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Energy Systems

Increasing diversity in the heating sector to address the skills shortage and meet Net Zero



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February 2023

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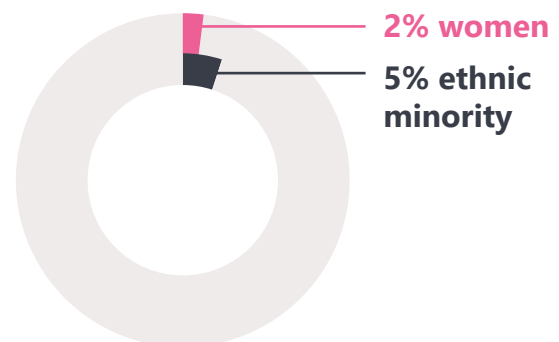
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Increasing diversity is key

to addressing the skills shortage and meeting Net Zero targets

- To meet UK's Net Zero targets by 2050, the domestic heating sector will need to be decarbonised, as it represents around 14% of the UK's carbon emissions.¹ This low carbon opportunity represents a once-in-a-generation shift, in terms of uplift of skills and creation of new roles within the industry.
- The heating sector is already experiencing a shortage of labour, which is likely to worsen as it consists of an ageing workforce with few new entrants. The latest Gas Safe Register data shows that engineers' median age is 55, an age around which many start retiring or leaving the sector.² In addition to the lack of workers, there is a large skills gap which needs to be addressed if Net Zero goals are to be met.
- At present, the vast majority of houses use gas boilers. The current workforce is largely unequipped to advise on and install low carbon heating, such as heat pumps, and energy efficiency measures, such as insulation and double glazing, to support the efficient and effective performance of those heating systems.³ Upskilling is required across the heating sector, to ensure people are equipped to advise on low carbon heating and to help integrate it into homes, for example designing and installing heat pump systems effectively, including sizing radiators and pipework to deliver low temperature heat.
- There are currently 120,000 gas boiler installers but to meet Net Zero targets the number of heat pump installers will likely need to rise from 2000 to around 50,000-100,000.⁴ More skilled labour is already needed, as the industry is starting to experience rising consumer demand for low carbon heating installations as gas prices soar.⁵
- Urgent action is required to encourage more entrants to the workforce, considering the current labour shortages and the upcoming shift in the industry. The plumbing and heating industry consists mainly of white males, with only 2% of plumbers and heating/ventilating engineers being women.⁶ Moreover, it is estimated that only 5% of heating and cooling installers have an ethnic minority background.⁷ To put this into context, in 2021, 21% of working age people did not identify as 'White British'.⁸



Women and ethnic minorities represent an untapped talent pool that could help address both the labour and skills shortage.

Cultural, social, functional and financial benefits can be gained through a more diverse workforce for both businesses and consumers. Organisations that lead the way in increasing their diversity have a chance to gain a competitive advantage.

	Businesses	Consumers
Cultural Benefits	<ul style="list-style-type: none"> • Diverse and more nuanced collective knowledge and understanding • Environment accommodating a wide spectrum of backgrounds, beliefs, attitudes etc. 	<ul style="list-style-type: none"> • Better understanding of the best solution • Understanding of customers' life routines, household structures etc
Social Benefits	<ul style="list-style-type: none"> • Improve mental health of employees • Relatability with co-workers • Sense of belonging 	<ul style="list-style-type: none"> • Empathy: Emotional sense of relatability and belonging • Sense of trust • Increased confidence • Transparent communication
Functional Benefits	<ul style="list-style-type: none"> • Diversity of capabilities and skills • Diversity of thoughts and opinions • Boost innovation and solutions • Boost employee productivity and performance 	<ul style="list-style-type: none"> • Sense of efficiency • Sense of process transparency • Proactive advice • Increased customer satisfaction of a job well done
Financial benefits	<ul style="list-style-type: none"> • Increased revenue and profit • Reduced employee churn (cost efficiency) 	

The most diverse companies are now more likely than ever to outperform less diverse peers on profitability.

(McKinsey, 2020)

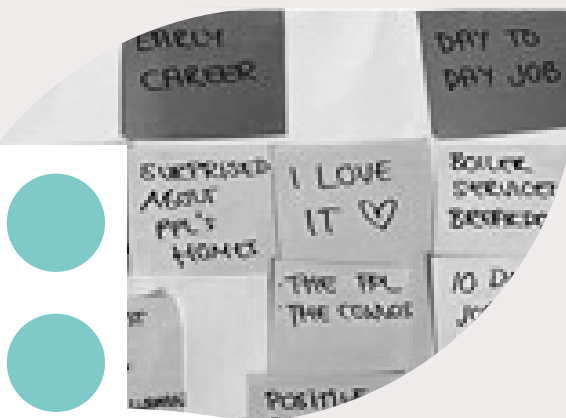


Methodology

This project is part of Energy Systems Catapult's work on Skills and Training for Net Zero Homes and complements the Fair Futures Programme, which was created to predict and prevent risks that can come from innovation and ensure everyone can enjoy the benefits.

Energy Systems Catapult worked with Livework to address the following research objectives:

- Identify and explore the barriers for women and ethnic minorities working in the heating sector
- Identify opportunities for improving diversity and growing the workforce
- Explore how a more diverse workforce might support the Net Zero transition



Livework conducted desk research, analysing in- and out-of-industry initiatives and whitepapers on diversity and inclusion. Following this, they conducted 60-minute semi-structured interviews with 16 participants across three typologies in the heating industry: 5 tradespeople, 6 professionals with recruitment responsibility and 5 industry experts and academics. A mixed sample was sought, where 12 participants identified as women, 4 identified as male and 5 participants identified as ethnic minorities.

We want to emphasise that the findings of this research are by no means representative of all businesses in the heating sector. However, many may not yet have a diverse workforce and therefore might not have been challenged to consider how inclusive their working environment is.

The sector needs to change

to recruit and maintain a diverse workforce,
enabling them to better meet consumer needs

By employing a more diverse workforce, organisations may gain additional knowledge and understanding that helps them reach new customers whose needs are currently not being fulfilled.

They bring different opinions to the table and they have different contacts and come from different sort of sides of the industry too. [...] We've got a guy that came to work for us just two weeks ago. He's only just moved here from Albania [...] he works in a very different way [...] And it's actually really exciting because he's showing us things that we didn't know before and he can offer different services that we've never been able to offer.

Professional, female

Tradespeople suggested that customers want to be able to relate and connect to the tradesperson that enters their house, including their culture, values, language and belief system. Female tradespeople may be preferred in some religious households and by female customers, who might feel more comfortable with them than tradesmen. Male customers may also prefer female tradespeople as they can feel shamed by male tradespeople for not being able to manage or fix an issue.

Empathy to a customer's cultural background and values and how those might drive attitudes, behaviours and decision-making is a key reason why a diverse workforce will be important in the Net Zero transition, particularly as the installation of low carbon heating technologies, such as heat pumps, requires much more interaction with customers and more upheaval compared to traditional boiler installations or replacements. This means surveying and installation teams will also need to adapt their skillset to ensure they have good communication skills and are able to provide enough information for the customer to feel comfortable using the product. Moreover, professionals from diverse communities might be able to build a better rapport with customers in those communities and thus serve them more effectively.

"To make transitions effective long-term we need homeowners to understand how their homes work and they feel empowered about that [...] They need to know how it works and they need people near them that they can have a conversation with."

Tradesperson, female



At present, customer expectations of interactions with male tradespeople can often be quite low if previous interactions have involved unsatisfactory customer service. Female tradespeople expressed how customers are surprised when they show up on time, clean up after themselves, provide transparent communication and proactive advice, including taking the customer through the process of installing low carbon heating, such as a heat pump.

"I think that householders have been trained to expect that they will be badly treated and their house will be disrespected by tradesmen coming into their home and that they will have a mess left."

Industry expert & tradesperson, female



WaterSafe conducted a survey revealing that:

31% would prefer a female plumber.

The main reasons being

- they feel **safer** with a woman (37%),
- they feel they **wouldn't be ripped off** by a female (12%),
- they **trust** advice from a woman more than a man (10%)
- and that a woman is **less likely to patronise** them (10%).

(Cherry, A., 2021)

There is a key opportunity to deliver improved customer service. Actively encouraging and supporting a more diverse workforce could help businesses focus on delivering satisfactory outcomes.

To recruit and maintain a more diverse workforce, the sector will need to change considerably. This research highlights that the key needs for women and ethnic minorities entering or staying in the heating sector are:

- Increase availability and awareness of fair job opportunities
- The option to train and work flexibly
- A healthy and inclusive environment, in which they feel a sense of belonging

This report will discuss how the industry is currently falling short of meeting these needs, and will highlight opportunities to address these in future.

Unmet needs of women and ethnic minorities

in the heating industry

Increase availability and awareness of fair job opportunities

Societal bias and stereotypes

An inherent societal stereotype is driving the perception that trades are for men rather than women, which is introduced throughout childhood and is manifested when young people have to make a career decision. Women are then often discouraged from moving into trades and manual labour by teachers, family and friends.

More diverse role models and early life champions would likely attract and inspire entrants into the industry by helping to tackle current societal stereotypes and expectations. They could also increase awareness of the career benefits, which include feeling a sense of achievement when solving problems and completing jobs. As more low-carbon heating is installed in the future, tradespeople may also be motivated by their positive contribution to a more sustainable world.

"When in school it's clear you're not an academic, boys get sent into trades and girls get sent into beauty."

Industry expert & tradesperson, female

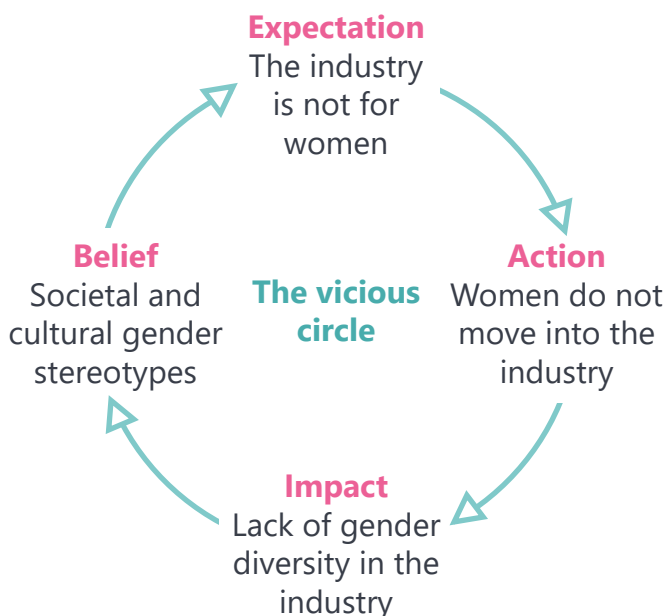
Gender stereotypes impact children's career aspirations

In a study with 13,000 pupils, 36% of the children based their career ambitions on someone they knew, and for those that didn't

45% claimed they were heavily influenced by TV, film and radio.



(UCL, 2018)



"[...] builders got that little network of people [they] work with [...] often they're related, very much often they're all the same nationalities. So, they might be all Polish or all Bulgarian."

Industry expert, female



Implicit bias fuels a flawed recruitment process

Some of the professionals with recruitment responsibilities who were interviewed in this research downplayed the lack of diversity in the workforce, particularly gender diversity. A common refrain was: 'we don't look at gender or ethnicity, we look at skills'. Despite voicing this view, a bias towards hiring men persists, particularly within SMEs, as it is considered 'easier' to hire men. Employers 'know what they get' when hiring mainly white men and thus rarely experience tensions or challenges that might highlight issues with their working culture.

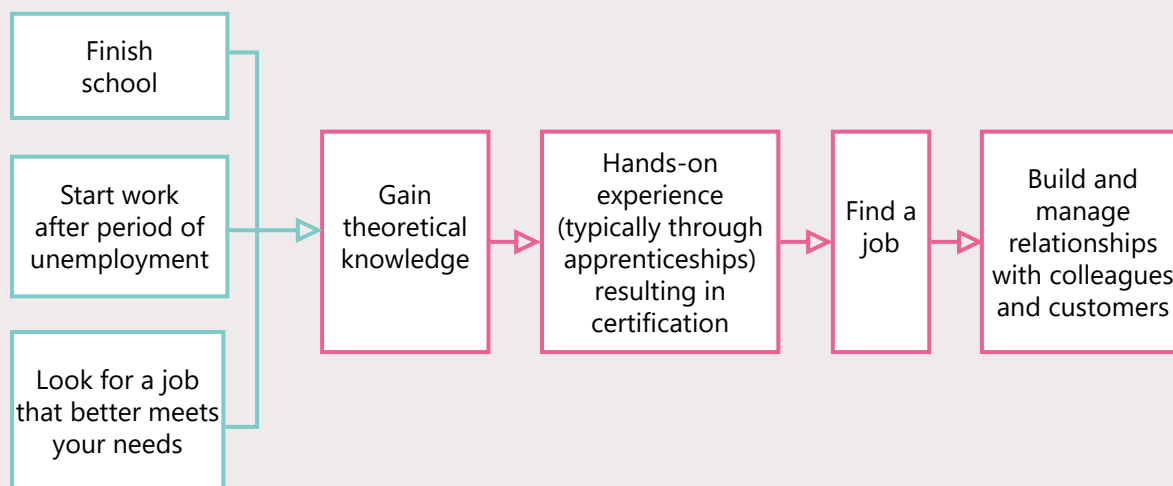
The recruitment processes used are also often not inclusive. Informal recruitment channels such as Facebook groups predominantly target and reach men and can enhance a biased recruitment process. Moreover, advertising for training often depicts and targets a male audience. Employers voiced that they are struggling to find talent, whilst female tradespeople are feeling ignored. For instance, women are finding it very difficult to land an apprenticeship and when reaching out to potential employers, they are sometimes assumed to be calling on behalf of a husband or son.

Networking and nepotism promote unfair recruitment practices

Networking is an important part of the industry. Landing a new role or project is often heavily dependent on who you know or who you are related to, in particular within SMEs. This means that opportunities are often not advertised transparently, making it difficult for people without existing connections to enter the industry.

Tailor training to individual's needs, prior experiences and ambitions

Training – One size does not fit all



Individuals' professional development determinants can affect the direction and speed of their career path.



The process of training and qualifying to work in the sector is similar, despite the very different routes into the sector and each person's specific professional development determinants. People may enter the heating industry after school, after a period of unemployment or as a career change looking for a job that better meets their needs. Currently, no matter the entry point, everyone follows the same path of gaining theoretical and practical experience before finding a job, whether they are an employee or self-employed. They then build and manage relationships with colleagues and customers. Each step within the career path could likely be improved to encourage a more diverse workforce to enter and, importantly, stay within the industry.

A starting point would be to consider an individual's professional development determinants, which help shape their career path. These determinants consist of a person's: awareness of the career opportunity, motivation for professional development, career ambition, financial opportunities they can draw upon and their employer's support.

An example case might be a marketing executive, motivated by a desire to help decarbonise the UK. She has recently become aware of the important role heating installers play in the transition but has no prior experience in this sector. She has a long-term career ambition to be self-employed but lacks the financial means to afford the initial training. Her professional development determinants suggest that

she is interested in a singular training course turning a novice into a heat pump installer but will require access to funding for her training and potentially for setting up her own business in the future. Training experiences that can be adapted to suit different individuals and their different professional development approaches could help attract a more diverse workforce.

Training should also consider trainees' prior experiences and career aspirations. Career changers' training could be streamlined, for example there is currently no direct pathway to becoming a low carbon heating installer, despite the urgent need to decarbonise homes. For those with relevant prior knowledge, a modular training approach could also be considered to enable them to develop the skills they need to perform well in the workforce faster.

There is no starting-from-scratch course. Have to go to plumbing college course and only in year 3 you go into heat pump and sustainability stuff."

Industry expert, female

Apprenticeships are commonly used to gain hands-on experience, but they are sparse. This is partly due to employers, particularly SMEs, lacking an incentive to take on apprentices, as they often see no or little financial gain for the time invested. Considering that apprenticeships are a key component of the career path though, more thought needs to be given to how employers could be incentivised to offer apprenticeships.

"[...] taking on apprentices really is really difficult. It's very taxing on the person, especially if you're a sole trader, because time is money."

Industry expert & tradesperson, female

Lack of financial support

Lack of financial support is a key barrier to joining the industry. Training courses can be prohibitively expensive and at present the lack of visibility and awareness of funding support can deter new entrants. Many, particularly career changers, might not be able to financially support themselves or their families during training, being dependent on the income gained from their current job. The potential move into the industry can therefore cause financial uncertainty and worry.

"If I did not have a husband who could support me financially, I would not have been able to do it. This will not be a possibility for single moms."

Tradesperson, female



Lack of flexible training and working

Lack of flexibility during training and at work was identified as a barrier to entering the industry. Training opportunities are often not locally available, which can lead to long travel times. To increase flexibility, some content could be made available online. The training course hours can also be prohibitively rigid, making it difficult to manage work and private life, particularly for people with childcare or other caring responsibilities.

Introducing more flexible working models, such as working shift patterns, compressed or reduced hours, or working every other week might also help attract more diverse talent. Respondents felt that such flexible working models were not only feasible but could benefit customers too.

Flexible working hours are beneficial for accommodating medical appointments and religious beliefs (e.g. daily prayers), as well as prioritising physical and mental health.

(Shah, 2022)

"You've got emergency work. You've got some customers who want to do late installs. I think that flexibility is definitely possible".

Professional, female

"If people can crack well-being in terms of modifying job roles, in terms of thinking about individuals as they come on board [...] there wouldn't be such a representation issue".

Professional, female

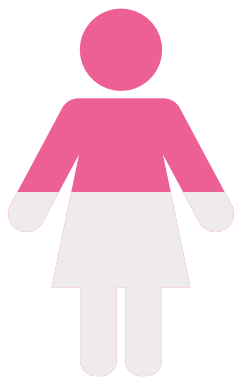


Tackling discrimination to achieve a healthy and inclusive environment

Training environments are not gender inclusive

A key need from tradespeople was to train and work in a healthy and inclusive environment. However, training facilities were often not gender inclusive, for instance only offering male toilets, which can lead to women feeling excluded. Participants also expressed how stereotypes and bias can make the training environment feel hostile, with reports of educators being dismissive of female trainees.

Bullying vs banter: Wanting to belong but feeling excluded



55%
of women in construction
have experienced sexual
discrimination, and

56%
have experienced
harassment.

(Gardiner and Rogers, 2018)

"Not a week goes by without us hearing another story of a tradeswoman getting harassed."

Professional, female

Navigating the 'banter culture' is perceived as vital to surviving and succeeding in the sector, but banter often turns into bullying. Bullying and discrimination often draws on sexist, misogynistic and racist language and stereotypes. Experiences of verbal and physical harassment and abuse are common amongst female tradespeople, with one participant giving an example of a female bricklayer having "tools put up her shorts".

Racist and sexist bias and stereotypes leave tradespeople reluctant to be their authentic selves, often feeling they need to adapt their behaviour in the workplace to avoid banter and bullying. Racist bias and stereotypes can result in tradespeople feeling they need to adapt their behaviour in the workplace to avoid being stereotyped. They can also be subjected to derogatory racist language by colleagues outside work hours, sometimes with no repercussions. Women also reported not wanting to appear 'too feminine' to avoid being ostracised.

Cases were reported of tradesmen obstructing and undermining the work of female colleagues with no perceived consideration of the professional or personal impact. For instance, one interviewee shared an example of a male colleague swapping around the pipes a tradeswoman had installed on purpose, so that when the water was turned on, everything got wet.

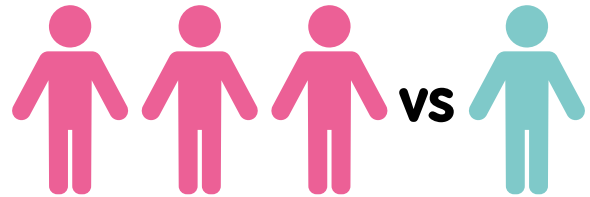
To achieve a healthy and inclusive environment that encourages new entrants and retains staff, the bullying and discrimination culture needs to be addressed urgently. However, there is currently a lack of employer initiative around changing the banter culture, particularly within SMEs. Large corporations seem to be aware of the issue but have not successfully implemented strategies to prevent it.

"When we spoke to the workers one-on-one about their 'banter', they'll say sorry, but as soon as they are in a group it starts all over again"

HR Manager, female



Men in construction are **3 times more** likely to commit suicide compared to those in **other sectors**.



(Rees-Evans, 2020)

Toxic masculinity creating mental health concerns

There is an inherent blame culture within the industry, with tradespeople regularly looking to shift fault on site. Rather than looking for solutions, the instant reaction is often to find a culprit to blame, which can drive unhealthy interactions and relationships. This is coupled with toxic masculinity and gendered expectations in the industry, which is leading to poor mental health among all tradespeople, including men who are not from ethnic minority backgrounds. Increasing gender diversity may provide a good counterbalance to the 'blame and macho culture' and therefore improve the environment for everyone.



"It is a toxic environment. Yes it is. But unfortunately, individuals are being told [...] they've got to deal with it rather than being taken onboard as a structural problem in society."

Industry expert & tradesperson, female

Lack of trust in female tradespeople from male counterparts

Female tradespeople feel they have to keep proving themselves, due to frequently encountering expectations that they don't know what they are doing until proven otherwise. This lack of trust can sometimes lead to gendered social interactions, with women receiving favours and a misguided sense of 'gentlemanliness' from male colleagues.

Sector fragmentation can lead to isolation

The heating sector is a relationship-driven and fragmented industry, largely made up of many smaller players. This can make it difficult to build connections and feel a sense of belonging for people newly entering the sector. This culture can also lead to the creation of isolated communities, where minority groups are disconnected from the wider industry.

Even within organisations, feelings of isolation can occur. New entrants may not be familiar or comfortable engaging with daily ceremonies for informal knowledge exchange, such as going to the pub or having tea with the team in the morning. This can lead to missed opportunities for future work and mean that people can lack a sense of belonging, which this research identified as a key need for tradespeople.



"You have to work a long time for people to be convinced that you know what you're doing. It's hard to put your finger on stuff. People being surprised that you know what you're doing."

Industry expert, female

"It's a very fragmented industry, it's kind of lots and lots of little players doing sort of their own part [...] So I think if you don't have people that you trust and you know, to work with, it's really just miserable."

Industry expert, female

Real change is needed

The sector is slowly changing but faster progress is required

"More women are getting in, especially on Instagram. A community is being built. Even at the tradeshows you see more girls there now. I think over the years more have entered [...]. Even "girly girls" get in, goes against the stereotypes".

Tradesperson, female

The renewable energy sector is attracting more women and younger people who are interested in work that aligns with their values and who consider their job's impact on the future. As the heating sector starts to decarbonise there is a similar opportunity to attract a more diverse range of people that are looking for a sense of accomplishment and want to be part of the decarbonisation journey.

Larger corporations acknowledge the need to hire more diverse tradespeople but are unsure how to go about it, whilst SMEs generally appear less aware of, or less motivated to tackle, diversity gaps. However, underrepresented groups are creating independent virtual and in-person communities to feel a sense of belonging and break down stereotypes. This progress is relatively slow though and needs to be accelerated to ensure the sector not only attracts but also retains new entrants

There is a danger that focus will largely be on tokenistic interventions. For instance, participants highlighted that it is not enough to merely change the wording from tradesman to tradespeople, which does not in itself solve the underlying inequality. Moreover, initiatives such as unconscious bias training do not always lead to people thinking about their actual biases.

"The answer isn't to make everything pink and cover it in glitter".

Academic, female



"There need to be spaces to have meaningful conversations without fear of reprimand."

Academic, female



Despite diversity needing to increase, counter-balancing an unequal sector can be perceived by some as 'positive discrimination'. There are instances where women or ethnic minorities are hired or retained despite lacking the motivation or skills to do the job well, in order to tick a metaphorical diversity box. This practice is harmful, as it can further worsen stereotypes, such as the aforementioned lack of trust in tradeswomen's work.

Next steps

This research highlights the key barriers to increasing diversity in the sector, which are numerous but not insurmountable. Instead of focusing on tokenistic interventions, real change can and needs to happen to address the industry skills shortage and meet the decarbonisation challenge. Increasing diversity could provide cultural, social, functional and commercial benefits to the industry at large. The table highlights areas that various stakeholders could explore next to seize the opportunities in the sector.

	Employers	Industry bodies	Training bodies	Political bodies
Increase availability and awareness of fair job opportunities	<p>Making recruitment content more inclusive and accessible.</p> <p>Improving access to opportunities for ethnic minority and female apprentices.</p>	<p>Raising awareness of career opportunities through in- and out-of-industry engagement and advertising.</p> <p>Enabling consumers to find tradespeople that match their needs (e.g. language skills, flexibility).</p>	<p>Highlighting a clear career pathway for different entrants.</p>	<p>Communicating benefits of a more diverse workforce.</p> <p>Incentivising organisations to build/ recruit diverse workforces (e.g. certification).</p>
Tailor training to individual's needs, prior experiences and ambitions	<p>Understanding value of flexible training and working patterns.</p>		<p>Designing training and apprenticeships to suit trainees needs, prior experiences and ambitions</p>	<p>Provide more long-term policy assurances to drive installer demand for low-carbon heating training courses</p>
Tackle discrimination to achieve a healthy and inclusive environment	<p>Providing inclusive work environments and physical spaces.</p> <p>Providing diversity and inclusivity training for the workforce.</p> <p>Creating a sense of belonging for new and existing employees.</p> <p>Increasing job satisfaction and retention.</p>	<p>Creating and supporting spaces for knowledge exchange.</p>	<p>Providing inclusive work environments and physical spaces.</p> <p>Fostering a sense of belonging within the sector for trainees and self-employed.</p>	

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Contact Energy Systems Catapult if you would like to hear more about this project or work together with us on tackling these next steps.

If you'd like to discuss or challenge these findings, we're very open to extending and developing the conversation on this topic.

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