ECITB Workforce Census 2021

Overview of the Engineering Construction Industry

Table of Contents

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

Written by:
Franziska von Blumenthal (Policy and Research Manager, ECITB)
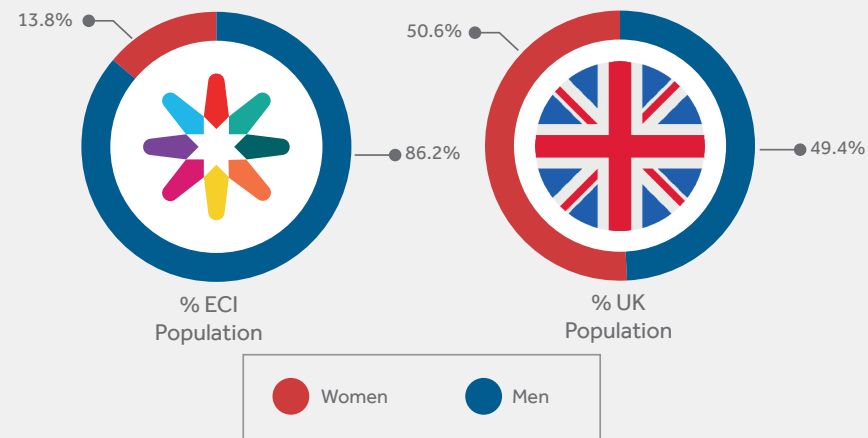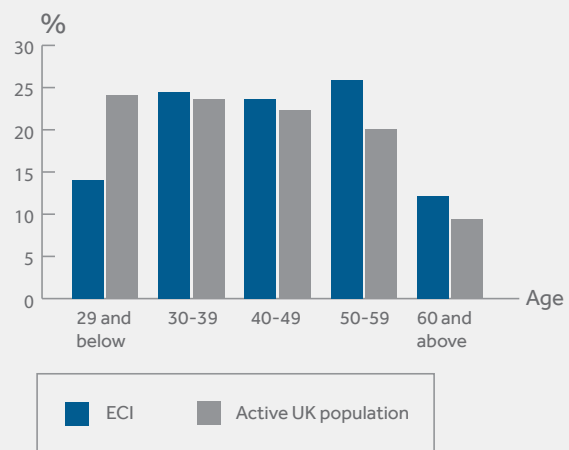**Adrien Boyer Fantini** (Research Analyst, ECITB)

At a glance

Distribution of workers across sectors

- Oil & Gas 37%
- Renewables 3%
- Nuclear 35%
- Food & Drinks 2%
- Chemicals 7%
- Pharmaceutical 2%
- Other non ECI 7%
- Other ECI 2%
- Power Generation 5%
- Water 1%

Gender

13.8%
86.2%
% ECI Population

50.6%
49.4%
% UK Population

- Women
- Men

Age

- ECI
- Active UK population

Workforce growth

100
82
108.4
100.7

- All
- SME
- Large

Brexit

How do you expect your business to be affected by Brexit?
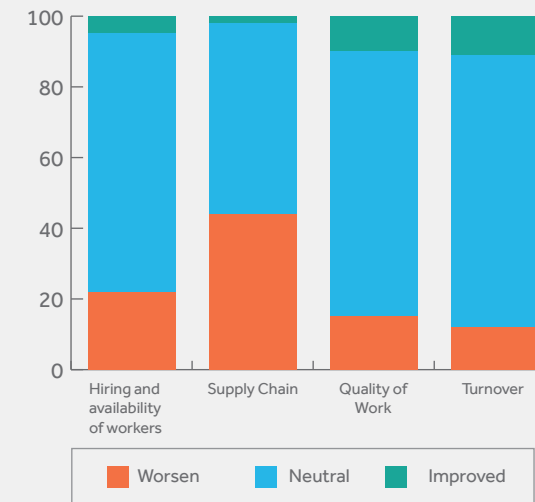
Hiring and availability of workers | Supply Chain | Quality of Work | Turnover

- Worsen
- Neutral
- Improved

Do you feel your business is prepared for the potential changes implied by Brexit?

SME | Large

- Yes
- No
- Don't know
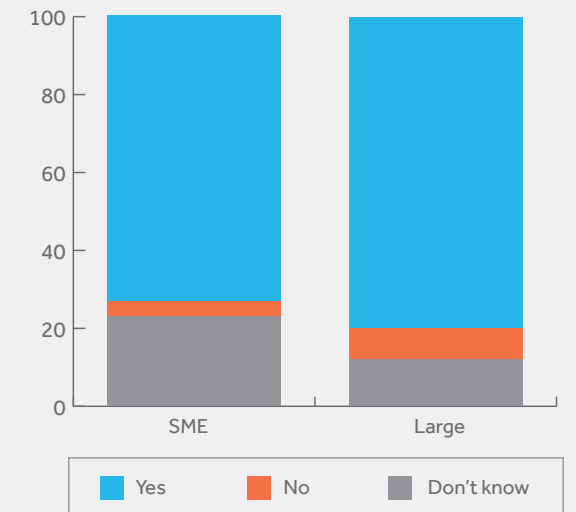
10 ways companies fill their vacancies

- **57%** Word of mouth
- **62%** Agencies
- **4.3%** Local colleges
- **5%** Headhunting
- **2%** From Gov / local authority schemes
- **11.3%** Own company / agency / team
- **12%** Own website
- **35%** Advertising
- **11%** Former workers / train workers
- **37%** Recruitment website / social media

Foreword

Thank you to all the employers who participated in the ECITB's Workforce Census.

The Census has provided us with an up-to-date and detailed snapshot of the engineering construction industry and its current workforce at what is a critical time for our industry. This contemporary industry data is invaluable to the ECITB in responding to your skills needs appropriately and to represent the engineering construction industry accurately in our discussions with government.

By getting a better understanding of workforce demographics we can recognise regional trends, invest to bridge skills shortages and identify opportunities for the transfer of in-demand skills between sectors or areas.

Now we have the strong evidence base from our employers, the ECITB can really get to work to address the current skills requirements of industry as well as identify challenges, looming skills shortages and surpluses and help prepare the workforce for future change.

Chris Claydon
Chief Executive

Executive Summary

In early 2021, the ECITB undertook a Workforce Census of its in-scope companies, which principally aimed to collect and analyse the number and location of people in Engineering Construction Industry (ECI) -specific and supporting roles. The census expanded to include demographic information and perception questions surrounding workforce growth, net zero, Covid-19 and Brexit. This report provides a high level overview of the key findings.

Fifty percent of the ECITB's in-scope employers responded, covering 45,351 workers and 1,360 locations. Over 800 different occupations were identified and consolidated into a shortlist of 140 occupations for the purposes of analysis.

Whilst the findings are based on responses from employers in-scope to the ECITB, we are confident in suggesting that these are representative of the wider industry.

Oil and gas and nuclear remain the largest sectors in terms of workforce, with 37% and 35% of the workforce, respectively. The number of off-site workers across the industry appears to be increasing; further disaggregation is needed to ascertain at the exact split, and this remains a complex task as some roles may be split between site and off-site and particular categories (for instance Supervisors and Engineers) will contain roles with both site and off-site workers.

Specific hotspots have been identified for specific occupations, and these are often linked to a predominant sector. Key hotspots appear to be centred around Teesside, Liverpool, the Humber Bank, Edinburgh and the Central Belt, Aberdeen, and London.

The ECI workforce remains homogenous, with 96% of our sample identifying as white and 86% as male. This is not representative of the UK population as a whole, although we would urge caution from drawing robust conclusions from this until a deeper geographical analysis is conducted.

Age continues to be an issue in the industry with 38% of the workforce over 50 years old and only 14% under the age of 29. This again, is not consistent with the distribution of the active UK population, signalling a very worrying issue. Further study is needed to gain a deeper understanding as to why young people are not entering the industry. Interestingly, qualitative data from employers regarding the difficulties in hiring young people are consistent with previous research undertaken by the ECITB .

Fifty three percent of respondents reported facing difficulties hiring employees. In total, the number of vacancies that these employers struggled to fill in a year is 761. This potentially means that in one year, the ECI struggles to fill vacancies which account for the equivalent of 2.5% of the actual workforce.

In 2021, the ECI workforce as a whole has decreased by 15.25% when compared to 2019, and is expected to recover to 102.40% of the 2019 figure by 2023. Coupled with the identified ageing workforce and the difficulty in hiring new workers, this is an area that requires immediate attention.

The net zero technologies that are perceived as having the most potential in terms of growth are Biofuels, Nuclear, CCS and Hydrogen. Wind power deserves mention here, too. Although not as high up the rankings, Wind was ranked most consistently in terms of potential, as well as ranking well above the remaining areas.

The impact of Covid-19 has been felt across the industry to varying degrees. The stark impact of the pandemic when it hit in March 2020 has now been mitigated and industry appears to have reacted well in 2021. Nevertheless, 69% of our sample have made use of furlough, 30% have experienced delays and downturns in work, 29% have had to make use of redundancies (however, this is predominantly in oil and gas and may be linked to the fall in the oil price rather than to Covid-19 exclusively), and 26% have seen a decrease in turnover. Whilst these figures are linked to Covid-19, we would stress that no causal link was found in the analysis.

With regards to Brexit, the verdict is still out. Whilst a majority of companies declare they are prepared for the potential implications of Brexit, there are concerns surrounding the supply chain in particular. Preparedness does not translate to optimism and the vast majority of the areas of concern identified were ranked as neutral, signalling an element of uncertainty.

01.
Introduction

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 works with employers, governments and many others to attract, develop and qualify personnel across a wide range of craft, technical and managerial disciplines in the industry.

Employers which are mainly engaged in engineering construction work fall within the scope of the ECITB. If such 'in-scope' employers are over a certain size, they are required by law to pay an industrial training levy to the ECITB. However, all in-scope employers, regardless of size, are eligible to receive grants for training undertaken by their workers.

Engineering construction is a complex industry made up of a series of sectors specialising in the processing, maintenance and decommissioning of heavy industry, including the following:

Water Treatment

Oil & Gas (Upstream/Downstream)

Power Generation

Pharmaceuticals

Food & Drink

Chemicals

Renewables

Nuclear
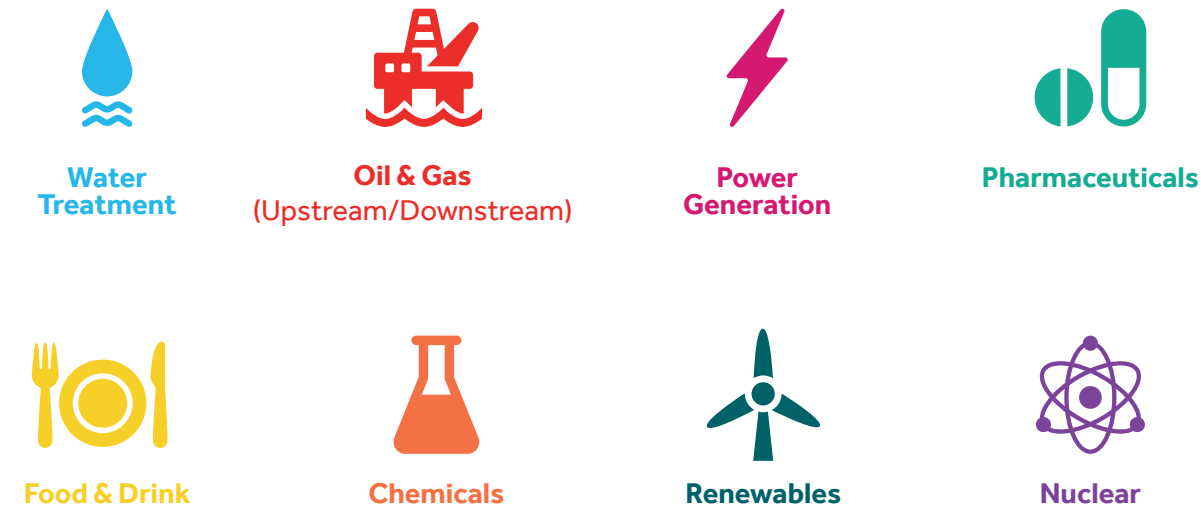
- Other (for example steel processing, fabrication).

Many of the skills and occupations that make up the workforce are shared with other industries, making it difficult to ascertain what the actual size of the workforce is by occupation. Currently, there is no official measure, such as a unique Standard Industrial Classification (SIC) code, which allows for a detailed analysis of the Engineering Construction Industry (ECI) workforce. SIC codes identify high-level sectors such as manufacturing or construction, as well as all the sub-sectors they cover. Moreover, each sub-sector is composed of occupations defined by Standard Occupational Classification (SOC) codes that work in a similar way as SIC codes. The ECI is for now an ensemble of several SOC codes in several SIC codes. This makes for difficulties analysing the level of skills shortages, regional and sectoral skills disparities, the potential for skills transferability both in terms of mobility (be that geographical or between sectors) and in terms of existing skills being contextualised to the net zero agenda, and so forth. Certain 'truths' are universally accepted by industry, but there is a lack of recent evidence that is specific to the ECI to support or refute them; for instance, it is accepted that an ageing

workforce that lacks diversity prevails, but the ECITB's concrete evidence to demonstrate this is now out of date. This hampers an empirical approach to tackle the issues and could lead to under or over estimations, or to misplaced interventions and false conclusions as to why these issues persist. Similarly, effective strategic planning for the future, requires an empirical understanding of the current workforce.

In response, the ECITB launched its 2021 Workforce Census. The Census sought to understand the make-up of the ECI workforce, both in terms of demographics and occupations, as well as what current perceptions regarding Brexit, Covid-19, and workforce growth are. The data was collected on a sectoral and geographic basis to allow for more detailed analysis into the nuances of each sector and geographical region. This report serves as an overview of the industry in its entirety and will cover trends across all sectors and regions. It is, however, the first of a series of reports that will provide detailed breakdowns wherever the data allows.

In February 2021, the ECITB conducted a pilot of its Workforce Census with a group of 6 in-scope employers. Following adjustments, the survey was live between 1st March 2021 and 30th April 2021. The survey was extensive (see Annex A) and was conducted either via telephone interview or completed by employers and returned via email.

A total of 45,351 workers from 153 in-scope establishments (representing 50% of ECITB's in-scope establishments), covering 1,360 locations were captured in the Census. Over 800 occupations were listed; for the purposes of analysis, some of these have been consolidated, resulting in 140 occupations for the purposes of this analysis. A full list of all given occupations and numbers is provided in Annex B.

The survey was designed to capture the state of the ECI at a precise point in time in lieu of an overview of the yearly activity. This approach is helpful for obtaining an accurate representation of the geographic location of the workforce, as well as in which sector each individual is working.

A series of descriptive statistics were produced, along with detailed analysis using a machine learning technique named k-prototype clustering, developed by Z. Huang in 1998 as an extension to the k-means algorithm. This technique allows for analysis on databases composed of both numerical and categorical values. It creates groups of observations (in our case, companies from the ECI) that share similar characteristics. These characteristics are companies' answers to our survey (see Annex A). The k-prototype algorithm ensures that, while sharing characteristics within a group, each group is as different as possible from the others. This is a powerful tool to investigate trends within the ECI.
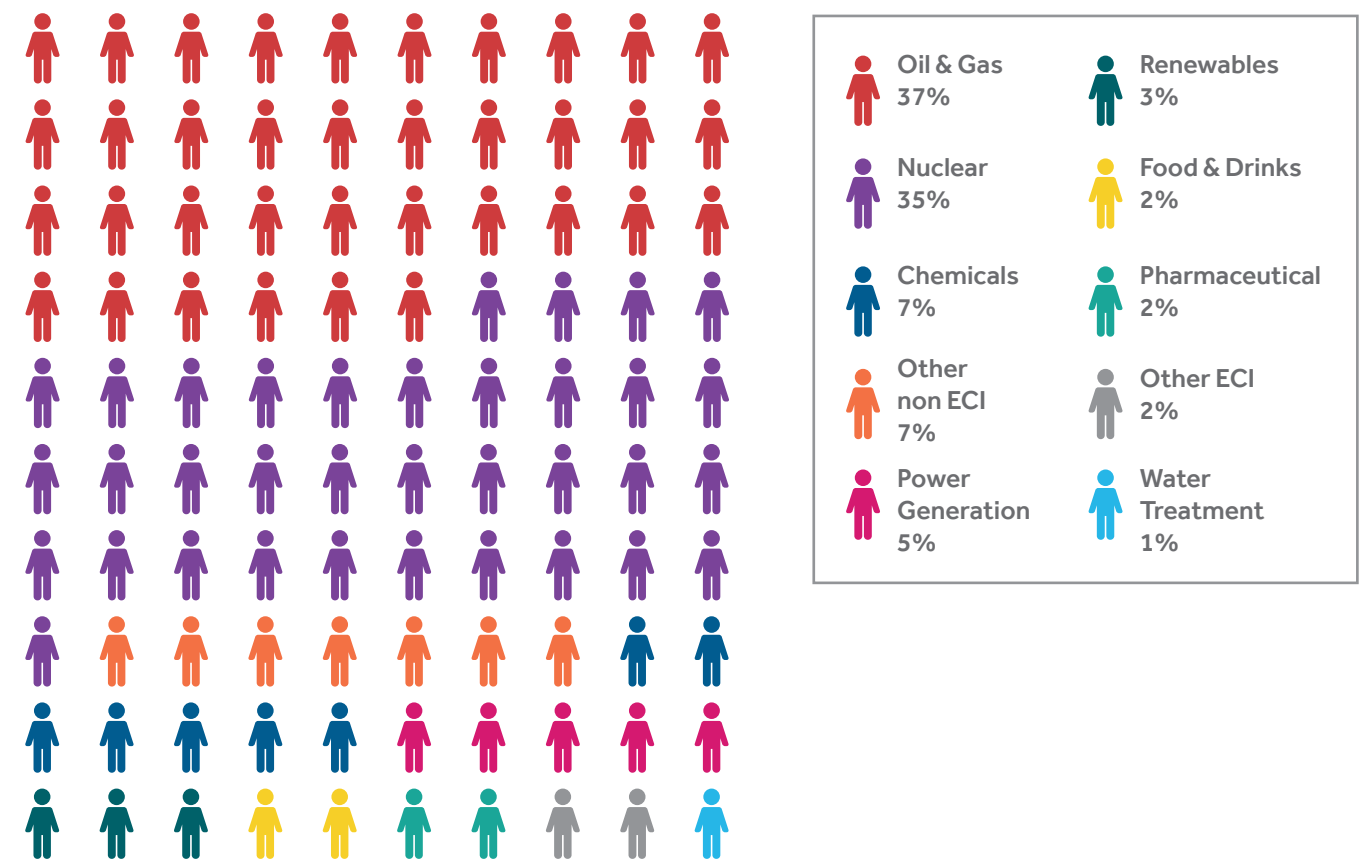
02.
Methodology

Distribution of workers across sectors

This section looks at the distribution of the workforce across the different ECI sectors as well as demographic data. The findings take into account workers based on sites in the UK unless otherwise stated.

The majority of workers covered by the ECITB Workforce Census work in the oil and gas and nuclear sectors (37% and 35% of all workers respectively). This largely correlates to the distribution of ECITB in-scope establishments. During analysis, each company was assigned a 'score' for each sector (other-ECI and other non-ECI were included as 2 distinct sectors). A company with 60% of its site-based workers in renewables and 40% in water treatment, for instance, would score 0.4 under the water treatment category and 0.6 under its renewables category. Companies employing no site-based workforce have equally distributed scores in each sector they are operating in. All other categories (i.e. the remaining sectors) would be scored as 0. By doing this, we are able to base our results on the workforce rather than on companies, and we keep a highly accurate view of the ECI.

Distribution of Census responses by sector:

Oil & Gas 37%	Renewables 3%
Nuclear 35%	Food & Drinks 2%
Chemicals 7%	Pharmaceutical 2%
Other non ECI 7%	Other ECI 2%
Power Generation 5%	Water Treatment 1%

37% of the UK-based ECI workforce is working in Oil & Gas

03.
Findings

These figures also take into account those working in sectors classed 'other non-ECI sites' (7%). Whilst this is a small figure it is a point for thought. Data collection demonstrated that, whilst 51% of all in-scope establishments work exclusively in one sector, others work across multiple sectors.

Looking at the number of companies working in single or multiple sectors, as well as the workforce distribution between ECI and non-ECI sites, we can deduce that there is a level of flexibility; those currently working on 'other non-ECI sites' could potentially be moved to ECI sites in the future. Where the surveys were completed on the phone, it was often confirmed that workers moved between sites with frequency, particularly those employed at SMEs. Whilst this may not be entirely new information, it does suggest that the potential for transferability is greater than previously anticipated, and the barriers are not necessarily at a sector to sector level, but rather on the level of recognition of experience, skill and qualifications of a purely non-ECI worker approaching an ECI employer.

Occupational Data

The Census asked employers to provide data for their workforce by occupation and by location. This allowed for a cross-sectional geographic and sectoral analysis. As each location was linked to a sector, geographic trends were easily highlighted.

Occupations were split into the following general categories which were then made up of specific occupations (for example, within craft, occupations such as welding, pipefitting etc.):

Census Occupational Categories:

Category	Count
Craft	4,436
Semi-skilled	3,612
Technician	6,546
Supervisors	2,535
Engineers	10,849
Management and professional	11,421
Scientists	347
Support staff	4,492
Other uncategorised	1,113

In total, the Census registered 800 occupations, which were consolidated for the purposes of analysis. For a full list with count, please see Annex B.

The table above provides a useful baseline from which to measure any growth or decline in, for instance, occupations that are on-site or off-site based. Whilst the above is representative of the ECITB in-scope workforce, it cannot be concluded at this point that these figures are representative of the wider occupational pools or indeed the entirety of the ECI workforce.

Particularly interesting to note is the high number of people working in the management and professional category; this area takes into account occupations such as directors, project managers, project planners, commercial support, etc. This does not include site supervisors which have been grouped separately. These findings support the thesis that we are seeing an increase in the off-site workforce in the ECI.

It is also interesting to note that the current workforce is made up of more technicians than craftspeople.

In terms of location, we looked at high prevalence occupations (more than 500 people) and identified a series of hotspots. These individuals were also attached to a sector, which corresponded to what we would expect to find in the geographical analysis.

Figure 1

Occupation: Pipefitters (869 individuals, 19.50% of craft workers)
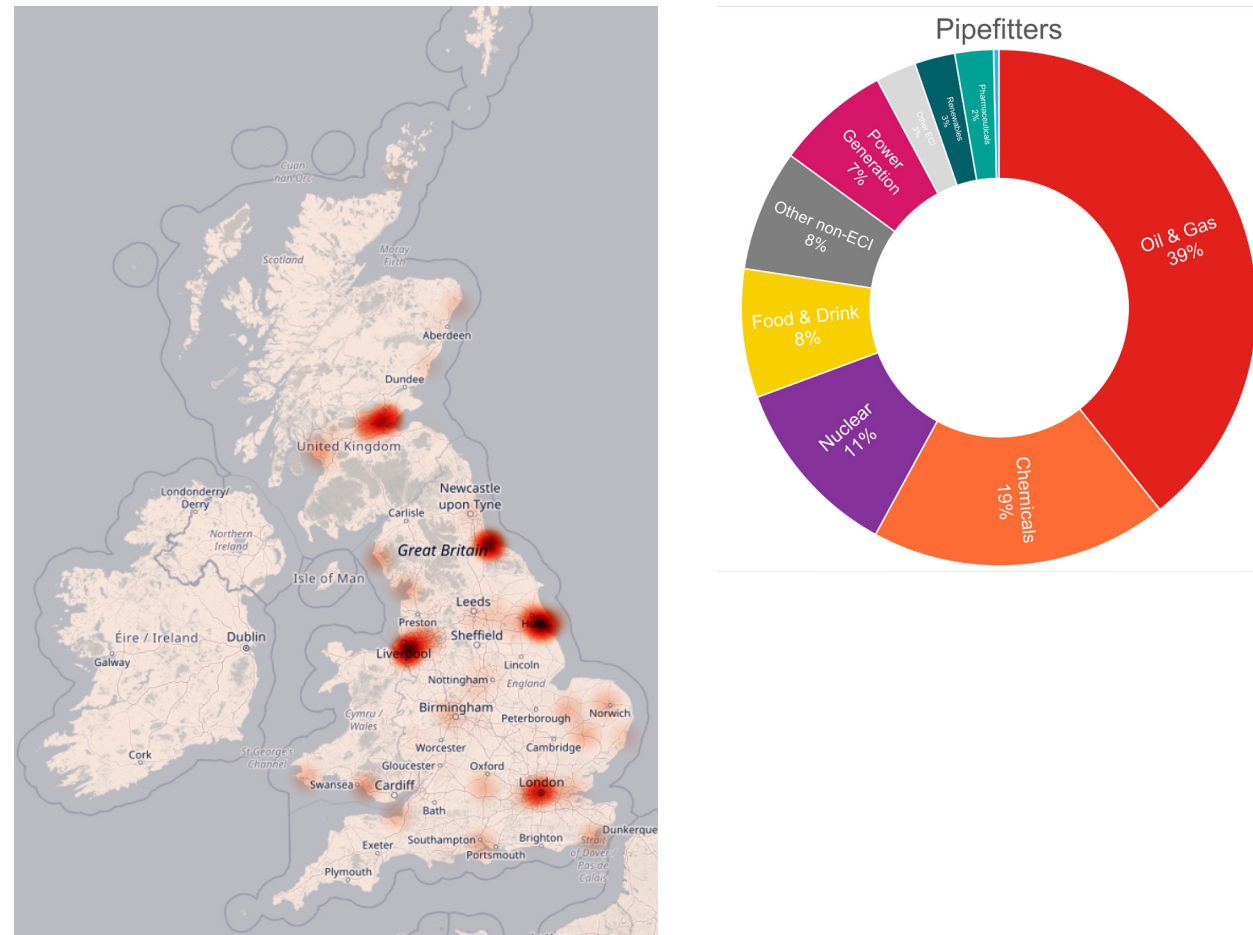

Pipefitters

Figure 1 shows that 39% of all pipefitters in the Census database work in the oil and gas sector and are concentrated in the hotspots around Liverpool, the Humber Banks and Teesside. Other areas of concentration are around London and Edinburgh and the Central Belt.

Figure 2

Occupation: Production or Process operators (1990 individuals, 30.50% of technicians)

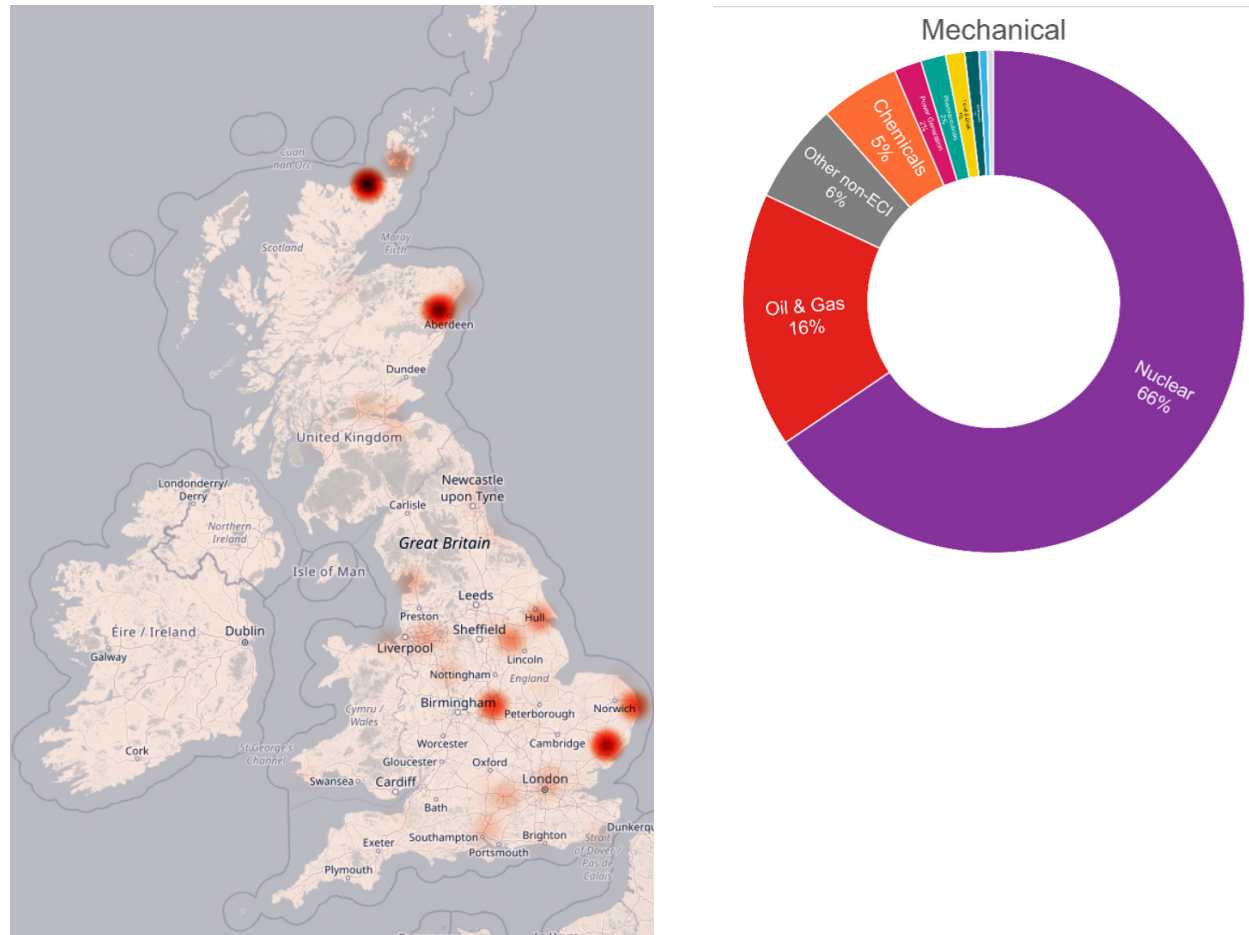Production or Process Operators
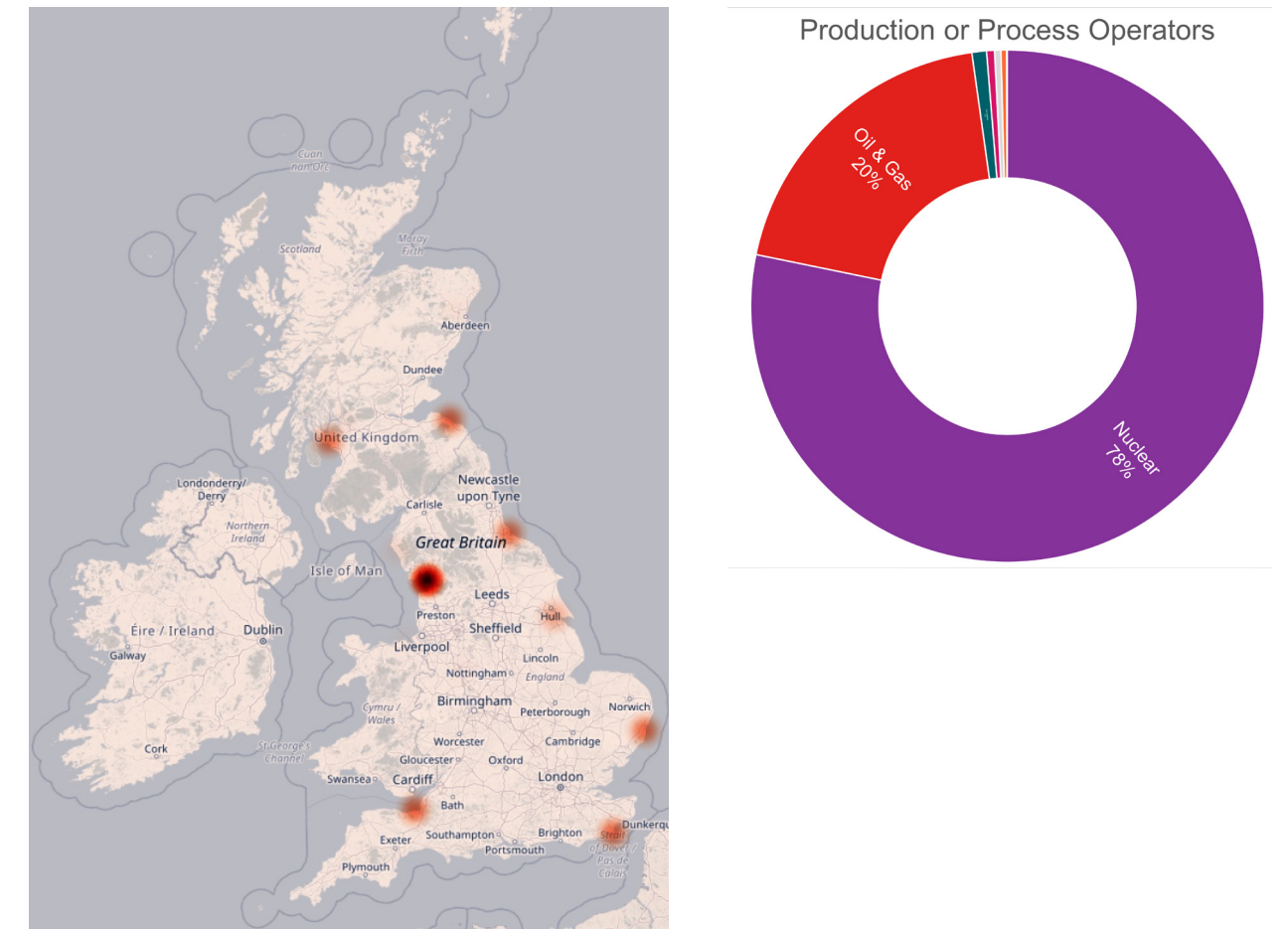
In cases such as Figure 2, where an occupation is predominantly linked to one sector and one location, caution would be advised in drawing wider conclusions as this could be indicative of project-specific occupations.

Figure 3

Occupation: Mechanical (2433 individuals, 22.50% of engineers

Within the engineering category we observed a greater geographical spread for mechanical engineers than any other. This occupation was also the most populous in the category, but is again dominated by one sector, namely nuclear.

This report will be followed by sector specific reports which will discuss the distribution of these findings in more detail.
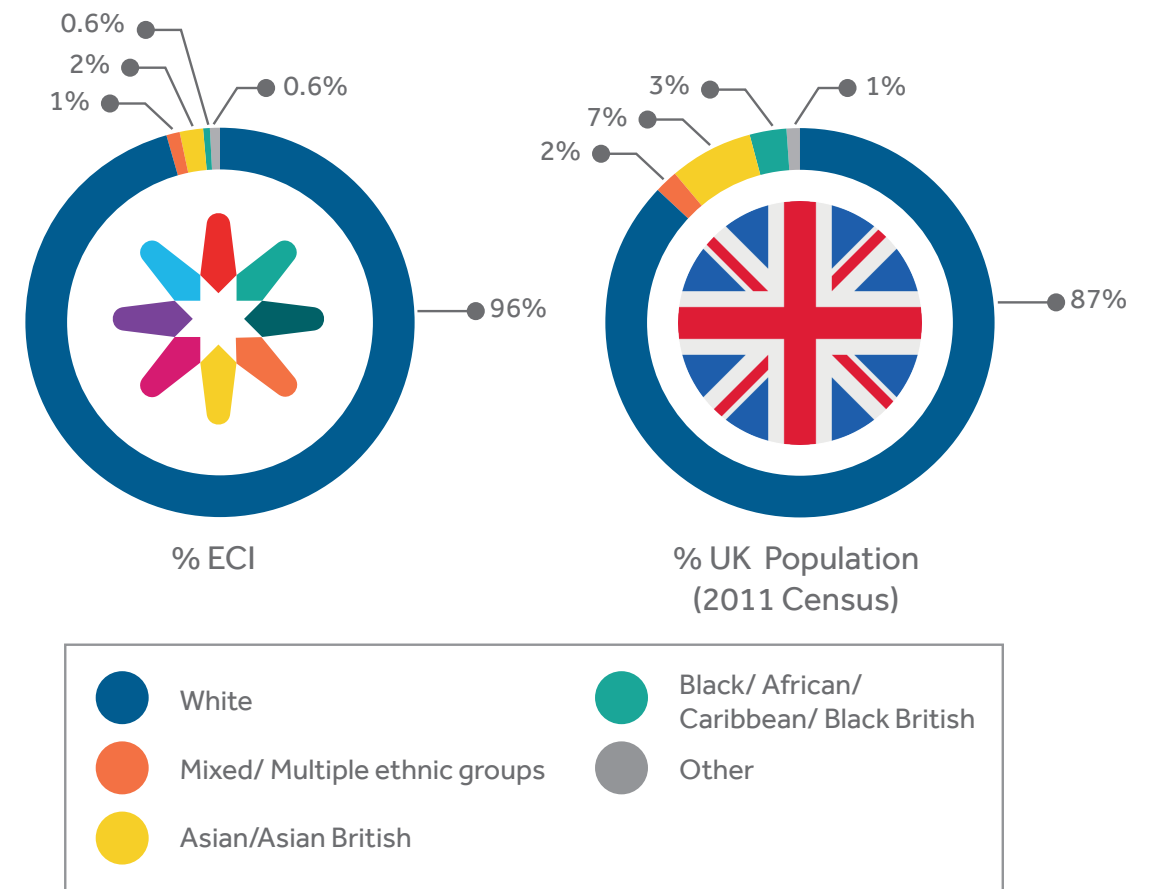
Please see Annex C for a further breakdown of the craft, technician and engineering categories.

Ethnicity

Ethnicity data was received for 8,874 workers. This is less than 20% of the UK-based census return. Of the 153 establishments that responded to the ECITB Workforce Census, 14 skipped this question, and 45 responded 'don't know' or 'don't collect this data'. Larger companies were less likely to provide this data, explaining why the responses from 61% companies cover only 20% of the workforce. These categories of non-return are arguably more important than the statistics below, demonstrating the huge amount of work that is still required to raise the issue of diversity and underrepresentation and the importance of data collection in bringing focus to action.

Ethnicity profile:

% ECI

% UK Population
(2011 Census)

- White
- Mixed/ Multiple ethnic groups
- Asian/Asian British
- Black/ African/ Caribbean/ Black British
- Other

When compared to the general UK population, it is clear that all non-white ethnic groups are underrepresented in the ECI.

Our regional analyses will be able to shed more light regarding disparities in regional proportional representation; it is possible that the disparities between the UK and ECI populations have more to do with geography than a strict lack of diversity, however, this initial summary finding demonstrates that on average, the ECI is not representative of the UK population in terms of ethnicity.

Gender

Data collection processes at a UK level recently started to allow people to choose a gender other than 'man' or 'woman'. This is the case in the 2021 United Kingdom census produced by the ONS, the General Register Office for Scotland and the Northern Ireland Statistics and Research Agency. However, this means that there are no robust data with regards to more inclusive gender classifications at national level yet (the 2011 Census only allowed for sex assigned at birth).

The graph below therefore contains comparisons with the UK population based only on the classifications 'men' and 'women'.

91% of respondents responded to this question, covering 40,589 workers (or 90% of the total workforce captured in the ECITB Workforce Census).

Gender profile:

% ECI Population — 13.8% / 86.2%
% UK Population — 50.6% / 49.4%

Legend: Women / Men
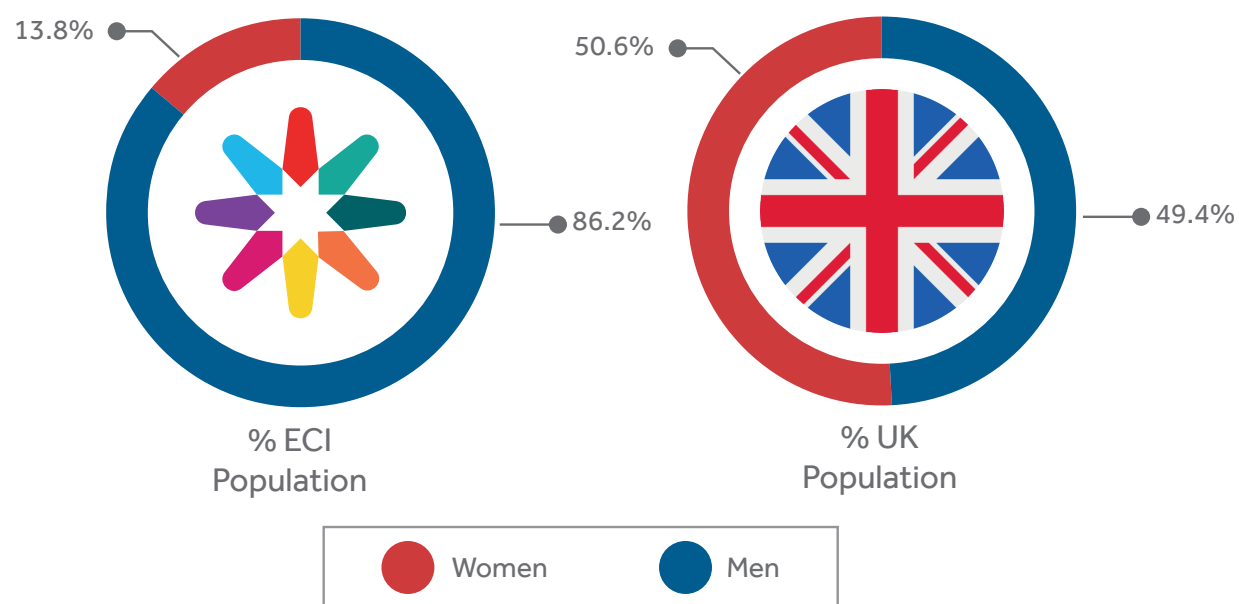
49.4% of the UK population and 86.21% of the ECI workforce identify as men.

The contrast between men and women employed in the ECI remains incredibly stark and does not represent the wider UK population. Research conducted by Pye Tait on behalf of the ECITB in 2018/9 demonstrated a gender split of 87.5% male and 12.5% female; it is disappointing to see that the last two years have seen no real improvement on this front.

Telephone submissions allowed for further discussion on the topic and overwhelming response from these showed that women working in site-based roles, the exception. The majority of women in the ECI appear to work in office based and in support staff roles (for instance HR and finance).
Whilst some sectors are actively working to

attract more women, and there is a continuous national drive to recruit more women to STEM and engineering roles, these efforts do not seem to deliver results in the ECI. This is especially true in the technical and craft roles, which are predominantly occupied by men.

There are clearly barriers to entry to the ECI which are beyond the control of industry, for instance cultural and societal norms and personal biases encouraged from childhood, however, there do also appear to be barriers within industry that need to be addressed. The ECITB would encourage all ECI companies to undergo diversity and inclusion training and to audit their internal policies to ensure

they meet the needs of and are attractive to women. Industry must collectively recognise that focussing on inclusion is highly beneficial, and must start to collect the necessary data to support action in this area. The ECITB Census demonstrated that there is a huge data gap in the type of demographic data that is collected in the majority of companies, and a lack of data that can be easily cross-referenced, for instance demographics with occupation or location. A better understanding of this data will allow for more targeted interventions that can be tailored to the specific needs of a sector or location.

Age

Age data for 37,481 workers (83% of Census database, UK based) was received. This gives us a robust base from which to draw general conclusions.

The majority of the ECI workforce sits at mid-career level (48% between 30-40 years old). What is worrying however, is the low number of new entrants and early career workers: only 14% of the workforce is under 30, while 38% is over 50 years old. This highlights a clear tilt towards the older end of the spectrum, with almost 40% of the workforce nearing

retirement age, and not nearly enough younger people are coming into the industry to replace them. Telephone responses revealed that this is an issue that employers are aware of and concerned about.

The chart below compares activity levels in the ECI to that of the active population in Great Britain, and this indicates a disparity. The chart is based on projections of the active population in Great Britain for February - April 2021. The active population is all those who are either in employment or unemployed, expressed as a percentage of all people.

Age profile:
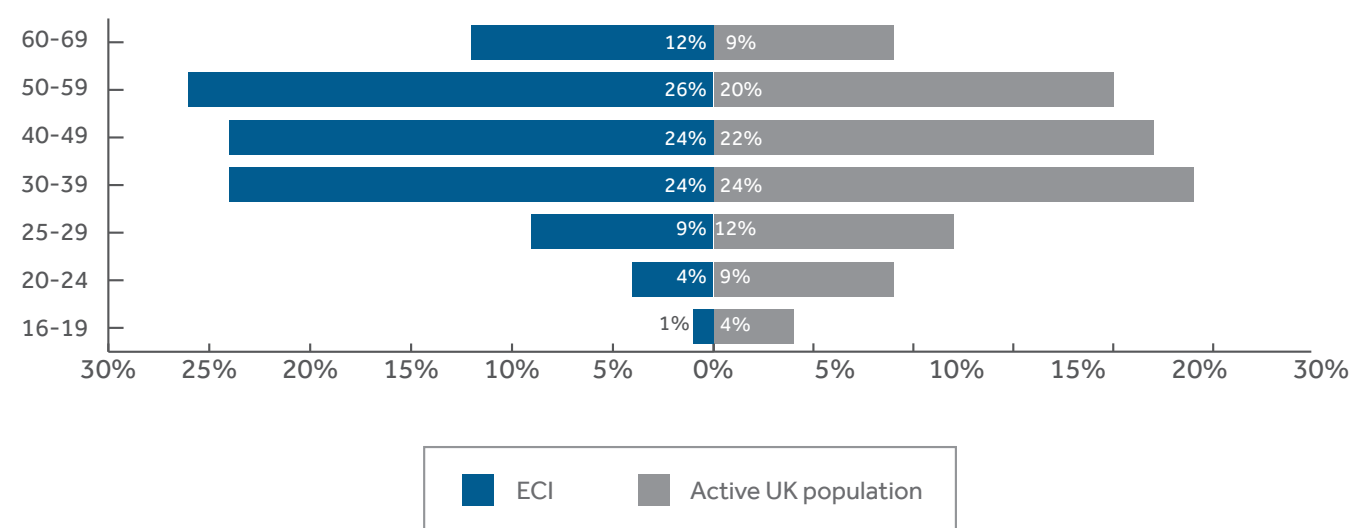
1% of the ECI workforce is aged between 16 to 19 years old, while 3.96% of the active UK population is in this same age group.

Although rates for February - April 2021 are similar to those from previous months in the vast majority of age groups, it must be noted that this is not true for 16 to17-year-olds. Before February - April 2021 and on average, the activity rate of those aged 16 to 17 years old fluctuated around 30%. However, the rate dropped down to 20.3% in Feb-Apr 2021.

Considering that the ECITB Census data collection was done in these months, the following figure is based on these 20.3% when it comes to this cohort. We cannot be certain why these 16 and 17-year-olds dropped out of the economically active group, but further research into this could reveal interesting trends that may correlate to the issues experienced by the ECI.

More research is urgently needed to understand why young people are not entering the ECI workforce. Exploring attitudes towards the ECI, its occupations, workplace culture and behaviours, would potentially touch upon some of the issues. It was noted, however, during telephone responses, that there was sometimes a reluctance to hire younger people for a number of reasons. These included not finding the 'right' candidate, young people not having satisfactory levels of English and Maths, and the attitudes and behaviours of young people not being aligned to company values.

There appears to be a disconnect of expectations on both sides, namely, what a company expects from a young person, and what a young person can expect from an employer. Employers appear to expect a level of maturity from often very young people (16-21) coupled with what is considered a basic level of skill (particularly in Maths and English) and often find that this is difficult to find. On the other hand, there is an argument that this level of maturity, in particular, along with workplace behaviours, are developed by the employer taking on the training of young people. The level of support required to develop the next generation may be greater than some employers expect or are able or prepared to give.

These findings are supported in earlier research carried out by the ECITB (2020) and published in the report 'Igniting the Spark? Apprenticeships in the ECI'.

Nationality

In light of Brexit and an overhaul of UK visa and immigration rules, the ECITB felt it was pertinent to collect data on nationality. Only 73 companies of the total of 153 respondents gave data on the nationality of their employees. Collectively, this represents a workforce of 16,577 workers.

Based on these companies, we estimate that 2.79% of the ECI workforce are EU nationals, and 1.65% are from other countries. This, however, is an estimate and not necessarily representative of the overall workforce, particularly given the small sample size. This could be indicative of employers not collecting this information or simply not completing the question due to a number of reasons, including potentially having a workforce that is 100% British.

Nationality:

2.8%
of the ECI workforce
are EU Nationals

## 1.6%
of the ECI workforce
are from other countries

Workforce growth

Using a base 100 index, the graph below equates the 2019 ECI workforce to 100, enabling a comparison with the current situation in 2021, as well as to employer expectations for 2023. The graph

demonstrates that in 2021 the ECI workforce as a whole has decreased by 15.25% when compared to 2019, and is expected to recover to 102.4% of the 2019 figure by 2023.

Workforce growth projections:
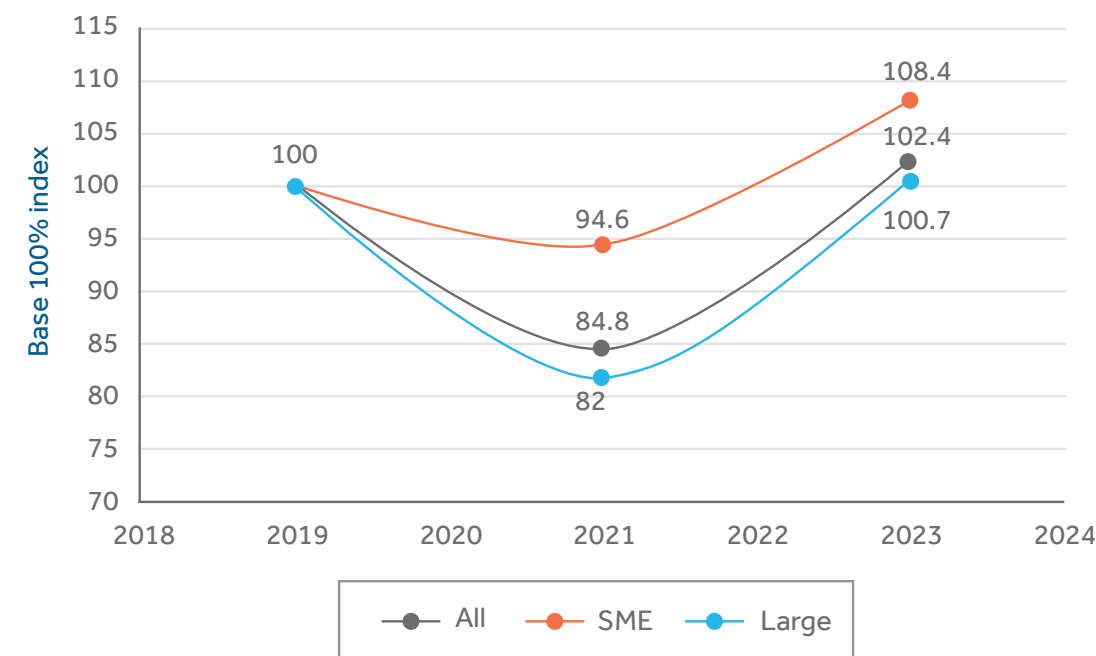
Compared to 2019, the ECI workforce as a whole decreased by 15.25% in 2021 and is expected to increase up to 102.4% (20.8% increase compared to 2021, 2.4% compared to 2019)."

It is interesting to note that large companies were significantly more impacted than SMEs. The expected increase in the ECI workforce from large companies in 2023 is not enough to recover pre-Covid levels.

This is particularly worrying when coupled with the issues surrounding the ageing workforce; not only are the projections for workforce growth below those of 2019, but it is likely that there will be an even larger gap as the older members of the workforce move into retirement and the numbers of younger

people moving into the industry remains well below what is needed to both plug this gap and increase the workforce to what is required. There are several questions surrounding retirement that are difficult to answer and that adds to the complexity of retirement analysis. It is likely that as a result of Covid-19, some members of the workforce have postponed retirement, whilst others may have brought this forward as a result of facing furlough or possible redundancy. The effects of this will only become apparent in the next few years.

Companies were also asked about any hiring difficulties and vacancies that were difficult to fill. Of the 141 companies (92% of all responses) that replied to this question, 53% reported facing difficulties hiring employees. These (53%) companies represent 64% of the total workforce of the 141 that replied to this question. In total, the number of vacancies that these employers struggled to fill in a year is 761. The total workforce of these 141 companies, is composed of 30,981 workers. This means that in one year, the ECI struggles to fill vacancies which account for the equivalent of 2.5% of the actual workforce.

Among these 761 vacancies, 731 were linked to a broad category (craft, technician, support, etc.). The following table shows the distribution of these vacancies among the categories of occupations used in the ECITB Census.

Vacancies by occupational category:

Category	Count	%
Engineers	366	50%
Craft	143	19.6%
Management and Professional	142	19.4%
Technicians	61	8.3%
Support	12	1.6%
Semi-Skilled	4	0.6%
Supervisors	3	0.4%

By linking vacancies with what were designated headquarters (or company main office), we were able to create a geographical representation of these vacancies. In order to have a sense of employers' difficulties in filling vacancies, the values on the map were weighted by the proportion of vacancies over the total number of workers employed in the company. By doing so, we ensured that a company of 100 employees with 10 vacancies was equally represented with another company of 1000 employees with 100 vacancies.

Vacancy hotspots:
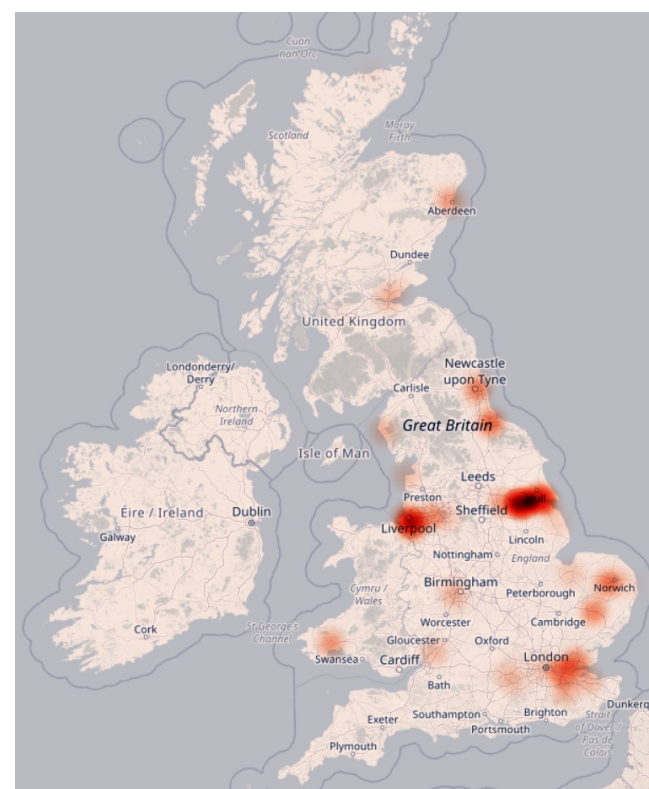
This map shows that companies with main offices in the North of England face significant difficulties hiring new employees compared to other regions.

The following analysis focuses on hiring difficulties, exploring the factors behind employers' answers to the question: "Do you face difficulties hiring employees?"

Employers facing difficulties hiring:

Answer	Count	%
Yes	75	49%
No	66	43%
No reply	11	7%

1. **Those who replied 'No – we face no difficulties filling vacancies'**
   Analysis identified 11 groups based on similarity of characteristics. Two of these 11 groups report a much lower percentage of companies facing difficulties hiring staff. While approximately 50% of employers report difficulties, this number drops to between 15% and 20% for these 2 groups. The following looks in more detail at these two groups.

1.1 First group
The first small group of employers (3.30% of companies) faces significantly smaller difficulties than what can be found in the general population of this census. They are primarily SMEs working in "other ECI" sectors, such as cement, bricks and steel mill. Surprisingly, this group distinguishes itself not because they use specific means of hiring employees, but rather because they do not use certain means of hiring. To be more specific, companies in this group almost never use recruitment websites, social media or agencies. However, we will see in part 2.2, some companies also working in "other ECI" sectors have very different answers to those from this group.

1.2 Second group
The second group of employers (8.55%) mainly operates in renewables. The main difference with this group and the other groups, is that this one uses headhunting twice as much, although it is still a practice that does not seem to be widespread across the industry (5% of employers use headhunting).

It is currently not possible to conclude that changes in how companies fill vacancies explain why some companies face fewer difficulties than others. Whilst this information provides an interesting starting point, it should be taken in context of the following analysis of those groups that reported facing more difficulties filling vacancies than the average in our data. There are 4 such groups.

2. **Those who replied 'Yes – we face difficulties filling vacancies'**

2.1 First group
With a significant proportion of large companies, this group (15%) typically work in non-ECI sectors. They have very few activities in the ECI (proportionally to their size) and these activities are often in the oil and gas sector. These companies heavily rely on word of mouth and almost 30% of them have a team or structure dedicated to hiring, compared to 11% of companies in the entire database. The last element that makes this group stand out is that companies in this group use social media and recruitment websites (55% in this group versus 35% in the database).

2.2 Second group

This group is comprised of a small number of companies (2%), mostly working in other-ECI sectors, face difficulties hiring employees. This is counterintuitive considering what was found in section 1.1 with regards to such companies. However, companies from group 2.2 are very small, smaller than those in 1.1. This could be suggestive of a split among companies operating in other-ECI sectors with regards to experiencing difficulties hiring workers, with very small companies potentially struggling more than larger ones. As opposed to companies from 1.1, they significantly rely on word of mouth and agencies. They also use government or local authority schemes and advertising to source employees. Here, advertisement should be understood in its broadest sense, whether it is through newspapers or on search engines. These facts need to be treated with caution.

It is difficult to determine whether or not these companies turn to these schemes because they face difficulties hiring staff, or, on the contrary, because they initially turn to these schemes, they subsequently face difficulties filling vacancies. Our database cannot provide a conclusive answer to this question.

3. Third group

These employers (7%), largely from the power generation sector, predominantly use word of mouth. To a lesser extent, they rely on local colleges, advertising and recruitment websites or social media.

3.1 Fourth group

The last group that faces significant difficulties hiring employees is a very small one (1% of companies) and suggests that the pharmaceutical sector is subject to these difficulties. Although the small percentage of companies calls for caution, we can say that this group recruits through agencies, their own websites, former workers being called back, or existing workers being trained to fill new vacancies.

Why do companies face difficulties

When we look at some of the reasons employers gave as to why they find it difficult to hire staff, we see a potentially interesting connection between the top three explanations: 47% stated that candidates did not have the right qualifications, 22% mentioned their location as problematic, and 18% stated that candidates did not have the necessary experience:

5 top reasons why they face difficulties to fill vacancies:

47%
Candidates don't have the necessary qualifications

22%
Location

18%
Candidates don't have the necessary experience

16%
Lack of candidates

16%
Salary or career progression offered by companies are under expectations

Other reasons why they face difficulties to fill vacancies:

Lack of candidates	16%
Competition among companies to attract employees	9.6%
The occupation is niche	9.6%
There is a lack of awareness of ECI among youth	2.7%

Attitudes towards younger candidates and the younger workforce were briefly touched upon earlier in this report, and there may be a link between the perceived lack of experience, age, and the level of support that might be expected of an employer in hiring a younger, less experienced worker. Further to this, the perceived difficulty of gaining meaningful career progression may also be connected to the age profile of the industry, as young people struggle to rise through the ranks as they reach the levels of their more senior and experienced colleagues.

However, there may also be cases of workers moving between sectors where their qualifications and experience are not recognised by employers in other sectors.

The ECITB has encouraged and worked on recognition of qualifications and skills through its Connected Competence programme and has been favourable of recognising skills passports and skills overlaps in occupations and qualifications to allow for more fluidity. The question of location could be indicative of local skills provision not catering to the job market, or, in the case of employers in remote locations, an issue of access. Geographical provision of skills and access to qualifications and experience is an area that will require further research and needs to be linked to policy initiatives such as the Local Skills Improvement Plans in England.

The above gives an overview of the groups that reported significantly lower or higher rates of companies facing difficulties hiring employees. Nevertheless, there is still a majority of companies (63%) that do not fall into one of the aforementioned groups. Further analysis is needed to deduce more detailed conclusions. The above aimed to give an overview by identifying very specific interactions between sectors, company size, means of advertising and hiring employees and difficulties in hiring employees.

4. Other findings

One additional group mostly composed of large companies, accounting for 27% of employers in the Census database, operates predominantly in the oil and gas sector. Due to the size of these companies, employers from this group are more able to rely on a dedicated team or structure when it comes to hiring employees. They also tend to make greater use of their own websites to post vacancies.

Another group (9.21%) is dominated by large nuclear companies which make a greater use of headhunting and local colleges than what can be found in the database as a whole.

How employers fill vacancies:

57%
Word of mouth

62%
Agencies

4.3%
Local colleges

5%
Headhunting

2%
From Gov / local authority schemes
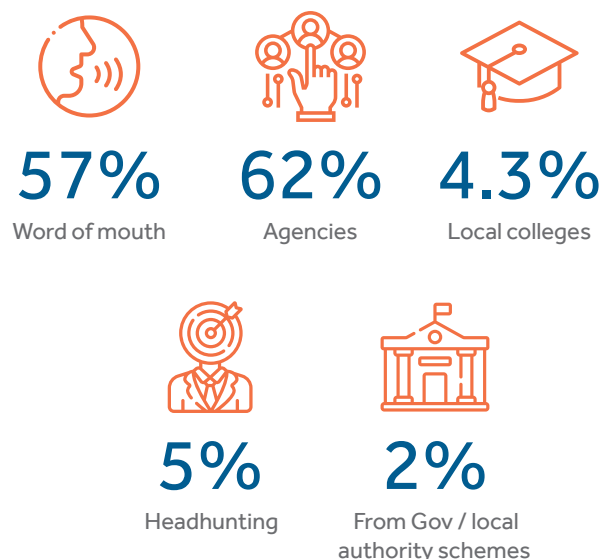
Advertisement	35%
Own website	12%
Own company / agency / team	11.3%
Former workers / train workers	11%
Headhunting	5%
Local colleges	4.3%
Government / Local Authority scheme	2%

Net Zero Activity

The principal question concerning net zero attempted to ascertain which net zero technology is perceived as the biggest area of potential growth within the ECI:

 "Which of these nine areas do you see as having the greatest increase in terms of share of your business? Please rank with 1 being the highest and 9 the lowest"

These areas are: Biofuels, CCS, Geothermal, Hydro power, Hydrogen, Nuclear, Solar, Wave and Tidal, and Wind.

The table below excludes companies that have 100% of their activities in one of the 9 areas and ranked only this specific area. This is justified as the question sought to gain insight into areas of potential growth, rather than current activities.   For instance, consider a company that only operates in the nuclear sector and only ranked nuclear technology. As the company already has 100% of its business dedicated to Nuclear, it comes as no surprise, nor is it particularly revealing, that it intends

to pursue its efforts within the nuclear sector. Including such responses would skew the analysis.

Forty-two companies (27% of Census database) did not reply to this question. This does not necessarily reflect a lack of interest in net zero activities, or even a lack of potential or opportunity. Further research would be needed to gain meaningful insight as to why some companies may not engage with net zero technologies.

For the purposes of analysis, 107 companies (70%) responded in a meaningful way to this question.

The distribution of the workforce for each area at each level of priority has been derived. This gives a better understanding of the areas the existing workforce and its skills can potentially be mobilised in. Percentages do not always add up to one hundred due to rounding and companies ranking several sectors at the same level of priority.

The following table shows the distribution of the workforce for each area at each level of priority.

Rank	Biofuels	CCS	Geothermal	Hydro	Hydrogen	Nuclear	Solar	Wave and Tidal	Wind
1	9%	18%	1%	1%	17%	38%	1%	1%	14%
2	32%	30%	13%	14%	26%	2%	14%	13%	25%
3	16%	6%	4%	3%	24%	4%	7%	3%	11%
4	6%	10%	4%	8%	0%	4%	4%	2%	14%
5	8%	6%	4%	7%	3%	1%	18%	11%	3%
6	2%	8%	9%	13%	1%	0%	3%	1%	8%
7	2%	1%	29%	3%	1%	5%	3%	4%	3%
8	1%	1%	3%	13%	0%	10%	9%	5%	2%
9	24%	19%	33%	37%	26%	35%	43%	61%	20%

Companies who expected to see Biofuels having the greatest increase (1st) in terms of share of their business represent 9% of the workforce.

Biofuels, CCS, hydrogen, and nuclear all dominate in the top three rankings of potential future growth. Nuclear is seen as the largest area of potential increase in share of business, with companies ranking it as their number 1 area of growth representing 38% of the workforce. Companies that ranked hydrogen, CCS and biofuels between the first and third positions in the ranking, account for between 57% and 67% of the workforce, respectively.
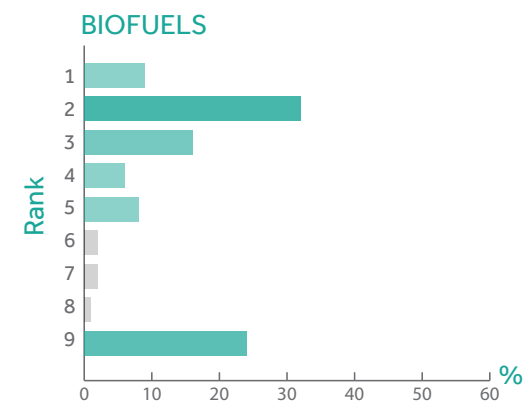
Nuclear is significantly polarised between 1st (representing 38% of the workforce) and the 9th (representing 35% of the workforce) positions. It is clear that nuclear is an area identified as either a huge opportunity or out of consideration without a significant in-between.
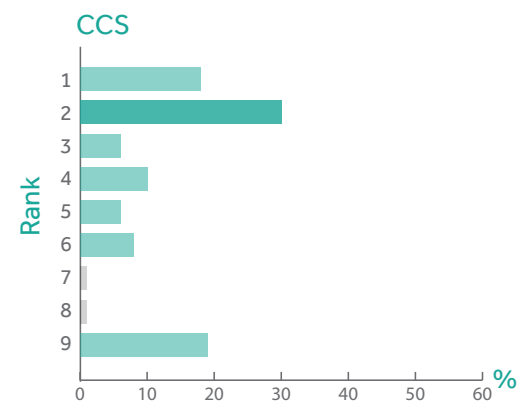
The lowest ranked area of potential growth appears to be wave and tidal, with companies ranking it in last place accounting for 61% of the workforce, followed by solar (43%), hydro power (37%) and geothermal (33%). The figures for these three areas are low throughout, with only a very small number ranking these areas in the top three for potential increase in terms of business share.

BIOFUELS

CCS

WAVE & TIDAL

SOLAR

NUCLEAR

HYDROGEN

HYDRO

GEOTHERMAL
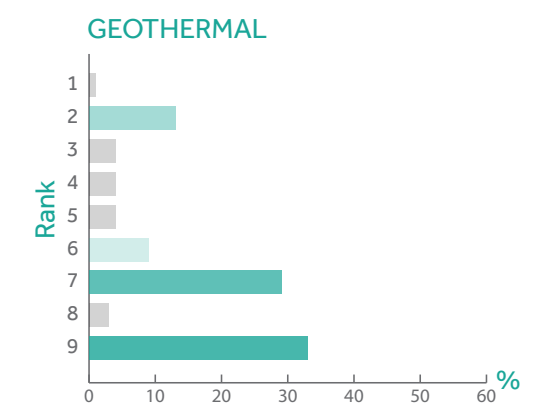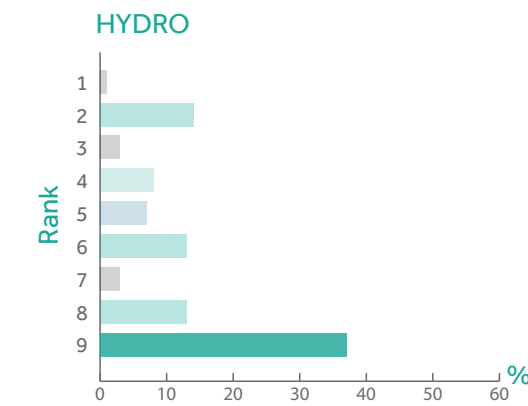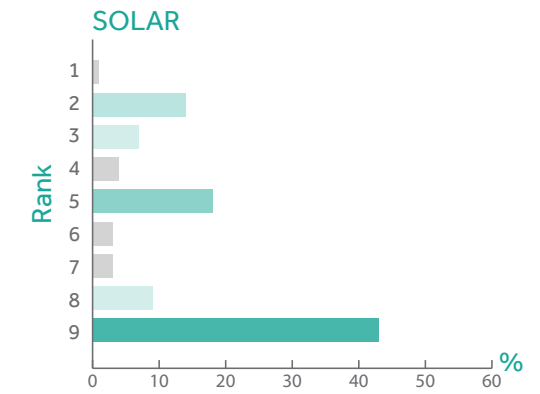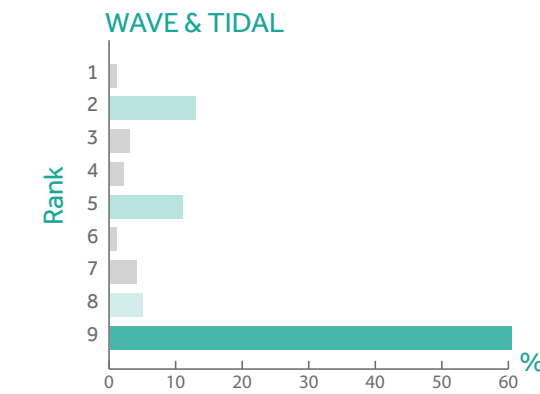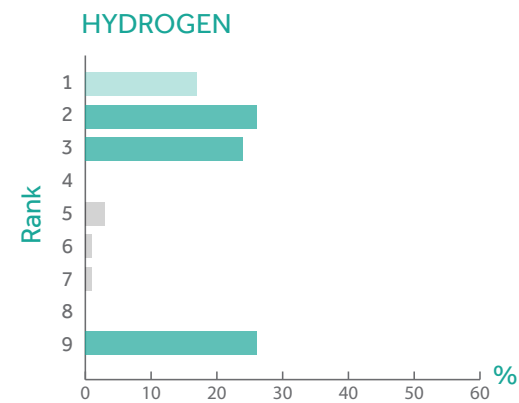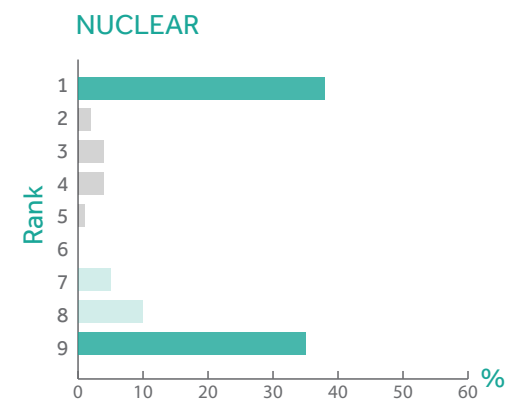
Wind is well spread over several rankings across the whole scale and it would be worth monitoring activities in this area as there appears to be potential for growth, even if in a niche manner. Wind ranked higher across the top 3 rankings (50%) than nuclear (44%), indicating a healthy level of opportunity.

WIND
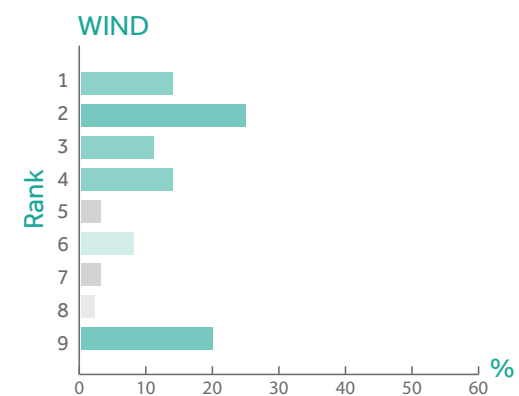
Covid-19

Covid-19 has impacted the engineering construction industry in an unprecedented way. Whilst some sectors appear to have suffered greatly, others have weathered the storm well. In May 2020, the ECITB collected Covid-19 related data from 61 of its in-scope establishments and found that 69% of these had furloughed a total of 5,220 workers.

In 2020, the sector most hit was undoubtedly the oil and gas sector, however, the Covid-19 crisis coincided with a drop in the global oil price, making it impossible to determine if the level of staff furloughed came as a result of Covid-19 or of a combination of these two factors.

Moving into 2021, the ECITB was interested in understanding if Covid-19 had brought any lasting changes to ways of working or the industry as a whole. Questions regarding Covid-19 focused on the characteristics that shaped the pandemic's impact on the industry, with employers explaining what the impact on their business was.

The breakdown of the total of furloughed staff by sector in May 2020 was as follows:

Oil & Gas	71.5%
Nuclear	9.2%
Water Treatment	4.4%
Food & Drink	0.7%
Renewables	0.9%
Power Generation	10%
Chemicals	0.3%
Pharmaceuticals	0.4%
Other sectors	2.6%

How has Covid-19 affected your business?

69% Furlough

30% Delays and downturn in work

29% Redundancies

26% Turnover decreased

17% Change in working pattern/ WFH

16% Reduced Training

14% Smaller workforce

12% Lower productivity

4% Increased training

2% Increased hours

2% Reduced hours

How has Covid-19 affected your business?
19 employers also expanded on the impact of Covid-19 on their business. They listed 4 main items:

26% Cleaning and hygiene measures

21% Improved communication

37% Travels (adaptation or decrease)

26% Wellbeing (lower mental health)

Nineteen employers expanded on the impact that Covid-19 had on their business during telephone interviews, citing adaptation or decrease in travel (37%), changes cleaning and hygiene measures (26%), a negative impact on wellbeing and mental health of staff (26%), and improved internal communication (21%) as the main additional areas of impact. The companies that expanded on the impact of Covid-19 all mentioned a recognition of the importance of communication and mental health of staff as an areas that has come to the fore as a result of the pandemic.

It is important to note that a lack of reporting does not equate the absence of any of the above (or indeed other) characteristics. For instance, it should not be concluded that an employer did not make use of the furlough scheme, simply because it was not reported. Nonetheless, the data we have here provides a strong picture of how the Covid-19 impact was (and is) felt by companies, precisely because the questions were not limiting and allowed for free expression. Companies were able to comment on any topic of their choice. What arises is an interest in understanding why some companies suffered more furlough or turnover decrease than others. Are there any sector specificities? Is there any link between some of the items in the list? The analysis unveiled 9 groups of companies and suggests important sector specificities.

Water Treatment

1. Water treatment
A group of 5% of companies, dominated by water treatment SMEs, was one of the two groups that significantly used redundancies and furlough the most, but it also stands out that they did not face lower productivity. They are also the group that saw a greater decrease in training.

Oil & Gas
(Upstream/Downstream)

2. Oil & Gas
Companies in this group (26%) mainly work in the oil and gas industry and saw a decrease in their workforce, not only in that they made more redundancies than seen by other sectors, but also in that they did not hire and saw people leaving the company or the industry. The use of furlough was not significantly different compared to other sectors nor does the rate stray from the average (69%). It should also be pointed out that workers on furlough continued to be on the payroll and there is no way of knowing whether or not those on furlough left the company and/or sector.

Companies in this group are predominantly large ones. This result is in line with what was observed in relation to workforce growth, where the data suggests that large companies faced greater decrease in workforce than SMEs in terms of percentage of their workforce. It is clear that the oil price was an important factor in conjunction with Covid-19.

Food & Drink

3. Food & Drink
This group (9%) is principally comprised of SMEs in the food and drink sector which are characterised by their turnover decrease. This decrease also goes hand in hand with a significant use of furlough and redundancies when compared to other groups. However, they faced fewer delays and a lower downturn in work. As with the first group introduced in this section, companies in this group were not able to pursue training of their workforce as much as they wanted.

Power Generation

4. Power generation
A group of companies (11%) mostly working in the power generation sector is a mix of large and small and medium companies. The group also includes a small proportion of companies also involved in pharmaceuticals and oil and gas. Less than 30% of these companies mentioned furlough as one of the impacts of Covid-19 on their business, compared to the 60% of the entire database that does refer to furlough. Similarly, they faced slightly fewer redundancies than the average in the ECI. Similar to the previous group dominated by food and drink companies, they did not face many delays or a significant downturn in work. This should also explain why companies in this group do not mention having delayed hiring or seeing people leave the sector.

Chemicals

5. Chemicals
Companies in this group (14%) are first and foremost large establishments involved in chemicals, with some activities in pharmaceuticals and oil and gas. This is one of the groups that mentioned furlough the most, but are also a group characterised by the fact that few of them reported having delayed hiring or having seen people leaving the company and not being replaced.

6. Renewables

This mix of large and smaller companies (9%) is focused on renewables and is the group that mentioned redundancies and a decrease of their turnover the least. Difficulties for this sector seem to be linked to a lower productivity and significant delays and a downturn in work.

7. Nuclear

As anticipated, nuclear companies dominate an entire group due to their characteristics and their footprint in only one sector. Companies in this group represent 10% of the database and are generally large companies. As with the group dominated by power generation companies, employers in this group did not mention furlough often (around 30% of companies in power generation mentioned furlough, this was around 40% for nuclear companies, whereas the average mention of furlough in the entire database was more around 60%). Similarly to group 4, these employers did not face significant delays in work compared to the ECI as a whole. There was no significant delay in hiring nor did the sector see employees leaving their companies or the sector. We can see there are a lot of similarities between companies from the nuclear and from the power generation sectors in how they weathered the Covid-19 crisis. Nonetheless, this group of nuclear companies stands out in that none of them reported having decreased their training. On a more negative note, reports of lower productivity were more numerous in this group.

8. Other sectors

8.1 Other ECI sectors

A group is mostly composed of companies (5%) involved in other ECI sectors such as cement and bricks, steel or paper mills. The analysis suggests that companies in this group did not change their working pattern that much compared to other sectors. However, they faced a lower productivity rate than that reported in other sectors. Their turnover was also more negatively impacted, and training also decreased. Although this information must be treated with care due to the small number of companies in this group, the analysis shows that none of them mentioned delays or downturn in work.

8.2 Non-ECI sectors

The last group is made of companies (10%), mostly large, mainly working in non-ECI sectors. For them, the impact of Covid-19 has been lower productivity, a change in working patterns, delayed hiring and seeing employees leave in a greater proportion than in any other group. Notably, they are the only group that uses working from home arrangements more scarcely. Their training was also negatively impacted. These characteristics are interesting in that they seem to outline a different dynamic between the ECI and other industries.

Brexit

In the Census, we asked employers "do you feel your business is prepared for the potential changes implied by Brexit?" Answers are as follows:

Answer	Count	Percentages
Yes	101	66.4%
No	7	4.6%
Don't know	29	19.1%
No reply	15	9.9%

It is important to note that, whilst some aspects of Brexit have slowly become clear, the country is not yet at a stage where it can be suggested that the full impact of Brexit is known. The effects of Brexit may also be complicated by the effects of Covid 19.

Employers were also asked to rate from 0 (largely worsen) to 10 (largely improved) how they expect their business to be affected by Brexit with regards to the following:

How do you expect your business to be affected by Brexit?

	Rating		
	worsen	neutral	improved
Hiring and availability of workers	22%	73%	5%
Supply chain	44%	54%	2%
Quantity of work	15%	75%	10%
Turnover	12%	77%	11%

For this analysis, we must keep in mind that ratings on these topics are always mainly 5s, indicating a neutral answer. In the following paragraphs, we sometimes use "optimism" or "pessimism" to point out that companies are rating it above or below 5. In other words, these terms indicate a tendency to expect a positive or negative impact of Brexit, but most of the time the general answer is neutral.

The goal of the following analysis is to find the characteristics behind those who mainly replied yes, no and also those who reported uncertainty. One solution would be to simply look at those employers who said their business is not ready for potential changes implied by Brexit, but by doing so we would miss crucial information about other respondents who share the same characteristics but didn't reply "No". By grouping companies into several groups based on similarities other than simply their answers to this question, we are able to define more accurate trends. For instance, an employer can answer "No" to this question but also share many if not all characteristics with employers who replied "Yes" or "Don't know". This could mean that the fact that this employer replied "No" is not due to the sectors the company is operating in, or the size of the company. More research is needed in this area to determine common characteristics.

1. **Those who replied no**

   The analysis unveiled one group of employers with a very high percentage of "No" in their answers compared to what is found in the data. In this group, nearly 40% of respondents reported that they do not feel their business is prepared for potential changes implied by Brexit, while this number in other groups varies from 0% to 5%, in line with what is found in the database as a whole.

   It must be noted that we are talking about a very small number of companies, but these companies share similarities that could potentially explain their answers. This group is the only group that is mainly involved in "Other ECI" activities. In other words, they operate neither outside the ECI nor in one of the 8 main ECI sectors. Examples of sectors in this category include, but are not limited to, cement and bricks, steel mill and paper mill. Companies in this group are all SMEs.

   When looking at their ratings on the aforementioned topics, this group stands out in that they are slightly more pessimistic than other groups regarding the hiring and availability of workers. Their ratings are divided between 4 and 5, while other groups are mainly concentrated around the 5 rating.

   With regards to the impact of Brexit on the supply chain, employers in this group mostly ranked this at 3, indicating that there is a significant level of pessimism regarding this matter.

With regards to the quantity of work, they usually split their ratings between 4 and 8, with a significant weight on the neutral option, 5. However, they are the group that is the most optimistic with regards to the impact of Brexit on quantity of work. Although this is less clear, this optimism is also shown in their ratings regarding the impact on turnover, for which a majority voted the neutral option but with a significant vote on the 6 rating.

To summarise the findings pertaining companies that feel unprepared for the potential changes implied by Brexit, we can point out that these companies are SMEs, operating in steel mill, cement and bricks and paper mill. They are mainly worried by the impact of Brexit on their supply chain and, to a lesser extent, on the availability of workers. They are, however, either neutral or slightly optimistic about the impact of Brexit mainly with regards to the quantity of work and to a lesser extent, turnover.

2. Those who replied don't know

The percentage of employers who replied "don't know" to this question is around 20% for the database as a whole. The analysis isolated 3 groups for which this percentage varies between 30% and 40%.

2.1 First group

Companies in this group primarily work in the pharmaceutical and chemical sectors, with a lower but significant part of them with activities in the food and drink industry and sectors outside the ECI. They are a mix of SMEs and larger companies.

They are the group that shows the greatest levels of pessimism regarding hiring and availability of workers following Brexit, with not a single positive impact foreseen and slightly more than 30% of ratings below 5, while this number is close to 20% in the database. They also expect a negative impact on the supply chain, and are even more likely to rate this impact as a 4 or below, than rate it as a 5. However, as opposed to the previous group, they are pessimistic about the impact of Brexit on the quantity of work. They are the most neutral group when rating the impact on turnover.

2.2 Second group

This group is composed of SMEs, predominantly involved in the food and drink industry. They are quite neutral toward Brexit's impact on availability of workers, the quantity of work and the turnover. However, half of this group expect a negative impact on the supply chain.

2.3 Third group

Companies in this group are mostly SMEs with a low proportion of larger companies. They mainly operate in renewables, but also in oil and gas, although this is not their main activity. They show a clear pessimism regarding the impact of Brexit on all the 4 topics explored in this analysis, with non-neutral ratings being almost always equally spread between 0 and 4.

To summarise the findings with regards to companies that feel uncertain toward the impact of Brexit on the industry, it is clear that SMEs are overrepresented in this category. They mainly work in food and drink, renewables, pharmaceuticals and chemicals. The renewable sector seems to be the most pessimistic generally speaking, with significant negative expectations about all the aforementioned 4 topics. The food and drink sector is usually only concerned with the supply chain. Companies working in pharmaceuticals and chemicals join other groups in having a negative view of the impact of Brexit on the supply chain, but they are also more worried about the quantity of work.

3. Those who replied yes

The percentage of employers who replied "YES" to this question is around 66% for the database as a whole. The analysis again isolated 3 groups for which this percentage are much higher, varying between 85% and 100%.

3.1 First group

The first group is composed of companies predominantly working in water treatment. Keeping in mind that companies generally always rate topics as a 5, these SMEs report a significant level of optimism regarding the impact of Brexit on hiring and the availability of workers. They mostly expect a negative impact on the supply chain. In fact, they are even more numerous in terms of rating 4 or below than rating a neutral 5, which is unusual enough to be highlighted. No clear pattern arises when analysing answers for the quantity of work and the impact on the turnover, with most companies being neutral and a minority either expecting a positive or a negative impact on these matters.

3.2 Second group

Companies in this group mostly work in power generation and are almost exclusively SMEs. They are quite neutral toward the availability of workers but are the least pessimistic with regards to the impact of Brexit on the supply chain. None of them have negative expectations regarding the quantity of work and the impact on turnover.

3.3 Third group

This group is a mix of SMEs and large companies working in chemicals and, in a lesser extent, in oil and gas. They are true neutral when assessing impact on availability of workers, quantity of work and turnover. As always, companies in this group are also pessimistic regarding the supply chain, but much less than in other groups.

Finally, as a means of summarising findings surrounding companies that feel prepared for the impact of Brexit, we can say that although the supply chain is always identified as a concern, water treatment companies do not expect negative impacts regarding the other areas highlighted. The fact that these companies that replied "yes" are often neutral is consistent, because no foreseen impact of Brexit means that the companies do not have to significantly adapt their business.

Companies in the power generation sector are also significantly represented in those who report being ready. Interestingly, businesses in the chemical sector are present in both "don't know" and "yes" respondents. Chemicals companies being uncertain about Brexit are larger than those stating they are ready, so company size in this sector

seems to potentially play a role here.

4. **But what about Nuclear and Oil and Gas?**
   Readers may have noticed that the nuclear sector has not yet been mentioned, and that references to the oil and gas sector are sparse. This is because their profile is not specific when looking at how these companies replied to the question. However, the analysis did isolate 2 groups, one in which companies predominantly work in nuclear, and one dominated by oil and gas companies.

4.1 Nuclear

It comes as no surprise that companies in this group are also usually larger than in any other groups. As explained above, they do not really differ from the numbers that can be found in the table from the introduction. However, they do report a few very pessimistic views on the availability of workers, being the most likely to give a 0 rating to this issue. As a reminder, companies mainly hold neutral views regarding availability of workers, but this small proportion of 0 ratings should be noted. Their views on the supply chain show the usual slight pessimism, but this time with a greater dispersion of ratings between 0 and 4, almost similar to what we observed for the companies working in renewables mentioned in 2.3. They are quite neutral regarding the other topics.

4.2 Oil & Gas

This group is a mix of SMEs and large companies, with a slight lean toward larger companies. They hold somewhat pessimistic views regarding the availability of workers and there is a small proportion with strong negative views regarding the impact of Brexit on the supply chain. However, they still are mostly neutral regarding this topic. As with the nuclear companies, they are quite neutral regarding quantity of work and impact on turnover.

Annex A:
Full Survey

ECITB Workforce Census 2021

Establishment name: _____

Part 1 – Occupations

Please complete Part 1 for each location where you have workers deployed. Additional sheets are provided for establishments that have workers deployed on more than six sites. Parts 2-6 only need to be completed once for the whole workforce.

1. Type of location (Please indicate by inserting an 'X' in the relevant box):

	Loc.1	Loc.2	Loc.3	Loc.4	Loc.5	Loc.6
Main UK office						
Satellite site/other office						
Client site						

2. If client site, which sector? (Please indicate by inserting an 'X' in the relevant box).

Core Engineering Construction sectors	Loc.1	Loc.2	Loc.3	Loc.4	Loc.5	Loc.6
Chemicals						
Food and Drink						
Nuclear						
Oil & Gas						
Pharmaceuticals						
Power Generation						
Water Treatment						
Biofuels (Renewables)						
Carbon Capture (Renewables)						
Geothermal Power (Renewables)						
Hydro Power (Renewables)						
Hydrogen (Renewables)						
Solar Power (Renewables)						
Wave and Tidal Power (Renewables)						
Wind Power (Renewables)						
Other						
Cement and Bricks						
Paper Mill						
Steel Mill						
If not listed, please specify:						

3. Postcode:

	Loc.1	Loc.2	Loc.3	Loc.4	Loc.5	Loc.6
Postcode						
If offshore, state region						
If classified, state region						

4. Estimate the number of FTE workers in each of the relevant occupation. You can leave blanks where the number is 0.

	Number of workers					
Craft	Loc.1	Loc.2	Loc.3	Loc.4	Loc.5	Loc.6
Diver (welding/MJI/inspection)						
Electrical Fitters						
High Integrity Welders						
Instrument Pipefitters						
Mechanical Fitters						
Pipe Welders						
Pipefitters						
Plate Welders						
Platers						
Riggers						
Safety Advisers						
Steel Erectors						
Thermal Insulation Technicians (laggers)						
Tray Fitters						
Other						

Technicians	Number of workers					
	Loc.1	Loc.2	Loc.3	Loc.4	Loc.5	Loc.6
Commissioning Technician						
Design/Draughtspersons						
Electrical Maintenance						
Field Service Technician						
Heat Treatment Technicians						
Instrument Control						
Mechanical Maintenance						
Metering Technicians						
Non Destructive Testing						
Production or Process Operators						
Project Controls						
Rope Access Technician						
ROV Technician/Pilot						
Wind turbine technicians						
Other						

Semi-Skilled	Number of workers					
	Loc.1	Loc.2	Loc.3	Loc.4	Loc.5	Loc.6
Blaster/Painter						
Deck Operators/Deck Crew						
Electrical						
General Mates						
Labourers						
Mechanical Fitting						
Non Destructive Testing Operative						
Pipefitting						
Plating						
Scafolders						
Slinger/Banksman/Rigger						
Steel Erector						
Storeman						
Thermal Insulation Operative						
Welding						
Other						

Supervisors	Number of workers					
	Loc.1	Loc.2	Loc.3	Loc.4	Loc.5	Loc.6
Appointed Person						
Electrical						
General Foreman/Superintendent						
Instrumentation						
Lifting (Rigging/Erecting)						
LOLER/Lifting Focal Point						
Mechanical						
Production						
Radiation Protection / Health Physics						
Scaffolding						
Thermal insulation (Lagging)						
Welding						
Other						
Thermal Insulation Operative						
Welding						
Other						

Engineers	Number of workers					
	Loc.1	Loc.2	Loc.3	Loc.4	Loc.5	Loc.6
Chemical Engineer						
Commissioning Engineer						
Design Engineer						
Electrical Engineer						
Environmental Engineer						
Fault Analysis Engineer						
Instrument and Control						
IT / Telecom / Cybersecurity						
Mechanical Engineer						
Nuclear safety case engineer						
Pipeline Engineer						
Process Engineer						
Remote and Robotic Engineer						
Safety engineer						
Subsea Engineer						
Technical Safety Engineers						
Welding (Metallurgist) Engineer						
Other						

Management & Professional	Number of workers					
	Loc.1	Loc.2	Loc.3	Loc.4	Loc.5	Loc.6
Area Manager						
Commercial Support						
Construction Manager						
Cost Engineers / Quantity Surveyor						
Directors & Managers						
Document Controller						
Estimators						
Industrial relations manager						
Installation Managers (OIM)						
Planners						
Procurement Specialists						
Project Controllers						
Project Engineers						
Project Managers						
Quality Control / QA Staff						
Safety, Health, Environment and Quality (SHEQ)						
Site Managers						
Other						

Support Staff	Number of workers					
	Loc.1	Loc.2	Loc.3	Loc.4	Loc.5	Loc.6
Admin						
Canteen workers and cleaners						
Competence Assessors/Supervisors						
Finance						
Health & Safety						
Human Resources + Learning and Development						
Legal						
Marketing						
Other						

Other occupations	Number of workers					
	Loc.1	Loc.2	Loc.3	Loc.4	Loc.5	Loc.6

Part 2 – Net Zero

6. What percentage of workers at these sites would you estimate to be engaged (either part or full time) in net zero / decarbonisation / energy transition activity?

Loc.1	Loc.2	Loc.3	Loc.4	Loc.5	Loc.6

Please complete the following for the workforce as a whole, across all sites. This section only needs to be completed once.

7. Which of these nine areas do you see as having the greatest increase in terms of share of your business? Please rank with 1 being the highest and 9 the lowest:

	Last 2 years	Coming 2 years
Biofuels		
Carbon capture, usage and storage		
Geothermal Power		
Hydro Power		
Hydrogen		
Nuclear		
Solar Power		
Wave and Tidal		
Wind Power		

Part 3 – Demographics

8. As a whole, how many of your workforce is of the following ethnic groups. Please provide a breakdown where possible:

Ethnic group	Number of workers
White	
British/English/Northern Irish/Scottish/Welsh	
Irish	
Gypsy or Irish Traveller	
Any other white background	
Mixed / multiple ethnicities	
White and Asian	
White and Black Caribbean	
White and Black African	
Any other mixed/multiple ethnic background	
Asian/Asian British	
Pakistani	
Indian	
Bangladeshi	
Chinese	
Any other Asian background	
Black / African / Caribbean / Black British	
African	
Caribbean	
Any other Black background	
Arabic / Middle Eastern background	
Any other ethnic background	
Don't know / we don't collect this data.	

9. How many of your workforce (%) are not British nationals?

EU Nationals	
Other Countries	

10. How many of your workforce as a whole identify as:

Disabled	
Having a learning disability	
Don't know	

11. How many of your workforce:

Use the Welsh language as a medium of communication in the working day	
Use a language other than English as a medium of communication in the working day	
Don't know	

12. How many of your workforce identify as:

Female	
Male	
Non-binary	
Transgender	
Prefer not to say	
Don't know	

13. How many of your workforce as a whole fall into the following age categories:

Age category	Number of workers
16-19	
20-24	
25-29	
30-39	
40-49	
50-59	
60+	

Part 4 – Workforce growth

14. Estimate the percentage of increase or decrease in your workforce in the last 2 years:

Increase (%)	
Decrease (%)	

15. Estimate the percentage of expected increase or decrease in your workforce in the next 2 years:

Increase (%)	
Decrease (%)	

16. Do you face difficulties hiring employees? (Please indicate by inserting an 'X' in the relevant box).

Yes	
No	

17. If yes, how many and what type of vacancies do you struggle to fill in a year, and what are the reasons for this?

Number of vacancies you struggle to fill in a year.	Type of vacancies you typically struggle to fill.	Reasons for difficulties filling vacancies.

18. How do you usually fill vacancies? (For example, advertising, word of mouth, agencies, etc.)

_____

19. If you are engaged in shutdowns or turnaround (TARS), in what quarter during the year do they occur and what is the increased impact on your workforce (%) and, if possible, which occupations are affected? (Please use separate rows for each occupation).

Quarter	% increased impact	Occupations

20. What are the main drivers behind the increase/decrease in occupations?

_____

Part 5 – Covid 19

21. How has Covid-19 affected your business? Please comment on workforce numbers, productivity, furlough, redundancy, turnover, training, etc.

_____

22. Please comment on the following changes within your business.

Changes	Comments
What is the percentage increase of the number of employees working from home as a result of Covid (%), and how many people do you expect to WFH post Covid?	
This change will be kept after the crisis.	
Have your working patterns changed as a result of Covid and if so how?	
This change will be kept after the crisis.	
Accessed online/e-learning training	
This change will be kept after the crisis.	
Any other changes?	
Will other changes be kept after the crisis?	

23. What is your Approximate percentage increase (+) / decrease (-) in work as a result of Covid-19?

Approximate percentage increase	
Approximate percentage decrease	

Part 6 – Brexit

24. Rate from 0 (largely worsen) to 10 (largely improved) how you expect your business to be affected by Brexit with regards to the following:

	Rate 0 - 10
Hiring and availability of workers	
Supply Chain (obtaining equipment or sub-contractor availability, etc.)	
Quantity of work (availability of contracts to bid for)	
Turnover	

25. Please add any other comments relating to Brexit and its effects on your business in the box below:

_____

26. Do you feel your business is prepared for the potential changes implied by Brexit? (Please indicate by inserting an 'X' in the relevant box).

Yes	
No	
Don't know	

27. Any other comments?

_____

End of survey

Annex B: List of occupations including count

Exact numbers from occupations with less than 10 individuals are not disclosed to maintain anonymity.

- Craft: 4,436 individuals

Occupation	Number
Pipefitters	869
Mechanical Fitters	698
Electrical Fitters	645
Riggers	503
Platers	348
Pipe Welders	294
Steel Erectors	231
Plate Welders	120
Thermal Insulation Technicians (laggers)	80
Plumber	60
HVAC	55
Safety Advisers	48
High Integrity Welders	38
Civil	37
Fabricators	30
Diver (welding/MJI/inspection)	-
Tray Fitters	-
Unidentified Craft	380

- Technicians: 6,546 individuals

Occupation	Number
Production or Process Operators	1990
Design/Draughtpersons	693
Mechanical Maintenance	689
Instrument and Control	583
Electrical Maintenance	537
Rope Access Technician	414
Field Service Technician	381
Safety Technicians	281
Commissioning	133
Non-Destructive Testing	113
Metering Technicians	66
ROV Technician / Pilot	63
Project Controls	43
Radioactive Waste	35
Civil	26
Heat Treatment Technician	26
Subsea Technicians	23
Waste	-
Unidentified Technicians	450

- Semi-skilled: 3,612 individuals

Occupation	Number
Scaffolders	1282
Labourers	279
Deck Operator / Deck Crew	272
General Mates	255
Blaster / Painter	241
Decommissioning Operative	210
Welding	167
Electrical	161
Storeman	135
Mechanical fitting	81
Pipefitting	81
Slinger/Banksman/Rigger	42
Steel Erector	37
Thermal Insulation Operative	32
Plating	31
Plant Operator	28
Civil	19
Desal Operator	-
Non-Destructive Testing Operative	-
Radio Operator	-
Unidentified Semi-Skilled	259

- Supervisors: 2,535 individuals

Occupation	Number
General Foreman / Superintendent	495
Mechanical	445
Electrical	241
Scaffolding	147
Rope Access	143
Appointed Person	109
Welding	88
Lifting (Rigging/Erecting)	83
LOLER / Lifting Focal Point	57
Radiation Protection / Health Physics	48
Instrumentation	42
Fabric Maintenance	40
Production	24
Pipefitters	22
Decommissioning	-
Joiner	-
Plating	-
Conditon Monitoring	-
Unidentified Supervisors	551
Radio Operator	-
Unidentified Semi-Skilled	259

- Engineers: 10,849 individuals

Occupation	Number
Mechanical Engineer	2433
Process Engineers	1257
Electrical Engineers	868
Instrument and Control	819
Design Engineer	621
Civil & Structural	570
Environmental Engineer	464
Pipeline Engineer	392
Commissioning Engineer	319
IT / Telecom / Cybersecurity	294
Subsea Engineer	200
Safety Engineers	198
Nuclear Engineers	191
Chemical Engineer	174
Field Service Engineers	161
Nuclear Safety Case Engineer	132
Welding (Metallurgist) Engineer	99
Asset inspection/ Integrity Engineers	78
Technical Safety Engineer	72
Fault Analysis Engineer	-
Mining Engineers	-
Remote and Robotic Engineer	-
Unidentified Engineers	1507

- Management & Professionals: 11,421 individuals

Occupation	Number
Directors & Managers	1912
Project Managers	1821
Project Engineers	1227
Procurement	883
Commercial Support	686
Project Controllers	626
Planners	603
Quality Control / QA staff	590
Safety, Health, Environment and Quality	446
Construction Manager	431
Cost Engineer / Quantity Surveyor	401
Document Controllers	346
Site Managers	292
Consultants	226
Estimators	220
Focal Point	87
Analysts	81
Operations	50
Area Manager	49
Installation Managers (OIM)	42
Industrial Relation Manager (ORM)	-
Unidentified M&P	402
Unidentified Engineers	1507

- Scientists: 347 individuals

Occupation	Number
Physicists	230
Misc Science	57
Chemists	46
Geologist	14
Unidentified Scientists	-

- Support: 4,492 individuals

Occupation	Number
Admin	1342
Finance	867
Health and Safety	741
Human Ressources + Learning and Develop.	737
Marketing & Communications	173
Legal	80
Canteen Workers and Cleaners	46
IT / Telecom / Cybersecurity	36
Competence Assessors / Supervisors	32
Facilities	-
Trade Controls	-
Unidentified Support Staff	438

- Other unidentified workers: 1,113 individuals

These diagrams focus on occupations from the Census database with more than 500 workers in the craft, technician and engineering categories.

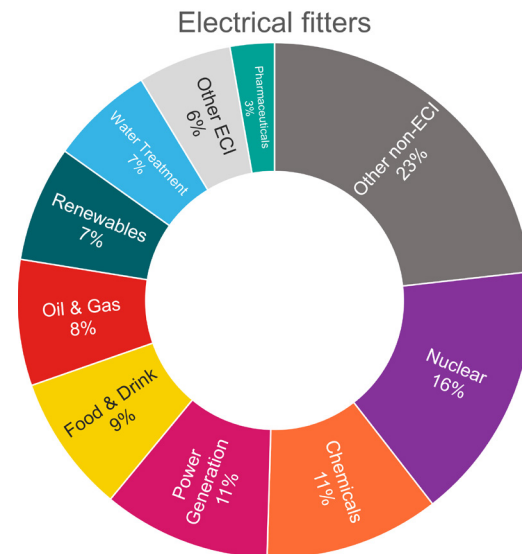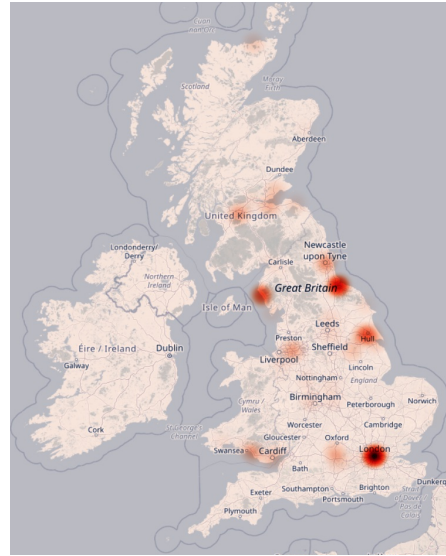### I. Craft

Pipefitters (869 individuals, 19.50% of craft)

Pipefitters

- Oil & Gas 39%
- Chemicals 19%
- Nuclear 11%
- Food & Drink 8%
- Other non-ECI 8%
- Power Generation 7%
- Renewables 1%
- Pharmaceuticals 1%
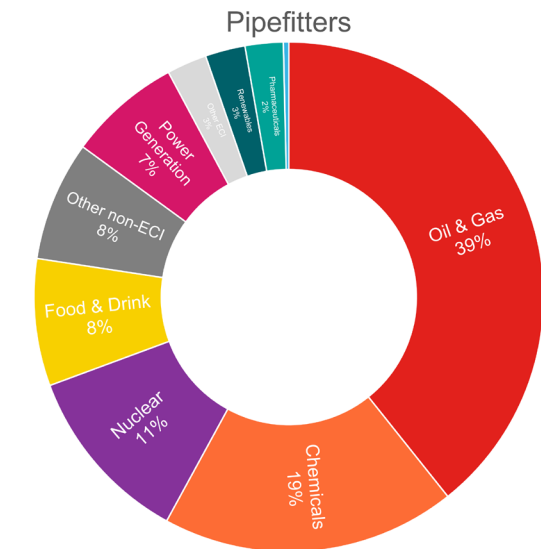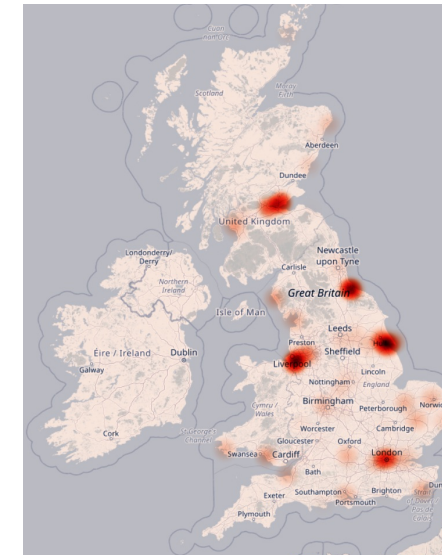
Mechanical fitters (698 individuals, 16% of craft)

Mechanical fitters

- Power Generation 22%
- Chemicals 18%
- Oil & Gas 16%
- Other ECI 15%
- Nuclear 11%
- Other non-ECI 6%
- Food & Drink 4%
- Renewables 4%
- Water Treatment

Annex C: Occupation and sector maps
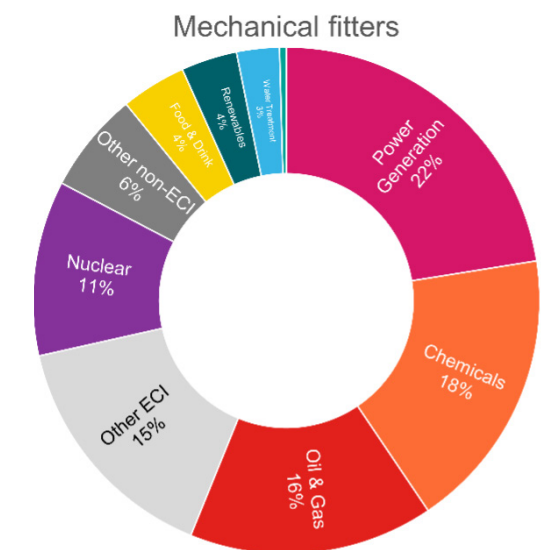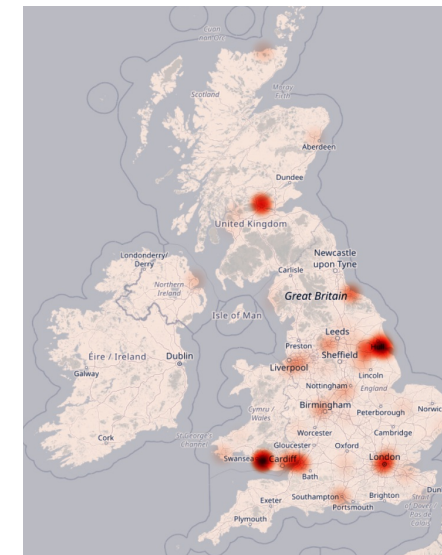
Electrical fitters (645 individuals, 14.50% of craft)

Electrical fitters

- Other non-ECI 23%
- Nuclear 16%
- Chemicals 11%
- Power Generation 11%
- Food & Drink 9%
- Oil & Gas 8%
- Renewables 7%
- Water Treatment 7%
- Other ECI 6%
- Pharmaceuticals 3%

Riggers (503 individuals, 11% of craft)

Riggers

- Oil & Gas 71%
- Chemicals 8%
- Other ECI 7%
- Power Generation 7%
- Nuclear 4%
- Renewables 2%

II. Technicians

Production or Process operators (1990 individuals, 30.50% of technicians)

Production or Process Operators

- Oil & Gas 20%
- Nuclear 78%
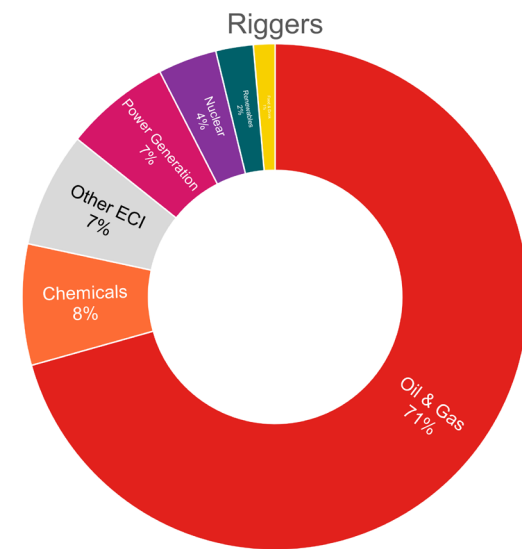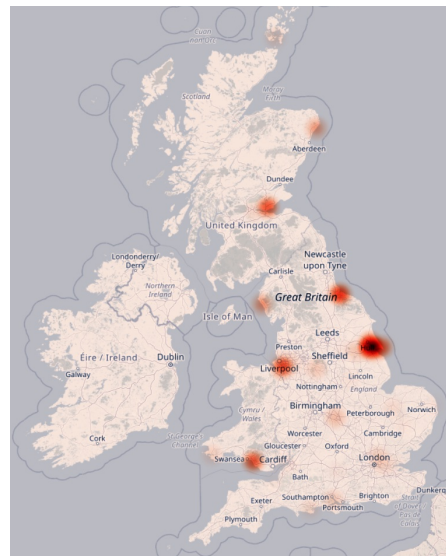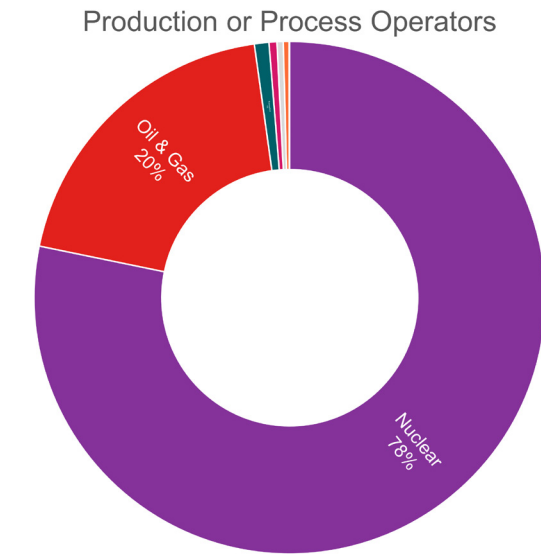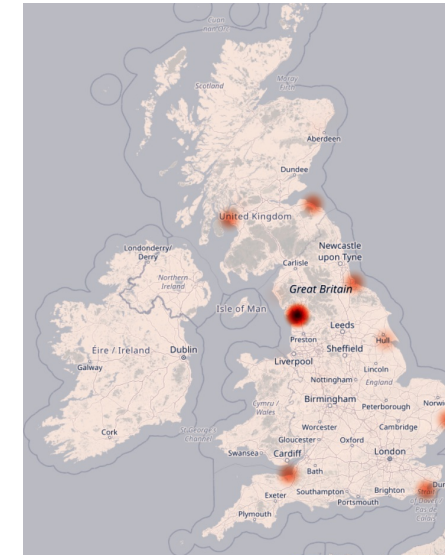
Design & Draughtspersons (693 individuals, 10.50% of technicians)

Design/Draughtpersons

- Nuclear 47%
- Oil & Gas 30%
- Other non-ECI 6%
- Food & Drink 4%
- Chemicals 3%
- Renewables 3%
- Water Treatment
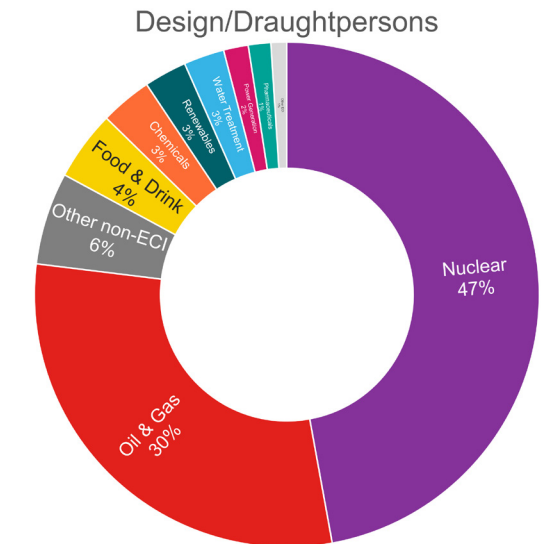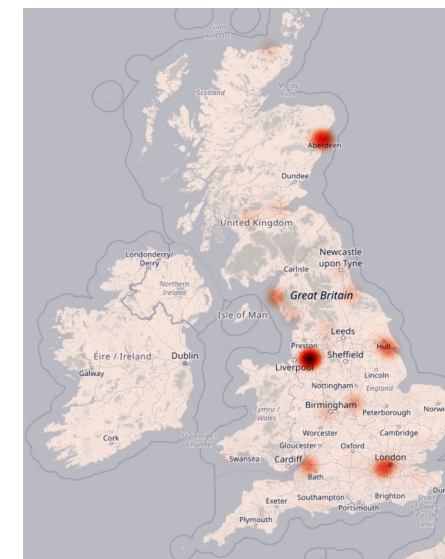
Mechanical maintenance (689 individuals, 10.50% of technicians)

Mechanical maintenance

- Oil & Gas 69%
- Nuclear 13%
- Renewables 9%
- Power Generation 7%
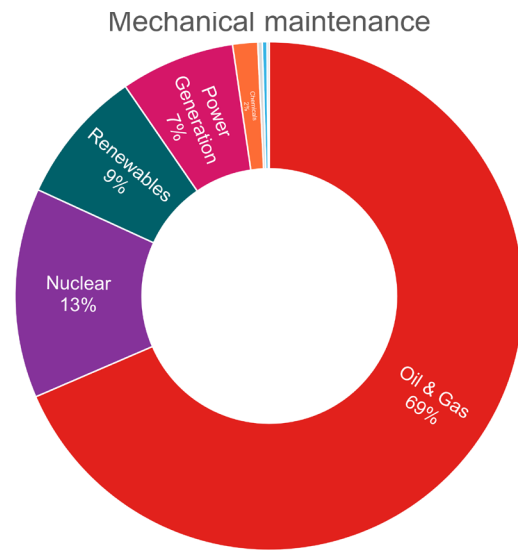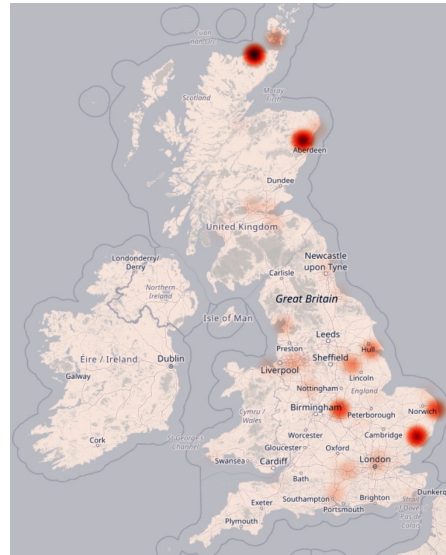
Electrical maintenance (537 individuals, 8% of technicians)

Electrical maintenance

- Oil & Gas 79%
- Nuclear 11%
- Other non-ECI 4%
- Chemicals 1%
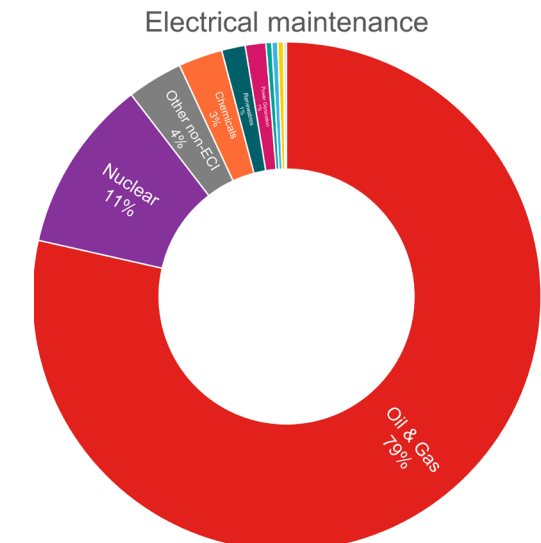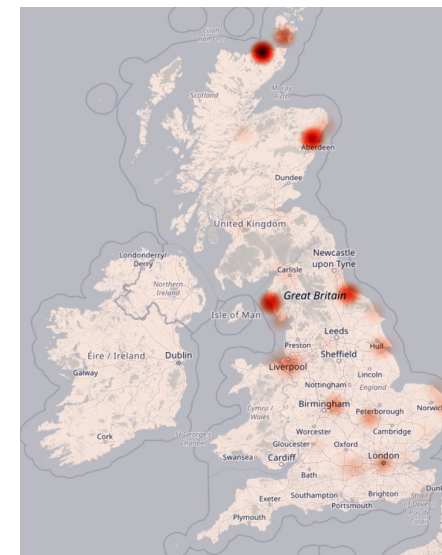
Instrument and Control (583 individuals, 9% of technicians)

Instrument and Control

- Oil & Gas 62%
- Nuclear 20%
- Other non-ECI 7%
- Power Generation 3%
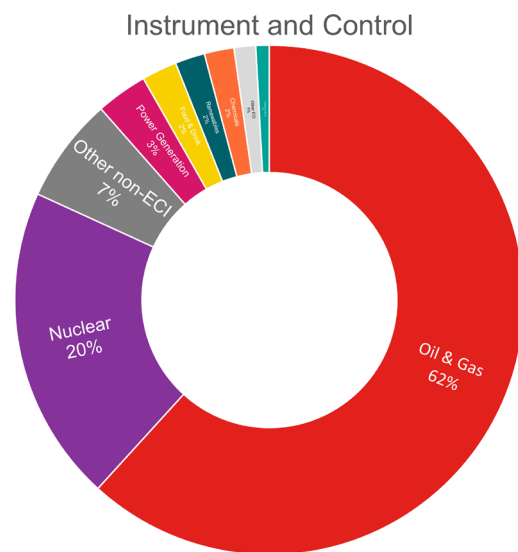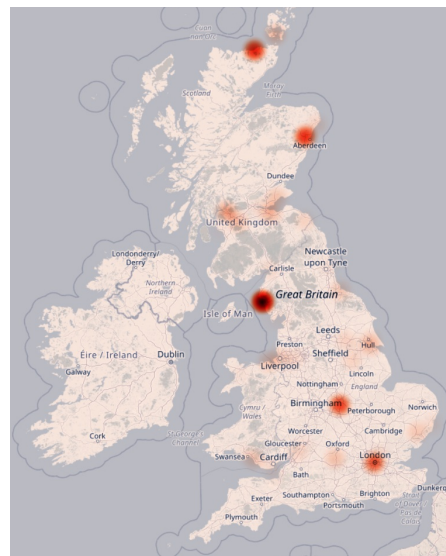
III. Semi-skilled

Scaffolders (1282 individuals, 35.50% of semi-skilled)

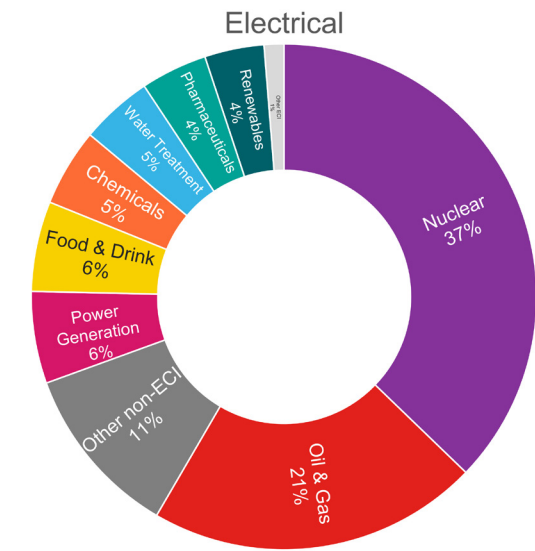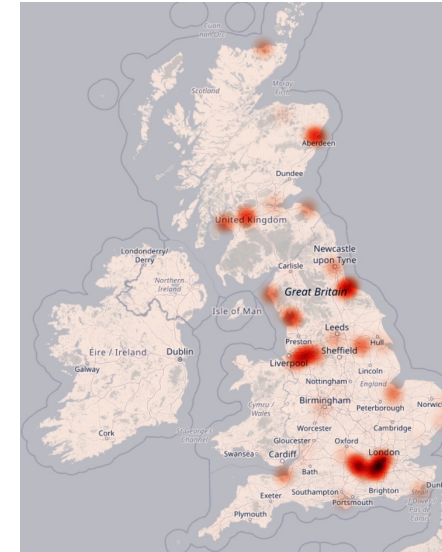### Scaffolders

- Oil & Gas 81%
- Chemicals 14%
- Food & Drink 4%
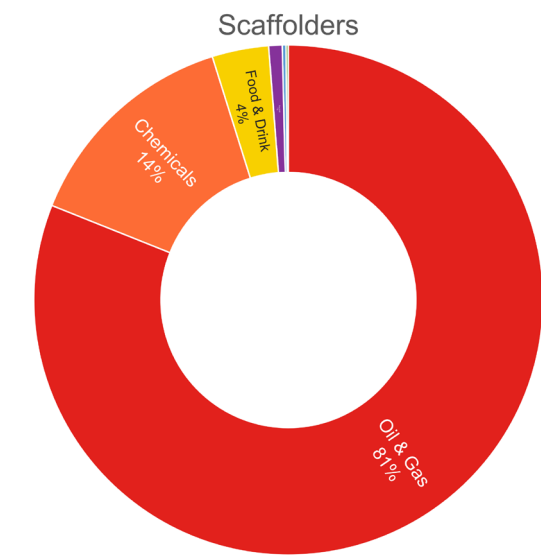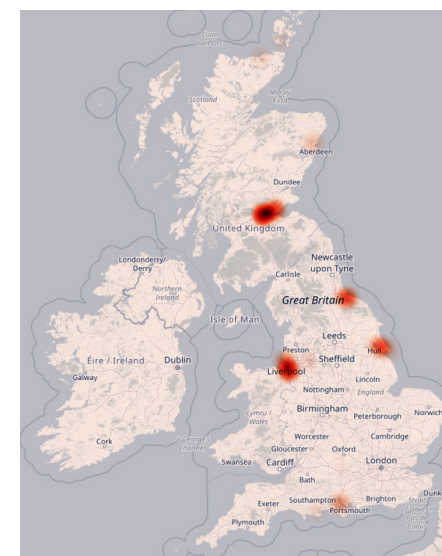
IV.   Engineers
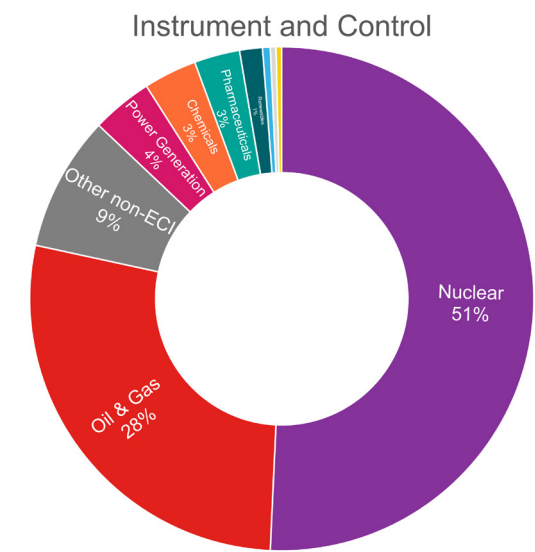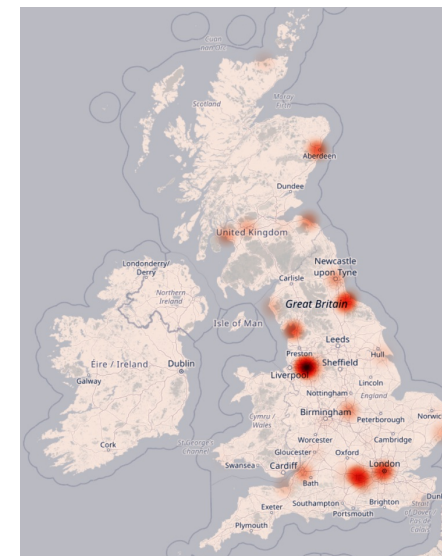
Mechanical (2433 individuals, 22.50% of engineers)

Mechanical

- Nuclear 66%
- Oil & Gas 16%
- Other non-ECI 6%
- Chemicals 5%

Process (1257 individuals, 11.50% of engineers)

Process

- Oil & Gas 39%
- Other non-ECI 22%
- Nuclear 15%
- Pharmaceuticals 11%
- Chemicals 5%
- Renewables 4%
- Power Generation 2%

Electrical (868 individuals, 8% of engineers)

Electrical

- Nuclear 37%
- Oil & Gas 21%
- Other non-ECI 11%
- Power Generation 6%
- Food & Drink 6%
- Chemicals 5%
- Water Treatment 5%
- Pharmaceuticals 4%
- Renewables 4%
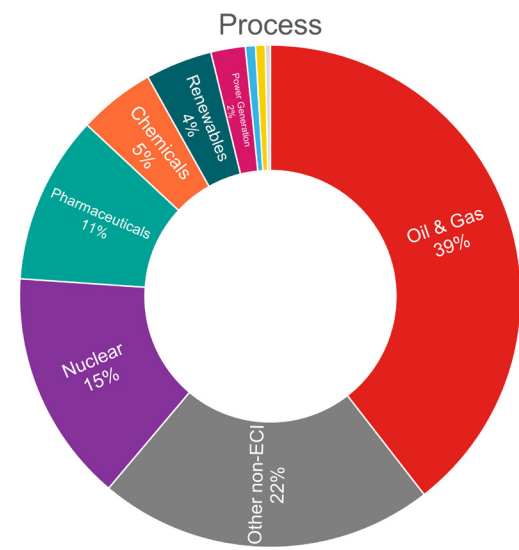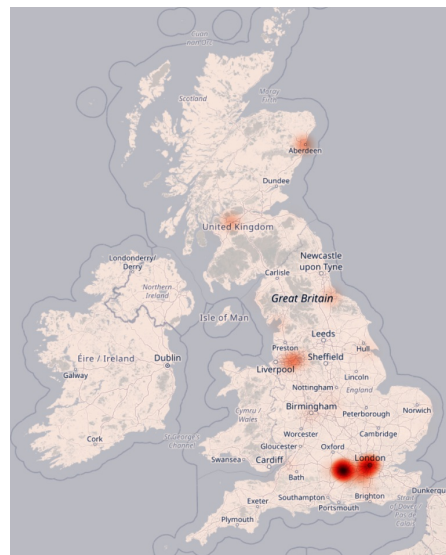
Instrument and Control (819 individuals, 7.50% of technicians)

Instrument and Control

- Nuclear 51%
- Oil & Gas 28%
- Other non-ECI 9%
- Power Generation 4%
- Chemicals 3%
- Pharmaceuticals 3%

Design (621 individuals, 6% of engineers)

Design

- Oil & Gas 34%
- Nuclear 28%
- Power Generation 16%
- Chemicals 9%
- Pharmaceuticals 3%
- Renewables 3%
- Water Treatment 2%
- Food & Drink
- Other ECI
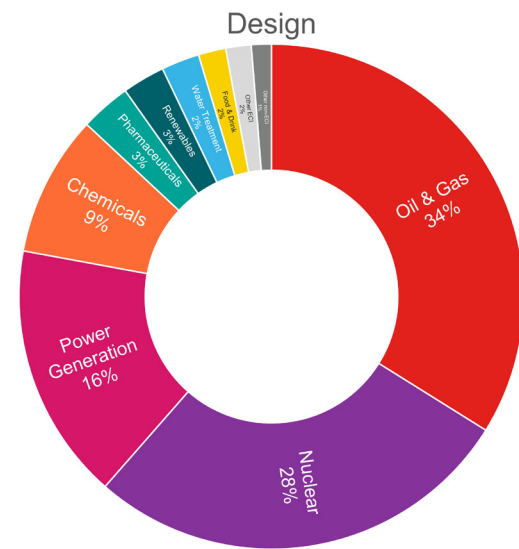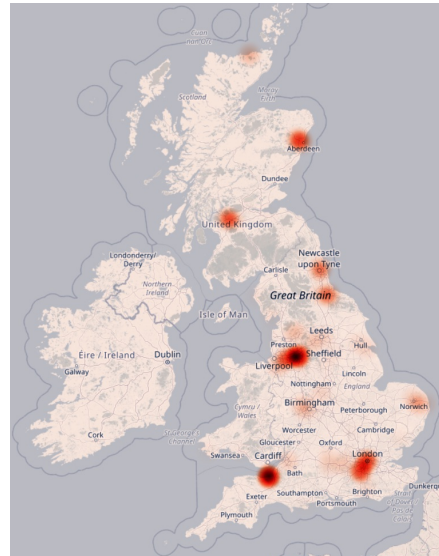
V. Civil & Structural (570 individuals, 5% of engineers)

Civil & Structural

- Nuclear 76%
- Oil & Gas 12%
- Other non-ECI 5%
- Renewables 3%
- Chemicals