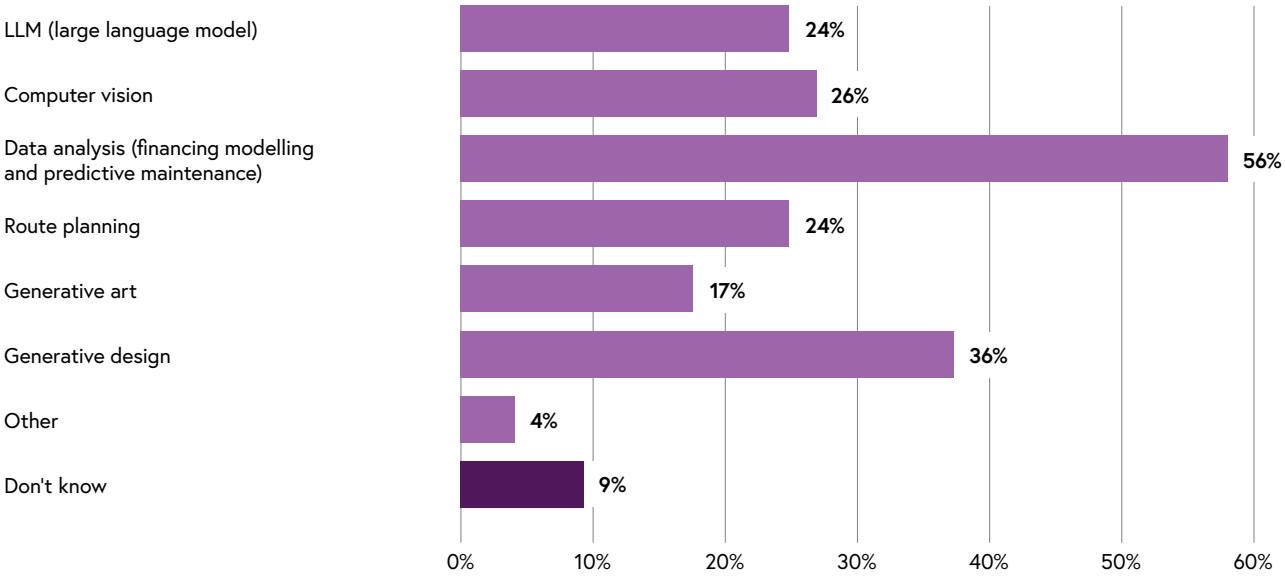
Around six in ten (58%) engineering employers report currently using AI software or equipment to optimise their products or services, and of these, 18% say they use AI regularly. A further 23% say that while they do not currently use AI software or equipment, they plan to in the future, while 13% reportedly do not plan to use it in the future.

Engineering employers in London are most likely to say they currently use AI (86%), with a third (33%) reportedly using it regularly. When looking across nations, those in England are more likely than those in Scotland to report currently using AI (59% vs 47%), and those in Scotland are the least likely to be regularly using AI (10% vs 18% in England, 22% in Wales, 24% in Northern Ireland).

Those in large organisations are also more likely to currently use AI compared to SMEs (66% vs 49%). Across industries, those working in IT & communications are the most likely to be currently using AI (82%), while those in aerospace/defence are the least likely to (45%).

Of the organisations that use AI, the most common type is data analysis AI (such as financing modelling and predictive maintenance), with over half (56%) who report using this. This is followed by over a third (36%) who use generative design, and around a quarter who use computer vision (26%), route planning and LLM (both 24%). 17% also report using AI for generative art.

Figure 17: Most common types of AI used by engineering employers.



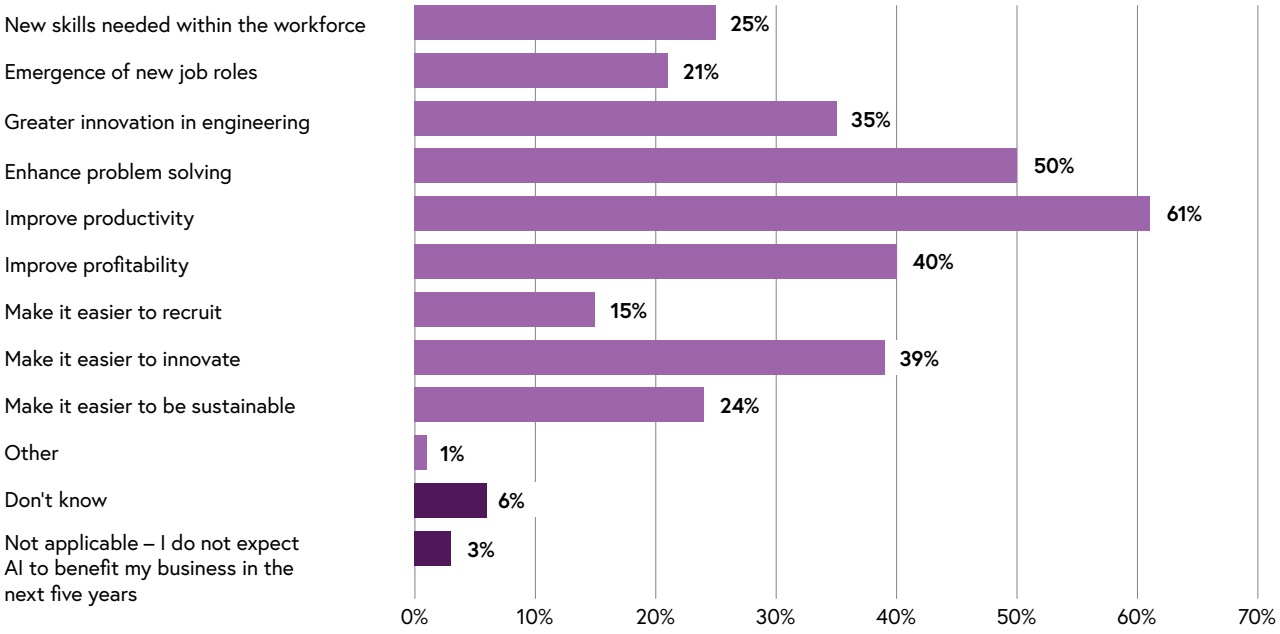
You said your organisation uses AI to some degree... Which, if any, of the following types of AI does your business use? Please select all that apply.
Base: All who use AI software (757)

Engineering employers in England are more likely to be using AI for route planning (25%) compared to those in Scotland (14%) and Wales (10%). Those working in IT and communications are most likely to be using AI for generative art (28%), and those in electrical/electronics are most likely to be using it for generative design (58%), computer vision (42%) and route planning (40%). Those in electrical/electronics are the least likely to be using AI for LLM (5%), compared to the IT and communications (33%) and manufacturing industries (24%).

How AI can benefit businesses

Of those who either currently use AI or plan to in the future, the most cited ways AI is expected to benefit businesses in the next five years are improved productivity (61%), enhanced problem solving (50%) and improved profitability (40%). Over a third also cite ease of innovation (39%) as well as greater innovation in the engineering field (35%) as a future business benefit, while around a quarter say it will make it easier to be sustainable (24%). One in five (21%) say it will allow new jobs to emerge, and 15% believe it will make recruitment easier.

Figure 18: How AI will benefit businesses over the next five years.

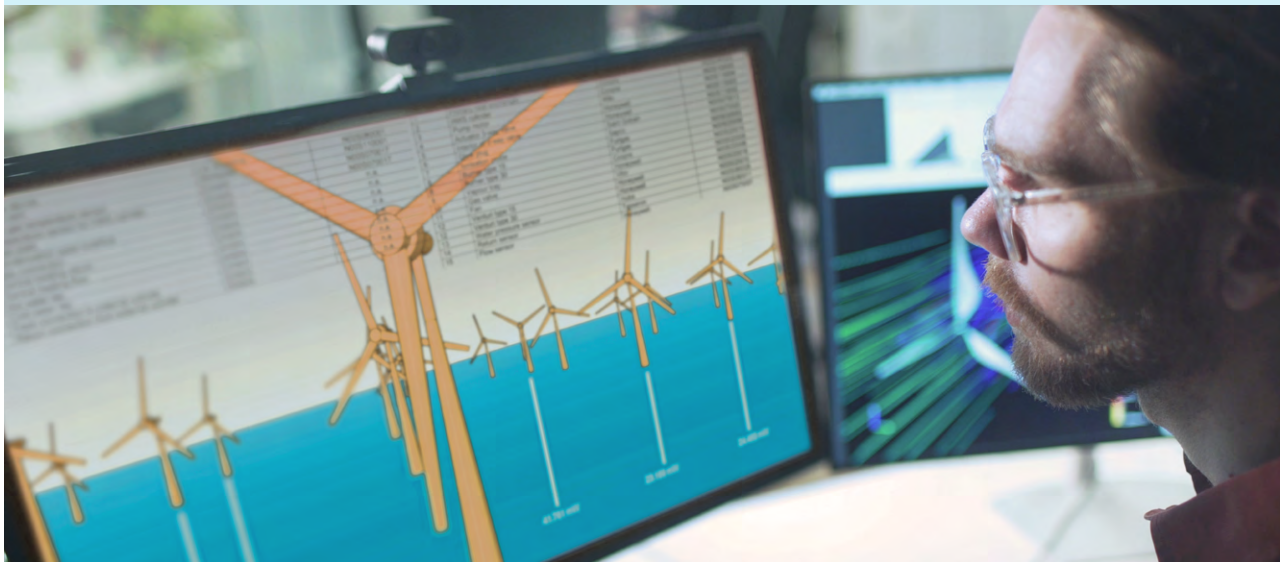


Q **And in which of the following ways, if any, do you expect AI to benefit your business within the next five years?** *Base: All who currently use AI or plan to in the future (936)*

Engineering employers in IT & communications are most likely to expect AI to make it easier to innovate (48%, compared to 30% in transport), and those in the energy industry are most likely to expect it to enhance problem solving (78%, compared to 34% in electrical/electronics). Those in manufacturing (non-metals) are less likely to expect AI to lead to greater innovation in engineering (32%, compared to 47% in electrical/electronics).

Additionally, those in Wales are more likely than those in Scotland to cite improved profitability (44% vs 28%) while those in England see greater engineering innovation (36% vs 25%) as expected benefits from AI. Those in both England (25%) and in Wales (30%) are more likely than those in Scotland to cite new skills needed within the workforce (15%).

Sustainability and decarbonisation



Key findings

More than a third (36%) of engineering employers do not feel their organisation has the skills needed to decarbonise by 2050.

The top barriers to meeting decarbonisation goals focus on cost – a third cite increased operating costs (34%), while three in ten cite investment costs (29%).

Technical/specialist sustainability skills/ knowledge is considered the most necessary skill to decarbonise by 2050 (39%) and is also cited as the top necessary decarbonisation skill missing (35%).

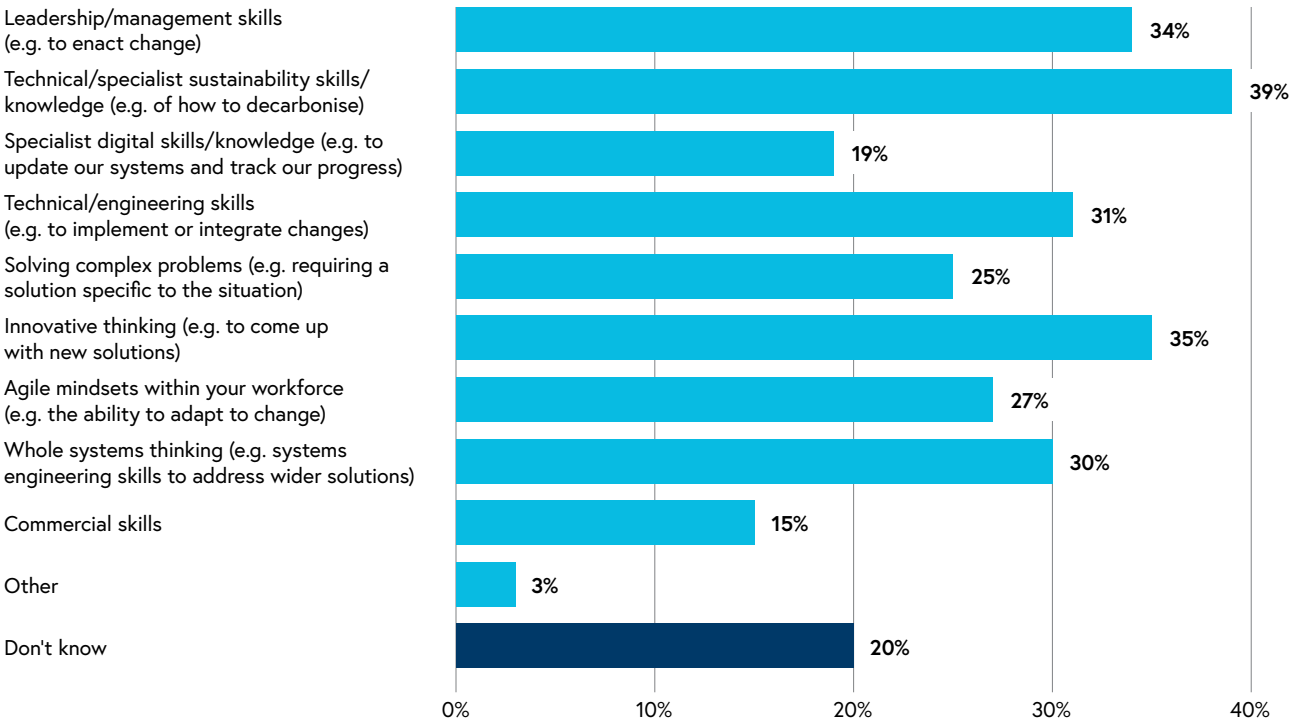
Introducing new technologies (39%), upskilling/reskilling existing employees (36%) and hiring new employees with those skills in the UK (34%) are the most cited responses to demand for decarbonisation skills.

Skills needed to decarbonise by 2050

First, engineering employers were asked about decarbonisation – which means completely divesting from fossil fuels to only use carbon-free and renewable energy sources – and what skills they believe will be necessary to achieve this by 2050.

The skill that is considered most necessary for organisations to achieve this is technical/specialist sustainability skills and knowledge, with two in five (39%) citing this, while slightly fewer cite technical/engineering skills (31%). One in five (19%) also cite specialist digital skills and knowledge as most important for this. Around a third feel that other non-technical skills, such as innovative thinking and leadership/management skills, will be important (35% and 34%, respectively).

Figure 19: Most necessary skills to decarbonise by 2050.



Q **Thinking generally about decarbonising by 2050 (i.e. completely divesting from fossil fuels to only use carbon-free and renewable energy sources)... if any, of the following skills do you think your organisation might need to meet this? Please select all that apply.** *Base: All (1,316)*

The energy industry is the most likely to cite nearly all listed skills (except commercial skills, which those in transport are most likely to cite).

However, one in five (20%) overall are uncertain which skills would be necessary for their organisation to decarbonise by 2050, which is higher among those in Wales (28%) and Scotland (26%) than those in England (19%). Additionally, those in large organisations are more likely than SMEs to cite all skills, while SMEs are more likely to say they are uncertain (25% vs 15% of large organisations). Engineering employers in the electrical/electronics industry are also more likely to say they are uncertain (30%).

Further, when examining what proportion feel their organisation currently has the skills needed to decarbonise, just over two in five (42%) feel they do, compared to more than a third (36%) who say they do not. More than one in five are uncertain (22%). Those most likely to report that they do not currently have the necessary skills are SMEs (41%) and those in Northern Ireland (55%).

Engineering employers on track to decarbonise by 2050?

Respondents were also asked if they have a decarbonisation strategy, which is defined as specific activities and goals to lower the organisation's environmental impact, like moving towards having net zero carbon emissions. This can be integrated into the organisation's wider business strategy or as a separate strategy.

Overall, more than half (57%) of engineering employers reportedly have a decarbonisation strategy, compared to three in ten (29%) who do not. This is broadly in line with previous years where, when asked a similar question, around half reported having a sustainability strategy. And when asked if they believed their organisation was on track to fully decarbonise by 2050, a similar pattern emerged, with 61% saying they are on track compared to 28% who do not believe they are on track.

Having a decarbonisation strategy correlates with whether employers are on track to meet decarbonisation goals by 2050, as 85% who have a strategy say they are on track, but this drops to just one in four (26%) for those with no strategy.

Likelihood to have a strategy increases with organisation size, as large organisations are more likely to have a decarbonisation strategy (71%) than medium (56%), small (32%), or micro (24%) organisations. Large organisations are also most likely to say they are on track to fully decarbonise by 2050 (69% vs 51% SMEs). This was consistent with trends seen in previous years, as a similar pattern emerged between large organisations being more likely to have a sustainability strategy.

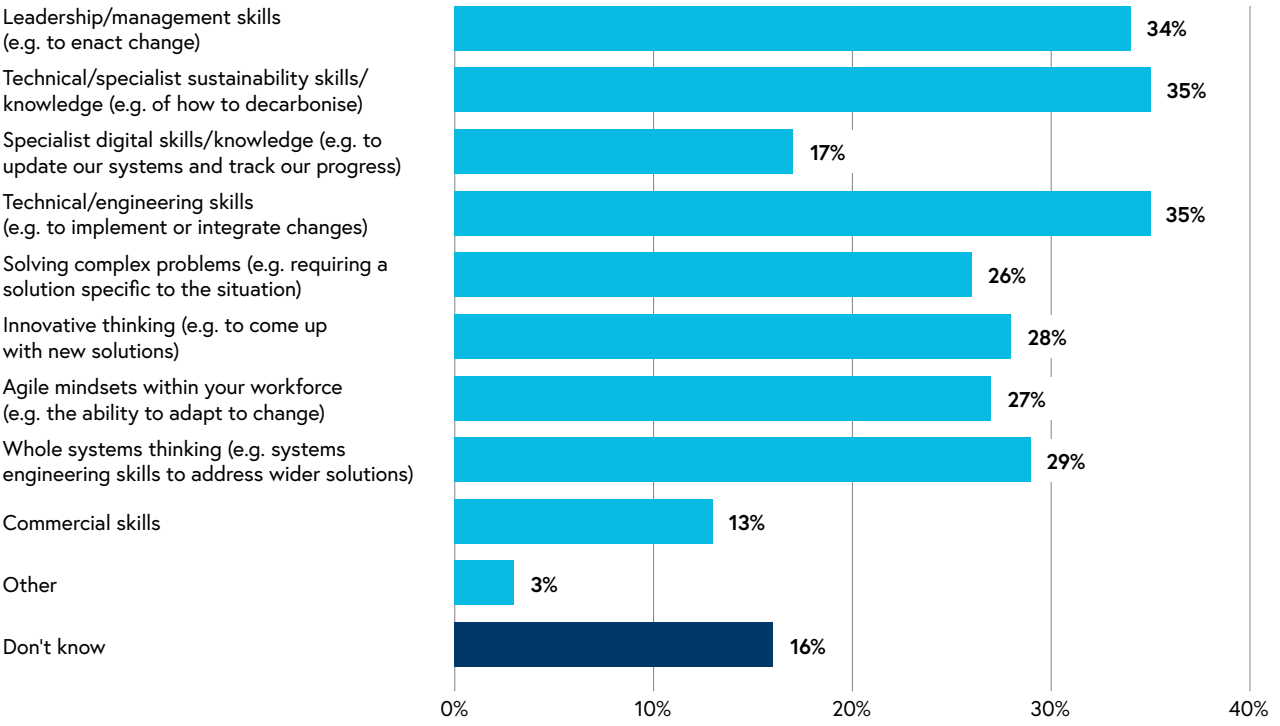
There are also differences that emerge across industry: those in the energy industry are most likely to have a decarbonisation strategy (79%) and be on track with their 2050 decarbonisation goals (68%), compared to 48% in the aerospace/defence industry who say they are on track with these goals. There is no difference in likelihood to be on track to decarbonise by 2050 between nations.

Skills most needed to achieve decarbonisation strategy

Of those with a decarbonisation strategy, a majority (86%) report this strategy takes future skills needs into consideration, with over half (53%) saying this is a major consideration.

That said, more than a third (36%) of engineering employers do not feel their organisation has the skills needed to decarbonise by 2050. Of those who have a strategy and report a shortage in the skills needed to deliver it, the top missing skills cited are technical/engineering skills and technical/specialist sustainability skills (both 35%), or leadership/management skills (34%). 17% cite a gap in specialist digital skills/knowledge.

Figure 20: Top necessary skills for decarbonising by 2050 missing from those with a decarbonisation strategy.



Q **Now thinking about your organisation's ability to meet its decarbonisation strategy specifically... Which, if any, of the following skills do you think your organisation is missing? Please select all that apply.** *Base: All with a decarbonisation strategy who do not have the necessary skills to decarbonise by 2050 (266)*

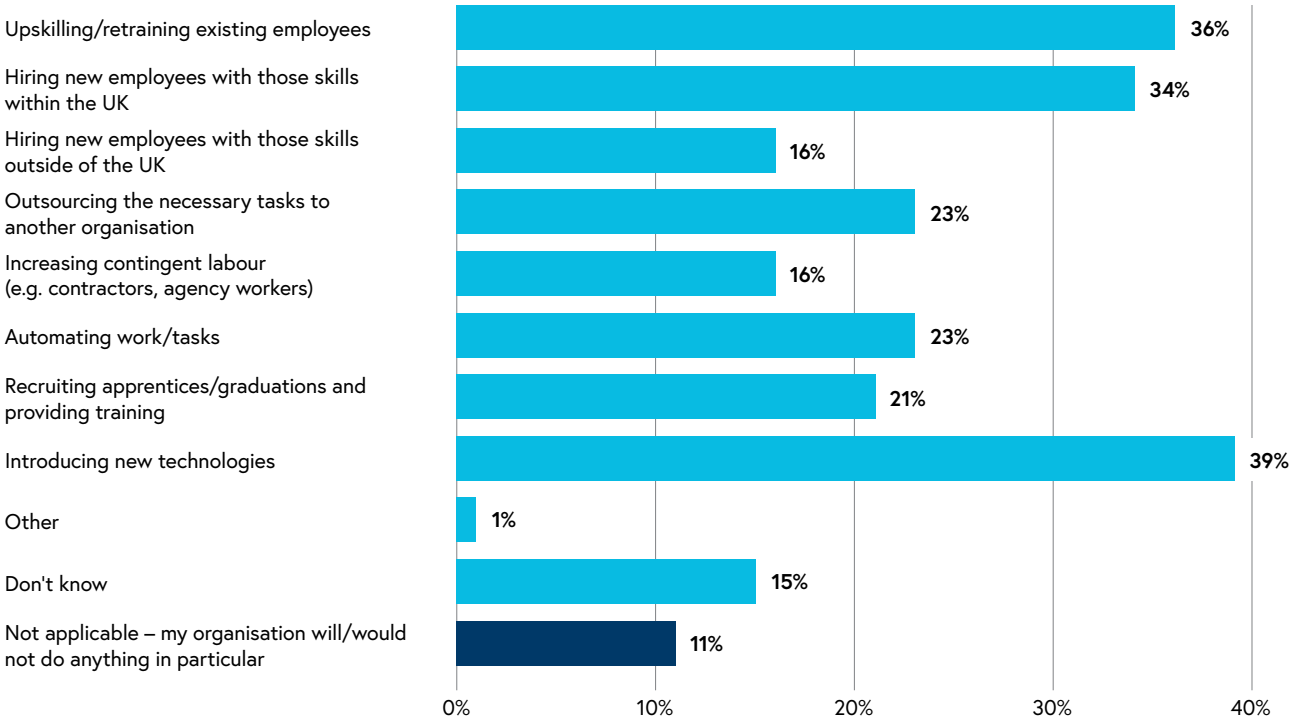
Responding to a gap in decarbonisation skills

Engineering employers were then asked to think about how their organisation will/would respond to the gap in required skills for decarbonising. Introducing new technologies is the most cited response to this gap, with two in five (39%) selecting this, closely followed by

upskilling/retraining existing employees (36%) and hiring new employees with these skills in the UK (34%). However, around one in four say they would outsource to another organisation or automate the tasks (both 23%), and 16% would hire new employees with those skills outside the UK. One in five (21%) would rely on recruiting new apprentices and provide the necessary training.

That said, 15% report being unsure and one in ten (11%) say their organisation will not do anything to respond to these skill demands.

Figure 21: How organisations would/will respond to needed skills for decarbonisation.



Q **Now thinking about the skills your organisation will/would need to deliver a decarbonisation strategy... How will/would your organisation respond to needing these skills in your workforce? Please select all that apply.** *Base: All (1,316)*

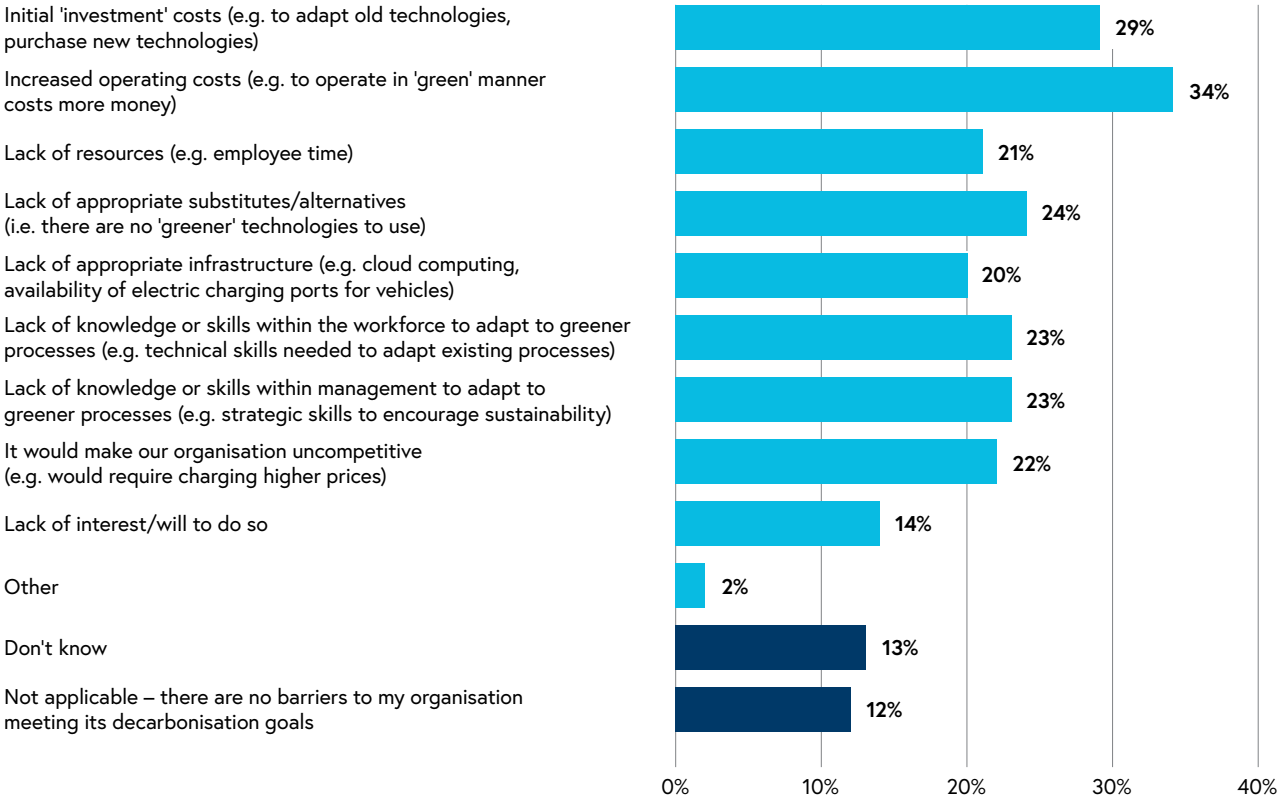
Those in large organisations are more likely than SMEs to say they would do all listed actions, except for outsourcing to another organisation (where there is no difference). Additionally, those in Northern Ireland are most likely to say they would automate tasks (42% vs 23% overall).

When looking specifically at differences across industries, those in the aerospace/defence industry are the least likely to say they would increase contingent labour (2% vs 16% overall) and automate tasks (7% vs 23% overall), while those in the electrical and electronics industry are the most likely to say they would not do anything in particular (22% vs 11% overall).

Barriers to decarbonisation

Around three-quarters (76%) reported facing barriers to meeting decarbonisation goals. The top barriers concern costs, with a third of engineering employers citing increased operating costs (34%) and a similar proportion citing initial investment costs (29%). These are similar to the barriers cited in response to a similar question in our 2022 survey.

Figure 22: Barriers to meeting decarbonisation goals.



Q **What, if any, of the following are barriers to your organisation's ability to meet its decarbonisation goals? Please select all that apply.**
Base: All respondents (1,316)

22% say it would make their organisation uncompetitive (e.g. would require raising prices), while around a quarter find the lack of appropriate substitutes/alternatives (24%) or the necessary knowledge/skills to adapt to greener processes within the workforce (23%) and management (23%) to be barriers.

Those working at SMEs are more likely than large organisations to cite lack of resources (25% vs 18%) as well as lack of interest/will to do so (18% vs 9%).

Equality, diversity, and inclusion

Key findings

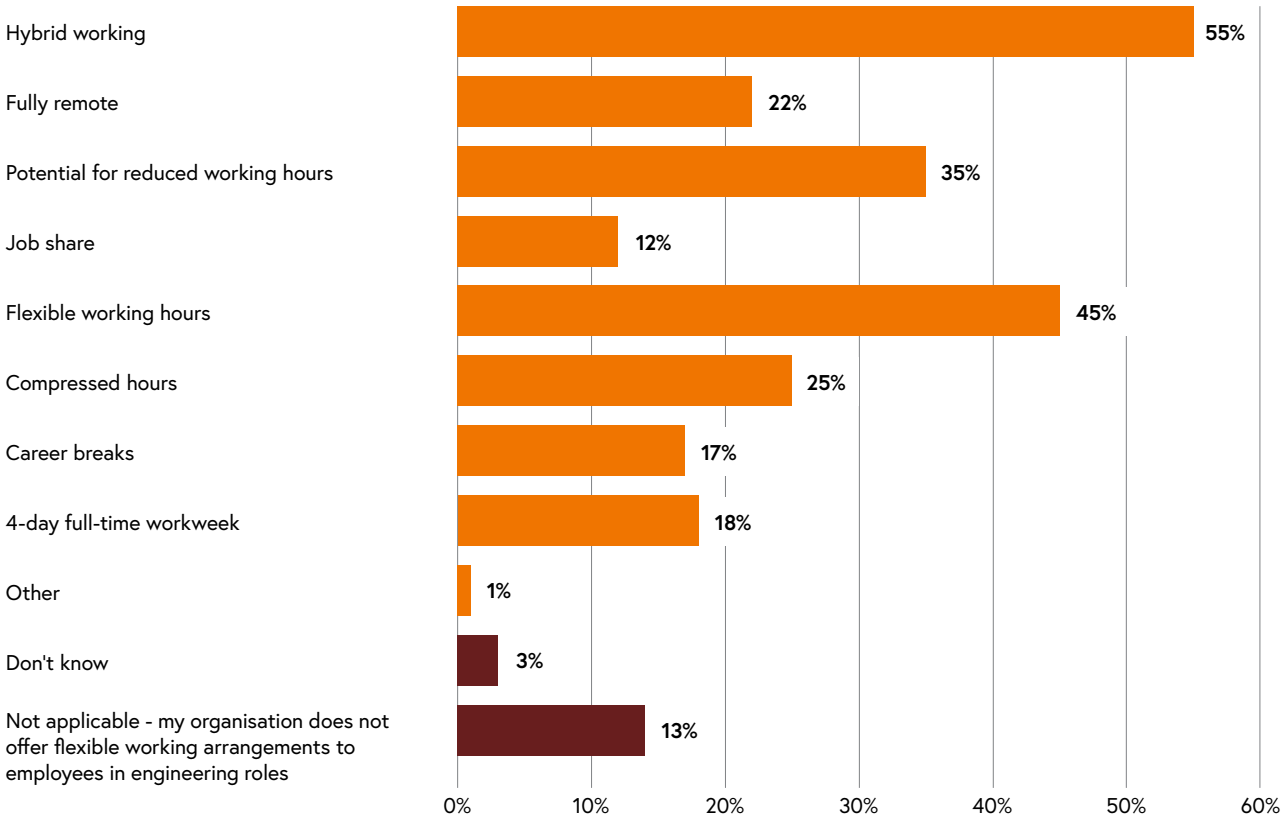
A large majority of engineering employers offer flexible work in some form (83%). Of those who do not offer flexible work (14%), three in five (59%) attribute this to the job not being able to be done at home or elsewhere.

Seven in ten (70%) are interested in improving the diversity of their workforce, while 52% have recently taken some kind of action to do so.

Flexible working and the barriers to providing it

More than four in five (83%) of engineering employers offer at least one type of flexible work arrangement to employees in engineering roles. More than half (55%) say they offer hybrid working (working from home/not on-site at least one day per week), while fewer (45%) say they offer flexible working hours (the ability to choose start and finish time of the working day) or the potential for reduced working hours (35%).

Figure 23: Types of flexible work arrangements offered.



Q **Which, if any, of the following flexible work arrangements does your organisation currently offer to employees in engineering roles? Please select all that apply.** *Base: All respondents (1,316)*

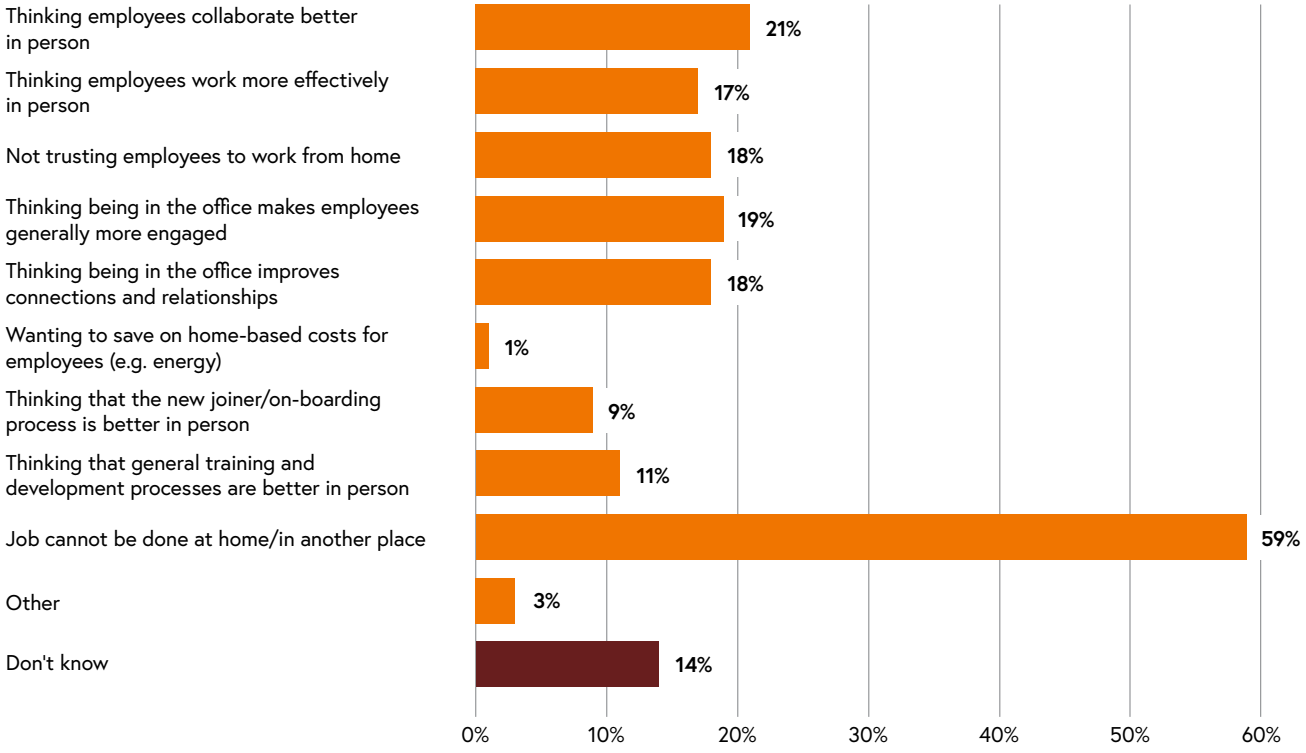
Engineering employers in Wales are the least likely to offer at least one form of flexible working arrangement (72%), compared to those in Scotland (86%) and England (84%). Those in Scotland are more likely to offer hybrid working (63% vs 49% in Wales), and a third (33%) of those in Scotland say they offer compressed hours (working the same number of hours per week across fewer days), compared to a quarter (25%) of those in England and 17% in Wales.

Large organisations are more likely to say they offer flexible working arrangements (87%) compared to SMEs (79%) – this is the case across all types of flexible work listed. It follows that SMEs are more likely to say they do not offer any flexible working arrangements to those in engineering roles, with one in five (20%) saying this compared to one in ten (9%) large organisations.

Engineering employers in the IT and communications industry are more likely to say they offer at least one form of flexible working arrangements (94%), while those in the manufacturing industry are less likely to say the same (79%).

Of the 14% who say they do not offer flexible working arrangements to employees in engineering roles, three in five (59%) say this is due to the job not being able to be done at home or in another place. Around one in five say it is because they believe employees collaborate better in person (21%) or that being in the office makes employees generally more engaged (19%). Reasons for not offering flexible work arrangements are consistent across organisation size.

Figure 24: Reasons for not offering flexible work arrangements.



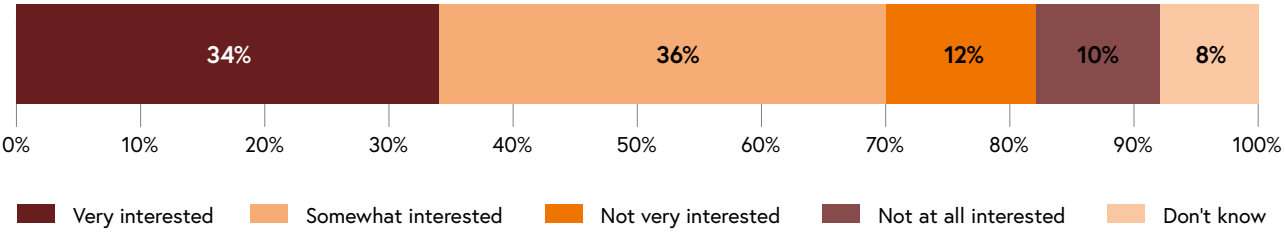
Q

You said that your organisation does not offer flexible work arrangements for employees in engineering roles... Which, if any, of the following are reasons for this? Please select all that apply. *Base: All who do not offer flexible work arrangements (185)*

Interest in improving EDI in the engineering and technical industry

The majority of engineering employers express an interest in improving the diversity of their workforce, with seven in ten (70%) saying this. Large organisations are more likely than SMEs to say they are very interested in improving it (44% vs 23%), while the two are comparable in those saying they are somewhat interested (37% vs 36%). Around a third (33%) of SMEs say their organisation is not interested in improving the diversity of their workforce, compared to just over one in ten (12%) of large organisations.

Figure 25: Interest in improving workforce diversity.

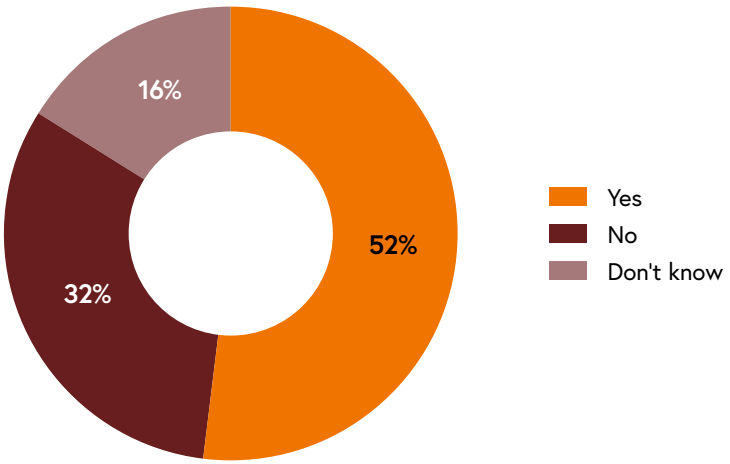


Q **Now, thinking about equity, diversity and inclusion (EDI) in the engineering and technical workforce... To what extent, if at all, would you say that your organisation is interested in improving the diversity of its workforce?** *Base: All respondents (1,316)*

Action on improving EDI

Around half (52%) of engineering employers have taken some form of action in the past 12 months to improve the diversity of their workforce, while around a third (32%) have not and a further 16% do not know. Two thirds (66%) of large organisations say they have, nearly twice the proportion of SMEs who say the same (36%).

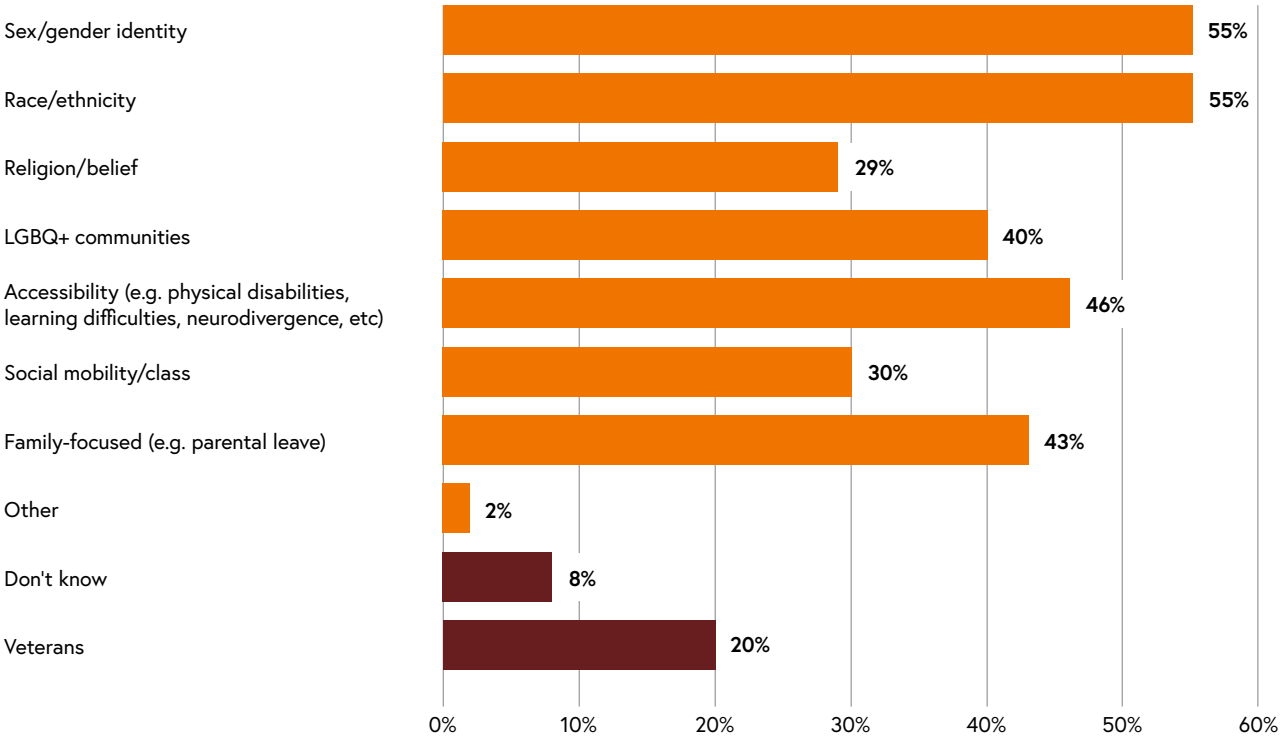
Figure 26: Taken any action to improve diversity of workforce in past 12 months.



Q **Still thinking about equity, diversity and inclusion (EDI) in the engineering and technical workforce, has your organisation taken any action in the past 12 months to improve the diversity of its workforce? This may include things like creating or promoting policies, seminars, events, etc., that aim to promote and deliver a more equitable, diverse, and inclusive workplace.** *Base: All respondents (1,316)*

Of those who have recently taken some form of action to improve EDI, their actions are most likely to have focused on sex/gender identity or race/ethnicity (both 55%). This is followed by just under half (46%) focusing on accessibility (e.g. physical disabilities, learning disabilities, neurodivergence, etc.), 43% on family-focused actions (e.g. parental leave), and 40% on LGBQ+ communities.

Figure 27: Specific areas focused on when taking action to improve EDI in workforce.

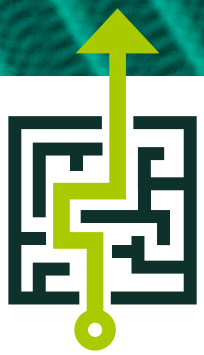


Q **Thinking about the action(s) your organisation has taken to improve EDI among its workforce in the past year, what specific area(s) has this focused on?** *Base: All who have taken action towards improving EDI recently (677)*

Engineering employers in Scotland are more likely than those in England to have focused on sex/gender identity (67% vs. 54%) when acting on EDI. Large organisations are more likely than SMEs to have focused on race/ethnicity (59% vs 45%), sex/gender identity (58% vs 47%), LGBQ+ communities (49% vs 19%), religion/belief (32% vs 22%) and veterans (22% vs 15%).

Those in the IT and communications industry are more likely than the overall sample to say they focused on social mobility/class (43%) and less likely to say they focused on LGBQ+ communities (27%); in the transport industry they are more likely to say they focused on religion/belief (41%); and in construction they are more likely say they focused on religion/belief (35%) and veterans (27%).

Conclusions



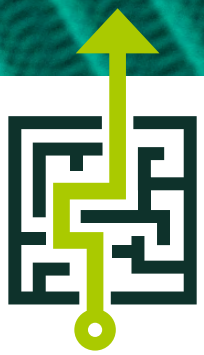
Overall, engineering employers do think the industry workforce is fit for purpose, but they struggle to recruit for specific skills. Engineering employers say there are challenges in finding specialist sustainability skills as well as innovative thinking or complex problem solving. The need for innovative solutions is recognised across the industry, with engineering employers citing it as one of the top skills their organisation needs to grow.

Then too, specialist sustainability skills and innovative thinking were also highlighted as key skills engineering employers will need to decarbonise. Most engineering employers already have a decarbonisation strategy with specific activities and goals to lower the organisation's environmental impact. One of the key activities for a decarbonisation strategy is the inclusion of new technologies as well as upskilling their existing employees.

Engineering employers are prepared to embrace emerging technologies but do have concerns about the skills available in their workforce to meet their goals. Most engineering employers say their organisation is confident embracing new technologies, with cyber security and automation particularly important for industry growth over the next five years. However, employers also say that they can struggle to find certain skills in the labour market when they recruit, and automation is noted as an area where organisations do not have the skills they need.

Skills shortages are particularly evident at the professional level (i.e. with a HND/ degree level qualification) followed by technician-level skills. Fewer employers report significant skills shortages at the apprentice or trainee level, and, in fact, many do report that they engage with educational initiatives such as apprenticeships or internships/work experience. Among organisations who do employ apprentices, there does appear to be a level of turnover, with proportions of apprentices completing training higher than the proportion who remain long-term employed within the original organisation.

Conclusions



Staff turnover can affect the skills present within engineering employers, with some reporting that employees switch companies after being upskilled and thus the knowledge is leaving the organisation rather than being retained or transferred to other employees. Even so, most engineering employers think they are effective at transferring skills and knowledge between individual employees. They are less effective at sharing technical skills and knowledge with other organisations, so more could be done to foster cross-industry employer networks.

Engineering employers have already embedded Artificial Intelligence with most saying they currently use AI software or equipment to optimise their products and services. While most use is currently focussed on data analysis, over the next five years engineering employers anticipate that AI will improve their productivity and problem solving. As complex problem solving is one of the key skills which employers struggle to find in the labour market, appropriate use of AI could bring significant benefits.

Aside from technical skills, engineering employers are interested in improving the diversity of their workforce. The majority say they have taken some form of action over the last year to do so, with focusses on improving diversity of their workforce across sex/ gender identity and race/ ethnicity. However, the proportion of organisations who are interested in improving their workforce diversity is markedly higher than the proportion who have taken action to do so. Understanding the barriers to taking action around EDI and how these interact with specific skills challenges or needs across the industry could help more organisations diversify their workforce.

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