Department for
Business, Energy
& Industrial Strategy

Social research with installers of heating systems in off gas grid areas of England and Wales

A study for the Department of Business, Energy and Industrial Strategy (BEIS)

BEIS Research Paper Number 2021/011

May 2021

Acknowledgements

This report has been prepared by Impact Research Ltd. The Impact team was led by Susie Smyth and included Dawn Mulvey, Chris Ralph, Steve Morley, Sophie Cook and Helena Smalman-Smith.

We are grateful for the contributions of the organisations and individuals who participated in this research.

Any enquiries regarding this publication should be sent to us at:
enquiries@beis.gov.uk

Contents

Glossary of terms

Installers: this refers to heating system installers. For this research this included only installers who work on properties which are not connected to the gas grid and who have responsibility for decisions relating to which heating systems their company installs.

Off gas grid buildings: Buildings in areas of England and Wales which are not connected to a mains gas supply and therefore rely on alternative heating systems.

Low carbon heating system: A heating system which uses less carbon than traditional fossil fuel heating systems (e.g., heat pump)

High carbon heating system: A heating system which relies on burning fossil fuels (e.g., oil or coal boiler system)

Heat pump, ground source (GSHP), air source (ASHP) or water source heat pump (WSHP): A low carbon heating system that uses electricity to heat a building.

Solar thermal: A low carbon heating system that harnesses energy through solar panels and transfers it to thermal energy to heat a building.

Biomass: A low carbon heating system that uses pellets to power a boiler to heat a building.

Heat Network: Also known as District Heating, a heating system that takes heat from a central source and delivers to a building through insulated pipes.

Combined Heat and Power System: A heating system that uses a combination of thermal energy and electricity to heat a building.

Liquified petroleum gas (LPG) Boiler: A heating system that uses liquified petroleum gas as its fuel source.

Oil boiler: A heating system that uses oil as its fuel source.

Gas Safe Register: Official gas registration body for installers of gas heating.

Executive Summary

Introduction

The greenhouse gas emissions associated with heating domestic and non-domestic buildings (excluding industry) were responsible for 20% of the UK's emissions in 2019[1]. The Government's Clean Growth Strategy[2] and Ten Point Plan for a Green Industrial Revolution[3] stress the importance of cutting emissions from heating to meet the UK's legally binding climate change commitments, but also identify this area as an opportunity to improve air quality, create jobs and support economic growth.

A key government policy is to phase out the installation of high carbon forms of fossil fuel heating in new and existing buildings off the gas grid during the 2020s, starting with new buildings. Heating installers servicing both domestic and non-domestic energy consumers who are not connected to the gas grid will likely be affected by the phase out of the use of high carbon fossil fuels in heating buildings off the gas grid. BEIS wishes to develop the evidence-base to understand how best to develop options for the transition that maximise benefit and minimises risk to those involved. This research examines off gas grid installer views on the transition to low carbon heating in the properties they service, how they believe their business will be affected, and appropriate supporting measures.

This research was conducted in tandem with a similar, complementary project examining the impact of policy on non-domestic consumers off the gas grid.

Research aims and objectives

This research investigates the impact of the future transition away from high carbon fossil fuel heating systems in areas of England and Wales that are not connected to the gas grid, on heating installers who work in these areas. The specific research questions were:

- How are installers of off gas grid heating systems going to be affected by moving away from conventional heating to modern low carbon heating solutions?
- What are the attitudes of installers about these changes?
- Which support mechanisms would assist with the uptake of low-carbon heating systems in off gas grid buildings?

[1] Department for Business, Energy & Industrial Strategy (2021), Final UK greenhouse gas emissions national statistics 1990-2019, emissions categories included: 'Commercial and miscellaneous combustion and electricity', 'Public' and 'Residential' https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2019
[2] HM Government (2018), Clean Growth Strategy https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/700496/clean-growth-strategy-correction-april-2018.pdf
[3] HM Government (2020), Ten Point Plan for a Green Industrial Revolution https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution

- How would stakeholders respond to the ending of installing fossil fuel heating systems in new build non-domestic properties from 2025?

Methodology

The study comprised three phases:

- A literature review.
- A quantitative telephone survey with 200 installers conducted between January and March 2020.
- In-depth qualitative telephone interviews with 15 installers conducted between August and October 2020[4].

Respondents were recruited by targeting installers registered in postcode areas which are not connected to the gas grid. Impact acquired from Xoserve[5], a full list of postcodes in Great Britain where there is no record of a gas connection by either large or small gas transporter. This list was then reduced to only cover England and Wales. It was then sent to the sample provider Experian[6], who provided contact numbers for approximately 600 businesses registered under the following SIC codes:

- Central Heating - Installation & Servicing.
- Gas Engineers.
- Heating Contractors & Consultants.

Once this list was exhausted, it was extended to adjacent postcodes, which increased the sample to over 4,000 installers.

All respondents were screened against the following eligibility criteria:

- All or part of their job included being a heating system installer.
- They have some responsibility for making decisions on which heating systems their organisation installs and services.
- A percentage of their time is spent installing and maintaining heating systems on properties that are not connected to the gas grid.

The qualitative interviews were conducted amongst a subgroup of quantitative survey respondents who agreed to participate in further research.

[4] The quantitative phase was conducted before Covid-19 lockdown measures were implemented on 23rd March 2020. Therefore, it is possible installers views changed between the survey and interviews.
[5] https://www.xoserve.com/media/2687/off-gas-postcodes-v2.xlsx
[6] https://www.experian.co.uk/business-express/marketing-data-lists/

Results

A summary of the key findings from the research is outlined below. Data from the survey and interviews with installers are discussed together and are structured around key themes which emerged from analysis.

Installers' backgrounds

Length of time as a heating system engineer

Around two thirds of the installers surveyed in the quantitative phase have been installing heating systems for 20 years or more. 26% of installers surveyed have been doing the job for over 10 years and the remaining 10% have been doing so for less than five years.

Reasons for becoming a heating installer

Routes into the industry were not explored quantitatively, however the majority of the installers interviewed started their careers at a young age. Amongst the installers interviewed, the route taken was often via working for a family business, shortly after leaving school, or through completing an apprenticeship. Many suggested they saw becoming a heating installer as a 'safe' job, in the sense that there will always be a demand for such expertise.

Types of heating system installed

During the quantitative survey, installers were shown a list of different types of heating systems and asked which, if any, they personally install. The most commonly selected heating systems were gas boilers (80%), liquified petroleum gas (LPG) boilers (70%), and oil boilers (64%). One third of the installers surveyed (33%) said they currently install heat pumps. Of those who said they currently install heat pumps, 70% had done so in the last year, however 39% had only installed between 1 and 5 units in this time period. None of the installers surveyed worked exclusively with heat pumps, but five respondents said they only installed low carbon heating systems[7].

It is clear from the qualitative interviews that installers' perceptions of low carbon technologies, and heat pumps especially, vary greatly, as do the reasons why installers decide whether to install them or not. Of those who install heat pumps, many do so because they see it as 'the way the industry is going' and because there is enough consumer demand for it to be worth their while to re-train.

Survey results suggested that installers may adapt and undertake training in low carbon technologies to meet changes in demand; 72% of non-heat pump installers surveyed said they would continue to work and learn how to install new low carbon technologies if demand for fossil fuel heating systems were to significantly reduce in areas not connected to the gas grid.

[7] The other low carbon heating systems shown to installers were biomass boiler and solar thermal.

Installer experience and confidence of heat pumps installations

Among installers surveyed who personally install heat pumps and have done so in the past 12 months, 93% reported they are very or fairly confident in assessing the appropriateness of heat pump options in different building types and 98% are very or fairly confident in their ability to install them. Overall confidence levels among the 30% of heat pump installers that have not installed heat pumps in the last year were also high, however the number of installers reporting to be very confident as opposed to fairly confident did rise with the number of installs completed. This suggests that frequency of completing installations may have some bearing on installer confidence to assess the suitability of heat pumps and to install them. It also indicates that despite having the skills to do so, installers are only installing heat pumps in low numbers based on customer demand, even in areas known to contain off gas grid properties. When explored in the qualitative interviews, one installer who does currently install heat pumps felt they were a very simple technology in comparison to high carbon heating systems.

Of the 67% of installers surveyed who stated they do not personally install heat pumps, 46% stated they would be very or fairly confident in assessing appropriateness and 38% in installing heat pumps.

What barriers to heat pump uptake do installers highlight?

From the installers interviewed, those who do not currently install heat pumps were the most sceptical about low carbon technology, although some were positive. Often, the perception from installers was that their customers find them too expensive to install.

There was also a perception among many installers that consumers currently do not know enough about the benefits of heat pumps to request to have one installed or agree to install one if suggested by an installer.

The nature of an installer's client base can also be a perceived barrier to installing heat pumps. For example, those who worked in areas with predominantly older housing stock perceived the lack of insulation as a limiting factor in a heat pump's suitability for these houses. This suggests a need for wider installer training in identifying options for energy efficiency improvements and optimising homes for heat pumps.

Finally, some installers interviewed were of the impression that heat pumps would not work efficiently during the winter months, despite evidence that heat pumps are able to comfortably operate at or below zero degrees Celsius[8].

[8] Department for Business, Energy & Industrial Strategy (2017), International Comparisons of Heating, Cooling and Heat Decarbonisation Policies https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/699674/050218_International_Comparisons_Study_MainReport_CLEAN.pdf

Training and upskilling

Uptake of training for heating systems other than gas central heating

Of the installers surveyed, nearly seven in ten (69%) reported they had received training to install one or more heating systems other than gas central heating. As all installers surveyed spend at least some of their time working on off gas grid systems, this indicates that some are doing so without having received specific training on these systems.

Furthermore, only 71% of installers who have installed a heat pump in the last 12 months have received training in installing at least one type of heat pump, highlighting that a number of installers who currently install heat pumps have received no formal training on their installation.

Despite there being little difference in those with or without formal training reporting they were either very or fairly confident in installing a heat pump for their customers, attending a formal training course on heat pump installation increased the number of installers reporting they were very confident. Overall, 81% of installers who had installed a heat pump in the last 12 months and had received training on at least one kind of heat pump reported being very confident in installing heat pumps for their customers. This contrasts to 53% of installers who had installed a heat pump in the past 12 months but had not received training on at least one kind of heat pump.

Most installers agreed that the cost of attending these courses was often very high, not only in terms of the price they need to pay to attend, but also the costs of missing out on a day's worth of work.

Of the installers surveyed who had not previously had heat pump installation training, half have considered upskilling to be able to install heat pumps. This was broadly the same for installers who had not received heat pump training but had fitted a heat pump in the past 12 months, indicating a desire for training amongst installers who are currently installing heat pumps without training. For those who have not considered upskilling, the top three reasons cited were proximity to retirement, lack of consumer demand, and lack of time.

The same reasons for not considering training were mentioned by respondents in the qualitative phase of the research. When installers felt they had enough work without diversifying into heat pumps, they simply did not see the need to re-train, especially those nearer the end of their careers. For those who said they would consider upskilling, this was usually demand-led, i.e., they would only do so when they were confident there would be sufficient demand for these services.

Initiatives to increase the uptake of training for low carbon technologies

There were high levels of support for the different initiatives suggested to the installers, irrespective of their level of experience. The most popular was 'low carbon training schemes which are only accredited if they are delivered to an agreed standard', about which 86% of installers were either very supportive or fairly supportive. 83% of installers were very or fairly supportive of 'subsidised costs for low carbon training / voucher schemes to retrain', whilst 76% were very or fairly supportive of mandatory low carbon modules in all traditional heating /

plumbing qualifications. The least popular option was 'in order to register with a trade organisation such as OFTEC, Gas Safe or MCS, you must complete training in low carbon heating'. However, 70% of installers were still very or fairly supportive of this, whilst 10% were very unsupportive.

The law requires all gas installations to be notified to the Gas Safe Register, and for the work to be carried out by a Gas Safe Registered engineer; nine in ten installers (88%) supported extending the law so that a register applies to all heating system installers and installations, not just gas. There was also broad support for the idea of a low carbon training skills card, comparable to a Gas Safe accreditation, with 72% saying that this appealed and 22% saying that this did not.

Who should be involved in providing training?

Installers identified roles for both manufacturers and the Government in providing training. While manufacturers were often seen as providing the best training due to product knowledge, some installers interviewed felt that in the past they had attended low-quality courses, which seemed more an opportunity for companies to sell their products than to provide training. It was suggested that the Government could back schemes deemed to meet the standards required, adding credibility to these courses and providing assurance to installers signing-up to them.

Overall, the perception was that the Government and industry needs to collaborate more on training to make it easier for installers to attend these courses, especially in keeping the training courses affordable.

Phasing out of fossil fuel heating systems

Awareness of plans to phase out fossil fuel heating systems in off gas grid buildings

Installers were asked whether they were aware of government plans to phase out high carbon fossil fuel heating in buildings off the gas grid (expected to involve LPG, coal and oil, during the 2020s). Awareness of these plans was high among all installers surveyed, with 90% reporting they were either fully aware, or aware but not in detail. This was slightly higher among those who currently install heat pumps (97%) compared with installers who do not (87%). However, a greater proportion of heat pump installers reported being fully aware (73%) of these government plans than those who do not currently install heat pumps (49%).

Installers were also asked how aware they thought their customers were of government plans to phase out high carbon fossil fuel heating in buildings off the gas grid. The overwhelming perception was that customer awareness was much lower than their own. Overall, 71% of installers thought their customers were unaware, whilst only 5% thought they were fully aware.

Installers' views on the effectiveness of measures to increase demand for low carbon technologies

The installers surveyed were asked to consider various measures which could be implemented by the Government to drive demand for low carbon technologies. Overall installers thought that providing loans and subsidies to make low carbon technologies more affordable would be the most effective, with 87% believing this would be either very or fairly effective. Banning the installation of new fossil fuel systems by 2030 was also seen as an effective measure, with 69% believing this would be either very or fairly effective.

Actions to increase the installation, maintenance, or running costs of fossil fuel heating systems were viewed as the least effective options to increase demand for low carbon technologies. 63% of installers thought that increasing the cost of fuels for fossil fuel heating would be either not very effective or not at all effective, whilst 56% thought increasing the cost of high carbon technologies and parts would be not very or not at all effective. It is worth noting that whilst some biases may be expected when asking professionals about measures which may either positively or negatively impact their business, both heat pump installers and non-heat pump installers had very similar views on these measures.

Awareness of the Future Homes Standard

The Future Homes Standard[9] will require new build homes to be future-proofed with low carbon heating and world-leading levels of energy efficiency from 2025. Eight in ten installers surveyed (80%) were aware of this policy. When asked what impact the future homes standard would have on their business, six in ten installers (60%) thought it would "make no difference". Of the remainder, a greater proportion felt the standard would have a positive impact (20%) compared with those who thought it would have a negative impact (15%) on their business.

The quantitative survey did not explore how much time installers spent working on new builds, however the majority of installers who participated in the qualitative interviews rarely, if ever, worked in new builds. Among the installers interviewed, those who do not currently install heat pumps claim that this legislation has not motivated them to add low carbon options to the types of heating system they install. Some installers elaborated on this point by stating they believe that even once the legislation has come into force there will still be plenty of work available for them. They felt this would come from maintaining and installing fossil fuel heating systems in existing buildings in both on and off gas grid areas.

Perceived barriers to heat pump deployment and uptake

Installers' views about obstacles to UK heat pump deployment

Despite largely being in favour of low carbon technologies, there were a number of obstacles to heat pump deployment identified by installers, the largest being the cost to consumers (64%), followed by the perceived lack of awareness, knowledge and understanding among

[9] https://www.gov.uk/government/consultations/the-future-homes-standard-changes-to-part-l-and-part-f-of-the-building-regulations-for-new-dwellings

consumers (21%), the cost of heat pumps to installers (18%), and the noise heat pumps make and space they require (15%).

Cost to the customers was also identified by participants in the qualitative interviews as the key barrier to the deployment of heat pumps; interviewees felt that many consumers were not primarily driven by sustainability considerations. Installers highlighted that the high upfront cost of a heat pump often came as a surprise to consumers and that many baulked at the initial outlay.

Another obstacle raised during the qualitative interviews was the poor level of insulation in many older UK properties, which meant installers would not recommend a heat pump in some circumstances. Moreover, uncertainty over how to size heat emitters and whether underfloor heating was required for a heat pump to work efficiently were other obstacles highlighted by interviewees.

What measures do installers think will be effective to support wider heat pump deployment and overcome barriers?

What measures would installers like to see?

Incentives came out as the main suggestion to help installers upskill to increase the installation of heat pumps. Whilst one installer suggested incentives could be given by the manufacturers, a number of installers felt that if demand for these products was there, that alone could encourage them to upskill.

Interviewees were asked to discuss their views and experiences of the Renewable Heat Incentive (RHI). Installers who had completed installations under RHI were the most positive, with some suggesting that the scheme was a key consideration when choosing which heating system to install and that customers also had some knowledge about it. Installers less familiar with the scheme were more sceptical. Some felt that there were ‘hoops to jump through’ to be able to complete installations under the scheme and one non-heat pump installer explained the cost of registering to be an eligible installer had stopped his company from doing so.

Installers interviewed were also prompted to discuss the Clean Heat Grant[10], which is due to start in 2022. Only two installers reported to have heard of the proposed scheme. Once it was explained to interviewees who were previously unaware of it, there was consensus that in principle the proposals were strong and could help increase uptake of low carbon heating systems. However, questions were raised as to whether the grant amount of £4,000 would be sufficient; even with a price reduction of this magnitude, there was still a perception among installers that heat pumps were still considerably more expensive than fossil fuel heating systems and this would be prohibitive to consumer uptake.

[10] Future support for low carbon heat
https://www.gov.uk/government/consultations/future-support-for-low-carbon-heat

Introduction and background

This research provides new, robust evidence about the impacts of a transition to low-carbon heating technologies on off gas grid heating installers.

This research project was conducted with two sets of respondents, off gas grid heating installers and off gas grid non-domestic consumers. This document focusses solely on the findings from heating installers. A separate report has been published summarising the findings from non-domestic consumers.

Background

The UK has committed to reaching net zero carbon emissions by 2050. In order to reach these decarbonisation goals, transition towards low carbon energy and heat are required.

The greenhouse gas emissions associated with heating domestic and non-domestic buildings (excluding industry) were responsible for 20% of the UK's emissions in 2019[11]. The Government's Clean Growth Strategy[12] and Ten Point Plan for a Green Industrial Revolution[13] stress the importance of cutting emissions from heating to meet the UK's legally binding climate change commitments, but also identifies this area as an opportunity to improve air quality, create jobs and support economic growth.

A key government policy is to "phase out the installation of high carbon forms of fossil fuel heating in new and existing buildings off the gas grid during the 2020s, starting with new buildings. This will require a significant increase in the deployment of low-carbon heating solutions, particularly heat pumps. Heating installers servicing both domestic and non-domestic energy consumers who are not connected to the gas grid will likely be affected by the phase out of high carbon fossil fuel heating systems in buildings off the gas grid. BEIS wishes to develop the evidence-base to understand how best to develop options for the transition that maximise benefit and minimises risks to those involved. This research examines off gas grid installers' views on the transition to low carbon heating in the properties they service, how they believe their businesses will be affected, and explores what measures may be required to support installers with the future transition.

[11] Department for Business, Energy & Industrial Strategy (2021), Final UK greenhouse gas emissions national statistics 1990-2019, emissions categories included: 'Commercial and miscellaneous combustion and electricity', 'Public' and 'Residential' https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2019

[12] HM Government (2018), Clean Growth Strategy https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/700496/clean-growth-strategy-correction-april-2018.pdf

[13] HM Government (2020), Ten Point Plan for a Green Industrial Revolution https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution

Low carbon heating options

Fossil fuel heating accounts for the majority of energy used for heating systems in the UK. There are over four million homes in England, Scotland and Wales that are off the gas grid[14] and the market for heating these homes is dominated by high carbon fuels, such as oil and LPG, highlighting the need for low carbon heating alternatives in these areas.

The main types of low-carbon heating and hot water solutions available for off gas grid buildings are:

- Heat pumps, ground source (GSHP) or air source (ASHP): GSHPs require land adjacent to the building to lay the ground array, which can make them an appropriate solution in less-dense rural areas. ASHPs are often more suitable for customers as they tend to be cheaper and require less disruption at installation, therefore are more commonly used in the UK[15]. Both types of heat pump are relatively expensive to install (compared with gas central heating or high carbon alternatives), according to a recent report[16] stating prices start at around £7,000 for an ASHP and £15,000 for a GSHP in domestic properties.
- Solar thermal: the characteristics of off gas grid building stock and availability of space near buildings in off gas grid areas may make this solution more practical than in denser areas. However, they can cost more than £3,000 and, in most cases, won't be able to provide the entire hot water supply.
- Bioenergy boilers: These can be fuelled by solid biomass, bioliquids/bioLPG or biopropane. An advantage of these is that they do not rely on an electricity supply and can be retrofitted into an existing high temperature heating system with minimal disruption. However, systems can cost in excess of £10,000.
- Other electrical systems: Electric panel heaters, storage heaters, or infrared heaters can be an effective solution in some situations, but are generally less efficient than other electrical heating systems, like ASHPs and GSHPs.

Many of these solutions involve heating being used differently from typical customer usage today, at different levels and for different periods of time. They deliver the greatest benefit to customers when the heat demand of buildings is also minimised through improved thermal efficiency. Some of these systems will work most efficiently when used with underfloor heating or high efficiency radiators which are more easily installed in new-builds than being retrofitted to existing stock. In addition, buildings off the gas grid are extremely diverse in their construction method and materials, age and location. No single type of heating and hot water system will suit all of them, so it is essential that a range of low carbon solutions be made

[14] The Committee on Climate Change (2016), Heat in UK buildings today https://www.theccc.org.uk/wp-content/uploads/2017/01/Annex-2-Heat-in-UK-Buildings-Today-Committee-on-Climate-Change-October-2016.pdf
[15] Statista (2020), Annual amount of heat pumps in operation in the United Kingdom (UK) from 2013 to 2019, https://www.statista.com/statistics/740491/heat-pumps-in-operation-uk/
[16] Department for Business, Energy and Industrial Strategy (2018), The Cost of Installing Heating Measures in Domestic Properties, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/913508/cost-of-installing-heating-measures-in-domestic-properties.pdf

available for retrofitting or installation at new premises, to ensure that each can benefit from an appropriate solution. Some solutions will be more appropriate in particular regions, depending on the dominant building stock in that area, and therefore a regional approach to installation may be considered beneficial.

The transition from existing, high carbon heating methods to any of these solutions may present a number of barriers. These include:

- High up-front costs in purchasing and installing low carbon heating compared with higher carbon systems, although research[17] suggests overall costs are likely to reduce in time.
- For new buildings, the developer bears the installation cost of the system whilst the tenant or purchaser bears the ongoing running cost. Developers are therefore financially motivated to install cheaper systems.
- Both heating engineers and customers are familiar with existing methods, how to install and operate them, and the costs and availability of the fuels involved.
- The method of installing most alternative heat systems requires a different skill set[18] from those used for traditional systems. Heating companies and individual engineers may be sceptical about the benefits of investing in these skills for a small market. Compounding this issue, the heating engineering market as a whole is facing a skills shortage, as the average age of Gas Safe registered professionals is now around 55[19], meaning that much of the workforce will be retiring within the next 10 years.

[17] Department of Energy & Climate Change (2016), Potential Cost Reductions for Air Source Heat Pumps, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/498962/150113_Delta-ee_Final_ASHP_report_DECC.pdf
[18] The Heat Pump Association (2020), Building the Installer Base for Net Zero Heating, https://www.heatpumps.org.uk/wp-content/uploads/2020/06/Building-the-Installer-Base-for-Net-Zero-Heating_02.06.pdf
[19] GasSafe Register (2016), The UK gas industry considers its past, present and future, https://www.gassaferegister.co.uk/media/2490/decade-review.pdf

Research aims and objectives

Heating installers that work in areas of England and Wales that are not connected to the gas grid are likely to be affected by a future transition that phases out the use of high carbon fossil fuels for heating buildings off the gas grid.

This research aims to develop the evidence base by exploring potential impacts of the future transition on installers and also how government policy could support the change. There is some research that has been conducted with consumers about the transition to low carbon technologies, but to-date, this is fairly limited. Wave 32 of the Public Attitudes Tracker[20] showed varying levels of awareness for renewable heat technologies and low levels of awareness of whether they would be beneficial to consumers. In addition, the Renewable Heat Incentive Evaluation[21] provided further detail into consumer motivations for the transitioning to renewable heating systems, but a gap persists regarding the impact it will have on the off gas grid sector, and in particular how it will impact consumers and installers.

Four research questions focussing on the impacts of the future heat transition on installers were developed to address key evidence gaps and to inform understanding of measures that may be required to support installers with the future transition;

- How are installers of off gas grid heating systems going to be affected by moving away from conventional heating to modern low carbon heating solutions?
- What are the attitudes of installers and consumers towards these changes?
- What support mechanisms could assist with the uptake of low-carbon heating systems in off gas grid buildings?
- How would stakeholders respond to the ending of installing fossil fuel heating systems in new build non-domestic properties from 2025?

Evidence from this research will allow policy to be developed with input from those involved in the transition.

As previously mentioned, this research project was conducted amongst two sets of respondents, heating installers and non-domestic consumers. This report focusses solely on the findings from heating installers.

[20] Department for Business, Energy and Industrial Strategy (2020), BEIS Public Attitudes Tracker, Wave 32, https://www.gov.uk/government/statistics/beis-public-attitudes-tracker-wave-32
[21] Department for Business, Energy and Industrial Strategy (2017), Renewable Heat Incentive evaluation, https://www.gov.uk/government/collections/renewable-heat-incentive-evaluation#domestic-rhi-evaluation-reports.

Methodology

The research was conducted by Impact Research Ltd and was split into three phases.

Phase 1: Literature review

The project began with a literature review, undertaken in October 2019. The literature reviewed a combination of government issued literature, academic reports, and commercially produced materials covering the following topics:

- Low carbon heating solutions.
- Support mechanisms available to encourage uptake of low carbon heating systems.
- Energy consumption and heating systems outside the UK.
- Certification and qualifications for new-build commercial properties.
- Refining definitions for the target sample.
- Barriers to conversion to low carbon heating (for customers and installers).
- Example initiatives of low carbon heating.

This review covered published work already conducted by BEIS, along with a variety of other sources. These materials were found using Google searches of the above terms and through searches on the 'Research and Statistics' section of the BEIS website[22].

There were six government research projects referenced, along with thirteen external sources. The findings from the literature review informed the design and content of the primary research conducted in Phases 2 and 3.

A full list of referenced materials can be found in Annex A.

Phase 2: Quantitative measurement

The first phase of primary research was a quantitative telephone survey conducted with 200 heating installers that work in off gas grid areas of England and Wales.

Installers were defined as employees who were responsible for decisions relating to which heating systems their company offers to install, and only in the following professions:

- Installers or servicers of central heating.
- Gas engineers.

[22] https://www.gov.uk/search/research-and-statistics?organisations%5B%5D=department-for-business-energy-and-industrial-strategy&parent=department-for-business-energy-and-industrial-strategy

- Heating contractors and consultants.
- Heating system installers.

Respondents were recruited by targeting installers registered in postcode areas which are not connected to the gas grid. Impact acquired from Xoserve[23], a full list of postcodes in Great Britain where there is no record of a gas connection by either large or small gas transporter. This list was then reduced to only cover England and Wales and was sent to the sample provider Experian[24], who provided contact numbers for approximately 600 businesses registered under the following SIC codes, within the postcode list developed:

- Central Heating - Installation & Servicing.
- Gas Engineers.
- Heating Contractors & Consultants.

Once this list was exhausted, it was then extended to adjacent postcodes, which increased the sample to over 4,000 installers. The sample file also contained contact name, job title, trading name at location, full address and an approximation of company size. The number for each installer was dialled at least once[25], and if the phone was answered, the respondent was screened against the following eligibility criteria:

- Part of their job included being a heating system installer.
- They have some responsibility for making decisions on which heating systems their organisation installs and services.
- They spend at least some of their time installing and maintaining heating systems on properties that are not connected to the gas grid.

Hard quotas were not set, but numbers of completed interviews were monitored throughout the fieldwork to ensure some representation of locations. Where there was an under representation from a certain location, it was prioritised.

The full details of the contact approach and breakdown of the sample are given in Annex B and Annex C.

The survey was conducted by telephone between January 2020 and March 2020. Surveys were completed before the national lockdown measures in response to the COVID-19 pandemic were implemented on 23rd March 2020.

The questionnaire covered the following topics:

- Awareness and attitudes towards the phasing out of fossil fuel heating systems in off gas grid buildings
- Perceived impacts of the future phasing out of fossil fuel heating systems on installers

[23] https://www.xoserve.com/media/2687/off-gas-postcodes-v2.xlsx
[24] https://www.experian.co.uk/business-express/marketing-data-lists/
[25] Respondents were contacted a maximum of ten times without a contact outcome, before the sample was considered exhausted, in line with Market Research Society guidance

- Installers' training, experience and familiarity with low carbon heating systems
- Installers' attitudes towards potential policies to promote heat pump deployment and installer re-training.

The questionnaire is included in Annex D.

Each survey took approximately 15 minutes to complete.

Phase 3: Qualitative understanding

The final phase of research was a detailed, in-depth qualitative telephone interview with 15 heating installers.

Participants were drawn from respondents from Phase 2 who had consented to be re-contacted and invited to take part in Phase 3. A purposive sampling approach was adopted, recruiting heating installers based on certain characteristics, which were identified as being most likely to provide relevant data to answer the research questions and inform policy. Respondents were only selected if they spent a minimum of 20% of their time working in areas not connected to the gas grid. Target quotas were set for each characteristic of interest and are shown below, alongside the actual numbers recruited:

Installer characteristic		Minimum target number of interviewees per characteristic	Actual number of interviewees per characteristic
Heat pump experience	Have installed at least 3 heat pumps in the last 12 months	5	6
	No heat pump installing experience	10	9
Training	Have considered re-training for heat pumps (taken from those with no heat pump experience)	6	5
Experience	Mix of experience levels, predominantly those who are not nearing retirement		
Location	Spread across England and Wales		

A full breakdown of the sample for Phase 3 is given in Annex E.

The qualitative interviews were conducted by telephone between August 2020 and October 2020.

Once contacted, respondents were screened to ensure they still met the Phase 2 criteria and a time was arranged to complete the interview.

The topic guide for heating installers covered the following topics:

- Experience of low carbon heating systems.
- Perceptions of low carbon heating systems.
- Training, upskilling, encouraging new installers into the industry.

The full topic guides are included in Annex F.

The interviews lasted approximately 30 minutes and respondents were offered an incentive of £20 to thank them for their time.

All interviews were recorded, with respondent consent, and once completed, they were transcribed. Thematic analysis was undertaken and identified key themes recurring across the interviews.

Limitations

Key limitations to this research relate to the sampling approach that was adopted for the survey; it was not feasible to undertake 'gold-standard' random probability sampling and the survey sample was limited to 200 participants. Steps were taken to ensure the sample was as robust as possible, which included setting target quotas, which were monitored throughout the fieldwork period, and randomly drawing numbers to dial from the sample list.

Due to the sample size, the views of smaller specialist groups of installers were not established. For example, no installers who took part in this research specialised only in heat pump installations, even though these types of businesses likely exist. Furthermore, new build installation specialists were not specifically targeted, so it was not possible to explore in detail the impact of policies such as the Future Homes Standard on this group. Future research would be beneficial to explore impacts on specialists such as these.

The impact of non-response bias should also be considered. Many installers were too busy to take part in this research, therefore it is possible that those who found the time to participate may differ to those who did not find the time. For example, participating installers may be more engaged or aware of low carbon technologies than non-participating installers.

In addition, the quantitative phase was conducted before Covid-19 lockdown measures were implemented on 23rd March 2020, whilst the qualitative interviews were conducted after the first Covid-19 lockdown measures. Therefore, it is possible installers' views changed between the two periods of fieldwork.

Results

Installers background

Length of time as a heating system engineer

Two thirds of installers (66%) surveyed in the quantitative phase have been a heating systems installer for 20 years or more. The majority of the remaining installers have been doing the job for over 10 years and only a small percentage (2%) have been doing so for less than five years.

Table 1: Length of time as a heating system engineer

Base: All installers (200)

Length of time	Percentage
Less than 5 years	2%
Between 5 to 10 years	8%
Between 10 to 20 years	25%
20 to 40 years	48%
More than 40 years	17%

Reasons for becoming a heating installer

The majority of the installers interviewed had been doing the job for a number of years and had started their careers from a young age. The route taken into becoming a heating installer was often via working for a family business, shortly after leaving school, or through completing an apprenticeship.

The majority of the installers interviewed suggested they saw becoming a heating installer as a ‘safe’ job, in the sense that there will always be a demand for such expertise so they should always be able to find work.

> *“It’s because we’ve got a constant stream of work on it [fossil fuel heating systems], there is still so much business out there to be had on it at the moment.*

It's the case that we have a constant stream of boilers to install for people." (Non heat pump installer)

In addition, installers were quick to point out that many continued in this career path as it something they enjoy doing, with one particular installer referring to their work as a *"paid hobby".*

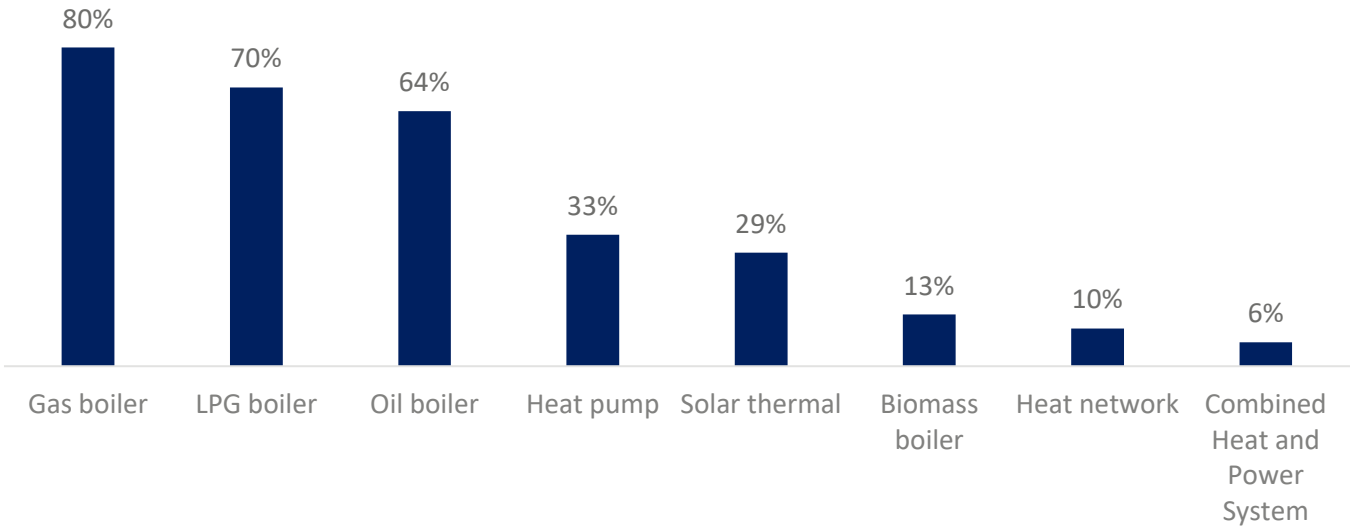
These findings were consistent across installers irrespective of the type of heating systems they installed, with similar reasons given for becoming an installer and continuing to work in the field.

Types of heating systems installed

During the quantitative survey, installers were shown a list of different types of heating system and asked which, if any, they currently install. As shown in Figure 1, the most commonly selected heating systems were gas boilers (80%), LPG boilers (70%), and oil boilers (64%). One third of the installers surveyed (33%) said they currently install heat pumps. None of the installers surveyed in the quantitative survey exclusively installed heat pumps, but there were five who only installed low carbon heating systems[26].

Figure 1: Heating systems currently installed[27]

Base: All installers (200)



Further analysis shows that installers who install heat pumps are more likely to also install each of the other types of heating systems in Figure 13, compared to installers who do not install heat pumps. Table 2 shows this to be particularly true for oil boilers, solar thermal, biomass boilers and heat networks. Heat pump installers surveyed were generally more versatile in terms of the systems they install than those who do not install heat pumps.

[26] The other low carbon heating systems shown to installers were biomass boiler and solar thermal.
[27] Respondents were able to select multiple responses.

Table 2: Further analysis of types of heating systems currently installed

Type of heating system installed	Do install heat pumps (n=66)	Do not install heat pumps (n=134)
Gas boiler	89%	75%
Oil boiler	79%	57%
LPG boiler	71%	69%
Solar thermal	58%	14%
Biomass boiler	27%	6%
Heat network	20%	4%
Combined Heat and Power System	12%	3%

Further to the above, 45% of the installers surveyed only install either gas, oil or LPG boilers, and 9% of the total sample only install one particular heating system. This was either oil or LPG boilers (4% of all installers surveyed only install oil boilers and 5% only install LPG).

It is clear from the qualitative interviews that installers' perceptions of low carbon technologies, and heat pumps especially, vary greatly, as do the reasons why installers decide to install them or not. Of those that do install heat pumps, a majority do so because they see it as the way the industry is going and because there is enough consumer demand to be worth their while. None of the installers interviewed solely install heat pumps, supporting the findings from the quantitative phase that those who install heat pumps tend to install a wider range of heating systems.

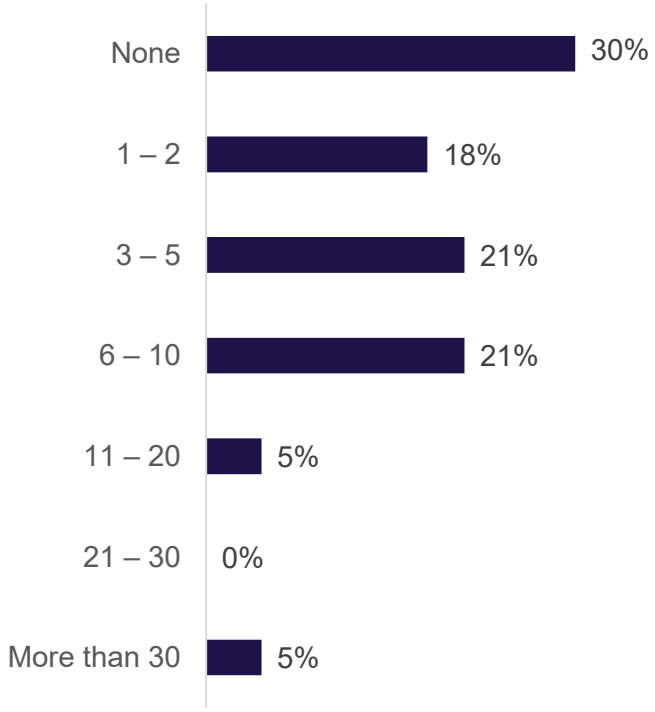
It was suggested by installers in the quantitative survey that if demand for fossil fuel heating systems were to significantly reduce in areas not connected to the gas grid, the majority would adapt, with heat pump installers increasing the number of low carbon technology installations they do. For the non-heat pump installers, 72% reported they will continue to work and learn how to install new technologies. This compares to just one in five (22%) who said they would not learn how to install low carbon technologies, however, would continue to install the systems they currently do.

Number of heat pumps installed in the last year

Of all the installers surveyed who stated they currently install heat pumps, 30% had not fitted any heat pumps in the past 12 months and 39% had only installed between 1 and 5 units. This indicates that despite having the skills to do so, installers are still installing heat pumps in low numbers, even in areas known to contain off gas grid properties where this research was focused.

Figure 2: Number of heat pumps installed in the last 12 months

Base: Installers that state they currently install heat pumps (66)



Heat pump installers' experience

As explained above, the quantitative survey's findings showed that installers that offer heat pumps do so as a wider offering of a range of heating systems, as opposed to the narrower range of heating systems offered by those who do not install any heat pumps.

Table 3 suggests that most heat pump installers surveyed are very experienced, with 73% having been a heating system engineer for 20 years or more (although to note, this does not necessarily reflect their experience in installing heat pumps). This is a slightly higher figure than for non-heat pump installers, for which only 61% have been in the industry as long.

Table 3: Length of time as a heating system engineer

Length of time	Do install heat pumps (n=66)	Do not install heat pumps (n=134)
Less than 5 years	2%	1%
Between 5 to 10 years	4%	10%
Between 10 to 20 years	21%	28%
More than 20 years	73%	61%

The qualitative interviews showed than many non-heat pump installers felt that they did not need to add heat pump installation to their skills, as there would be enough work for them using their current skills for the remainder of their careers. This work would be limited to maintenance, repair and servicing if legislation limited their ability to install particular heating systems (e.g., gas boilers in new-build properties), they still felt that there would be enough maintenance work to see them through to retirement.

Installer confidence in assessing heat pump types for fitting and installing heat pumps

As shown below in Table 4, among heat pump installers that have installed one or more heat pumps in the last year, 93% reported they are very or fairly confident in assessing the appropriateness of heat pumps in different building types and 98% are very or fairly confident in their ability to install them. Confidence levels among the 30% of heat pump installers that have not installed heat pumps in the last year were also high, suggesting that frequency of completing installations was not a major factor in installer confidence to assess the suitability of heat pumps or to install them.

Table 4: Installer confidence

Base: Installers that install heat pumps (66)

Installer confidence in…	Heat pumps installed in the last year	Very confident	Fairly confident	Not very confident	Not at all confident	Don't know
Assessing the appropriateness of different types of heat pumps in different building types	None (n=20)	55%	35%	10%	0%	0%
	1 or more (n=46)	65%	28%	2%	0%	5%
Installing heat pumps for your customers	None (n=20)	80%	15%	5%	0%	0%
	1 or more (n=46)	83%	15%	2%	0%	0%

There was however, some indication that increased experience of fitting heat pumps does have an effect on confidence levels for both of these measures. Table 5 shows that confidence for both making the right assessment and for installing heat pumps, does increase among installers with higher numbers of heat pumps installed in the last year. The numbers on which this table is based are low, so should be treated as indicative findings, but it does lend support to the argument that it can take a while to build up familiarity and confidence with the new technology.

Table 5: Heat pump confidence by number of heat pump installations in the last year

Number of heat pumps installed in the last year	Proportion very confident in making right assessment	Proportion very confident in installing heat pumps for customers
1-2 heat pumps (n=21)	48%	52%
3-5 heat pumps (n=16)	56%	69%
6+ heat pumps (n=22)	77%	95%

As might be expected, among the 67% of installers who stated they do not currently install heat pumps, confidence in both these measures was lower. However, 46% still claimed to be very or fairly confident of being able to make the correct assessment and 38% said that they would be very or fairly confident in installing one for their customers.

This variation in confidence about installing heat pumps was reinforced in the qualitative interviews. The majority of non-heat pump installers interviewed felt they would definitely need extensive training in the area before they would be confident installing them. One respondent explained that he felt one day of training was unlikely to be enough, questioning whether this could cover the breadth of information needed such are the implications of something being done incorrectly.

One respondent, however, said that installing an air source heat pump was easier than some other heating systems, suggesting it simply required connecting two pipes. This suggests that some installers may believe the pre-existing skills they have from installing other types of heating system, are transferrable to heat pumps, even if they have not completed formal training.

> *"It's like the most basic gas boiler of maybe 50 years ago, you know, just connect two pipes to the two fittings on the unit." (Heat pump installer)*

Barriers to heat pump uptake

Installers who do not currently install heat pumps were the most sceptical about low carbon technology, although some were positive. Often, the perception from installers was that their customers find them too expensive to install. In addition, some of these installers do not believe heat pumps are cost effective if installed in properties without effective insulation. While running costs may be low in some cases, there were suggestions that if a building does not have sufficient insulation, the heat pump would have to run continuously on a high setting to maintain an adequate level of heat. There were no installers interviewed that routinely recommended upgrades to insulation to enable heat pumps to operate at their most effective

level; rather they would recommend an alternative heat source that complemented the existing property infrastructure. This suggests a need for wider installer training in identifying options for energy efficiency improvements and optimising homes for heat pumps.

There was also a perception among many installers that at present, consumers simply do not know enough about the benefits of heat pumps to request to have one installed, or agree to installation of one, if suggested by an installer.

The nature of an installer's client base could also be seen as a barrier to installing heat pumps, where in some cases it was felt that heat pumps would not be suitable for the types of buildings or areas that they work in. For example, those who worked in areas with predominantly older housing stock perceived the lack of insulation as a limiting factor in a heat pump's suitability for these houses.

In addition, some installers interviewed were of the impression that heat pumps were extremely inefficient during colder periods when they are most needed. Although experience from operation of heat pumps in colder climates suggests they are able to comfortably operate at or below zero degrees Celsius[28].

> *"As it gets below six Celsius outsides, the heat pump becomes so inefficient that it's almost the same as an electric radiator in that you're actually directly using electrical energy to provide heat then." (Non-heat pump installer)*

Training and upskilling

Uptake of training for heating systems other than gas central heating

Of the installers surveyed, nearly seven in ten (69%) reported they have received training for the installation of any heating system other than gas central heating. As all installers surveyed spend at least some of their time working on off gas grid systems, this indicates that many are doing so without having received specific training on these systems.

Of those who have received training, over half (62%) had been trained in installing at least one type of heat pump system. Table 6 shows the breakdown of non-gas central heating system training received.

[28] Department for Business, Energy and Industrial Strategy (2017), International Comparisons of Heating, Cooling and Heat Decarbonisation Policies, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/699674/050218_International_Comparisons_Study_MainReport_CLEAN.pdf

Table 6: Type of heating system training taken previously

Base: Installers with training on a system other than gas central heating (138)

Type of heating system training taken previously	Proportion
Any type of heat pump training	62%
Solar thermal	45%
Air-to-water heat pump	40%
Air-to-air heat pump	36%
Ground source heat pump	36%
Biomass boiler	24%
Water source heat pump	13%
Hybrid heat pump	8%
Heat network	6%
Combined Heat and Power System	1%
Other	7%

Furthermore, only 71% of installers who have installed a heat pump in the last 12 months have received training in installing at least one type of heat pump, highlighting that a number of installers who currently install heat pumps have received no formal training on their installation.

Despite there being very little difference in those with or without formal training reporting they were very or fairly confident in installing a heat pump for their customers, attending a formal training course on heat pump installation appears to increase the level of installers' confidence with the technology. Overall, 81% of installers who had installed a heat pump in the last 12 months and had received training on at least one kind of heat pump reported being very confident in installing heat pumps for their customers. This contrasts to only 53% of installers who had installed a heat pump in the past 12 months but had not received training on at least

one kind of heat pump. Again, the number of installers in each category was low and therefore should be taken as indicative rather than representative of all heat pump installers.

Table 7: Installer confidence

Base: Installers that have installed one or more heat pumps in the last year (59)

Installer confidence in…	Heat pump training	Very confident	Fairly confident	Not very confident	Not at all confident	Don't know
Assessing the appropriateness of different types of heat pumps in different building types	Have attended training on heat pumps (n=42)	69%	24%	5%	0%	2%
	Have not attended training on heat pumps (n=17)	41%	41%	6%	0%	12%
Installing heat pumps for your customers	Have attended training on heat pumps (n=42)	81%	12%	7%	0%	0%
	Have not attended training on heat pumps (n=17)	53%	41%	6%	0%	0%

In the installer interviews, feedback on the training received was mixed. Some installers were very complimentary about the training sessions that they had attended. In contrast, others were less so, suggesting they had attended courses run by unqualified trainers or companies

simply trying to sell their product. The majority of installers agreed that the cost of attending these courses was often very high, considering not only the price they need to pay to attend but also the cost of missing out on a day's worth of work.

Barriers to heat pump training

Of the installers who had not previously had training in installing heat pumps, 50% have considered upskilling to install heat pumps. This was broadly the same for installers who had not received heat pump training but had fitted a heat pump in the past 12 months, 53% of these installers indicated they have considered upskilling, indicating a desire for training amongst installers who are currently installing heat pumps. Of those who have not considered upskilling to be able to install heat pumps, the top three reasons cited were: approaching retirement (35%), lack of consumer demand (25%), and lack of time to take the training (16%). Table 8 lists the full range of answers given.

Table 8: Reasons for not considering upskilling

Base: Have not considered upskilling (57)

Reasons for not considering upskilling to install heat pumps	Proportion[29]
Nearing retirement	35%
No demand	25%
Too busy	16%
Not suitable for type of work/customers	9%
Do not trust/agree with the technology	9%
Cost	5%
Other[30]	14%

These reasons for not considering training were again mentioned by respondents in the qualitative phase of the research. When installers felt they have enough work without

[29] Respondents were able to select multiple responses.
[30] Other includes: Get enough work without it, never considered, not interested, don't have the workforce to install them, no knowledge, someone else in the company is qualified.

diversifying into heat pumps, they simply did not see the need to retrain, especially those nearer the end of their careers.

Of those who said that they would consider upskilling during the qualitative phase, the majority suggested this would be demand-led i.e., they would only do so when they are confident there would be sufficient demand for these services.

> *"If demand were to increase, I'd definitely try and source something somewhere. Yes, if there is you've got to move with the times and if the demand isn't there to create the supply network then it's almost like getting on the course, paying for another ticket that is not going to be used." (Non-heat pump installer)*

The proportion of employees that would hypothetically be upskilled varied somewhat between companies, with some suggesting the whole engineer workforce would take the training. In contrast, others would only send one or two on a course as a starting point.

Initiatives to increase the uptake of training for low carbon technologies

There were high levels of support for different types of initiatives suggested to the installers surveyed, as shown in Table 9. The most popular was 'low carbon training schemes which are only accredited if they are delivered to an agreed standard', about which 86% were either very supportive or fairly supportive. The least popular option was 'in order to register with a trade organisation such as OFTEC, Gas Safe or MCS, you must complete training in low carbon heating'. However, 70% of installers were still very or fairly supportive of this, whilst 10% were very unsupportive.

The levels of support for each initiative were broadly consistent among installers with different levels of experience.

Table 9: Levels of installer support for various potential initiatives to encourage uptake of training for low carbon heating systems

Base: All installers (200)

Potential initiatives	Very supportive	Fairly supportive	Neither supportive nor un-supportive	Fairy un-supportive	Very un-supportive	Don't know
Low carbon training schemes which are only accredited	68%	19%	5%	3%	3%	2%

if they are delivered to an agreed standard						
Subsidised costs for low carbon training/ voucher schemes to retrain (e.g., £300 voucher to train as a heat pump installer)	61%	22%	7%	5%	4%	1%
Mandatory low carbon modules in all traditional heating/ plumbing qualifications	56%	20%	11%	8%	4%	1%
In order to register with a trade organisation such as OFTEC, Gas Safe or MCS, you must complete training in low carbon heating	52%	18%	11%	8%	10%	1%

Extending the law so that all kinds of installers and installations must be registered, not just gas

The law requires all gas installations to be notified to the Gas Safe Register, and for the work to be carried out by a Gas Safe Registered engineer. Nine in ten installers (88%) supported extending the law so that all heating system installers and installations must be registered, not just gas; only 10% opposed this. There was also broad support for the idea of a low carbon training skills card, comparable to a Gas Safe accreditation, with 72% saying that this appealed and just 22% saying that this did not appeal.

Figure 5: Support for laws similar to Gas Safe Register being extended to all installers and installations

Base: All installers (200)

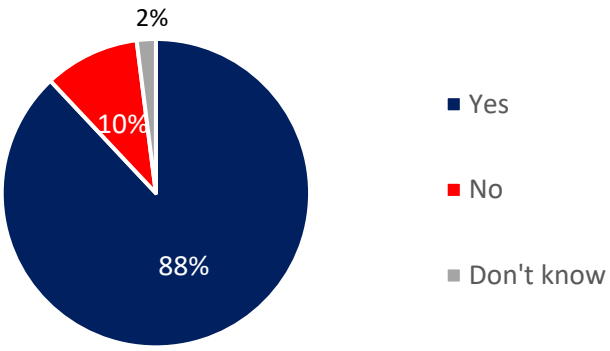
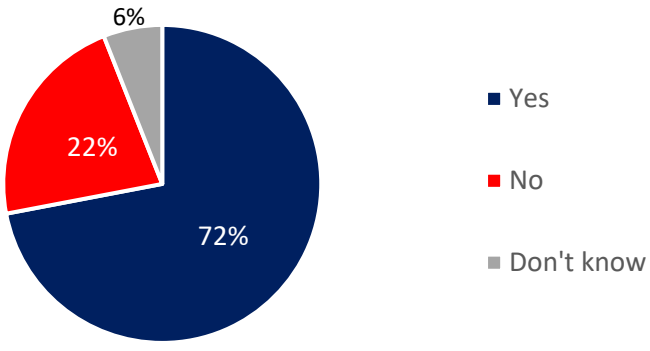


Figure 6: Would the idea of a low carbon skills card appeal?

Base: All installers (200)



Who should be involved in providing training?

Installers identified roles for both manufacturers and the Government in providing training. While manufacturers were often seen as providing the best training due to product knowledge, some installers interviewed felt that in the past they had attended low-quality courses, which seemed more an opportunity for companies to sell their products than to provide training. It

was suggested that the Government could back schemes deemed to meet the standards required, adding credibility to these courses and providing assurance to installers signing-up to them.

> *"I think people won't be interested in spending thousands of pounds on training for sure, you know, so it's really got to go through government and industry really." (Non-heat pump installer)*

One respondent added that any training course they choose to attend would need to be detailed enough to be worth their while, rather than a simple one that might only cover basic information.

> *"I just feel more comfortable going on a proper course rather than some of these simple courses." (Non-heat pump installer)*

Overall, the perception was that the Government and industry need to collaborate more on training to make it easier for installers to attend these courses, especially in keeping the training courses affordable.

Phasing out of fossil fuel heating systems

Awareness of plans to phase out fossil fuel heating systems in off gas grid buildings

Installers were asked whether they were aware of government plans to phase out high carbon fuel heating in buildings off the gas grid (expected to involve LPG, coal and oil during the 2020s). Awareness of these plans was high among all installers surveyed, with 90% reporting they were either fully aware, or aware but not in detail. This was slightly higher among those who currently install heat pumps (97%) compared with installers who do not (87%). However, many more heat pump installers reported being fully aware (73%) of these government plans than those who do not currently install heat pumps (49%).

Installers were also asked how aware they thought their customers were of government plans to phase out high carbon fossil fuel heating in buildings off the gas grid. The overwhelming perception was that customer awareness was much lower than their own. This echoes a finding from the 'Transforming Heat – Public Attitudes Research'[31] conducted by BEIS in 2020, which found that a minority of the British population have 'a little' or 'a lot' of knowledge of the Government's carbon emission targets (37%) and even fewer (24%) stated they have 'a little' or 'a lot' of knowledge about the Government's ambition to eliminate nearly all emissions from heating buildings.

[31] Department for Business, Energy and Industrial Strategy (2020), Transforming Heat – Public Attitudes Research https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/913541/transforming-heat-public-attitudes-research-report.pdf

Overall, 71% of installers thought their customers were unaware, whilst only 5% thought they were fully aware. This was most evident among those who do not install heat pumps, of which 74% believed customers to be unaware. Figures 3 and 4 shows the full breakdown of responses to these questions, split by heat pump and non-heat pump installers.

Figure 3: Awareness of plans to phase out fossil fuel heating systems in off gas grid buildings during the 2020s

Base: All installers (200)

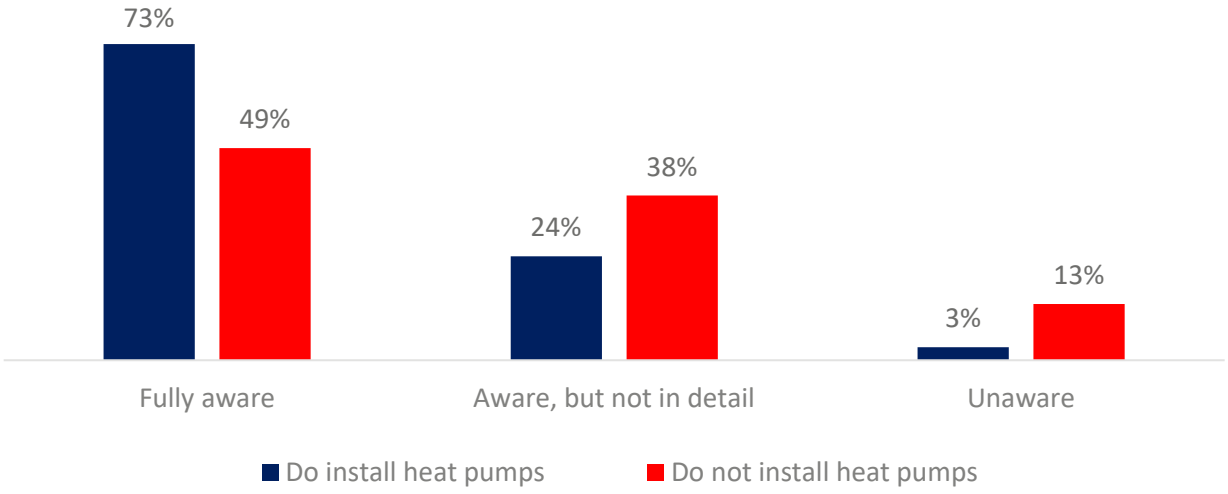
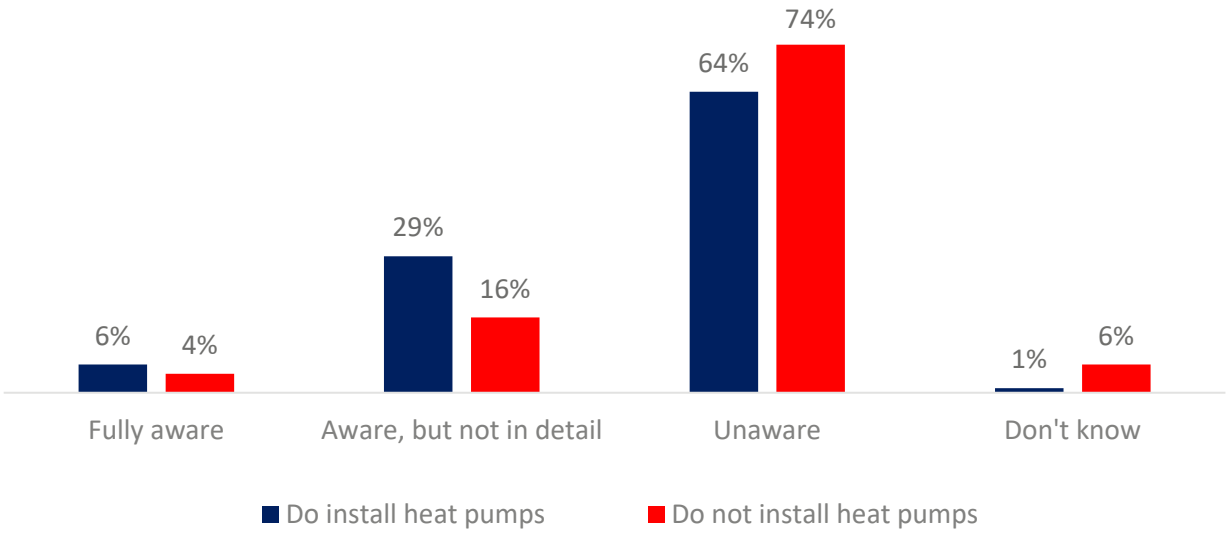


Figure 4: Installers perception of customers' awareness of plans to phase out fossil fuel heating systems in off gas grid buildings during the 2020s

Base: All installers (200)



Installers' views on the effectiveness of measures to increase demand for low carbon technologies

The installers surveyed were asked to consider various measures which could be implemented by the Government to drive demand for low carbon technologies. The full breakdown of responses is given below in Table 10. Overall installers thought that providing loans and subsidies to make low carbon technologies more affordable would be the most effective, with 87% believing this would be either very or fairly effective. Banning the installation of new fossil fuel systems by 2030, was also seen as an effective measure with 69% believing this would be either very or fairly effective.

Actions to increase the installation, maintenance, or running costs of fossil fuel heating systems were viewed as the least effective options to increase demand for low carbon technologies. 63% of installers thought that increasing the cost of fuels for fossil fuel heating would be either not very effective or not at all effective, whilst 56% thought increasing the cost of high carbon technologies and parts would be not very or not at all effective. It is worth noting that whilst some biases may be expected when asking professionals about measures which may either positively or negatively impact their businesses, both heat pump installers and non-heat pump installers had very similar views on these measures.

Table 10: Installer opinion on effectiveness of measures to drive low carbon technologies

Base: All installers (200)

Measures to drive low carbon technologies	Very/fairly effective	Not very/not at all effective	Don't know
Loans and subsidies to help make low carbon technology affordable	82%	16%	2%
Banning the installation of new fossil fuel heating systems by 2030	69%	26%	5%
Boiler scrappage scheme	65%	31%	4%
Increasing the cost of high carbon technologies and parts	39%	56%	5%
Increasing the cost of fossil fuels for heating	35%	63%	2%

The level of support for loans and subsidies especially, highlight that incentive schemes can be a powerful motivator for change. The installer view supports findings from previous consumer research on the RHI evaluation[32] that identified that without the scheme, almost half of the new

[32] Renewable Heat Incentive evaluation, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/642097/Domestic_Census_waves_1-24.pdf

RHI applicants surveyed would either not have replaced their current heating system at all, or would have replaced it with a non-renewable technology. The same study also highlighted that consumers were encouraged to push ahead with applications earlier than might otherwise have been the case, to benefit from the maximum subsidy available, being aware that the value of the tariff might decrease over time.

Awareness of the Future Homes Standard

The Future Homes Standard[33] will require new build homes to be future-proofed with low carbon heating and world-leading levels of energy efficiency from 2025. Eight in ten installers surveyed (80%) were aware of this policy. When asked what impact the future homes standard would have on their business, six in ten installers (60%) thought it would "make no difference". Of the remainder, a greater proportion felt the standard would have a positive impact (20%) compared with those who thought it would have a negative impact (15%) on their business.

The quantitative survey did not explore how much time installers spent working on new builds, however the majority of installers who participated in the qualitative interviews rarely, if ever, worked in new builds. However, those who do work on new builds generally felt that alternative heating systems, such as heat pumps, will be sufficient to meet the heating needs of the property, as they can be designed with this in mind. The key element is including enough insulation to enable a heat pump to work at its optimum level as this would reduce the need for traditional, more heat-intense fossil fuel heating systems. One installer explained how a new build property can be built with a ground source heat pump in mind.

> *"Well, the ground source heat pumps are fine and dandy, if you've got a private owned house, [where it's a] new build [and] where you've got a bit of land behind it to start off with…what it is cost effective for you then is to trench it out. Trench it out and stick your coil in there." (Heat pump installer)*

Among the installers interviewed, those who do not currently install heat pumps claim that this legislation has not motivated them to add low carbon options to the types of heating system they install. Some installers elaborated on this point by stating they believe that even once the legislation has come into force there will still be plenty of work available for them. They felt this would come from maintaining and installing fossil fuel heating systems in existing buildings in both on and off gas grid areas.

> *"I think that there will be enough gas appliances around to see me out in my time. I think I will get twenty years more work out of it to be honest. You know, so I am not too worried about adapting." (Non-heat pump installer)*

[33] https://www.gov.uk/government/consultations/the-future-homes-standard-changes-to-part-l-and-part-f-of-the-building-regulations-for-new-dwellings

Perceived barriers to heat pump deployment and uptake

Installers' views about obstacles to UK heat pump deployment

Despite largely being in favour of low carbon technologies, there were a number of obstacles to heat pump deployment identified by installers, the largest being the cost to consumers (64%). Other commonly cited reasons were the perceived lack of awareness, knowledge and understanding among consumers (21%), the cost of heat pumps to installers (18%), and the noise heat pumps make and the space they require (15%). A full list of reasons given is shown in Table 11.

Table 11: Main obstacles to UK heat pump deployment

Base: All installers (200)

Main obstacles to UK heat pump deployment	Proportion[34]
Cost of heat pumps to consumers	64%
Perceived lack of consumer awareness, knowledge and understanding	21%
Cost of heat pumps to installers	18%
Noise and space of heat pumps	15%
Issues with building stock	9%
Building regulations/planning	7%
Lack of installer confidence and certainty to install heat pumps	7%

Cost to the customers was also identified by participants in the qualitative interviews as a key reason why more heat pumps are not being installed in the UK. Installers highlighted that the high upfront cost of a heat pump, compared to that of an oil or LPG boiler, often came as a surprise to consumers and that many baulked at the initial outlay. Research suggests the typical cost starting from around £7,000[35], however, one installer suggested they could be a lot more.

[34] Respondents were able to select multiple responses
[35] The Cost of Installing Heating Measures in Domestic Properties, 2018, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/913508/cost-of-installing-heating-measures-in-domestic-properties.pdf

> *"If you change boiler over on LPG or oil…say, £4,000. Whereas air source or ground source they're looking at thousands, aren't they really? £10,000 up to £20,000 or £30,000 depending on the size and the complexity of the installation. So, I think that's what is stopping a lot of people (Non-heat pump installer)*

Another obstacle discussed during the qualitative interviews was the poor level of insulation in many UK properties. There were suggestions from multiple respondents that the amount of heat provided by a heat pump is ample for a properly-insulated new build home, but it would not be enough for an older building with less effective insulation. One heat pump installer explained that in some cases it might be necessary to 'clad the outside of a house' to make a heat pump a viable alternative to oil or LPG, and customers would not consider doing this. This installer used their own house as an example:

> *"Your only way of physically bringing my house up [to the level needed] would be to clad the outside of the house. Then to be able to permanently insulate it better, to be able to then put some other kind of heating in it." (Heat pump installer)*

Underfloor heating was also mentioned by multiple respondents. While it is not the case that heat pumps require underfloor heating, some installers suggested underfloor heating is a necessity if a heat pump is to run efficiently and provide consumers with expected levels of thermal comfort. Another installer, again, used their own property as an example:

> *"I live in a Victorian cottage, and I don't think really putting a heat pump would be suitable for this property, because it's just not designed to have that and, you know, that kind of technology in to it. So, a gas boiler, it was never designed for, but a gas boiler can cope with it, heat pumps run at a lot lower temperatures, you know, you'll either end up with massive radiators or you'd be digging the floor up to try to put some underflooring. To retrofit, it is difficult." (Non-heat pump installer)*

What measures do installers think will be effective to support wider heat pump deployment and overcome barriers?

What measures would installers like to see?

Incentives came out as the main suggestion to help installers upskill to increase the installation of heat pumps. Whilst one installer suggested incentives could be given by the manufacturers, similar to a scheme currently run by Worcester Bosch.

> *"Incentivise it like Worcester does really, I think we get fifteen pounds now for every boiler we install. So, incentivising it that way, the more you install the more you get." (Non-heat pump installer)*

A number of installers did suggest, however, that if demand for these products is there, that alone could encourage them to upskill.

> *"It's going to come down to the want of people wanting that stuff to be installed. So, if there's a requirement, there's a lot of customers in a certain area that need these things installed then that's going to get people going on the courses to do them, to get qualified to do installations. So, it's going to come down to the uptake of that." (Non-heat pump installer)*

In addition to the above, interviewees were asked to discuss their views and experiences of the Renewable Heat Incentive (RHI). Installers who had completed installations under RHI were the most positive, with some suggesting that the scheme was a key consideration when choosing which heating system to install and that customers also had some knowledge about it.

> *"I haven't had anybody that didn't have some sort of knowledge before they came to me and asked for an air source heat pump. Without that, I don't think anybody would have installed it." (Heat pump installer)*

Installers less familiar with the scheme were more sceptical. Some felt that there were 'hoops to jump through' to be able to complete installations under the scheme and one non-heat pump installer explained the cost of registering to be an eligible installer had stopped his company from doing so.

Installers interviewed were also prompted to discuss the Clean Heat Grant[36], which is due to start in 2022. Only two installers reported to have heard of the proposed scheme. Once it was explained to interviewees who were previously unaware of it, there was consensus that in principle the proposals were strong and could help increase uptake of low carbon heating systems. However, questions were raised as to whether the grant amount of £4,000 would be sufficient; even with a price reduction of this magnitude, there was still a perception among installers that heat pumps were still considerably more expensive than fossil fuel heating systems and this would be prohibitive to consumer uptake

As with all grant and incentive schemes, installers want to be sure they are properly funded and transparent, so that they know what they are signing up for at the outset.

> *"Hopefully it [a new grant for renewable energy] is just transparent [and clear] it is a legitimately government funded company [providing the scheme]" (Non-heat pump installer)*

[36] https://www.gov.uk/government/consultations/future-support-for-low-carbon-heat

Conclusions

Research question 1: How are installers going to be affected by the move towards modern low carbon heating solutions?

Many of the installers surveyed often install more than one type of heating system, the most common being gas, LPG or oil boilers. Whilst no installers solely installed heat pumps at present, one third of those surveyed did install heat pumps as part of their service offering. This group was the most confident in their ability to assess heat pumps' appropriateness for different building types and install them. Therefore, they are unlikely to be negatively affected by the move towards low carbon heating systems as they could increase the volume of low carbon heating systems they install accordingly.

For the two-thirds of installers who currently have no heat pump experience, changes in the market may be more impactful. This group were understandably far less confident in their ability to identify the right heat pump for different types of building, or in their ability to install heat pumps. To transition their businesses would require training, but a key consideration for some non-heat pump installers was their proximity to retirement. Some of the most experienced installers of this type did not see the value in upskilling, as they could foresee a sufficient volume of maintenance, repair and servicing of traditional heating systems to support their business for the remainder of their career.

Half of the installers surveyed had already considered upskilling to be able to install heat pumps, with many acknowledging that the decarbonisation of heating and hot water is the way the market is going and that they will need to move with the times. When asked how they would react if the demand for fossil fuel heating systems were to significantly reduce in areas not connected to the gas grid 72% of non-heat pump installers reported they would continue to work and learn how to install new technologies. This compares to just one in five (22%) who said they would not learn how to install low carbon technologies, however, would continue to install the systems they currently do.

There is significantly more doubt around the extent to which heating installers might transition their business to enable them to retrofit properties in order to make them suitable for heat pumps. This was perceived as a barrier to uptake, not just from a consumer demand perspective, but also because installers did not feel they had the level of expertise to make changes to insulation or it was seen as beyond the scope of heating replacement quotes.

Research question 2: What are the attitudes of installers to government commitments to phase out the use of high carbon fossil fuels in off gas grid buildings?

Installers, on the whole, were supportive of the initiatives suggested to help the phasing out of fossil fuel heating, but suggested appropriate support mechanisms would need to be put in place to encourage both consumer demand and motivate installers.

Nearly all installers interviewed had at least basic awareness of government plans to phase out installation of fossil fuel heating systems, as well as the Future Homes Standard. However, their perception is that customers are much less aware. This echoes similar findings from the BEIS Transforming Heat – Public Attitudes Research[37] conducted in 2020. As such, there is some work to be done here on educating customers on the need to convert their heating systems and therefore driving demand on the consumer side.

Research question 3: What kind of support mechanisms are appropriate to encourage uptake of low carbon heating systems in off gas grid buildings?

Making lower carbon heating options more appealing through subsidies and banning installation of fossil fuel installations in new builds were seen by installers as the most effective ways to encourage overall uptake of low carbon heating. These show how incentive schemes can be powerful motivators for change. The installer view supports findings from previous consumer research on the RHI evaluation[38] that identified that, without the scheme, almost half of the new RHI applicants surveyed would either not have replaced their current heating system at all, or would have replaced it with a non-renewable technology.

The research suggests, any incentive schemes, such as the Clean Heat Grant, will need to reassure installers that they are properly funded and transparent as to the benefits for those applying and need to reduce the initial investment below or at least close to that of fossil fuel alternatives, for it to be seen as attractive enough in the context of higher running costs.

Installers were strongly supportive of the idea of an extension to the law in a similar format to the Gas Safe Register, that accredits the quality of installation of low carbon heating options. In turn this is likely to build consumer confidence as the market grows.

[37] Department for Business, Energy and Industrial Strategy (2020), Transforming Heat – Public Attitudes Research https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/913541/transforming-heat-public-attitudes-research-report.pdf

[38] Renewable Heat Incentive evaluation, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/642097/Domestic_Census_waves_1-24.pdf

The focus for government support should not be limited to entry level installers, but also to those with more experience. Many installers with 20 years' or more experience have already taken steps to adapt to what they see as a changing market.

Research question 4: How would stakeholders respond to the ending of installing fossil fuel heating systems in new build non-domestic properties from 2025?

For installers currently working on new build properties, the phase out of fossil fuel heating is likely to be manageable. It will be designed into the build with appropriate insulation and infrastructure to optimise the efficiency. Those who do not work on new build properties do not perceive the impact on their business to be significant, as they are confident that there is sufficient workload from traditional heating to continue until the end of their careers without diversifying.

Annexes

Annex A: Literature review referenced materials

Property Industry Alliance, Property Data report (2017) https://www.bpf.org.uk/sites/default/files/resources/PIA-Property-Data-Report-2017.PDF

Carbon Trust, Energy Efficiency Loan Fund (Wales) https://www.carbontrust.com/client-services/programmes/finance/interest-free-loans-wales/#faq

Zero Waste Scotland, SME Loan Fund https://energy.zerowastescotland.org.uk/SMELoan

The Guardian, How to make old homes energy efficient (2014) https://www.theguardian.com/environment/2014/nov/18/how-to-make-old-homes-energy-efficient

Eurostat, Energy Consumption in households https://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_consumption_in_households

The European Heat Pump Association, Market Data https://www.ehpa.org/market-data/

Association Française pour les Pompes à Chaleur, French Market https://www.ehpa.org/fileadmin/red/09._Events/2019_Events/Market_and_Statistic_Webinar_2019/EHPA_webinar_FR_market_AFPAC.pdf

International Energy Agency, Heat Pumps https://www.iea.org/reports/heat-pumps

UKERC Technology and Policy Assessment, Best practice in heat decarbonisation policy: A review of the international experience of policies to promote the uptake of low-carbon heat supply https://www.theccc.org.uk/wp-content/uploads/2017/01/UKERC-for-the-CCC-Best-practice-in-heat-decarbonisation-policy.pdf

HM Government, The Buildings Regulations 20, Combustion appliances and fuel storage systems https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/468872/ADJ_LOCKED.pdf

BEIS Building Energy Efficiency Survey (2014-2015) https://www.gov.uk/government/publications/building-energy-efficiency-survey-bees

CPS Fuels, Fake News: No oil boilers by 2030 https://www.cpsfuels.co.uk/news/fake-news-no-oil-boilers-by-2030

Non-Gas map https://www.nongasmap.org.uk/

The MCS Service Company https://www.microgenerationcertification.org/about-us/statistics/

The Committee on Climate Change, Heat in UK buildings today, 2016
https://www.theccc.org.uk/wp-content/uploads/2017/01/Annex-2-Heat-in-UK-Buildings-Today-Committee-on-Climate-Change-October-2016.pdf

Alternative Heat Solutions, Converting a town to low carbon heating (2019)
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/794998/Converting_a_town_to_low_carbon_heating.pdf

Electrification of Heat Demonstration Project, BEIS, 2019
https://www.gov.uk/guidance/electrification-of-heat-demonstration-project

Annex B: Contact Records for Telephone Survey

The table below shows the response from the numbers dialled as part of the quantitative survey. Please note, this shows the most recent attempt on the number, so does not reflect the total number of attempts made to each number.

Table 12: Numbers dialled

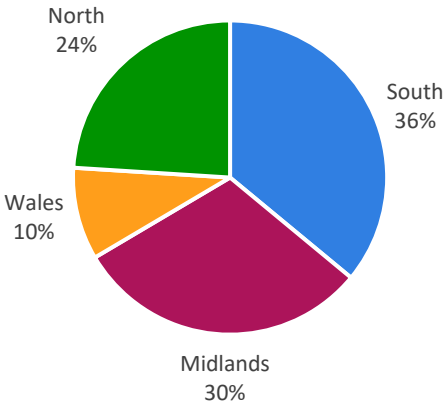
Total numbers / leads	**4121**
Survey completed	200
No answer/engaged	1523
Call back requested	381
Contact out of date	227
Number not recognised	319
Declined survey	1471

Annex C: Phase 2 sample

Almost all (96%) of the 200 installers surveyed had 1-9 employees. As shown in Figure 8, most installers spent the majority of their time working on installations in properties connected to the gas grid. Non-domestic off gas grid installations were less frequent than domestic (Table 13).

Figure 7: Location of installers surveyed

Base: All installers (200)



North	North East, North West, Yorkshire
Midlands	East of England, East Midlands, West Midlands
South	London/Greater London, South East, South West

Figure 8: Proportion of time spent installing heating systems in buildings off the gas grid for the individual surveyed

Base: All installers (200)

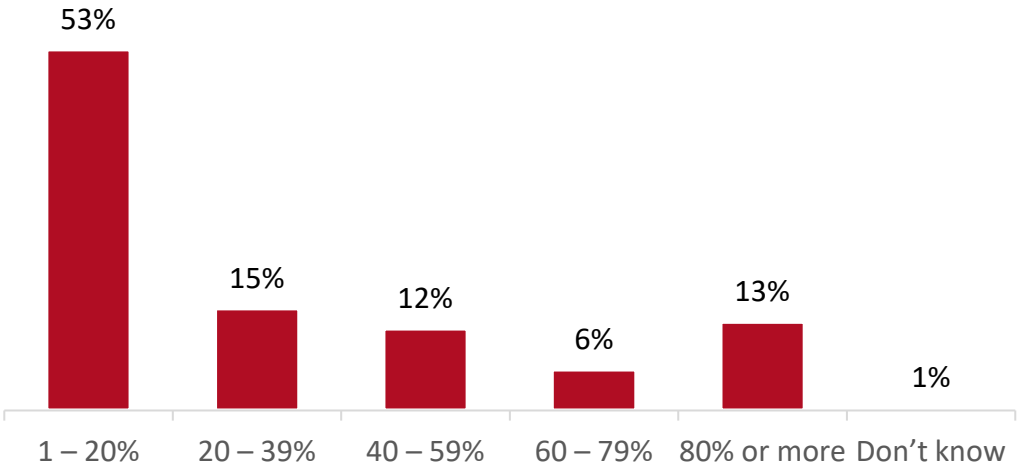


Table 13: No. of heating units installed by each installer in off gas grid buildings (per year)

Base: All installers (200)

Number of heating units installed	Domestic buildings	Non-domestic buildings
None	4%	67%
1-5	38%	22%
6-10	20%	6%
11-20	20%	5%
21-30	6%	0%
31-50	8%	0%
50+	4%	0%

Annex D: Quantitative survey questionnaires

INTRODUCTION TO THE RESEARCH AND ADHERENCE TO MRS CODE OF CONDUCT AND GDPR

Good morning/afternoon/evening. My name is …. And I am calling from Impact on behalf of the department for Business, Energy and Industrial Strategy.

TEXT 1 We are carrying out a survey on behalf of the Department for Business, Energy and Industrial Strategy about heating systems in areas that are not connected to the gas grid. Your opinion and judgment is very important to us and the results will be used by the Government to feed into their design of future policies in this area. The survey should take no more than 15 minutes to complete, depending on the answers you give us.

SC ASK ALL

INTRO 1 Are you, or someone else in your organisation able to take part in this survey around heating system installation?

- Yes, now - Continue
- Yes, but at more convenient time. INTERVIEWER: RESHEDULE CALL
- No - Close

SC ASK ONCE INITIAL CONSENT FOR INTERVIEW ESTABLISHED

INTRO 2 Thank you. Before we carry on, can I check you are a heating system installer?

- Yes - Continue
- No - Close

SC ASK IF CODE 2 AT INTRO 2

INTRO 3 Is there a heating system installer within your organisation who we may be willing to take part in this important research survey.

- Yes – INTERVIEWER: ONCE SPEAKING TO ‘NEW’ PERSON, LOOP BACK TO TEXT 1, FOLLOWED BY INTRO 2 and TEXT 2
- No – Close

TEXT 2: READ OUT TO ALL: This is a genuine research study and no sales call will result from our contact with you. The interview will be carried out in strict accordance with the Market Research Society's Code of Conduct and GDPR, with all results anonymised.

SCREENING

Firstly, I have some questions about you and your place of work.

MC ASK ALL

S1 Which of following describes your job role? READ OUT

Please select all that apply.

- Heating system installer CLOSE IF NOT CODED
- Plumber
- Gas engineer
- Plumbing / heating company manager
- Plumbing / heating company office staff
- Other (please specify)

SC ASK ALL

S2 In terms of making decisions on which heating systems your organisation installs and services, which of the following best describes your role:

- I have sole responsibility for making decisions on which heating systems my company installs and services
- I am a key member of a team responsible for making decisions on which heating systems my company installs and services
- I have some input into decisions on which heating systems my company installs and services
- I am not involved in decisions on which heating systems my company installs and services - CLOSE

SC ASK ALL

S3 Approximately, what percentage of your time is spent installing and maintaining heating systems on properties that are not connected to the gas grid?

- I do not install or maintain heating systems on properties off-grid - CLOSE
- 1 – 20%

- 20 – 39%
- 40 – 59%
- 60 – 79%
- 80% or more
- Don’t know

SC ASK ALL

S4 Approximately, how many employees are employed at the organisation that you work for, excluding owners and partners, across all sites?

- 1-9
- 10-99
- 100-249
- 250 or more
- The organisation is no longer operating - CLOSE

AUTOMATICALLY CODE INTO THE FOLLOWING REGIONS (HIDDEN VARIABLE)

QHIDSIZE: CODES 1 or 2 = SMALL | CODE 3 = MEDIUM | CODE 4 = LARGE

MC ASK INSTALLERS

S5 Which, if any, of the following types of heating systems do you personally currently install? Please select all that apply. READ OUT

- Gas boiler – CLOSE (if single coded)
- Oil boiler
- LPG boiler
- Biomass boiler
- Heat network [IF NECESSARY ADD Sometimes called district heating, a heat network is a distribution system of insulated pipes that takes heat from a central source and delivers it to a number of domestic or non-domestic buildings]
- Heat pump
- Solar thermal
- Combined Heat and Power System
- Other (please specify)
- There are no fixed premises that need heating – Close

- Don’t know - Close

MC ASK IF S5 = 6

S6 What type of heat pumps do you personally install? PROMPT IF NECESSARY

- Air-to-air heat pump
- Air-to-water heat pump
- Ground source heat pump
- Water source heat pump
- Hybrid heat pump
- Other (please specify)
- Don’t know

SC ASK ALL

S7 Please can you confirm where your main place of work is based? PROMPT IF NECESSARY

- London/Greater London
- South East
- South West
- East of England
- East Midlands
- West Midlands
- Wales
- Yorkshire
- North East
- North West

AUTOMATICALLY CODE INTO THE FOLLOWING REGIONS (HIDDEN VARIABLE)

QHIDREGION:

CODES 1, 2, 3	SOUTH
CODES 4, 5, 6	MIDLANDS
CODE 7	WALES

CODES 8, 9, 10 NORTH

CHECK QUOTAS ON SIZE, TURNOVER AND REGION BEFORE CONTINUING

NUM ASK ALL

S10 Approximately how many new heating units do you personally install for homes which are not on the gas network in a typical year? (Including all types of heating technology, and installation only - not maintenance and servicing)

NUMERIC

NUM ASK ALL

S11 Approximately how many new heating units do you personally install for non-domestic buildings (i.e. buildings that are not used as homes) that are not on the gas network in a typical year? (Including all types of heating technology, and installation only - not maintenance and servicing)

NUMERIC

SC ASK ALL

S12 How long have you personally been installing heating systems?

- Less than 5 years
- Between 5 to 10 years
- Between 10 to 20 years
- 20 to 40 years
- More than 40 years

EXPERTISE & TIME SPENT INSTALLING DIFFERENT TYPES OF HEATING

SC ASK ALL

IN1 Approximately, what percentage of your time is spent installing and maintaining high carbon heating systems, in areas off the gas grid?

IF NECESSARY ADD: High carbon heating systems include traditional heating technologies which use fossil fuels such as oil and LPG.

- Less than 20%
- 20 – 39%
- 40 – 59%

- 60 – 79%
- 80% or more
- Don’t know

SC ASK ALL

IN3 Over the last 12 months, what percentage of the customers you have installed a heating system for, have asked about installing a low carbon heating system?

IF NECESSARY ADD: Low carbon heating systems include heat pumps, biomass heating (wood and pellet fuelled) and solar thermal panels

- None
- 1 - 10%
- 10 – 20%
- 20 – 39%
- 40 – 59%
- 60 – 79%
- 80% or more
- Don’t know

HEAT PUMP SPECIFIC QUESTIONS

The next few questions are about heat pumps

SC ASK ALL

HP1 To what extent are you comfortable assessing the appropriateness of different types of heat pumps in different building types? Please answer using a scale of Very confident, Fairly confident, Not very confident and Not at all confident.

- Very confident
- Fairly confident
- Not very confident
- Not at all confident
- Don’t know

SC ASK ALL

HP2 And to what extent are you comfortable installing heat pumps for your customers? Again, please answer using a scale of Very confident, Fairly confident, Not very confident and Not at all confident.

- Very confident
- Fairly confident
- Not very confident
- Not at all confident
- Don't know

SC ASK ALL

HP3 How many heat pumps have you personally installed over the last 12 months?

- None
- 1 – 2
- 3 – 5
- 6 – 10
- 11 – 20
- 21 – 30
- More than 30
- Don't know

O/E ASK ALL

HP5A What do you think are the main obstacles to heat pump deployment across the UK? What else?

OPEN-ENDED

MC INTERVIEWER TO CODE

HP5B Obstacles to heat pump installation INTERVIEWER: PLEASE NOTE DISTINCTION BETWEEN 'CONSUMER' AND 'INSTALLER' OPTIONS AND PROMPT IF UNCLEAR WHETHER RESPONDENT IS TALKING ABOUT CONSUMER OR INSTALLER PERSPECTIVE.

• Consumer	• Lack of confidence and certainty in heat pumps

• Consumer • Consumer • Consumer • Consumer • Consumer	• Lack of awareness, knowledge and understanding about heat pumps • Belief that there is lack of support and up-to-date information • Belief renewables have poor reputation / historical installations poor quality • Lack of incentive to change / have heat pump installed • Cost
• Installer • Installer • Installer • Installer • Installer • Installer	• Lack of confidence and certainty installing heat pumps • Lack of awareness, knowledge and understanding about heat pumps • Belief that there is a lack of support and up-to-date information • Belief renewables have poor reputation / historical installations poor quality • Lack of incentive to change / install a heat pump • Cost

• Generic • Generic • Generic • Generic • Generic • Generic • Generic • Generic • Generic • Generic • Generic	• Building regulations / planning • Lack of installers and skills in the supply chain • MCS / red tape / unnecessary regulation / burden on installers • DNOs and network requirements • Building stock • Subsidised fossil fuels / low cost of fossil fuels • Consumer preferences / status quo / inertia • Noise and space • Not seen as Govt. priority / additional Govt. support or marketing needed • Renewable Heat Incentive (RHI) • Generic - Other (specify)

SC ASK IF HP5B IS MULTI-CODED

HP5C What do you think is the biggest obstacle for heat pump deployment in the UK?

DISPLAY CODES SELECTED AT HP5B

QUESTIONS ON POLICY INTERVENTIONS

During the 2020s the Government plans to phase out high carbon fossil fuel heating in buildings off the gas grid. Liquid Petroleum Gas (LPG), coal and oil are likely to be replaced with low carbon technologies and fuels.

SC ASK ALL

P1 Before today, to what extent were you aware, or not, about this? Would you say you were fully aware, aware, but not in detail or were you unaware?

- Fully aware
- Aware, but not in detail
- Unaware
- Don't know

SC ASK ALL

P2 And how aware do you think your customers are about this? Would you say they are fully aware, aware, but not in detail, or are they unaware?

- Fully aware
- Aware, but not in detail
- Unaware
- Don't know

SC ASK ALL

P3 Which, if any, of the following would you be most likely to do if demand for fossil fuel heating systems significantly reduced in areas not connected to the gas grid? Would you… READ OUT

- Continue to install the heating systems you currently do
- Continue to work and learn how to install low carbon technologies

- Yes
- No
- Don't know

G ASK ALL

P4 In off gas grid areas there are number of ways to reduce demand for fossil fuel heating systems, whilst increasing demand for low carbon technologies.

Please tell me how effective you feel each of the following measures would be to increase demand for low carbon technologies: Would you say very effective, fairly effective, not very effective and not at all effective.

- Increasing the cost of fossil fuels for heating
- Increasing the cost of high carbon technologies and parts
- Banning the installation of new fossil fuel heating systems by 2030
- Loans and subsidies to help make low carbon technology affordable
- Boiler scrappage scheme

- Very effective
- Fairly effective
- Not very effective
- Not at all effective
- Don’t know

QUESTIONS ON NEW BUILD POLICY SCENARIOS

SC ASK ALL

NB1 Are you aware of the introduction of the Future Homes Standard which will require new build homes to be future-proofed with low carbon heating and world-leading levels of energy efficiency from 2025?

- Yes
- No
- Don’t know

SC ASK ALL

NB2 On balance, do you think the introduction of the Future Homes Standard will have a positive or negative impact on your business, or do you think it will make no difference?

- A positive impact

- Make no difference
- A negative impact
- Don’t know

QUESTIONS ON TRAINING AND ACCREDITATION

This next section is about any training you may have had and accreditations you may hold

SC ASK ALL

TA1 Have you ever received training for the installation of any heating system (aside from gas central heating)?

- Yes
- No
- Don’t know

O/E ASK IF TA1 = 1

TA2A What heating system training have you received previously? What else?

OPEN-ENDED

MC INTERVIEW TO CODE

TA2B Type of training received on heating systems

- Biomass boiler
- Heat network [INTERVIEWER NOTE: Sometimes called district heating, a heat network is a distribution system of insulated pipes that takes heat from a central source and delivers it to a number of domestic or non-domestic buildings]
- Air-to-air heat pump
- Air-to-water heat pump
- Ground source heat pump
- Water source heat pump
- Hybrid heat pump
- Solar thermal
- Combined Heat and Power System

- Other (specify)

SC ASK IF TA2B ≠ 3-6

TA3 Have you considered upskilling to be able to install heat pumps?

- Yes
- No

O/E ASK IF TA3 = 2

TA4 Why have you not considered upskilling for heat pump installations?

OPEN-ENDED

QUESTIONS ON TRAINING POLICY SCENARIOS

I am now going to read out a list of potential schemes which could be introduced to encourage training for low carbon heating technologies.

SC ASK ALL

TP1 How supportive are you of each initiative? Would you say very supportive, fairly supportive, neither supportive nor unsupportive, fairly unsupportive or very unsupportive?

- Subsidised costs for low carbon training / voucher schemes to retrain (for example, £300 voucher to train as a heat pump installer)
- Mandatory low carbon modules in all traditional heating / plumbing qualifications
- Low carbon training schemes which are only accredited if they are delivered to an agreed standard.
- In order to register with a trade organisation such as OFTEC, Gas Safe or MCS, you must complete training in low carbon heating

- Very supportive
- Fairly supportive
- Neither supportive nor unsupportive

- Fairly unsupportive
- Very unsupportive
- Don’t know

SC ASK ALL

TP2 The law requires all gas installations to be notified to the Gas Safe Register, and for the work to be carried out by a Gas Safe Registered engineer. Different rules apply to other heating systems, such as oil boilers or heat pumps. Should the law be extended to require all installers and installations to be registered, not just gas?

- Yes
- No
- Not sure

SC ASK ALL

TP3 Would the idea of a low carbon training skills card, comparable to Gas Safe, appeal to you?

- Yes
- No
- Don’t Know

MEMBERSHIP/ACCREDITATIONS

This next section is about memberships of professional and trade organisations.

MC ASK ALL

MA1 Are you registered with any of the following organisations? READ OUT

Please select all that apply.

- APHC (Association of Plumbing & Heating Contractors Limited)
- OFTEC (Oil firing technical association)
- Gas Safe
- HETAS (heating equipment and testing approval scheme)
- NAPIT (national association of professional inspectors and testers)
- NICEIC (national inspection council for electrical installation contracting)

- MCS (microgeneration certification scheme)
- Other (please specify)

SC ASK FOR ALL REPSONSES TO MA1

MA2 Does [INSERT FROM MA1] give you any support with low carbon tech installation?

- Yes
- No

SC ASK ALL

MA4 Thinking about all heating systems you install, do you only install certain brands?

- Yes
- No

SC ASK ALL

MA5 Why is that?

- Quality of the product
- Customer preference
- Best value
- Only comfortable with these brands
- Only had training on installing these brands
- Other (specify)

DEMOGRAPHICS / WRAP UP

SHOW ALL

In this final section, we would like to ask you a few classification questions.

SC ASK ALL

QD1 For classification purposes, can you tell me which of the following age bands you fit into?

- 16-24

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

SC ASK ALL

DP1 On occasion we may need to re-contact respondents to perform standard quality checks. Are you happy for us to contact you by phone in the event of quality checks or to verify some of your answers?

- Yes
- No

SC ASK ALL

DP2 Would you be happy for Impact Research to get in touch with you again in the future to discuss the results you have given in this survey?

- Yes, I'm happy to be contacted again to discuss my answers
- No, I do not want you to get in touch again to discuss my answers

SHOW ALL

Finally, we are very interested in hearing your views on our survey design

G ASK ALL

DP3 Using the rating please let us know how you would rate each of the following:

	1 Very Bad	2	3	4	5 Very Good
Length of survey					
Ease of completion					

Ability to express my true opinion					
Overall experience					

If you have any additional feedback, please enter your comments here:

SHOW ALL

Thank you for taking part in the survey. Your feedback is greatly appreciated. Would you like to write down our telephone number, should you have any queries?

Annex E: Phase 3 sample

Of the 15 installers interviewed, 6 had experience installing heat pumps and 9 did not. Most of those with heat pump experience had installed 1-10 heat pumps in the last 12 months (Table 15).

Figure 9: Location

Base: Installers with heat pump experience (6)

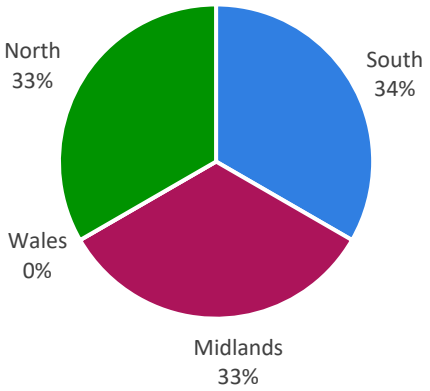
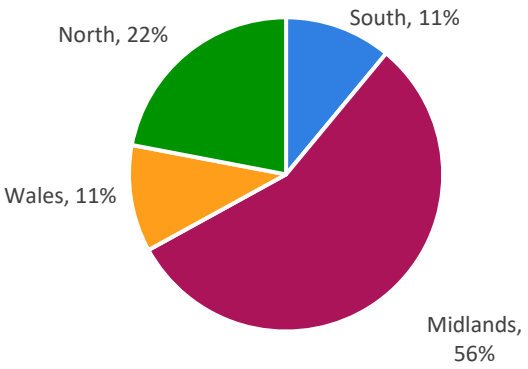


Figure 10: Location

Base: Installers without heat pump experience (9)



North	North East, North West, Yorkshire
Midlands	East of England, East Midlands, West Midlands
South	London/Greater London, South East, South West

Figure 11: Age of installers interviewed

Base: All installers (15)

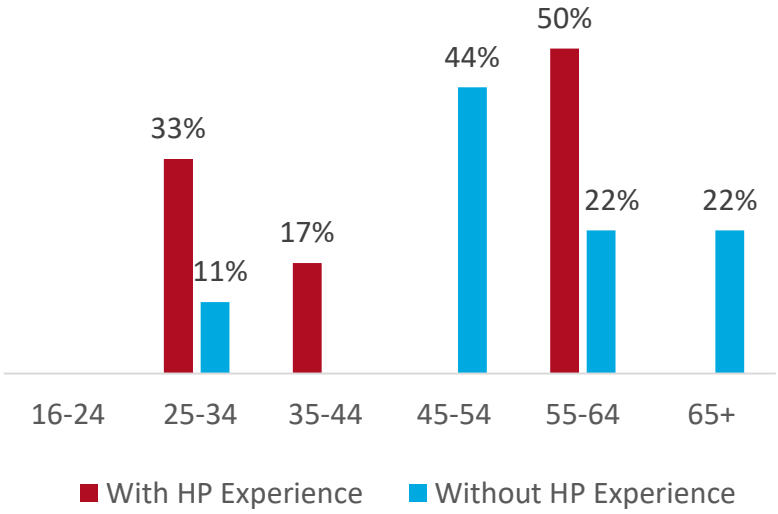


Table 14: Heat pump experience by proportion of time spent installing heating systems in building off the gas grid

Base: All installers (15)

Time spent installing heating off the gas grid	Heat pump experience (n=6)	No heat pump experience (n=9)
20-39%	33%	22%
40-59%	33%	11%
60-79%	17%	0%
80% or more	17%	67%

Table 15: Number of heat pumps installed in the last 12 months (from interview date)

Base: Installers with heat pump experience (6)

Number of heat pumps installed	Proportion
1-10	67%
11-20	17%
21-30	0%
More than 30	17%

Annex F: Qualitative interview topic guides

Installer with heat pump experience topic guide

Installer interview guide (30 minutes) – with heat pump experience FV	Overall Objective: Understand the opinions of heating installers in relation to low carbon heating technologies available and the phase-out of high carbon technologies.

SUMMARY OF RECRUITMENT CRITERIA

- 5 with heat pump experience (must have installed at least 3 heat pumps in the last 12 months)
- Sample those who took part in Phase 1 in the first instance.
- Start by sampling those who reported working >20% time off the gas grid
- Approach a spread of experience levels, though predominantly those who aren't nearing retirement.
- Ensure coverage across regions

Introduction (2-3 minutes):

- Introduce yourself
- Explain that the research is being conducted on behalf of BEIS (the Government department for Business, Energy & Industrial Strategy.
- Explain purpose of discussion (understand the opinions of heating installers in relation to low carbon heating technologies available and the phase-out of high carbon technologies)
- No right/wrong answers, interested in your opinions, in as much detail as possible
- Request permission for audio recording and explain interview is confidential and bound by the MRS Code of Conduct. Also ask permission to use their name and quotes in analysis for internal BEIS use only.

Warm-up (5 minutes):

- How long have you been an installer of heating systems?
    - What made you choose this career path?
    - What qualifications have you taken?
    - What motivated you to become an installer?

- What are the heating systems you currently install? Why do you install these particular types of heating systems / technologies? Do you offer any other services other than heating installation?
    - What types of buildings do you install heating systems in? Specifically looking for balance of:
    - Domestic vs non-domestic; new build installations
    - Off the grid vs on the grid installation

Low carbon heating systems (HP EXPERIENCE] (5-10 minutes):

Moderator read out: I'd first like to spend some time talking about heat pumps.

- Do you install heat pumps?
    - What motivated you to install heat pumps?
    - How and why did you to first start to install heat pumps?
    - How many heat pumps do you install each year?
    - What types of heat pumps do you install?
    - Why do you install these types of heat pump?
- What types of building do you install heat pumps in?
    - Do you install certain types of heat pump in different types of building?
        - Why Is this?
        - Do certain types of building have different needs?
    - Who, generally, are the customers that have heat pumps installed?
        - Businesses: Large businesses? Small? Particular industries?
        - Domestic customers: Age? Gender? Small properties? Large properties?
- Why are your customers choosing to have heat pumps installed?
    - Have you installed any under the Renewable Heat Incentive (RHI)?
        - What proportion of heat pumps that you install have fallen under RHI?
        - What impacts a customer decision to use/not use the RHI?
        - What are your views on RHI? What was good? What could have been better?
- Are you aware of the Clean Heat Grant coming into effect from 2022?
    - What is your view on this?
- Do you think a £4000 grant for domestic consumers is sufficient to remove cost barrier/ encourage greater uptake?
    - Why is this?

    - What do you think the value should be?
    - For any non-domestic customers you have, what do you think they would be willing to pay for total HP installation?
- How do you sell/market heat pumps to your customers?
- Do you offer a finance package yourself?
- Do you recommend alternative way to finance the installation?
    - Do customers typically take these up?
- How many heat pumps they install a year and how much their business/workload is split between heat pumps and other technologies/ services you offer?
    - Do they have capacity for more heat pump installations?
- What are the circumstances that customers approach you for heat pump installations?
    - Prompt for: previous system broken? Wanting to install a low carbon solution? Any other reason?
- Are customers making a proactive choice to have a heat pump installed, or is it a distress purchase (ask for balance if a mix of answers)?
- How do you access the suitability of buildings for heat pumps in general? How about for different types of heat pump?
    - What would you do if a house needed retrofitted (i.e. work to be completed) before a heat pump installation was possible?
- Thinking specifically about installing heat pumps off the gas grid, what are the barriers to installing in domestic and non-domestic properties? Prompt for:
    - Different types of building
    - Location (rural vs urban)
    - Availability of qualified installers
- How do you monitor the effectiveness of your installations? Prompt for:
    - Carbon savings
    - Comfort
    - Customer satisfaction
    - Value for money
- How disruptive is it to buildings / households when installing heat pumps? Before, during and after the installation? Describe the nature of the disruption.
    - How long does the installation typically take?
- Once the heat pump has been installed, are there further costs that customers need to consider? Are there specific costs for different types of customers? If not mentioned, how about non-domestic off gas grid customers?

    - Are there any costs that consumer need to consider prior to installation?
- What are the typical issues installers face when installing heat pumps? What can be done about it?
- How has the market developed in recent years? Have you noticed any change in demand from any customer types or new customer types (e.g. off gas grid non domestic customers)?
- How do you see the future evolving over the next 10 years?
- Do you have any concerns about the heat pump market increasing rapidly over this timeframe? Prompt for:
    - Installer skills gap
    - Quality of installations
    - Supply-chain issues
    - Suitability of homes to take heat pumps
    - Whether further regulation required
- And how about the impact on your business. Prompt for:
    - Diversifying the business
    - Retraining
    - Taking on more staff/apprentices

Training, upskilling, encouraging new installers into the industry (5-10 minutes):

Moderator read out: I'd now to discuss your views of training, upskilling and encouraging new installers to the industry.

- Have you ever had training on the installation of heat pumps?
    - What specifically was the training you completed?

If no, ask:

- Why have you not completed any training on heat pump installations?
- How did you learn how to install heat pumps, if not through training courses?

If yes, ask the following in relation to heat pumps. If not then in general training

- What is your general opinion and experience of this training you may have received in the past? Prompt for:
    - acceptability of cost
    - whether it was worth the expense

  - barriers to training
  - what makes people take the training
  - on the job vs class-room training
  - who should be funding training?
- How did you hear about the training you did?
- How was it financed?
- How long did it take?
- What was good/bad about the training?
- Would they recommend it to a friend?

If have had heat pump training,

- Did you have training on other heating systems prior to heat pumps?

- Aside from subsidised training, how else can installers be encouraged to upskill for heat pumps? Prompt for:
  - Willingness of installers to upskill?
  - What are the barriers to taking this training and how can these be overcome?
  - How can Industry/ Government increase demand for heat pump training?
  - Do you think the increased demand for heat pumps would encourage installers to upskill to be able to install heat pumps and encourage new installers into the industry, without direct government intervention?
  - And how much of a role do you think the Government needs to play, to encourage upskilling and more installers into the industry?
  - What is the role of apprentices and traditional college courses?
  - What is the role of accreditation bodies such as MCS?
  - And specifically, on the matter of encouraging new talent into the industry, how could heat pump and low carbon technology boiler installations as a career be made more desirable? How about increasing diversity?
  - How do you see your job and the industry changing over the next ten years? Prompt for:
  - Low carbon technologies
    - Other new technologies
    - New business models such as ‘Heat as a Service’ RECORD AWARENESS. NB: Definition: instead of buying units of energy (kWh)

consumers buy hours of warmth for their home (a package including servicing, maintenance and energy for a fixed monthly price).

- Climate change
- Workforce
- Leaving the EU

Wrap up (2-3 minutes)

- Is there any further feedback you would like to give BEIS on this subject?
- Ask if willing to:
  - be re-contacted about this survey
  - be contacted for further research opportunities
  - have their details passed on to BEIS for further research opportunities
- Collect payment details (BACS or cheque) for incentive

THANK AND CLOSE

Installer without heat pump experience topic guide

Installer interview guide (30 minutes) – without heat pump experience FV	Overall Objective: Understand the opinions of heating installers in relation to low carbon heating technologies available and the phase-out of high carbon technologies.

SUMMARY OF RECRUITMENT CRITERIA

- 10 without heat pump experience
- Sample those who took part in Phase 1 in the first instance.
    - Start by sampling those who reported working >20% time off the gas grid
    - At least 6 installers must have reported being willing to consider re-training for heat pumps
- Approach a spread of experience levels, though predominantly those who aren't nearing retirement.
- Ensure coverage across regions
-

Introduction (2-3 minutes):

- Introduce yourself
- Explain that the research is being conducted on behalf of BEIS (the Government department for Business, Energy & Industrial Strategy.
- Explain purpose of discussion (understand the opinions of heating installers in relation to low carbon heating technologies available and the phase-out of high carbon technologies)
- No right/wrong answers, interested in your opinions, in as much detail as possible
- Request permission for audio recording and explain interview is confidential and bound by the MRS Code of Conduct. Also ask permission to use their name and quotes in analysis for internal BEIS use only.

Warm-up (5 minutes):

- How long have you been an installer of heating systems?
    - What made you choose this career path?
    - What qualifications have you taken?
    - What motivated you to become an installer?

- What are the heating systems you currently install? Why do you install these particular types of heating systems / technologies? Do you offer any other services other than heating installation?
- What types of buildings do you install heating systems in? Specifically looking for balance of:
    - Domestic vs non-domestic; new build installations
    - Off the grid vs on the grid installation

Low carbon heating systems (NO HP EXPERIENCE) (5-10 minutes):

Moderator read out: I'd first like to spend some time talking about heat pumps (I realise you don't currently install them).

- What do you think about low carbon technologies? What about heat pumps in particular? Prompt for:
    - Perception of heat pumps vs fossil fuel systems
    - Reputation of heat pumps
    - What customers are saying about heat pumps
- Are your customers asking about heat pumps and other low carbon technology when they need a boiler installation? Is there a demand for these types of heating system? Prompt for:
        - Whether particular customer types are about/wanting heat pumps and low carbon technology?
- Why are they asking for this?
    - Have you noticed any changes in demand for heat pumps and low carbon technology over the last 5 years?
        - IF YES: When did you start to notice changes in demand? What changes have your noticed?
- How about changes in demand for off gas grid non-domestic customers?
- What do you think is stopping more customers getting heat pumps and low carbon technology heating systems installed? Prompt for reasons beyond cost and subsidies
    - Building stock
    - Location
    - Availability of qualified installers
- What do you think about government support for low carbon technologies and the phasing out of fossil fuels? What impact will it have? What about initiatives such as the Renewable Heating Initiative (RHI)? Are these effective? IF NECESSARY READ OUT:

This is a scheme designed to financially reward those who use renewable energy to heat their homes.

- How effective do you think a domestic consumer grant of £4,000 would be in encouraging greater take-up of low carbon heating systems like heat pumps?
    - IF NOT EFFECTIVE: Why do you say that? How much of a grant do you think would be necessary?
- What about non-domestic customers? How much do you think they would be willing to pay for a complete heat pump installation?
- Were demand for heat pumps to increase substantially, how would this impact the heating system industry? Prompt for:
    - Diversifying business
    - Retraining
    - Taking on new staff/apprentices
- And how would an increase in demand for heat pumps affect your own business? Prompt for:
    - Diversifying business
    - Retraining
    - Taking on new staff/apprentices
- Do you have any concerns about the heat pump market increasing rapidly over this timeframe? Prompt for:
    - Installer skills gap
    - Quality of installations
    - Supply-chain issues
    - Suitability of homes to take heat pumps
    - Whether further regulation required
- Are there any types of building or organisation for which you think a heat pump installation would be inappropriate? What types of buildings or organisations? What can be done to overcome this? Prompt for cost.

Training, upskilling, encouraging new installers into the industry (5-10 minutes):

Moderator read out: I'd now to discuss your views of training, upskilling and encouraging new installers to the industry.

- What is your general opinion and experience of any training you may have received in the past? Prompt for:

- acceptability of cost
- whether it was worth the expense
- barriers to training
- what makes people take the training
- on the job vs class-room training
- who should be funding training

- And thinking specifically now about heat pumps, have you ever received training on the installation of heat pumps?

IF YES	IF NO
• Who provided the training (organisation)?	• Why not?
• How did you hear about the training?	• Did you ever consider getting trained on how to install heat pumps? • If YES: Why didn't you follow through and do the training?
• Why did you take the training?	• What would encourage you to take training on how to install heat pumps? • PROMPT FOR: Being able to make the time to do training, having more interest in heat pumps, seeing consumer and non-domestic demand for heat pumps increase
• How was the training financed?	•
• How long did the training take to complete?	•
• How was the training course? What went well vs what could have been better?	•
• Would you recommend the training to other installers?	
• Given you've had training for it, why haven't you installed heat pumps?	

- Aside from subsidised training, how else can installers be encouraged to upskill for heat pumps? Prompt for:

  - Willingness of installers to upskill?
  - What are the barriers to taking this training and how can these be overcome?
  - How can the Government increase demand for heat pump training?
- Do you think the increased demand for heat pumps would encourage installers to upskill to be able to install heat pumps and encourage new installers into the industry, without direct government intervention?
- And how much of a role do you think the Government needs to play, to encourage upskilling and more installers into the industry?
- What is the role of apprentices and traditional college courses?
- What is the role of accreditation bodies such as MCS?
- And specifically on the matter of encouraging new talent into the industry, how could heat pump and low carbon technology boiler installations as a career be made more desirable? How about increasing diversity?
- How do you see your job and the industry changing over the next ten years? Prompt for:
  - Low carbon technologies
  - Other new technologies
  - New business models such as 'Heat as a Service' RECORD AWARENESS. NB: Definition: instead of buying units of energy (kWh) consumers buy hours of warmth for their home (a package including servicing, maintenance and energy for a fixed monthly price).
  - Climate change
  - Workforce
  - Leaving the EU

Wrap up (2-3 minutes)

- Is there any further feedback you would like to give BEIS on this subject?
- Ask if willing to:
  - be re-contacted about this survey
  - be contacted for further research opportunities
  - have their details passed on to BEIS for further research opportunities
- Collect payment details (BACS or cheque) for incentive

THANK AND CLOSE