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INDUSTRIAL STRATEGY

UK Research and Innovation

ERC Enterprise Research Centre

Equality, Diversity and Inclusion in UK Foundation Industries

An ERC report for UKRI

ERC Report

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Contents

Executive Summary

- Workforce diversity, in terms of age and gender, is highly variable across industry sectors. Official data point to a lack of representation of younger workers and female employees in the manufacturing sector and the survey conducted as part of this research confirms that foundation industries (which are a sub-set of manufacturing) have a similar workforce profile. This profile can also be seen in industry in other developed economies.

- There is an absence of academic and grey literature on workforce diversity in foundation industries, specifically. While business benefits of a more diverse workforce have been presented in terms of innovation performance and revenue gains for the economy at large, the same business case for greater diversity has not been developed at the sub-sector level.

The foundation industry workforce

- Female employees are in the minority in most foundation industry businesses and varies little with the size of businesses. However, there are some difference by sub-sector, with chemicals, ceramics and paper more likely to have female employees accounting for a higher share of the workforce. In addition, the survey finds that female employees are largely engaged in non-production roles and relatively few foundation industry businesses have female owner and partners.

- Across foundation industries, most companies report that the majority of the workforce is in the 25-49 years age bracket. The proportion of employees over 50 years greatly outweighs those under 25 years in all sectors and across businesses of all sizes. The age of directors across foundation industry sectors is also skewed towards the over 50 years age bracket.

- Foundation industry leaders acknowledge that the gender and age balance within the workforce is not optimal. There were particular concerns about the age profile of employees and the potential loss of important skills through retirement. In addition, the introduction of new processes in these sectors does not exclude female employees from production-related roles.

Factors contributing to the current and future structure of the workforce

- A range of factors have contributed to the current shape of the foundation industry workforce, including legacy issues, such as changes to workplace pensions, the need for workforce restructuring in response to recent economic challenges and a lack of female applicants for roles.

- Addressing gender imbalances in foundation industries is regarded as important, but this is not always embedded across all levels of an individual organisation. In addition, formalised recruitment practices to engage more female candidates is not normalised across the industry, with concerns noted about the risks of positive discrimination.

- There are many examples of businesses engaging with the education system to promote employment opportunities in the sector to young people, including some with an explicit focus on engaging with girls. These activities are regarded as crucial to increase the pipeline of young people applying for apprenticeship positions and studying relevant qualifications at university. These efforts

are locally focused and can lack scale. Capacity constraints, particularly in smaller companies, can be a barrier to sustained and structured engagement.

- Meeting future skills needs is a shared concern across foundation industries. Challenges engaging with the higher education system on curriculum development were highlighted as one which, if not addressed by the sector, would result in current skills shortages in technical qualifications persisting.

Policy options

- Current and future skills challenges, an ageing workforce and recruitment constrained by a dominance of male applicants, if not tackled, will leave foundation industry businesses ill-equipped to take advantage of future opportunities. Policy interventions should seek to achieve the following outputs:
    - Improved internal firm-level capacity to develop diversity strategies
    - Increased engagement with the education sector to increase skills supply
    - Increased collaboration to promote best practice and improve industry perception.

- Specific policy options put forward, based on the findings of the research include:

    - Increase learning opportunities for foundation industry management to develop a diversity strategy.
    - Increase networking and sharing of best practice.
    - Develop industry collateral on the benefits of increased diversity.
    - Support greater engagement with skills and training providers.
    - Encourage industry coordination to articulate future skills needs.
    - Build scale in STEM engagement.
    - Develop a coherent and consistent industry vision of the future.

- The next steps in developing the appropriate solutions to support the move to greater diversity in the foundation industry workforce is to identify external inputs required to support firm-level action in adopting new policies and practices in support of diversity and inclusion. New structures may also be required to facilitate effective engagement with the education sector and determine future requirements. In addition, securing senior leadership support will be important to develop a new proposition around opportunities in foundation industry sectors.

- Making progress will be a long-term undertaking as perceptions take time to shift and the development of a pipeline of appropriate skills will take time and sustained industry dialogue.

1. Introduction and methodology

The importance of workforce diversity is receiving an increasing amount of attention, from ensuring business practices are inclusive to active strategies to engage and recruit under-represented groups. Much of the research in this area has focused on large corporates with less consideration given to diversity and inclusion practices and challenges across SMEs or different industry segments. An initial review of the available data on diversity in foundation industries, specifically, has revealed this to be an under-researched topic with limited sector data available on workforce profile or the trends that underpin it.

The focus on increasing workforce diversity involves a broad range of protected characteristics, including age, gender, ethnicity and disability, for example. An Equality Impact Assessment completed by the Transforming Foundation Industries Challenge team at UK Research and Innovation sought to further investigate diversity issues as they relate to these particular sub-sectors. Although this found that it is well acknowledged that there is need for concerted effort in inclusivity and diversity under all protected characteristics, if business as usual continued without positive action for underrepresented groups in this sector, specifically young people and women, their programme of work could continue to disengage these people within this sector. For that reason, this report focusses upon age and gender, which were highlighted as areas of high potential impact within the life of the Challenge.

As this report will show, the foundation industry workforce is dominated by male employees at almost all levels and there is under-representation of younger employees, compared with the average in the economy. Research into the factors which have shaped this workforce profile and the actions that could be taken to drive greater employee diversity is timely for three reasons;

- The current lack of diversity in the workforce and challenges foundation industries face with skills availability and recruitment;
- The shift in future skills requirements as industry adopts new technologies and takes action to meet the net zero challenge;
- The profound labour market changes associated with the COVID-19 pandemic.

Recent ERC Research (2021) on innovation barriers in foundation industries found that 40 percent of surveyed businesses identified skills and recruitment as a barrier to growth, rising to 46 percent and 48 percent for businesses in the metals and paper sectors, respectively. This points to the need for a different approach to attract and develop the necessary skills industry needs now, including through engagement with currently under-represented groups in the local and national labour market. In some businesses and sectors, the pressure to replace skills, lost though retirement, is also looming on the horizon.

Business also acknowledge that skills needs are dynamic, with changing business models, the use of new technology and the development of new markets meaning that new skills will need to be introduced to ensure competitiveness of foundation industries in the UK is sustained in the long-term.

Thirdly, the economic consequences of the pandemic could potentially lead to profound shifts in the labour market. Official data have pointed to some early signs that younger workers have been particularly impacted by job losses in the economy. Consideration will need to be given to the provision of additional training and employment opportunities to minimise the long-term effects of the pandemic on the labour market, especially for this cohort.

1.1 Methodology

This research was undertaken by the Enterprise Research Centre on behalf of UKRI in order to improve understanding of the age and gender diversity of the foundation industry workforce. Our data and methods were targeted at developing new quantitative and qualitative insights into the UK foundation industry sectors and their workforce. The research sought to understand the factors that shape the current workforce structure, attitudes to age and gender diversity, actions at the firm- and industry-level to affect change and barriers encountered. The project involved three principal stages:

Stage 1. Review of existing literature and available data

A review of academic and grey literature was undertaken to document established thinking around diversity and the link with business performance. This stage also included a review of available evidence and statistics on age and gender with the UK workforce and the foundation industry sectors.

Stage 2. A CATI survey of foundation industry businesses

A telephone-based survey was undertaken by a specialist market research company on behalf of ERC in May through to September 2020. A total of 249 interviews were completed (see Table 3.2.2). Respondent businesses were recruited from sectors with SIC codes agreed with UKRI (see Annex 1).

Table 1.1 Achieved CATI survey responses by size and foundation industry

	Number of employees				
Foundation industry	**0-9**	**10 – 49**	**50 - 249**	**250+**	**Total**
Chemicals	3	35	7	5	50
Cement	5	24	4	2	35
Ceramics	9	16	5	1	31
Glass	14	18	2	1	35
Metal	5	30	13	4	52
Paper	3	25	16	2	46
Total Surveyed Firms					**249**

This survey was designed to provide data relating to:

- The proportion of female owners and partners
- The breakdown of employees by age
- The age profile of directors
- The gender split of employees
- The roles in which female employees are engaged

The survey outputs were analysed using SPSS software considering trends at the aggregate level across all industries and analysis by foundation industry and employment bracket.

Stage 3. A CATI survey of foundation industry businesses

The final stage of the fieldwork involved in-depth interviews with 8 businesses operating in these industries. The key objective of these interviews was to provide a greater depth of understanding of the issues affecting diversity. To achieve this, businesses across the foundation industries were interviewed using semi-structured questions between February and March 2021.

The interviewees were business owners, senior business executives, and high-level managers involved in shaping strategy and recruitment decisions in foundation industry businesses. The discussion guide for interviews was based on findings from the analysed survey responses and the discussion guide followed an iterative process that involved input from UKRI. The objectives of the interviews were:

- To understand the gender and age make up of the workforce and management team
- To gather views on how this shapes company strategy and priorities
- To understand activities undertaken across foundation industries to enhance workforce diversity, challenges and areas for additional support?
- To identify drivers and barriers associated with achieving greater equality.

The remainder of this report is structured as follows; a review of available evidence and data on diversity in the UK workforce, the output from the CATI survey of foundation industry businesses, an analysis of the findings from qualitative interviews of senior leaders in the industry and policy options to affect change in the profile of the foundation industry workforce.

2. Background

Foundation industries are those sectors (or sub-sectors) of the economy that are principally concerned with the manufacture of core materials that supply other industrial firms, primarily serving other businesses underpinning critical supply chains. Increasing interest and research about foundation industries is a reflection of the recognised importance of maintaining sufficient domestic capacity due to the potential for disruption to global value chains and the consequences for production across other sectors.

- As noted in ERC's recent "*Innovation readiness in UK Foundation Industries"* report, the UK's foundation industries have been faced with a range of challenges, including some related to policies that have impacted on the UK cost base. Businesses have faced significant challenges in the decade following the financial crisis and have not been shielded from the impact of the recent COVID-19 pandemic and associated recession.

2.1 Foundation Industries in the UK

As shown in Table 2.1.1 there are approximately 7,000 businesses with employees in the six foundation industry sectors considered in this report. These businesses account for just over five percent of businesses in the UK manufacturing sector and approximately 0.26 percent of all UK businesses. As is the case more generally, the majority of businesses in the foundation industries are relatively small; there are just 700 medium-sized businesses (50 to 249 employees) and only 140 large businesses (250 or more employees).

In total, the six UK foundation industries sectors employ 253,825 people, which amounts to approximately 10 percent of all manufacturing sector jobs and 0.8 percent of all jobs in the non-financial economy as a whole.

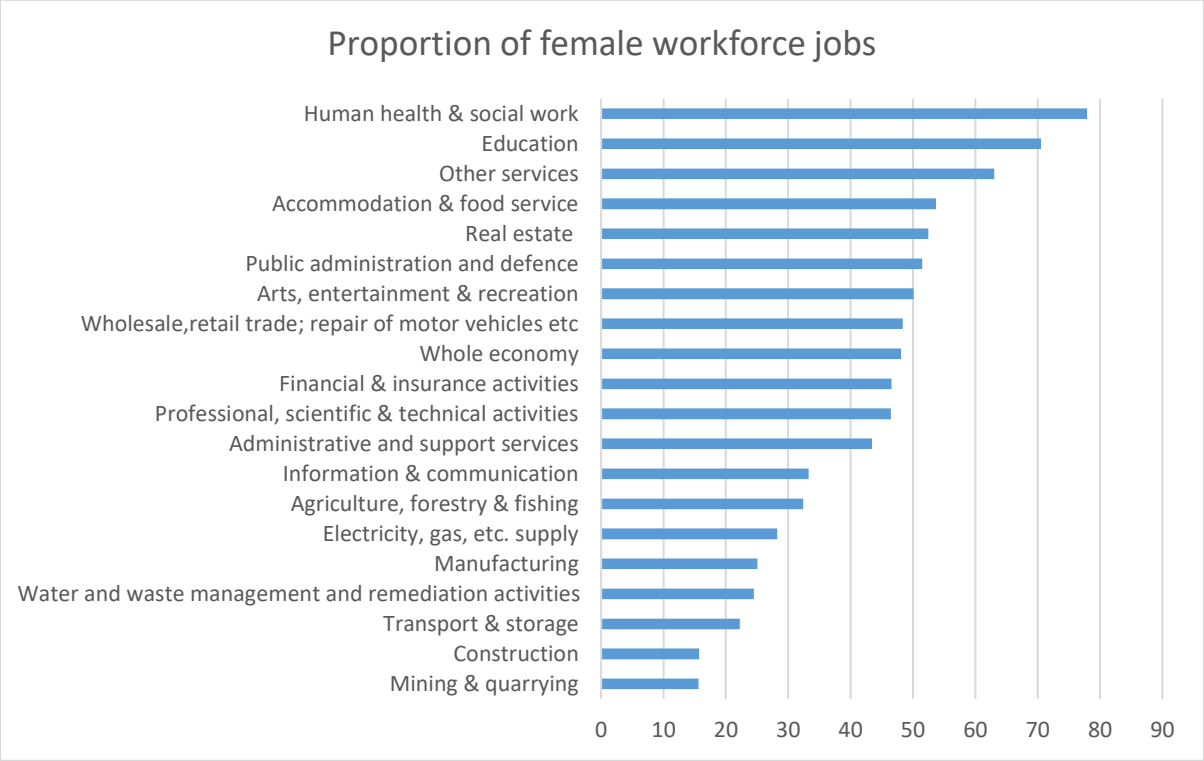
These six sectors have a combined turnover of over £67,584m, which accounts for just under 12 percent of total manufacturing sector turnover and approximately 1.7 percent of the turnover of all non-financial UK businesses. These data show that the mean turnover of businesses in the foundation industries is considerably higher than those in the manufacturing sector as a whole and throughout the economy.

	Number of businesses						
	All businesses	Micro (1 to 9 employees)	Small (10 to 49 employees)	Medium (50 to 249 employees)	Large (=> 250 employees)	Employment	Turnover £m
Cement	1165	770	275	100	20	37450	8583
Paper	1370	790	370	175	35	58050	12188
Ceramics	545	430	70	35	10	17550	2513
Metals	2030	1315	500	180	35	69175	18642
Chemicals	1240	785	280	145	30	47830	22075
Glass	735	475	185	65	10	23770	3583
All Foundations industries	7085	4565	1680	700	140	253825	67584
All Manufacturing	137365	108300	21575	6205	1285	2521519	570095
All Economy	2718435	2431995	233960	42000	10480	31574358	4005865*
Source: Office for National Statistics					* Non-financial economy		

2.2 Workforce diversity in foundation industries

The research sought to understand the profile of the workforce in the foundation industries, in terms of the age and gender of employees. There is little granular official data available covering these metrics and more detailed information was, therefore, collected directly from businesses through a CATI survey, the results of which are presented in section 3. However, figures 2.2.1 and 2.2.2 show the variation in workforce diversity across broad sectors of the UK economy.

Figure 2.2.1 Proportion of female workforce jobs by sector



Source: NOMIS

Figure 2.2.1 shows a large degree of variation in female workforce presentation by sector. Across the economy as a whole 48 percent of workforce jobs are occupied by women. Sectors related to public sector activity, such as health, social care and education have a disproportionate share of female employees – over 70 percent. Industries such as professional and scientific activities, financial services and wholesale and retail trade are in line with the whole economy average. At the other end of the spectrum, mining and quarry and construction report that around 15 percent of the workforce is female.

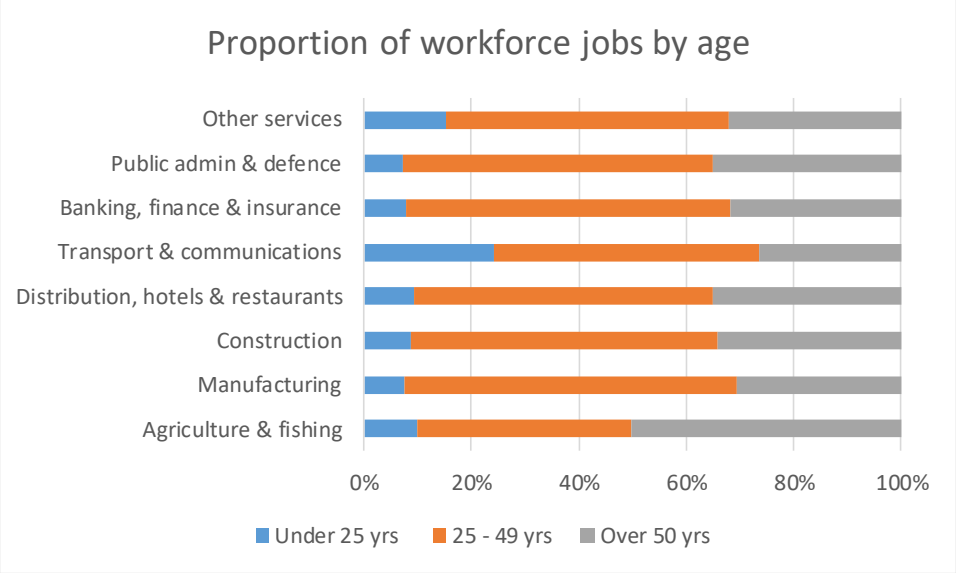
In manufacturing, of which the foundation industries are a sub-set, a quarter of the workforce is female. As the survey notes in section 3, female representation in foundation industries is comparable with that in manufacturing at large. Moreover, the gender balance of the UK's manufacturing sector is similar to that seen in other developed economies. Research from PWC in the US showed that, in 2017, 29 percent of the manufacturing workforce was female. Survey evidence from the International Innovation Barometer (2020) which looked at the gender balance in R&D teams also found diversity wanting. The survey showed that R&D teams, internationally, are male dominated, with 83 percent of respondents stating that fewer than half of those on their innovation teams are women, while a quarter stated that fewer than one in ten of their R&D employees are female.

Figure 2.2.2 illustrates how the workforce breaks down by age. Data is only available at a broader sector breakdown, with the ONS NOMIS database providing information on workforce age across four age groups, 16-19 years, 19-24 years, 25-49 years and over 50 years. Across the economy as a whole, the largest proportion (56 percent) of the workforce falls within the 25-49 years age bracket, with 11 percent under 25 years and almost a third (33 percent) aged over 50 years. As with the gender breakdown, there is also a relatively high degree of variation in the age profile across difference economic sectors.

Agriculture and fishing has by far the largest share of the workforce aged over 50 years (50 percent) and one in ten employees in this sector are under 25 years. In other sectors, the percentage of the workforce

over 50 years varies from 27 percent in transport and communications to 35 percent in distribution, hotels, and restaurants. At the other end of the age distribution, manufacturing and construction have lower representation in the workforce of those under 25 years, 8 percent and 9 percent respectively. As we will show in section 3, the survey findings for foundation industries are not out of line with the manufacturing picture.

Figure 2.2.2 Proportion of workforce jobs by age and sector



Source NOMIS

2.3 Why diversity matters and what drives it

There is a somewhat limited body of literature about the business benefits of a more diverse workforce. Much of this extends beyond the aspects of diversity under investigation in this research, to include ethnicity, for example. Kandola and Fullerton (1994) showed that the business benefits of diverse workforce rest on three pillars: excluding groups from recruitment results in the under-utilisation of skills available in society; diversity within a business makes the proposition to customers more appealing; and diversity leads to greater operational efficiency and effectiveness.

Attempts have also been made to quantify the bottom-line benefits to firms from a more diverse workforce, with diversity considered in its broadest sense. Estimates point to a 19 percent uplift in revenues as a result of higher levels of innovation activity in more diverse firms (BCG, 2018). Looking specifically at the impact of diversity on innovation activity, research points to innovation levels positively correlated with an equal gender balance in teams (Gratto et al, 2007). Analysis from McKinsey (2015) showed that greater gender diversity on the senior-executive team corresponded to a performance uplift: for every 10 percent increase in gender diversity, business earnings rose by 3.5 percent.

In addition, a survey of engineers (RAEng, 2017) points to the diversity benefits to employees, with 80 percent of engineers reporting increased motivation, 68 percent increased performance and 52 percent increased commitment to their organisation. The flip side of a diverse workforce, is the lack of one, which can have negative business and societal consequences (CIPD, 2019) including discrimination in recruitment, pay gaps and barriers to progression.

While economy-wide insights are helping in making the case for increased diversity, there is considerably less literature about how this translates across different firm types and sectors. The CIPD (2019) notes that context is important in determining the benefits of diversity in the workforce. It notes that *'solutions that work in one context may not be relevant, appropriate or effective in another.'* One research paper points to potential differences in the benefits of diversity between services and manufacturing firms (Ali et al, 2011). It points to results that suggest that industry type can modify the relationship between organisational gender performance and productivity with the effects in manufacturing positive, but weaker than in services. They conclude that a gender-diverse workforce might 'need to be managed differently in different industries to fully realize the benefits of diversity. For instance, close proximity to final consumers in the services industry means that managers need to manage gender diversity at the employee–customer interface to capitalize on the resource of market insights.'

While there is the business case for greater diversity, the role this plays in successful manufacturing businesses is somewhat less clear cut and absent for the foundation industries specifically, there is also something of an evidence gap on what drives diversity at the firm level. There are many organisations with an explicit remit to promote women into the sciences, this is an important starting point in building a pipeline of future employees. This campaigning approach is evident in the UK and in other similar economies, such and the US, Canada, and Australia. The CPID (2019) shows that in general management interventions on diversity and inclusion are only likely to succeed when actively supported by senior management, both initially and on an ongoing basis. This is seen as crucial to achieve buy-in and commitment right across organisations, though again it notes that research is this area is limited.

Evidence from the International Innovation Monitor (2020) suggests there is some way to go to win hearts and minds on the importance of firm-level diversity. The survey finds that thirty-five percent of R&D managers say gender diversity is not that important and 24 percent of CEOs say it is not important at all. These views are echoed in the RAEng (2017) survey, which also identified a lack of importance attached to increased diversity and inclusion amongst engineers. When asked to list five top changes to the culture of engineering that would make it a better environment to work in only a quarter cited more diversity.

Section 3: Survey findings

This section outlines the finding from a survey of 249 foundation industry businesses, which explored the age and gender profile of employees and company partners and directors. The method of data collection meant that respondents were asked to provide a breakdown of the gender and age of the workforce into broad categories, rather than providing precise numbers. Our analysis therefore presents the data as the proportion of businesses employing people within the specified age and gender characteristics.

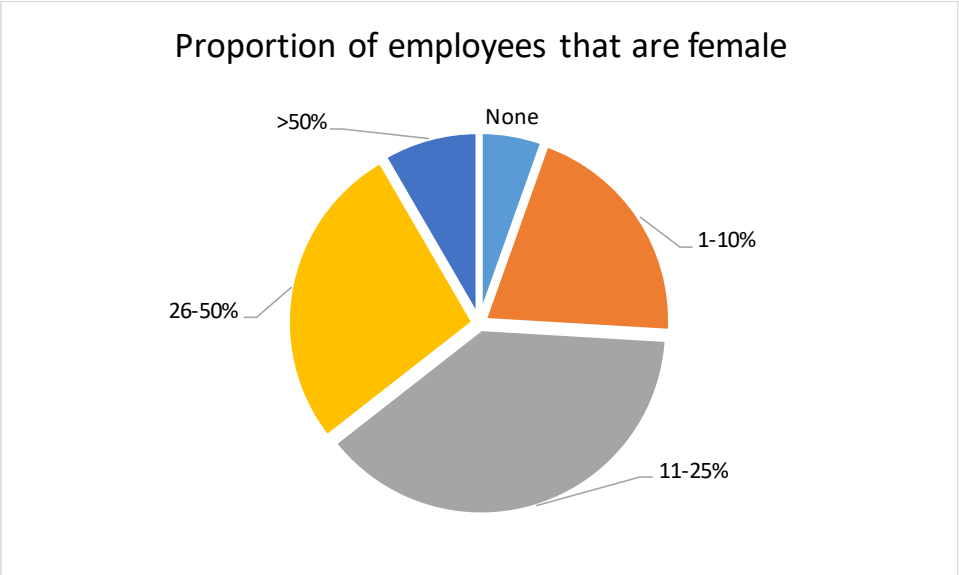
Key findings

- Female employees account for a minority of the workforce in most foundation industry businesses.
- The gender profile varies little by business size, but there are differences between foundation industries.
- Women in foundation industries tend to be engaged in non-production roles.
- Across foundation industries, as a whole, most companies report that a majority of the workforce is in the 25-49 age bracket.
- The estimated proportion of the workforce under 25 years is in line with the economy average, but over a quarter of foundation industry businesses have no employees in this age bracket.
- A quarter of foundation industry businesses report that more than half of employees are aged over 50 years.
- Relatively few foundation industry businesses have women owner and partners, with the smallest companies more likely to.
- The age of directors across foundation industries is also skewed towards the over 50 years age bracket.

3.1 Gender profile of foundation industry businesses

Our survey sought to understand the share of female representation in the foundation industry workforce (excluding owners and directors as this is covered separately in Section 3.4). Figure 3.1.1 shows that female employees account for less than a quarter of the workforce in nearly three-fifths of businesses (59 percent). In one in 20 foundation industry businesses, there are no female employees. Only in a small minority of respondents (8 percent) do female employees account for half or more of the workforce. Overall, this indicates that across surveyed businesses, female representation in the workforce is lower than that seen across the wider economy.

Figure 3.1.1 Proportion of female employees in foundation industry businesses percentage of businesses



Figures 3.1.2 and 3.1.3 point to some differences in the gender profile of foundation industry businesses by size and sector. Starting with differences by company size (figure 3.1.2), businesses with no female employees are concentrated among smaller size bands with nearly a fifth (19 percent) of businesses with fewer than 10 staff employing no women. However, small businesses are also found at the other end of the spectrum, with one in seven (14 percent) business employing fewer than 10 people also reporting that more than half of the workforce is female. The relatively low number of people working in this cohort of businesses means that there should be some caution in drawing conclusions about firm-level diversity.

All businesses employing more than 25 people have some female representation in the workforce. While there is a higher degree of variation in female representation in the smallest businesses, female employment accounts for less than a quarter of the workforce in the majority of businesses across all size bands.

Figure 3.1.2 Proportion of female employees in foundation industry businesses percentage of businesses by turnover

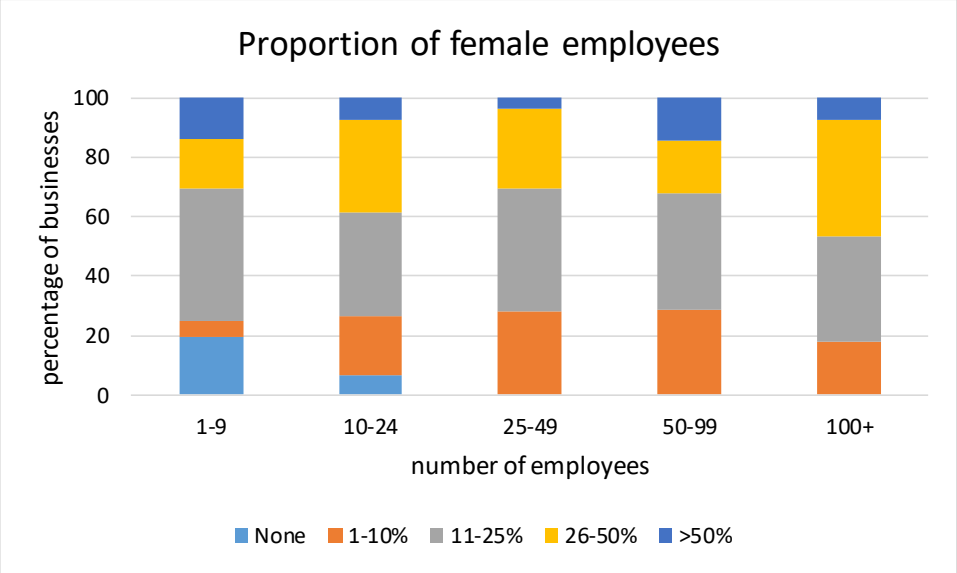
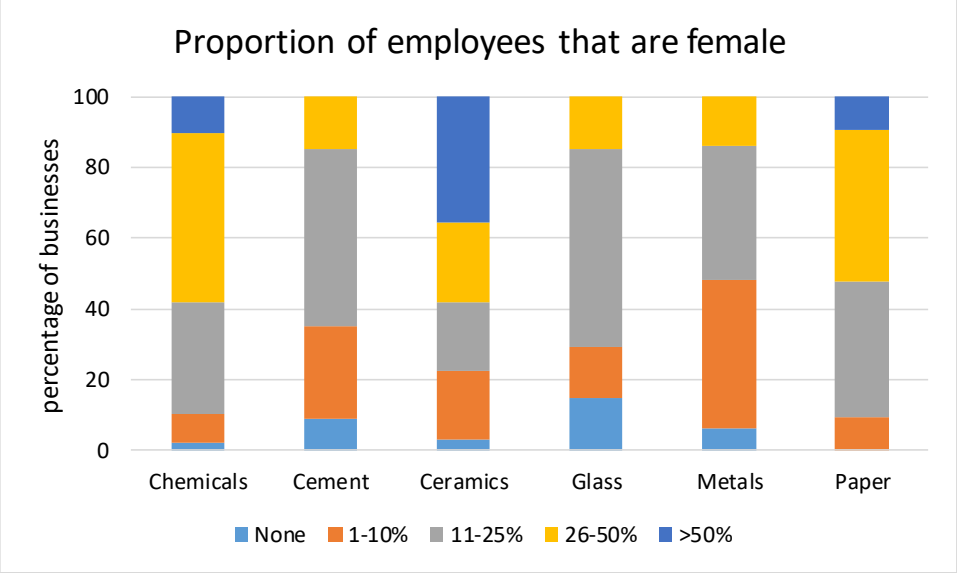


Figure 3.1.3 suggests there is a greater degree of variation in female employment across foundation industries. Female representation is reported to be higher in the ceramics, chemicals, and paper sectors. These sectors account for the lowest shares of businesses with no female employees and ceramics businesses are the most likely to report that women are more than half of the workforce (36 percent compared with 8 percent across all foundation industry businesses). In contrast, no businesses in metals, cement, and glass report that more than half of the workforce is female and in around 85 percent of businesses in these sectors the proportion of women in employment is less than a quarter of the total.

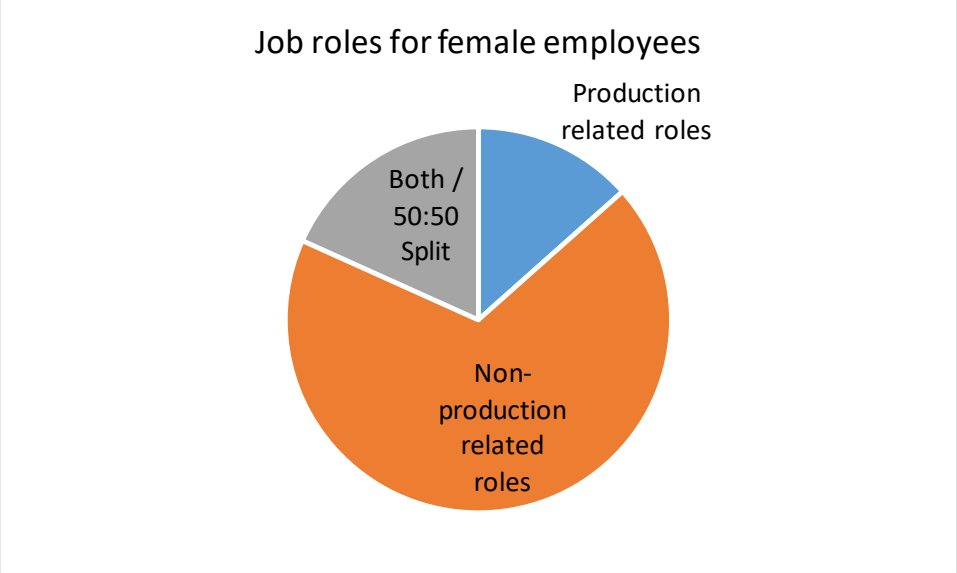
Figure 3.1.3 Proportion of female employees in foundation industry businesses percentage of businesses by sector



3.2 Job functions for female employees

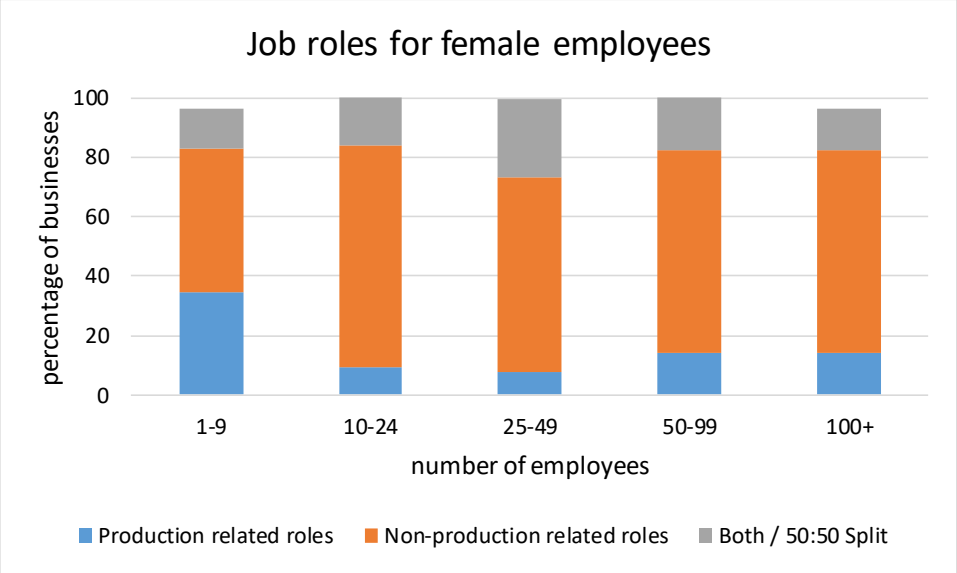
In addition to gaining insights into the gender mix of the foundation industry workforce, our survey also sought to understand the broad job roles in which female employees are engaged. Figure 3.2.1 shows that across the industry as a whole the majority of businesses employ women in largely non-production roles (this will include, for example, HR, finance, marketing and sales). Over two-thirds of respondents (68 percent) report than female employees are engaged mainly in non-production roles, with 13 percent of businesses employing women mainly in production roles (these include, for example, manufacturing, engineering, and technical functions). The remainder, 18 percent, have women employed in an even split between production and non-production functions.

Figure 3.2.1 Female employees engaged in production and non-production functions percentage of businesses



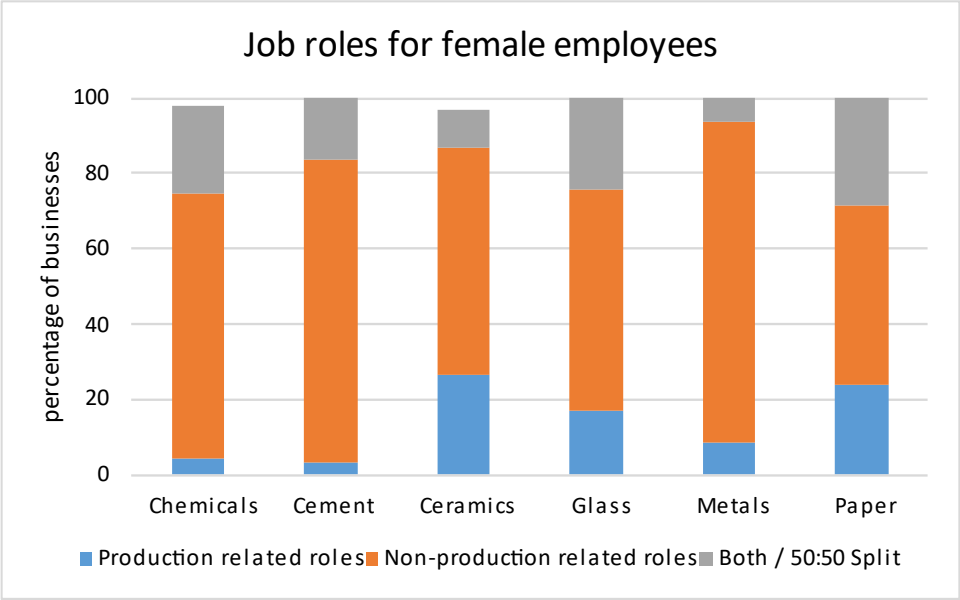
Figures 3.2.2 and 3.2.3 consider difference in female job roles by business size and foundation industry sector. The smallest businesses (fewer than 10 employee) are more likely to employ women to largely production-related roles, however, these are still very much in the minority of female roles. Female representation in production roles is lower than average in businesses with between 10 and 49 employees. Across all sizes of businesses, the majority of respondents employ women largely non-production roles.

Figure 3.2.2 Female employees engaged in production and non-production functions percentage of businesses by size



As with the gender profile of foundation industry businesses more generally, the job functions where women are employed also varies somewhat by sector in our survey. Chemicals and cement stand out as having a very low proportion of women engaged in production-related roles. For example, 3 percent of businesses the cement sector said female employees were mainly engaged in production roles. This contrasts with the ceramics and paper sectors, in which business are more likely to have female employees working mainly in production functions (27 percent and 24 percent respectively).

Figure 3.2.2 Female employees engaged in production and non-production functions percentage of businesses by sector



Taking the data from sections 3.1 and 3.2 together suggests that women are under-represented in the foundation industry workforce and across the sectors in aggregate female employment is concentrated

in non-production or support functions. Business size does not appear to be a major determinant of these trends; however, the nature of the sector does seem to have a greater bearing on the likelihood of female employment and the roles in which they are engaged. Nevertheless, the low proportion of businesses employing women in manufacturing or technical roles could present a missed opportunity to address current and future skills requirements.

3.3 Age profile of foundation industry businesses

Our survey also investigated the age structure of employees (this analysis again excludes owners and directors) in foundation industries to gauge the extent to which industries are facing the challenges of an ageing workforce or are succeeding in attracting a pipeline of younger talent. Figure 3.3.1 begins by illustrating the aggregate picture across the six sectors, presenting the proportion of businesses with employees across three age brackets – under 25 years, 25 to 49 years and over 50 years.

Our survey finds that nearly half of surveyed businesses (47 percent) have a majority (over 50%) of the workforce in the 25 to 49 years age bracket with a further 36 percent of respondents reporting that between 25% and 50% of employees are in this age range. Figure 3.3.1 also points to a sizeable minority of businesses with an ageing workforce. Over a quarter of surveyed businesses report that over half of employees are aged 50 years or over with a further 32 percent having between 25% and 50% of the workforce in this age bracket.

At the other end of the age spectrum, over a third of foundation industry businesses report that fewer than one in ten employees is under 25 years, including 28 percent of businesses which have no employees within this age group.

Figure 3.3.1 Breakdown of the foundation industry workforce by age percentage of businesses

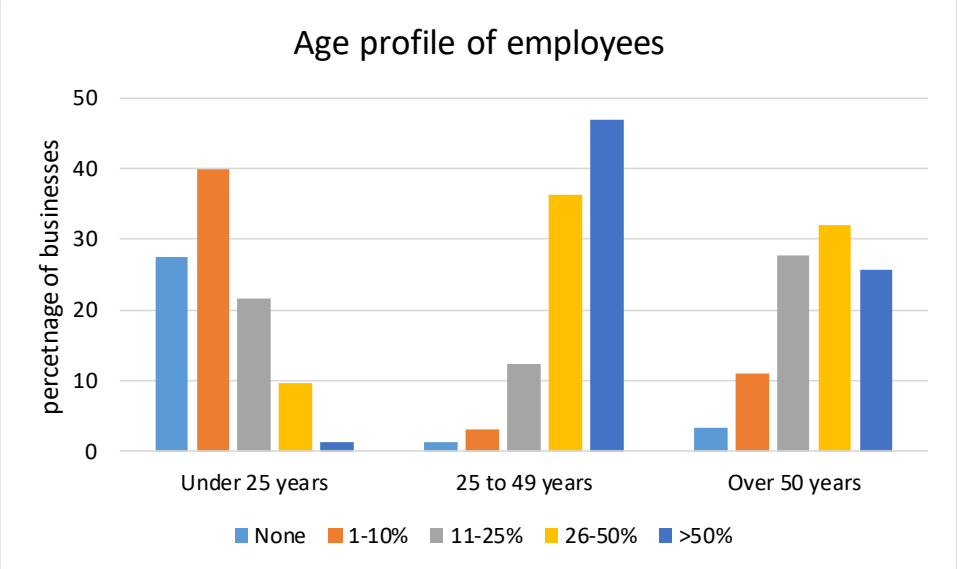


Table 3.3.1 shows that there is some variation between age ranges across businesses of different sizes. Across all size bands there is a concentration of employees in the mid-range age band of 25 to 49 years.

In the majority of businesses with between 10 and 49 employees and over 100 employees, workers in this age range account for more than half the workforce.

In the over 50 years age bracket, the smallest businesses (fewer than 10 employees) are more likely to have a high proportion of the workforce in this age range. Nearly two-fifths (39 percent) of businesses in the smallest size band report that more than half of employees is over 50 years, but this proportion tapers as business size increases. That said, 15 percent of larger businesses with over 100 employees report than more than half of the workforce is over 50 years.

Converse is true at the younger age bracket, with relatively few mid-size and larger businesses in our survey (over 50 employees) reporting that none of the workforce is under the age of 25 years. This is potentially a result of regular graduate or apprentice intakes amongst companies of this size. The picture on the share of younger workers among smaller businesses is more mixed as one or two young people joining or leaving the business can have a marked impact on workforce age profile – therefore making it difficult to draw conclusions on recruitment and retention activities in businesses of this size, based on the survey data alone.

Table 3.3.1 Breakdown of the foundation industry workforce by age percentage of businesses by size

	Number of employees				
	1-9	**10-24**	**25-49**	**50-99**	**100+**
What proportion of staff are under 25 years old					
None	50.0	36.5	15.1	8.0	7.7
1-10%	5.6	38.5	49.1	56.0	57.7
11-25%	22.2	16.7	22.6	28.0	30.8
26-50%	16.7	7.3	13.2	8.0	3.8
>50%	5.6	1.0	0.0	0.0	0.0
What proportion of staff are between 25 and 49 years old					
None	5.6	1.0	0.0	0.0	0.0
1-10%	0.0	4.2	5.9	0.0	0.0
11-25%	16.7	14.6	3.9	16.0	11.5
26-50%	55.6	30.2	29.4	52.0	30.8
>50%	22.2	50.0	60.8	32.0	57.7
What proportion of staff are over 50 years old					
None	11.1	3.1	2.0	0.0	0.0
1-10%	8.3	12.5	15.7	8.0	3.8
11-25%	11.1	30.2	33.3	20.0	38.5
26-50%	30.6	29.2	25.5	48.0	42.3
>50%	38.9	25.0	23.5	24.0	15.4

Figure 3.3.2 uses the survey data to estimate the age profile across foundation industry businesses in different size brackets. Across foundation industries as a whole, the estimated proportion of the workforce under the age of 25 years is 11 percent, similar to that seen in the economy as a whole and a little higher compared with manufacturing. The estimated proportion of the foundation industry workforce over 50 years, at 37 percent, is higher than the economy average, however. Smaller companies, with fewer than 10 employees, have the highest proportion of workers aged over 50 years (figure 3.3.2).

Figure 3.3.2 Estimates of the foundation industry workforce by age percentage of employees by business size

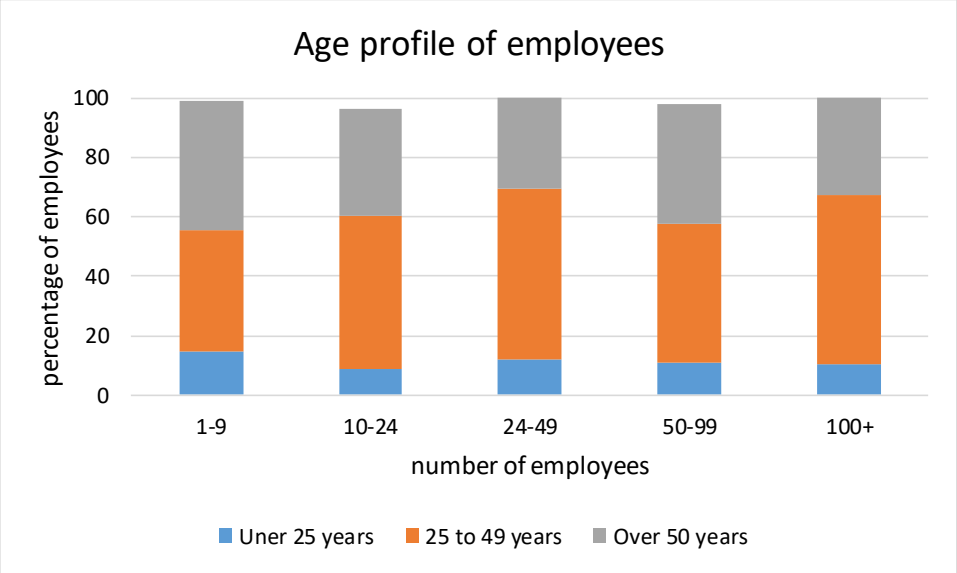


Table 3.3.2 suggests that there are some differences in workforce age profile across the six foundation industries. Looking first at the concentration of businesses with a large proportion of the workforce over 50 years old, ceramics, glass and paper appear to be facing somewhat more acute pressures from an ageing workforce. Around a third of businesses in these sectors reported that more than half of employees fall into this older age bracket. In chemicals, cement, and metals more than half of businesses report that the majority of the workforce is between 25 and 49 years.

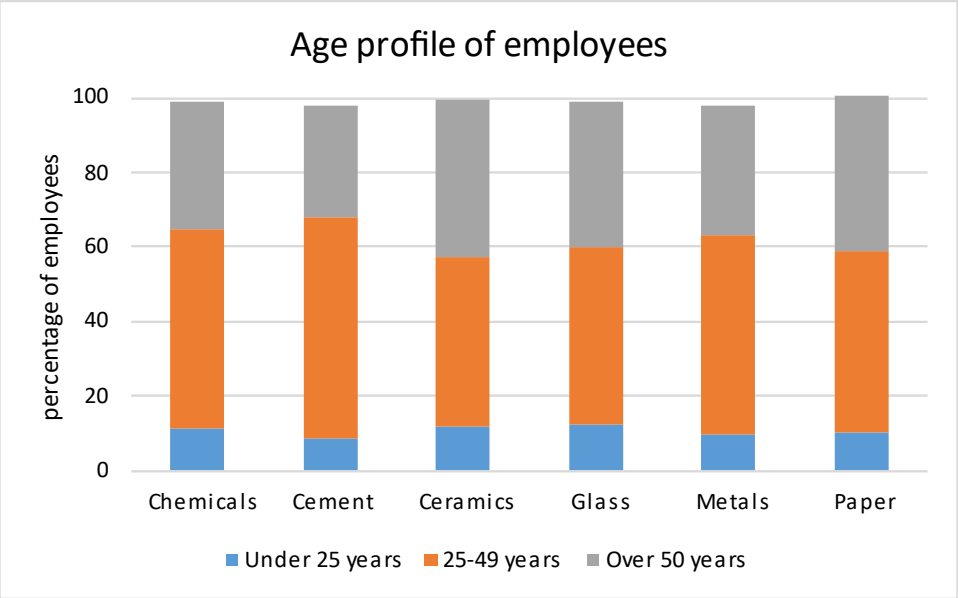
Table 3.3.2 Breakdown of the foundation industry workforce by age percentage of businesses by sector

	Foundation industry					
	Chemicals	**Cement**	**Ceramics**	**Glass**	**Metals**	**Paper**
What proportion of staff are under 25 years old						
None	21.3	41.2	28.6	37.1	16.3	27.9
1-10%	44.7	29.4	39.3	22.9	55.1	39.5
11-25%	23.4	20.6	25	20	20.4	20.9
26-50%	8.5	8.8	0	20	8.2	11.6
>50%	2.1	0	7.1	0	0	0
What proportion of staff are between 25 and 49 years old						
None	2.2	0	0	2.9	2	0
1-10%	2.2	0	7.1	0	4.1	4.7
11-25%	13.0	2.9	17.9	11.8	10.2	18.6
26-50%	30.4	38.2	39.3	50	30.6	34.9
>50%	52.2	58.8	35.7	35.3	53.1	41.9
What proportion of staff are over 50 years old						
None	4.3	8.8	3.6	0	4.1	0
1-10%	6.5	8.8	3.6	23.5	8.2	16.3
11-25%	39.1	29.4	25	17.6	32.7	18.6
26-50%	28.3	41.2	35.7	26.5	34.7	27.9
>50%	21.7	11.8	32.1	32.4	20.4	37.2

Survey responses on the share of the workforce under 25 years also vary by sector. Businesses in cement and glass are most likely to businesses with no employees in this age range (41 percent and 37 percent of businesses). However, responses from the glass sector where quite skewed with a fifth of businesses in this sector also reporting that between a quarter and a half of the workforce is under 25 years.

Again, we have used the survey to estimate the age breakdown of foundation industries. Figure 3.3.3 shows that chemicals, cement, and metals have a workforce age profile similar to that seen in the wider workforce. In contrast, potential pressures from an ageing workforce look more acute paper and glass and, to a less extent, glass, with proportions of over 50 year old employees is higher than the economy average and the share of employees under 25 years is lower.

Figure 3.3.3 Estimates of the foundation industry workforce by age percentage of employees by sector



3.4 Profile of owners, partners, and directors

The survey also explored these trends amongst the partners and directors in foundation industry businesses.

Figure 3.4.1 illustrates the proportion of businesses with female working owners and partners and in three-fifths of foundation industry businesses (59 percent) no female representation was reported at this level. Three in ten businesses had one working female owner or partner and the remaining 5 percent of businesses had two or more.

Figure 3.4.1 Businesses with female owners and partners percentage of businesses

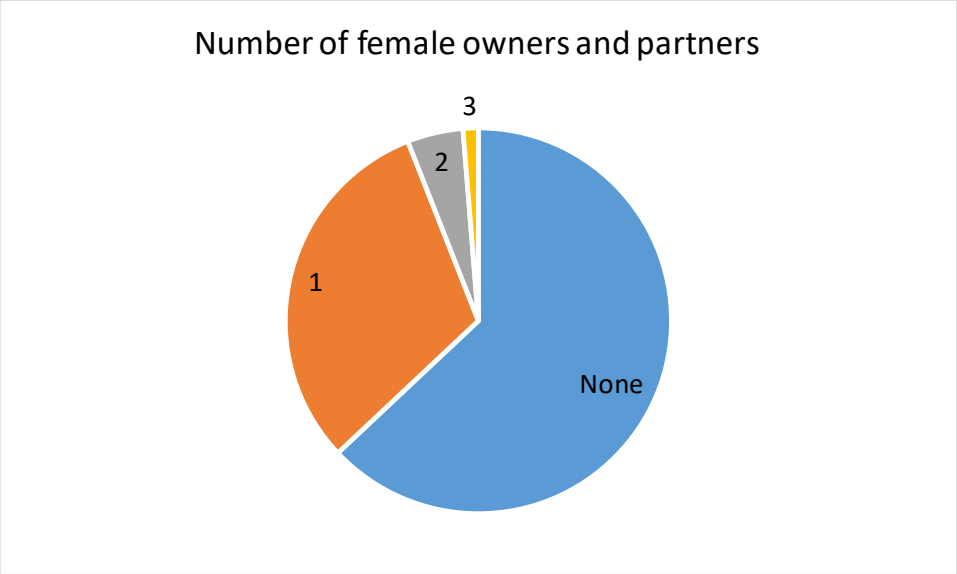


Figure 3.4.2 illustrates female partners and owners within foundation industry businesses across difference size brackets. The majority of businesses with more than 10 employees have no female working owners/partners, with little variation in representation across the business size bands. Of those that do have women in these roles, most have one female partner/director. The smallest businesses are something of an outlier, with those employing fewer than 10 people more likely to have a female partner/owner.

Figure 3.4.2 Businesses with female owners and partners percentage of businesses by size

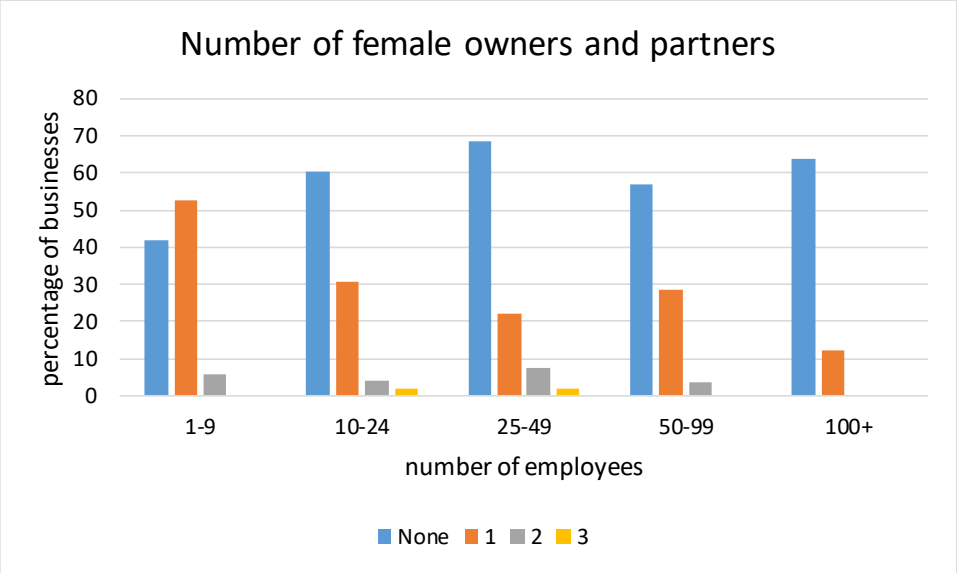


Figure 3.4.3 Businesses with female owners and partners percentage of businesses by sector

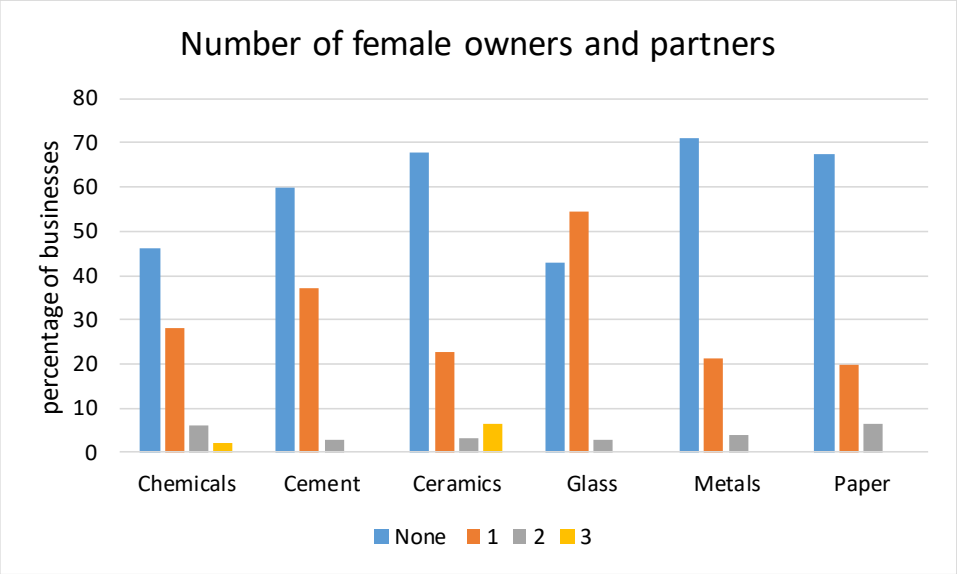
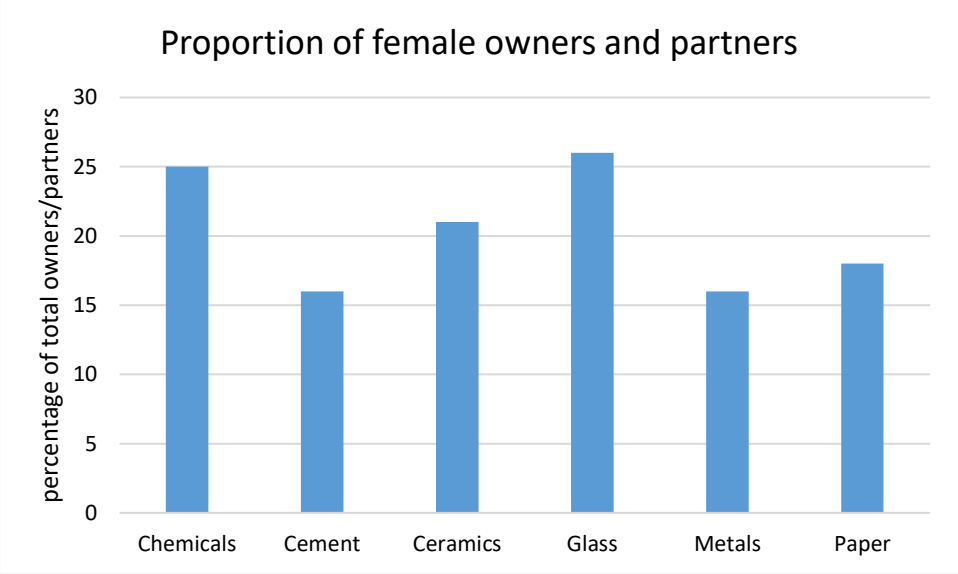


Figure 3.4.4 Proportion of female owners and partners percentage of total



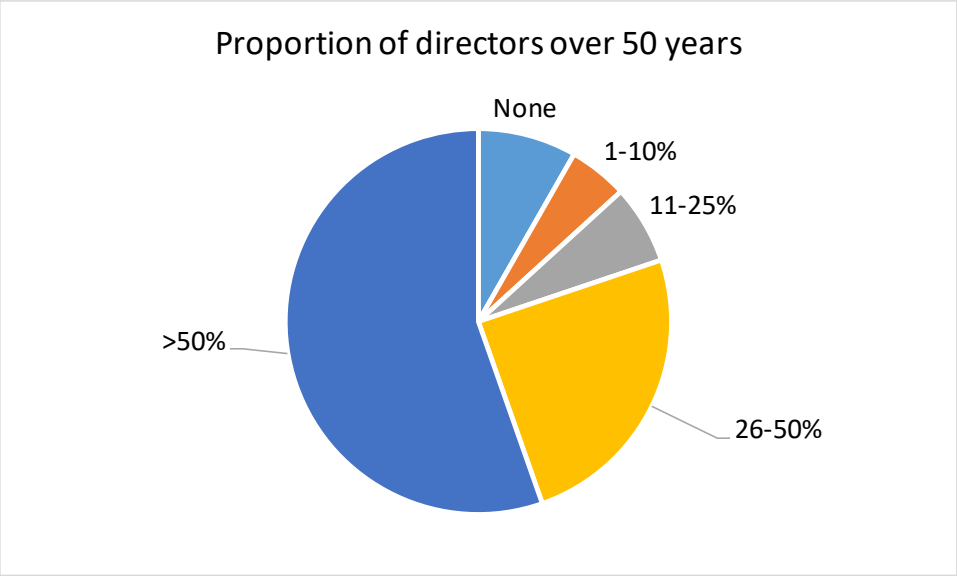
It is not an homogenous picture across foundation industries. While five out of the six have female representation amongst owners and partners in line with the industry average, businesses in the glass sector are more likely to report women in these roles, with ceramics, metals, and paper somewhat more likely to have men dominate in owner/partner positions.

The survey data also allows us to estimate the share of women in the total population of owners/partners in foundation industries. Across the six sectors in total female partners account for a fifth of the total. Comparing individual sectors this proportion varies from 16 percent in cement and metals to over a quarter (26 percent) in glass.

The sample of female owners/partners is small which means that our ability to conduct additional analysis on how this impacts on other workforce characteristics is limited. However, the data does suggest that

businesses with female owners/partners are more likely to employee women into other roles, though not necessarily in production functions.

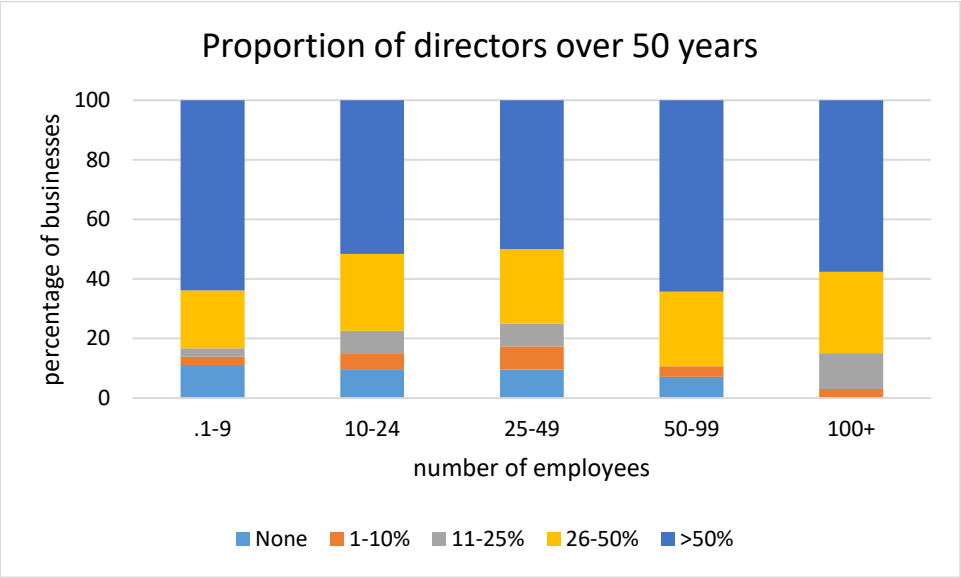
Figure 3.4.5 Proportion of businesses with directors over 50 years percentage of businesses



The final area of investigation was the age profile of directors within foundation industry businesses. Our survey finds that in over half of businesses (55 percent) more than half of the directors are aged over 50 years and in over a quarter (27 percent) between 25-50% of the senior management is within this age group. Only one in twenty businesses report having no directors in this age bracket.

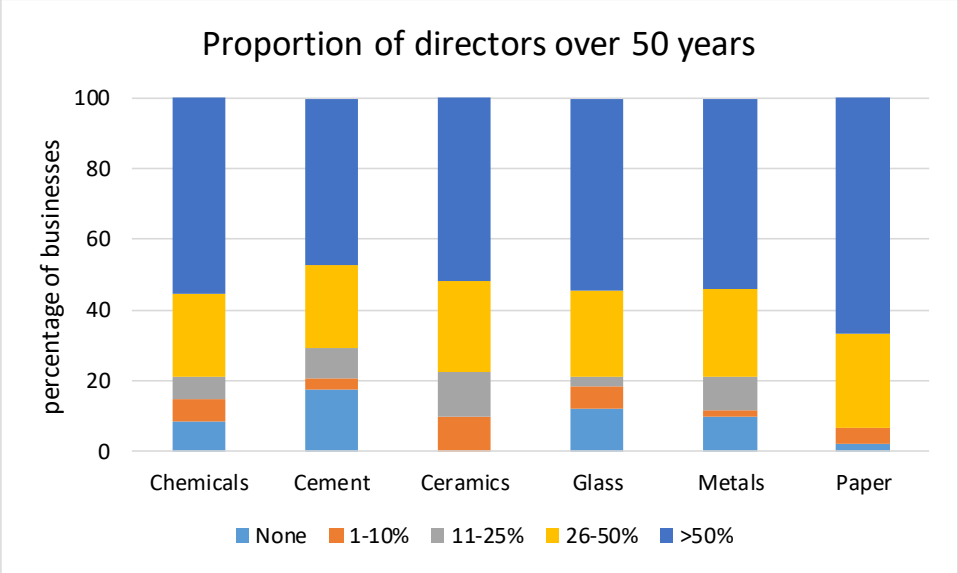
Unlike some other workforce demographics we have explored, there are relatively limited differences in this profile across both size and sector of foundation industries. Figure 3.4.6 first considers this management age breakdown by business size, and in each size band a majority of businesses have more than half of their directors in the over 50 years age group. The largest companies were most likely to have no directors in this age group.

Figure 3.4.6 Proportion of businesses with directors over 50 years percentage of businesses by size



The sector picture (figure 3.4.7) has a similar profile and apart from the cement sector, all industries see a majority of businesses report that more than half of their directors fall within this age group.

Figure 3.4.7 Proportion of businesses with directors over 50 years percentage of businesses by sector



4. Findings from the in-depth interviews

In addition to the quantitative data gathering through the CATI survey, the research explored a range of additional questions around the gender and age profile of the foundation industry workforce through a number of depth interviews with individual businesses. These interviews sought to

- understand the gender and age make up of the workforce and management team;
- gather views on how this shapes company strategy and priorities;
- understand activities undertaken across foundation industries to enhance workforce diversity, challenges and areas for additional support; and
- identify drivers and barriers associated with achieving greater equality.

A total of eight businesses interviews were undertaken with senior leaders from five out of the six foundation industries. The section outlines the main themes that emerged from the interviews.

About the businesses interviewed
Seven out of the eight business interviewed operated in what would be considered traditional manufacturing sites, encompassing production activities, technical and research functions and administration and support services. One interview was focused largely on Headquarters and the technical operations of the business, but also had some production facilities based in the UK. Six of the eight businesses operated multiple sites across the UK and two were based on a single site.

4.1 Structure of foundation industry workforce

All interviewed businesses were able to provide good estimates of the gender profile of their workforce across UK sites. Overall, all respondents were broadly in agreement with the survey data presented, with all reporting that female employees generally accounted for between 15 to 30 percent of the workforce. Further investigation about the roles that female employees were engaged in found that a majority were engaged in non-production related functions, these were predominantly administration, support services, HR and finance.

> *"The female population is not represented in bits of the business and in some areas is over represented."*

However, a small number of interviewees noted slightly higher levels of female representation in production and manufacturing, these roles included managing automated production lines, robotics and quality control functions. There were some examples of females employed in research and technical functions, and a notable outlier was the more equal gender split across research roles in the technical department of a large glass manufacturer, which has had an active diversity strategy for a number of years.

Across all interviewed businesses there was female representation on the Board and senior management teams. However, in line with the broader workforce women in these positions were generally in HR and

finance roles rather than operations or technical ones. Moreover, in every case female Board members were in the minority.

All respondents acknowledged that the gender balance within their organisations was not optimal and required some action from the business in order to address female representation. In addition, changes in the nature of much of the production processes, for example digitised production facilities with capabilities for remote operation, within foundation industries meant there was little reason why women could not be engaged in all activities across the business.

> *"We're typical of the industry, maybe a bit better on gender. If you look at the parent company female representation is worse. We're OK, but it's not good enough."*

> *"The business needs to strike a better balance. Women can operate in all areas of our business."*

> *"There are lots of positions in the organisation that both sexes could do – no limitations on women doing those roles"*

Considering the age breakdown of the workforce, there was less specificity from respondents on the profile of the workforce, nevertheless there was broad agreement that organisations were facing the challenge of an ageing workforce. One respondent noted that the technical workforce was *"heavily loaded"* towards those aged over 45 years and another identified more than three-quarters of employees aged over 40 years.

> *"It matters, ageing workforce and skills shortages are looming"*

4.2 Determinants of workforce profile

Interviews probed the reasons why the foundation industry was skewed towards a high proportion of male employees and those in higher age brackets. Determinants of the current workforce structure included issues such as:

- Legacy issues such as changes to pensions provision
- Recent economic circumstances and workforce restructuring
- A lack of female applicants for roles, particularly graduate-level positions
- A tendency to recruit 'like for like' when vacancies arise.

A number of respondents noted the actions taken, in relation to their workforce, in response to recent industry challenges were an important determinant in the current workforce structure. These challenges largely pre-date the current COVID-19 pandemic but had led to headcount reductions and some restructuring across interviewed businesses. The consequence of this was a focus on skills retention within the business rather than recruitment of new workers or prioritising other activities, such as action on diversity, or developing apprenticeship programmes for example. One company also noted the impact of previous changes to pensions provision within the business, which led to a short-term increase in

turnover of older workers within the business without sufficient succession planning, leaving a disproportionate number of employees in the over 45 years age group.

In some cases, the current gender profile of the workforce generally guides recruitment, with appointees being more of the same. In some cases, where businesses are seeking to fill skilled vacancies, the pool of candidates tends to be a similar age and gender profile to those being replaced, in particular, this can limit the in-take of younger workers. However, for one business with a somewhat higher share of female production employees, this is also the case when recruiting for roles that have tended to be filled by women. The business noted that when there are vacancies they do not have a problem with female applicants as they are considered to be skilled roles with higher salaries than those prevailing in the local labour market.

> *"When we look for people to replace those retiring or to develop new areas of the business we are looking at similarly aged people because we can't find that skill set in younger people, which is a shame, that's not the way we want to be."*

The current profile of the workforce can also drive the shape of the senior management team. A number of respondents noted that these roles were often filled through internal promotion, rather than external recruitment, which exacerbates the dominance of men in Board-level positions.

As noted earlier, there was somewhat more diversity in the gender balance in technical roles, but this appears to be driven by the academic requirements of the roles being recruited for. For example, one respondent noted a relatively high proportion of female applications for roles requiring a background in chemistry. In other disciplines, such as mechanical or electrical engineering this was not the case. It was thought that these trends were a general reflection of the gender balance of the population at under-graduate level in higher education.

> *"We've never had a female apply for a technical role".*

More generally, however, there was widespread concern about skills availability and the provision of education and training across disciplines required by the foundation industries. All respondents were keen to stress challenges in recruiting for graduate and technical level skills for their industry, noting that this is expected to intensify in the coming years as technologies and business models continue to evolve within the sector.

> *"There is a lack of men and women with the right skills coming through at higher education level in (our industry). We just don't have skills sets coming through and that's high reflected in our aging workforce."*

> *"The training provision in the sector is crucial. I didn't think I would come into an industry where I would struggle to find training providers for the technology we need."*

> *"There isn't the drive or ability to finance courses (we need) at universities and there aren't enough candidates."*

4.3 Equality, diversity, and inclusion priorities

There was an acknowledgement across all interviewees that greater workforce diversity should be more of a priority, but views were more varied on the extent to which this is a company-wide ambition. In some cases, past restructuring efforts have taken priority over developing a people strategy, talent management reviews and succession planning, though actions now appear to be in the early stages of development across foundation industry businesses. One interviewee noted that the business needed to address a range of diversity weaknesses within the business and on seeking external advice on how to move forward had decided to prioritise gender in the first instance to demonstrate progress.

A number of companies noted that they felt some caution was needed in taking action to address diversity. Attracting the right people for the business was seen as the most important priority, with recruitment based on merit rather than any other characteristics of applicants. Some interviewees noted that they felt there was a fine line in developing policies and procedures to promote a more diverse workforce and being seen to positively discriminate.

> *"You need to appoint on merit at all times, but you need to work harder to attract females from certain sources and target areas to encourage them to come into certain sectors."*
>
> *"We hope to attract female candidates, but we're looking for the right people."*
>
> *"We're mindful of it (diversity) and where female candidates are present – we try and do it based on the right candidate rather than discriminating either way."*

Interviewees were asked about the perceived benefits of a more diverse workforce and in many cases a clear narrative on the benefits of greater diversity was difficult to articulate. Most respondents noted that there were no reasons why women would not be suitable candidates for most roles. In addition, a number referred to the benefits of greater diversity for organisational culture. It was not clear that, when thinking about a diversity and inclusion agenda, this was underpinned by a clear rationale for how this could bring benefits to the businesses in terms of innovation or company performance, for example.

> *"Diversity of ways of thinking, the team dynamic would change for the better if there were more female employees. It would also give us some better credibility as we look to improve female representation at all levels."*
>
> *"Gender make up matters. Women have different perspectives on things, it's good to have a balance of ideas and suggestions."*

However, there were some examples of external drivers to increase diversity within the business. Two respondents, both from larger businesses within the sector noted potential for customer and investor interest in diversity to become a more important consideration for businesses developing a diversity agenda. Diversity, along with other factors, such as sustainability are becoming a more important component of the CSR agenda and some foundation industries recognise the need to respond to this. One noted that attracting future investment many be challenging without action on age and diversity – this is seen as critical in how the company presents itself.

"If [we] want to continue to be a supplier to big corporates then we need to make sure that our agenda is in tune with their agenda."

However, this customer pull was not universally seen as a reason for action on diversity, noting that industry is not customer-driven on the diversity agenda.

4.4 Skills and recruitment strategies

Across the companies interviewed there were limited examples of formal processes to increase the proportion of female candidates with most noting that there were no specific recruitment campaigns to target female applicants. Most did not currently have written policies on increasing diversity or formal monitoring processes for the diversity of applicants across the full range of vacancies within the business. However, a number noted that this is currently a work in progress.

"There are no diversity targets – we don't want the perception that recruitment is about hitting targets."

One interviewee, however, noted long-standing action on more pro-active recruitment of female employees, this included initiatives such as reviewing advertisements for new vacancies to target female applicants, promoting workplace benefits such as greater flexibility.

While there were few other examples of formal processes embedded in the recruitment process, several businesses pointed to a range of other, informal, business initiatives to engage with potential female employees, promoting the opportunities of working in their sector. Examples include using digital channels – podcasts and videos, for example, which promote existing female employees, a women's network, employee engagement surveys and hosting women in industry events. One respondent pointed to discussions with trade unions on increasing diversity, but the outcomes of these conversations were not yet clear.

Across interviewed businesses there appeared to be substantially more activity to bring younger people into the workforce. The primary mechanism for this was through recruitment of apprentices. All of those interviewed were currently employing or recruiting for apprentices, in some cases this was a long-standing activity within the business, with an annual in-take of apprentices across different business functions, i.e. production, engineering and business. For others, this was a relatively new venture, with programmes currently under development and recruitment planned for later in the year.

"Graduates and apprentices are good to build pipeline. More people leaving at 55 due to closure of final salary scheme, exposed more gaps and increased the need to recruit externally."

There were a range of responses on how successful businesses had been in filling apprenticeship positions and attracting a diverse range of applicants. Interestingly some businesses noted that the economic challenges resulting from the COVID-19 pandemic had attracted a different profile of applications, with more coming from recent graduates and career-changers looking for an alternative career path. While formal tracking process of applications are largely absent, some respondents noted that they would be reviewing whether the move to more on-line engagement had led to a shift in the types of people expressing interest in apprenticeship vacancies.

Overall, many interviewees struggled to attract female applications onto apprenticeship programmes. A number of smaller businesses said that apprenticeship training providers led on the initial recruitment

stages, and therefore did not have good visibility of the diversity of applications or whether there were specific efforts to encourage women to apply.

> *"Gender mix of apprentice intake poor. We did not attract applications much as we tried to make the advert appealing – not about a dirty factory any more, but no interest from female apprentices."*

While, interviewees pointed to the demographic benefits of apprenticeship recruitment, it was also noted that apprentices would be important in meeting future skills needs, for example as new technologies were introduced to the business or new processes were developed to support diversification into new markets. Similarly, half of those interviewed had a specific programme of graduate recruitment, with others looking a bringing in graduate-level skills on an ad-hoc basis, depending on business need. However, the challenges of sufficient supply in some disciplines – as noted above – has been a constraint on graduate recruitment.

> *"Our agenda is apprenticeships and gradates, trying to upskill who we have but also build in skills for the future."*

Another tactic adopted by the majority of interviewed businesses is outreach activity with schools and colleges. Almost all respondents reported some interaction with schools to promote their business or the sector at large. There were varying degrees of engagement intensity – in large part this is determined by business size and capacity. Activity ranges from school visits, to make pupils and teachers aware of opportunities in industry and support for the curriculum, to offering work experience and more immersive summer placements for A-level students.

This activity is regarded as crucial by companies in seeking to engage the future pipeline of applications into the industry and to foster greater interest and understanding about the foundation industries. These are largely solo endeavours with respondents noting little collaboration across their industry on school engagement, though there was a clear interest in doing so. In line with what has been reported elsewhere, a number of respondents pointed to the difficulties in engaging females in these school-level activities.

> *"We do a lot of work in schools on STEM to drive up female interest in a career in manufacturing – even if not with us, but didn't see the interest."*

> *"We do a lot of STEM outreach activity, we go to schools to give talks and you see as soon as you start talking, girls aren't interested. We've been doing this for a few years and only had a couple of girls that showed any interest."*

> *"Graduation recruitment challenged by not many women on appropriate courses. This is why we start in schools."*

4.5 Future workforce requirements

All interviewees pointed to concerns about meeting future skills requirements, in addition to current challenges with recruitment. Businesses are looking out to the next decade, the transformation their industry and their individual operations are likely to undergo, in terms of fully digitised production capabilities, the need to adopt new technologies and processes that will underpin the transition to net-zero, diversification into new product markets and increasing use of data and analytics.

Attracting younger workers into the industry is regarded by many of those interviewed as the means by which businesses will be equipped to manage these transitions, however, future skills concerns centred around continuing to attract a pool of suitable people into foundation industry sectors and further challenges engaging with the higher education sector to deliver appropriate training provision.

While several interviewees noted that this transition and associated investment cycles will take place over the next decade and beyond, businesses should be thinking about skills now as there will be an overlap of old and new processes. One respondent pointed to specific future skills their business will need, such as data science, artificial intelligence and interdisciplinary subjects at higher education institutions, and was currently uncertain as to where sufficient provision would come from or the best means to engage with universities.

> *"Looking at digitisation and future of the industry and thinking that we need younger people with those skills to take the business forward."*

> *"In future looking for more tech savvy people who will be sitting in a control room rather than next to a hot line."*

Although future skills needs are a source of concern, the industry transition underpinning it was also regarded as a potential opportunity. Presenting a new vision of the future of foundation industries, which focuses to a greater extent on technology and environmental credentials, could make the sector more attractive to a more diverse range of people.

4.6 Barriers to increasing diversity

A broad range of barriers to recruiting a more diverse workforce were identified by interviewees. Challenges such as the current population of undergraduates in key disciplines required by businesses in foundation industries, a more general lack of appropriate training provision for the industry, together with a lack of specific company level actions to drive increased diversity have already been discussed. Two other broad industry challenges also emerged from discussions; firstly the reputation of manufacturing and specifically the perception of foundation industries, more specifically.

Respondents pointed to a number of factors within manufacturing activities that may be perceived has inhibiting a more diverse pool of talent coming into the sector. One noted that *"manufacturing has the reputation for being male dominated."* Another pointed to the lack of awareness of the breadth of activity in the sector and contrasted this with experience of other sectors, which have a more compelling proposition for prospective employees.

Moreover, there are more local factors are play for some businesses. Some foundation industries have experienced significant challenges in recent years, including those that have resulted in job losses. This has inevitably made promoting opportunities more difficult to young people or in the local area.

> *"But we have to overcome that there has been a lack of investment –doesn't fill you with confidence that it's a nice work environment."*

4.6 Driving change in the foundation industries

Interviewees were asked what actions might help to deliver change in workforce diversity in the foundation industries. Suggestions fell into three broad, but overlapping, categories:

- Promoting a future-focussed vision of foundation industries.
- More clearly defined industry leadership.
- Greater collaboration and sharing of best practice

As noted above, almost all respondents pointed to the potential opportunity to increase diversity through a compelling message about the future of foundation industries. It was recognised that while many businesses try to promote their business or sector to local schools and universities, these activities lack scale and impact. Although some concerns were noted about partnering with industry competitors and the potential to be competing for talent, this was not seen as insurmountable and would be outweighed by having a clear message about the future of the sector.

> *"We really need to consider whether a single industry message is needed about future opportunities – technology, green agenda."*
>
> *"Might be beneficial to pool resources – this could help change industry perception, it's a better work environment than people think."*

While this approach was considered to be a desirable next step, a number of respondents noted that this would also require more clearly defined industry leadership. Some trade associations were seen to be very active advocates for their sector, this was not the case across all interviewed sectors. Many felt that it would be more effective to bring foundation industries together to develop and disseminate any messaging.

There was an appetite for greater collaboration and sharing of best practice. Many businesses, as noted earlier, are in the relatively early stages of thinking more strategically about their approach to diversity and inclusion and had an appetite to engage with other businesses on policies and procedures that can support that agenda. A number of interviewees noted the potential benefit of understanding approaches that had been effective in making the case internally for changes and practices that had resulted in different recruitment outcomes. Learning from others in similar industries, was of particular interest.

5. Conclusions

5.1 Key findings

The evidence presented in this report clearly shows that the UK's foundation industry workforce is lacking in diversity, dominated by male employees; this is evident across the workforce at large and representation at senior management and board level. In addition, the age profile of employees points to a looming challenge from loss of skills through retirement in the medium-term. Foundation industries are not unique in this respect, other sectors, such as broader manufacturing and construction face a similar lack of diversity across the workforce.

Multiple factors have combined to create the workforce profile we currently see in foundation industries. In the past these sectors have been perceived as providing a 'hostile' working environment, that has been seen to be better suited to male employees. While the nature of many jobs is changing, and will continue to do so as new technologies and automation come to the fore, the perception of fewer suitable job opportunities for female employees persists. There were, nevertheless, a very limited number of examples from interviews where this remains the case.

In addition, foundation industries have faced a decade of significant economic challenges, including increased foreign competition and shifting demand from key sectors. The resulting restructuring requirements to the workforce have provided fewer opportunities to bring younger workers into the industry and pushed efforts to pursue other workforce priorities, such as increasing diversity, off the agenda for many businesses.

Despite these significant legacy issues, there is an acknowledgement that the status quo will not support successful foundation industries in future. This is particularly true of the age profile of the workforce. A recognition that these sectors will need to undergo major transformations to improve productivity, transition to net zero and respond to new supply chain requirements will require businesses to bring new blood and skills sets into the sector.

Many representatives that contributed to this research also agreed that the gender balance with the foundation industry workforce was poor and that greater efforts were required to ensure that workforce better reflected diversity seen in the local labour market. While it is the case that there are senior decision makers within foundation industry businesses that see increasing diversity as a priority, it was not always the case that this translates into a company-wide ambitions.

Nevertheless, a range of efforts now appear to be underway across many parts of the industry to try and reshape the workforce; to bring in new skills through the recruitment of younger employees and to increase engagement with a potential pool of female candidates. There were a number of examples where business felt these efforts were hampered by a lack of suitable skills and training provision, including in some disciplines in higher education.

It was also unclear that diversity efforts were yielding results with strategies often lacking formal recruitment and HR processes, and firm-level actions to attract potential female employees into the industry did not have the required scale and coordination to have impact.

The research points to a recognition amongst some foundation industry businesses that there is now a window of opportunity for more concerted efforts to make progress on developing the workforce industry needs for the future. The legacy of the COVID-19 pandemic is likely to bring about profound change in parts of the economy and in local labour markets. Unlike in previous recessions, production-related industries are expected to mount a stronger recovery, in contrast to private sector services. Foundation industry businesses also have the opportunity to reposition themselves as offering skilled, stable and well-paid employment opportunities.

The drive towards new technology adoption and more sustainable production processes provides a further opportunity to present a more compelling vision of these sectors for the future and their important contribution to the economy, in contrast to the perception of hostile working environments and the legacy of past under-investment. However, the industry must also present itself as one which is striving to be representative of the labour market in the local communities in which they are located.

5.2 Rationale for policy development

The evidence presented in this report points to the need for a different approach to workforce development within the UK's foundation industries. Current and future skills challenges, an ageing workforce and recruitment constrained by a dominance of male applicants for roles, if left unaddressed, will leave many businesses ill-equipped to take advantage of future opportunities. It is clear that firm-level efforts alone will not be sufficient to tackle these challenges in the timescales required by industry. This, therefore, provides a rationale for new policy thinking in this area. In summary, the key arguments for action are:

- Many parts of the sector are currently facing recruitment challenges and skills shortages and are uncertain about whether the market will deliver a pipeline of future skills requirements.

- There are concerns around industry engagement with training providers and how to effectively shape delivery of education and training provision linked to future technology requirements of foundation industries.

- Individual actions to drive change in the perceptions of the industry and influencing skills provision is important, but insufficient against the scale of the challenge in changing the profile of the workforce, not least as the majority of foundation industries businesses are SMEs.

- The workforce is ageing and, as employees retire, there is an acknowledged risk that key skills and capabilities could be lost to the industry without action to encourage younger applicants.

- In addition to demographic pressures, there are indications that customer pressure for workforce diversity and other CSR objectives could become more common across the supply chain, leaving some businesses at a potential disadvantage.

- The lack of a clear business case on the benefits of greater diversity is constraining the development of company-wide strategies to increase female representation in all business functions.

5.3 Policy objectives

Before addressing specific options to increase diversity in the foundation industry workforce, it is good practice to outline the objectives that policy should be seeking to achieve. And in line with good practice we have defined recommendations for objectives in terms of outcomes – the ultimate objective of the policy, and outputs – steps needed to achieve outcomes.

Outcome objectives

- Increase investment in and competitiveness of the UK's foundation industries

- Raise skill levels and competencies in the sector to support technology adoption and business model development

- Develop a foundation industry workforce that is representative of the labour market

Output objectives

- Improve internal firm level capacity to develop coherent and ambitious diversity strategies

- Increase effective engagement between foundation industries and the education sector to increase skills supply

- Increase collaboration to promote best practice and improve industry perception

5.4 Policy options

Best practice in policy development requires that a range of policy options are identified and their absolute and relative merits are considered in order to identify those options that are both realistic and most likely to be impactful. The policy options available for promoting greater levels of age and gender diversity in the UK's foundation industries outlined below can be categorised into those which can support more effective firm-level actions, greater cooperation across foundation industries and their supply chains and foundation industry collaboration to attract a more diverse pool of potential employees.

- ***Do nothing***. Policy development best practice suggests that the first policy option considered should always be to do nothing. The research findings are clear that this will not lead to the scale of change required to support the future growth of the UK's foundation industries. Businesses across the sector report constraints from current training provision, ingrained perceptions of the industry and under-developed internal capabilities to develop and implement the necessary diversity strategies. Current efforts across the industry could bring about change, but this is unlikely to happen in the timescales required to address demographic and technological pressures the industry is facing.

Supporting effective firm-level strategies

- ***Increase learning opportunities for foundation industry management to develop a diversity strategy.*** Foundation industry businesses are now beginning to acknowledge the need to take action to develop the workforce needed for the future. While there are some examples of businesses that have diversity priorities embedded in their people strategy, this is not normalised within the industry, with some at the early stages of this journey and, inevitably, many that have yet to start. Developing internal capabilities around recruitment process, creating career progression pathways, workforce engagement and overcoming caution about the potential to be seen as discriminating, would be beneficial for businesses of all sizes in the sector.

- ***Increase networking and sharing of best practice.*** The diversity challenge is pervasive across the foundation industries. Formal structures to encourage networking and the sharing of best practice could further aid the development of internal capabilities. Such structures could help disseminate information about effective engagement with education, recruitment practices and making the case within businesses on the importance of a diversity policy. This approach could be enhanced by expanding networks beyond the six foundation industries that formed part of this research, into associated supply chains. This could have the twin benefits of alleviating concerns about companies in the same industry competing for talent and sharing insights into supply chain expectations around workforce diversity.

- ***Develop industry collateral on the benefits of increased diversity.*** There is no specific foundation industry research on the businesses benefits of diversity. While individuals within foundation industries businesses can seek to introduce formal policies to increase diversity, the lack of a coherent business case means these efforts may not be adequately embedded in broader business strategy. Developing industry-specific case studies and collateral could more effectively make the case for change. In addition, this could draw on the experience of related industries and those with a similar workforce profile.

Greater cooperation across foundation industries

- ***Support greater engagement with skills and training providers.*** Coordinated action is needed to overcome the limited pipeline of male and female graduates in some disciplines from the higher education sector. Small businesses, in particular, struggle to engage with the higher education sector to articulate needs, influence the curriculum and promote employment opportunities in foundation industries. A forum which can bring together cross-sector skills requirements and externalise that to

training partners could spur improved communication between the industry and further and higher education sectors.

- ***Industry coordination to articulate future skills needs.*** Foundation industry businesses are looking at potentially significant transformation over the next decade, noting that skills requirements will be dynamic over this period as the foundation industries, like many other parts of manufacturing, transition to greater use of new technologies, data and production processes. Early coordination across industry to identify future needs will help to minimise the risk of a limited supply of younger, technically qualified employees persisting.

- ***Build scale in STEM engagement.*** The research revealed a broad range of engagement with schools and the STEM agenda. Much of this is carried out at a local level and often on an ad-hoc basis as personnel and capacity allow. There are a broad range of (manufacturing) industry initiatives, though few are seen as specifically promoting foundation industries. It was not obvious that the development of a new initiative is the answer, given that this activity is likely to remain locally focused given the geographical dispersion and the dominance of small companies in the industry. However, shared material, particularly that ***tailored to engaging girls in STEM*** and the foundation industries could improve the effectiveness of this engagement. Consideration should also be given to greater involvement of professional bodies and apprenticeship providers, as the latter can be involved directly in recruitment.

Collaboration on a future vision of foundation industries

- ***Development of coherent and consistent industry vision.*** One of the most cited barriers to increasing diversity is the perception of foundation industries. A future that embraces new technology and is part of the UK's drive towards net zero offers an opportunity to reframe the importance of these industries and the nature of job roles within them. A compelling cross-sector narrative about the future of foundation industries will require a high level of industry coordination, and respondents to this research expressed a clear appetite to do so. There could be benefits from bringing together senior industry leaders, the research base and appropriate elements of the supply chain to develop this messaging and ensure it caters to the diverse workforce industry is seeking to secure. Consideration could also be given to appropriate partners to amplify this message, including trade associations, the education sector, professional bodies and recruitment partners. The articulation of a vision for the future of foundation industries is the first step in changing perceptions, however the sector also must make progress in meeting technological and net zero goals. Achieving this will require a step change in investment and innovation activity, in line with the goals of the Transforming Foundation Industries challenge. Without an holistic approach to this agenda, efforts on workforce diversity will be undermined by delayed progress in technology adoption and action on sustainability.

5.5 Next Steps

This research has shown that local, firm specific actions and industry-wide collaboration are required to reshape the foundation industry workforce, ensuring it meets future need and is representative of the local labour market. Making progress will be a long-term undertaking – perceptions take time to shift and the development of a pipeline of appropriate skills will also take time.

Some of the most important actions will need to take place at the firm level, this includes supporting businesses to adopt different practices and policies that underpin the drive for a more diverse workforce. Accelerating this will require external input that is tailored to the needs of foundation industries and accounts for the current workforce profile and realistic industry ambitions.

Making progress on more effective engagement with training providers and the articulation of a compelling future proposition of the industries will likely require new structures or networks to galvanise the voice of the industry. An important part of building new structures will be securing senior leadership engagement and support for the agenda.

Appendix

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