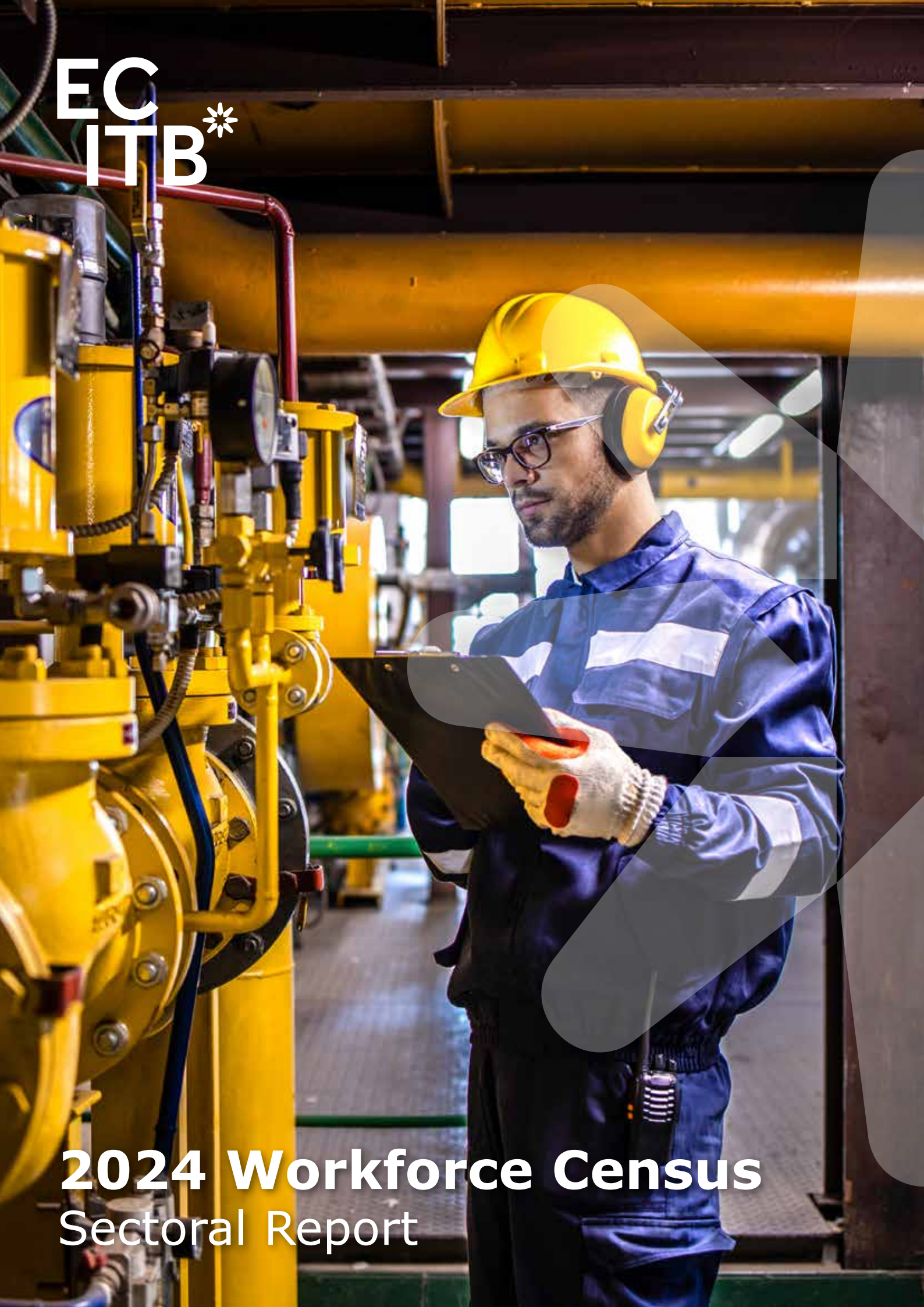

2024 Workforce Census

Sectoral Report

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This report was produced by the Engineering Construction Industry Training Board.

Cover photo © littlewolf1989 / Adobe Stock

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At a glance

Nuclear

2024 39.2% | 2021 34.6%

Workforce site distribution: **60%** on site **40%** off site

Nationality: **96%** UK

Gender: ♂ **79%** ♀ **21%**

Age: <30 **20%** | 30-49 **44%** | >50 **36%**

Workforce growth expectations: ↑ **10%**

Oil and Gas

2024 35.2% | 2021 36.7%

Workforce site distribution: **53%** on site **47%** off site

Nationality: **94%** UK

Gender: ♂ **86%** ♀ **14%**

Age: <30 **12%** | 30-49 **48%** | >50 **41%**

Workforce growth expectations: ↑ **12%**

Renewables

2024 6.2% | 2021 3.4%

Workforce site distribution: **34%** on site **66%** off site

Nationality: **86%** UK

Gender: ♂ **80%** ♀ **20%**

Age: <30 **22%** | 30-49 **48%** | >50 **30%**

Workforce growth expectations: ↑ **18%**

Chemicals

2024 6% | 2021 6.8%

Workforce site distribution: **57%** on site **43%** off site

Nationality: **96%** UK

Gender: ♂ **88%** ♀ **12%**

Age: <30 **17%** | 30-49 **42%** | >50 **41%**

Workforce growth expectations: ↑ **12%**

Water and waste

2024 2.9% | 2021 1%

Workforce site distribution: **18%** on site **82%** off site

Nationality: **95%** UK

Gender: ♂ **80%** ♀ **20%**

Age: <30 **23%** | 30-49 **45%** | >50 **33%**

Workforce growth expectations: ↑ **16%**

Power Generation

2024 1.9% | 2021 4.7%

Workforce site distribution: **32%** on site **68%** off site

Nationality: **90%** UK

Gender: ♂ **84%** ♀ **16%**

Age: <30 **23%** | 30-49 **43%** | >50 **33%**

Workforce growth expectations: ↑ **22%**

Food & Drink

2024 1.8% | 2021 2.3%

Workforce site distribution: **60%** on site **40%** off site

Nationality: **97%** UK

Gender: ♂ **79%** ♀ **21%**

Age: <30 **20%** | 30-49 **44%** | >50 **36%**

Workforce growth expectations: ↑ **10%**

Other ECI

2024 1.2% | 2021 1.6%

Workforce site distribution: 40**%** on site 60**%** off site

Nationality: **96%** UK

Gender: ♂ **83%** ♀ **17%**

Age: <30 **14%** | 30-49 **47%** | >50 **39%**

Workforce growth expectations: ↑ **7%**

Carbon Capture

2024 1.2%

Workforce site distribution: **9%** on site **91%** off site

Nationality: **93%** UK

Gender: ♂ **79%** ♀ **21%**

Age: <30 **22%** | 30-49 **48%** | >50 **30%**

Workforce growth expectations: ↑ **13%**

Hydrogen

2024 1.1%

Workforce site distribution: **12%** on site **88%** off site

Nationality: **89%** UK

Gender: ♂ **73%** ♀ **27%**

Age: <30 **21%** | 30-49 **50%** | >50 **28%**

Workforce growth expectations: ↑ **11%**

Pharmaceutical

2024 0.9% | 2021 2%

Workforce site distribution: **43%** on site **57%** off site

Nationality: **99%** UK

Gender: ♂ **80%** ♀ **20%**

Age: <30 **23%** | 30-49 **46%** | >50 **31%**

Workforce growth expectations could not be obtained due to insufficient responses.

Entire ECI

Nationality: **95%** UK

Workforce site distribution: **51%** on site **49%** off site

Gender: ♂ **83%** ♀ **17%**

Age: <30 **17%** | 30-49 **45%** | >50 **38%**

Workforce growth expectations: ↑ **12%**

Executive summary

This report provides a sectoral breakdown of the Engineering Construction Industry (ECI) 2024 Census data. The overarching overview and regional reports are available on the ECITB's website.

The data, collected in May and June 2024, offers a snapshot of the industry and its 94,680 workers, highlighting the specific characteristics and challenges of each sector. Geographical distribution, occupational breakdowns, recruitment difficulties and business opportunities are detailed across twelve sectoral sections. The Census focuses on employers within the ECITB's scope and as such, may not fully encompass the entire ECI workforce or activities in each sector.

The nuclear sector has emerged as the largest ECI sector by workforce size, representing 39.2% of the workforce, overtaking the oil and gas sector, which accounts for 35.2%. The renewables and water treatment sectors have experienced notable growth since 2021, increasing their workforce shares from 3.4% to 6.2% and 1% to 2.9%, respectively. Renewables include biomass, energy from waste, onshore and offshore wind [1], biofuels and solar. Conversely, the workforce share engaged in non-ECI activities has declined sharply, from 6.9% to 2.3%. The share involved in conventional power generation projects dropped by 2.8 percentage points, while the hydrogen and carbon capture sectors now account for 2.3% of the workforce, though many roles in these sectors remain office-based.

Saltend Chemicals Park, Hull. © burnstuff2003 / Adobe Stock

1 It is important to note that according to the Industrial Training Act, the Industrial Training Order and the supporting legislation, the definition of the ECITB's scope outlines that the offshore component of the offshore wind sector falls outside its remit.

The hydrogen, carbon capture, nuclear, renewables, water and waste treatment and pharmaceuticals sectors demonstrate a less unbalanced gender profile than the industry average. However, no sector reports a female workforce share exceeding 27%. Reliance on non-UK workers also varies significantly, with renewables, hydrogen and conventional power generation sectors employing 10–14% non-UK nationals, while this figure drops to nearly 1% in pharmaceuticals.

Age demographics present a challenge, particularly in the oil and gas, chemicals and food and drink sectors, where 41–42% of workers are aged 50 or older. Oil and gas is especially concerning, with only 12% of its workforce under 30 - the lowest share across all sectors in this study. This raises questions about the feasibility of transferring oil and gas workers to other sectors beyond the short term.

While workforce growth expectations are positive across all sectors, they are particularly strong in conventional power generation and renewables. The former is well-positioned to capitalise on the scaling up of hydrogen and carbon capture projects.

Conversely, smaller ECI sectors, such as steel manufacturing, report more modest growth expectations. The nuclear sector also falls within the lower range; however, these projections must be considered in the context of each sector's total workforce size. In absolute terms, the potential volume of new hires in the nuclear sector is likely to remain particularly high. Additionally, growth expectations from employers mainly engaged in one sector may reflect opportunities they identified in other sectors. For example, growth expectations from employers in the conventional power generation sector may reflect business opportunities identified in hydrogen and carbon capture.

Each sector exhibits distinct demographic characteristics, as outlined in the At a Glance section. Detailed occupational headcounts, along with sector-specific hiring challenges, are provided in their respective sections, offering unique insights into workforce capabilities and training needs.

Introduction

Sizewell B Nuclear Power Station. Photo courtesy of EDF Energy.

The Engineering Construction Industry Training Board (ECITB) is the statutory skills body for the Engineering Construction Industry (ECI) in Great Britain. A non-departmental public body sponsored by the Department for Education (DfE) and accountable to Parliament, the ECITB collaborates with employers, central and devolved governments and various stakeholders to attract, develop and qualify personnel across a broad spectrum of craft, technical and managerial roles within the industry. Employers mainly involved in engineering construction are considered 'in-scope' of the ECITB's remit. Those exceeding a certain wage threshold are legally required to contribute to an industrial training levy. Regardless of size, all in-scope employers are entitled to receive grants for training their workforce.

The engineering construction industry consists of employers providing services spanning engineering design, project management, construction, maintenance and decommissioning of process plant and machinery on industrial sites, across a range of sectors including, but not limited to:

- Chemicals
- Food and drink
- Nuclear
- Oil and gas
- Pharmaceuticals
- Power generation
- Renewables
- Water Treatment

In January 2025, the ECITB published the overarching report of the second iteration of the Workforce Census, presenting national-level results on a wide range of topics: sectoral, regional and occupational data based on work locations, demographics, growth and hiring challenges. This comprehensive report offers an overview of the entire industry, highlighting trends across all sectors and regions.

This sectoral report offers a detailed analysis of disparities across the eight aforementioned sectors, alongside the emerging hydrogen and carbon capture and storage sectors. It also examines the engineering construction workforce involved in smaller sectors by workforce size such as steel manufacturing and those operating in non-engineering construction industries.

The analysis explores key characteristics of the 94,680 workers within the ECI, employer confidence and perceptions and external factors influencing each of these sectors.

Where possible, results are compared with industry averages and 2021 data to evaluate recent changes and understand sectoral trends. This report is designed to complement the aforementioned industry overview and a regional report is available on the ECITB website.

Unless otherwise stated, results and comparisons are reliable at a statistically robust level. For clarity, headcounts per occupation exclude details for occupations with fewer than 10 workers, which are grouped into 'other' categories. For additional details on methodology and data collection, please refer to the main report: ECITB 2024 Workforce Census: Overview of the Engineering Construction Industry. Readers should note that the census focuses on employers in the ECITB's scope and does not include all employers within the engineering construction industry. Nonetheless, the ECITB is confident that the analyses presented here are representative of the Engineering Construction Industry. Instances where data quality limits reporting are highlighted in the footnotes.

Water treatment facility in East London. © Tom Falcon Harding / Adobe Stock.

Carbon capture and storage (1.2% - 1,150 workers)

Most carbon capture and storage (CCS) projects are in the early stages of development, awaiting final investment decisions (FID), with the exception of the Teesside Industrial Cluster, which was confirmed in December 2024[2]. Consequently, the sector's workforce, representing 1.2% of the ECI workforce, is predominantly office-based (90%). Delays in FIDs have slowed the uptake in the sector. An analysis of projects initially set to reach FID in 2024 or later reveals that, between December 2023 and December 2024, the average announced FID date for carbon and capture projects was delayed by 7 months. Employers in the engineering construction industry view the sector as presenting interesting business opportunities, though the pace at which projects reach FID tempers some of their optimism. However, 2024 has seen major advancements, including the North Sea Transition Authority awarding the UK's first-ever carbon storage permit to the East Coast Cluster[3].

Given the sector's characteristics, government subsidies and incentives are likely to remain a primary mechanism enabling many CCS projects to proceed. Attracting private investment will also be crucial in the long run. This could be supported by regulations that factor in environmental costs, along with the expansion of captured carbon use.

Enhanced oil recovery can use carbon dioxide to extract additional oil, but, other industrial uses include synthetic fuels, building materials and beverages. Furthermore, carbon capture and storage is a key requirement for the production of blue hydrogen, as seen in the HyNet project in the North West of England and North Wales.

This economic context is reflected in the sector's occupational structure. Key roles include process, mechanical and project engineers, as well as professionals in procurement, planning, estimating and project managers. Welders, pipefitters and mechanical fitters currently represent 8% of the sector's workforce but are expected to play an increasingly critical role as major projects reach FID. This underscores the need for enabling structures and policies around industrial clusters to support skills development in the sector[4].

Employers in the engineering construction industry involved in carbon capture and storage anticipate a potential 12% increase in their workforce over the next three years, reflecting broader industry expectations. Meanwhile, companies not currently operating in this sector may consider entering it, particularly as construction activity accelerates following FIDs, which will ultimately further increase the number of workers in the sector.

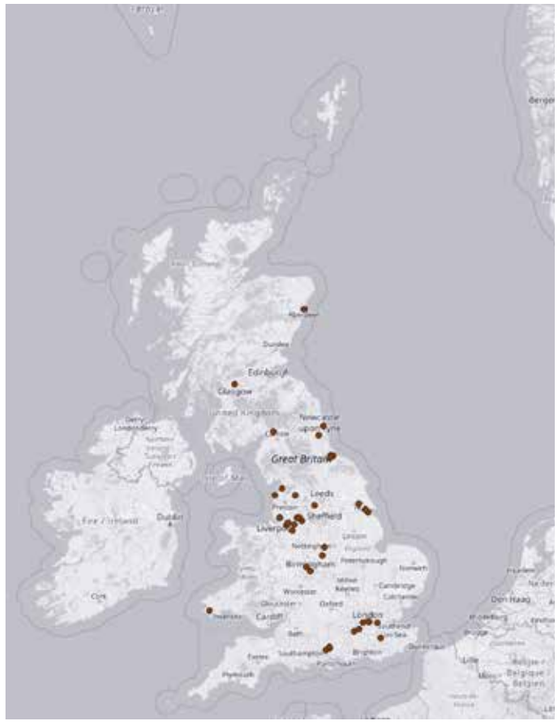
2 Green light for carbon capture and low carbon power joint venture projects in Teesside (bp – 2024)
3 NSTA awards Endurance first ever UK carbon storage permit (North Sea Transition Authority – 2024)
4 Green Jobs Delivery Group – CCS Task and Finish Group: Findings and recommendations of the group (BP, CCSA, ECITB - 2024)

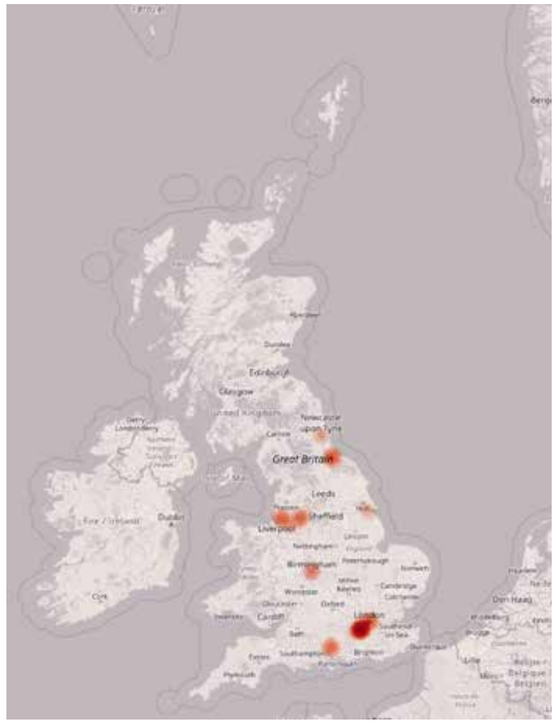
Due to its developmental phase, London and its surrounding areas is the primary workforce hotspot. Other significant locations include the outskirts of Liverpool up to Manchester, Birmingham, Middlesbrough, Newcastle upon Tyne and Winchester.

The CCS sector has a higher proportion of workers under 30 (22%) compared to the entire engineering construction industry (ECI) (17%). While the share of workers aged 50–59 is 6 percentage points lower than the ECI, the proportion of workers aged over 60 is similar at 13–14%. The higher representation of young workers in CCS could be attributed to the popularity of clean energy sectors among younger generations, as highlighted in a recent ECITB study.[5]

In terms of ethnicity, the CCS sector is slightly more diverse than the wider ECI workforce, likely due to its workforce hotspots being in areas with more ethnically diverse populations. Regarding gender, the sector employs a higher proportion of women compared to the broader ECI workforce (21% vs. 17%). This may partly be explained by the predominance of office-based roles within the sector, which tend to have more balanced gender representation, with some roles even being more commonly occupied by women (cf. Demographics section of the ECITB Census overview of the ECI). Finally, 93% of the CCS workforce is estimated to hold a UK citizenship, compared to 94.6% in the entire industry.

Maps 1 and 2: Location of workers in the carbon capture and storage sector (data points and heatmap)





5 Inspiring directions: Understanding career choices to accelerate change (ECITB – 2024)

Table 1: Workforce in the carbon capture and storage sector by occupation

Apprentices and trainees	**30**
Other apprentices and trainees[6]	30
Craft	**123**
Pipefitting craft	34
Welding craft	32
Mechanical fitting craft	25
Other craft	32
Engineers	**438**
Process engineers	96
Mechanical engineers	69
Project engineers	55
Design (mechanical) engineers	36
Cost engineers	30
Electrical engineers	25
Instrumentation and control engineers	21
Civil and structural engineers	18
Electrical, instrumentation and control engineers	15
Structural engineers	11
Other engineers	61
Managers	**181**
Project managers	65
Other directors	18
General managers	14
Commercial managers	13
Other managers	71
Professionals	**166**
Procurement professionals	36
Planning professionals	23
Estimating professionals	19
Quality assurance/quality controls professionals	18
Project controls professionals	13
Other professionals	56
Semi-skilled	**14**
Other semi-skilled	14
Supervisors	21
Other supervisors	21
Support	**100**
Administrative support	45
Finance support	13
Commercial support	13
Other support	29
Technicians	**73**
Commissioning technicians	38
Design technicians	11
Other technicians	24
Other	**17**

6 Please note that individual occupations with fewer than 10 workers are grouped into 'Other' categories throughout the report.

Figure 1: Age profile of the ECI workforce in the carbon capture and storage sector

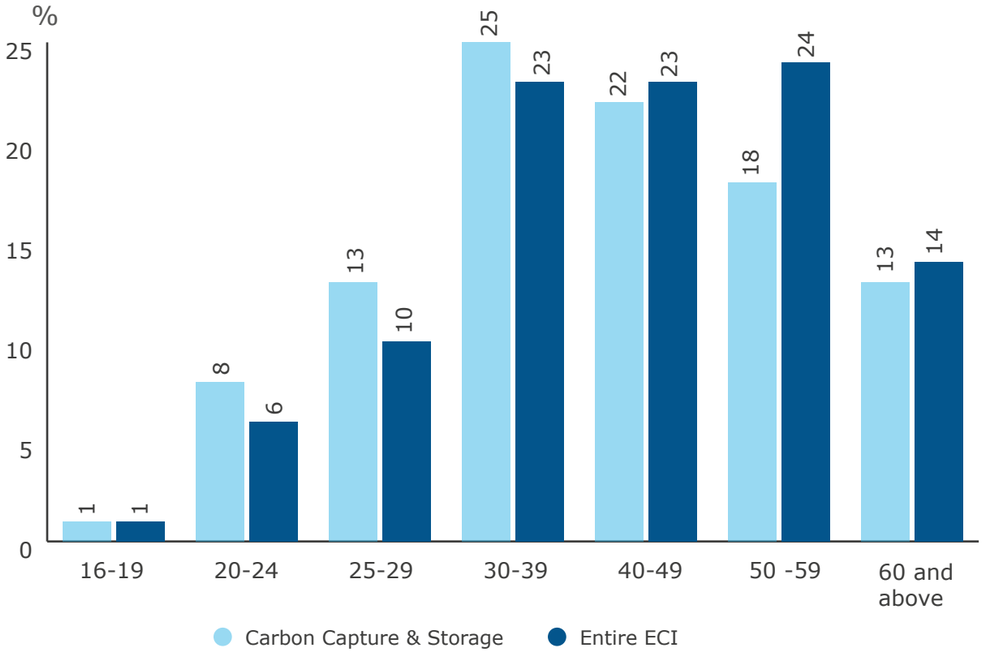


Figure 2: Ethnicity profile of the ECI workforce in the carbon capture and storage sector

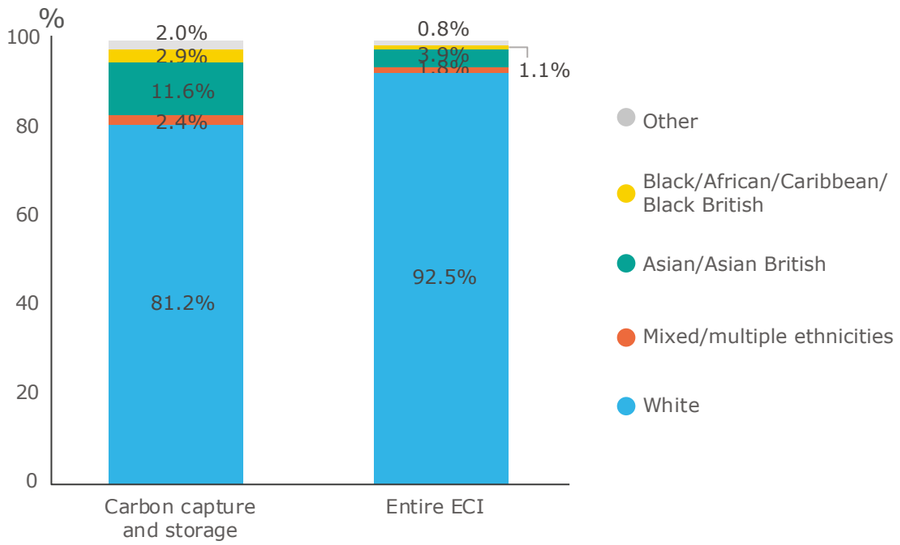


Figure 3: Gender profile of the ECI workforce in the carbon capture and storage sector

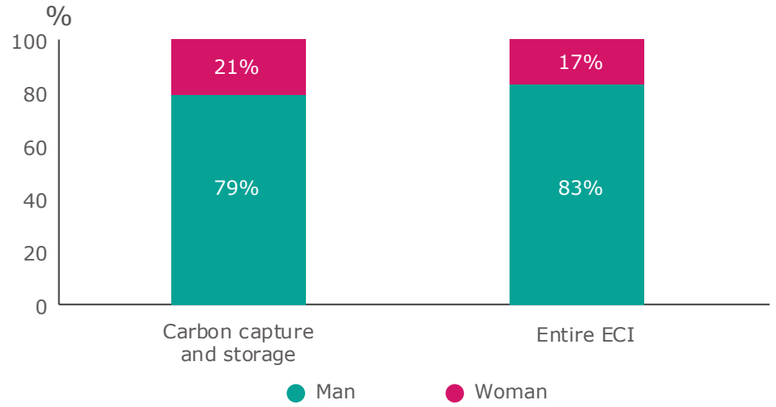
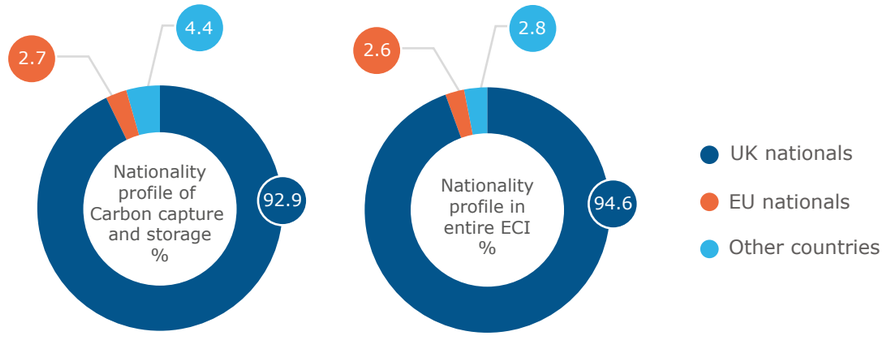


Figure 4: Nationality profile of the ECI workforce in the carbon capture and storage sector



Chemicals (6% - 5,700 workers)

The chemicals sector employs 6% of the ECI workforce, with notable concentrations in Middlesbrough, Immingham, Ellesmere Port to Manchester and around Farnborough. The sector faces significant investment challenges, with the UK chemicals industry falling from 12th to 20th place in foreign direct investment rankings over the past seven years. Additionally, chemical output in the third quarter of 2024 remains 29% below pre-pandemic levels. Regulatory uncertainty adds further pressure, as highlighted by concerns over the cost-effectiveness of the current UK REACH regulation [7]. The sector represented 6.8% of the ECI workforce in 2021.

A defining feature of the sector is the predominance of craft workers (27%), demonstrated by the high number of scaffolders, pipefitters and mechanical fitters. Other essential roles include general operatives, design technicians, project managers, process engineers, design engineers and insulation engineers. Riggers, design technicians and engineers, welders, platers, pipefitters, process engineers and instrumentation and control technicians are among the occupations that employers in the chemicals sector find difficult to recruit. Employers cite competition from other companies, particularly in terms of salaries or contract lengths, as well as qualification requirements, as reasons for these challenges.

Employers in the chemicals sector anticipate workforce growth of 16%, approximately four percentage points higher than the broader industry expectation. This optimism may also reflect opportunities arising from other sectors, particularly given the location of the chemicals workforce within several industrial clusters poised to benefit from significant investments in carbon capture and storage and hydrogen. It is worth noting that multiple employers will compete for the same contracts, potentially offsetting some of the anticipated workforce growth. Nevertheless, this outcome still reflects a high level of optimism among companies operating in the chemicals sector.

The share of workers under 30 is aligned with that of the wider ECI (17%), although it has decreased from 19% in 2021. Workers aged over 50 are slightly overrepresented in the sector (41% compared to 38% in the ECI), while the share of workers aged 30 to 49 is lower (41% compared to 46%). The sector's share of workers above 50 decreased by three percentage points over the last three years.

The ethnicity profile of the sector closely mirrors that of the broader ECI. However, the gender balance varies from that of the ECI, with men comprising 88% of the workforce compared to 83% in the wider ECI. In 2021, men represented 90% of the sector's workforce. Reliance on foreign workers is consistent with the wider ECI, with 96.4% of workers holding UK citizenship, compared to 98.1% in 2021.

7 Britain's chemical industry fuelling UK growth (Chemical Industries Association – 2024)

Maps 3 and 4: Location of workers in the chemicals sector (data points and heatmap)

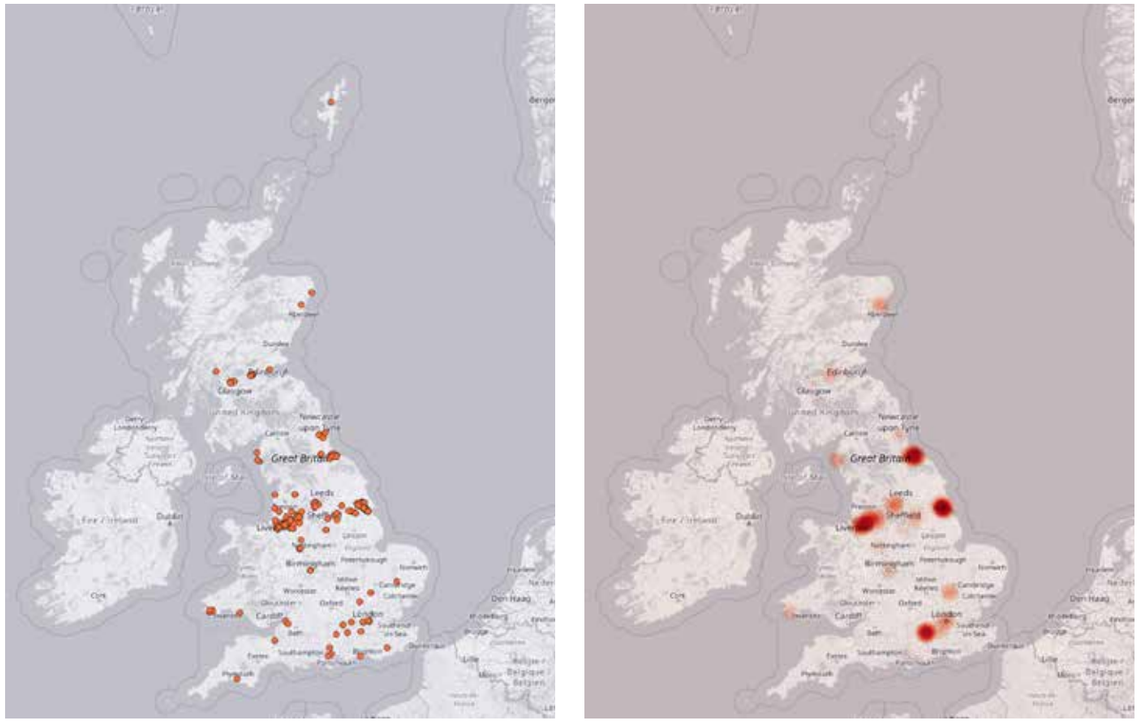


Table 2: Workforce in the chemicals sector by occupation

Apprentices and trainees	**143**
Scaffolding apprentices and trainees	36
Electrical apprentices and trainees	16
Pipefitting apprentices and trainees	14
Other apprentices and trainees[8]	77
Craft	**1,538**
Scaffolding craft	506
Pipefitting craft	227
Mechanical fitting craft	198
Rigging craft	122
Welding craft	100
Blasters and painters craft	78
Plating craft	77
Electrical craft	77
Electrical fitting craft	21
Fabrication craft	21
Blasters and painters (rope access) craft	19
Steel erecting craft	18
Welding and pipefitting craft	16
Welding and fabricators craft	11
Other craft	48
Engineers	**876**
Process engineers	147
Design engineers	142
Insulation engineers	104
Project engineers	90
Civil, structural and architectural engineers	48
Mechanical engineers	42
Electrical engineers	41
Civil and structural engineers	33
Systems engineers	23
Cost engineers	19
Integration engineers	17
Electrical, instrumentation and control engineers	17
Piping engineers	15
Instrumentation and control engineers	13
Structural engineers	11
Commissioning engineers	11
IT engineers	10
Civil engineering engineers	10
Other engineers	83
Managers	**665**
Project managers	238
General management managers	40
Commercial managers	37
Contracts managers	36
Other directors managers	31
Site management managers	24
IT managers	19
Project (EPC) managers	16
Health and safety managers	16
Operations managers	14
Engineering management managers	13
Project controls managers	13
Human resources managers	12
Legal and compliance managers	12
Construction managers	12
Administrative managers	12
Other managers	121
Professionals	**456**
Planning professionals	80
Project controls professionals	75
Health and safety professionals	47
Quantity surveyors professionals	40
Quality assurance/quality controls professionals	32
Semi-skilled	668
General operatives semi-skilled	251
Scaffolding semi-skilled	82
Labourers semi-skilled	68
Materials semi-skilled	59
Construction semi-skilled	42
Drivers semi-skilled	35
Electrical supervisors	27
Insulation semi-skilled	20
Maintenance semi-skilled	13
Blasters and painters semi-skilled	11
Other semi-skilled	59
Supervisors	**522**
General supervisors	79
Electrical technicians supervisors	66
Scaffolding supervisors	66
Site supervisors	44
Mechanical fitting supervisors	44
Blasters and painters supervisors	16
Insulation supervisors	15
Rigging supervisors	13
Piping supervisors	13
General (rope access) supervisors	12
Welding supervisors	11
Pipefitting supervisors	10
Other supervisors	120
Support	**394**
Administrative support	109
Finance support	55
Commercial support	52
Human resources support	30
IT support	29
Project management support	23
Contracts support	19
Personal assistants support	17
Health and safety support	15
Other support	46
Technicians	**355**
Design (piping) technicians	91
Design technicians	74
Quality assurance/quality controls technicians	27
General technicians	27
Instrumentation and control technicians	25
Mechanical technicians	15
Electrical technicians	13
Safety technicians	13
Non-destructing testing (rope access) technicians	12
Non-destructing testing technicians	10
Other technicians	62
Other	**92**

8 Please note that individual occupations with fewer than 10 workers are grouped into 'Other' categories throughout the report.

Figure 5: Age profile of the ECI workforce in the chemicals sector

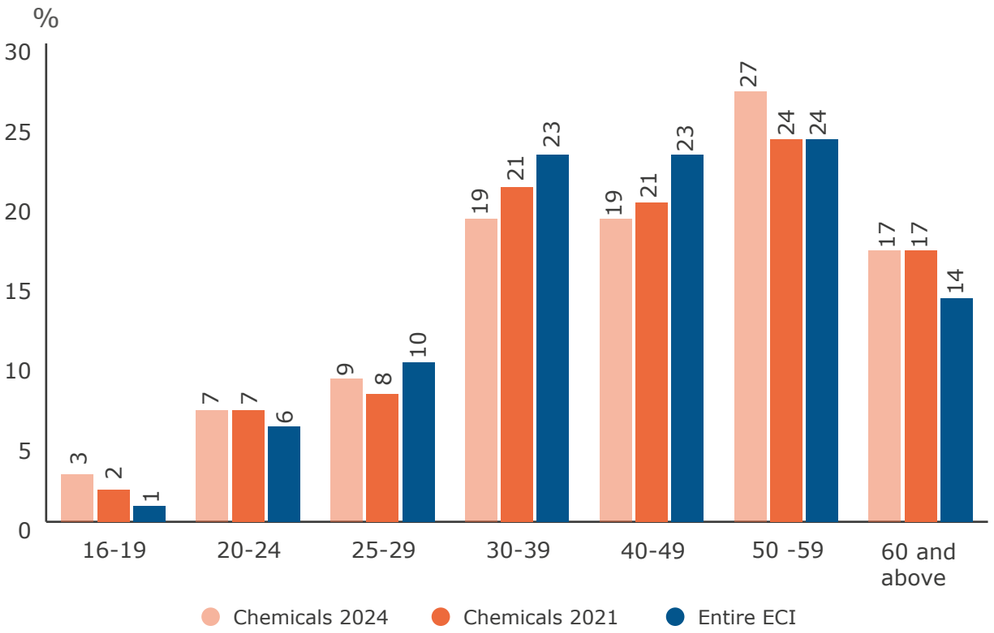


Figure 6: Ethnicity profile of the ECI workforce in the chemicals sector

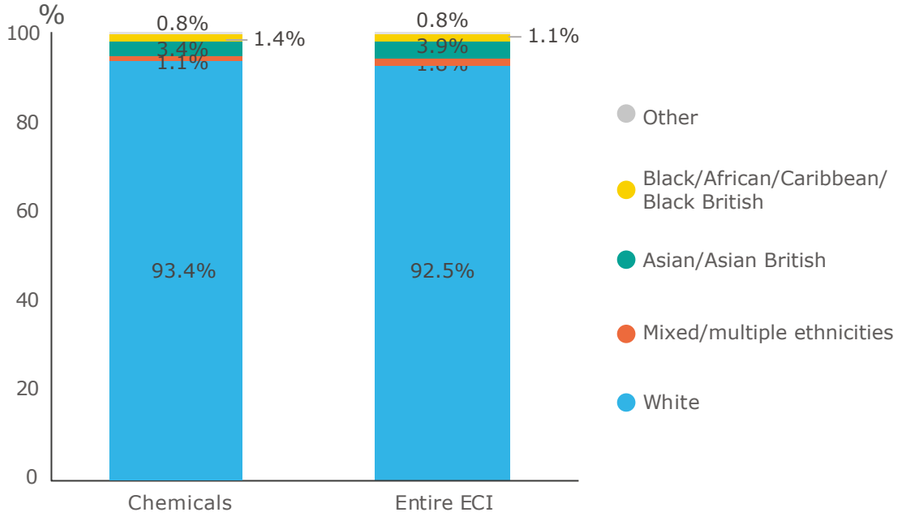


Figure 7: Gender profile of the ECI workforce in the chemicals sector

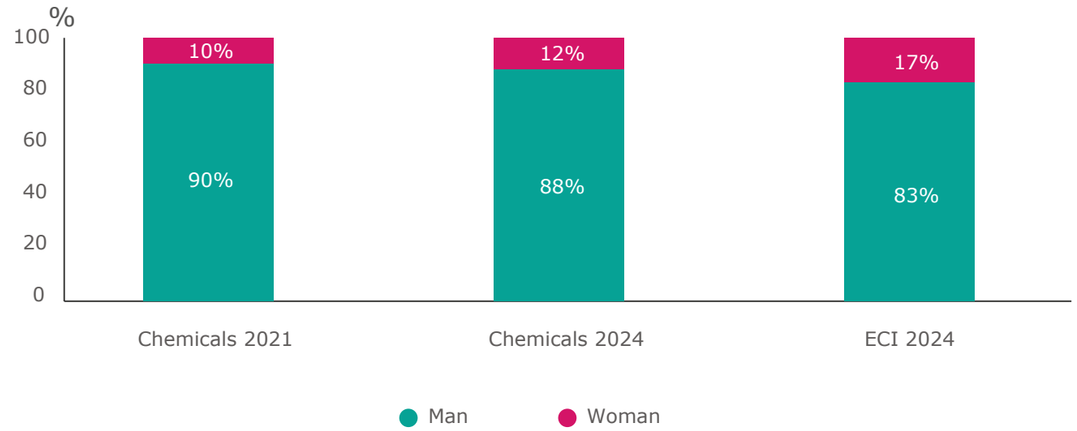
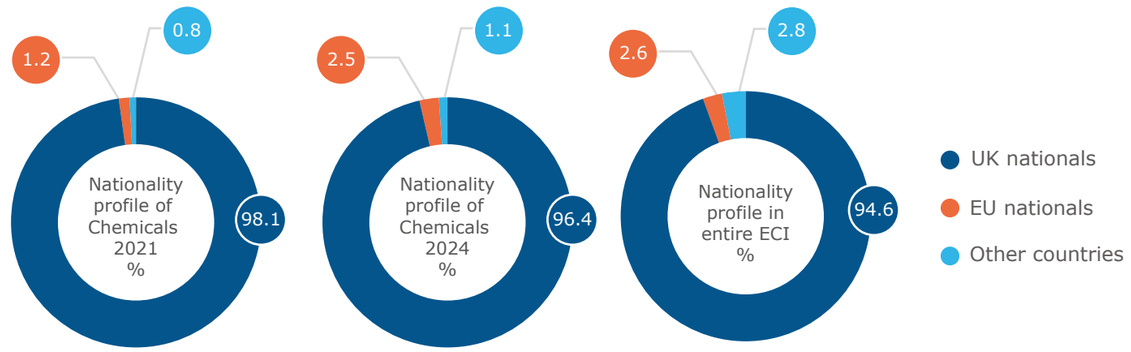


Figure 8: Nationality profile of the ECI workforce in the chemicals sector



Conventional power generation (1.9% - 1,850 workers)

The importance of the conventional power generation sector has declined since 2021, with the percentage of ECI workers in the sector decreasing from 4.7% to 1.9% in 2024. Part of this decrease may be attributed to the emergence of the carbon capture sector, which, among other activities, involves capturing carbon from gas-fired power plants. The government's plan to achieve clean power by 2030[9] is expected to accelerate the transition of the conventional power generation sector toward net-zero commitments.

The workforce is primarily concentrated in Newcastle upon Tyne, the area between Connah's Quay and Manchester, near Middlesbrough and along a crescent stretching from Leeds to Gainsborough through Scunthorpe. Secondary workforce hotspots include London, Birmingham, the Humber estuary and Pembroke. Craft workers and engineers make up the largest shares of the workforce, with key roles such as scaffolders, mechanical fitters, pipefitters, platers, project engineers, mechanical engineers and process engineers. Project managers are also notably prevalent.

Employers in the conventional power generation sector report difficulties filling vacancies, particularly for electrical technicians, craft workers, design technicians and pipefitters. Challenges often stem from competition with other employers and localised mismatches between workers' skills and employers' needs. For instance, some regions experience shortages of installation electricians, while maintenance technicians may be more readily available. Employers in this sector have the highest workforce growth expectations, with a collective estimate of a 22% increase, ten percentage points above the industry average. This optimism is closely tied to well-identified opportunities in hydrogen and carbon capture development, areas where many companies are strategically positioned to benefit. For more details on business opportunities, please refer to the 'Business opportunities' section of the overarching 2024 Workforce Census report.

As observed in 2021, the sector's workforce is younger compared to the broader ECI, with 23% of workers under 30, compared to 17% in the wider ECI. Conversely, the share of workers over 50 is five percentage points lower than in the ECI. Between 2021 and 2024, the share of workers below 30 in the sector increased by seven percentage points, with most of the increase relating to the 16 to 19 and 20 to 24 age groups.

Workers from ethnic minority groups make up 12% of the sector's workforce, slightly higher than the 8% observed in the wider ECI. While the gender split aligns with that of the broader industry, there is a significant difference in the proportion of non-UK nationals (10.4% versus 5.4%), with 6.8% of the workforce holding citizenships from outside the UK or the EU.

9 Make Britain a clean energy superpower (UK Government – 2024)

Maps 5 and 6: Location of workers in the conventional power generation sector (data points and heatmap)

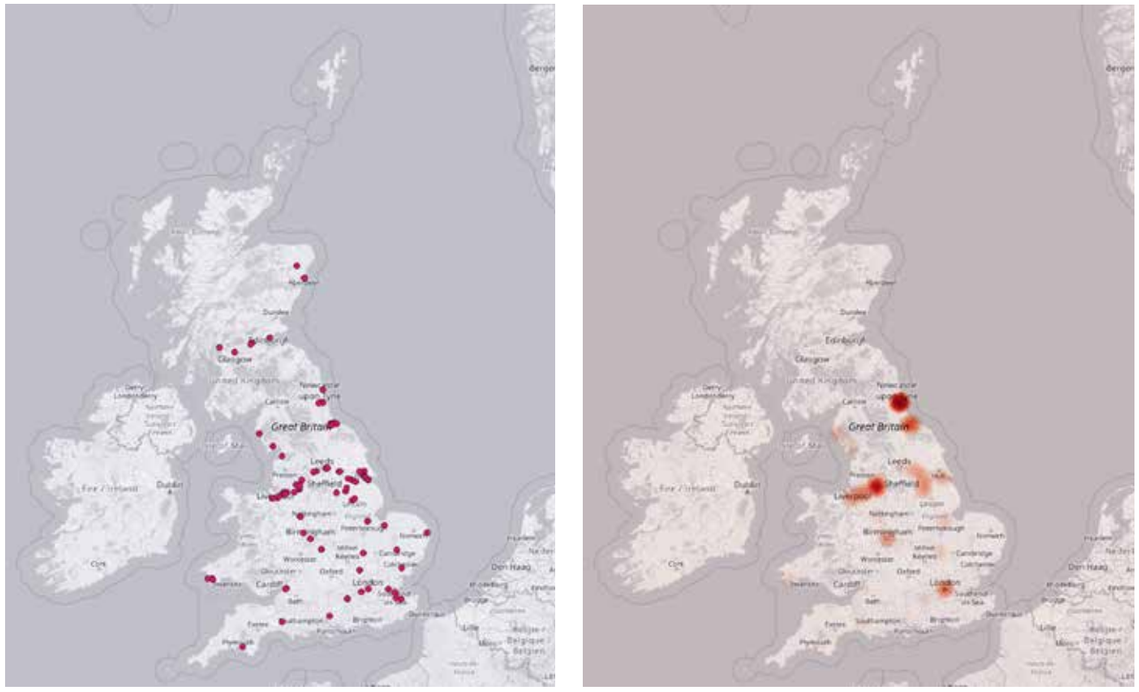


Table 3: Workforce in the conventional power generation sector by occupation

Apprentices and trainees	**101**
Scaffolding apprentices and trainees	11
Other apprentices and trainees[10]	90
Craft	**522**
Scaffolding craft	187
Mechanical fitting craft	99
Pipefitting craft	49
Plating craft	45
Electrical craft	27
Grinders craft	24
Welding craft	23
Steel erecting craft	19
Electrical fitters craft	18
Other craft	31
Engineers	**384**
Project engineers	71
Mechanical engineers	40
Process engineers	30
Design engineers	23
Electrical engineers	23
Integration engineers	18
Systems engineers	18
Commissioning engineers	13
Operations engineers	12
Maintenance engineers	11
Other engineers	125
Managers	**308**
Project managers	90
Commercial managers	38
General management managers	29
Operations managers	19
Other directors managers	17
Project (commercial) managers	15
Site management managers	11
Other managers	90

10 Please note that individual occupations with fewer than 10 workers are grouped into 'Other' categories throughout the report.

Professionals	108
Procurement professionals	19
Planning professionals	13
Technologists professionals	12
Other professionals	63
Semi-skilled	**84**
General operatives semi-skilled	29
Labourers semi-skilled	13
Scaffolding semi-skilled	12
Other semi-skilled	30
Supervisors	**91**
Electrical supervisors	20
General supervisors	12
Other supervisors	59

Support	110
Administrative support	36
Finance support	25
Commercial support	15
Project management support	11
Other support	23
Technicians	**70**
Design technicians	19
Design (electrical) technicians	11
General technicians	11
Other technicians	29
Other	**66**

Figure 9: Age profile of the ECI workforce in the conventional power generation sector

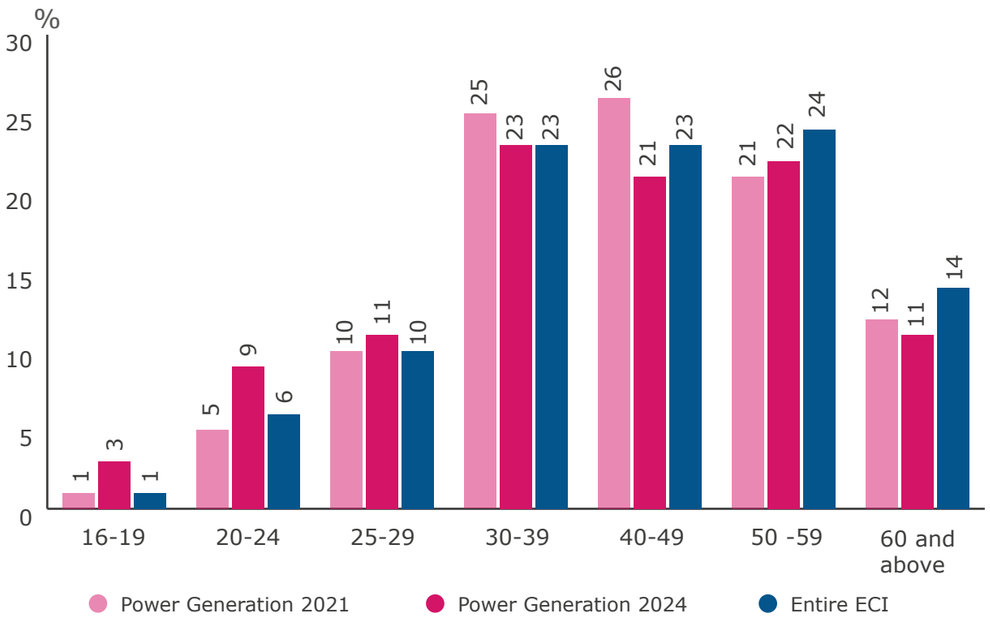


Figure 10: Ethnicity profile of the ECI workforce in the conventional power generation sector

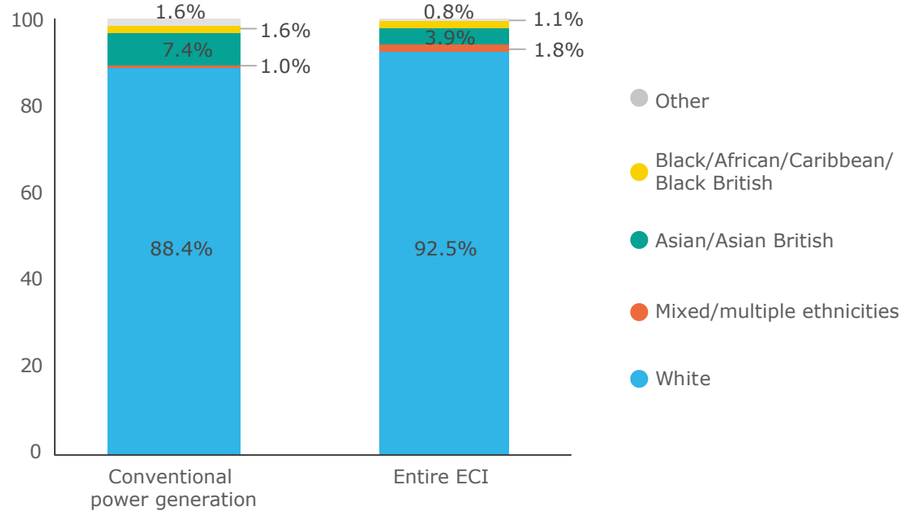


Figure 11: Gender profile of the ECI workforce in the conventional power generation sector

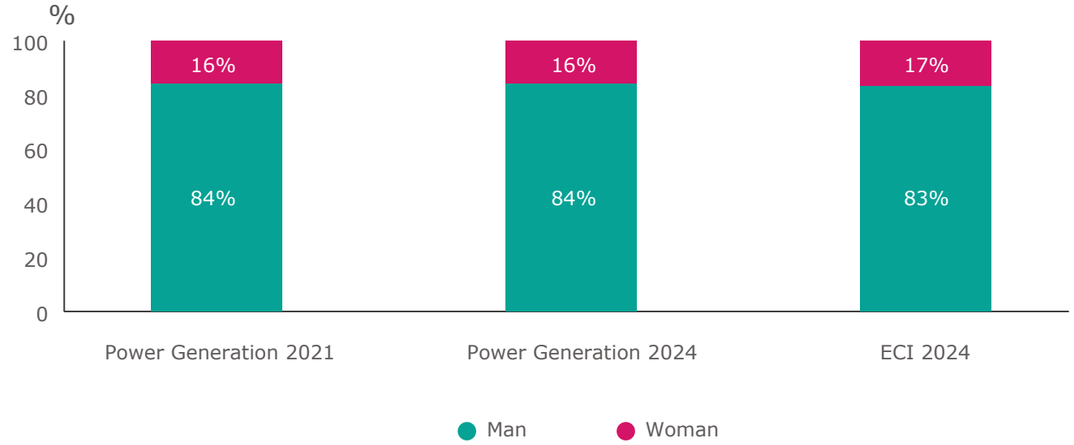
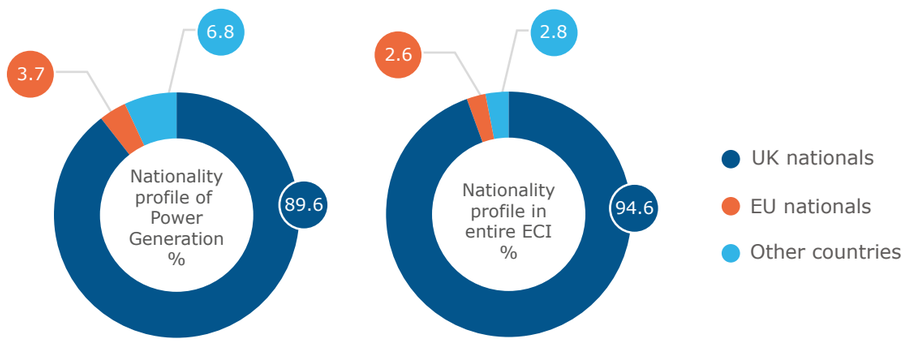


Figure 12: Nationality profile of the ECI workforce in the conventional power generation sector



Hydrogen (1.1% - 1,100 workers)

The hydrogen sector employs 1.1% of the ECI workforce, with 87% of these workers in office-based roles due to the sector's early stage of development. Delays in final investment decisions (FID) have slowed the uptake in the sector. An analysis of projects initially set to reach FID in 2024 or later reveals that, between December 2023 and December 2024, the average announced FID date for hydrogen projects was delayed by 9 months.

The sector's ability to grow and develop the necessary skills will depend on the country's capacity to sustain sufficient levels of hydrogen demand. This can be achieved through policy mechanisms incentivising fuel-switching to hydrogen and expanding its use in sectors such as aviation and maritime[11]. The Government's ongoing Hydrogen Allocation Round 2 is expected to support up to 875 MW of low-carbon hydrogen, compared to the 125 MW supported through Round 1[12].

The sector's workforce is primarily located in London and its surrounding areas, as well as between Ellesmere Port and Manchester. Smaller workforce concentrations exist near Newcastle upon Tyne, the Humber estuary, Birmingham, Norwich and Whitehaven. Engineers and professionals form the core of the sector's emerging workforce, with key roles including process, mechanical and project engineers, as well as planners and procurement professionals.

Employers currently engaged in hydrogen projects anticipate a potential 11% increase in their workforce over the next three years, in line with broader industry expectations. It is worth noting that the start of construction phases in this sector is expected to attract additional companies to what is currently an almost entirely office-based sector, likely sustaining further workforce growth.

Meanwhile, companies not currently operating in this sector may consider entering it, particularly as construction activity accelerates following FIDs, which will ultimately further increase the number of workers in the sector.

The hydrogen sector benefits from a relatively younger workforce compared to the industry average, with 22% of its workforce under 30, compared to 17% in the wider ECI. Additionally, the share of workers over 50 in the hydrogen sector is ten percentage points lower than in the ECI overall. The sector is also more ethnically diverse, potentially reflecting the demographics of its major workforce hotspots, which are located in areas with higher ethnic diversity.

With 27% of its workforce being women, the hydrogen sector has one of the least unbalanced gender distributions in the industry. This may be partly attributed to the predominance of office-based roles, as suggested by findings on gender distribution across different roles in the ECI (cf. Demographics section of the ECITB Census overview of the ECI). Finally, the sector's reliance on non-UK workers is six percentage points higher than the ECI average, with most of them holding citizenships from non-EU countries.

11 Hydrogen UK Manifesto (Hydrogen UK – 2024)
12 Notice: Hydrogen Allocation Round 2 (Department for Energy Security and Net Zero – 2024)

Maps 7 and 8: Location of workers in the hydrogen sector (data points and heatmap)

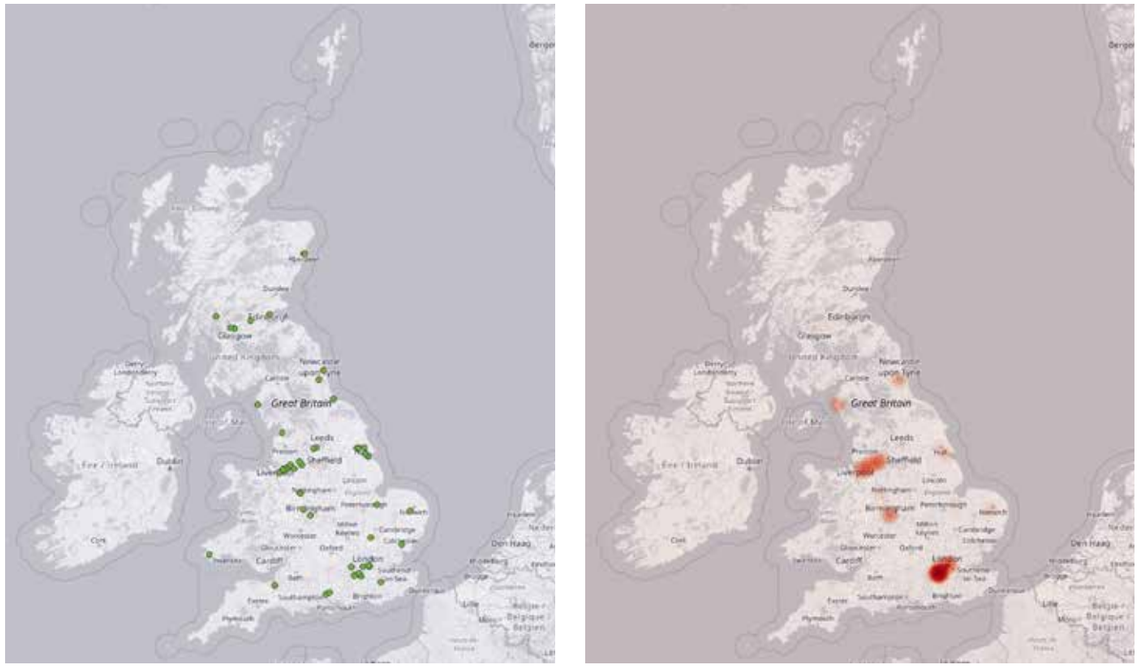


Table 4: Workforce in the hydrogen sector by occupation

Apprentices and trainees	**14**
Other apprentices and trainees [13]	14
Craft	**60**
Other craft	60
Engineers	**372**
Process engineers	84
Mechanical engineers	63
Project engineers	49
Cost engineers	32
Electrical engineers	26
Instrumentation and control engineers	21
Civil and structural engineers	15
Other engineers	82
Managers	**188**
Project managers	60
Other directors	15
Other managers	112
Professionals	**216**
Planning professionals	39
Procurement professionals	36
Estimating professionals	19
Quality assurance/quality controls professionals	19
Quantity surveyors professionals	17
Project controls professionals	16
Other professionals	70
Semi-skilled	**28**
General operatives semi-skilled	15
Other semi-skilled	13
Supervisors	27
Other supervisors	27
Support	**84**
Administrative support	38
Other support	46
Technicians	**70**
Commissioning technicians	38
Other technicians	32
Other	**16**

13 Please note that individual occupations with fewer than 10 workers are grouped into 'Other' categories throughout the report.

Figure 13: Age profile of the ECI workforce in the hydrogen sector

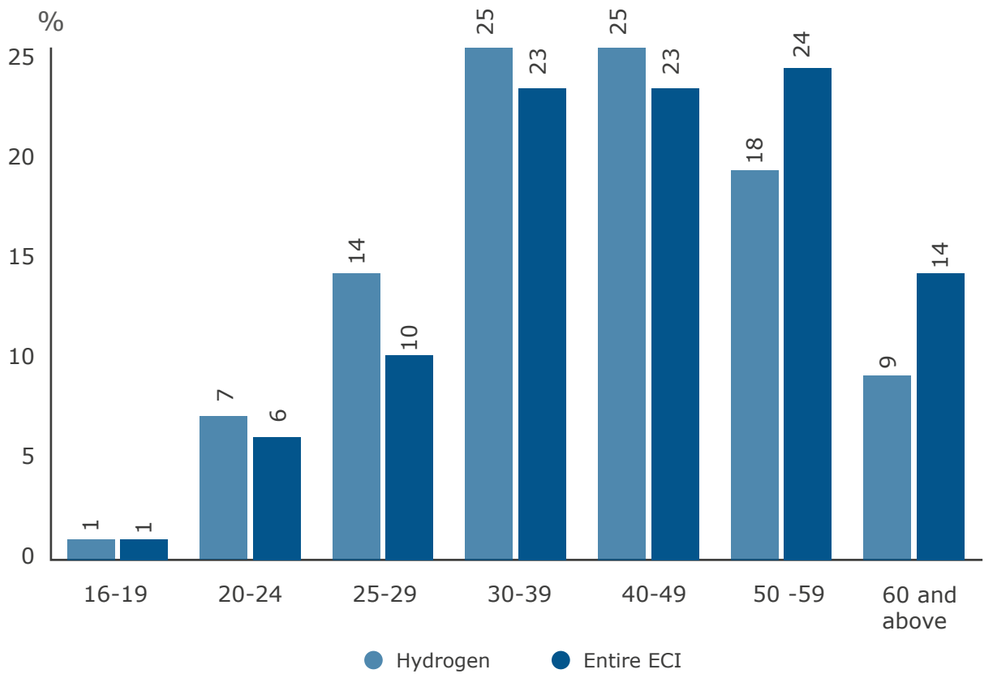


Figure 14: Ethnicity profile of the ECI workforce in the hydrogen sector

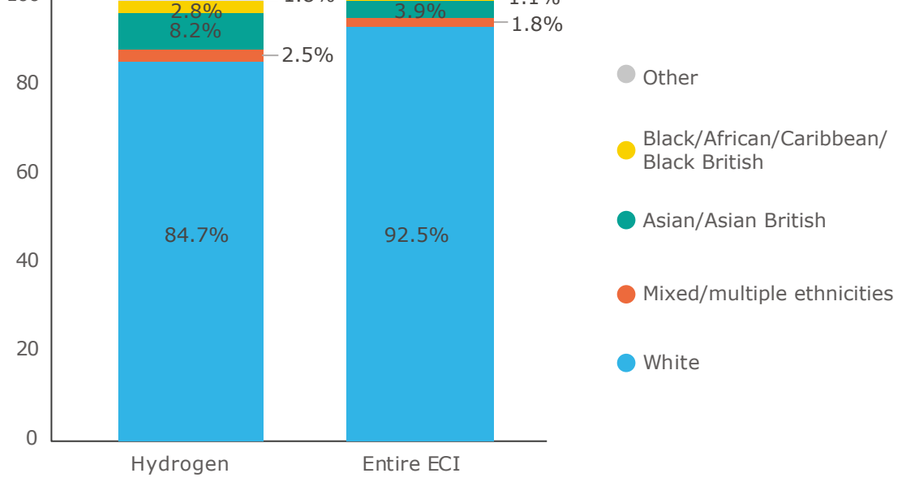


Figure 15: Gender profile of the ECI workforce in the hydrogen sector

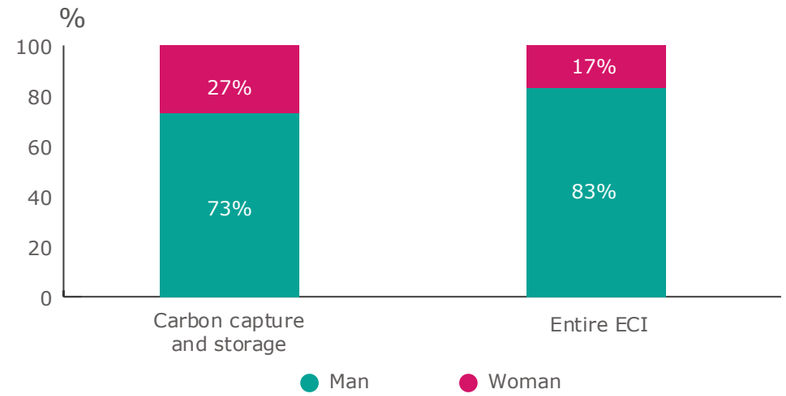
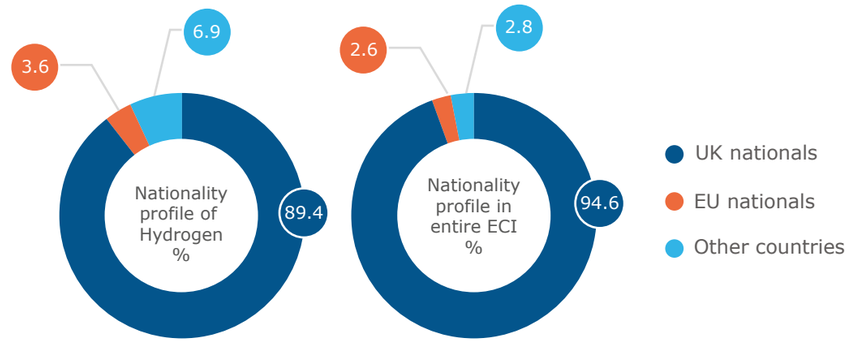


Figure 16: Nationality profile of the ECI workforce in the hydrogen sector



Food and drink (1.8% - 1,750 workers)

The food and drink sector employs 1.8% of the engineering construction workforce, a decline from 2.3% in 2021. The sector is working to implement advances in automation and digital technologies while also addressing the challenge of decarbonising heat processes, such as switching gas ovens and boiling vats to electric versions. A key obstacle is proving a significant return on investment within an acceptable time frame [14], as implementation costs are perceived to outweigh the benefits.[15]

Unlike most engineering construction sectors, the food and drink workforce is widely dispersed across numerous localities rather than being concentrated in a few hotspots. Examples of significant workforce concentrations can be found in areas such as Liverpool to Manchester, the Humber Estuary, Dalry, Burton-on-Trent, London and Winchester, as shown in Map 10 below.

Craft workers and engineers dominate the sector's workforce, with pipefitters, scaffolders, welders, project engineers and mechanical design engineers playing particularly central roles. Employers who report difficulties in filling vacancies cite competition from other companies and a lack of skills and qualifications as significant issues. This challenge is most acute for roles such as welders, pipefitters, riggers, mechanical fitters, fabricators, electrical fitters and mechanical design engineers.

Employers in the food and drink sector anticipate a 10% increase in their workforce over the next three years, two percentage points below the broader industry average. This is still indicative of positive prospects for the sector, which is still recovering from the departure of many European workers in some of its subsectors following the UK's withdrawal from the European Union.

The age profile of the food and drink workforce shows overrepresentation of workers under 25 (11% vs. 7% in the ECI) and those over 60 (20% vs. 14%). In 2021, workers under 25 were also overrepresented, but the over-60 category was aligned with the ECI average. While improved sector representation in the 2024 data may partly explain this shift, the results likely reflect a structural change in the workforce's age composition.

The proportion of women in the workforce has increased from 8% in 2021 to 11% in 2024, though it remains below the ECI average. The sector's ethnic profile aligns closely with the wider ECI. Finally, 97% of food and drink engineering construction workers are UK nationals.

14 Future factory: Supercharging digital innovation in food and drink manufacturing (Food & Drink Federation – 2024)
15 Konur, S., Lan, Y., Thakker, D. et al. Towards design and implementation of Industry 4.0 for food manufacturing. Neural Comput & Applic 35, 23753–23765 (2023)

Maps 9 and 10: Location of workers in the Food and drink processing sector (data points and heatmap)

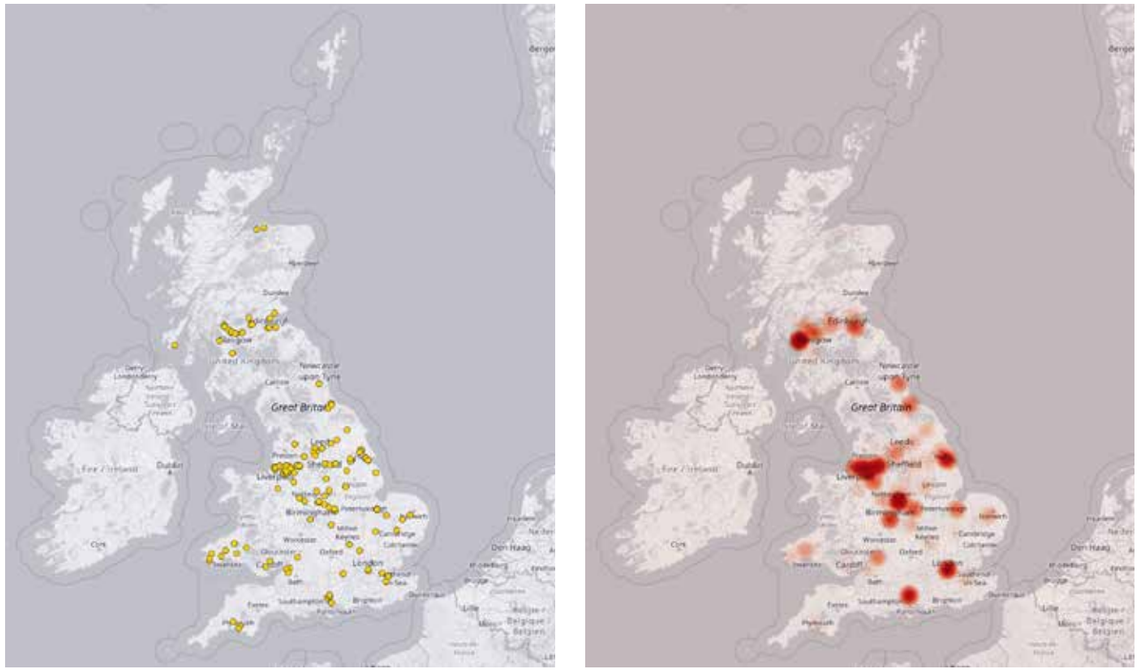


Table 5: Workforce in the food and drink sector by occupation

Apprentices and trainees	**95**
Electrical apprentices and trainees	38
Production technicians apprentices and trainees	16
Other apprentices and trainees[16]	41
Craft	**425**
Pipefitting craft	95
Scaffolding craft	63
Welding craft	56
Fabrication craft	34
Electrical craft	30
Mechanical fitting craft	27
Plating craft	20
Welding and fabricators craft	17
Welding and plating craft	16
Steel erecting craft	12
Rigging craft	10
Electrical fitters craft	10
Other craft	35

Engineers	**326**
Project engineers	47
Design (mechanical) engineers	46
Process engineers	34
Electrical engineers	30
Mechanical engineers	28
Insulation engineers	17
Design engineers	14
Systems engineers	10
Other engineers	100
Managers	**231**
Project managers	69
Site management managers	20
Other directors	17
Commercial managers	16
Operations managers	11
Other managers	98

16 Please note that individual occupations with fewer than 10 workers are grouped into 'Other' categories throughout the report.

Professionals	101
Planning professionals	16
Electrical semi-skilled	12
Procurement professionals	11
Other professionals	62
Semi-skilled	**124**
Labourers semi-skilled	36
Electrical supervisors	31
General operatives semi-skilled	24
Scaffolding semi-skilled	15
Other semi-skilled	18
Supervisors	**203**
Electrical technicians supervisors	113
Site supervisors	24
Mechanical fitting supervisors	13
General supervisors	13
Scaffolding supervisors	11
Other supervisors	29

Support	126
Administrative support	47
Commercial support	31
Finance support	20
Other support	44
Technicians	**81**
Design technicians	21
General technicians	11
Other technicians	34
Other	**23**

Figure 17: Age profile of the ECI workforce in the food and drink sector

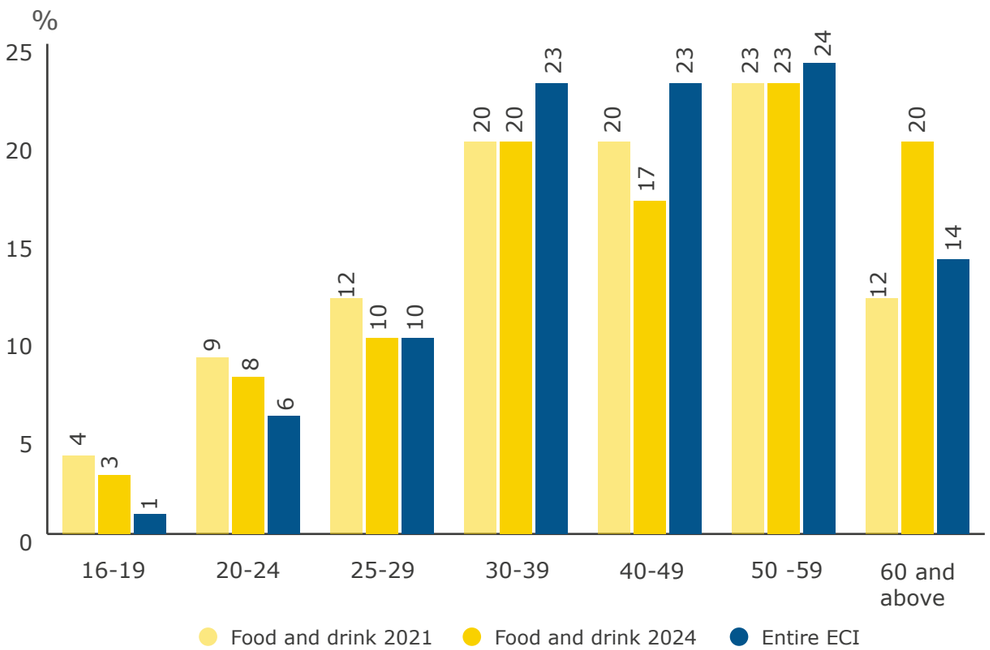


Figure 18: Ethnicity profile of the ECI workforce in the food and drink sector

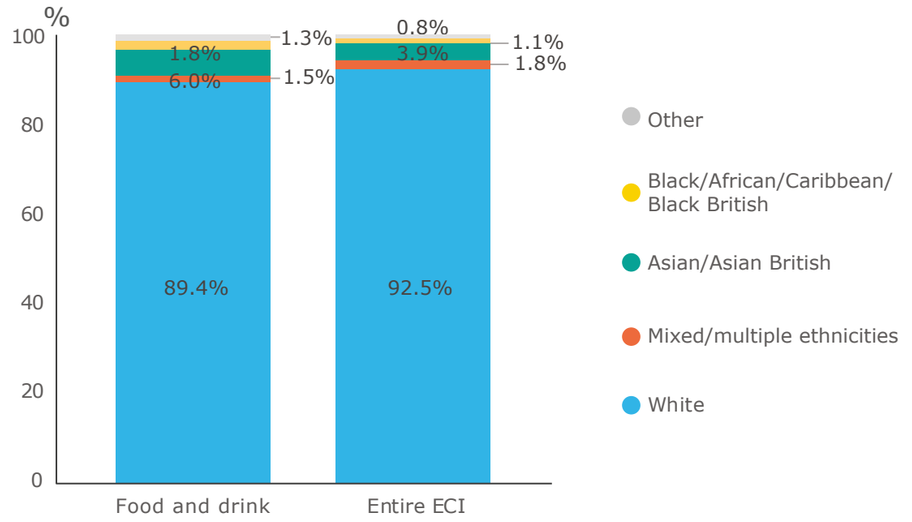


Figure 19: Gender profile of the ECI workforce in the food and drink sector

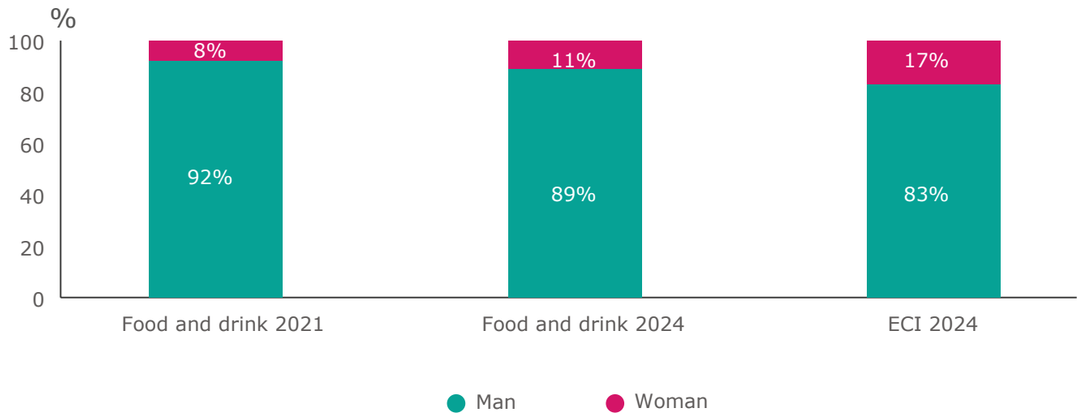
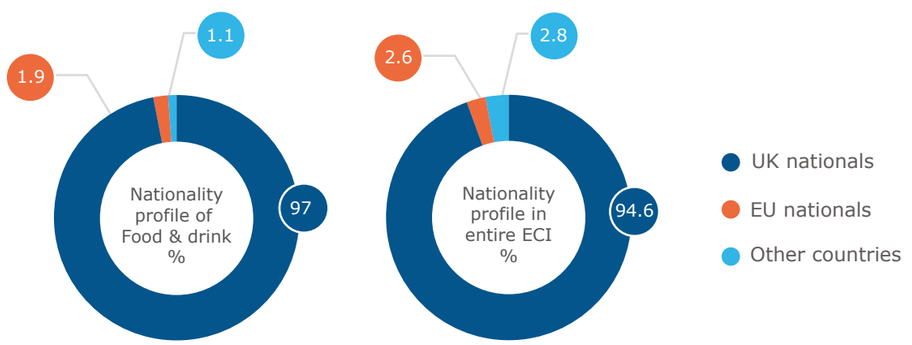


Figure 20: Nationality profile of the ECI workforce in the food and drink sector



Nuclear (39.2% - 37,100 workers)

The nuclear sector is now the largest engineering construction sector in terms of workforce, employing 39.2% of the total workforce, up from 34.6% in 2021. With most of the remaining fleet of generating stations set to retire by 2030, the power gap is such that even with the completion of Hinkley Point C, nuclear capacity will fall below current levels[17]. The final investment decision on Sizewell C, anticipated in 2025 and Great British Nuclear's expected decision on the small modular reactor programme in the spring [18] are likely to continue supporting the attractiveness of careers in the sector while presenting new business opportunities for employers, especially in regions where these projects will take place.

The nuclear sector is identified as one of the main business opportunities by ECI companies (see the section on business opportunities in the overarching 2024 ECITB Census report). At the same time, nuclear-focused companies, including the supply chain, tend to focus primarily on their sector rather than expanding into other ECI sectors, with only defence and, to a lesser extent, hydrogen being seen as potential significant opportunities.

As highlighted in a previous ECITB study[19], the nuclear sector is particularly attractive to ECI learners and workers but is seen less favourably among the general public compared to most other ECI sectors. Addressing these image issues would assist in expanding recruitment in the sector. The sector offers median wages that are 1.8 times higher than the national average[20].

This prospect is appealing to ECI workers and learners; however, it may make it more difficult for other engineering construction sectors to compete for and retain workers. Given the size of the sector, locations that may appear as secondary hotspots on map 12 below, such as Glasgow, Dungeness, Sizewell, Harwell and the Welsh decommissioning sites at Wylfa and Trawsfynydd, are still significant employers within the ECI.

Employers that struggle filling vacancies in the nuclear sector are either concerned about a general volume problem or a lack of recognised qualifications or skills among applicants. According to employers, the location of offices and sites often exacerbates recruitment difficulties, particularly for experienced workers. In some regions, large-scale projects can deplete the local pool of suitably qualified talent for specific roles. Roles such as project managers, safety case technicians, project controllers, civil and mechanical engineers, electrical fitters, planners and designers are frequently reported as difficult to recruit.

The nuclear workforce stands out from other sectors due to its higher proportion of managers and professional workers. Project managers dominate the management category, while planning, data and analysis, quality control and assurance, waste management and health and safety are prominent in the professional category.

17 Delivering nuclear power (House of Commons – 2023)
18 Negotiations begin for UK's small modular reactor programme (Great British Nuclear – 2024)
19 Inspiring directions (ECITB – 2024)
20 Delivering value (Nuclear Industry Association – 2023)

Other key roles include project, mechanical, systems, waste, site and cost engineers, as well as scaffolders, mechanical fitters, production technicians and radiological protection technicians.

Employers in the nuclear sector were asked to estimate their workforce growth over the next three years, resulting in a projected 10% increase for the entire sector. While this reflects a certain level of confidence and optimism about the future, it is slightly below the industry average of 12%.

However, a 10% workforce increase in the nuclear sector represents a significant rise in absolute terms, given that it is currently the largest employer within the industry. Furthermore, geographical distribution will shift in the coming years, with Hinkley Point C in the South West of England and, later, Sizewell C in the East of England coming into focus. The entry of some reactors into the defueling phase and subsequently into decommissioning will also impact workforce regional distributions.

Unlike most other ECI sectors, companies in the nuclear sector's supply chain, are usually almost exclusively focused on nuclear projects and do not identify important business opportunities in other sectors, with the notable exception of the defence industry (more detail on the methodology to assess business opportunities can be found in the overarching Census report). This suggests that these growth expectations are concentrated within the nuclear sector itself, in contrast to sectors like conventional power generation, which are more inclined to identify opportunities across a broader range of sectors, including hydrogen, carbon capture, oil and gas or renewables.

Notably, 3.12% of the nuclear workforce consists of apprentices and trainees, compared to 2.4% across the entire ECI.

This contributes to the sector's younger age profile, with 20% of workers under 30 (compared to 17% in the ECI). The proportion of workers over 60 in the sector is 11%, which is three percentage points lower than the ECI average of 14%. Between 2021 and 2024, the share of workers aged over 50 decreased by three percentage points, while the share of workers under 30 increased by five percentage points.

Regarding ethnicity, the nuclear workforce is less diverse than the ECI, with 4.9% identifying as from a minority ethnic background, compared to 7.5% across the ECI. This should, however, be considered in relation to the local population of the region where nuclear sites and offices are located (cf. Regional census report).

The proportion of women in the sector is higher, at 21%, up from 17% across the ECI and nearly two percentage points higher than in 2021. The Nuclear Sector Deal sets a target of 40% women by 2030 [21]. At the current rate, this target for the engineering construction segment of the nuclear sector would not be achieved until 2050 and gender parity would be reached in 2063.
Finally, reliance on non-UK workers is comparable to the wider ECI, with 95.6% of the nuclear workforce holding UK citizenship, which represent a decrease of two percentage points compared to 2021. This may partly reflect the decreasing proportion of roles that require higher levels of security clearance.

21 Nuclear Sector Deal (Department for Energy Security & Net Zero – 2018)

Maps 11 and 12: Location of workers in the nuclear sector (data points and heatmap)

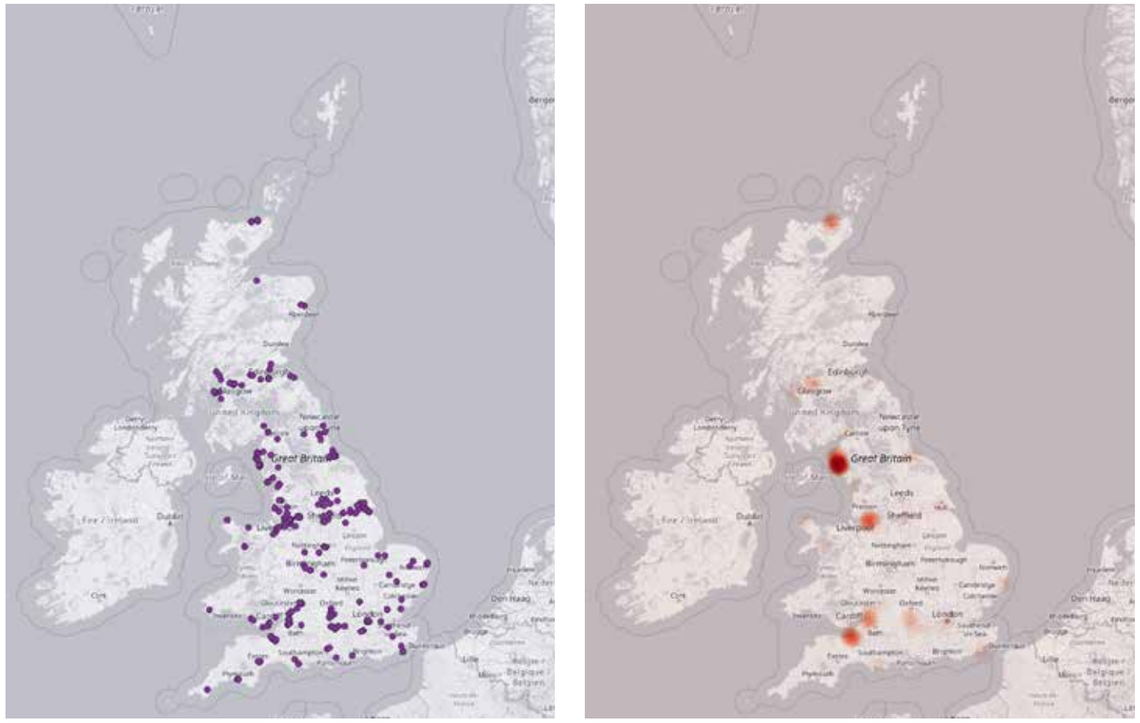


Table 6: Workforce in the nuclear sector by occupation (please see annex for full table)

Apprentices and trainees	**1,174**
Craft	**2,061**
Scaffolding craft	658
Mechanical fitting craft	254
Blasters and painters craft	166
Rigging craft	150
Pipefitting craft	121
Other craft	712
Engineers	**7,043**
Project engineers	1,239
Mechanical engineers	755
Systems engineers	540
Waste engineers	332
Site engineers	313
Cost engineers	296
Operations engineers	286
Electrical, instrumentation and control engineers	265
Commissioning engineers	253
Radiological protection engineers	240
Process engineers	234
Safety case engineers	223
Health and safety engineers	177
Electrical engineers	158
Civil engineering engineers	153
Insulation engineers	145
Maintenance engineers	145
Other engineers	1289
Managers	**9,008**
Project managers	2,481
Commercial managers	446
General managers	407
Operations managers	383
Other directors	323
Health and safety managers	315
Engineering management managers	295
Construction managers	281
Human resources managers	274
Site management managers	245
Quality assurance/quality controls managers	231
Planning managers	220
Waste managers	195
Project controls managers	162
Finance managers	158
Supply chain managers	154
IT managers	118
Integration managers	108
Other managers	2212
Professionals	**5,445**
Planning professionals	620
Data and analysis professionals	576
Quality assurance/quality controls professionals	510
Waste professionals	414
Other consultants professionals	345
Health and safety professionals	329
Health physics professionals	271
Quantity surveyors professionals	267
Technologists professionals	215
Document controls professionals	186
Procurement professionals	152
Project controls professionals	139
IT professionals	138
Environmental professionals	138
Other professionals	1145
Semi-skilled	**2,568**
General operatives semi-skilled	830
Decommissioning semi-skilled	444
Labourers semi-skilled	237
Security semi-skilled	234
Operators semi-skilled	178
Asbestos removal semi-skilled	104
Other semi-skilled	541
Supervisors	**2,504**
General supervisors	362
Electrical technicians supervisors	258
Security supervisors	210
Decommissioning supervisors	141
Scaffolding supervisors	139
Mechanical fitting supervisors	104
Waste supervisors	100
Other supervisors	1190
Support	**2,755**
Administrative support	999
Finance support	317
Project management support	178
Health and safety support	150
Personal assistants support	144
Human resources support	136
Other support	831
Technicians	**3,721**
Production technicians	618
Radiological protection technicians	509
General technicians	316
Decommissioning (waste) technicians	234
Production (operations) technicians	206
Production (maintenance) technicians	180
Design technicians	171
Safety technicians	142
Operations technicians	116
Quality assurance/quality controls technicians	106
Other technicians	1123
Other	**835**

Figure 21: Age profile of the ECI workforce in the nuclear sector

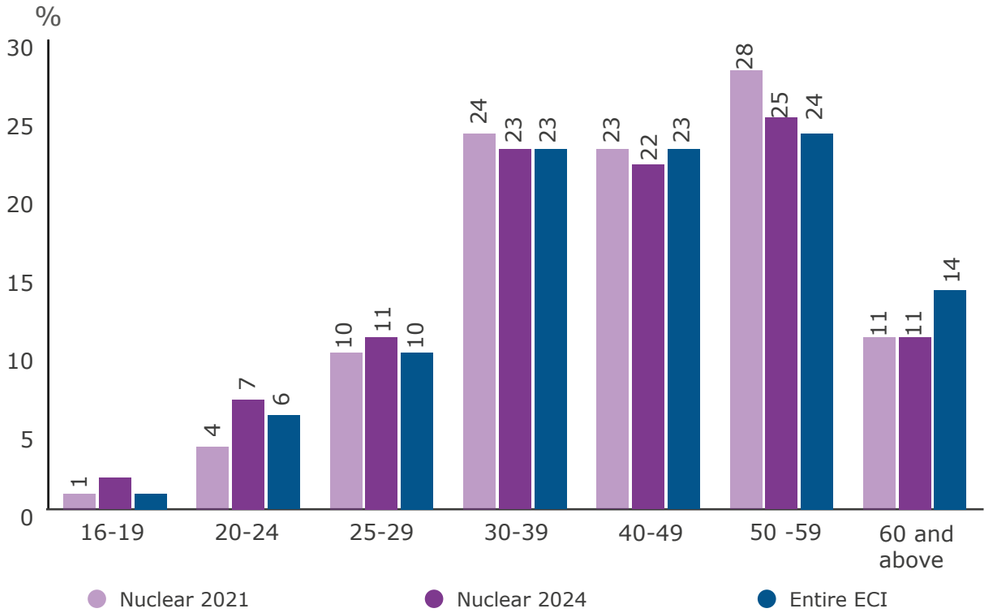


Figure 22: Ethnicity profile of the ECI workforce in the nuclear sector

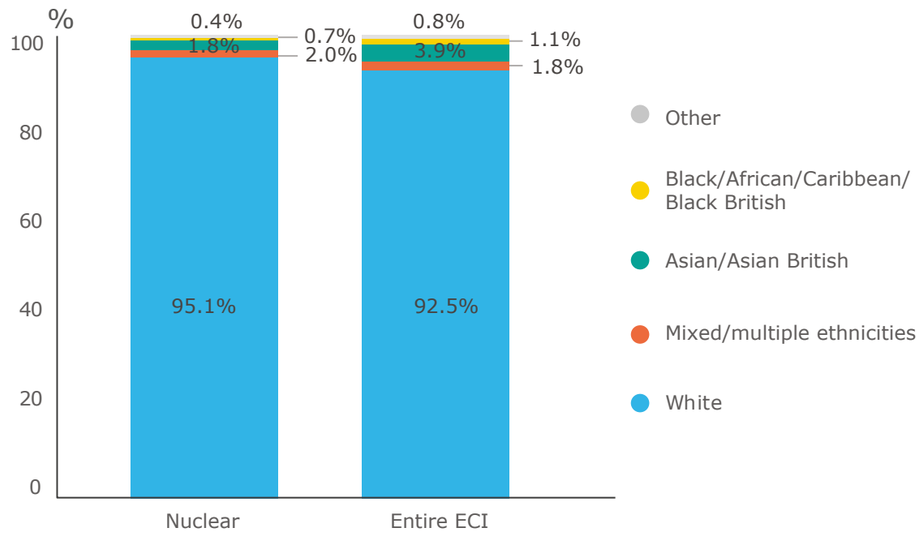


Figure 23: Gender profile of the ECI workforce in the nuclear sector

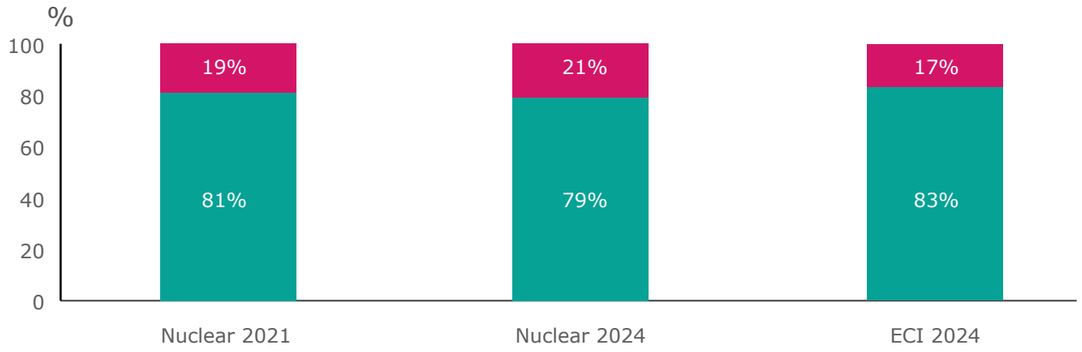
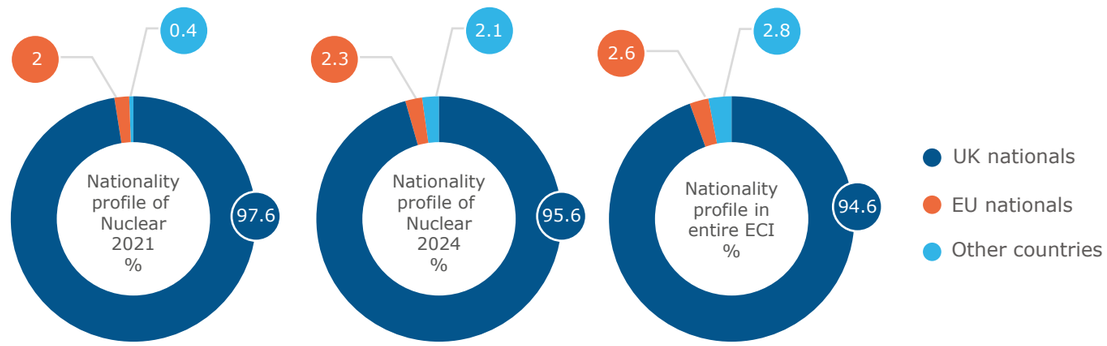


Figure 24: Nationality profile of the ECI workforce in the nuclear sector



Oil and gas (35.2% - 33,350 workers)

The oil and gas sector employs 35.2% of the engineering construction industry's workforce in 2024, down from 36.7% in 2021. However, the overall engineering construction workforce has grown in recent years, so this percentage decrease does not reflect a loss of workers. OEUK's Workforce Insight reports[22] show an increase in headcounts between 2020 and 2022 in oil and gas. Similarly, the oil and gas workforce in engineering construction grew from 30,700 to 33,350, recovering from a year in which the industry was still addressing the aftermath of the pandemic.

The Robert Gordon University's[23] and ECITB's[24] forecasts suggest that the sector's workforce may begin to decline from 2025 and 2026, respectively. The cessation of new licences for exploring additional fields[25] may accelerate the sector's shift from UK waters to other regions, as it transitions to more late life asset management and decommissioning-focused activities in the North Sea.

This anticipated decline in oil and gas activity in the UK could help ease hiring challenges in other sectors such as renewables, hydrogen, carbon capture and nuclear, which are driving additional demand for skilled workers. Transitioning the oil and gas workforce - currently the second largest in the industry after nuclear - into these emerging sectors will be essential for achieving net-zero commitments.[26]

Employers in the oil and gas sector estimate a potential 12% workforce increase, a projection aligned with the wider industry average. However, these expectations depend on employers securing contracts, many of which are highly competitive. Moreover, these growth projections may not be limited to oil and gas alone but could also reflect opportunities in renewables, hydrogen and carbon capture and storage (see the 'Business Opportunities' section of the overarching census report). Given that many employers in this sector are multinational companies, opportunities outside the UK may also influence these projections.

That said, the oil and gas sector, alongside nuclear, is recognised as a significant business opportunity by engineering construction companies. Even firms not currently involved in oil and gas view it as a promising area, comparable in appeal to hydrogen, nuclear and energy-from-waste. This optimism may seem at odds with the sector's overall negative growth outlook but likely stems from opportunities such as field developments like Rosebank and Lochnagar, the ramp-up of decommissioning, but also in transition projects like repurposing pipelines for carbon capture and hydrogen. Additionally, as noted earlier, growth expectations may be driven by increased oil and gas activity in other countries.

22 Workforce Insight 2023 and 2022 (OEUK – 2023 and 2022)
23 Powering up the Workforce (RGU Energy Transition Institute – 2023)
24 Labour Forecasting Tool (ECITB – 2024)
25 Offshore industry: Licensing – Question for DESNZ (2024)
26 Unleash our potential. Power our future. (Offshore Energies UK – 2024)

Previous ECITB research[27] outlines a difference in popularity of the oil and gas sector between ECI learners and workers and the general public. The sector, historically the largest employer in the industry, is known for paying good wages and its technical characteristics often form the foundation for developing training programmes and educational pathways that attract new generations to the industry. However, it suffers from a less favourable image among the general public.

Even with a predicted decline in workforce numbers, the oil and gas sector may still face hiring challenges, particularly for site-based roles with a high proportion of workers nearing or past retirement age (see the demographics section of the 2024 ECITB Workforce Census report). Employers that report difficulties filling vacancies mention resource issues, rising challenges in offering competitive salaries and a lack of training, skills and qualifications. Additionally, the niche nature of certain roles and overall volume issues place further strain on recruitment. Occupations most affected include project managers, riggers, platers, pipefitters, design technicians and engineers, electrical engineers, project engineers and subsea engineers.

Most oil and gas workers in engineering construction are based in Aberdeen, London and offshore locations, primarily in the Central and Northern North Sea. Downstream oil and gas workforce hotspots include Grangemouth, Glasgow, Ellesmere Port, Middlesbrough, the Humber estuary, Reading and Fawley (see map 14 for details).

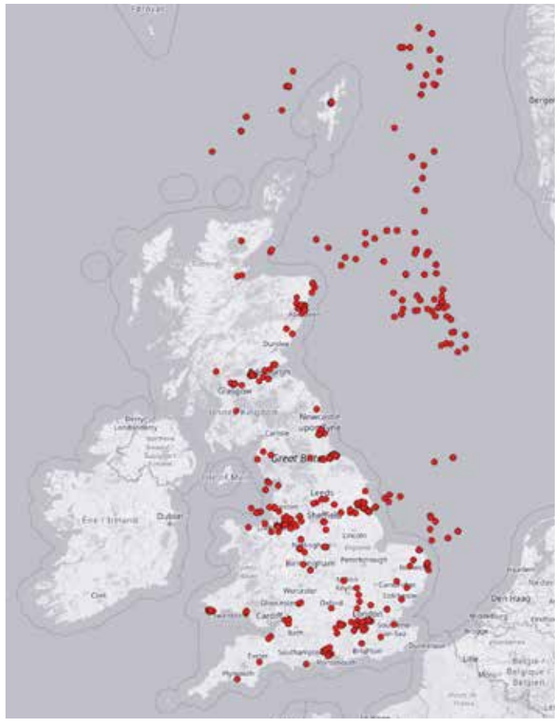
Common roles in the sector include scaffolders, riggers, pipefitters, general operatives, electrical and mechanical technicians, instrument and control technicians, production technicians, project managers and process, project and mechanical engineers, as well as planners.

The sector has the oldest workforce in the industry, with only 12% of workers under 30 compared to 17% in the ECI, showing no change compared to 2021. Workers over 50 make up 41% of the workforce, compared to 38% across the industry, with a four percentage-point difference in workers over 60. The share of workers above 60 increased by six percentage points between 2021 and 2024. This demographic profile raises concerns about the sector's ability to transition its workforce to other sectors in the medium to long term.

The sector's workforce is more diverse than the ECI average, with higher proportions of Asian and Asian British (9% vs. 4%) and Black, African, Caribbean and Black British (3% vs. 1%) workers. However, with 14% of its workforce being women, the sector lags three percentage points behind the industry average and has shown no significant improvement since 2021. Finally, the sector's reliance on workers from outside the UK aligns with that of the wider industry, with 94.3% of workers holding UK citizenship. The share EU nationals has decreased by one percentage point between 2021 and 2024 while the share of workers from countries outside the UK or the EU increased by 1.5 percentage point.

27 Inspiring directions (ECITB – 2024)

Maps 13 and 14: Location of workers in the oil and gas sector (data points and heatmap)



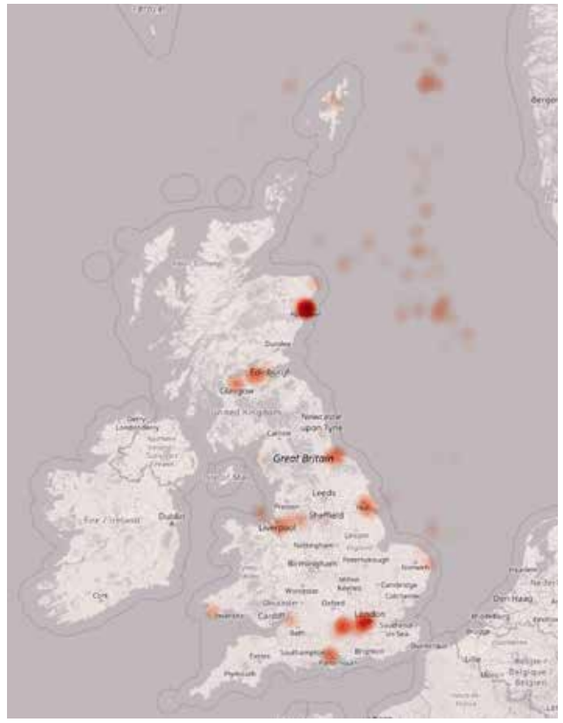


Table 7: Workforce in the oil and gas sector by occupation

Apprentices and trainees	463
Scaffolding apprentices and trainees	72
Pipefitting apprentices and trainees	47
Electrical apprentices and trainees	34
Instrumentation and control apprentices and trainees	28
Integration apprentices and trainees	23
Mechanical fitting apprentices and trainees	15
Welding apprentices and trainees	15
Production technicians apprentices and trainees	14
Blasters and painters apprentices and trainees	13
Design apprentices and trainees	12
Other apprentices and trainees	188

Craft	5,756
Scaffolding craft	2,264
Rigging craft	712
Pipefitting craft	534
Blasters and painters craft	327
Mechanical fitting craft	311
Blasters and painters (rope access) craft	279
Plating craft	230
Welding craft	192
Rigging (deck crew) craft	111
Insulation (rope access) craft	102
Electrical craft	73
Steel erecting craft	71
Plating (rope access) craft	70
Insulation craft	58
Instrument pipefitters craft	47
Fabrication craft	39
Rigging (steel erectors) craft	39
Electrical fitters craft	38
Pipefitting (rope access) craft	38
Instrumentation and control craft	28
Joiners craft	16
Scaffolding (rope access) craft	11
Other craft	167

Engineers	6,533
Process engineers	724
Project engineers	669
Mechanical engineers	659
Structural engineers	462
Instrumentation and control engineers	455
Piping engineers	369
Electrical engineers	358
Insulation engineers	342
Health and safety engineers	205
Civil engineering engineers	170
Integrity engineers	149
Pipeline engineers	140
Cost engineers	109
Commissioning engineers	103
Design engineers	99
Subsea engineers	93
Maintenance engineers	93
Automation engineers	92
Systems engineers	92
Environmental engineers	84
Quality assurance/quality controls engineers	82
Construction engineers	76
Civil and structural engineers	71
IT engineers	65
Corrosion engineers	53
Wells engineers	44
Telecommunications engineers	38
Nuclear engineers	35
Drilling engineers	28
Operations engineers	24
Non-destructing testing engineers	21
HVAC engineers	20
Architectural engineers	20
Insulation (rope access) engineers	20
Quality assurance/quality controls (rope access) engineers	20
Geotechnical engineers	20
Data and analysis engineers	20
Welding engineers	19
Estimating engineers	19
Materials engineers	19
Contracts engineers	17
Stress (piping) engineers	17
Electrical, instrumentation and control engineers	17
Planning engineers	16
Naval engineers	16
Pipeline (subsea) engineers	16
Design (safety) engineers	14
Stress engineers	14
Chemicals engineers	13
Proposals engineers	13
Commissioning (instrumentation) engineers	13
Systems (subsea) engineers	13
Electrical and instrumentation engineers	11
Compliance engineers	10
Other engineers	151

Managers	4,519
Project managers	823
Process managers	321
Commercial managers	285
Other directors managers	224
Operations managers	221
Construction managers	198
Engineering management managers	170
General management managers	167
Finance managers	158
Site management managers	114
Project controls managers	113
Health and safety managers	107
Presidents	101
Planning managers	98
Quality assurance/quality controls managers	98

Electrical professionals	94
Maintenance managers	93
Human resources managers	83
Supply chain managers	78
IT managers	71
Legal and compliance managers	64
Estimating managers	50
Procurement managers	50
Lifting managers	40
Contracts managers	40
Learning and development managers	40
Document controls managers	37
Communications managers	35
Project engineering managers	35
Civil engineering managers	31
Commissioning managers	31
Design managers	29
Proposals managers	28
Systems managers	25
Logistics managers	23
Technologists managers	23
Asset management managers	22
Marketing managers	21
Data and analysis managers	17
Strategy managers	16
Other managers	16
Products managers	12
Project (risk) managers	12
Materials managers	12
Facilities management managers	12
Technical management managers	12
Cost controls managers	11
Risk managers	11
Fabrication managers	11
Other managers	134
Professionals	**2,940**
Planning professionals	415
Health and safety professionals	254
Procurement professionals	222
Document controls professionals	215
Data and analysis professionals	214
Other consultants professionals	201
Quality assurance/quality controls professionals	136
Project controls professionals	124
Technologists professionals	89
Estimating professionals	85
IT professionals	81
Human resources professionals	79
Environmental professionals	71
Cost controls professionals	70
Quantity surveyors professionals	59
Construction professionals	59
Legal and compliance professionals	52
Learning and development professionals	38
Supply chain professionals	37
Commercial professionals	35
Radiological protection professionals	32
Contracts professionals	27
Geotechnical professionals	24
Process professionals	21
Systems professionals	20
Maintenance professionals	17
Commissioning professionals	16
Surveyors professionals	15
Risk professionals	14
IT (cybersecurity) professionals	13
Operations professionals	12
Electrical and instrumentation professionals	11
Carbon professionals	11
Chemicals professionals	10
Other professionals	162
Semi-skilled	**2,032**
General operatives semi-skilled	452
Deck crew semi-skilled	350
Scaffolding semi-skilled	287
Labourers semi-skilled	219
Electrical supervisors	129
Blasters and painters (rope access) semi-skilled	110
Drivers semi-skilled	89
Asbestos removal semi-skilled	56
Crane semi-skilled	56
Cleaning semi-skilled	50
Insulation semi-skilled	39
Blasters and painters semi-skilled	38
Operators semi-skilled	32
Helicopter crew semi-skilled	29
Logistics semi-skilled	18
Other semi-skilled	78
Supervisors	**3,711**
Electrical technicians	555
General supervisors	464
Scaffolding supervisors	276
Lifting supervisors	214
Electrical technicians	194
General (rope access) supervisors	144
Construction supervisors	142
Mechanical fitting supervisors	129
Deck crew supervisors	126
Pipefitting supervisors	104
Insulation supervisors	103
Rigging supervisors	102
Blasters and painters (rope access) supervisors	86
Maintenance supervisors	77
Site supervisors	65
Operations supervisors	60
Instrumentation and control supervisors	59
Non-destructing testing (rope access) supervisors	51
Helicopter crew supervisors	46
Welding supervisors	45
Blasters and painters supervisors	44
Facilities management supervisors	40
Piping supervisors	37
Plating supervisors	34
Mechanical supervisors	30
Integrity supervisors	27
Production technicians supervisors	25
Insulation (rope access) supervisors	23
Design (piping) supervisors	19
Design (structural) supervisors	17
Other supervisors	17
Electrical fitters supervisors	16
Electrical maintenance technicians	16
Steel erecting supervisors	15
Naval supervisors	15
Pipefitters and mechanical fitting supervisors	13
Asbestos removal supervisors	11
Design supervisors	11
Electrical (rope access) supervisors	11
Process supervisors	10
Other supervisors	237
Support	**1,744**
Finance support	367
Administrative support	366
Commercial support	183
Logistics support	136
Human resources support	117
Health and safety support	108
Project management support	76
Personal assistants support	74
IT support	64
Facilities management support	39
Legal and compliance support	23
Compliance support	20
Contracts support	19
Marketing support	17
Learning and development support	15
Training support	15
Supply chain support	13
Other support	93
Technicians	**4,828**
Mechanical technicians	697
Instrumentation and control technicians	606
Production technicians	516
Design (piping) technicians	256
Operations technicians	231
Non-destructing testing technicians	198
Quality assurance/quality controls technicians	196

Material technicians	187
Non-destructing testing (rope access) technicians	154
Design technicians	151
General (rope access) technicians	145
Design (structural) technicians	117
Production (operations) technicians	91
Design (instrumentation) technicians	82
Maintenance technicians	77
Electrical (rope access) technicians	67
Design (electrical) technicians	63
Logistics technicians	57
Health and safety technicians	55
Commissioning technicians	49
Subsea technicians	46
Design (civil) technicians	45
Process technicians	42
Telecommunications technicians	41
Electrical technicians supervisors	39
Safety technicians	36
Architectural technicians	26
Commissioning (instrumentation) technicians	25
Materials technicians	23
Design (electrical and instrumentation) technicians	22
Insulation technicians	21
Design (civil and structural) technicians	19
Design (instrumentation and control) technicians	19
Laboratory technicians	19
Mechanical maintenance technicians	18
Cleaning technicians	16
HVAC technicians	16
Design (mechanical) technicians	15
Design (architectural) technicians	13
Design (pipeline) technicians	13
Maintenance (mechanical) technicians	12
Electrical, instrumentation and control technicians	11
Surveyors technicians	10
Other technicians	116
Other	**850**

Figure 25: Age profile of the ECI workforce in the oil and gas sector

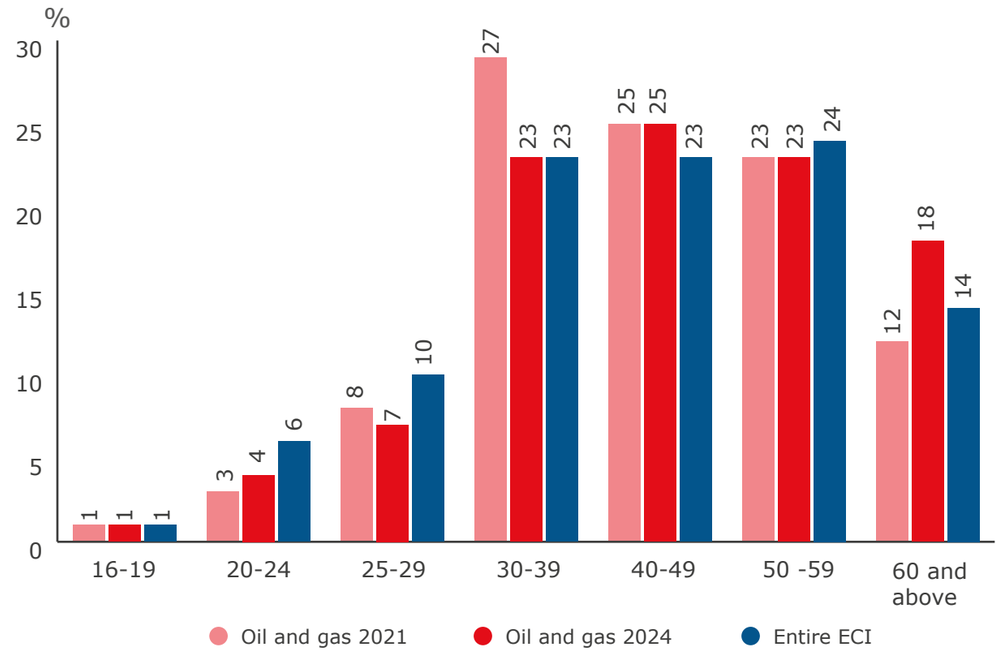


Figure 26: Ethnicity profile of the ECI workforce in the oil and gas sector

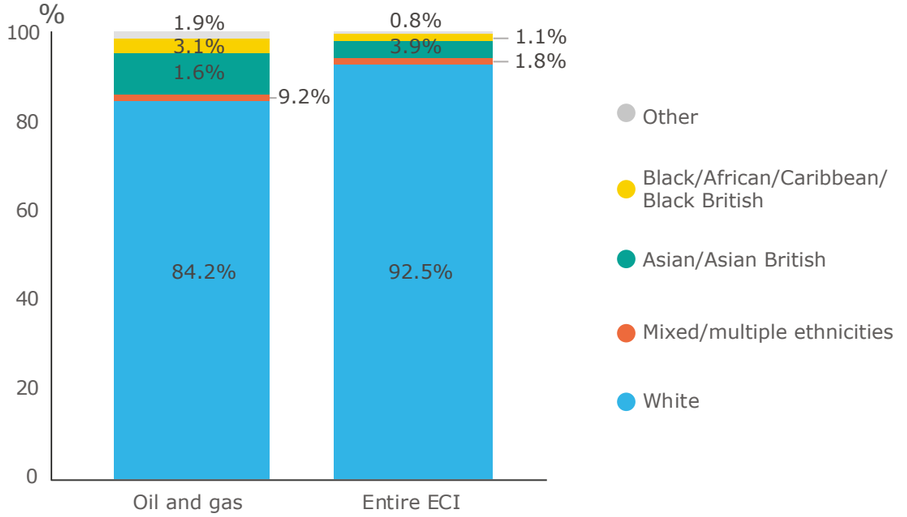


Figure 27: Gender profile of the ECI workforce in the oil and gas sector

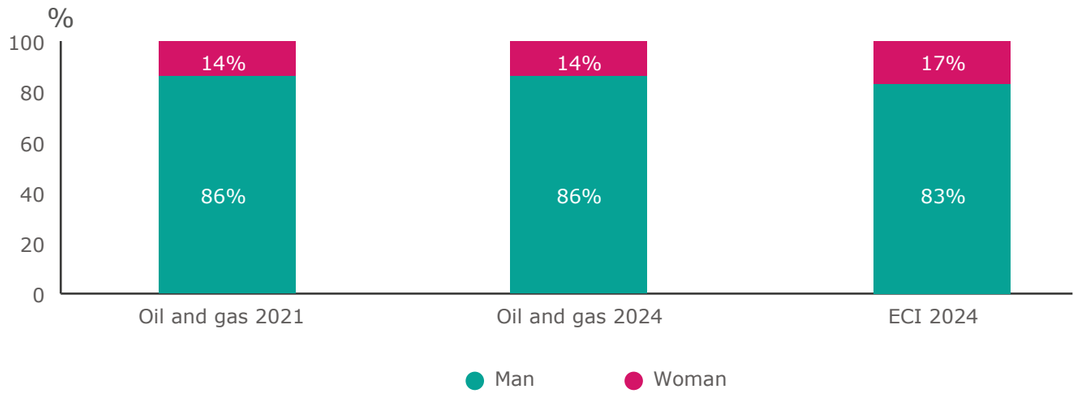
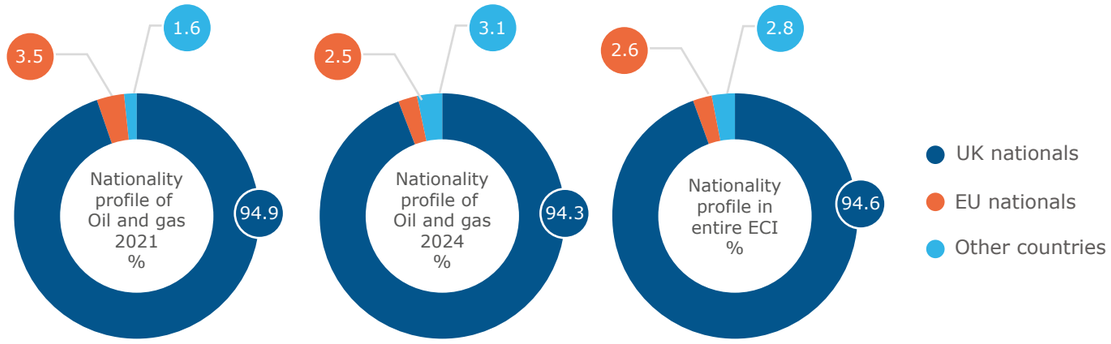


Figure 28: Nationality profile of the ECI workforce in the oil and gas sector



Pharmaceuticals (0.9% - 800 workers)

The pharmaceuticals sector is the smallest engineering construction sector in terms of workforce size in 2024, representing 0.9% of the industry's workforce, down from 2% in 2021. The sector's workforce is mostly evenly distributed across a range of hotspots, namely Montrose, Newcastle upon Tyne, Middlesbrough, Manchester, Burton-on-Trent, Birmingham, Stevenage and London. Roles such as pipefitters, process engineers, project engineers and project managers are central to the sector's workforce.

The sector recognises the importance of investing in the infrastructure needed to support medicines manufacturers and their supply chains to transition to net zero, with a focus on reskilling and upskilling existing staff[28]. Employers in the pharmaceuticals sector facing difficulties filling vacancies consider fabricators, design technicians, software engineers, electrical engineers, welders and process engineers as posing significant challenges. These difficulties are attributed to competition from other companies, with salary expectations particularly difficult to meet for some roles and a lack of qualifications, skills and training.

The pharmaceuticals sector attracts a younger workforce than the ECI as a whole, with 23% of its workforce being under 30 compared to 17% in the ECI. While 31% of the sector's workforce is over 50, 38% of workers in the ECI are in this age group. As such, the sector benefits from one of the youngest workforces in the engineering construction industry. Furthermore, it enjoys a particularly good image among the general public, suggesting the sector is well-placed to continue expanding its talent pool[29].

The sector is more diverse in terms of ethnicity than the ECI, with 15.4% of the workforce identifying as from a minority ethnic background compared to 7.5% in the wider industry. The gender split also differs between the pharmaceuticals sector and the entire ECI, with 20% of the workforce being women in the sector compared to 17% in the industry. The aforementioned popularity of the sector among the general public may partly explain the relatively higher diversity of the sector's workforce across these metrics. Finally, the sector relies mainly on a national workforce, with 99.3% of the workforce being UK nationals.[30]

28 ABPI manifesto for investment, health and growth (Association of the British Pharmaceutical Industry – 2024)
29 Inspiring directions (ECITB – 2024)
30 Please note that workforce growth expectations for the pharmaceuticals sector are not included in this report due to a lack of data.

Maps 15 and 16: Location of workers in the pharmaceuticals (data points and heatmap)

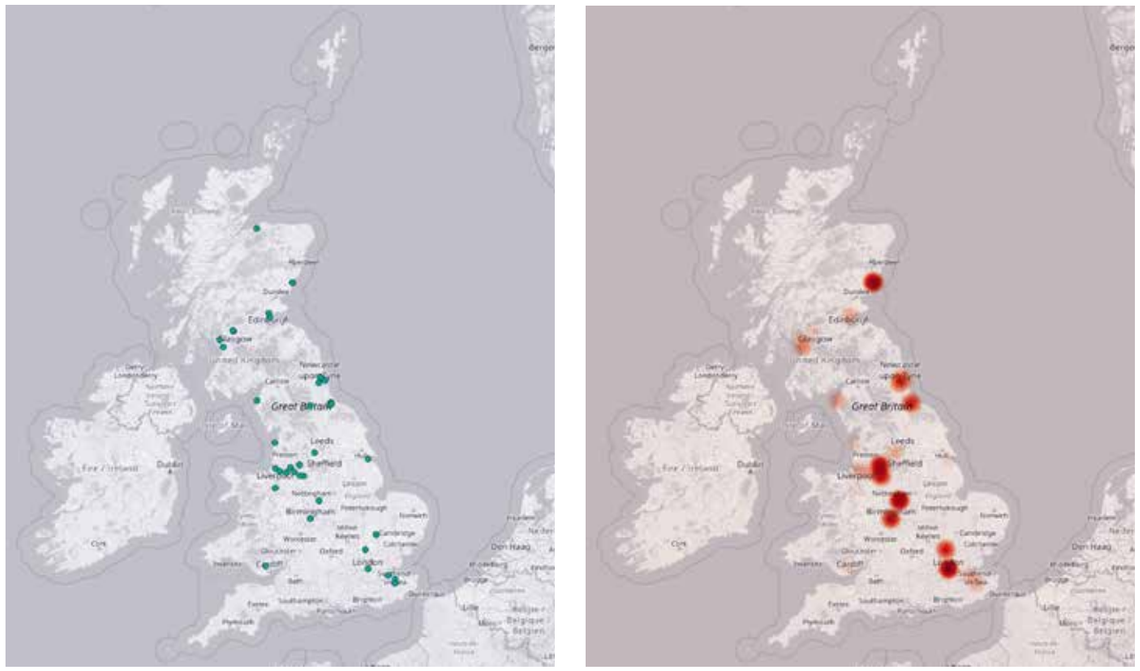


Table 8: Workforce in the pharmaceuticals sector by occupation

Apprentices and trainees	**32**
Other apprentices and trainees[31]	32
Craft	127
Pipefitting craft	35
Scaffolding craft	25
Welding craft	14
Fabrication craft	10
Other craft	43
Engineers	**210**
Process engineers	34
Project engineers	31
Mechanical engineers	22
Design (mechanical) engineers	11
Insulation engineers	10
Other engineers	103
Managers	**152**
Project managers	54
Other managers	97
Professionals	**82**
Planning professionals	14
Procurement professionals	10
Other professionals	57
Semi-skilled	**47**
Labourers semi-skilled	18
Electrical supervisors	13
Other semi-skilled	15
Supervisors	52
General supervisors	16
Electrical technicians	16
Other supervisors	21
Support	**58**
Administrative support	24
Finance support	11
Other support	24
Technicians	40
Other technicians	40
Other	**13**

31 Please note that individual occupations with fewer than 10 workers are grouped into 'Other' categories throughout the report.

Figure 29: Age profile of the ECI workforce in the pharmaceuticals sector

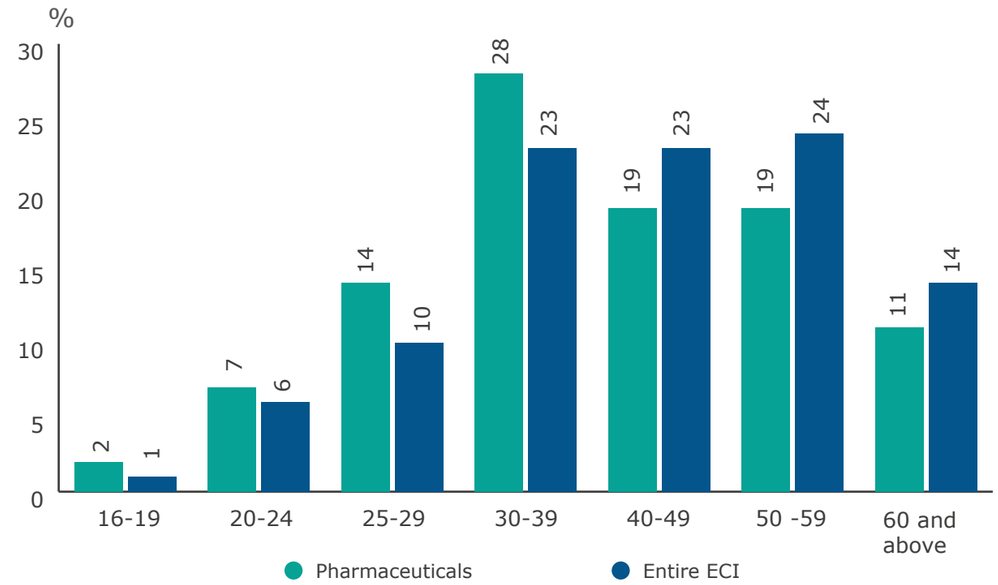


Figure 30: Ethnicity profile of the ECI workforce in the pharmaceuticals sector

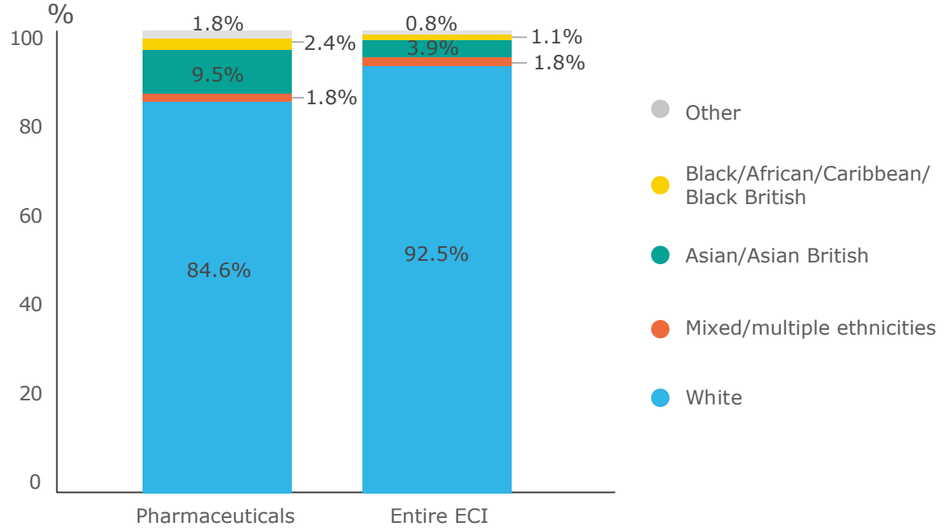


Figure 31: Gender profile of the ECI workforce in the pharmaceuticals sector

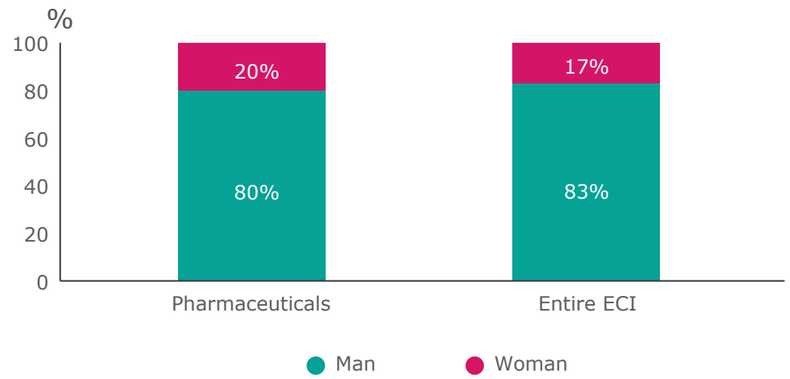
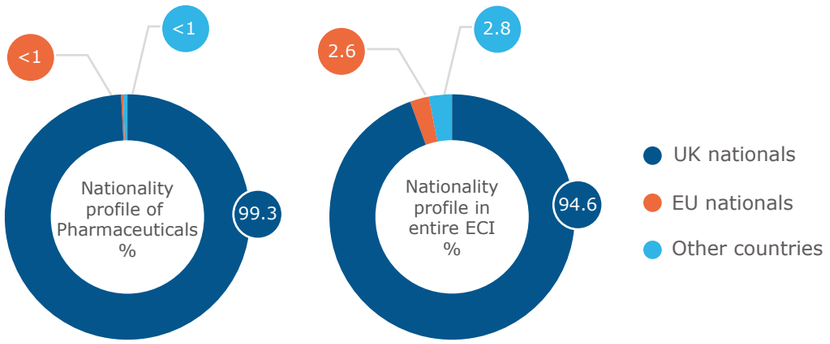


Figure 32: Nationality profile of the ECI workforce in the pharmaceuticals sector



Renewables (6.2% - 5,850 workers)

The renewables sector nearly doubled its share of the workforce over three years, growing from 3.4% in 2021 to 6.2% in 2024. Major workforce hotspots include London, Birmingham, Manchester, Newcastle upon Tyne and Drax. Secondary hotspots include Aberdeen, Kilmarnock, Middlesbrough, Ratcliffe-on-Soar, Pembroke and Great Yarmouth.

Scaffolders, pipefitters, welders, process engineers, mechanical engineers, project engineers, project managers, planners, subsea technicians and cleaning and general operatives are key roles within the sector's workforce. Employers experiencing difficulties filling vacancies cite a lack of qualifications and skills as well as challenges meeting salary expectations. The rapid growth of the renewables sector may naturally drive wages higher, emphasising the importance of facilitating the transition of part of the oil and gas workforce into renewables roles. Particularly hard-to-fill vacancies include electrical fitters, pipefitters, mechanical fitters, platers, non-destructive testing technicians and planners.

Employers in the sector have the second-highest workforce growth expectations of all those presented in this report, with an 18% increase projected between 2024 and 2027. This high level of optimism underscores the increasingly central role the sector is playing in the industry. Several subsectors within renewables are identified by engineering construction employers as important business opportunities, particularly energy-from-waste, biofuels and biomass. Please refer to the 'Business Opportunities' section of the overarching census report for more details.

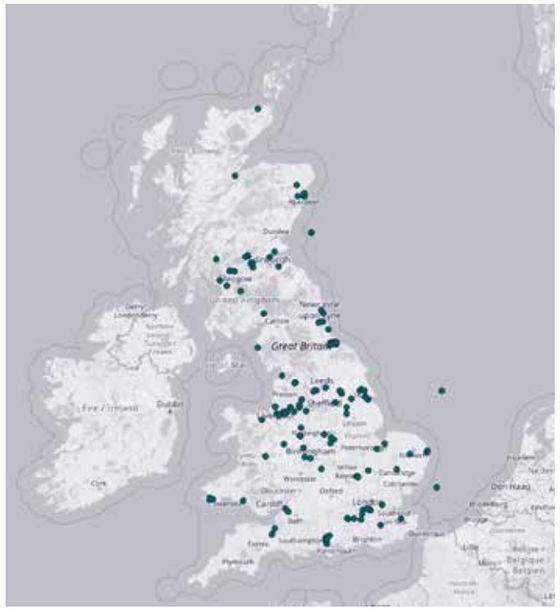
The sector benefits from a particularly young workforce compared to the industry average, with 22% of the workforce below 30 against 17% for the industry. This share increased by nine percentage points between 2021 and 2024. The sector's share of the workforce above 50 is eight percentage points lower than that of the entire industry and impressively decreased from the 41% assessed in 2021 (against 30% in 2024). The sector is the most attractive of all ECI sectors for ECI learners and workers below 30 and is the industry's most popular sector among the general UK population[32].

The workforce in the renewables sector is more ethnically diverse than in the ECI. The percentage of workers identified as Asian/Asian British, Black/African/Caribbean/Black British and Other ethnicities is higher at 13.6%, 2.8% and 2%, respectively. In comparison, the ECI has lower proportions for these groups, with 3.9%, 1.1% and 0.8%. Workers identified as White make up 79.6% of the renewables sector's workforce compared to 92.5% in the ECI. This likely partly reflects the location of the sector's major workforce hotspots, which are often in areas where the local population is more ethnically diverse.

The renewables sector has a slightly higher share of women in its workforce compared to the industry average (20% versus 17%), representing a four percentage points increase compared to 2021. Finally, it is the sector that relies most on foreign workers, with 86.2% of the workforce holding UK citizenship, while this figure rises to 94.6% for the entire industry.

32 Inspiring directions (ECITB – 2024)

Maps 17 and 18: Location of workers in the renewables sector (data points and heatmap)



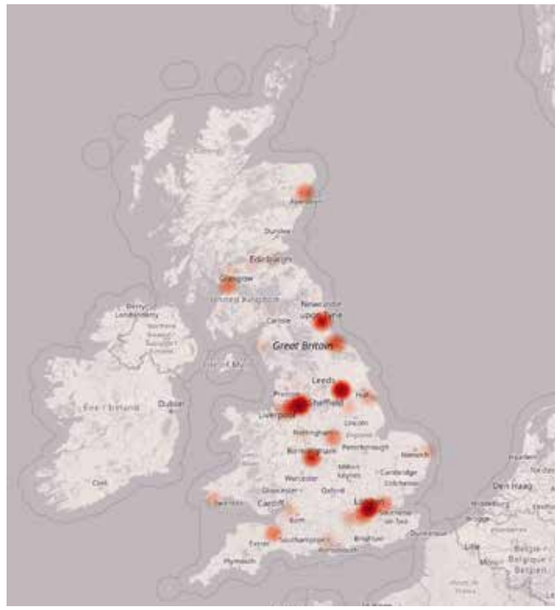


Table 9: Workforce in the renewables sector by occupation

Apprentices and trainees	**123**
Pipefitting apprentices and trainees	19
Welding apprentices and trainees	14
Project controls apprentices and trainees	12
Other apprentices and trainees[33]	77
Craft	**1,042**
Scaffolding craft	360
Pipefitting craft	181
Welding craft	114
Plating craft	81
Electrical craft	78
Rigging craft	45
Mechanical fitting craft	40
Steel erecting craft	31
Electrical fitters craft	22
Welding and fabricators craft	13
Grinders craft	12
Fabrication craft	11
Other craft	53

Engineers	**1,305**
Process engineers	199
Mechanical engineers	186
Project engineers	143
Design engineers	99
Electrical engineers	90
Structural engineers	79
Insulation engineers	54
Construction engineers	46
Integration engineers	40
Instrumentation and control engineers	40
Civil engineering engineers	34
Commissioning engineers	32
Electrical, instrumentation and control engineers	30
Piping engineers	29
Systems engineers	27
Cost engineers	27
Civil and structural engineers	24
Design (mechanical) engineers	17
Other engineers	108

Managers	**895**
Project managers	303
Commercial managers	73
Other directors managers	55
General management managers	43
Project (commercial) managers	32
Site management managers	28
Engineering management managers	27
Operations managers	26
Process managers	26
Project controls managers	21
Health and safety managers	20
Human resources managers	16
Finance managers	15
Construction managers	15
Project (civil) managers	13
Design managers	11
Other managers	171
Professionals	**523**
Planning professionals	120
Procurement professionals	52
Data and analysis professionals	51
Other consultants professionals	35
Project controls professionals	34
Quantity surveyors professionals	29
Document controls professionals	26
Technologists professionals	24
Waste professionals	20
Estimating professionals	19
Health and safety professionals	18
Environmental professionals	17
Quality assurance/quality controls professionals	15
Other professionals	65
Semi-skilled	**448**
Cleaning semi-skilled	184
General operatives semi-skilled	82
Labourers semi-skilled	39
Scaffolding semi-skilled	39
Operators semi-skilled	36
Asbestos removal semi-skilled	17
Other semi-skilled	51

Supervisors	**300**
Electrical technicians	51
General supervisors	39
Scaffolding supervisors	33
Welding supervisors	29
Pipefitting supervisors	21
Plating supervisors	17
Cleaning supervisors	16
Site supervisors	14
Other supervisors	80
Support	**629**
Administrative support	151
Commercial support	92
Finance support	77
Human resources support	66
Operations support	40
Training support	28
Project management support	24
Personal assistants support	22
Health and safety support	18
Logistics support	14
Other support	96
Technicians	**453**
Subsea technicians	92
Design technicians	73
General technicians	53
Commissioning technicians	44
Operations technicians	31
Non-destructing testing technicians	30
Design (piping) technicians	27
General (rope access) technicians	23
Surveyors technicians	18
Quality assurance/quality controls technicians	17
Other technicians	45
Other	**133**

33 Please note that individual occupations with fewer than 10 workers are grouped into 'Other' categories throughout the report.

Figure 33: Age profile of the ECI workforce in the renewables sector

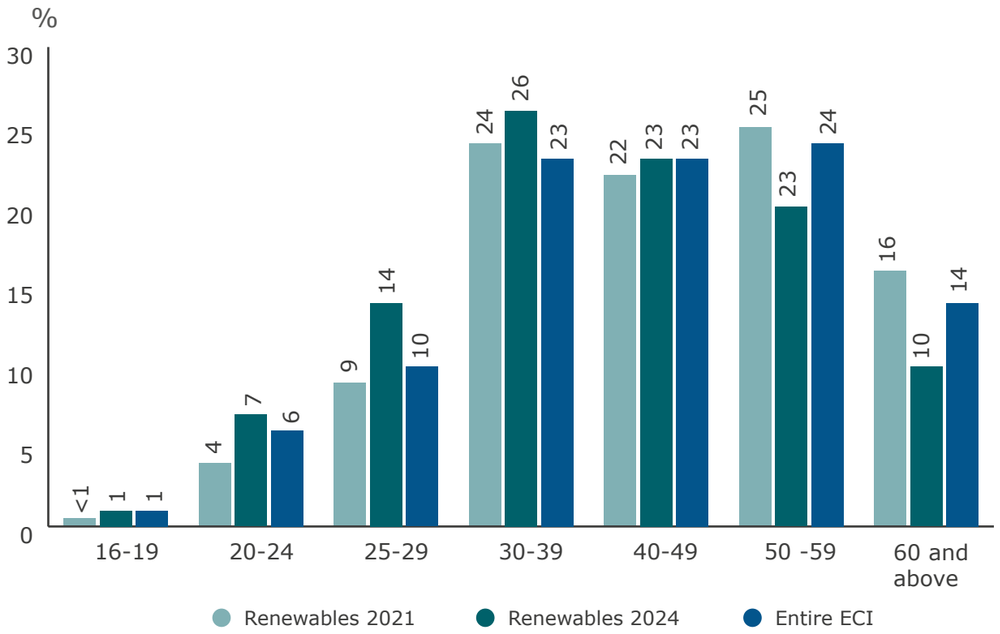


Figure 34: Ethnicity profile of the ECI workforce in the renewables sector

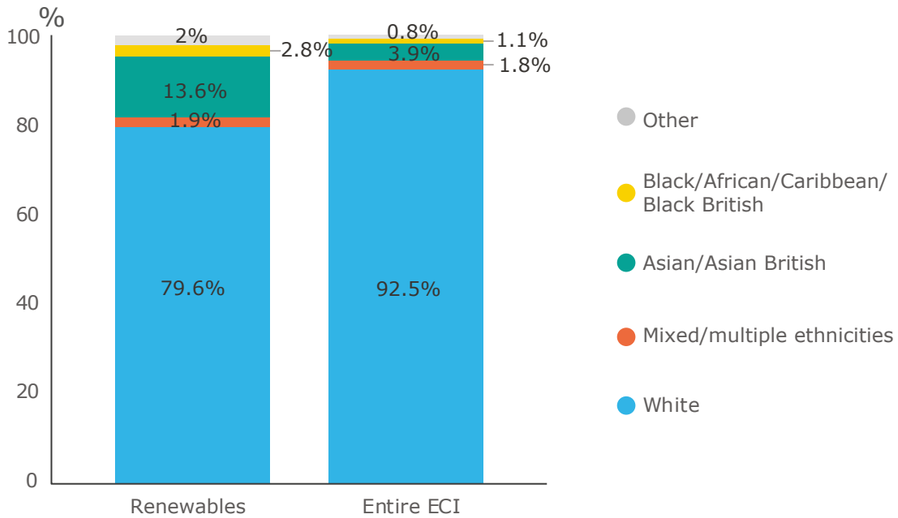


Figure 35: Gender profile of the ECI workforce in the renewables sector

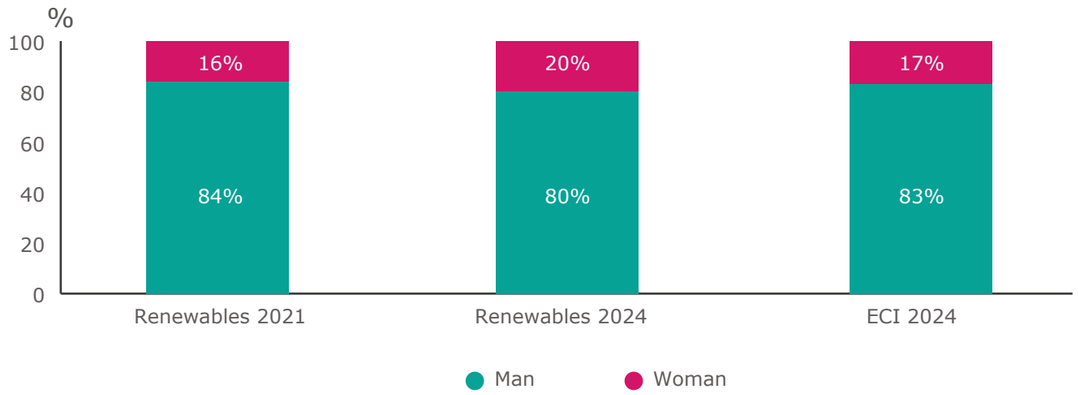
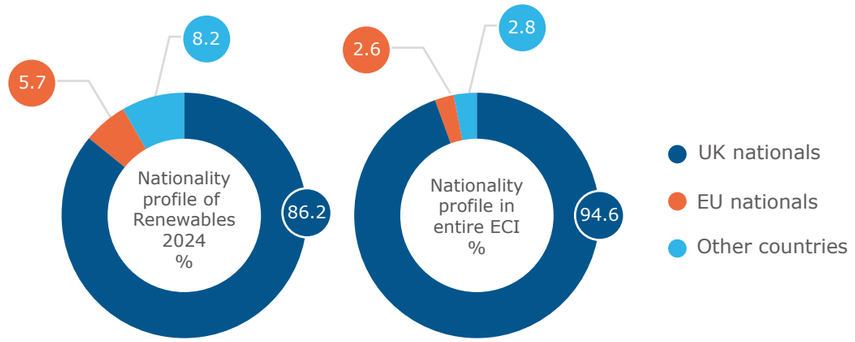


Figure 36: Nationality profile of the ECI workforce in the renewables sector



The engineering construction industry's renewables sector can be divided into six distinct sub-sectors:

- Biomass: 24% of the sector's workforce.
- Energy from waste: 21%
- Offshore wind[34]: 20%
- Biofuels: 15%
- Onshore wind: 14%
- Solar: 8%

The 2023 Biomass Strategy[35] outlines various opportunities for growth in the biomass sub-sector, such as the development of bioenergy with carbon capture and storage (BECCS) projects and the expansion of non-energy uses like wood-based products and bioplastics, which could further drive demand for biomass.

The growth of the energy from waste sub-sector will depend on competition mechanisms between energy from waste facilities, waste exports and landfill as final destinations for waste. Ensuring the competitiveness of energy from waste facilities against the other two options is crucial for fostering a sustainable and growing sub-sector within renewables. Additionally, carbon capture is expected to play an increasingly central role in existing and future energy from waste facilities.[36]

The offshore wind sub-sector highlights the need for an enduring market regime to provide the stability required to attract private investment.

This aligns with the development of critical skills necessary to deliver an expanding pipeline of projects[37]. Promoting career pathways into offshore wind will be vital, whether through facilitating transitions from oil and gas workers or leveraging the renewables sector's popularity among the general public to attract new talent.

Planning policies for onshore wind were updated in 2024, placing onshore wind projects on an equal footing with other forms of development. This coincided with the UK Government's commitment to doubling onshore wind energy by 2030[38]. In parallel, the sub-sector faces challenges, including the potential loss of nearly 9GW of capacity by 2040 as multiple farms reach the end of their lifespan[39]. As a result, the sub-sector must simultaneously ramp up decommissioning efforts while significantly increasing installed capacity.

Sustainable aviation fuel (SAF) represents a key growth driver for the biofuels sub-sector, showcasing how the engineering construction industry supports other industries. The SAF mandate is set to begin in 2025, with a target of reaching 10% of total UK jet fuel demand by 2030. This is expected to be supported by the introduction of a revenue certainty mechanism for producers, details of which are to be confirmed.[40]

Finally, the solar sub-sector is poised for growth, driven by the Government's target of 45-47 GW of solar power by 2030[41] up from 20 GW in 2024[42]. However, the demand for engineering construction workers in this sub-sector is likely to remain limited. This is due to solar panel components being predominantly imported and requiring less labour-intensive installation and maintenance activities compared to the manufacturing processes or complex construction phases seen in other sub-sectors.

In addition to facing unique opportunities and challenges, these six renewables sub-sectors exhibit distinct workforce characteristics. Workers under 30 make up 24% and 23% of the workforce in the onshore wind and offshore wind sub-sectors, respectively, but this share falls to 19% in biomass.

At the other end of the age spectrum, workers over 50 account for 37% of the workforce in energy from waste and biomass, compared to 27%-28% in solar, biofuels and offshore wind and just 20% in onshore wind.

The gender balance also varies significantly by sub-sector. Women comprise 12% of the workforce in biomass, whereas this figure rises to 28% in solar and 30% in biofuels. In the remaining sub-sectors, women represent between 20% and 21% of the workforce. Geographical differences are also notable. Maps 19 to 30 provide a detailed view of the major workforce hotspots for each renewables sub-sector.[43]

34 It is important to note that according to the Industrial Training Act, the Industrial Training Order and the supporting legislation, the definition of the ECITB's scope outlines that the offshore component of the offshore wind sector falls outside its remit.
35 Biomass Strategy (Department for Energy Security & Net Zero – 2023)
36 Manifesto for a sustainable, circular future (Resource Recovery UK – 2023)
37 Manifesto for an era of delivery and growth (RenewableUK – 2024)
38 Policy statement on onshore wind (Department for Energy Security & Net Zero – 2024)
39 Manifesto for an era of delivery and growth (RenewableUK – 2024)
40 Sustainable aviation fuel initiatives (Department for Transport – 2024)
41 Clean Power 2030 Action Plan (UK Government – 2024)
42 Solar & Energy Storage Manifesto (Solar Energy UK – 2024)
43 Ethnicity and nationality data are not reported for the six renewables sub-sectors because the available returns are not sufficient to enable reliable reporting on these characteristics for several of these sub-sectors.

Figure 37: Workforce distribution within the renewables sector

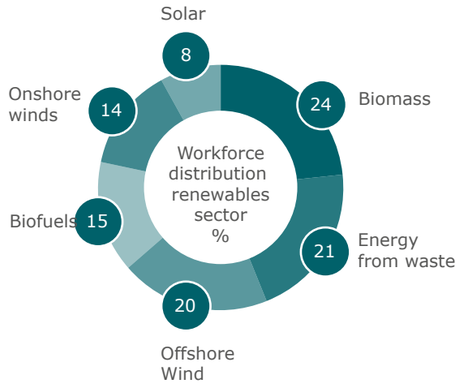


Figure 38: Age profile of the ECI workforce in the six renewables sub-sectors

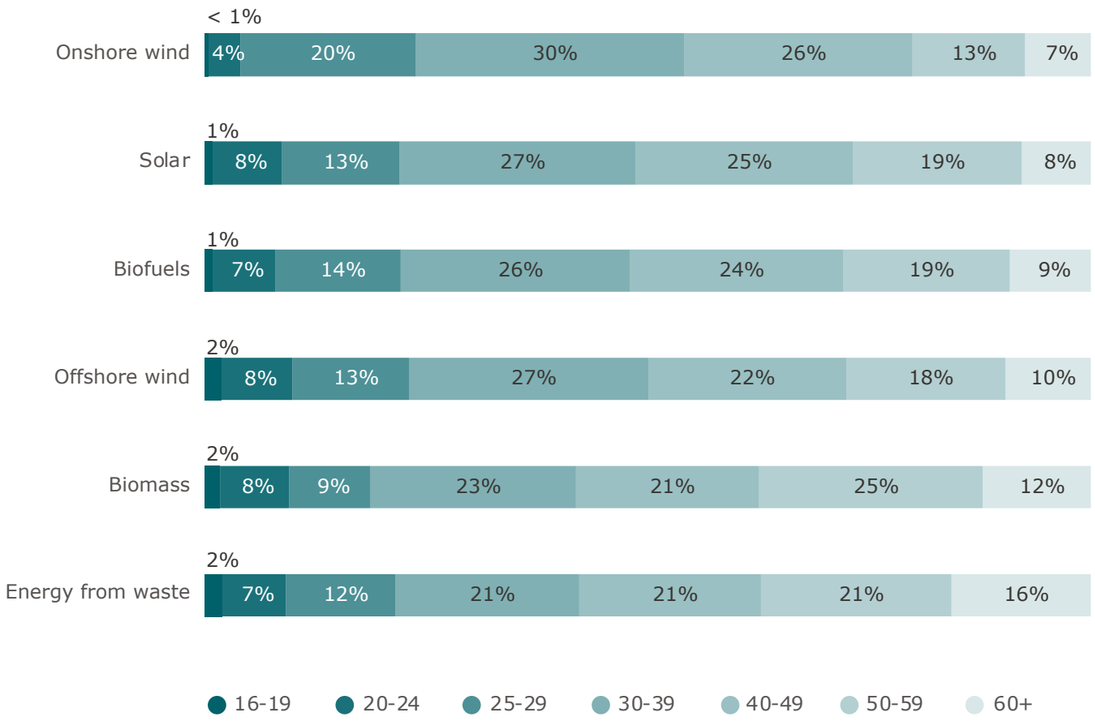
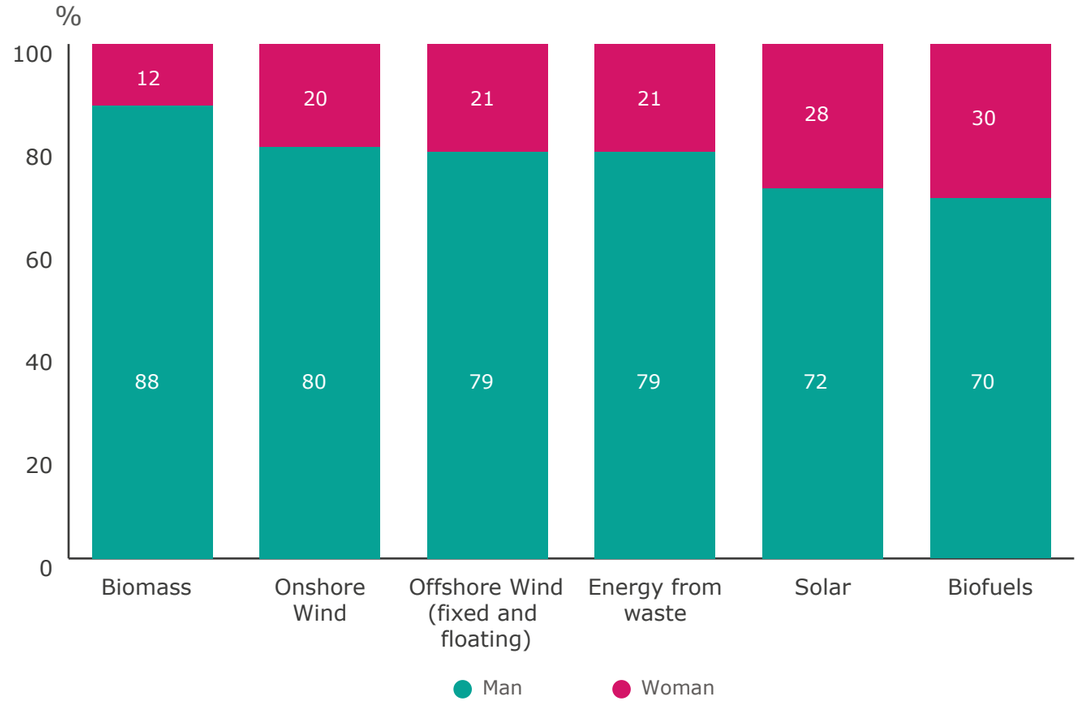
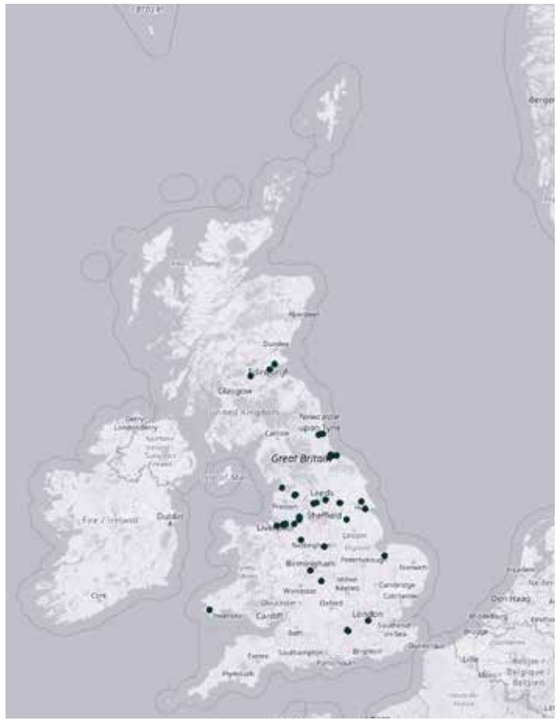


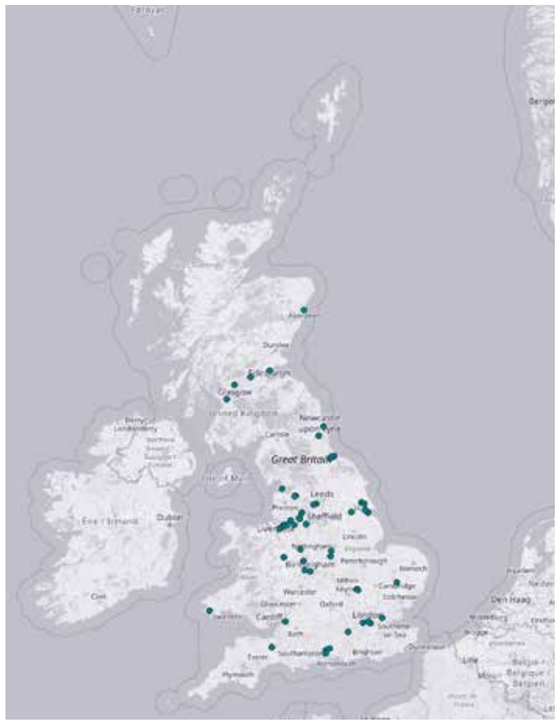
Figure 39: Gender profile of the ECI workforce in the six renewables sub-sectors

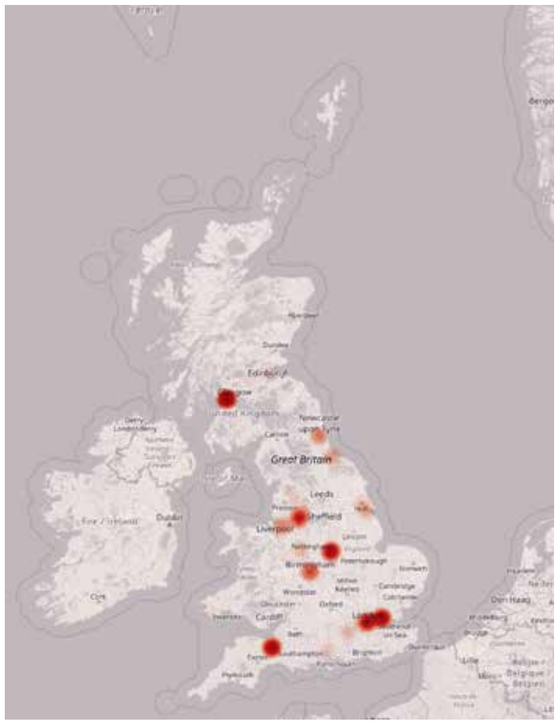


Maps 19 and 20: Location of workers in the biomass sub-sector (data points and heatmap)

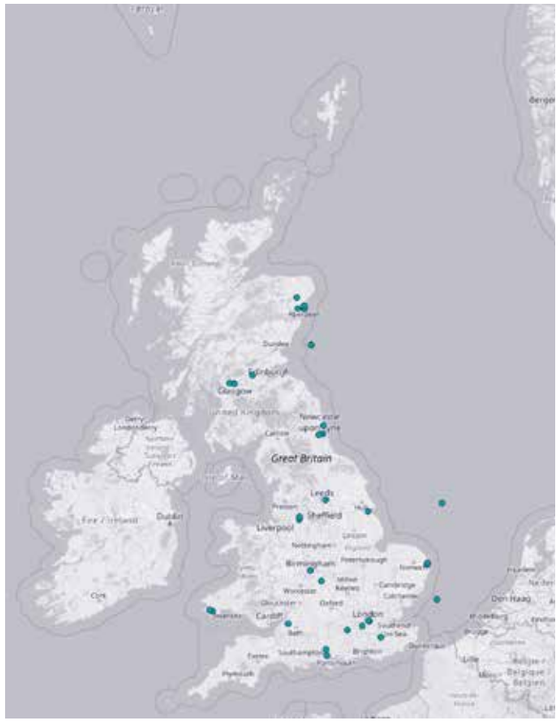


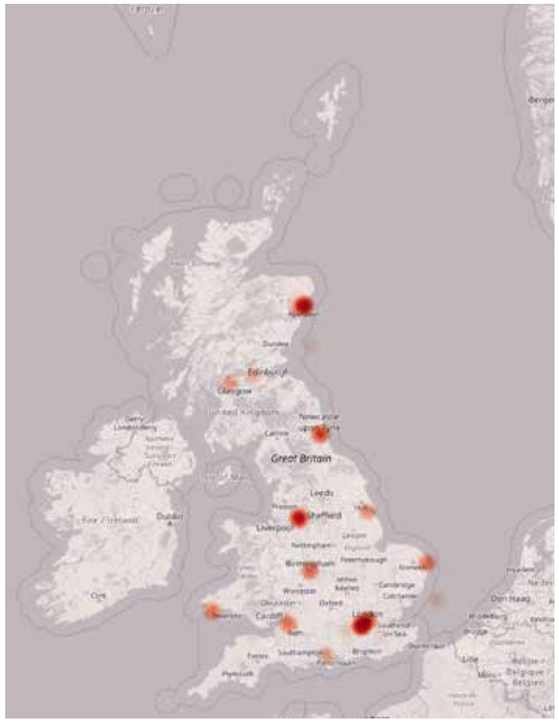
Maps 21 and 22: Location of workers in the energy from waste sub-sector (data points and heatmap)



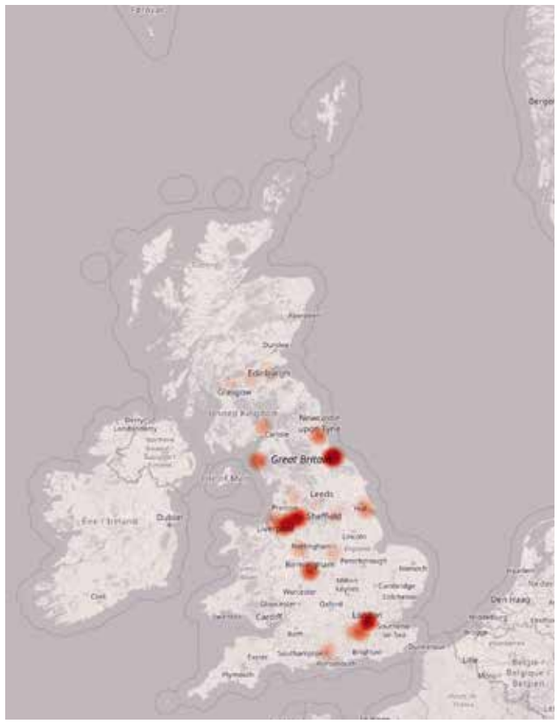


Maps 23 and 24: Location of workers in the offshore wind sub-sector (data points and heatmap)

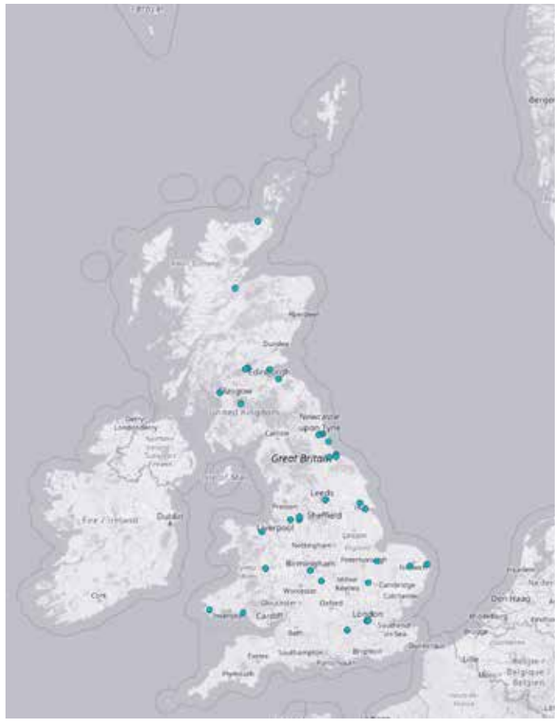


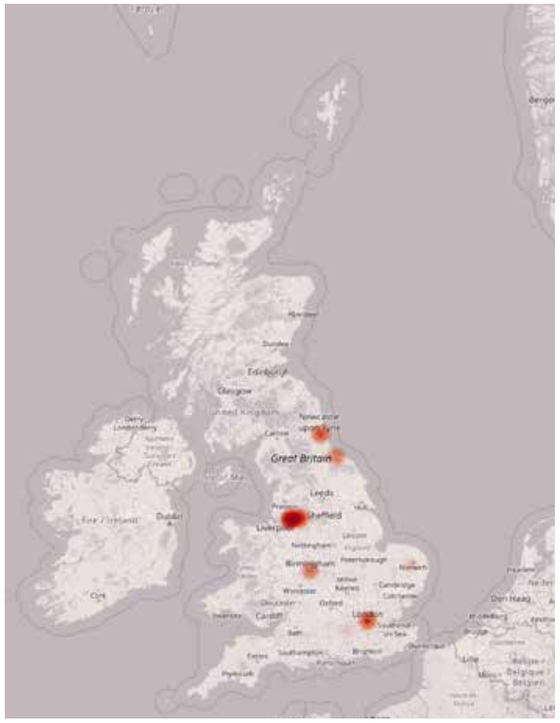


Maps 25 and 26: Location of workers in the biofuels sub-sector (data points and heatmap)

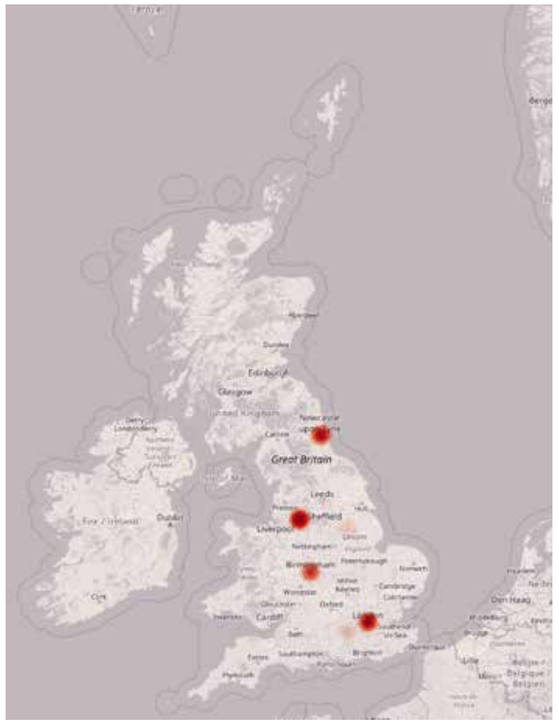


Maps 27 and 28: Location of workers in the onshore wind sub-sector (data points and heatmap)





Maps 29 and 30: Location of workers in the solar sub-sector (data points and heatmap)



Water and waste treatment (2.9% - 2,700 workers)

The water and waste treatment sector employs 2.9% of the engineering construction workforce, a significant increase from the 1% recorded in 2021. This growth is partly due to the sector's previous underrepresentation in the 2021 data. The 2024 data now includes a greater proportion of office-based workers from the sector. Additionally, the timing of the 2024 Census coincides with the end of the current five-year asset management plan (AMP7), which concludes in April 2025, a period when much of the project work is carried out and design work for the next period is ramping up.

This cyclicality negatively impacts the sector's efficiency by reducing employee security and deterring potential new entrants, while also driving up costs. Greater workforce transferability would allow contractors to work in other sectors before returning to the water sector during peak spending periods. The sector is benefitting from record levels of investment, £96 billion for AMP8, with even more needed in the coming decades to upgrade the existing infrastructure and install cutting-edge technology[44]. However, although innovations could improve efficiency by addressing leakage issues or enhancing data collection and analytics, the sector's supply chain has expressed frustration with the slow pace at which such changes reach maturity[45].

The aforementioned cyclicality has also brought changes to the sector's age profile compared to the first iteration of the census in 2021. Workers below 30 now represent 23% of the workforce, six percentage points higher than in 2021 and exceeding the 2024 ECI value by the same margin[46]. The sector's workforce is more ethnically diverse than the wider industry, with 11.9% identifying as from ethnic minority groups compared to 7.5% in the industry.

The water and waste treatment sector is slightly more balanced in terms of gender, with women making up 20% of the workforce compared to 17% in the wider industry. In 2021, women represented just 13% of the sector's workforce. However, the greater inclusion of office-based workers in the 2024 data (therefore including occupations that typically have a more balanced gender split compared to site-based roles) partly explains this increase. While the sector's reliance on non-UK workers aligns with the wider industry at nearly 5%, dependence on EU workers is very limited (<1%).

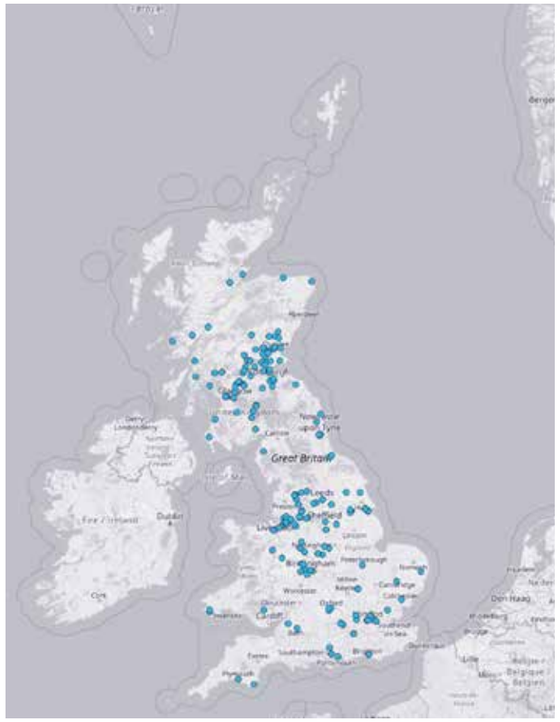
The most important occupations by workforce size in the sector include mechanical fitters, pipefitters, electricians, electrical fitters, scaffolders, planners, commercial support staff, project managers, commissioning engineers and design technicians. Key workforce hotspots can be found in Glasgow, Manchester, Derby, Peterborough, Maple Cross, London and Brighton.

44 Water companies deliver record levels of investment, with even more needed in the coming decades (Water UK – 2024)
45 Building a better UK water sector supply chain (British Water – 2023)
46 Please note that, even considering the changes in the representation of the water and waste treatment sector between the first and second iterations of the census, these increases remain statistically significant.

Employers experiencing difficulties filling vacancies attribute these challenges to a lack of qualifications and skills, as well as insufficient resources to offer competitive compensation to potential new entrants. Occupations such as pipefitters, welders, site managers, electricians and design engineers are frequently mentioned as being difficult to recruit.

Employers in the water treatment sector expect their workforce to increase by 16%, a four-percentage-point difference from the industry-wide estimate of 12%. This positive growth outlook reflects historically high investments and the likelihood that such investment will continue to sustain the sector's activities in the coming years.

Maps 31 and 32: Location of workers in the water and waste treatment (data points and heatmap)



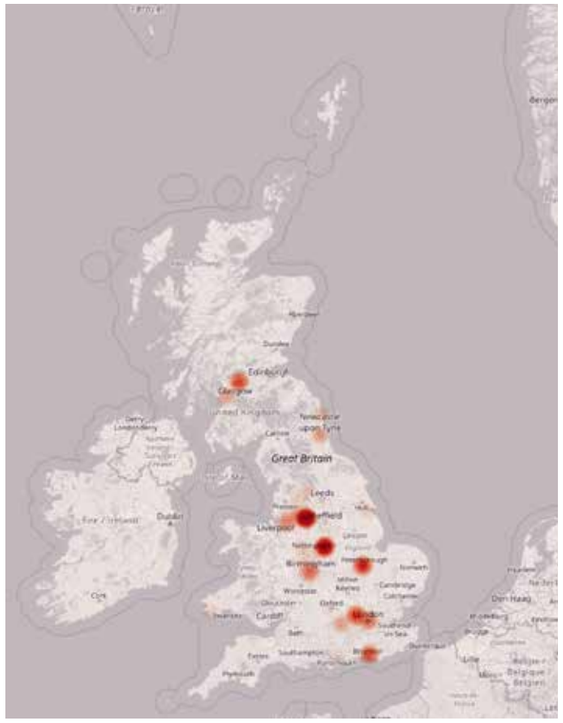


Table 10: Workforce in the water and waste treatment sector by occupation

Apprentices and trainees	**27**
Other apprentices and trainees[47]	27
Craft	**554**
Mechanical fitting craft	197
Pipefitting craft	83
Electrical craft	72
Scaffolding craft	69
Electrical fitters craft	50
Rigging craft	18
Welding and fabricators craft	14
Pipefitters and mechanical fitting craft	12
Instrument pipefitters craft	11
Fabrication craft	11
Other craft	17
Engineers	**320**
Commissioning engineers	66
Electrical engineers	29
Project engineers	28
Mechanical engineers	25
Process engineers	24
Proposals engineers	22
Insulation engineers	16
Instrumentation and control engineers	13
Electrical, instrumentation and control engineers	11
Design engineers	11
Systems engineers	10
Other engineers	63
Managers	475
Project managers	318
Human resources managers	32
Other directors managers	24
Technologists managers	22
Commercial managers	14
Other managers	65
Professionals	**231**
Planning professionals	58
Procurement professionals	49
Estimating professionals	26
Technologists professionals	22
Quantity surveyors professionals	13
Other professionals	64
Semi-skilled	**41**
Electrical supervisors	18
Other semi-skilled	23
Supervisors	**93**
Electrical technicians	48
General supervisors	14
Other supervisors	31
Support	**408**
Commercial support	135
Administrative support	80
Health and safety support	69
Finance support	55
IT support	42
Other support	28
Technicians	**542**
Design technicians	441
Commissioning technicians	64
General technicians	16
Other technicians	21
Other	**26**

47 Please note that individual occupations with fewer than 10 workers are grouped into 'Other' categories throughout the report.

Figure 40: Age profile of the ECI workforce in the water and waste treatment sector

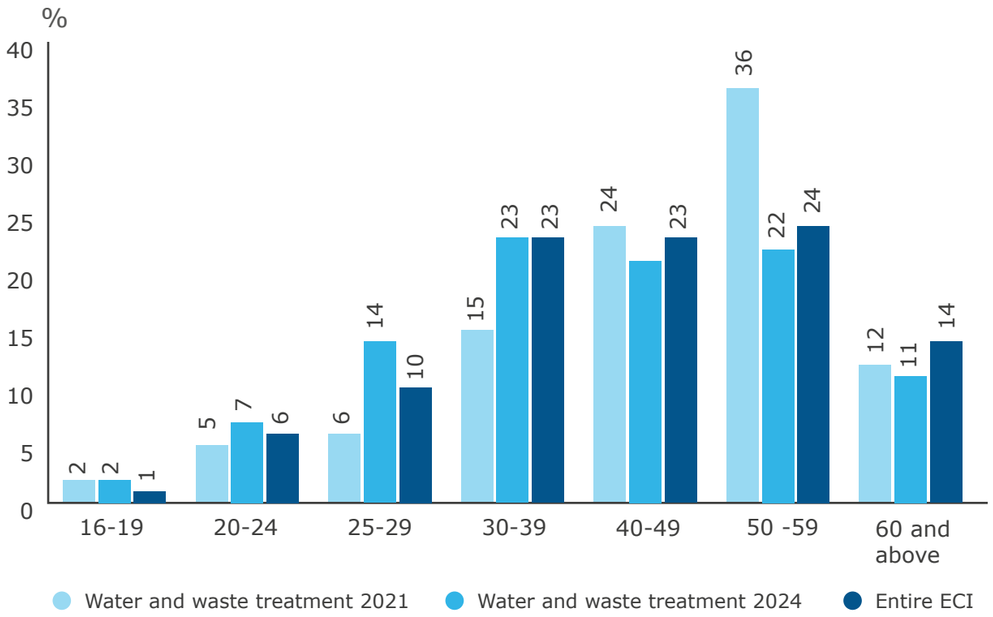


Figure 41: Ethnicity profile of the ECI workforce in the Water and waste treatment sector

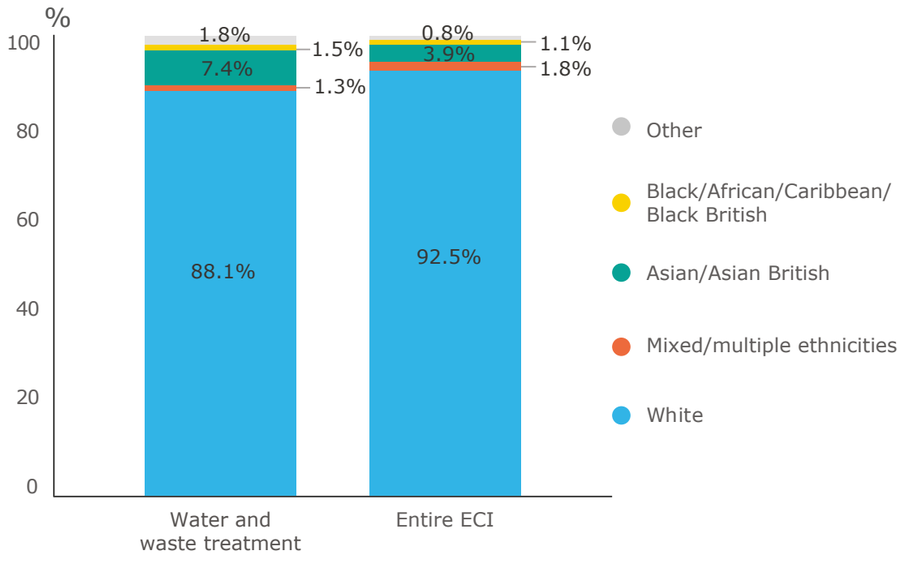


Figure 42: Gender profile of the ECI workforce in the water and waste treatment sector

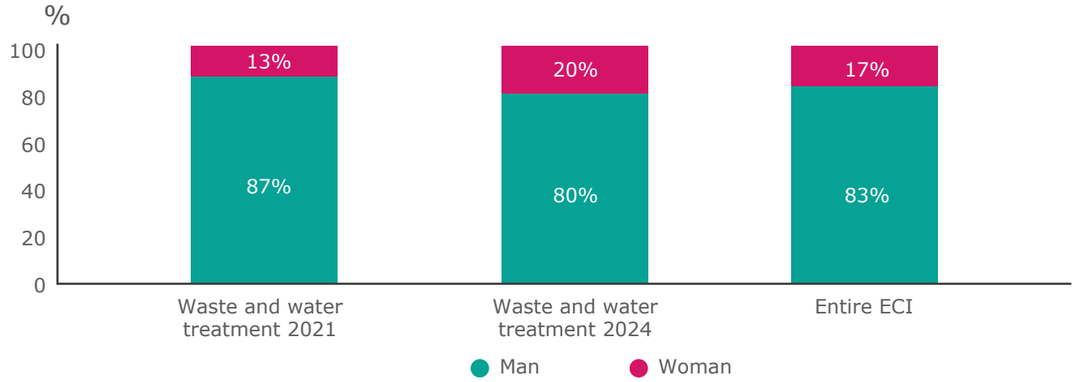
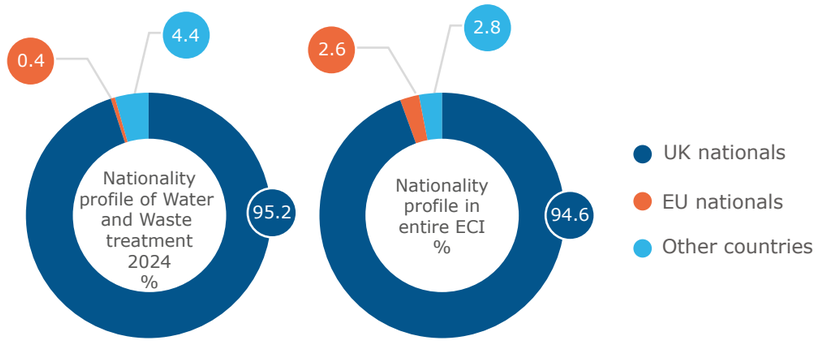


Figure 43: Nationality profile of the ECI workforce in the water and waste treatment sector



Other ECI (1.2% - 1,100 workers)

This section presents the 1.2% of the engineering construction workforce involved in ECI projects not directly linked to the sectors covered in previous sections. This category typically includes smaller engineering construction sectors such as paper mills, vinyl manufacturing, cement plants and steel production. It also includes a small portion of the workforce identified as working in engineering construction sectors not covered in previous sections, but who were not linked to any specific sector, whether due to respondents' confidentiality preferences or because employers do not classify their business within the sectors presented in this report.

Since further disaggregation of this category would not have produced statistically meaningful results, these sectors are all grouped into this separate 'Other ECI' category. However, it is important to note that 53% of the 1,100 workers covered in this section are employed in steel production. Furthermore, data collection for this second iteration of the census took place in May and June 2024, prior to the closures of major furnaces later in the year.[48]

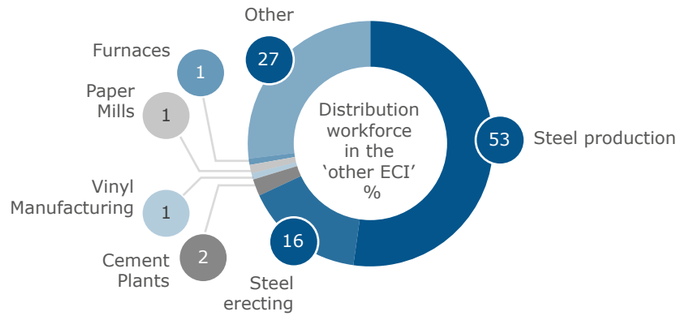
This workforce is primarily located near Sheffield, Birchwood, Scunthorpe, Middlesbrough and Port Talbot.

Secondary workforce hotspots are near Preston, Shotton, London, Coventry and Bournemouth. Steel erectors, mechanical fitters, labourers and general operatives, project engineers and design engineers represent relatively high shares of the workforce in this category.

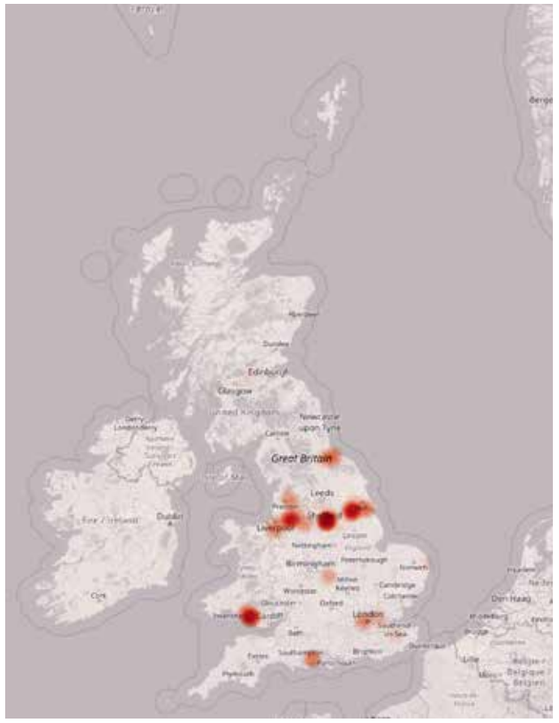
Employers facing difficulties to fill vacancies report challenges for recruiting mechanical fitters, pipefitters, mechanical engineers, electrical engineers and welders. These difficulties are attributed to a lack of qualifications and skills, and also more generally to a volume issue in the total number of applicants. Employers in this category have the lowest growth expectations of all sectors presented in this report. While still positive, the expected 7% workforce growth reflects the negative prospects the steel manufacturing sector faced, which materialised in the closure of significant furnaces just a few months after data collection.

The age profile of the workforce in this category is aligned with that of the entire industry, with the notable exception of the 25 to 29 age group (representing 7% of the other ECI workforce against 10% for the wider industry). The gender and nationality profiles of the workforce in other ECI sectors is well aligned with that of the entire industry.[49]

Figure 44: Distribution of the workforce in the 'other ECI' category



Maps 33 and 34: Location of workers in the 'other ECI' category (data points and heatmap)



48 Britain's biggest steel works to end production after 100 years (Reuters – 2024)
49 Please note that ethnicity data for the other ECI category is not included in this report due to a lack of data.

Table 11: Workforce in the 'other ECI' category by occupation

Apprentices and trainees	**43**
Other apprentices and trainees[50]	43
Craft	**299**
Steel erecting craft	125
Mechanical fitting craft	45
Scaffolding craft	23
Plating craft	19
Welding craft	19
Rigging (steel erectors) craft	12
Pipefitting craft	12
Blasters and painters craft	11
Welding and fabricators craft	11
Electrical craft	10
Other craft	11
Engineers	**215**
Project engineers	28
Design engineers	24
Mechanical engineers	20
Commissioning (mechanical) engineers	17
Process engineers	16
Systems engineers	15
Electrical, instrumentation and control engineers	14
Other engineers	80
Managers	**207**
Other directors managers	40
General management managers	29
Commercial managers	18
Project managers	14
Engineering management managers	13
Other managers	93
Professionals	**56**
Procurement professionals	12
Other professionals	43
Semi-skilled	**62**
Labourers semi-skilled	21
General operatives semi-skilled	17
Crane semi-skilled	12
Other semi-skilled	12
Supervisors	**55**
General supervisors	15
Other supervisors	40
Support	**84**
Administrative support	30
Commercial support	15
Finance support	13
Other support	25
Technicians	**58**
Design technicians	11
Other technicians	46
Other	**18**

50 Please note that individual occupations with fewer than 10 workers are grouped into 'Other' categories throughout the report.

Figure 45: Age profile of the ECI workforce in the 'other ECI' category

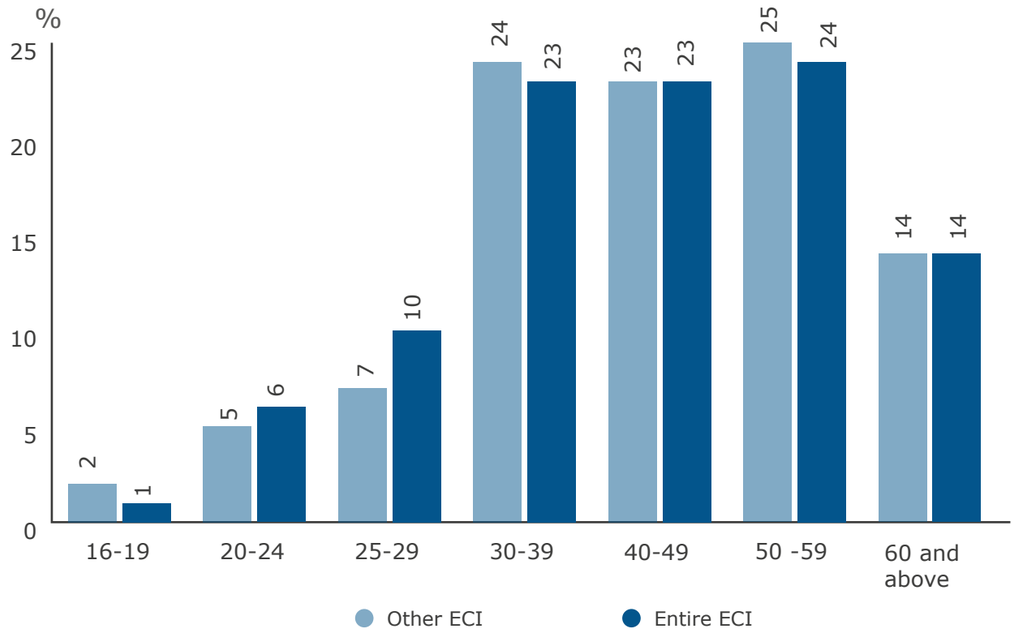


Figure 46: Gender profile of the ECI workforce in the 'other ECI' category

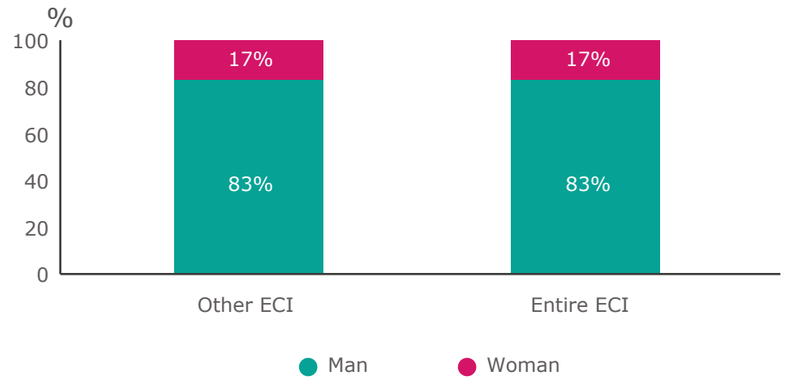
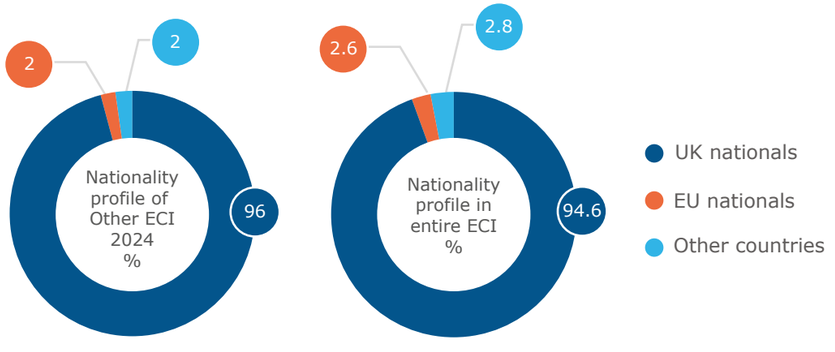


Figure 47: Nationality profile of the ECI workforce in the 'other ECI' category



Non ECI (2.3% - 2,200 workers)

This section covers the 2.3% of the workforce employed by engineering construction companies involved in projects outside of engineering construction. The four main industries where this workforce operates are defence (39%), rail (17%), construction (e.g. houses, schools, hospitals) and utilities (11%). The remaining 17% includes industries such as robotics, aerospace and automotive, but also a portion of the workforce identified as working in non ECI sectors who were not linked to any specific industries because of respondents' confidentiality preferences.

In 2021, the percentage of workers engaged in non-ECI activities was 6.9%, marking a steep decrease in just three years and reflecting a strong refocus on core ECI activities. This shift can be attributed to positive industry prospects, which have increased the certainty and viability of certain projects. However, it raises questions about the feasibility of other sectors recruiting from the engineering construction industry in the current climate, as well as the transferability of skills from the ECI to other industries.

It is therefore worth noting the economic context in which these industries operate:

- **Defence:** Growth prospects will greatly depend on the outcome of the recent Statement of Intent released in December 2024, with industry responses expected by February 2025[51].
- **Rail:** The industry has welcomed the Government's plans to devolve more power and funding to local leaders across England, signalling a fundamental shift in how rail services and skills are managed. However, the full impact will depend on how these changes are implemented[52].
- **Construction:** The workforce is expected to increase by 0.6% annually on average up to 2028 to meet demand associated with new housebuilding, infrastructure and repair and maintenance opportunities[53].
- **Utilities:** Occupations such as science, research, engineering and technology professionals, as well as skilled metal, electrical and electronic trades are expected to be in high demand up to 2030[54].

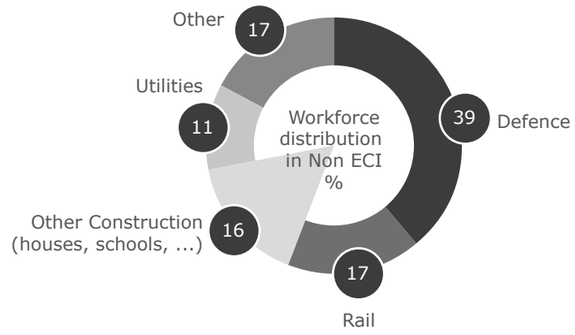
By definition, no employer in the 2024 census employs the majority of its workforce in a non-ECI sector. As such, data on hiring difficulties largely reflects challenges experienced in ECI sectors. Nevertheless, employers significantly involved in non-ECI work[55] report difficulties recruiting HV electricians, welders, mechanical engineers, electrical engineers and design engineers.

Currently, key occupations in the workforce of engineering construction employers engaged in non-ECI activities include steel erectors, electrical fitters, electrical engineers, project engineers, project managers, mechanical engineers, process engineers and electrical technicians. Major workforce hotspots include Aberdeen, Middlesbrough, Warrington to Manchester, Immingham, Birmingham, London and Tadley.

This workforce is generally younger than the overall ECI workforce, with 44% of non-ECI workers aged over 40, compared to 61% across the entire industry. There is also a strong overrepresentation in the 30–39 age group (+11 percentage points). Additionally, this workforce is more ethnically diverse, with 14.2% identifying as being from an ethnic minority background compared to 7.5% in the wider ECI workforce.

The gender profile is also more balanced, with women representing 23% of non-ECI workers, compared to 17% in the entire ECI. Finally, the percentage of non-UK workers remains low at 2.2%, versus 5.4% in the wider ECI.[56]

Figure 48: Distribution of the workforce in the 'Non ECI' category



51 Defence Industrial Strategy – Statement of Intent (Ministry of Defence – 2024)
52 Policy update: Devolution white paper (NSAR – 2024)
53 Focusing on the skills construction needs (CITB – 2024)
54 Workforce demand estimates – 2024 to 2030 (EU Skills – 2024)
55 i.e. employers with between 25% and 50% of their workforce involved in non ECI projects.

56 Please note that workforce growth expectations for non-ECI sector are not included in this report due to a lack of data.

Maps 35 and 36: Location of workers in the 'Non ECI' category (data points and heatmap)

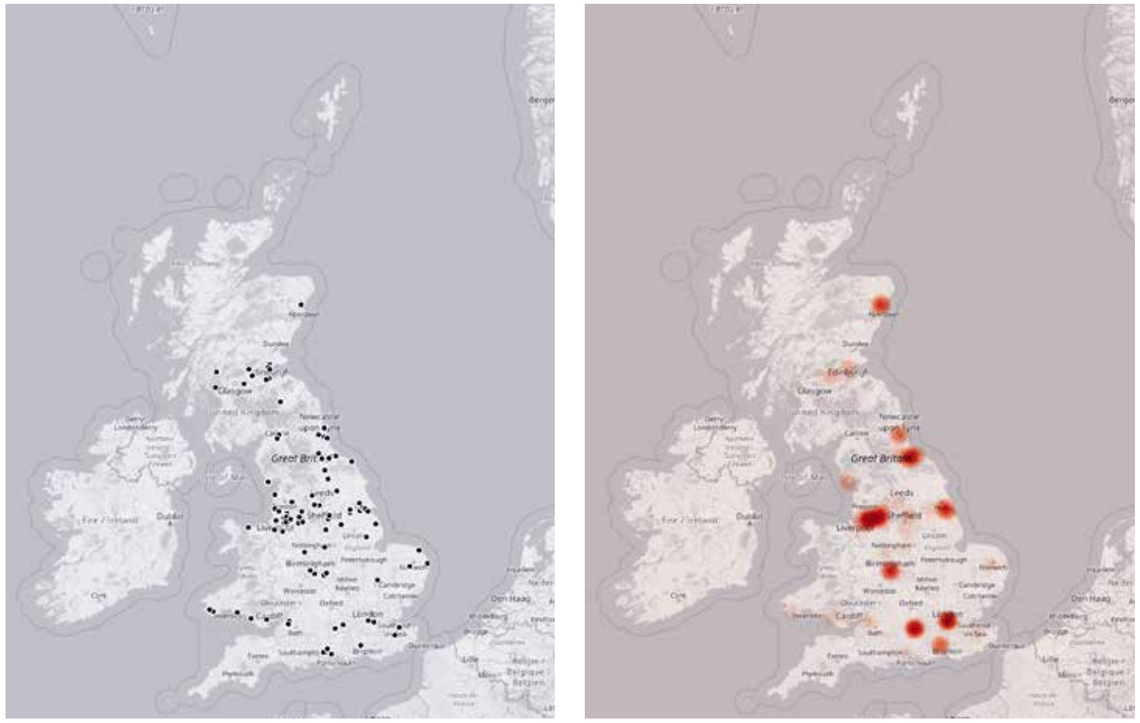


Table 12: Workforce in the 'non ECI' category by occupation

Apprentices and trainees	58
Electrical apprentices and trainees	18
Other apprentices and trainees[57]	40
Craft	**315**
Steel erecting craft	79
Electrical fitters craft	56
Scaffolding craft	24
Pipefitting craft	24
Mechanical fitting craft	24
Welding craft	17
Plating craft	13
Electrical craft	13
Welding and plating craft	11
Blasters and painters craft	11
Other craft	43

Engineers	532
Electrical engineers	90
Project engineers	57
Mechanical engineers	48
Process engineers	44
Commissioning engineers	34
Systems engineers	30
Electrical, instrumentation and control engineers	30
Design engineers	18
Commissioning (mechanical) engineers	17
IT engineers	17
Construction engineers	14
Structural engineers	14
Civil and structural engineers	12
Other engineers	106

Managers	384
Project managers	132
Other directors	29
Commercial managers	27
General management managers	21
Operations managers	17
Engineering management managers	14
Human resources managers	11
Other managers	132
Professionals	**208**
Planning professionals	47
Quantity surveyors professionals	18
Procurement professionals	15
Health and safety professionals	14
Document controls professionals	12
Quality assurance/quality controls professionals	12
Technologists professionals	12
Other consultants professionals	11
Estimating professionals	11
Project controls professionals	11
Other professionals	45
Semi-skilled	**89**
General operatives semi-skilled	23
Labourers semi-skilled	18
Electrical supervisors	12
Other semi-skilled	36

Supervisors	169
Electrical technicians	43
Site supervisors	26
General supervisors	19
Electrical technicians	14
Testing supervisors	10
Other supervisors	56
Support	**228**
Administrative support	100
Finance support	34
Commercial support	15
Human resources support	11
Site support	11
Other support	57
Technicians	**161**
Design technicians	32
General technicians	19
Quality assurance/quality controls (electrical) technicians	17
Non-destructing testing technicians	17
Other technicians	76
Other	**35**

57 Please note that individual occupations with fewer than 10 workers are grouped into 'Other' categories throughout the report.

Figure 49: Age profile of the ECI workforce in the 'Non ECI' category

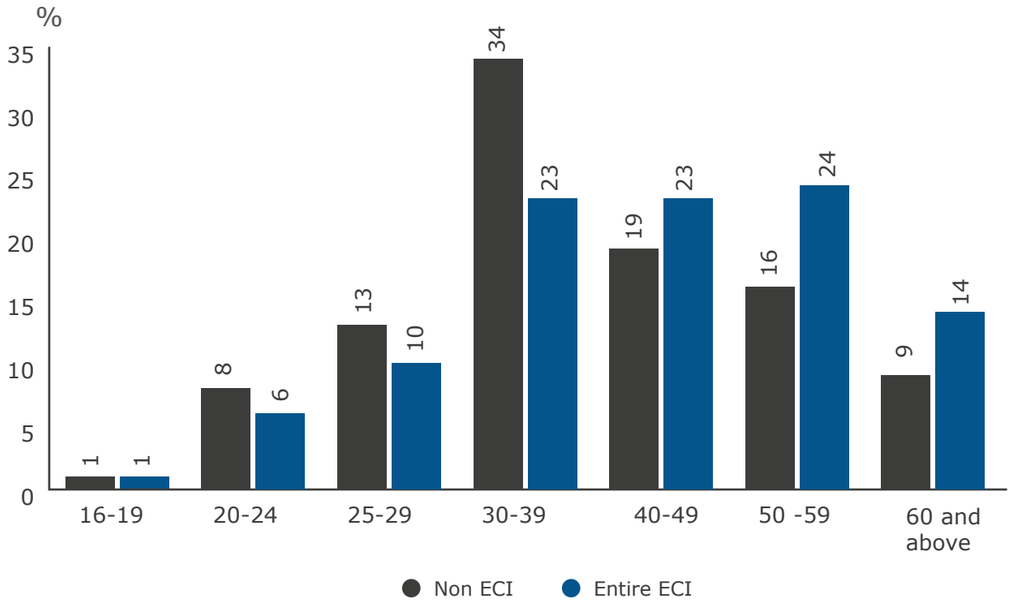


Figure 50: Ethnicity profile of the ECI workforce in the 'Non ECI' category

Figure 51: Gender profile of the ECI workforce in the 'Non ECI' category

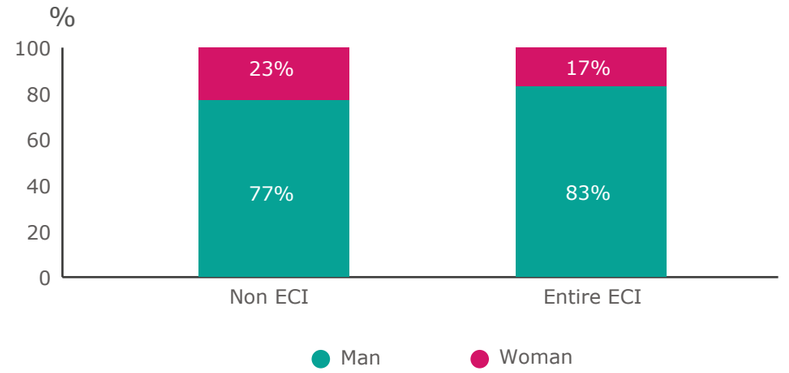
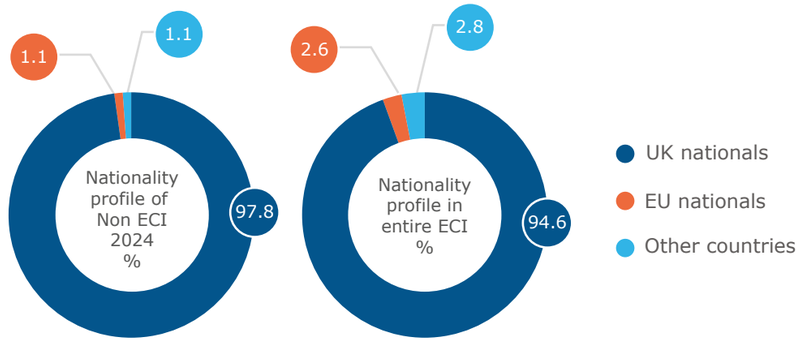


Figure 52: Nationality profile of the ECI workforce in the 'Non ECI' category



Annex

Table 6: Workforce in the nuclear sector by occupation

Apprentices and trainees	1,174
Maintenance apprentices and trainees	80
Electrical apprentices and trainees	77
Welding apprentices and trainees	66
Health physics apprentices and trainees	61
Project management apprentices and trainees	42
Project controls apprentices and trainees	39
Instrumentation and control apprentices and trainees	36
Nuclear apprentices and trainees	32
IT apprentices and trainees	31
Maintenance (mechanical) apprentices and trainees	29
Pipefitting apprentices and trainees	27
Scaffolding apprentices and trainees	27
Radiological protection apprentices and trainees	26
Design (mechanical) apprentices and trainees	24
Maintenance (electrical) apprentices and trainees	20
Health and safety apprentices and trainees	20
Electrical, instrumentation and control apprentices and trainees	19
Mechanical fitting apprentices and trainees	18
Unidentified engineers apprentices and trainees	18
Civil engineering apprentices and trainees	17
Planning apprentices and trainees	16
Production technicians apprentices and trainees	16
Design apprentices and trainees	15
Quality assurance/quality controls apprentices and trainees	12
Non-destructing testing apprentices and trainees	12
Quantity surveyors apprentices and trainees	12
Administrative apprentices and trainees	11
Other apprentices and trainees	370

Craft	2,061
Scaffolding craft	658
Mechanical fitting craft	254
Blasters and painters craft	166
Rigging craft	150
Pipefitting craft	121
Welding craft	99
Plating craft	97
Steel erecting craft	91
Electrical fitters craft	76
Joiners craft	57
Carpentry craft	43
Instrumentation and control craft	42
Decommissioning craft	39
Electrical craft	25
Grinders craft	23
Fabrication craft	17
Insulation craft	13
Other craft	89
Engineers	**7,046**
Project engineers	1,239
Mechanical engineers	755
Systems engineers	540
Waste engineers	332
Site engineers	313
Cost engineers	296
Operations engineers	286
Electrical, instrumentation and control engineers	265
Commissioning engineers	253
Radiological protection engineers	240
Process engineers	234
Safety case engineers	223
Health and safety engineers	177
Electrical engineers	158
Civil engineering engineers	153
Insulation engineers	145
Maintenance engineers	145
Design engineers	91
Instrumentation and control engineers	89
Quality assurance/quality controls engineers	86

Nuclear engineers	74
Civil and structural engineers	72
Structural engineers	66
Environmental engineers	64
Civil, structural and architectural engineers	61
Asset management engineers	42
IT engineers	41
HVAC engineers	41
Piping engineers	41
Compliance engineers	31
Construction engineers	30
Robotics engineers	27
Chemicals engineers	26
Commissioning (mechanical) engineers	25
Welding engineers	25
Automation engineers	23
Materials engineers	23
Integration engineers	23
Design (mechanical) engineers	20
Planning engineers	17
Data and analysis engineers	15
Design (electrical) engineers	14
Non-destructing testing engineers	14
Naval engineers	14
Project (mechanical) engineers	13
Project (electrical) engineers	12
Safety engineers	12
Design (scaffolding) engineers	12
Asbestos removal engineers	10
Other engineers	135
Managers	**9,011**
Project managers	2,481
Commercial managers	446
General managers	407
Operations managers	383
Other directors	323
Health and safety managers	315
Engineering management managers	295
Construction managers	281
Human resources managers	274
Site management managers	245
Quality assurance/quality controls managers	231
Planning managers	220
Waste managers	195
Project controls managers	162
Finance managers	158
Supply chain managers	154
IT managers	118
Integration managers	108
Maintenance managers	96
Risk managers	91
Legal and compliance managers	91
Technologists managers	90
Radiological protection managers	90
Environmental managers	88
Safety case managers	84
Commissioning managers	76
Project (IT) managers	73
Communications managers	73
Security managers	65
Facilities managers	64
Learning and development managers	61
Procurement managers	60
Testing managers	59
Asset managers	59
Process managers	58
Contracts managers	53
Technical managers	51
Strategy managers	51
Design managers	49
Electrical professionals	46
Civil engineering managers	39
Document controls managers	28
Compliance managers	26
Cost controls managers	26
IT (cybersecurity) managers	25
Logistics managers	24
Systems managers	24
Project engineering managers	23
Estimating managers	21
Presidents	21
Decommissioning managers	20
Waste (supply chain) managers	20
Other managers	18
Proposals managers	18
Mechanical managers	17
Administrative managers	16
Project (waste) managers	16
Electrical, instrumentation and control managers	15
Marketing managers	15
Project (health and safety) managers	13
Data and analysis managers	12
Materials managers	12
Decommissioning (waste) managers	11
Other managers	224
Professionals	**5,444**
Planning professionals	620
Data and analysis professionals	576
Quality assurance/quality controls professionals	510
Waste professionals	414
Other consultants professionals	345
Health and safety professionals	329
Health physics professionals	271
Quantity surveyors professionals	267
Technologists professionals	215
Document controls professionals	186
Procurement professionals	152
Project controls professionals	139
IT professionals	138
Environmental professionals	138
Radiological protection professionals	94
Estimating professionals	87
Physicists professionals	60
Supply chain professionals	56
Human resources professionals	53
IT (cybersecurity) professionals	50
Legal and compliance professionals	47
Risk professionals	46
Learning and development professionals	33
Logistics professionals	31
Cost controls professionals	30
Materials professionals	30
Products professionals	30
Process professionals	27
Chemicals professionals	26
Compliance professionals	23
Surveyors professionals	23
Construction professionals	22
Corrosion professionals	22
Training professionals	21
Communications professionals	20
Commercial professionals	20
Geotechnical professionals	19
Safety case professionals	19
Other professionals	18
Decommissioning professionals	17
Security professionals	17
Finance professionals	14
Electrical semi-skilled	13
Nuclear professionals	11
Other professionals	166
Semi-skilled	**2,567**
General operatives semi-skilled	830
Decommissioning semi-skilled	444
Labourers semi-skilled	237
Security semi-skilled	234
Operators semi-skilled	178
Asbestos removal semi-skilled	104
Scaffolding semi-skilled	78
Cleaning semi-skilled	59
Electrical supervisors	54
Drivers semi-skilled	44
Insulation semi-skilled	43
Environmental semi-skilled	42
Radiological protection semi-skilled	26
Waste semi-skilled	20
Quality assurance/quality controls semi-skilled	13

Materials semi-skilled	10
Other semi-skilled	152
Supervisors	**2,505**
General supervisors	362
Electrical technicians supervisors	258
Security supervisors	210
Decommissioning supervisors	141
Scaffolding supervisors	139
Mechanical fitting supervisors	104
Waste supervisors	100
Operations supervisors	91
Maintenance supervisors	79
Radiological protection supervisors	62
Asbestos removal supervisors	60
Welding supervisors	54
Health physics supervisors	50
Architectural supervisors	34
Insulation supervisors	31
Commissioning supervisors	29
Pipefitting supervisors	23
Labourers supervisors	23
Rigging supervisors	23
Safety supervisors	22
Civil engineering supervisors	22
Construction supervisors	21
Steel erecting supervisors	21
Plating supervisors	19
Site supervisors	16
Facilities management supervisors	15
Non-destructing testing supervisors	15
Blasters and painters supervisors	13
Health and safety supervisors	11
Electrical fitters supervisors	11
General technicians supervisors	10
Other supervisors	435
Support	**2,755**
Administrative support	999
Finance support	317
Project management support	178
Health and safety support	150
Personal assistants support	144
Human resources support	136
Commercial support	98
Facilities management support	94
Radiological protection support	89
IT support	65
Compliance support	63
Communications support	52
Project controls support	50
Legal and compliance support	37
Contracts support	34
Logistics support	30
Other support	28
Supply chain support	25
Operations support	23
Training support	23
Security support	19
Site support	17
Asset management support	14
Data and analysis support	12
Document controls support	11
Learning and development support	11
Other support	36

Technicians	**3,721**
Production technicians	618
Radiological protection technicians	509
General technicians	316
Decommissioning (waste) technicians	234
Production (operations) technicians	206
Production (maintenance) technicians	180
Design technicians	171
Safety technicians	142
Operations technicians	116
Quality assurance/quality controls technicians	106
Waste technicians	99
Design (mechanical) technicians	83
Architectural technicians	83
Maintenance technicians	65
Health and safety technicians	61
Mechanics technicians	59
Maintenance (electrical) technicians	58
General (rope access) technicians	44
Commissioning technicians	33
Materials technicians	32
Design (electrical, instrumentation and control) technicians	32
Design (piping) technicians	32
Production (waste) technicians	28
Non-destructing testing technicians	27
Mechanical technicians	23
Maintenance (mechanical) technicians	22
Production (electrical, instrumentation and control) technicians	22
Quality assurance/quality controls (welding) technicians	19
It technicians	19
Design (electrical) technicians	19
Process technicians	18
Water technicians	18
Commissioning (mechanical) technicians	17
Quality assurance/quality controls (insulation) technicians	16
Design (civil, structural and architectural) technicians	16
Laboratory technicians	15
Decommissioning (health and safety) technicians	15
Quality assurance/quality controls (electrical) technicians	15
Electrical managers	11
Environmental technicians	11
Other technicians	111
Other	**835**

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