

Heating Installers:

Taking the leap to a
low-carbon future

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BAXI



Introduction

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Developing a skilled army of low-carbon heating installers will help us meet our target of removing carbon from the heating of 29 million homes.

Across the UK, more than 130,000 installers keep our heating and hot water systems running. Every year, 1.7 million new heating appliances are sold, which means that, by time you finish your working day, another 5,000 will have been installed.

The UK has bold plans to decarbonise the heating and hot water systems which are responsible for about 17 per cent of the nation's carbon emissions.

That will require working with different appliances such as heat pumps or hydrogen boilers. Our heating installers will need to upgrade 29 million existing homes to low-carbon heating systems by 2050¹, which will require a very different skillset.

The solutions to families' heating needs are likely to become more complex. Heat pumps will work in many homes, but alterations to the fabric of the building may be required.

Installers will need to continue to repair and install products but will also need to provide more support with consultation, selection of the correct solution and system design. They might even support with financing, getting access to government grants, connected services and even leasing.

The solution for one building might not to be the same as for another and some may require hybrid solutions where a heat pump is sold alongside another source of heating.

We will need installers who have these skills. Perhaps most importantly, they need to be advocates for the move to low-carbon heating.

At Baxi, we have pledged to lead the phase-out of carbon intensive heating by ensuring every product we make from 2025 will work with low-carbon energy. Backed by the technology developed by our parent group, BDR Thermea, we are rising to this challenge. To this end, we know that we need to work even more closely with installers.

In this paper, we review the latest thinking amongst installers on low-carbon heating. We have listened to more than 200 installers, who gave us their views on the barriers and motivators for them to adopt and recommend this technology.

The results are promising and suggest that many are keen to begin installing low-carbon heating technology, particularly if they can be equipped with training, knowledge and financial support.

¹UK Parliament (2022), Decarbonising Heat in Homes, available [here](#).

Executive summary - research and recommendations

1 We are at a finely balanced tipping point

Nearly one third (28%) of installers – equivalent to around 37,000 in the UK – say they are likely to install heat pumps within the next three years. Contrastingly, there are 30% that are extremely unlikely to install heat pumps, and many are close to retirement. To stay on track to transition to a low-carbon future, we will need nearly all of the 37,000 who say they are going to enter the low-carbon market to do so, and we will need to attract a new generation of low-carbon heat installer.

2 Skills

Most installers do not currently have the required qualifications and accreditation to install heat pumps and hybrids today. When asked in our survey what was holding them back, a third said training. The route to Microgeneration Certification Scheme (MCS) accreditation can involve up to a week in the classroom. MCS accreditation is the gold standard for the industry and with more streamlined routes emerging, availability of training should be good. We also need to consider the other reasons why only around 2,000 installers are accredited to work with heat pumps today compared to more than 30,000 that will be needed by 2028.

3 Incentivising installers to skill up

Installers currently pay the cost of training and absorb the cost of missing possible work. Many are self-employed professionals and 39% of our installers gave training costs as a potential barrier. We recommend that a government scheme to incentivise participation would help. One scheme that has been suggested is from the Heat Pump Association, with the first 5,000 installers receiving vouchers to reduce the cost of training. We agree with the approach of offering a timebound incentive to encourage participation. Large employers, including Baxi, pay the apprenticeship levy with the opportunity to use it or lose it. We recommend that the surplus funds raised from the apprenticeship levy could be used in this important initiative to decarbonise our economy.

4 Demand

To give installers more certainty that there will be a market for installing low-carbon appliances, the government needs to give a clearer roadmap. There are targets in place with ‘600,000 installations of heat pumps every year by 2028’ often quoted in the press. However, the number of heat pumps being installed is currently around 10% of this number. Some 56% of our installers say current lack of demand for low-carbon appliances will hold them back. They will need to know that a demand-side initiative will drive interest in low-carbon heating beyond 2025 when the current Boiler Upgrade Scheme ends. There are policy interventions that are being considered but no certainty now, and 38% of our installers are concerned about lack of government support for the market. Early announcements on how electricity prices will be lowered by a reduction in the green levy would help.

5 Support with administration

Our research found that heating installers would be more likely to transition if the perceived amount of paperwork involved with installing low-carbon appliances were lowered. There are incentive schemes such as the Boiler Upgrade Scheme and manufacturers, such as Baxi, have a role to play in providing support to help installers with this paperwork. For example installers participating in the Baxi Works loyalty scheme get simplified boiler registration and Gas Safe notification if they are a member.

6 Attract new installers

With so many installers close to retirement, we will also need to recruit the next generation of low-carbon installer. This will require an industry-wide effort to increase apprenticeships and market them to school leavers. The role of the low-carbon installer needs to be popularised as there is plenty to recommend it: above-average wages², a role in battling climate change, and potentially flexible hours.

²According to Reed, the average heating engineer earns £47,562 at the time of writing <https://www.reed.co.uk/average-salary/average-heating-engineer-salary>

Policy context

Several technologies have the potential to decarbonise heat at scale, namely heat pumps, heat networks, biofuel boilers and hydrogen boilers.

All will play their part in decarbonisation; however air source heat pumps (ASHP) are likely to have the most immediate impact. Baxi is focused on leading the development of a range of low-carbon technologies to suit the varying needs of our customers.

The UK has a legally binding target to achieve a 78% reduction in carbon emissions from 1990 levels by 2035. This is an interim target for reaching net zero by 2050. Reducing demand from the UK's building stock (c.30 million buildings) is essential, and a range of aspirations and interventions has been introduced to encourage progress:

Figure 1: UK Low-carbon heating policy timeline and targets^{3,4}

Market target	
Home heat pump installations	600,000 annual heat pump installations by 2028 with one third to come from new builds and 1.9 million annual installations by 2035
Confirmed intervention	
Gas boiler phase-out	All new-build homes from 2025 (Future Homes Standard) An ambition to phase out gas boiler sales in existing buildings from 2035
Phase-out of fossil fuel in homes off the gas grid	Proposals to end new boiler installations in public and commercial off-gas buildings 2024-2026 (dependent upon floor area) Proposals to end new fossil fuel boiler installations in existing off-gas homes by 2026
Financial incentives	Boiler Upgrade Scheme (BUS), Social Housing Decarbonisation Fund and Public Sector Decarbonisation Scheme
Taxation	In spring 2022 the Chancellor announced zero-rate VAT on heat pump installation for a period of five years to 2027
Subject to consultation	
Market-based mechanism	Proposed obligation on manufacturers of fossil fuel appliances to sell a proportion of heat pumps as a percentage of total fossil fuel heating application sales from 2024

³BEIS (2021) Heat and Buildings Strategy 2021. Available [here](#).

⁴BEIS (2022) Market-based mechanism: Consultation Response. Available [here](#).

Today's home heating installers

The installer market today is mainly characterised by Small Medium Enterprises (SME), small businesses and the self-employed.

Approximately 60,000 SME heating businesses exist in the UK, with more than 131,000 registered Gas Safe engineers⁵. The heating market today is dominated by gas boilers, with 85% of households using gas for heating, and about 5,000 new gas boilers installed every day⁶.

A large increase in heat pump installers is needed to achieve the government's target of 600,000 installations by 2028. There are around 2,000⁷ installers today and this will need to rise to more than 30,000 by 2028 and 69,000 by 2035.

Installers will need to be incentivised to confidently make the switch from installing fossil fuel appliances to air source heat pumps.

The median age of heating installers is 55⁸ with retirement not far off. Some may see the transition to low-carbon heat as one for the next generation.

Installers also need confidence in government funding that drives and supports this change. The number of solar photovoltaic installers entering and exiting MCS has been strongly correlated to changes to the Feed-In-Tariff (FiT). At its introduction FiT provided a high level of subsidy for owners of solar PV therefore generating a significant level of activity. Subsequent reductions in the tariff, at very short notice, were correlated with increased installer exits and reduced joining rates⁹. Installers will respond to market incentives to introduce low-carbon heating if they are provided in a stable and predictable manner.

Linking to the end customer

Installers will need to be advocates for the switch to greener sources of heat as most customers tend to take their lead from a trusted installer's recommendation.

Most installers in our research reported that customers only occasionally ask about low-carbon heating with more than a fifth saying they never get asked about it.

Various studies have been conducted to understand consumer engagement. For example a survey found that around half of respondents were unaware of low-carbon heating, and half did not think their gas boiler contributed to climate change¹⁰.

Customer awareness is low and currently customers are not asking about low-carbon choices and if they do, they prefer not to pay extra, even if it does reduce their impact on the environment.

In a paper published in 2021 on the affordability gap between heat pumps and the traditional gas boiler, Baxi found that saving money is the most attractive reason for switching to a heat pump (66%). Additionally, in the same study nearly one-third (29%) of households stated they would not be willing to invest any additional funds to install a heat pump. 41% were willing to pay up to £1,000, 20% up to £2,000, 6% up to £4,000, with only 2% willing to pay up to £8,000¹¹.

Installers will need to be armed with comprehensive information that will help them to discuss the detail with customers, for example, how they can finance the upfront costs of a heat pump, whether the ongoing costs will be cheaper and how long the payback period is likely to be. They will also need to give confidence to customers about the heat pump's effectiveness, operation and ongoing maintenance.

⁵Gas Safe Register (2020-21), Gas Safe Register at a glance. Available [here](#).

⁶Installer Online (2021) Gas Boiler Sales in 2021 up 41% from 2020. Available [here](#).

⁷Heat Pump Association (2020) Building the Installer Base for Net Zero Heating. Available [here](#).

⁸Gas Safe Register (2017) The Decade Review. Available [here](#).

⁹Hanna, R., Leach, M., & Torriti, J. (2018). Microgeneration: The installer perspective. *Renewable Energy*, 116, 458-469. Available [here](#).

¹⁰Energy Systems Catapult (2020) Net Zero Living: Carbon Free. Available [here](#).

¹¹Baxi (2021) Affordable heat decarbonisation: is it time for a Green Heating Credit? Available [here](#).

Installer skills

Skills requirements

Low-carbon installers will still require many of today's core skills. This includes plumbing and heating systems, engineering and design (hot water and/or low temperature water) and pipefitting. Those installing and servicing some types of heat pumps may need further skills in electrical systems, refrigeration (FGAS) in the case of maintenance work on split systems, smart and digital technology (demand-side response, smart controls/meter/thermostat) and water regulations.

In addition, the changing role of an installer will require regular use of skills such as system design, room-by-room heat loss calculations and radiator sizing. The job description may look something like this:

Figure 2: Heating installer of the future - changes

1 Systems	The focus will shift from appliance replacement to system design of complex devices that communicate with one another.
2 Collaboration	The variety of heat generators will increase, as well as auxiliary devices with which they communicate. The fabric of a home may need to change, for example with more insulation. Since no one can be expected to master all trades, installers will need to work together with other experts.
3 Advice	Installers will need to provide more complicated and bespoke advice to customers about the right solution for them from a number of heating technologies. Heating engineers are generally regarded as some of the most trusted tradespeople. As engineers interact with customers on a daily basis, they play a crucial role in disseminating information to the public on the decarbonisation of home heat.
4 Economics	Installers will be offering advice not only about low-carbon technologies, but also about economic decisions. This won't be simple, as some appliances may have higher upfront costs but lower running costs. Financial decision-making may depend on the type of house but also on assumptions about subsidies, regulations and the even the future cost of energy.
5 Role	The responsibility of tackling climate change is added to their job profile. They become an energy transition expert.

What do installers think?

Figure 3

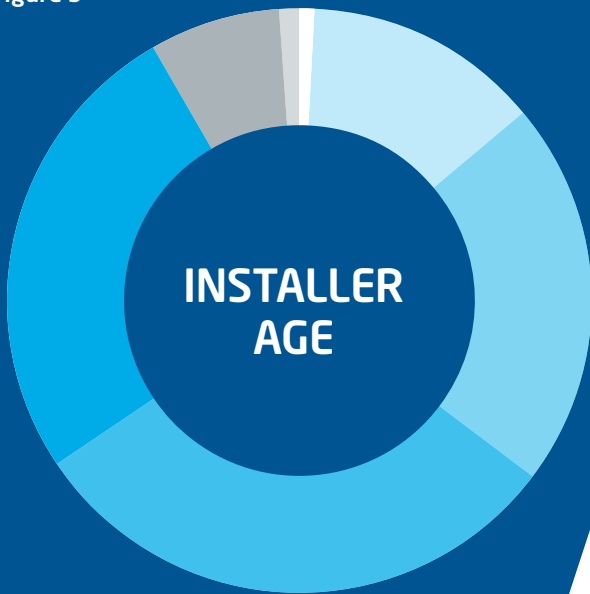
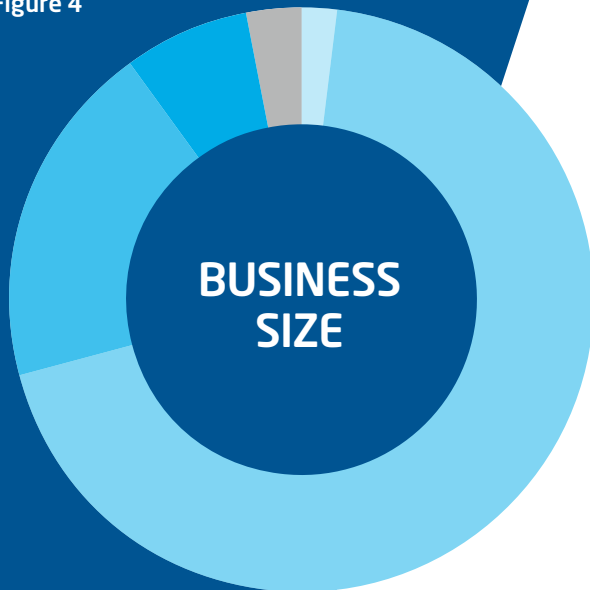


Figure 4



Methodology

We wanted to give a voice to today's installers to understand their views on the transition to low-carbon heat. They will play a vital role in decarbonising our home heating.

We surveyed more than 200 installers to capture their perception of the opportunity and the challenges.

There is a notable proportion of installers near retirement age (see Figure 3), with 33% of those surveyed aged 55 or above. This group may not feel incentivised to make the switch. The results show that the highest number of engineers are within the age range 45-54, at 31%, with the percentage decreasing as the age bracket reduces. This means that around two-thirds of engineers have 10-20+ years of their career left until they enter retirement.

As demonstrated in Figure 4, 98% of respondents had 10 employees or fewer in their business, with the majority (69%) being sole traders. Of those sole traders, 3% are already installing heat pumps, with 8% saying they are extremely likely to and 13% likely to in the next three years. The results show there is a significant relationship between the size of the business and how likely installers are to install air source heat pumps in the next three years: the smaller the business the less likely they are to install a heat pump within the next three years.

Installers also reported that customers often didn't ask about low-carbon heating, with only 10% saying that customers asked about low-carbon heating technology most of the time or more.

It is installers, as the main source of trusted advice to consumers, that will need to advocate for low-carbon heating.

Figure 3:

- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65+
- Prefer not to say

Figure 4:

- Sole trader
- 2-3
- 4-6
- 7-10
- 10+

<<< SURVEY RESULTS >>>

Likelihood of fitting ASHP in next 3 years

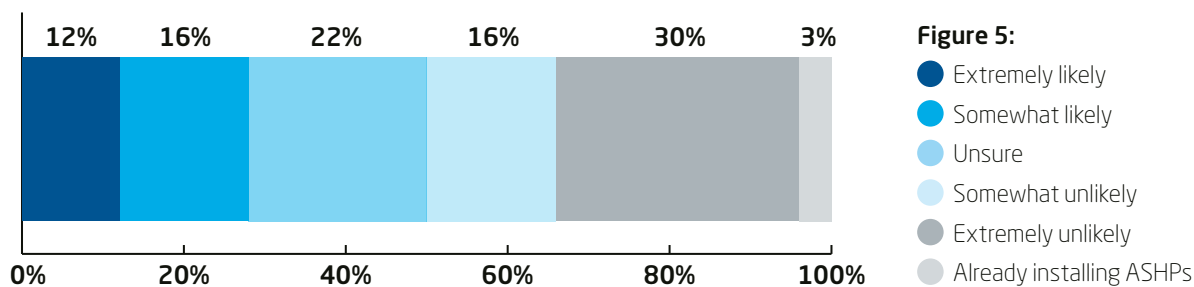


Figure 5: Installer likelihood of fitting air source heat pumps in the next three years

Appetite for Low-carbon Heat

Unsurprisingly, those that believed that heat pumps had a role to play in decarbonising the economy were more likely to fit heat pumps within the next three years. Our research shows a roughly 50-50 split between those unlikely to install heat pumps and those that are up for the job.

As depicted in Figure 5, nearly one third (28%) of installers are likely to install heat pumps within the next three years. This is equivalent to 37,000 in the UK that are the most positive about embracing heat pumps.

A similar number (around 30%) are extremely unlikely to install heat pumps.

The Heat Pump Association estimates that the UK will need 33,700 heat pump installers by 2028 to stay on track for net zero¹². So we will need nearly all of those who say they are planning to enter low-carbon market to do so.

We therefore consider that this is the group that government and heating manufacturers should focus on, to encourage those most likely to take the leap in the transition, so that they actually do.

Failing this, we will need to attract a new generation of low-carbon heat installer.

¹²https://www.heatpumps.org.uk/wp-content/uploads/2020/05/Building-the-Installer-Base-for-Net-Zero-Heating_02.06.pdf

<<< SURVEY RESULTS >>>

Making the leap

Despite many installers saying they are likely to install heat pumps within the next few years, many are unsure about their future business direction. This could be due to uncertainty in policy, consumer demand or supply chain issues. Our results in this section show key areas that would incentivise engineers to embrace heat pumps as part of their offering, and what is hindering optimism in making the switch.

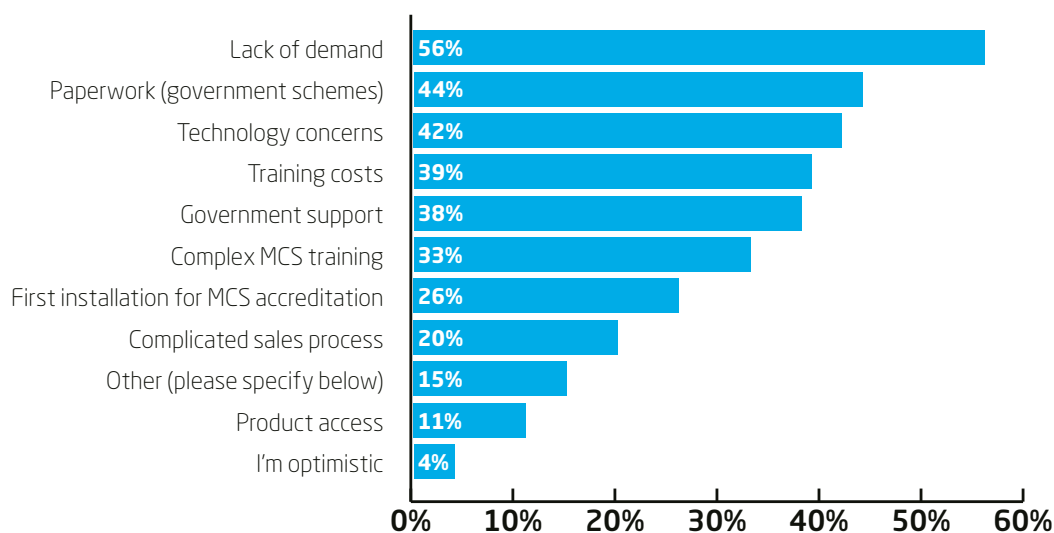


Figure 6: What is preventing optimism on low-carbon heat?

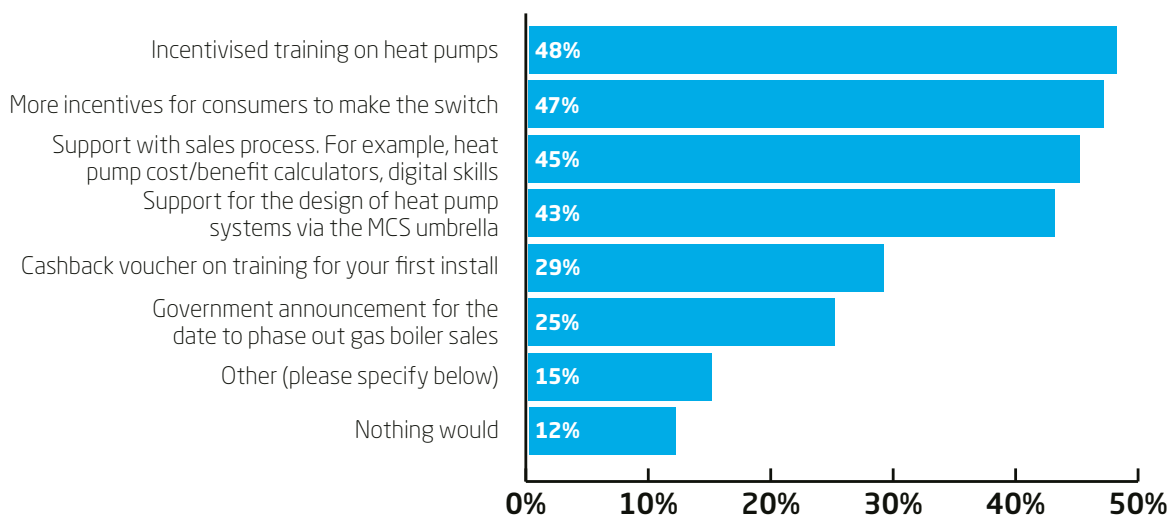


Figure 7: What would make engineers more likely to make the transition to low-carbon heat?

<<< SURVEY RESULTS >>>

If necessary knowledge, expertise and financial stability to install heat pumps, how likely are you to switch?

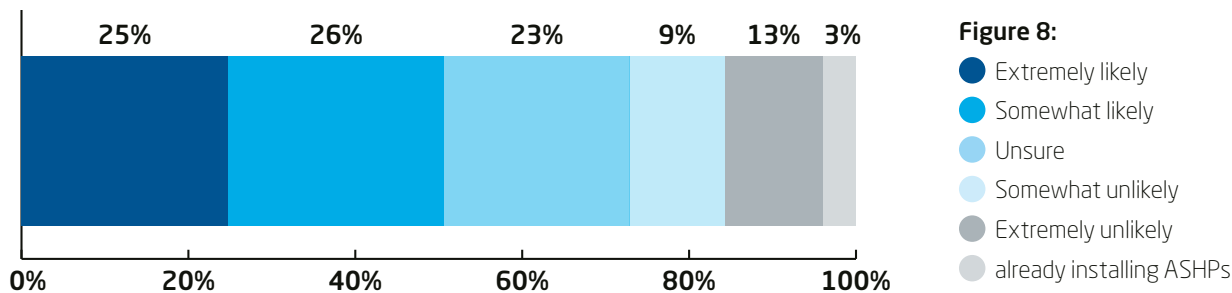


Figure 8: If you were equipped with the knowledge, expertise and financial stability to install heat pumps, how likely would you be to make the transition to install heat pumps?

Training and financial stability can incentivise those on the fence

We asked what would motivate installers to make the transition. They said the key areas to focus on were skills, consumer demand, making the transition easier (through admin and/or sales support) and financial support.

This is exemplified in Figure 8, as more than 50% of installers say they would be very likely (25%), and somewhat likely (26%) to make the transition to installing heat pumps, if they were equipped with the right knowledge, expertise and financial stability.

We found a significant number of heat pump sceptics (47% of installers) became more likely to envisage that they would ASHPs, if equipped with the knowledge, expertise and financial stability to fit heat pumps.

More than two-thirds (71%) of engineers chose hands-on training as the preferred route to becoming fully equipped to advise customers about low-carbon heating technology; see Figure 9. There is significantly less interest, but still a notable amount, in online training (36%).

Together with training and certification costs, the topic of financial stability also extends to installer interaction with the Boiler Upgrade Scheme. At present the BUS is designed such that installers carry out the required work and then receive a voucher to redeem for payment sometime after the event, following scheme-operator approval. Given that most of the installer base comprises SMEs, there are concerns that cashflow issues may prevent smaller companies from engaging with the incentive. This represents a missed opportunity, as part of the objective of the BUS is to help grow the supply chain for heat pump installations.

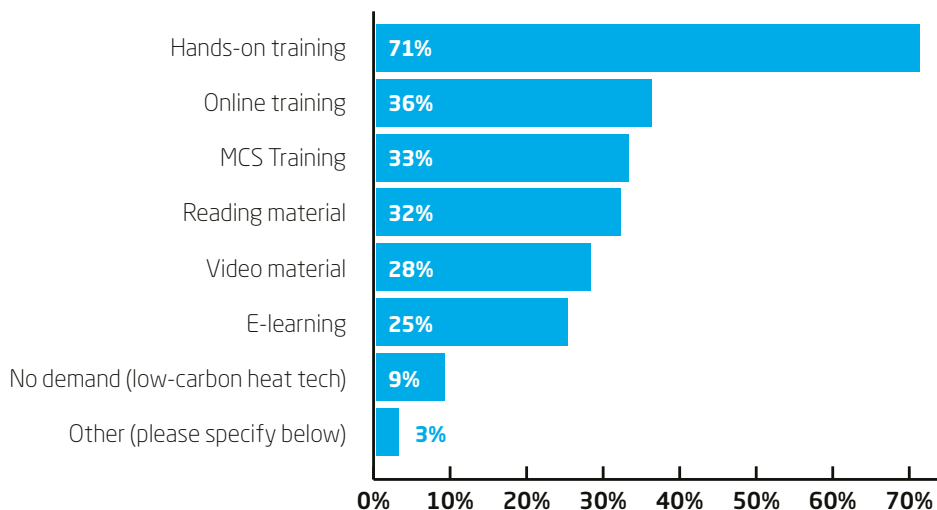


Figure 9: What would help you become more confident to speak to your customers about low-carbon heating technology?

Conclusions

Our research suggests that a combination of complementary measures is needed to incentivise installers to make the leap and inspire a generation to choose a professional life as a low-carbon installer.

About a third of installers are open-minded about making the leap which is enough to reach government targets to install 600,000 heat pumps per year by 2028.

There are a significant number that are not willing, and it's likely that this group are typically (but not exclusively) those who are nearing retirement age.

The government, training providers and the industry would be best incentivising those of all ages who are willing to make the leap.

Engineers told us that they would be more likely to make the transition if they had both hands-on and online training, along with financial incentives and administrative support.

The process of supporting installers to make the transition can be depicted by a transition support cycle (see Figure 10). This is a step-by-step model that includes the top barriers and enablers for engineers to achieving the leap to heat pumps, based on findings in this report. These are steps that engineers can directly engage with. Consistent support for these areas is key, as well as consistent messaging from government.

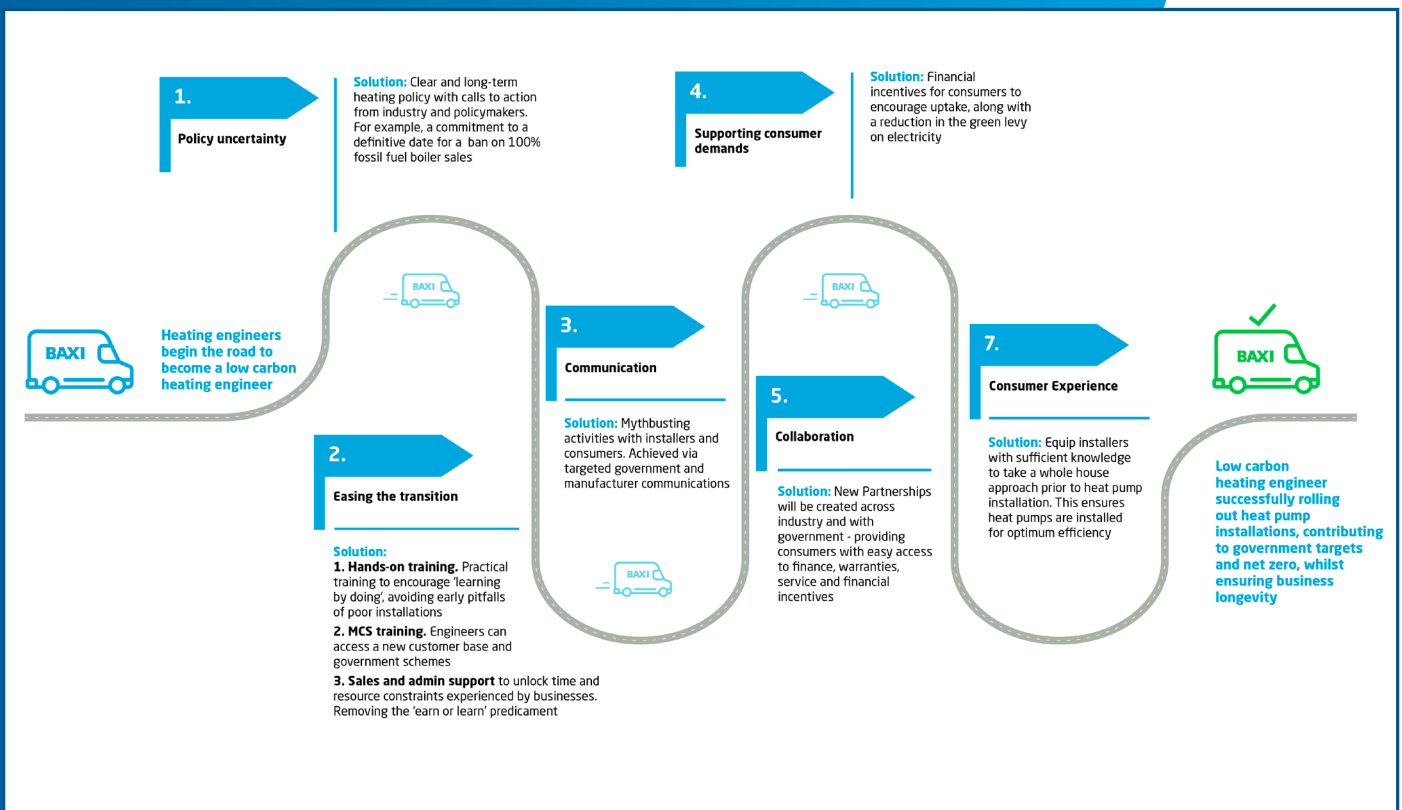


Figure 10: The Transition Support Cycle

Conclusions

Training

Heat pump skills need to be made a mandatory part of training for future installers to overcome the current disjointed, complex, and unstandardised routes to becoming a low-carbon heat installer.

All routes to competence for heating engineers must encompass the core skills required for heat pump installations and servicing to future-proof the industry. Opportunities to integrate these skills with current training routes can be through a specific Competent Persons Scheme (CPS) for heat pumps, at five-year Accredited Certification Scheme (ACS) renewal points for gas operatives and through conventional routes, such as apprenticeships. Routes to MCS (or equivalent) accreditation should be integrated into these courses to help streamline the onboarding process.

Hands-on training is the most important factor for increasing engineer confidence on low-carbon heating technology. Installers recognise the limitations of theoretical learning. To upskill engineers effectively and efficiently, courses must provide practical learning opportunities over theory, so that ongoing installation work after training is underpinned by hands-on experience.

Financial Support

Our results show financial support is a key for ensuring engineers make the leap. Financially incentivised training will support this through overcoming the loss of income associated with putting employees on training courses. Funding can't be expected to pay for everybody to make the transition, so a timebound or first-come, first-served approach would likely incentivise many to upskill in heat pumps.

This funding could be raised by redistributing funding from the Apprenticeship Levy. Some reporting suggests that £1 billion of Apprenticeship Levy funds expired between May 2020 and February 2021¹³ and so were not used. Additionally, there are claims that £330 million¹⁴ of the 2019-20 apprenticeships budget was given back to the Treasury. This money could be redirected to funding training schemes for upskilling the heating industry, especially by developing national courses on heat pump and renewable technology.

More must be done to stimulate demand

Installers cite lack of demand as the highest barrier to making the shift to heat pumps. In our 2021 paper¹⁵ on the affordability gap between heat pumps and the traditional gas boiler, Baxi demonstrated that the highest barrier for consumers to installing a heat pump is cost. The Boiler Upgrade Scheme alone will not be enough to create a significant switch in consumer preference for on-gas-grid homes. However, permanently removing the green levy on electricity would tilt the economics towards installing a heat pump by reducing running costs, therefore enabling a viable whole-life cost proposition.

Non-financial support

Bureaucracy associated with incentive and certification schemes can deter some installers. Our research found they would be more likely to make the transition with sales and design support.

This can be achieved through employing third parties and through the MCS umbrella.

Manufacturers could have a role to play in providing this support. The government can support and partner with manufacturers to administer these schemes through match funding. This will complement training courses provided by manufacturers, which are often trusted and are the largest source of training for engineers. Manufacturers can also incentivise heat pump adoption through good warranties, access to finance, and service plans on their products. Partnerships between industry and government will be key to achieving this.

¹³<https://feweek.co.uk/apprenticeship-levy-funding-the-truth-is-out-there/>

¹⁴<https://feweek.co.uk/treasury-took-back-330m-of-apprenticeships-funding-in-19-20/#:~:text=The%20Department%20for%20Education%20quietly,with%20some%20being%20turned%20away>

¹⁵<https://www.baxiheating.co.uk/news/baxi-report-finds-ongoing-affordability-gap>

Appendix 1:

Training routes to becoming a Low-carbon Heat engineer

Traditional heating system installers have good foundational skills and experience to build on and can therefore be upskilled quickly. The routes identified below include those that qualify as an apprentice, those that are already working as a gas engineer and domestic heating technician, and those that are new to industry and do not have any qualifications. A list of training routes is below:

Apprenticeships

There is a low-carbon heating technician apprenticeship that is in development.

Short course or 'fast track'

Knowledge-based, generally online and generally little advance knowledge required.

Manufacturer course

Manufacturers train up installers using their experience with low-carbon heat products and closer relationship with the installer to deliver competent installers. This covers the manufacturer's products, installation, and servicing. These are usually short courses – up to a week, which may require previous knowledge. Such courses typically offer a pathway to MCS accreditation.

Microgeneration Certification Scheme (MCS)

Installers who wish to access government incentive schemes must be MCS certified. Installers must demonstrate competence through regulated or unregulated (based on from National Occupational Standards) MCS-accredited courses. Manufacturers can be subcontracted through the MCS 'umbrella', despite not being MCS accredited, to support MCS installer accreditation.

Competent Persons Scheme (CPS)

Self Certification – if work comes under the 2010 Building regulations, installers can register on CPS. This allows businesses to bypass the local council or private approved building inspector verifying installer/engineer work. CPS providers will assess businesses and their workforces to the level of competence required before approval to the standards of the type of building work being done. There is a minimum technical competence required for the CPS, which ensures consistency and assurance of the level of skill for those qualified to this scheme.

Heat Pump Association course (new)

The Heat Pump Association has recently suggested a new route to becoming a heat pump installer, which provides the upskilling required for heat pump installation and servicing, and includes maintenance and repair, with a five-stage process. This option is provided by the Heat Pump Association itself, and the training programme is provided alongside heat pump manufacturers to deliver the new qualifications. It is adopted by the MCS standard which means that consumers can be confident of the level of competence of their heating engineer.

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