

PROJECTING THE FUTURE DOMESTIC HEAT PUMP WORKFORCE

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PROJECTING THE FUTURE DOMESTIC HEAT PUMP WORKFORCE

BACKGROUND CONTEXT

The primary objective of this report is to provide an up-to-date projection of the heat pump workforce needed to meet two different heat pump installation scenarios. This will help to inform policy development around heat pump installations and provide awareness of the growth needed in the workforce supply chain, to assist with decarbonising home heating, and to support in meeting the UK's legally binding net zero targets.

The two heat pump installation scenarios considered in this report are:

Scenario 1: Current and future policy¹. This scenario models heat pump installation across the UK according to policies already in place, as well as proposed policies that are set to come into force in future, for example, the Future Homes Standard (FHS)² and the Clean Heat Market Mechanism (CHMM)³. It considers the workforce that will be required to deliver this number of heat pump installations.

Scenario 2: UK Government heat pump installation targets⁴. This scenario considers the workforce that will be required to meet the following heat pump installation targets set by the previous UK Government:

- To install 600,000 heat pumps per year by 2028⁵.
- To install 1.6 million heat pumps per year by 2035⁶.

The workforce projections are based on a granular analysis of the heat pump installation process and the different job roles involved. They consider differences in the installation process and labour intensity requirements between various property archetypes and heat pump types.

1 These are either current policies which are already in place or ones that are expected with a reasonable degree of confidence to be implemented, for example those where the Government has set out a clear timeline for introduction (e.g. FHS) or has already consulted on them. This reflects the policy landscape at the time of writing.

2 Department for Levelling Up, Housing and Communities (2023) The Future Homes Standard 2023 consultation on the energy efficiency requirements of the Building Regulations affecting new and existing dwellings. Available at: https://assets.publishing.service.gov.uk/media/65cc90e139a8a7000f60d508/Future_Homes_Standard_consultation_stage_impact_assessment.pdf

3 DESNZ (2023). Clean Heat Market Mechanism. Available at: https://assets.publishing.service.gov.uk/media/6424154560a35e000c0cb07f/clean_heat_market_mechanism.pdf

4 Please note that these targets were announced by the previous Conservative Government. As of the time of writing of this report, these are assumed to remain in place, as there has no indication to the contrary from the new Labour Government. Nonetheless, the report does not account for any changes that may be implemented by the new Government between then and the publication date of this report. The same applies to all subsequent references to these targets in the report.

5 HM Government (2020). The Ten Point Plan for a Green Industrial Revolution. Available at: https://assets.publishing.service.gov.uk/media/5fb5513de90e0720978b1a6f/10_POINT_PLAN_BOOKLET.pdf

6 HM Government (2023). Responding to the Climate Change Committee's (CCC) 2023 Annual Progress Report to Parliament. Available at: <https://assets.publishing.service.gov.uk/media/666c1642fed5bd09e5195a4b/ccs-annual-progress-report-to-parliament-2023-government-response.pdf>

The assumptions and overall workforce projections are based on extensive engagement with key stakeholders in the sector, including heat pump installation businesses and manufacturers, as well as policy officials and third sector organisations. This has enabled a granular analysis of the end-to-end installation process to be conducted, which has identified the roles and skills required to meet each scenario.

JOB ROLES AND QUALIFICATIONS

Table 1 defines the job roles, functions and typical minimum qualifications of individuals carrying out the main steps of a heat pump installation⁷.

Table 1 - Summary of job roles and qualifications

ROLES	FUNCTIONS	TYPICAL *MINIMUM* QUALIFICATIONS
Salesperson	Generating leads and closing sales. In some smaller contractors, the role may be combined with installation responsibilities. Providing initial advice to the consumers.	No minimum qualification requirements
Administrator	Administrative tasks such as diary management, scheduling, issuing contracts, arranging subcontractors, data entry and notifications.	No minimum qualification requirements
Groundworks Technical Operative (GTO)	Preparing the ground for a project before the work begins. In the case of air-to-water heat pumps (AWHP) this may include preparing the plinth or platform for the heat pump. For ground source heat pumps (GSHP) this would involve drilling and preparing boreholes or horizontal loops for the unit.	Level 2 NVQ in Construction and Civil Engineering Operations Level 2 Groundworker Apprenticeship Level 2 NVQ in Land Drilling
Plumbing & Heating Technical Operative (PHTO)	Carrying out the installation and/or upgrading of the heating system including upgrading the heat emitters, fitting thermostatic radiator valves, installing the hot water pipework and installing a hot water cylinder, removal of existing heating appliances (for retrofit). PHTOs generally work on the plumbing and hot water system and may sometimes also have the specialist skillset or qualifications to install/maintain the heating unit itself, similarly to a HPTO (see below). ⁸	Level 3 Diploma in Plumbing and Domestic Heating (in England) Plumbing & Heating SVQ Level 3 SCQF 7 (in Scotland) Building Services Engineering – Plumbing & Heating Level 3 (in Wales) UKAS Accredited ISO 17024 Certificate of Competence for Gas or Oil Heating Certificate of Competence in Unvented Hot Water Cylinders Certificate of Competence in Energy Efficiency

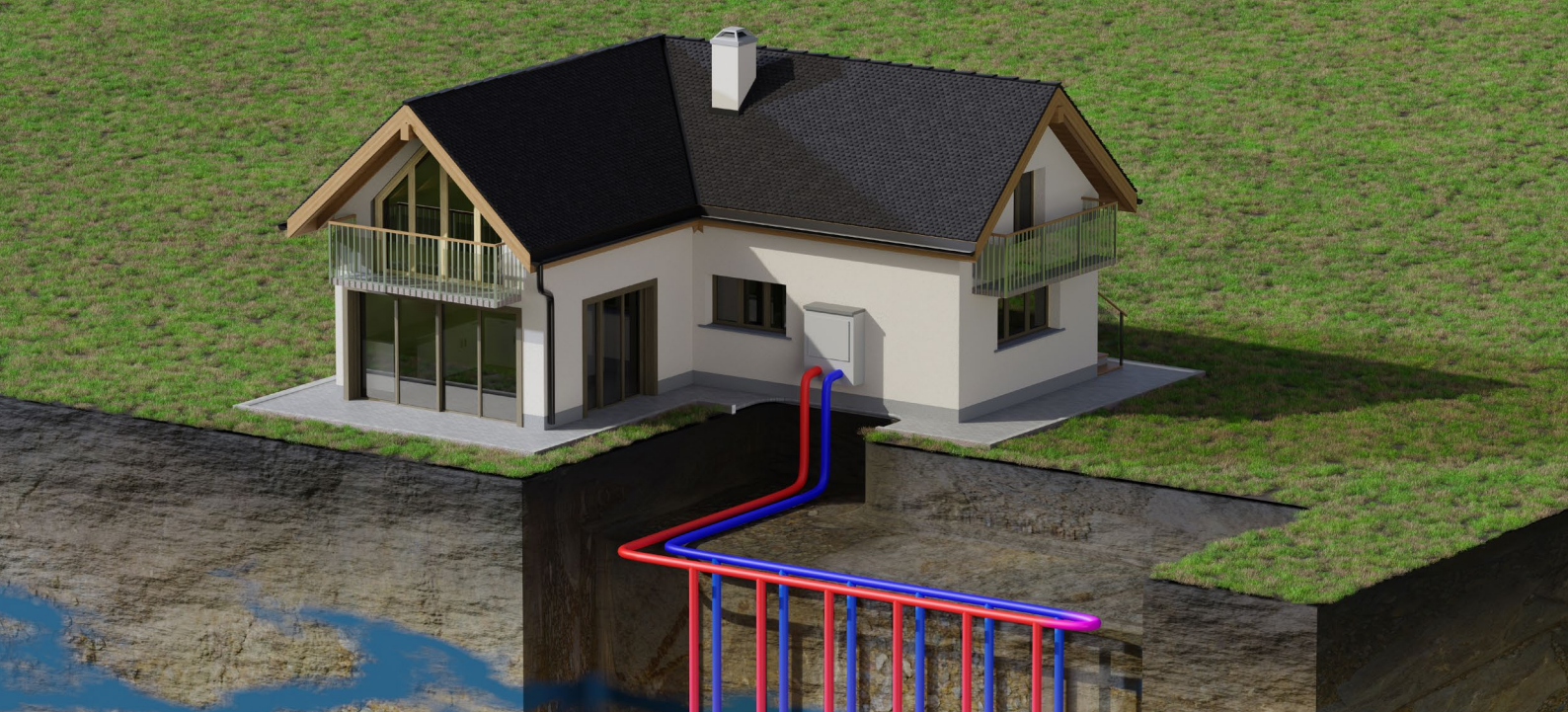
⁷ Different businesses may have different models meaning that sometimes one person may do many, or all of these roles.

⁸ This is why along with HPTOs PHTOs are referred to in this report as 'individuals qualified to install heat pumps'.

<p>Electrical Technical Operative (ETO)</p>	<p>Carrying out any electrical work necessary for the heat pump installation, including wiring the heat pump, consumer unit, residual-current devices, as well as any electrically connected heating controls.</p>	<p>Level 3 Electrotechnical Apprenticeship</p> <p>Level 3 Certificate in Installing, Testing and Ensuring Compliance of Electrical Installations in Dwellings</p> <p>Level 3 Award in the Requirements for Electrical Installations: BS 7671</p> <p>Level 3 Award in the Initial Verification of Electrical Installations</p>
<p>Heat Pump Technical Operative (HPTO)</p>	<p>Carrying out the installation, commissioning, and handover of the heat pump itself. This includes placing the unit, installing the drain, and fixing and connecting the piping of the system. For retrofit, this also includes decommissioning the existing heating system.</p> <p>Also responsible for carrying out post-installation maintenance, including routine servicing and necessary repairs.</p> <p>The HPTO might be involved in designing, scoping and planning for the installation, although in some cases this might be carried out by an independent designer, particularly in new build or large refurbishment projects.</p>	<p>Pre-requisites as per the heating and hot water installation role above, plus:</p> <p>Level 3 Low Carbon Apprenticeship</p> <p>Level 3 Heat Pump Installation Qualification</p> <p>Certificate of Competence for Heat Pump Installation</p> <p>F Gas or Flammable Refrigerant Qualification if handling refrigerants (in some but not all cases)</p>

*These are examples, other equivalences exist

**Individuals may hold qualifications exceeding those required for the role.



SCOPE OF THE REPORT

Both Scenario 1 and Scenario 2 cover the United Kingdom⁹. The report models deployment scenarios as a tool to determine the training requirement for the heat pump workforce under certain conditions. The purpose of this report is to determine the number of individuals needed within the heat pump workforce to deliver and maintain the heat pump installations projected under two scenarios. As such it does not consider:

- **The heat pump manufacturing workforce:** The report does not consider roles in the broader heat pump supply chain such as manufacturing and assembly of heat pumps.
- **Additional training drivers:** To achieve the necessary net growth in workforce, training demand will be greater than workforce need. This will be due to 5 yearly re-training cycles required by some courses and the need for Continuous Professional Development (CPD), together with a need to train to replace those who leave a given role for a variety of reasons (such as retirement, health, career change, promotion, etc.).
- **Non-domestic heat pump installations:** This report focusses on the domestic heat pump workforce. While there will be some inevitable overlap between the domestic and non-domestic heat pump workforces, the non-domestic workforce and any overlap is not modelled in this report.

The approach to the report does recognise the relative overlap in practice between the HPTO and PHTO roles. It therefore considers a range of training requirements depending on upper and lower estimates of this overlap and presents an average training requirement within this range. However, due to the exclusion of additional training drivers and non-domestic heat pump installations, the true workforce requirement will likely be larger than the one presented in this report.

⁹ Northern Ireland has a negligible impact on deployment in Scenario 1 because the policy landscape for heat pump deployment within Northern Ireland is currently minimal. The only dedicated policy that will apply there (from April 2025) is the CHMM, meaning it is challenging to accurately model policy-driven deployment for Northern Ireland. Analysis of MCS data suggests that Northern Ireland installations only accounted for 0.02% of UK installations in 2023. Therefore, Northern Ireland data has a negligible impact on UK-wide figures. MCS data is derived from MCS (2024). The MCS Data Dashboard. Available at: <https://datadashboard.mcscertified.com/InstallationInsights>

EXECUTIVE SUMMARY

This section provides a summary of the report's key findings on the future projected growth of the domestic heat pump workforce.

THE CURRENT HEAT PUMP WORKFORCE

It is important to consider the current state of the heat pump workforce as this will inform the projections for the future growth of the workforce. In terms of Full Time Equivalent (FTE) roles, it is estimated that the overall active heat pump workforce was 4,543 FTE in 2023, 2,000 FTE of which consisted of HPTOs. Analysis of various external sources suggests that the current HPTO workforce is made up of between 4,000 and 10,000 trained and active individuals (please see the [What is the size of the current workforce?](#) section for more detail on how this estimate has been derived).

The workforce is also growing, with Heat Pump Association (HPA) data showing that the number of individuals who have successfully completed a training qualification to install heat pumps in the UK is 17,924 since the start of 2022¹⁰. The recent growth in training numbers has been supported by policies such as the Heat Training Grant¹¹. To maintain and build on current training rates, it is important that these supportive policies remain in place.

The continued rise in heat pump installations,¹² together with the cumulative impact of ongoing maintenance represented by the analysis in this report, shows a need for continuous training and growth in the workforce to meet net zero and installation targets.

10 HPA 'Statistics' - 2023 training data (accessed July 2024). Available at: <https://www.heatpumps.org.uk/resources/statistics/>

11 DESNZ (2024). Apply for the Heat Training Grant: discounted heat pump training. Available at: <https://www.gov.uk/government/publications/heat-training-grant-for-heat-pumps>

12 HPA 'Statistics' - 2023 training data (accessed July 2024). Available at: <https://www.heatpumps.org.uk/resources/statistics/>

SCENARIO 1 – CURRENT AND FUTURE POLICY MIX

In Scenario 1, the current and future policy mix scenario, it is projected that there will be 435,722 heat pumps installed in the year 2028. It is estimated that this would be met by a total heat pump workforce of 29,498 FTE across all the roles. The qualified heat pump installers this would require is as follows:

- 16,373 FTE individuals qualified to install heat pumps
- 22,687 trained and active individuals (which accounts for those individuals actively working in the role but not on a full-time basis)
- 30,590 trained individuals (which accounts for those individuals qualified to install heat pumps but not actively working in the role)

SCENARIO 2 – UK GOVERNMENT INSTALLATION TARGETS

The previous UK Government's interim target of 600,000 annual heat pump installations by 2028 requires a total workforce of 41,143 FTE individuals. The 2035 target of 1.6 million annual heat pump installations requires a total workforce of 122,627 FTE individuals across all roles. Within this, the following number of individuals qualified to install heat pumps are required:

- 70,786 FTE individuals qualified to install heat pumps
- 98,083 trained and active individuals (which accounts for those individuals actively working in the role but not on a full time basis)
- 132,252 trained individuals (which accounts for those trained but not actively working in the role)

TRAINING REQUIREMENTS FOR INDIVIDUALS TRAINED TO INSTALL HEAT PUMPS

The heat pump sector is currently ahead of the minimum training rate required to meet projected workforce requirements in Scenario 1 – the current and future policy mix. The heat pump sector is projected to need a workforce of 30,590 individuals qualified to install heat pumps by 2028. This means that 21,537 additional individuals will need to be trained between 2023 and 2028 at an annual training rate of 4,307. The sector trained 7,856 individuals in 2023¹³, therefore it is 82% ahead of the annual training rate needed under Scenario 1.

To meet the target heat pump installation rates set out in Scenario 2, (600,000 installations per year by 2028 and 1.6 million installations per year by 2035) an additional 123,199 individuals trained to install heat pumps are required in the 12 years from 2023-2035. This figure is the average between an upper estimate of 155,530 and a lower estimate of 90,868.

13 HPA 'Statistics' - 2023 training data (accessed July 2024). Available at: <https://www.heatpumps.org.uk/resources/statistics/>

Different training rate profiles could deliver this target, Table 2 summarises the three different possible profiles for training the required individuals:

Table 2 - Scenario 2 training rate profiles

TRAINING PROFILE	ANNUAL TRAINING RATE	
	2023-2028 (5 years)	2028-2035 (7 years)
Scenario 2 modelled training rate	6,620	12,871
Maintain current training rate to 2028 then ramp up after 2028	7,856	11,990
Maintain a constant training rate to 2035	10,267	10,267

The current training rate of 7,856 individuals who successfully completed a recognised training course in 2023¹⁴ shows that the sector is on track to have the trained workforce needed to install 600,000 heat pumps in 2028. This would exceed the minimum required rate of 6,620 by 19%. However, the current rate would still be insufficient to train the workforce be able to install 1.6 million heat pumps in 2035. The degree to which rates would have to increase in each of the above profiles is as follows:

- Scenario 2 modelled training rate.** If the minimum training requirement needed to meet both the 2028 and 2035 targets was followed, it would mean reducing current training rates, from 7,856 per year to 6,620 per year in the period 2023 and 2028. This annual training rate would then need to increase by 94% after 2028 to 12,871 per year between 2028 and 2035. This could result in short term capacity challenges for the sector.
- Maintain current training rate to 2028 then ramp up after 2028.** Maintaining the current 2023 training rate of 7,856 for the period from 2023 to 2028 would mean that a 53% increase in training rates is still required for the period 2028-2035.
- Maintain a constant training rate to 2035.** The sector could maintain a constant annual training rate between 2024 and 2035. In this profile, training rates would need to increase by 31% from 2024 onwards (based on 2023 levels) and then remain constant thereafter. This profile will enable the workforce requirement for 2028 to be exceeded by 43% and the 2035 target to be met.

Maintaining a constant training rate across the period would have the advantage of avoiding the need for a significant increase in training rates after 2028, which could result in short term workforce shortages for the sector. It would also enable the sector to build on its current annual training rates which are already ahead of the rate required to meet the 2028 target. In this way, the sector can both maintain its current momentum and avoid training levels becoming a limiting factor in heat pump installation.

14 HPA 'Statistics' - 2023 training data (accessed July 2024). Available at: <https://www.heatpumps.org.uk/resources/statistics/>

ROLE REQUIREMENTS

- **Individuals qualified to install heat pumps make up the majority of the heat pump workforce:** The two roles with the greatest workforce requirement are HPTO and PHTO roles. HPTOs represent between 39% and 43% of the workforce, and PHTOs constitute between 30% and 32%. Taken together, this means that individuals qualified to install heat pumps consist of between 69% to 75% of the heat pump workforce, so efforts for training and recruitment will need to be prioritised for HPTO and PHTO roles.
- **ETOs represent the third largest workforce requirement** at 8% of the total heat pump workforce (as of 2023). In both scenarios, this is projected to rise slightly to 9% of the total workforce by 2028. In Scenario 2, the proportion of the total workforce made up by ETOs is expected to remain steady at 9% until 2035.

RETROFIT AND NEW BUILD

- **Retrofit is the sector with the biggest demand for the heat pump workforce** due to a combination of labour intensity, policy, and the size of the sector. In 2023, the retrofit sector accounted for 76% of the overall heat pump workforce. By 2028, this proportion is projected to decrease to 65% in Scenario 1 and 75% in Scenario 2.
- **The new build sector will require significant workforce growth between 2027 and 2028** caused by the introduction and phasing in of the FHS, which represents the main policy lever influencing heat pump installations and workforce requirements in the new build sector. In both Scenario 1 and Scenario 2, the heat pump workforce required to service the new build sector is projected to nearly double between 2027 and 2028. This is because the introduction and phasing in of the FHS from 2025 onwards results in a step change for new build over the years 2027 and 2028 while the growth of retrofit is projected to continue at a steadier rate.
- **From 2028 onwards, the new build heat pump workforce requirement is expected to stabilise.** In Scenario 2, the workforce requirement in new build is expected to stabilise after 2028, only rising by a total of 18% over the 7 years up to 2035. This is because, by 2029, the Future Homes Standard Impact Assessment (FHS IA) projects that 100% of new builds will have low carbon heating installed, hence the only growth after this date is down to a slight increase in the total number of new build constructions¹⁵.
- **At its highest, the new build workforce requirement is still considerably smaller than the retrofit workforce requirement,** with the new build workforce peaking at 35% of the overall requirement in 2028 under Scenario 1 and a low of 10% in 2035 under Scenario 2.

¹⁵ Department for Levelling Up, Housing and Communities (2023). The Future Homes Standard 2023 consultation on the energy efficiency requirements of the Building Regulations affecting new and existing dwellings. Available at: https://assets.publishing.service.gov.uk/media/65cc90e139a8a7000f60d508/Future_Homes_Standard_consultation_stage_impact_assessment.pdf

INSTALLATION AND MAINTENANCE WORKFORCE

- **The maintenance workforce is relatively small and, in this modelling, consists solely of HPTOs^{16, 17}.** The percentage of the total annual workforce attributed to maintenance varies between 8% and 16% depending on the scenario and year. While the numbers are small in overall terms, because the only role involved in maintenance is HPTO, the maintenance requirement has a significant implication for this role. For example, in Scenario 2, the maintenance workforce requirement rises to 30% of the total annual HPTO workforce by 2035 and would be expected to continue to rise thereafter. This is based on the need to install 1.6 million new heat pumps annually, while also carrying out an annual service on the 9.5 million existing heat pumps projected to be installed by 2035. As the number of heat pumps in situ continues to rise post-2035, it is likely that maintenance of existing heat pumps will become the main workforce requirement.
- **Installations¹⁸ drive most of the heat pump workforce growth.** Between 84% and 92% of the heat pump workforce can be attributed to installation, depending on the scenario and year. This means a significant growth in the FTE installation workforce is required in both scenarios compared to 2023 levels – the FTE installation workforce required by 2028 is projected to be almost 6 times higher in Scenario 1 and almost 9 times higher in Scenario 2 than the 3,833 FTE required in 2023. By 2035 in Scenario 2, the installation workforce requirement is projected to be almost 27 times higher than in 2023. Two thirds of the installation workforce growth in Scenario 2, amounting to 68,811 FTE, is projected to occur between 2028 and 2035.



16 This includes all heat pumps installed in the UK, including those installed prior to the dates covered in this report.

17 Maintenance in this report refers to an annual service and any required maintenance which may be needed alongside that. It does not include replacement of existing heat pumps.

18 In this context, installation workforce means the range of roles required to install a heat pump (including supporting roles) set out in detail in Table 1.

INTRODUCTION



The Heat Pump Association (HPA) provide a dedicated voice for the UK's heat pump sector and work to drive the widespread installation of heat pump technology throughout the UK. The HPA's membership comprises over 100 member organisations, including the UK's leading manufacturers of heat pumps, components and associated equipment, utility companies, installation businesses, certification bodies, awarding organisations, training providers, and others interested in heat pumps. The HPA supports policymakers in the development of effective heat decarbonisation policy and other matters that affect the interests of end users, wider stakeholders, and the industry. In addition, the HPA coordinates technical and market research into areas of mutual interest identified by members, the aim of which is to improve market opportunities and help markets to transform to low carbon heating solutions and technologies.

HEAT PUMP ASSOCIATION DELIVERABLES:

- **Advocacy and Policy:** Provide informed, well-constructed, evidence-based policy advice to support heat pump market growth within the UK. Lobbying and advocating for favourable government policies, incentives, and regulations that promote the adoption and installation of heat pumps in the UK, including incentives for consumers and businesses to switch to heat pump technology.
- **Quality, Training and Standards:** Through establishing training standards and feeding into certification standards, the HPA works to improve the quality and safety of heat pump installations whilst promoting best practice amongst members and the wider industry.
- **Sector Growth:** Developing strategies and initiatives to expand the market for heat pumps including consumer awareness initiatives, industry collaborations and efforts to increase adoption rates.
- **Unity:** Provide a united industry voice, collaborating with key stakeholders to align with policy proposals, calls for action and be representative of the heat pump supply chain.
- **Data and Analysis:** Develop thought-provoking, workable policy proposals underpinned by detailed analysis, create unique market updates, and undertake analysis created to suit member needs.

BACKGROUND

In 2019, the UK Government committed to a legally binding target to reduce greenhouse gas emissions to net zero by 2050¹⁹. As part of a phased approach, the Government also committed to an interim target of reducing emissions by 68% (against 1990 levels) by 2030²⁰. Accounting for 17% of carbon emissions in 2023²¹, the heating of buildings plays a central role in progress towards these goals. To decarbonise the homes needed to reach net zero, fossil fuel heating will need to be replaced by electrified, low carbon heating technologies in the majority of the UK's c.29 million homes²².

Heat pumps are a proven, efficient, low-carbon heating solution with the current potential to reduce carbon emissions from heating by 75% relative to fossil fuel heating solutions²³, with the potential to increase further as the electricity grid decarbonises. The Climate Change Committee's (CCC) Balanced Net Zero Pathway projects that of the low carbon heating systems installed in all homes by 2050, approximately 75% of these will be heat pumps²⁴.

In November 2020, the previous UK Government set a target to achieve 600,000 heat pump installations per year by 2028²⁵, rising to 1.6 million by 2035²⁶. Reaching this level of deployment will require a substantial increase in heat pump installations from the current level of 60,244 heat pumps installed in 2023²⁷. This increased level of deployment will necessitate a significant expansion in the overall size of the heat pump workforce.



19 BEIS (2019). UK becomes first major economy to pass net zero emissions law. Available at: <https://www.gov.uk/government/news/uk-becomes-first-major-economy-to-pass-net-zero-emissions-law>

20 BEIS (2021). Heat and Buildings Strategy. Available at: https://assets.publishing.service.gov.uk/media/61d450eb8fa8f54c14eb14e4/6.7408_BEIS_Clean_Heat_Heat_Buildings_Strategy_Stage_2_v5_WEB.pdf

21 CCC (2023). Progress in reducing emissions: 2023 Report to Parliament. Available at: <https://www.theccc.org.uk/publication/2023-progress-report-to-parliament/>

22 DESNZ (2023). Heat pump investment roadmap: Leading the way to net zero. Available at: <https://www.gov.uk/government/publications/heat-pump-net-zero-investment-roadmap/heat-pump-investment-roadmap-leading-the-way-to-net-zero>

23 Emissions savings calculated using historical heat pump efficiencies taken from the following trials and extrapolated: DECC (2012) Detailed analysis from the first phase of the Energy Saving Trust's heat pump field trial, DECC (2013) Detailed analysis from the second phase of the Energy Saving Trust's heat pump field trial, UCL (2017) FINAL REPORT ON ANALYSIS OF HEAT PUMP DATA FROM THE RENEWABLE HEAT PREMIUM PAYMENT (RHPP) SCHEME, ESC (2023) Electrification of Heat - Interim Heat Pump Performance Data Analysis Report. Future efficiency increases according to CCC (2020) Sixth Carbon Budget. Emissions factors according to DESNZ (2023) Green Book.

24 CCC (2020). The Sixth Carbon Budget. Pg 115. Available at <https://www.theccc.org.uk/wp-content/uploads/2020/12/The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero.pdf>

25 HM Government (2020). The Ten Point Plan for a Green Industrial Revolution. Available at: https://assets.publishing.service.gov.uk/media/5fb5513de90e0720978b1a6f/10_POINT_PLAN_BOOKLET.pdf

26 NAO (2024) 'Decarbonising home heating. Available at: <https://www.nao.org.uk/reports/decarbonising-home-heating/>

27 HPA 'Statistics' - 2023 training data (accessed July 2024). Available at: <https://www.heatpumps.org.uk/resources/statistics/>

PURPOSE OF THE RESEARCH

This research calculates the workforce projections for the heat pump sector based on two different heat pump deployment scenarios. It will help to inform policy development around heat pump deployment and support growth in the heat pump workforce. In addition, the research will:

- Improve on the detail and accuracy of the research conducted in 2020 by the HPA²⁸.
- Improve the understanding of the range of roles required to install heat pumps.
- Model the labour intensity of the heat pump installation and maintenance process, and improve understanding of the end-to-end process.
- Identify total workforce requirements for individuals qualified to install heat pumps, not just FTE roles.
- Evaluate the current workforce position and understand the scale of the growth needed.

BUILDING ON PREVIOUS RESEARCH

In June 2020, the HPA published a report, titled 'Building the Installer Base for Net Zero Heating', which developed projections for the future growth of the FTE HPTO workforce²⁹. Since this report was published, there have been important changes in the policy framework aiming to support heat pump deployment, with new policies implemented and increased levels of funding provided to drive heat pump uptake. This updated analysis considers the revised policy landscape and its implications for the heat pump workforce.

WHAT IS THE SIZE OF THE CURRENT WORKFORCE?

As there is no single industry or government recognised figure on the size of the current HPTO workforce, an estimated size range has been calculated by considering projections from the Microgeneration Certification Scheme (MCS), Gemserv and the HPA. The following bullet points explain how these estimated size ranges have been derived:

- **MCS projections:** As of September 2024, there are 1,935 MCS certified heat pump installation businesses³⁰. Data suggests that, on average, there are 4.8 HPTOs per registered company³¹. This gives a current projected workforce of 9,288 HPTOs. It should be noted that this figure does not cover all the market, as not all heat pump contractors operating in the market are MCS certified, for example, some may choose to be registered solely with a Competent Person Scheme or undertake installations which are signed off by Building Control, but this data is not publicly available.

28 HPA (2020). Building the Installer Base for Net Zero Heating. Available at: https://www.heatpumps.org.uk/wp-content/uploads/2020/06/Building-the-Installer-Base-for-Net-Zero-Heating_02.06.pdf

29 HPA (2020). Building the Installer Base for Net Zero Heating. Available at: https://www.heatpumps.org.uk/wp-content/uploads/2020/06/Building-the-Installer-Base-for-Net-Zero-Heating_02.06.pdf

30 MCS (2024). MCS Dashboard. Available at: <https://datadashboard.mcscertified.com/InstallationInsights>

31 MCS (2024) Research highlights heat pump business size. Available at: <https://mcscertified.com/research-highlights-heat-pump-business-size/>

- **Gemserv projections:** Gemserv's analysis suggests that there are currently between 4,153 and 5,548 trained and active individuals qualified to install heat pumps (as of September 2024). This analysis is based on the workforce required to deliver the current estimated heat pump deployment projections, not an estimate of the 'real size' of the heat pump workforce. This was derived from the HPA's 'factory gate' UK Heat Pump Sales Data and government policy impact assessments along with data on the labour intensity of the installation and maintenance process. This in turn was derived from extensive stakeholder engagement with the heat pump industry.

Taken together, this suggests that the current HPTO workforce is made up of between 4,000 and 10,000 trained and active individuals. The workforce is also growing, with HPA data showing that the number of individuals who have successfully completed a training qualification to install heat pumps in the UK stands at 17,924 since the start of 2022³².

The number of gas heating engineers certified to install and maintain gas boilers continues to dominate the heating market in the UK. As of 2024, there are 76,630 Gas Safe registered businesses and 150,729 individual gas engineers in the UK³³. While not all these individuals will be actively installing or maintaining gas boilers, be qualified to install domestic heating systems or indeed be inclined to retrain to install heat pumps, this represents a significant, albeit aging prospective labour pool for HPTOs³⁴. Nevertheless, it is important to note that not all these individuals will have the qualifications and competencies to install heating systems, as some will be solely focussed on maintenance of boilers and/or other gas appliances.

In all scenarios, it is expected that the size of the heat pump workforce will need to grow significantly over the next decade to meet the Government's heat pump deployment targets, particularly given the high number of installations that will be required relative to the current number of gas boiler installations. The extent of this growth is set out in the [Key Findings](#) section of this report.

32 HPA 'Statistics' - 2023 training data (accessed July 2024). Available at: <https://www.heatpumps.org.uk/resources/statistics/>

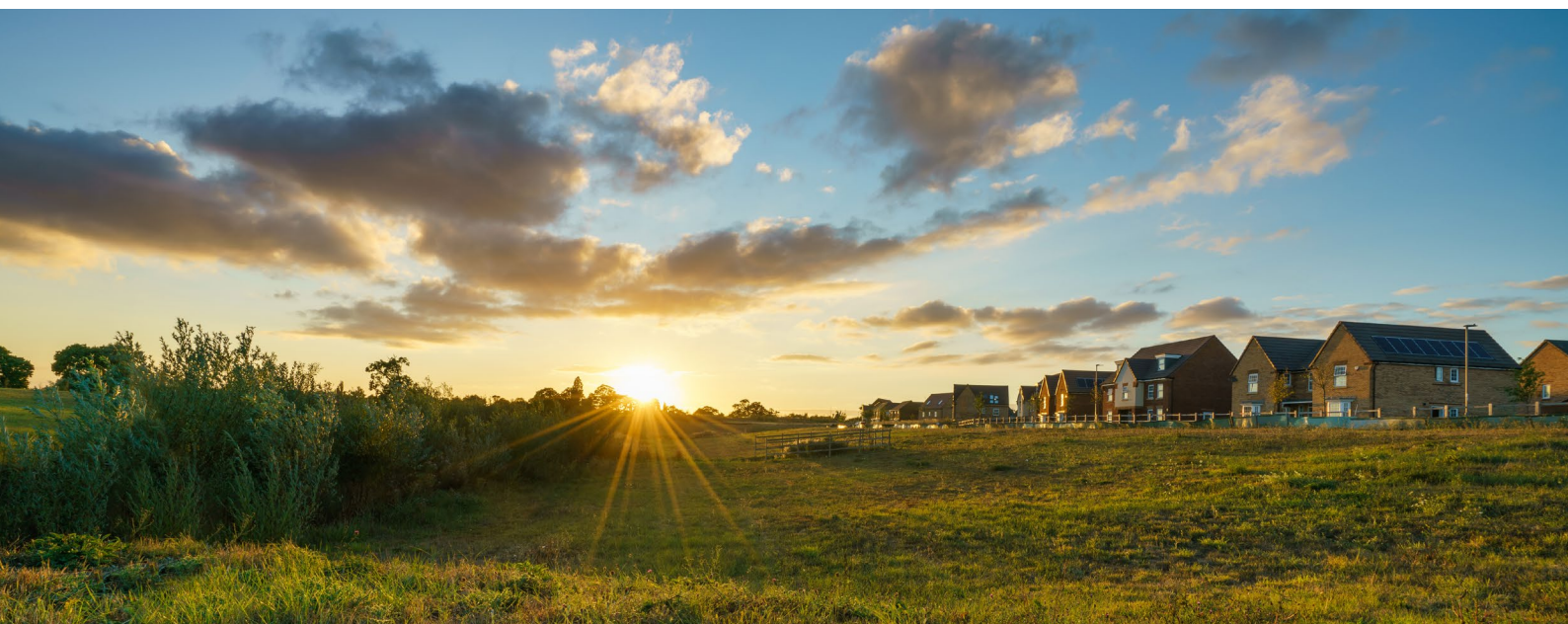
33 Gas Safe Register (2024). At a Glance Report 2023/24. Available at: <https://www.gassaferegister.co.uk/media/c5ag1xjo/2023-24-gas-safe-register-at-a-glance.pdf>

34 Gas Safe Register (2017) The Decade Review. Available at: <https://www.gassaferegister.co.uk/media/2490/decade-review.pdf>

HEAT PUMP DEPLOYMENT SCENARIOS

The workforce projections are determined by two different heat pump deployment scenarios. This reflects the fact that future heat pump uptake and policy is uncertain, therefore mapping out the two scenarios helps demonstrate how workforce requirements may differ depending on the level of future heat pump deployment and policy support. The two deployment scenarios that the workforce projections are based on are:

1. **Current and future policy³⁵**. This scenario models heat pump deployment in the UK in the period 2023-2028 according to current policies already in place, as well as proposed policies that are set to come into force in future, for example, the FHS³⁶ and CHMM³⁷. It considers the heat pump workforce that will be required to deliver this level of deployment. If the policy landscape changes, deployment and workforce projections will change with it.
2. **UK Government installation targets³⁸**. This scenario considers the workforce that will be required to meet the following previous Government targets for heat pump deployment:
 - To install 600,000 heat pumps per year by 2028³⁹.
 - To install 1.6 million heat pumps per year by 2035⁴⁰



35 These are either current policies which are already in place or ones that are expected with a reasonable degree of confidence to be implemented, for example those where the Government has set out a clear timeline for introduction (e.g. FHS) or has already consulted on them. This reflects the policy landscape at the time of development in July 2024.

36 Department for Levelling Up, Housing and Communities (2023) The Future Homes Standard 2023 consultation on the energy efficiency requirements of the Building Regulations affecting new and existing dwellings. Available at: https://assets.publishing.service.gov.uk/media/65cc90e139a8a7000f60d508/Future_Homes_Standard_consultation_stage_impact_assessment.pdf

37 DESNZ (2023). Clean Heat Market Mechanism. Available at: https://assets.publishing.service.gov.uk/media/6424154560a35e000c0cb07f/clean_heat_market_mechanism.pdf

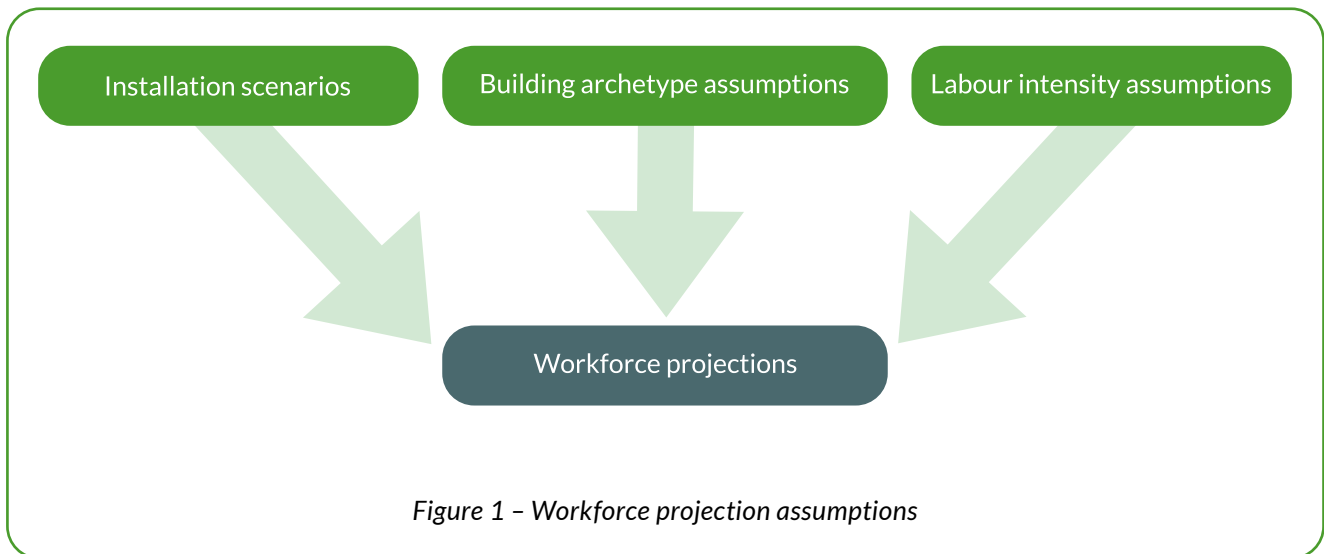
38 Please note that these targets were announced by the previous Conservative Government. As of the time of writing of this report, these are assumed to remain in place, as there has no indication to the contrary from the new Labour Government. Nonetheless, the report does not account for any changes that may be implemented by the new Government between then and the publication date of this report. The same applies to all subsequent references to these targets in the report.

39 HM Government (2020). The Ten Point Plan for a Green Industrial Revolution. Available at: https://assets.publishing.service.gov.uk/media/5fb5513de90e0720978b1a6f/10_POINT_PLAN_BOOKLET.pdf

40 HM Government (2023). Responding to the Climate Change Committee's (CCC) 2023 Annual Progress Report to Parliament. Available at: <https://assets.publishing.service.gov.uk/media/666c1642fed5bd09e5195a4b/ccs-annual-progress-report-to-parliament-2023-government-response.pdf>

METHODOLOGY

The methodology for this research brings together three elements to generate heat pump workforce projections. These are set out in Figure 1 and in more detail in the section below, where each element is explained in turn.



INSTALLATION SCENARIOS

A desk-based literature review informed the construction of the heat pump installation scenarios and the development of the initial analysis. For Scenario 1, this involved compiling a list of the current policies driving heat pump installation in the UK. This was guided by interviews with key policymakers. The Impact Assessments for these policies were scrutinised to determine how they are expected to affect overall heat pump deployment. A full list of policies can be found in the accompanying Background and Methodology Report⁴¹.

Scenario 2 is designed to show the growth in installations required to meet the previous Government's target for 600,000 annual heat pump installations by 2028 and 1.6 million annual heat pump installations by 2035. As such, Scenario 1 measures the impact of current policy, whereas Scenario 2 is policy agnostic and simply sets out the workforce required to meet the deployment targets for 2028 and 2035.

⁴¹ HPA (2024). Heat Pump Association – Projecting the Future Domestic Heat Pump Workforce: Background and Methodology Report. Available at: <https://www.heatpumps.org.uk/wp-content/uploads/2024/11/HPA-Projecting-the-Future-Domestic-Heat-Pump-Workforce-Background-and-Methodology.pdf>

An important variable for deployment other than the volume of heat pumps installed, is the mix of heat pump type within the deployment scenarios. This is based on the best available projections for the deployment of different heat pump types, but if the mix of heat pump types changes, then this will in turn impact the relative mix of workforce roles. For example, if the proportion of GSHPs were to increase relative to AWHPs, then the number of GTOs would increase with it. This nuance is discussed in more detail in the Background and Methodology Report⁴².

BUILDING ARCHETYPE ASSUMPTIONS

The UK’s building stock was also modelled to determine the impact of different property sizes and types on the heat pump installation process, accounting for the fact that this will affect labour intensity requirements for installation. To reflect the variation in the installation process across different types of property, the assumptions are based on two different property archetypes with variable labour intensity. This recognises that some properties will be more labour-intensive to fit a heat pump in than others. In consultation with the sector as part of the interview process of this research, heat pump installations were grouped into the following two archetypes: new build and retrofit⁴³.

The resulting archetype split for each scenario over the period 2023 to 2028 can be found in Figure 2 and Figure 3 below.

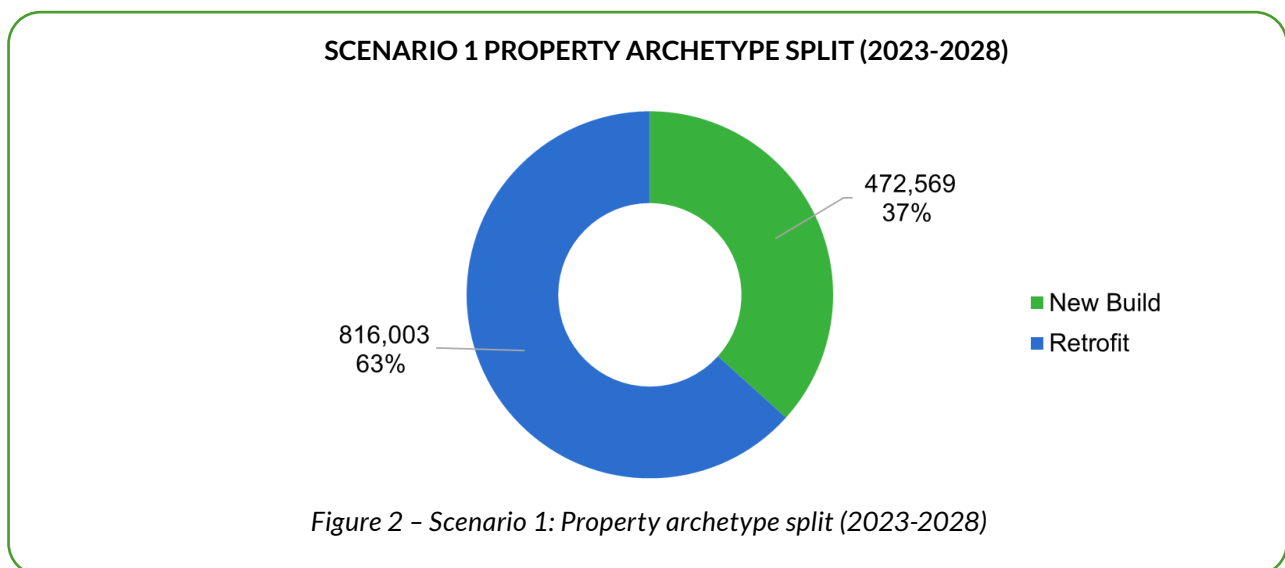


Figure 2 shows how the total projected heat pump installations carried out in Scenario 1 between 2023 and 2028 are split between property archetypes. The most common property archetype is a retrofit property, representing 63% of heat pump installations (816,003), while 37% (472,569) of installations are projected to be in new builds.

⁴² Ibid

⁴³ The retrofit archetype outlined in this report covers two sub-archetypes: retrofit average and retrofit large. These sub-archetypes are considered purely for analytical purposes. For more detail on this please see the Background and Methodology Report. This can be accessed at: HPA (2024). Projecting the Future Domestic Heat Pump Workforce: Background and Methodology Report. Available at: <https://www.heatpumps.org.uk/wp-content/uploads/2024/11/HPA-Projecting-the-Future-Domestic-Heat-Pump-Workforce-Background-and-Methodology.pdf>

SCENARIO 2 PROPERTY ARCHETYPE SPLIT (2023-2028)

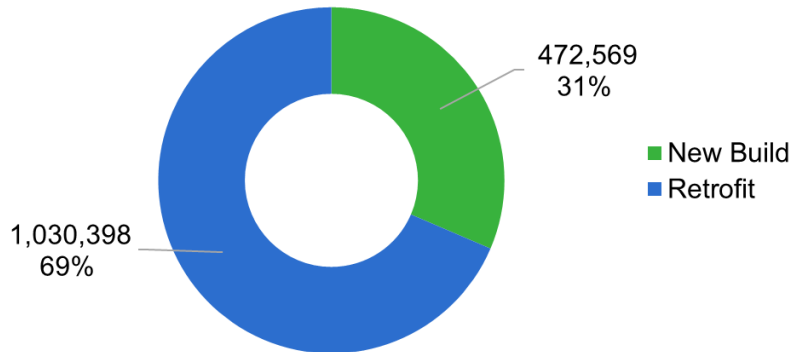


Figure 3 - Scenario 2: Property archetype split (2023-2028)

In Scenario 2, the split of cumulative heat pump installations between property archetype is slightly different as shown by Figure 3. Between 2023 and 2028, the same number of new build installations take place as in Scenario 1, however 214,395 more retrofit installations are projected during this period under Scenario 2. Therefore, the proportion of total heat pump installations that take place in retrofit properties is 6% higher (at 69%) in Scenario 2 than it is in Scenario 1 over the corresponding period.

SCENARIO 2 PROPERTY ARCHETYPE SPLIT (2023-2035)

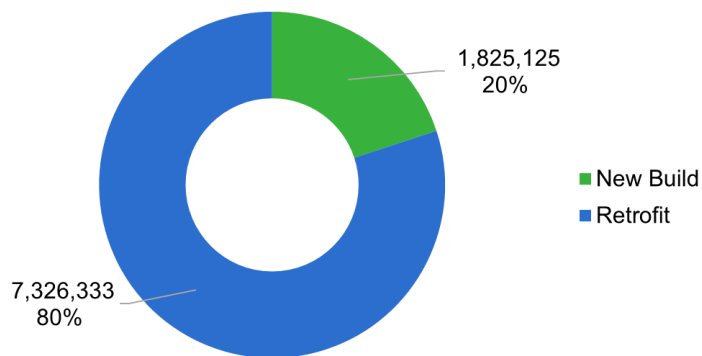


Figure 4 - Scenario 2: Property archetype split (2023-2035)

This changes after 2028 for the 1.6 million installations target, which is outlined in Figure 4. As total heat pump uptake increases, the number of retrofit heat pump installations will increase with it. The scale of growth in retrofit outpaces the scale of growth in new build. As such, the new build percentage decreases to 20% of all heat pump installations whereas the retrofit average increases to 80%.

LABOUR INTENSITY ASSUMPTIONS

Research was conducted into the heat pump installation process for each type of technology. This utilised both desk-based research and engagement with the sector through interviews and surveys. This process identified the main steps in the heat pump installation process along with the key heat pump workforce roles required for each step. The time taken to complete these tasks in FTE is referred to as the 'labour intensity' of the installation process throughout this report. This is mediated by three factors – the heat pump technology type, the property type, and the labour intensity.

- **Heat pump technology type:** Due to the varying installation requirements and processes, different heat pump technologies entail different labour intensity for the installation process⁴⁴.
- **Property type:** The report assumes that in general, larger property types will have more complex and time-consuming installation requirements than smaller ones.
- **Labour intensity:** The labour intensity is lower for new builds than for retrofit properties, where installation is more complex.

LABOUR UTILISATION AND ACTIVITY RATE ASSUMPTIONS

As well as calculating FTE workforce requirements, this research also projects the minimum number of trained individuals qualified to install heat pumps that the sector will need to meet its installation projections and targets under different scenarios. It does this by considering labour utilisation and activity rate assumptions for individuals qualified to install heat pumps. Labour utilisation and activity rates are only considered for individuals qualified to install heat pumps, not for other roles, for the following reasons:

- **Individuals qualified to install heat pumps represent a specialist role type specific to the heat pump sector which requires additional training and qualifications to carry out.** Unlike other job roles in the heat pump installation process, individuals qualified to install heat pumps require additional skillsets and qualifications specific to the heat pump industry. For instance, when recruiting ETOs into the heat pump workforce, the sector can recruit individuals from an existing workforce pool with little need for additional training. By contrast, when it comes to filling the workforce requirement for individuals qualified to install heat pumps, the sector will need to train new individuals or re-train the existing workforce in a new skillset. Since this job role cannot be undertaken by the existing workforces without additional training and qualifications, it is vital that the heat pump sector knows the total number of individuals that will need to be trained to install heat pumps in order to meet installation projections and targets.

⁴⁴ In scope technologies include air-to-air heat pumps, air-to-water heat pumps, ground source heat pumps and hybrid heat pumps. Shared Ground Loops (SGL) and Exhaust Air Heat Pumps (EAHP) are included as part of the ground source heat pump and air to water heat pump categories respectively.

- **High proportion of part-time operatives.** Unlike other roles like ETOs and GTOs, where workers generally spend most of their time carrying out work specific to that occupation, many individuals who are qualified to install heat pumps do not currently work full-time installing heat pumps, partly due to the growing nature of the heat pump market. This means that the number of 'trained and active' individuals required to install heat pumps is generally much higher than the FTE role requirement. As explained in more detail in the 'Background and Methodology Report'⁴⁵, this is expected to change in future as heat pumps become a more prominent heating technology.
- **Largest future workforce requirement.** Finally, in both scenarios, HPTOs and PHTOs are projected to constitute a majority of the workforce requirement. Therefore, it is crucial that the sector has a reliable estimate of the total number of individuals it will need to train to install heat pumps.

LABOUR UTILISATION RATE

The labour utilisation rate in this report is used to model the proportional time that individuals qualified to install heat pumps spend doing heat pump installations and maintenance. MCS data suggests that the current average percentage of time that heat pump installation businesses spend installing heat pumps is 48%⁴⁶. Therefore, it is assumed that individuals qualified to install heat pumps currently spend 48% of their time installing heat pumps. Based on expectations from the sector about the growth rate of their work, the report models a growth rate in labour utilisation of 8.4% per year until 2028 which remains constant thereafter at 72%⁴⁷.

The report also assumes that no individual qualified to install heat pumps will spend more than 72% of their time on installing heat pumps. This utilisation rate represents the productivity ceiling for the sector because firstly, a proportion of the heating engineer workforce will spend at least some time on installing and maintaining other heating systems (as it is anticipated that maintenance of existing gas and oil boilers will be necessary for a considerable time up to and beyond 2035). Secondly, even in the case of specialised installers that only install heat pumps, the workforce will be required to spend a proportion of their time doing work that is not directly related to their job of installing heat pumps. This could be general administration, line management, business strategy or even tasks like accounting for smaller businesses. On this interpretation, a per individual utilisation rate of 100% is essentially impossible. Regardless, the report already measures a theoretical 100% labour utilisation rate through the FTE figures.

45 HPA (2024). Projecting the Future Domestic Heat Pump Workforce: Background and Methodology Report. Available at: <https://www.heatpumps.org.uk/wp-content/uploads/2024/11/HPA-Projecting-the-Future-Domestic-Heat-Pump-Workforce-Background-and-Methodology.pdf>

46 MCS (2024) 'Research highlights heat pump business size.' Available at: <https://mcs-certified.com/research-highlights-heat-pump-business-size/>

47 This labour utilisation rate represents the average percentage of their time a typical individual qualified to install heat pumps would spend on installing and maintaining heat pumps. It is worth noting that this percentage might vary depending on an organisation's business model. For instance, in a smaller installation company, an individual might spend a greater proportion of time doing other tasks, such as general administration, sales and accounting. In a larger employer, there are likely to be dedicated personnel for admin, sales, accounting and other supporting activities, thereby enabling qualified individuals to spend a higher proportion of time on the core heat pump installation.

LABOUR ACTIVITY RATE

The labour activity rate refers to the proportion of individuals qualified to install heat pumps that actually go on to install heat pumps. The report assumes an activity rate of around 61% - to determine a ratio between trained and active individuals qualified to install heat pumps and all individuals qualified to install heat pumps. This means of those that are trained, 39% are not expected to enter the workforce to install heat pumps. This activity rate is modelled to increase in proportion to the increase in labour utilisation rate until 2028 and remain consistent thereafter.

The methodology for calculating inactivity rates is as follows.

- The number of trained and active individuals working for MCS contractors (total contractors at the end of June 2024), at a rate of 4.8 trained and active individuals per contractor, was compared with the total number of individuals who have undergone heat pump installation training to the end of June 2024.
- To capture the work done by unregistered contractors, MCS notified work⁴⁸ was compared to HPA-reported UK sales data⁴⁹. The ratio between the known heat pump installations and the modelled supply of HP installers gave an average activity rate of 61%.
- It is assumed that this activity rate will improve (due to increasing demand) at the same rate that the utilisation rate will improve. This results in the activity rate increasing from 61% in 2023 to 74% in 2028. The rate remains constant thereafter.

While the report utilises a similar methodology to labour utilisation, the incentives and behavioural assumptions are different. The activity rate for individuals qualified to install heat pumps will likely be driven by both economic and personal factors. Economic factors could include the availability of work installing heat pumps, and labour market conditions such as the availability and pay for heat pump installation work. As economic factors improve, it is assumed that labour activity rates will rise. Personal factors represent a 'ceiling' on activity rates. Influences such as sickness, pregnancy and children, moving home and other changes to personal circumstances will mean that inevitably, some who train and become qualified to install heat pumps will not take up work as one.

It is possible that the labour activity rate could rise higher than 74% particularly if economic factors are driving more of the inactivity than personal factors. However, based on current information, it is impossible to know how much inactivity is attributable to personal or economic factors, so a conservative rise in activity with a lower ceiling is assumed for the purposes of this report. For further information on the methodology of this report, please refer to the accompanying Background and Methodology Report which contains further details⁵⁰.

48 MCS (2024) Data Dashboard. Available at: <https://datadashboard.mcscertified.com/Welcome>

49 HPA (2024) Sales Data. Available at: <https://www.heatpumps.org.uk/resources/statistics/>

50 The accompanying Background and Methodology Report provides a detailed overview of the methodology, including insight into the underpinning analysis to this report. This can be accessed at: <https://www.heatpumps.org.uk/wp-content/uploads/2024/11/HPA-Projecting-the-Future-Domestic-Heat-Pump-Workforce-Background-and-Methodology.pdf>

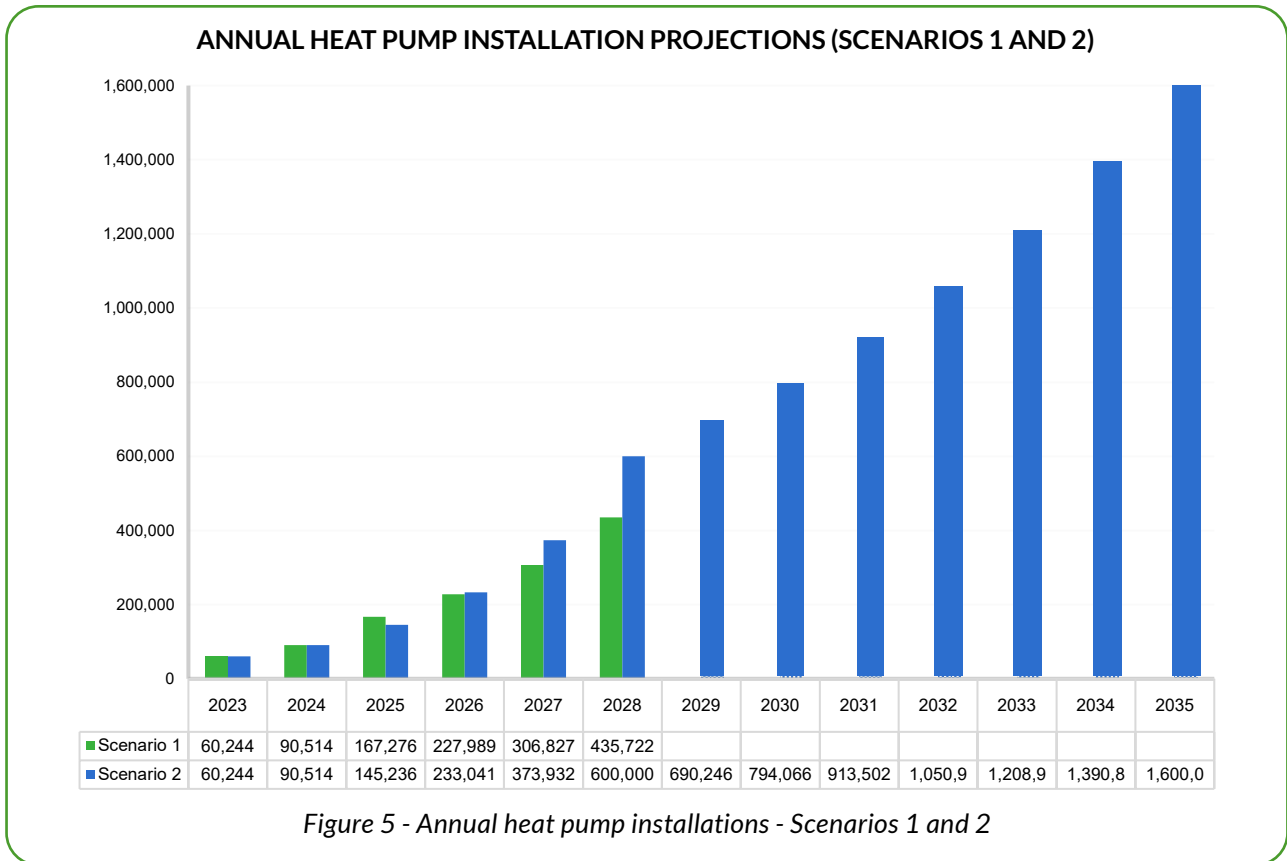
KEY FINDINGS

INSTALLATION PROJECTIONS

This section of the report sets out the projected and required heat pump installations by year for both scenarios.

Deployment figures for Scenario 1 are projected deployment volumes constructed from policies and impact assessments already in the public domain, such as impact assessments for policy schemes. This covers current policies which are already in place or ones that are expected with a reasonable degree of confidence to be implemented, for example those where the Government has set out a clear timeline for introduction (e.g. FHS) or has already consulted on them. It reflects the policy landscape at the time of writing. Deployment figures for Scenario 2 were created by modelling the growth needed from projected deployment in 2024 to the 2028 target of 600,000 heat pump installations per year. From 2028, the modelling then calculated the growth required to reach 1.6 million installations per year by 2035⁵¹.

Figure 5 below sets out annual heat pump installation projections for both Scenario 1 and Scenario 2⁵¹.



⁵¹ These estimates at Figure 5 for Scenario 1 are based on Gemserv’s interpretation of heat pump deployment projections. The modelling combines both policy driven and non-policy driven heat pump sales derived from HPA sales data. Policy deployment projections are derived from the latest publicly available impact assessment at the time of publication in autumn 2024. It should be noted that some of these impact assessments are several years old. These figures are liable to change, if the policy framework changes.

The analysis projects that the current and future policy mix will deliver 435,722 annual heat pump installations in 2028 for Scenario 1. This is 164,278 fewer (or 27% lower) than the 600,000 annual installations that will be required in Scenario 2 to meet the 2028 heat pump installation target. In both scenarios, annual heat pump installations are projected to increase significantly by 2028 – 623% in Scenario 1 and by 896% in Scenario 2.

In Scenario 2 across the entire period annual heat pump installations will need to increase by 2,556% from 2023 levels to 2035. In the first period of Scenario 2, between 2023 and 2028, annual installations will need to increase by 896% between to reach the Government’s 600,000 installations target, and then a further 167% between 2028 and 2035 to meet the 1.6 million installations target.

Under Scenario 1, a cumulative total of 1.29 million heat pumps are projected to be installed between 2023 and 2028. Whereas in Scenario 2, a cumulative 9.15 million heat pump installations are expected to be required between 2023 and 2035 - the equivalent to installing a heat pump in around one-third of the total UK building stock. It is this considerable growth in installations and maintenance that will drive the associated increase in the heat pump workforce.

OVERALL WORKFORCE PROJECTIONS

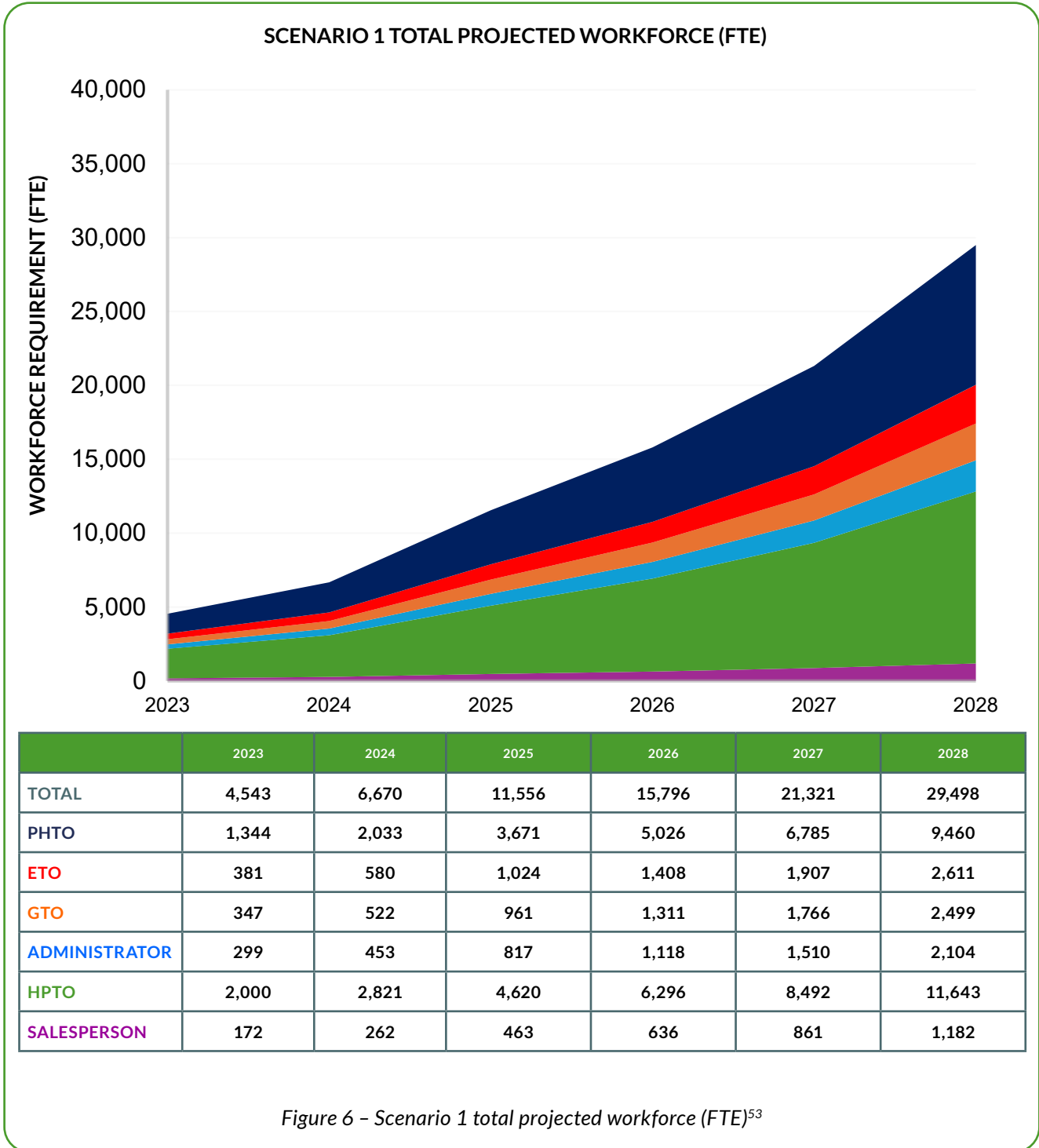
This section shows the total workforce requirement to install and maintain heat pumps under each of the two scenarios. Unless otherwise stated, all job roles are specified in terms of ‘Full Time Equivalent’ or FTE. This assumes that all individuals trained work full time on the jobs they are trained to do⁵².

⁵² In practice, this is unlikely to be the case, given that many individuals have multiple skillsets. The follow section ([HPTO workforce requirements by labour utilisation rates](#)) takes this factor into account for the HPTO role.

SCENARIO 1 - CURRENT AND FUTURE POLICY MIX

OVERALL WORKFORCE PROJECTIONS (INSTALLATION AND MAINTENANCE)

Figure 6 shows the overall workforce projections for Scenario 1 (current and future heat pump policy) across all roles in FTE.



⁵³ PHTO = Plumbing and heating technical operative, ETO = Electrical technical operative, GTO = Groundworks technical operative, HPTO = Heat pump technical operative.

To deliver the 435,722 annual heat pump installations projected under Scenario 1, it is predicted that a workforce of 29,498 FTE individuals will be required. The analysis shows that the largest role is HPTO; by 2028, it is expected that there will need to be 11,643 of them in FTE, representing 39% of the total heat pump workforce. The second largest role is PHTOs with 9,460 FTE roles in 2028. This amounts to 32% of the workforce. Taken together, PHTOs and HPTOs make up over 70% of the total workforce, with the remainder made up of salespeople, administrators, GTOs and ETOs.

INDIVIDUALS QUALIFIED TO INSTALL HEAT PUMPS

This section considers the number of individuals qualified to install heat pumps that will be required to deliver the projected installations and maintenance under Scenario 1. It considers how the FTE requirements set out in Figure 6 translate into ‘trained and active individuals’ and ‘total trained individuals’, defined as:

- **Trained and active individuals.** The number of individuals actively working on heat pump installations and maintenance. This assumes that a proportion of individuals will not work full-time on heat pump installations and maintenance for a variety of reasons.
- **Total trained individuals.** This refers to the total number of individuals the sector will need to train to install heat pumps. It is higher than the trained and active requirement because, in practice, not all individuals who successfully complete a training course relevant to heat pump installation will go on to actively install heat pumps⁵⁴.

This means that the number of individuals the sector needs to train will be higher than the FTE requirement, as Figure 7 demonstrates. For more detail on how these additional metrics have been calculated, please see the [Methodology section](#).

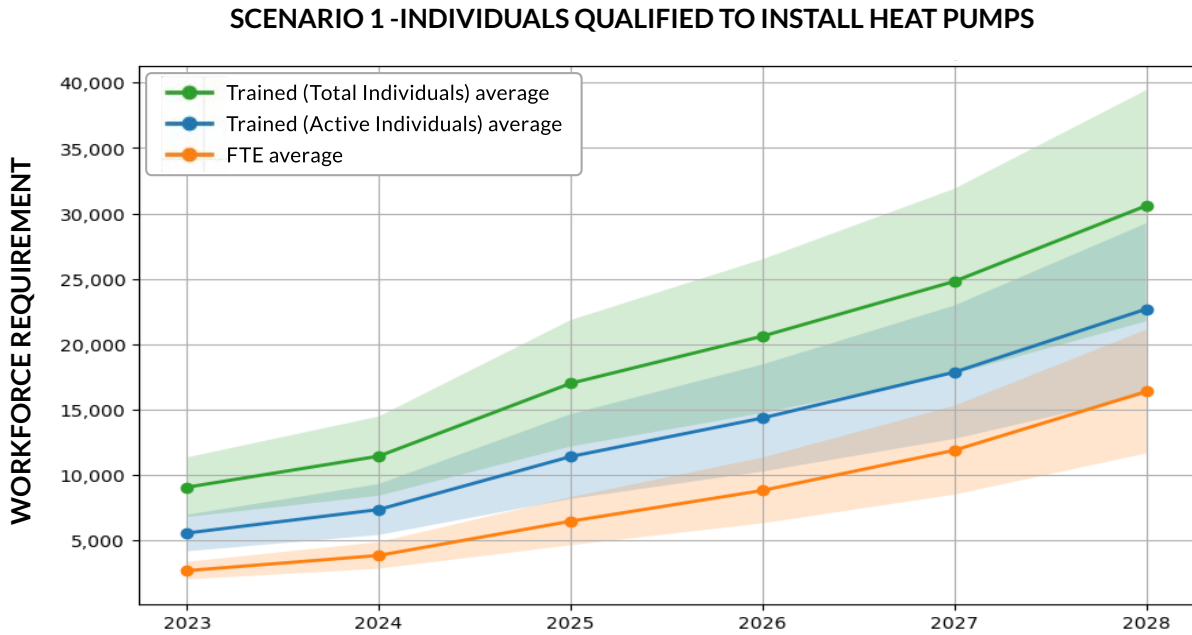
Since there is some overlap between the HPTO and PHTO roles, meaning that some PHTOs will in practice require heat pump qualifications and carry out both the plumbing and heating elements of the installation, the projected training requirements consider both roles. As a result, for each workforce metric in Figure 7, an upper estimate, lower estimate and average estimate has been calculated.

1. **Upper estimate.** This is based on the combined workforce requirement for both HPTOs and PHTOs.
2. **Lower estimate.** This only includes workforce requirements for HPTOs.
3. **Average estimate.** This takes the mean average between the upper and lower estimates.

For simplicity, and because in practice, there is likely to be a variety of installation business models, some with PHTOs requiring heat pump installation skills, and others where they will not, the average estimate is taken as the core training scenario.

⁵⁴ A fuller explanation of the labour utilisation rate and how it was calculated can be found in the methodology section of this report.

Figure 7 shows the number of individuals qualified to install heat pumps that will be needed to meet heat pump installation and maintenance requirements under Scenario 1.



		2023	2024	2025	2026	2027	2028
TRAINED (TOTAL INDIVIDUALS)	Upper Estimate	11,329	14,458	21,834	26,488	31,883	39,428
	Average Estimate	9,053	11,430	17,000	20,609	24,803	30,590
	Lower Estimate	6,776	8,403	12,166	14,730	17,723	21,752
TRAINED (ACTIVE INDIVIDUALS)	Upper Estimate	6,943	9,295	14,644	18,443	22,951	29,241
	Average Estimate	5,548	7,348	11,401	14,350	17,855	22,687
	Lower Estimate	4,153	5,402	8,159	10,256	12,758	16,132
TRAINED (FTE)	Upper Estimate	3,344	4,854	8,291	11,322	15,277	21,103
	Average Estimate	2,672	3,837	6,455	8,809	11,884	16,373
	Lower Estimate	2,000	2,821	4,620	6,296	8,492	11,643

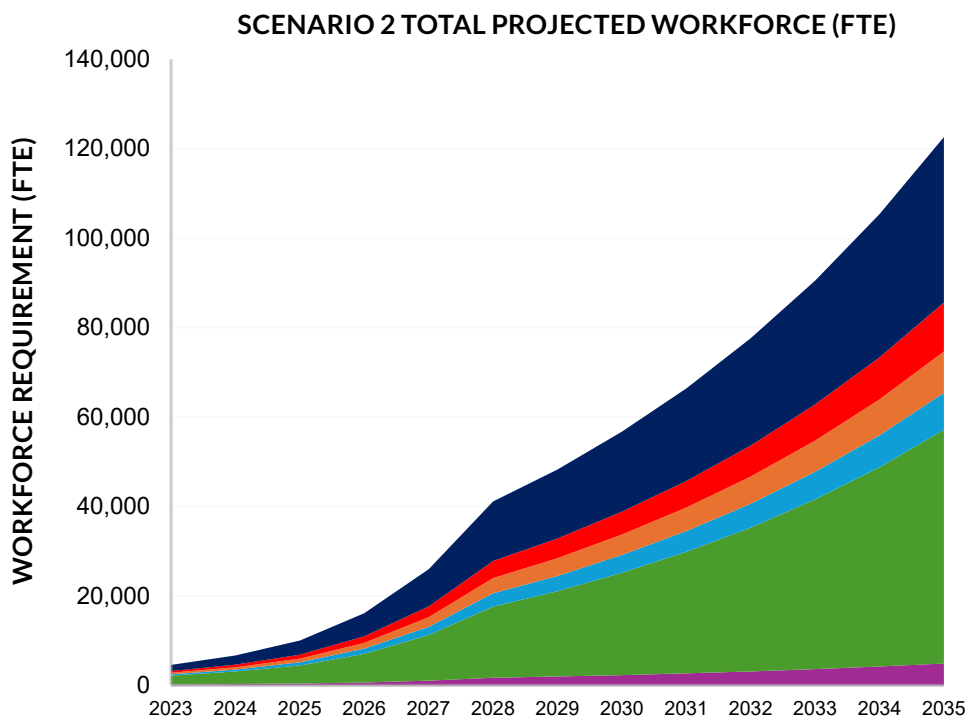
Figure 7 - Scenario 1: Individuals qualified to install heat pumps - workforce requirements

By 2028 for Scenario 1, the sector will need to have trained a projected total of 30,590 individuals qualified to install heat pumps to meet the average workforce requirement. This translates to an average of 22,687 trained and active individuals and in FTE this is an average workforce of 16,373. During this period, the workforce requirement is projected to increase by an average of 238% in terms of total trained individuals, 309% in terms of trained and active individuals and, 513% in FTE. Hence, in all cases, a significant increase in workforce requirements is projected over the period.

This means that, on average, an average of 4,307 additional individuals will need to be trained to install heat pumps per year over the 5 years between 2023 and 2028. This annual training requirement varies depending on which estimate is used. For instance, this annual training requirement increases to 5,620 additional individuals if the upper estimate is used and decreases to 2,995 per year for the lower estimate. In 2023, 7,854 individuals were trained to install heat pumps⁵⁵ meaning that the sector is on track to meet and exceed this training requirement, even in the case of the upper estimate.

SCENARIO 2 – UK GOVERNMENT INSTALLATION TARGETS

OVERALL WORKFORCE PROJECTIONS (INSTALLATION AND MAINTENANCE)



	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
TOTAL	4,543	6,670	10,005	16,115	26,015	41,143	48,283	56,751	66,443	77,602	90,552	105,350	122,627
PHTO	1,344	2,033	3,150	5,145	8,373	13,349	15,431	17,894	20,714	23,961	27,725	32,028	37,047
ETO	381	580	868	1,444	2,383	3,776	4,385	5,125	5,968	6,939	8,073	9,362	10,883
GTO	347	522	833	1,341	2,157	3,457	3,980	4,585	5,281	6,081	7,003	8,062	9,284
ADMINISTRATOR	299	453	700	1,145	1,864	2,972	3,436	3,986	4,615	5,339	6,180	7,140	8,261
HPTO	2,000	2,821	4,061	6,388	10,163	15,887	19,073	22,852	27,178	32,160	37,941	44,549	52,263
SALESPERSON	172	262	393	652	1,075	1,704	1,978	2,309	2,687	3,122	3,630	4,208	4,889

Figure 8 – Scenario 2 total projected workforce (FTE)⁵⁶

55 HPA (2024). Statistics. Available at: <https://www.heatpumps.org.uk/resources/statistics/>

56 PHTO = Plumbing and heating technical operative, ETO = Electrical technical operative, GTO = Groundworks technical operative, HPTO = Heat pump technical operative.

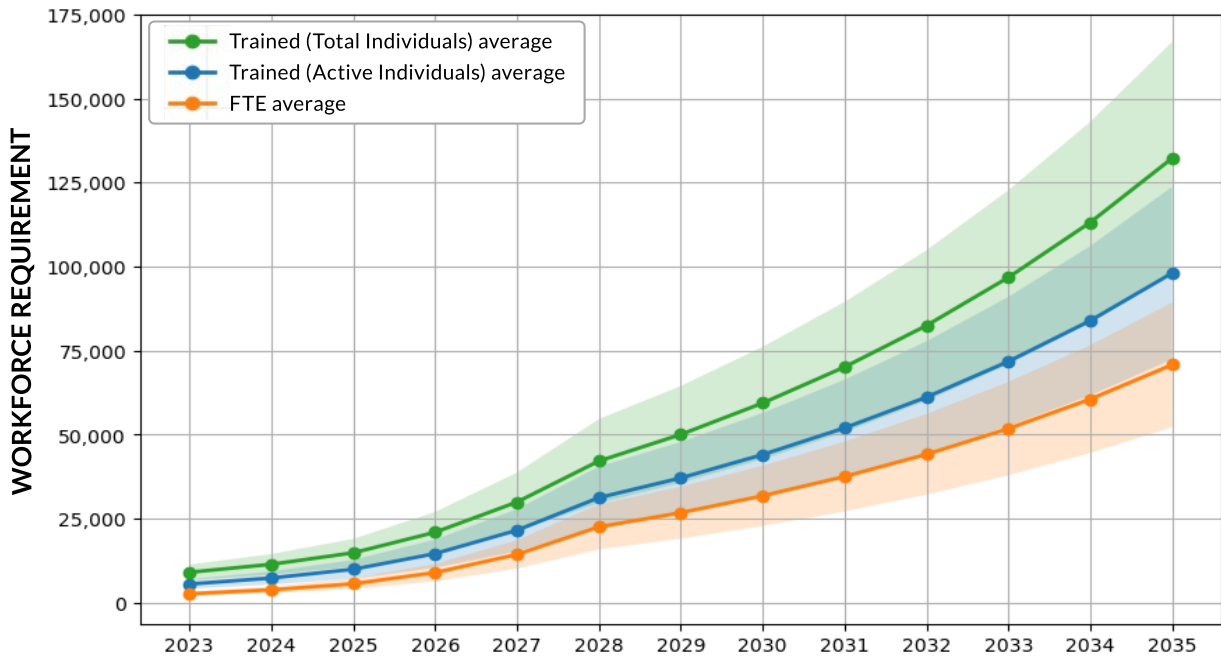
To reach the Government's target for 600,000 annual installations by 2028, it is projected that a total workforce of 41,143 FTE will be required. This is 11,645 more FTE roles than are projected under Scenario 1 and is an 806% increase on the total workforce requirement in 2023. Thereafter, a further 198% increase in the total workforce requirement will be needed between 2028 and 2035 to meet the Government's target for 1.6 million annual heat pump installations by 2035. By this year, it is projected that a total heat pump workforce of 122,627 FTE will be required.

The largest role is projected to be HPTO, with 15,887 FTE required by 2028 and 52,263 FTE required by 2035. HPTOs are projected to constitute 39% of the FTE heat pump workforce in 2028, rising to 43% in 2035. The second largest requirement is expected to be for PHTOs, with 13,349 FTE needed by 2028 and 37,047 FTE by 2035, making up 32% and 30% respectively of the total heat pump workforce in those years. The remaining required workforce is split evenly between ETOs, GTOs, administrators and salespeople.

INDIVIDUALS QUALIFIED TO INSTALL HEAT PUMPS

Figure 9 shows the number of individuals qualified to install heat pumps that will be needed to meet heat pump installation and maintenance requirements under Scenario 2 (600,000 heat pump installations by 2028 and 1.6 million installations by 2035). As outlined earlier for Scenario 1, this considers the number of trained and active individuals and the total number of individuals that the sector will need to train to meet the workforce requirements for installation and maintenance needed in Scenario 2.

SCENARIO 2 - INDIVIDUALS QUALIFIED TO INSTALL HEAT PUMPS



		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
TRAINED (TOTAL INDIVIDUALS)	Upper Estimate	11,329	14,458	18,990	26,981	38,686	54,622	64,465	76,127	89,478	104,851	122,686	143,071	166,859
	Average Estimate	9,053	11,430	14,843	20,962	29,948	42,152	50,050	59,411	70,128	82,468	96,786	113,151	132,252
	Lower Estimate	6,776	8,403	10,696	14,944	21,211	29,682	35,635	42,695	50,777	60,085	70,887	83,232	97,644
TRAINED (ACTIVE INDIVIDUALS)	Upper Estimate	6,943	9,295	12,736	18,786	27,848	40,510	47,810	56,459	66,361	77,762	90,988	106,107	123,749
	Average Estimate	5,548	7,348	9,955	14,596	21,559	31,261	37,119	44,062	52,010	61,162	71,780	83,917	98,083
	Lower Estimate	4,153	5,402	7,173	10,405	15,269	22,013	26,428	31,664	37,659	44,561	52,572	61,728	72,417
TRAINED (FTE)	Upper Estimate	3,344	4,854	7,211	11,533	18,536	29,236	34,504	40,746	47,892	56,120	65,666	76,577	89,310
	Average Estimate	2,672	3,837	5,636	8,960	14,350	22,561	26,789	31,799	37,535	44,140	51,804	60,563	70,786
	Lower Estimate	2,000	2,821	4,061	6,388	10,163	15,887	19,073	22,852	27,178	32,160	37,941	44,549	52,263

Figure 9 - Scenario 2 - Individuals Qualified to Install Heat Pumps



To achieve the Government's target of 600,000 annual heat pump installations by 2028, it is projected that the sector will need to have trained an average of 42,152 individuals to install heat pumps., This translates to an average of 31,261 trained and active individuals qualified to install heat pumps and in FTE terms an average workforce of 22,561. To meet the number of trained individuals required, this equates to 6,620 additional individuals per year trained between 2023 and 2028. In 2023, 7,856 individuals were trained to install heat pumps⁵⁷, meaning the sector is currently ahead of the annual average training rate required by 19%. Therefore, the sector is on track to train sufficient individuals qualified to install heat pumps required to meet the Government's 2028 target for 600,000 annual heat pump installations.

To reach the later target of 1.6 million heat pump installations by 2035, an average workforce of 132,252 trained individuals qualified to install heat pumps is needed in 2035. This is equivalent to 98,083 trained and active individuals and 70,786 FTE individuals by 2035. During the period from 2023 to 2035, the workforce requirement for individuals qualified to install heat pumps increases by 1,361% in terms of total trained individuals. This translates to a growth of 1,668% in terms of trained and active individuals and 2,549% in FTE. Most of this growth will come in the years between 2028 and 2035. An additional 90,100 qualified individuals will need to be trained to install heat pumps, or an average of 12,871 per year in the seven years from 2028 to 2035. This is 5,017 more trained individuals than the current 7,856 annual training rate - or 64% higher.

Taken over the whole 12-year period between 2023 and 2035, the sector will need to train 10,267 qualified individuals per year to install heat pumps. This is 31% higher than the current training rate of 7,856. Therefore, the sector's current rates of training are behind the average training rate required to meet the Government's 2035 target for 1.6 million installations.

There is a material difference between estimates in this scenario. At the lower workforce estimate, an average training rate of 7,572 individuals qualified to install heat pumps is required compared to 10,267 in the average estimate. While the lower estimate is within the current training rate, it could result in a risk of undertraining and missing the targets. On the other hand, the upper estimate is above the current rate at 12,961 per year. As a result, it is important that the sector increases its training rate to ensure it has a workforce capable of meeting the average estimate.

⁵⁷ To be sufficient to meet workforce requirements, this would require that 100% of individuals trained install heat pumps in some capacity. This conversion rate from training into delivery is likely to be lower in practice. For example, assuming a conversion rate of 75% from training into roles would require training 10,667 individuals per year for 8,000 heating installers. This issue is explored further in the [Labour activity rate](#) section.

NEW BUILD AND RETROFIT WORKFORCE PROJECTIONS

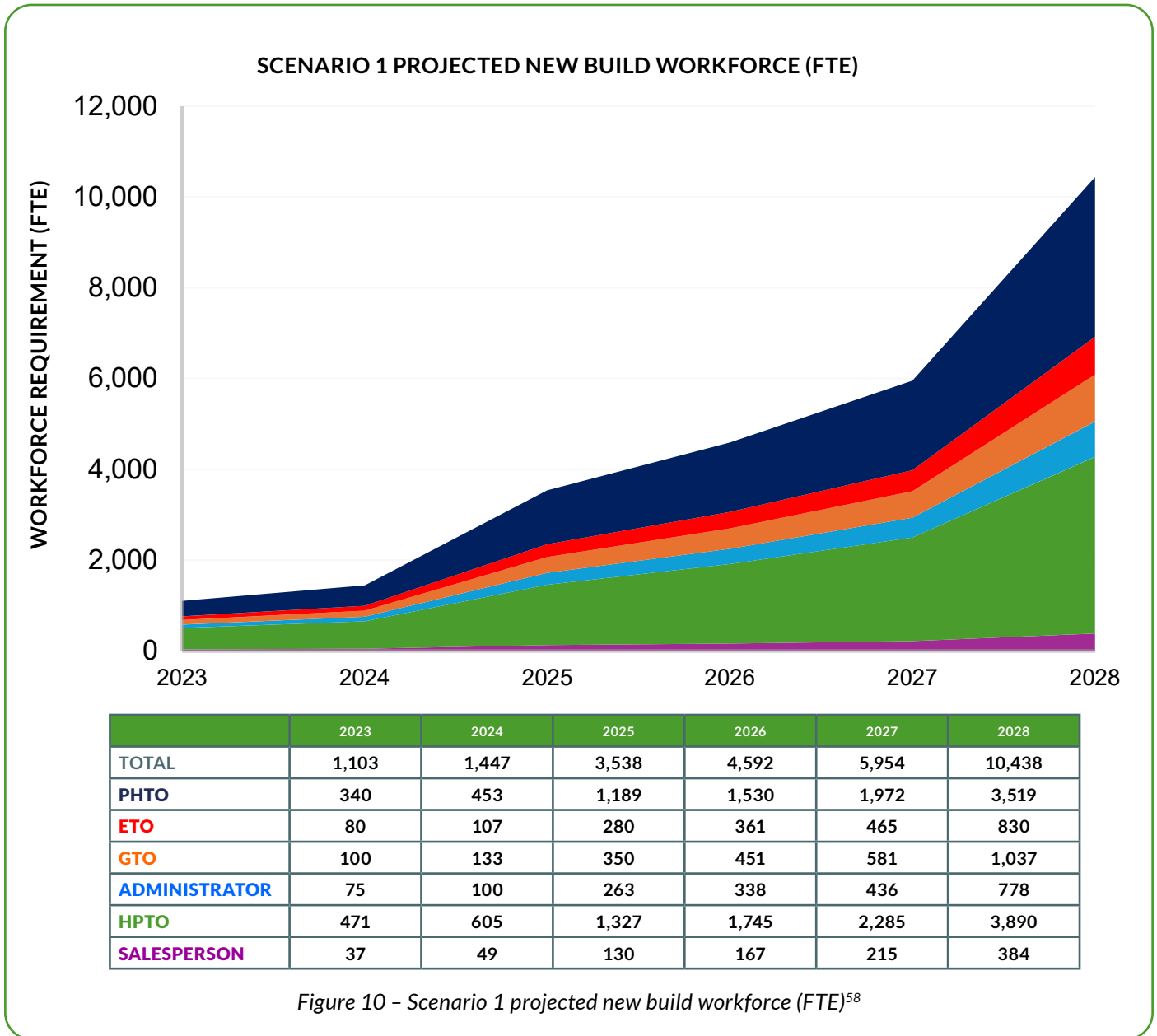
This section compares the workforce requirements between the new build and retrofit sectors. In practice, individuals are likely to work in both sectors. However, the policy landscape for both sectors is also very different, with regulations such as the FHS, Scottish New Build Heat Standard (SNBHS) and Part L 2025 Standard (Wales) expected to be important drivers for heat pump deployment and workforce requirements in the new build sector.

New build heat pump deployment and workforce projections are the same in both scenarios because, assuming the FHS and Part L 2025 Standards (Wales) are introduced, in addition to the SNBHS, all new build homes will be required to meet the updated Building Regulations, which will drive growth in heat pump deployment. By contrast, Building Regulations are not expected to be such a key driver in the retrofit sector (under the current policy landscape). Instead, retrofit installations are expected to be driven by a mix of government policy schemes, such as Boiler Upgrade Scheme (BUS), Energy Company Obligation (ECO) and CHMM, and (in the case of Scenario 2), organic market growth.

SCENARIO 1 - CURRENT AND FUTURE POLICY MIX

NEW BUILD

Figure 10 shows the projected heat pump workforce required to deliver the projected new build contribution to heat pump installations under Scenario 1.

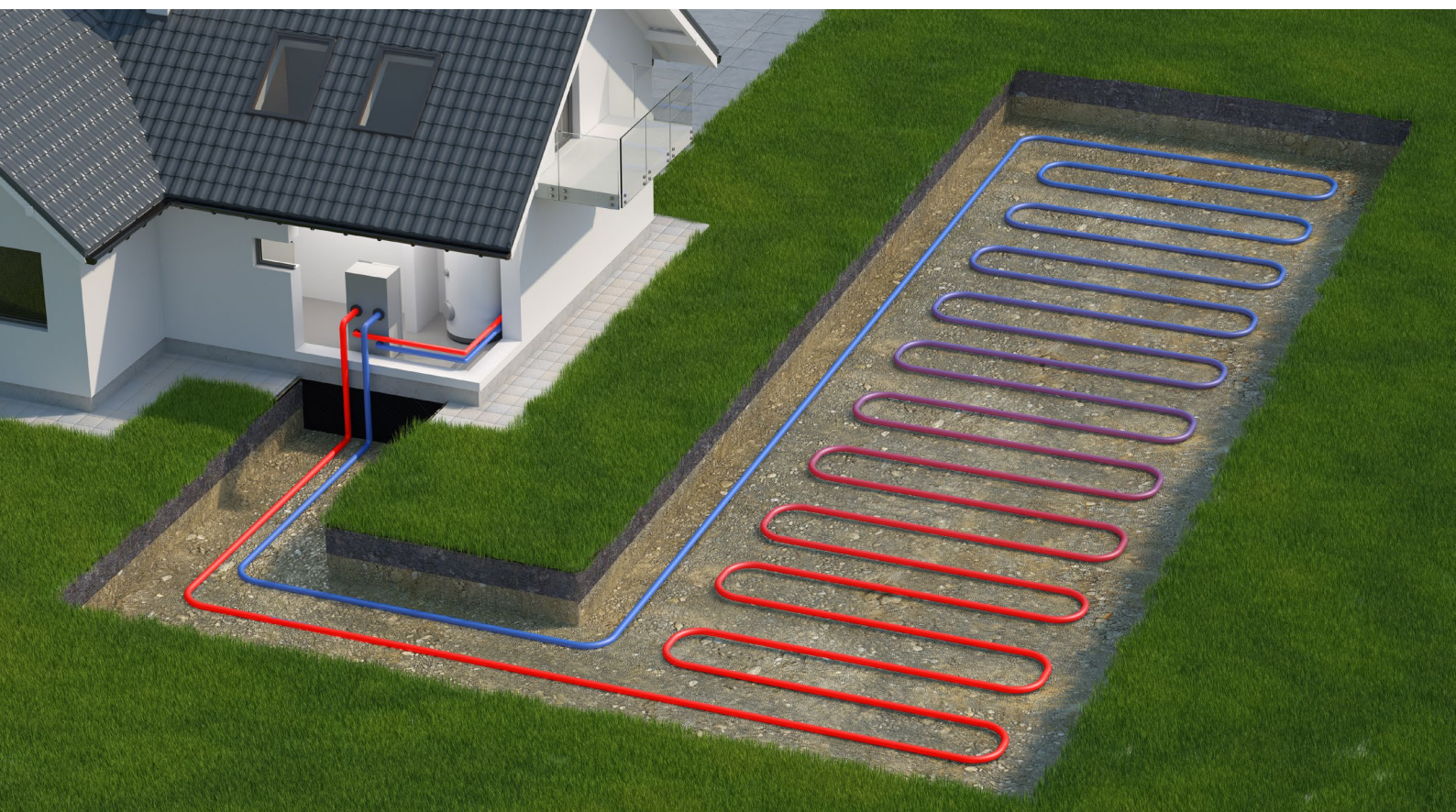


58 PHTO = Plumbing and heating technical operative, ETO = Electrical technical operative, GTO = Groundworks technical operative, HPTO = Heat pump technical operative.

The total new build workforce projection for 2028 under Scenario 1 is 10,438 FTE workforce roles. This represents 35% of the total projected heat pump workforce in 2028, meaning the remaining 65% of heat pump workforce roles are deployed in retrofit installations and maintenance. This is a significant increase on the current 24% of the heat pump workforce that are engaged in new build installations. This projected increase is largely down to the expected introduction of the FHS from 2025⁵⁹. Of this workforce, the largest roles are HPTO and PHTO, and, given the expected overlap as individuals qualified to install heat pumps, they total 71% of the overall new build workforce need.

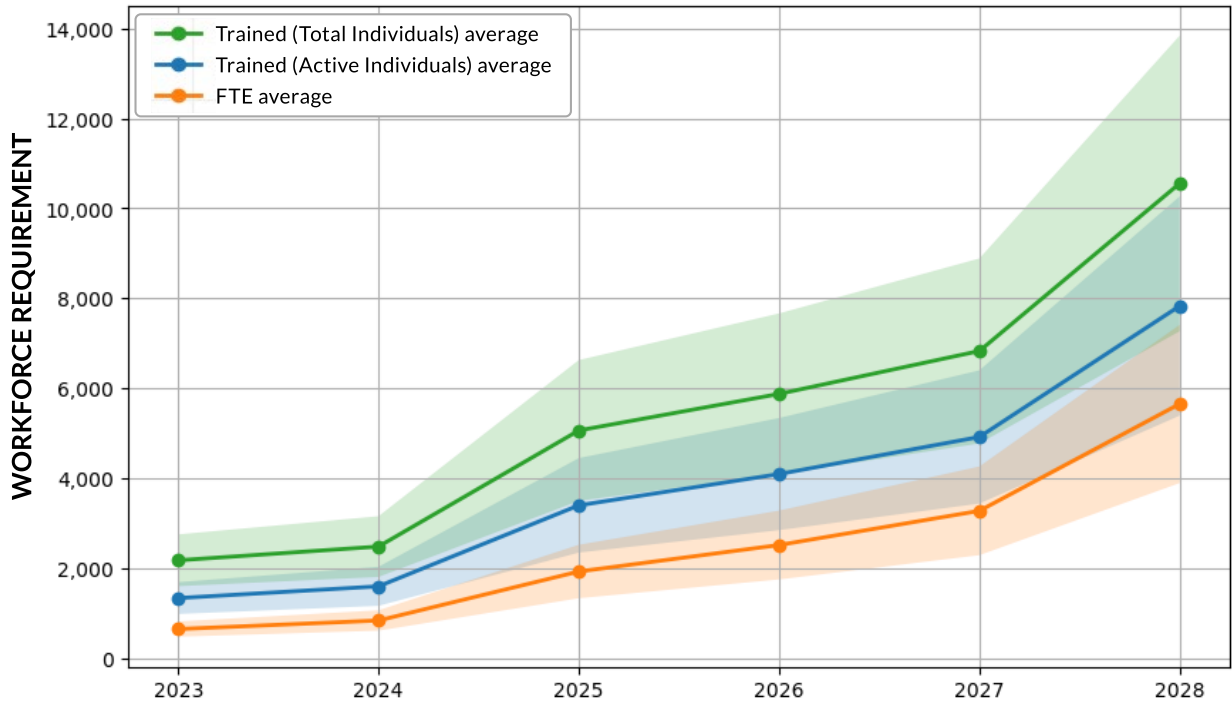
In Scenario 1, the new build workforce requirement increases gradually from 2024 before a sharp increase between 2027 and 2028. This is related to the expected introduction and phase in timelines of the FHS which is set to be introduced in 2025 but is expected to be phased in gradually over a transition period.

Figure 11 shows the number of individuals qualified to install heat pumps that will be required to deliver the new build contribution to the projected installations under the current and future policy mix scenario, in terms of FTE requirement, trained and active individuals, and total trained individuals.



59 The current new build workforce was calculated by utilising historic new build heat pump deployment taken from the EPC database and then applying the new build labour intensity figures to get a resultant workforce in FTE. For a full breakdown of the new build deployment, please see HPA (2024). Heat Pump Association – Projecting the Future Domestic Heat Pump Workforce: Background and Methodology Report. Available at: <https://www.heatpumps.org.uk/wp-content/uploads/2024/11/HPA-Projecting-the-Future-Domestic-Heat-Pump-Workforce-Background-and-Methodology.pdf>

SCENARIO 1 - INDIVIDUALS QUALIFIED TO INSTALL HEAT PUMPS (NEW BUILD)



		2023	2024	2025	2026	2027	2028
TRAINED (TOTAL INDIVIDUALS)	Upper Estimate	2,746	3,150	6,624	7,662	8,885	13,843
	Average Estimate	2,170	2,476	5,059	5,872	6,827	10,556
	Lower Estimate	1,595	1,801	3,494	4,082	4,770	7,269
TRAINED (ACTIVE INDIVIDUALS)	Upper Estimate	1,683	2,025	4,443	5,335	6,396	10,267
	Average Estimate	1,330	1,591	3,393	4,089	4,915	7,829
	Lower Estimate	977	1,158	2,343	2,842	3,434	5,391
TRAINED (FTE)	Upper Estimate	810	1,057	2,515	3,275	4,257	7,409
	Average Estimate	641	831	1,921	2,510	3,271	5,650
	Lower Estimate	471	605	1,327	1,745	2,285	3,890

Figure 11 - Scenario 1 projected new build workforce - individuals qualified to install heat pumps

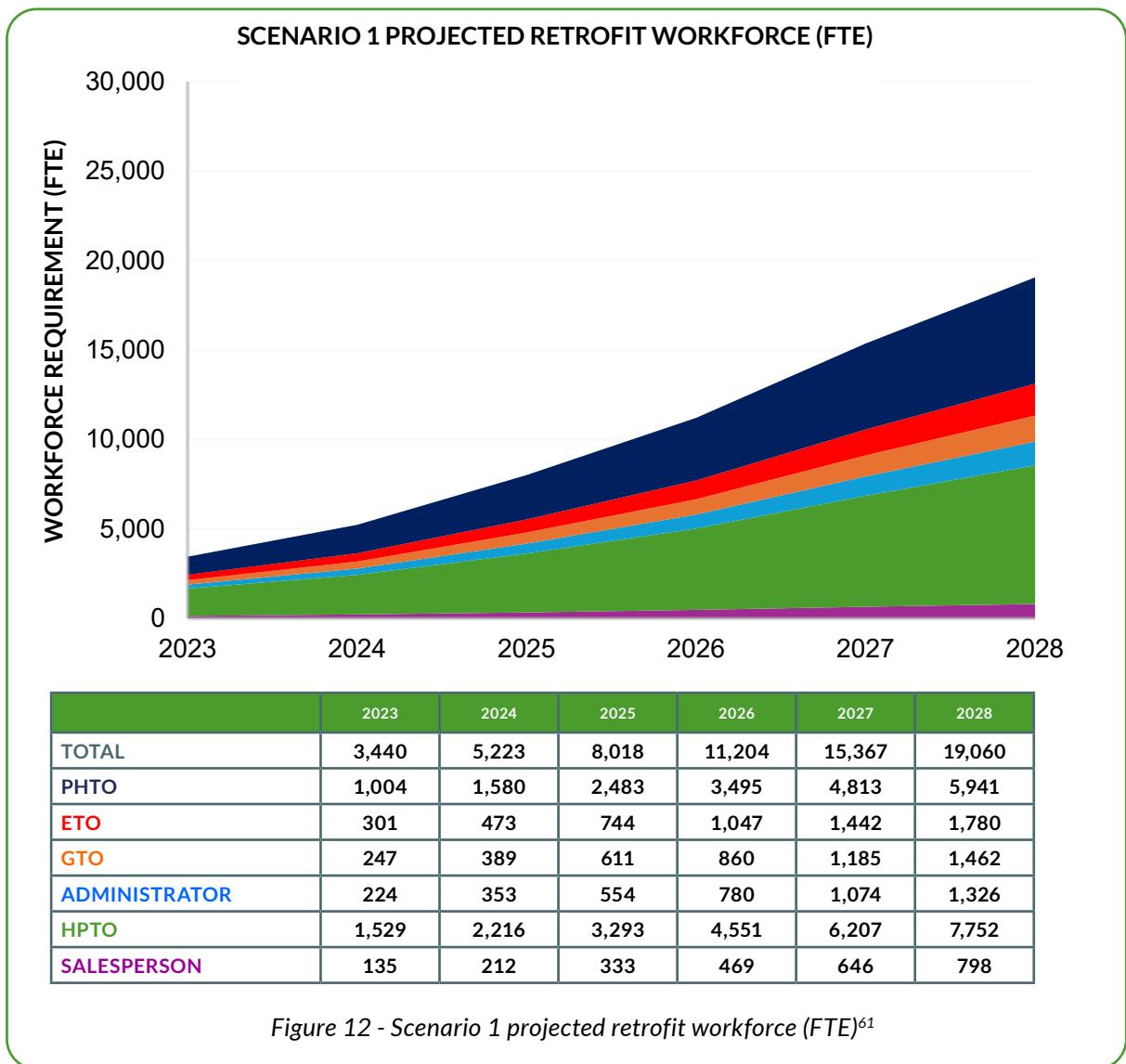
In Scenario 1, the individuals qualified to install heat pumps needed for the new build sector grows significantly between 2023 and 2028, 10,556 individuals trained to install heat pumps will be needed by 2028 to meet workforce requirements in the new build sector – this is a 386% increase on the required total number of trained individuals in 2023. Over this period, the required workforce is projected to increase by 489% for trained and active individuals and 781% in terms of FTE roles. The workforce grows most steeply between 2027 and 2028, due to the phasing in of FHS regulations from 2027 which will increase

the installation of heat pumps in new builds substantially. In line with this projected rise in deployment, the number of individuals qualified to install heat pumps that the sector will need to train increases by 55% between 2027 and 2028, from 6,827 to 10,556. In the new build sector, there is an average annual training requirement of 1,677 individuals per year, or 39% of the total average training requirement for Scenario 1.

RETROFIT

Figure 12 shows the workforce required to deliver the projected retrofit contribution to heat pump installations and maintenance under Scenario 1. The total retrofit workforce projection for 2028 under Scenario 1 is 19,060 workforce roles in FTE. This accounts for 65% of overall projected heat pump workforce roles.

The high proportion of roles attributed to retrofit over this period reflects a couple of factors. First is the property split – 80% of the properties expected to be around in 2050 have already been built⁶⁰. Therefore, most future installations will be in existing properties (retrofit contexts) rather than new buildings. Secondly, the labour intensity of the installation process is higher for retrofit than for new build, meaning that it would generally take more FTE individuals to complete the same installation in retrofit compared to new build installations.



60 Low Energy Transformation Initiative (LETI). Climate Emergency Retrofit Guide. Available at: <https://www.leti.uk/retrofit#:~:text=Around%2018%25%20of%20our%20annual,homes%20have%20already%20been%20built.>

61 PHTO = Plumbing and heating technical operative, ETO = Electrical technical operative, GTO = Groundworks technical operative, HPTO = Heat pump technical operative.

The retrofit workforce requirement in Scenario 1 increases by 454% over the period, from 3,440 FTE in 2023 to 19,060 FTE in 2028. The increase in workforce requirement over the period is more gradual than in the new build sector where the phasing in of a major policy lever like the FHS causes a steep increase in workforce requirement between 2027 and 2028. In the retrofit sector by contrast, there are several key policy drivers, rather than one, which are expected to drive a steady increase in deployment and workforce requirements over this period. The two largest policy drivers for retrofit installations are the BUS⁶² and ECO⁶³. As is the case in the new build sector, the greatest requirement in terms of individual roles are HPTOs and PHTOs, constituting 72% towards the total heat pump workforce requirement in the retrofit sector in 2028.

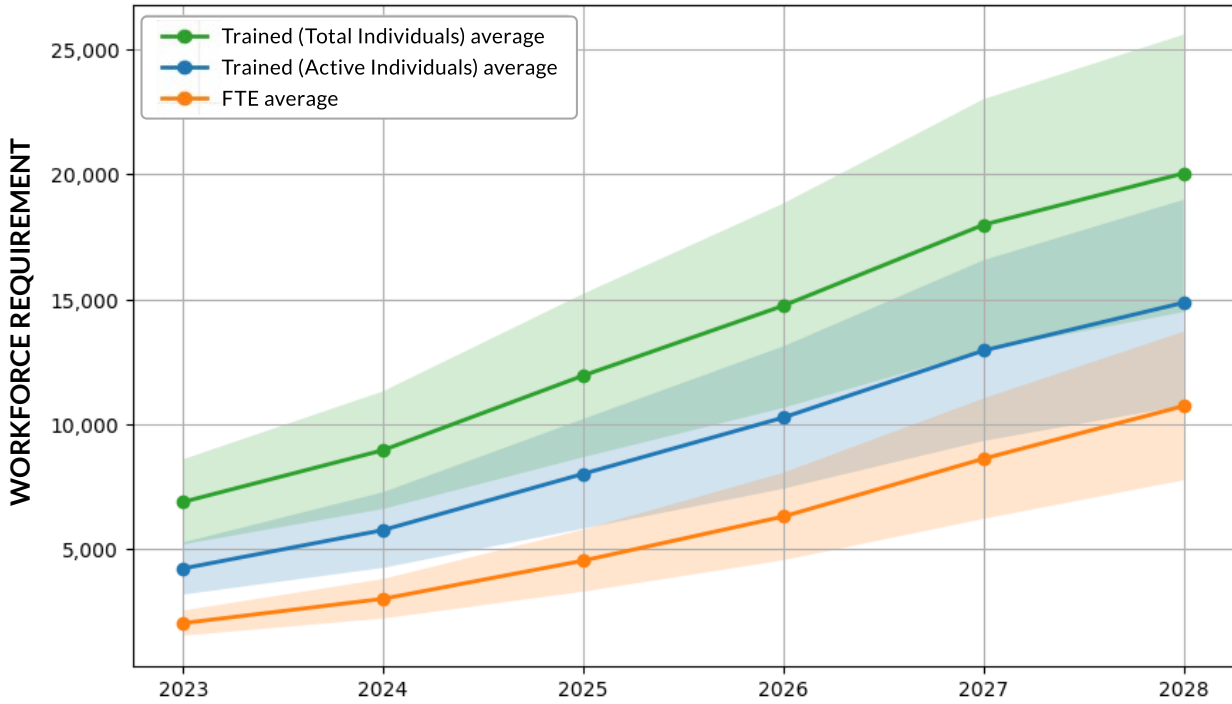
Figure 13 shows the number of individuals qualified to install heat pumps that will be required to deliver the retrofit contribution to the projected heat pump installations and maintenance under the current and future policy mix scenario, in terms of FTE requirement, trained and active individuals, and total trained individuals.



62 BEIS (2022). Future Support for Low Carbon Heat: Boiler Upgrade Scheme Impact Assessment. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1055336/boiler-upgrade-scheme-final-impact-assessment.pdf

63 BEIS (2022). Final stage Impact Assessment ECO4. Available at: <https://assets.publishing.service.gov.uk/media/6246c8f88fa8f527785ed18a/eco4-final-ia.pdf>

SCENARIO 1 - INDIVIDUALS QUALIFIED TO INSTALL HEAT PUMPS (RETROFIT)



		2023	2024	2025	2026	2027	2028
TRAINED (TOTAL INDIVIDUALS)	Upper Estimate	8,583	11,308	15,210	18,826	22,998	25,584
	Average Estimate	6,882	8,955	11,941	14,737	17,975	20,034
	Lower Estimate	5,182	6,602	8,672	10,648	12,953	14,484
TRAINED (ACTIVE INDIVIDUALS)	Upper Estimate	5,260	7,270	10,201	13,108	16,555	18,974
	Average Estimate	4,218	5,757	8,009	10,261	12,940	14,858
	Lower Estimate	3,175	4,244	5,816	7,414	9,324	10,742
TRAINED (FTE)	Upper Estimate	2,533	3,796	5,776	8,047	11,019	13,694
	Average Estimate	2,031	3,006	4,534	6,299	8,613	10,723
	Lower Estimate	1,529	2,216	3,293	4,551	6,207	7,752

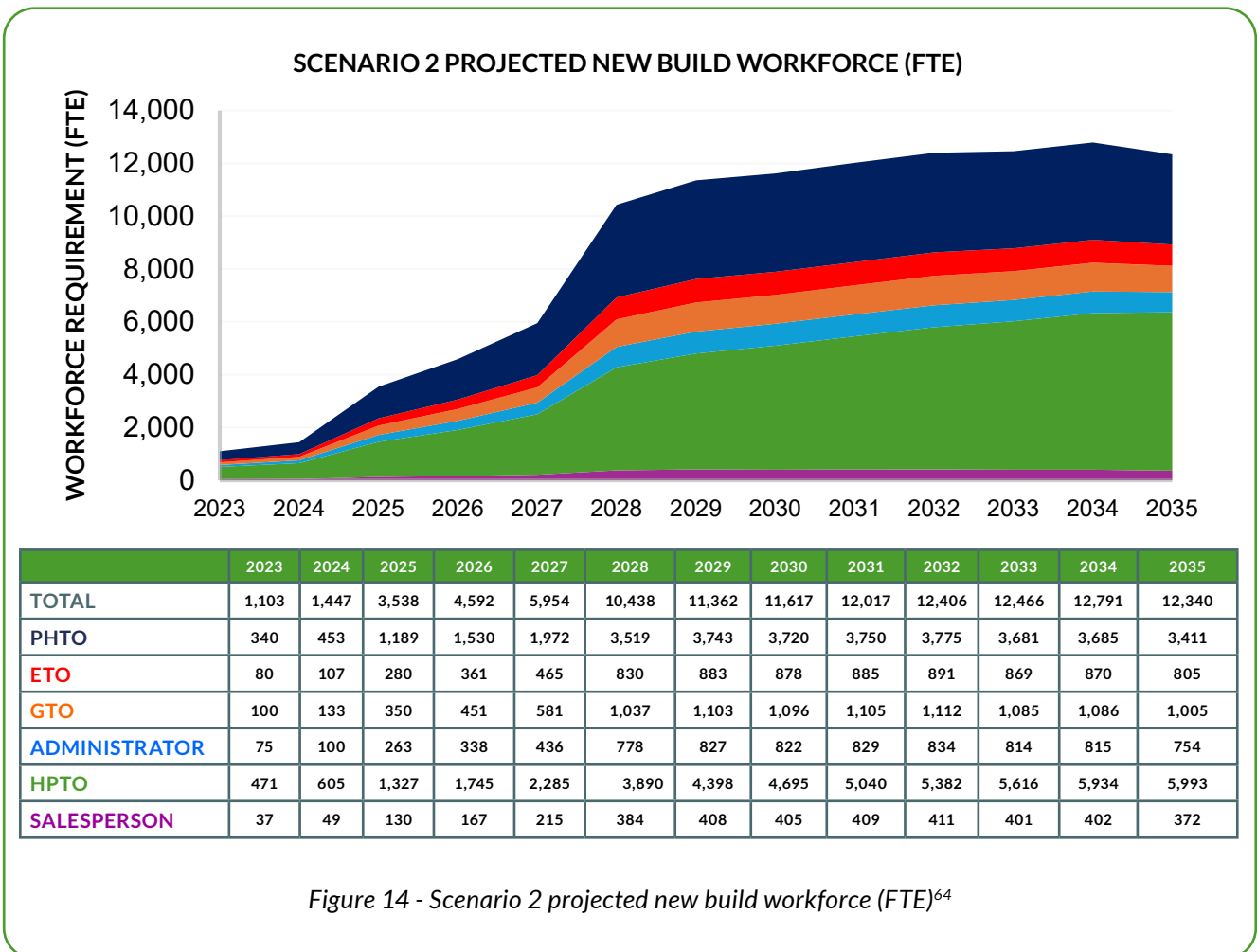
Figure 13 – Scenario 1 projected retrofit workforce – individuals qualified to install heat pumps

In Scenario 1, the number of individuals qualified to install heat pumps for the retrofit sector grows significantly between 2023 and 2028, meaning that the required workforce is projected to increase by 428% in terms of FTE roles and 252% for trained and active individuals. In terms of the total training requirement, the heat pump sector will need to train an average of 20,034 individuals to install heat pumps by 2028 to meet workforce requirements in the retrofit sector – this is a 191% increase on the total number of trained individuals in 2023. This equates to an average annual training requirement of 2,630 individuals per year or 61% of the total average training requirement for Scenario 1.

SCENARIO 2 – UK GOVERNMENT INSTALLATION TARGETS

NEW BUILD

Figure 14 shows the projected workforce required to deliver the projected new build installations under Scenario 2.



⁶⁴ PHTO = Plumbing and heating technical operative, ETO = Electrical technical operative, GTO = Groundworks technical operative, HPTO = Heat pump technical operative.

In Scenario 2, an overall new build heat pump workforce of 10,438 FTE will be required by 2028, an 846% increase on the workforce requirement for new build in 2023. This new build workforce represents 25% of the overall workforce requirement of 41,143 FTE in 2028. There is a sharp increase in the new build workforce between 2027 and 2028, with the overall new build workforce expected to almost double in size in the space of a year. As with Scenario 1, this is primarily due to the expected phase in of the FHS from 2027 which will lead to a massive increase in demand for heat pumps in the new build sector.

After this interim 2028 milestone, the total new build workforce is anticipated to grow by a further 22.5%, or 2,353 FTE in total up to the peak year of 2034. The FHS Impact Assessment⁶⁵ projects that 100% of new build homes are expected to include low carbon heating from 2028, hence the workforce is projected to remain relatively constant after then, with the only growth driven by increases in the total number of new build constructions⁶⁶. By 2035, the workforce requirement needed to service the new build sector will be 12,340 FTE. Nonetheless, over the whole period covered by Scenario 2, the new build heat pump workforce will need to grow by 11-fold between 2023 and 2035.

The largest required role is HPTO which accounts for 37% of the total projected new build workforce in 2028, rising to 49% in 2035. The total share of the workforce made up by HPTOs increases between 2028 and 2035 because the maintenance requirement becomes more significant over time, which will be met by HPTOs. The next largest role is PHTO, which constitutes 34% of the workforce requirement in 2028 and 28% in 2035. The remaining required workforce is split evenly between ETOs, GTOs, administrators and salespeople.

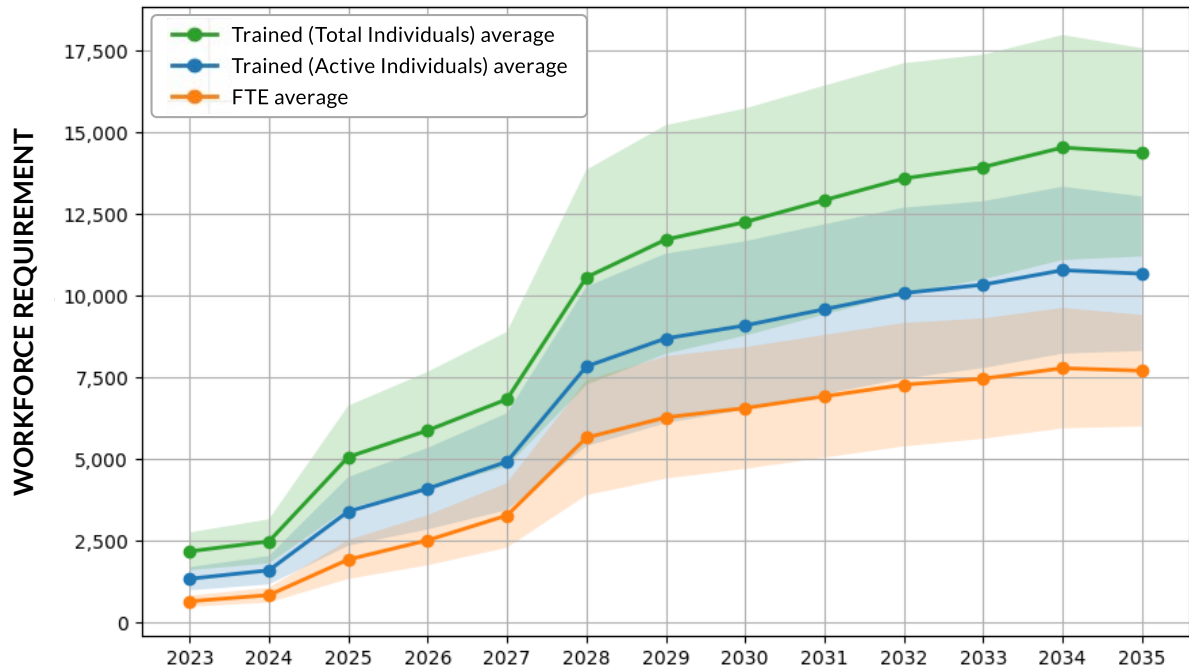
Figure 15 shows the number of individuals qualified to install heat pumps that will be required to deliver the new build contribution in Scenario 2, both in terms of FTE requirement, trained and active, and trained individuals.



65 DLUHC (2023), Future Homes Standard Consultation Stage Impact Assessment. Available at p22 https://assets.publishing.service.gov.uk/media/65cc90e139a8a7000f60d508/Future_Homes_Standard_consultation_stage_impact_assessment.pdf

2023 consultation on the energy efficiency requirements of the Building Regulations affecting new and existing dwellings. Available
66 DLUHC (2023), Future Homes Standard Consultation Stage Impact Assessment. Available at: https://assets.publishing.service.gov.uk/media/65cc90e139a8a7000f60d508/Future_Homes_Standard_consultation_stage_impact_assessment.pdf

SCENARIO 2 - INDIVIDUALS QUALIFIED TO INSTALL HEAT PUMPS (NEW BUILD)



		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
TRAINED (TOTAL INDIVIDUALS)	Upper Estimate	2,746	3,150	6,624	7,662	8,885	13,843	15,210	15,722	16,422	17,108	17,371	17,971	17,569
	Average Estimate	2,170	2,476	5,059	5,872	6,827	10,556	11,713	12,247	12,919	13,582	13,932	14,528	14,383
	Lower Estimate	1,595	1,801	3,494	4,082	4,770	7,269	8,217	8,772	9,416	10,055	10,493	11,086	11,196
TRAINED (ACTIVE INDIVIDUALS)	Upper Estimate	1,683	2,025	4,443	5,335	6,396	10,267	11,280	11,660	12,179	12,688	12,883	13,328	13,030
	Average Estimate	1,330	1,591	3,393	4,089	4,915	7,829	8,687	9,083	9,581	10,073	10,332	10,775	10,667
	Lower Estimate	977	1,158	2,343	2,842	3,434	5,391	6,094	6,506	6,983	7,457	7,782	8,222	8,304
TRAINED (FTE)	Upper Estimate	810	1,057	2,515	3,275	4,257	7,409	8,141	8,415	8,790	9,157	9,297	9,619	9,404
	Average Estimate	641	831	1,921	2,510	3,271	5,650	6,269	6,555	6,915	7,269	7,457	7,776	7,698
	Lower Estimate	471	605	1,327	1,745	2,285	3,890	4,398	4,695	5,040	5,382	5,616	5,934	5,993

Figure 15 - Scenario 2 projected new build workforce - individuals qualified to install heat pumps

Overall, it is projected that the heat pump sector will need to train a total of 10,556 individuals qualified to install heat pumps by 2028 and 14,383 by 2035 to meet workforce requirements for Scenario 2 in the new build sector. The total number of trained individuals must increase by 563% by 2035 to align with projected workforce requirements in the new build sector.

In comparison, the number of trained and active individuals is expected to increase by 489% over the same period from 1,330 in 2023 to 7,829 by 2028. The FTE workforce requirement increases from 641 FTE in 2023 to 5,650 FTE by 2028 – an increase of 781% over the period.

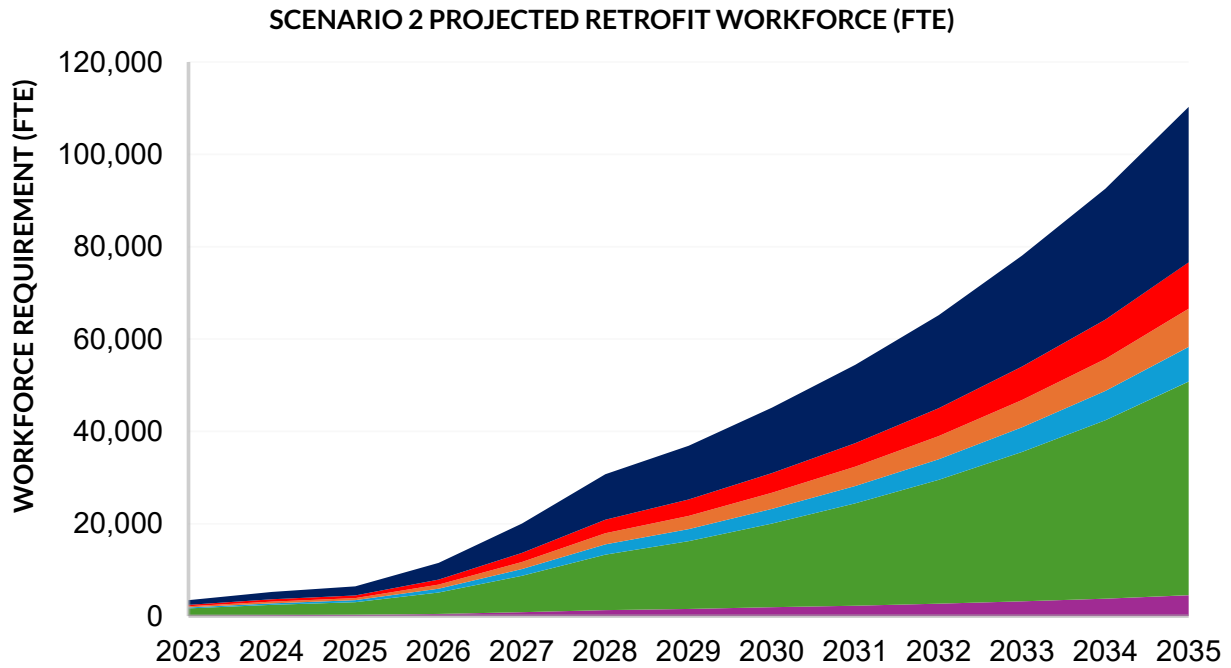
The most significant increase in the new build workforce requirement occurs between 2027 and 2028 in line with the expected phase in of the FHS, workforce requirements between 2027 and 2028 increase by 55% in terms of total trained individuals, 59% in terms of trained and active individuals, and 73% in terms of FTE. This increase in workforce requirement is expected to continue after 2028, with both the requirement for trained and active individuals and FTE requirement projected to increase by a further 36% by 2035, to 10,667 trained and active individuals and 7,698 FTE respectively.

The large percentage growth in required workforce in the new build sector is again reflective of the relatively small existing workforce, so large percentage increases belie smaller real term increases. So, a 386% increase in total trained individuals between 2023 and 2028 only equates to 8,386 additional trained individuals over this 5-year period. When taken over the 12 years between 2035, a 563% increase in average trained individuals is required which equates to an additional 12,213 trained individuals over the period or just over 1,000 per year. This is significant percentage growth, but a manageable training figure of 10% of the total average training requirement for Scenario 2.



RETROFIT

Figure 16 shows the retrofit workforce required to deliver the projected retrofit contribution to heat pump installations and maintenance visits under Scenario 2.



	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
TOTAL	3,440	5,223	6,467	11,523	20,061	30,705	36,920	45,134	54,426	65,196	78,086	92,559	110,287
PHTO	1,004	1,580	1,961	3,615	6,401	9,830	11,688	14,174	16,964	20,186	24,044	28,343	33,636
ETO	301	473	588	1,083	1,918	2,945	3,502	4,247	5,083	6,048	7,204	8,492	10,078
GTO	247	389	483	890	1,576	2,420	2,877	3,489	4,176	4,969	5,918	6,976	8,279
ADMINISTRATOR	224	353	438	807	1,429	2,194	2,608	3,163	3,786	4,505	5,366	6,325	7,507
HPTO	1,529	2,216	2,735	4,643	7,878	11,996	14,675	18,157	22,139	26,778	32,325	38,615	46,270
SALESPERSON	135	212	263	486	860	1,320	1,570	1,904	2,278	2,711	3,229	3,807	4,517

Figure 16 - Scenario 2 projected retrofit workforce (FTE)⁶⁷

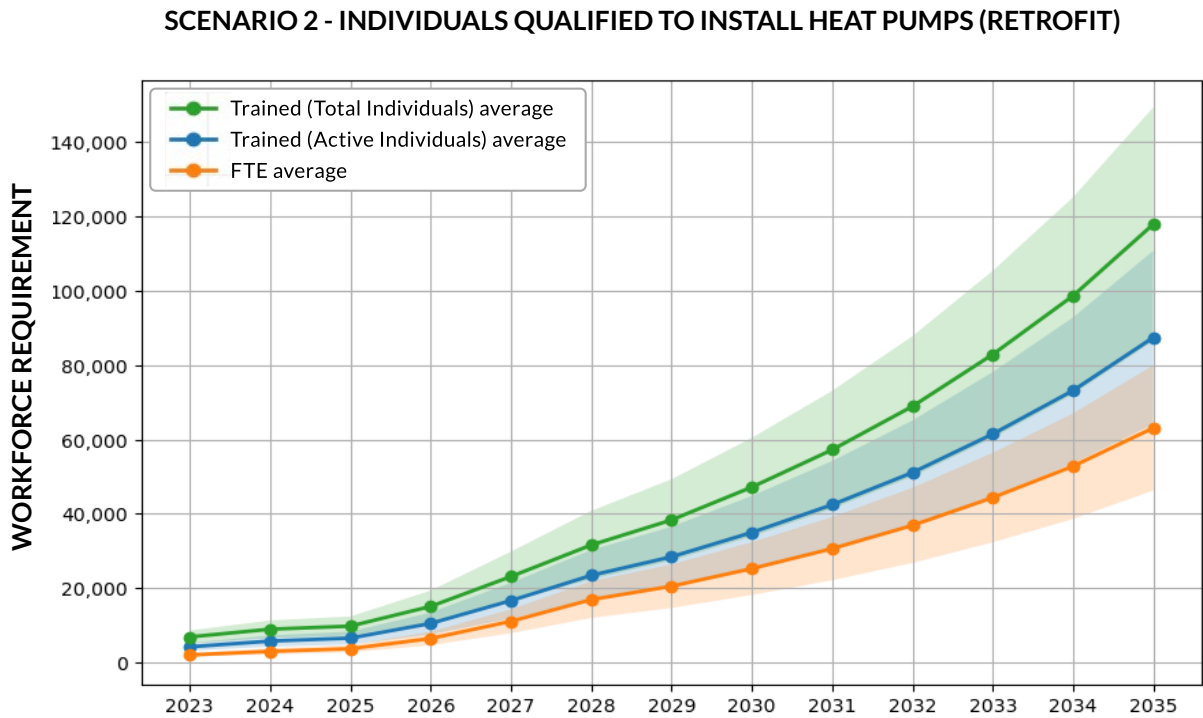
⁶⁷ PHTO = Plumbing and heating technical operative, ETO = Electrical technical operative, GTO = Groundworks technical operative, HPTO = Heat pump technical operative.

In Scenario 2, a heat pump workforce of 30,705 FTE will be required by 2028 to service the retrofit sector. This represents an increase by 793% on the estimated size of the retrofit workforce in 2023. By the peak year of 2035, the retrofit heat pump workforce will need to grow even further to 110,287 FTE – over three and a half times the size of the required workforce in 2028. Over the whole period, the heat pump workforce will need to increase by 3,106% between 2023 and 2035. There is a gradual increase in retrofit workforce requirement at the start of the period but the rate of increase ramps up from 2025 onwards to meet the Government’s 2028 and 2035 heat pump installation targets.

In 2023, the retrofit sector accounted for an estimated 76% of the overall heat pump workforce; this is projected to rise to 90% by 2035. This rise can be explained by the fact that the level of new build installations is expected to remain constant once the FHS has been introduced. Therefore, to reach the Government’s heat pump installation targets, installations will need to increase markedly in the retrofit sector from 2025 onwards. Accordingly, the retrofit sector will need to absorb most of the additional installations from 2025 onwards, hence the increase in the proportion of the workforce operating in the retrofit sector. The largest required role is HPTO which accounts for 39% of the total projected retrofit workforce in 2028, rising to 42% in 2035. The next largest role is PHTO, which constitutes 32% of the workforce requirement in 2028 and 30% in 2035. The remaining workforce requirement is split between ETOs, GTOs, administrators and salespeople.



Figure 17 shows the number of individuals qualified to install heat pumps that will be required to deliver the retrofit contribution to the Government’s 2028 and 2035 heat pump installation target.



		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
TRAINED (TOTAL INDIVIDUALS)	Upper Estimate	8,583	11,308	12,366	19,319	29,801	40,779	49,255	60,405	73,056	87,743	105,315	125,100	149,290
	Average Estimate	6,882	8,955	9,784	15,090	23,121	31,596	38,337	47,164	57,209	68,887	82,854	98,623	117,869
	Lower Estimate	5,182	6,602	7,202	10,861	16,441	22,413	27,418	33,923	41,362	50,030	60,394	72,146	86,448
TRAINED (ACTIVE INDIVIDUALS)	Upper Estimate	5,260	7,270	8,294	13,451	21,452	30,243	36,529	44,799	54,182	65,074	78,106	92,779	110,719
	Average Estimate	4,218	5,757	6,562	10,507	16,644	23,433	28,432	34,979	42,429	51,089	61,448	73,142	87,416
	Lower Estimate	3,175	4,244	4,830	7,563	11,835	16,622	20,334	25,159	30,676	37,104	44,790	53,506	64,113
TRAINED (FTE)	Upper Estimate	2,533	3,796	4,696	8,258	14,279	21,826	26,363	32,331	39,103	46,964	56,369	66,958	79,906
	Average Estimate	2,031	3,006	3,715	6,450	11,078	16,911	20,519	25,244	30,621	36,871	44,347	52,787	63,088
	Lower Estimate	1,529	2,216	2,735	4,643	7,878	11,996	14,675	18,157	22,139	26,778	32,325	38,615	46,270

Figure 17 - Scenario 2 projected retrofit workforce – individuals qualified to install heat pumps

A significant increase in the number of individuals qualified to install heat pumps will be required in the retrofit sector to reach the Government's 2028 heat pump installation target. Overall, it is projected that the sector will need a total of 31,596 individuals qualified to install heat pumps by 2028 and 117,869 by 2035 to meet workforce requirements for Scenario 2 in the retrofit sector. This means that the sector will need to train an average of 9,249 new individuals per year to install heat pumps between 2023 and 2035 just to service the retrofit requirement in Scenario 2. This amounts to 90% of the total training requirement for Scenario 2.

To reach this, average number of trained and active individuals will increase by 456% from 4,218 in 2023 to 23,433 in 2028. In the same period, the average FTE workforce will increase by 733% from 2,031 FTE in 2023 to 16,911 FTE in 2028.

After the 2028 interim target, the number of individuals qualified to install heat pumps will need to increase further to meet the Government's target for 1.6 million heat pump installations by 2035. The FTE workforce requirement, the number of trained and active individuals, and the total number of trained individuals are projected to grow by a further 273% up to 2035, to 63,088 FTE, 87,416 trained and active individuals, and 117,869 trained individuals respectively.



INSTALLATION AND MAINTENANCE WORKFORCE

This section compares the projected workforce for the installation and maintenance of heat pumps for Scenario 1 and Scenario 2. This distinction is made for modelling purposes; in practice, individuals are likely to work across both installation and maintenance tasks. The maintenance workforce is considerably smaller than the installation workforce. This reflects the fact that only a minority of properties in the UK already have heat pumps which inevitably puts a higher demand on installation until most households are converted to low carbon heating systems⁶⁸.

There are several notable differences between the installation and maintenance workforce. The first is that the installation workforce requirement is significantly larger than the maintenance workforce. This is because it is more labour intensive to install a heat pump than it is to maintain one. The second is that the composition of the workforce is notably different between installation and maintenance. Installation requires the full range of workforce roles and functions from administration, sales, electrical work, and plumbing and heating work. By comparison, it is assumed that typical maintenance checks can be completed by a HPTO alone. It is also assumed that the skills required to install heat pumps will generally be sufficient to service and maintain them⁶⁹.



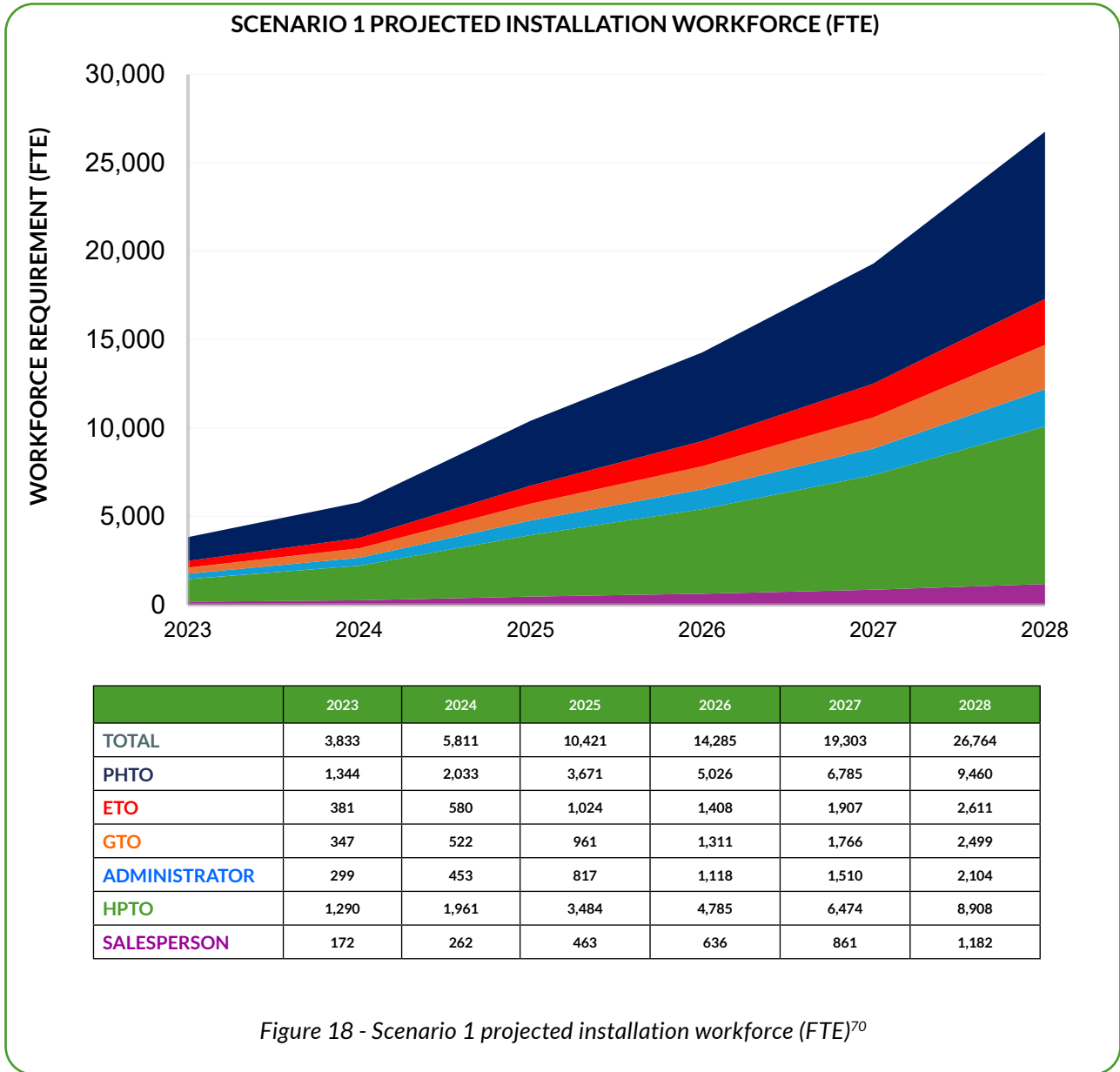
68 Office for National Statistics (2023). Census 2021: how homes are heated in your area. Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/housing/articles/census2021howhomesareheatedinyourarea/2023-01-05#:~:text=Mains%20gas%20central%20heating%20was,more%20on%20other%20heating%20sources.>

69 This scenario models routine maintenance which can be carried out by a HPTO – it involves an annual service and any required maintenance which may be needed alongside that. This routine maintenance requirement does not include specific issues that may arise with the electrical system or plumbing and hot water system, which could require an ETO or PHTO to carry out repairs.

SCENARIO 1 – CURRENT AND FUTURE POLICY MIX

INSTALLATION

Figure 18 models the projected workforce that will be needed to install the volume of heat pumps set out in Scenario 1.



In this scenario, an overall (installation and maintenance) workforce of 29,498 FTE is needed in the peak year of 2028 to install 435,722 heat pumps. 91% of this workforce (26,764 FTE) is associated with the installation of heat pumps, with the remaining 9% (2,735 FTE) required for maintenance of existing heat pump systems. This is almost seven times the size of the installation workforce in 2023 (3,833 FTE). Of the installation workforce required by 2028, 35% is PHTOs (9,460 FTE), while 33% is HPTOs (8,908 FTE), with the remaining 8,396 FTE roles divided between ETOs, GTOs, administrators and salespeople.

⁷⁰ PHTO = Plumbing and heating technical operative, ETO = Electrical technical operative, GTO = Groundworks technical operative, HPTO = Heat pump technical operative.

MAINTENANCE

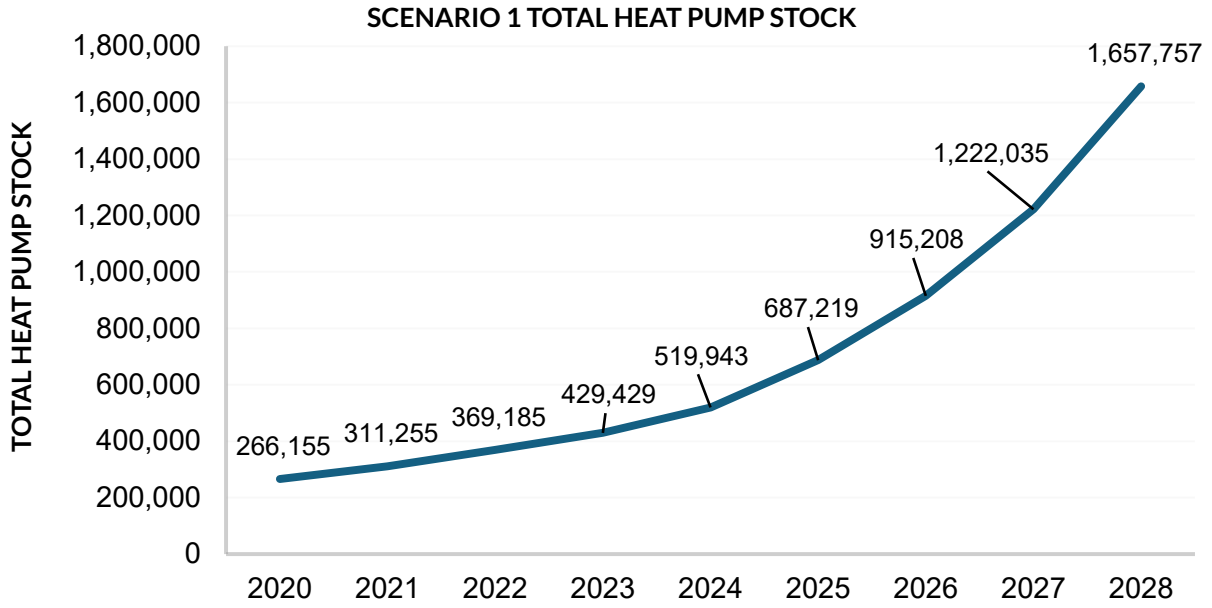


Figure 19 – Scenario 1 total heat pump stock (2020 -2028)⁷¹

The maintenance requirement over the period of Scenario 1 increases commensurately with the total number of installed heat pumps. The cumulative number of heat pumps installed increases by over sixfold over a period of 8 years from 266,155 in 2020 to nearly 1.7 million in 2028.

Figure 20 below models the projected workforce that will be needed to maintain the volume of heat pumps set out in Scenario 1.

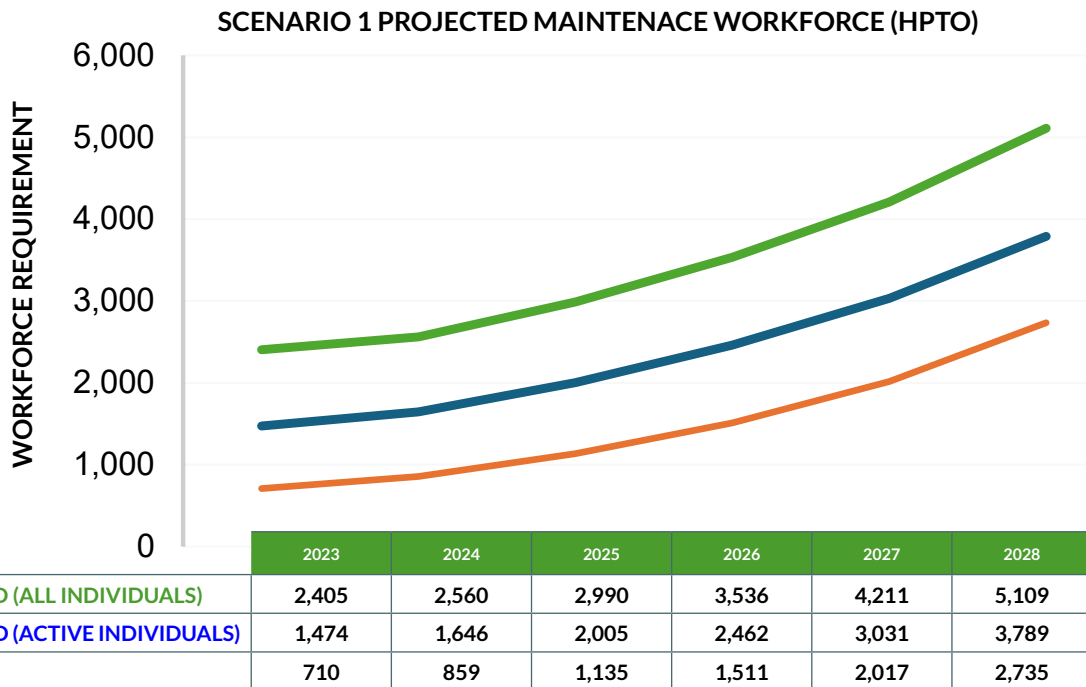


Figure 20 - Scenario 1 projected maintenance workforce (HPTO)

⁷¹ Data from 2019 onwards is derived from heat pump sales data submitted by HPA members. Estimates for the total heat pump stock pre-2019 are based on Statista data, source: Statista (2023). Annual amount of heat pumps in operation in the United Kingdom (UK) from 2013 to 2019. Available at: <https://www.statista.com/statistics/740491/heat-pumps-in-operation-uk/>.

The primary role required to carry out maintenance of existing heat pumps is HPTO. The sector will need to train a total 5,109 HPTOs by 2028 to fulfil heat pump maintenance requirements in that year. In comparison, 3,789 trained and active individuals will be required for maintenance in 2028, up 157% from 1,474 trained and active individuals in 2023. 2,735 FTE HPTOs are required to carry out maintenance of the total heat pump stock assumed by 2028 under Scenario 1. This is 23% of the overall HPTO workforce for Scenario 1, which represents an increase of 285% from the 710 FTE HPTO requirement in 2023.

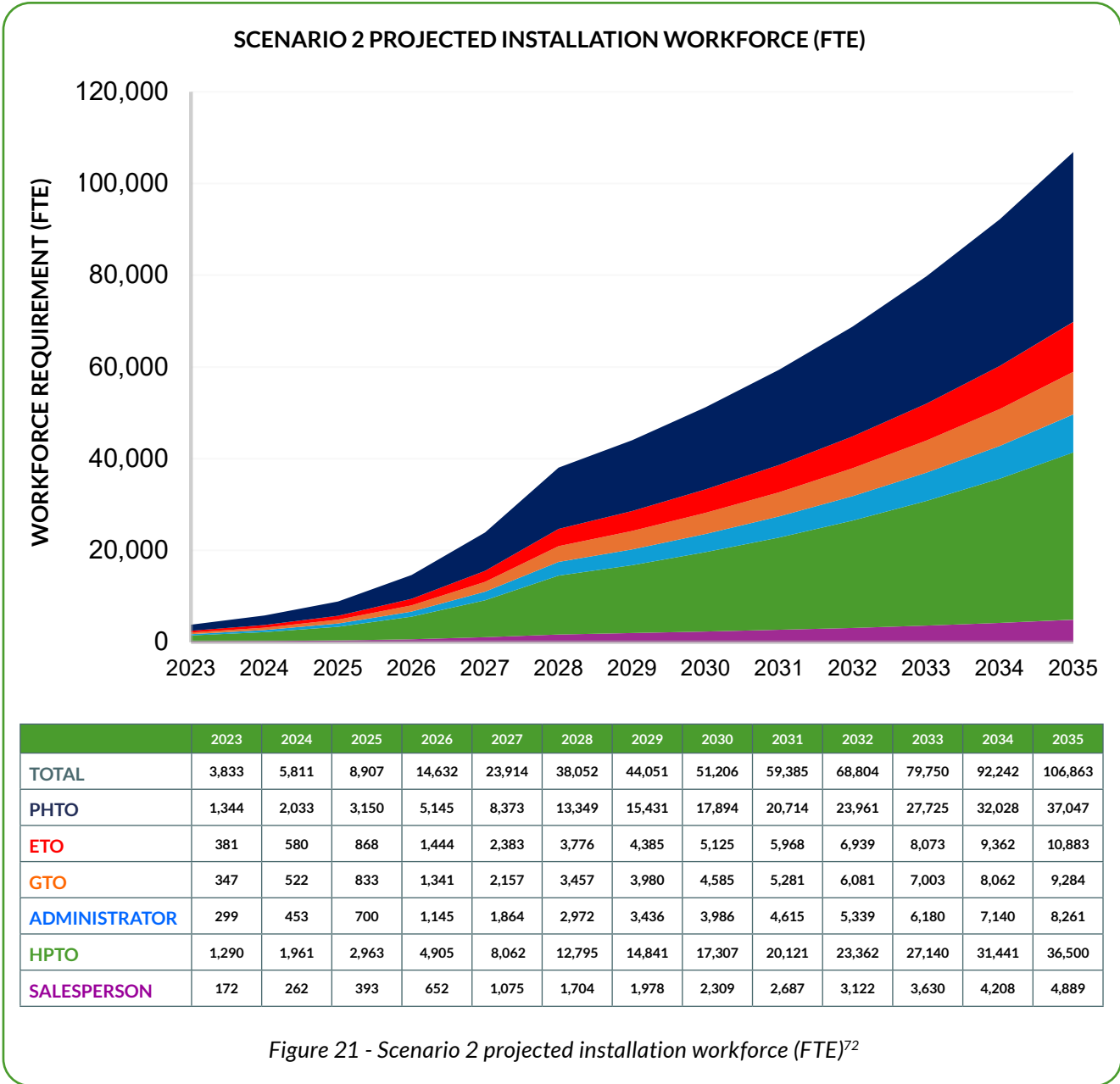
The maintenance workforce requirement represents a significant minority of the overall annual training requirement for individuals qualified to install heat pumps between 2023 and 2028 at 13%.



SCENARIO 2 - UK GOVERNMENT INSTALLATION TARGETS

INSTALLATION

Figure 21 shows the installation workforce that will be required to meet the Government's target for 600,000 heat pump installations per year by 2028 and 1.6 million per year by 2035.



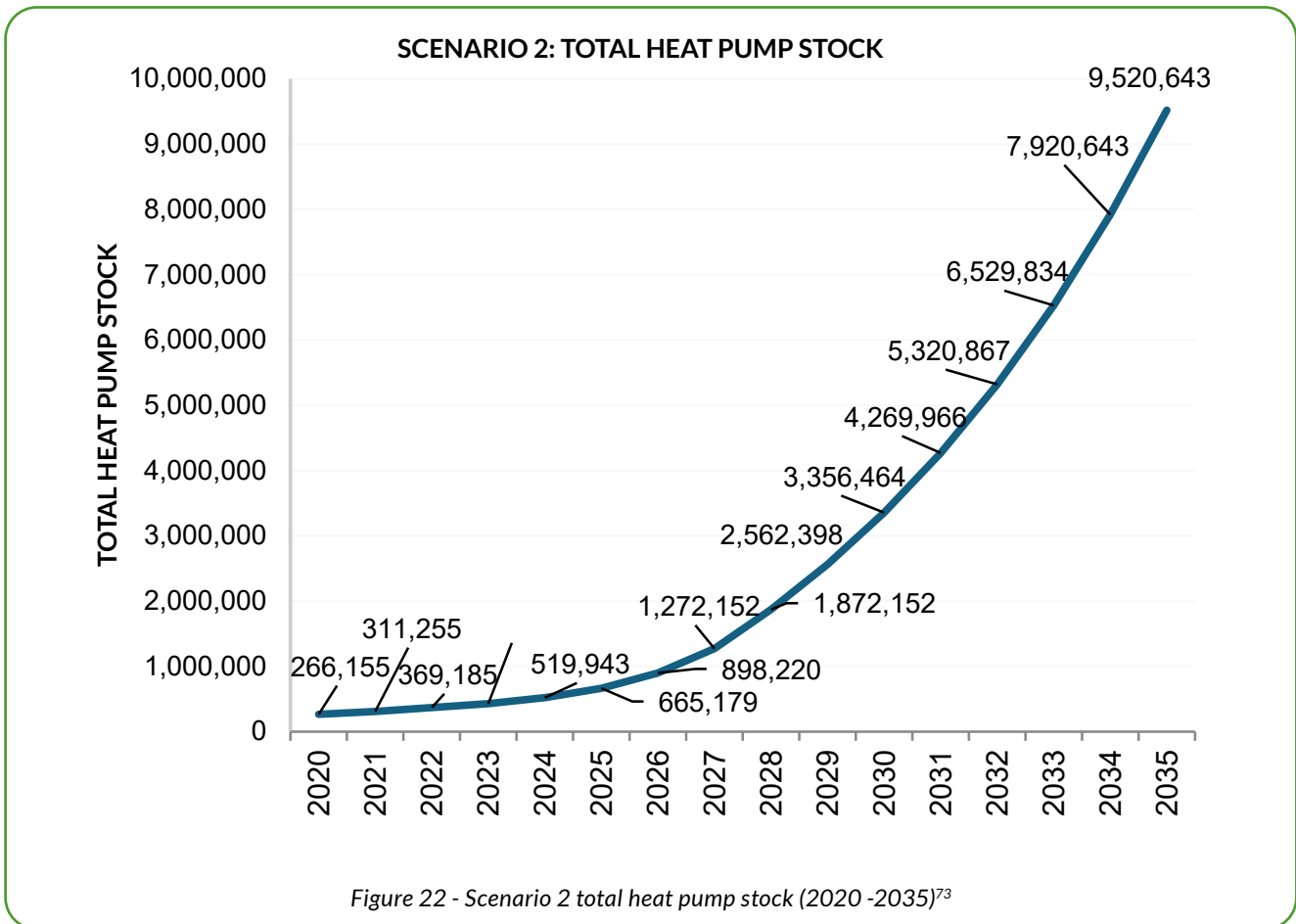
A total workforce of 41,143 FTE will be required by 2028 to deliver 600,000 annual heat pump installations along with required maintenance. Of this overall workforce, 92% will be required for the installation of new heat pumps with the remaining 8% of the workforce required for maintenance. The installation workforce requirement of 38,052 FTE by 2028 is 42% higher than the equivalent requirement in Scenario 1. This is because in Scenario 2, a greater number of installations will be required to reach the Government's 600,000 annual installation target. In Scenario 2, 35% of the installation requirement in 2028 is constituted of PHTOs (13,349 FTE) and 34% of HPTOs (12,795 FTE), with the remaining 11,908 FTE spread across other roles.

⁷² PHTO = Plumbing and heating technical operative, ETO = Electrical technical operative, GTO = Groundworks technical operative, HPTO = Heat pump technical operative.

An installation workforce of 106,863 FTE will be required by 2035 to meet the projected level of annual heat pump installations. This represents 87% of the total workforce requirement in this year and a growth of nearly 2,700% compared to the 2023 installation workforce. The proportion of the workforce required for installation in 2035 is lower than 2028. This is because, by 2035 – the peak year in Scenario 2 – the maintenance requirement is proportionally larger due to the high number of heat pumps already installed. By contrast, in 2028, the number of heat pumps already installed is smaller in proportion to the number of new installations. As the existing heat pump stock is larger in 2035, so is the annual maintenance requirement.

In terms of roles required, the largest requirement for installation is HPTOs and PHTOs which represent 34% and 35% respectively of the installation workforce requirement in 2035, with 36,500 FTE and 37,047 FTE required in each role respectively by 2035. The remaining third is split between ETOs, GTOs, administrators and salespeople.

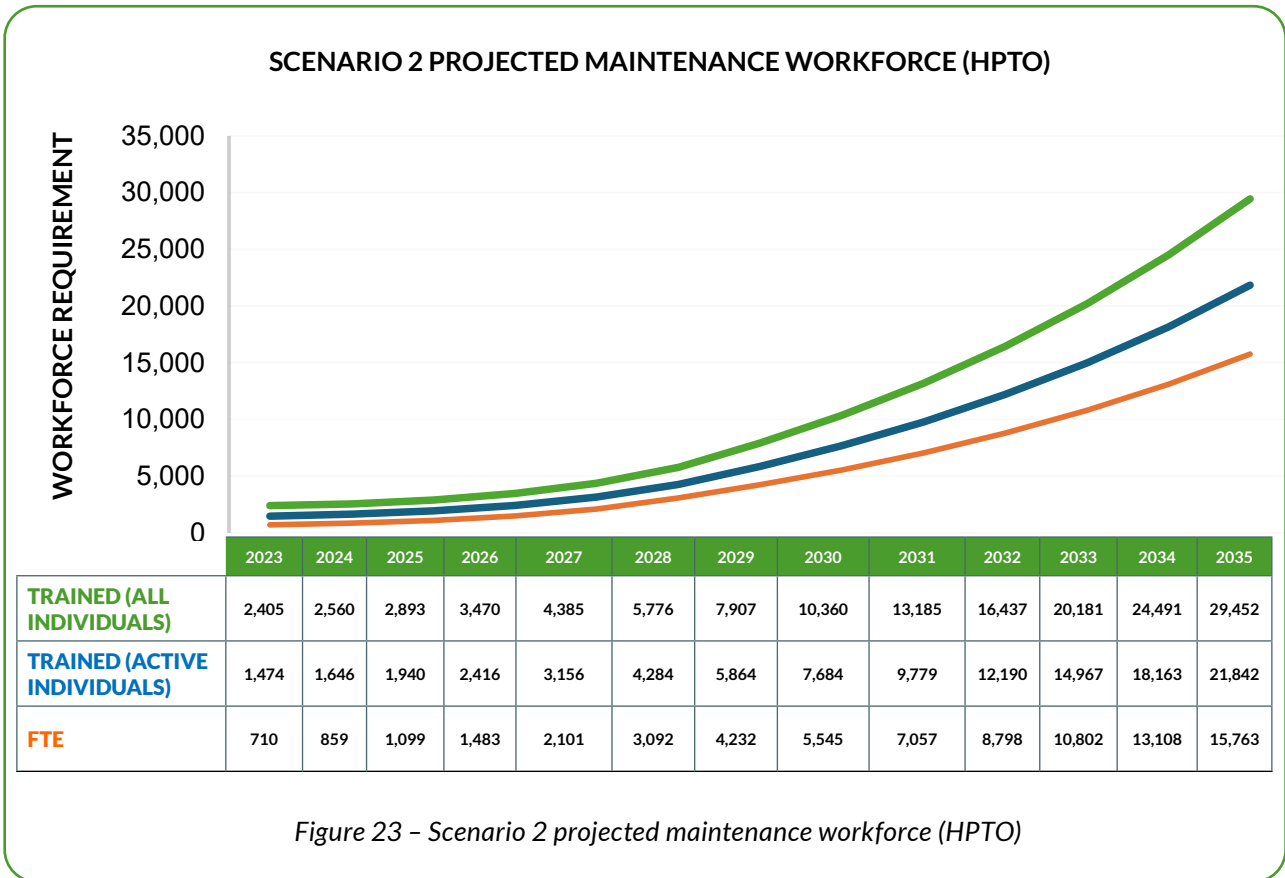
MAINTENANCE



The maintenance requirement over the period of Scenario 2 increases commensurately with the total number of installed heat pumps. The cumulative number of heat pumps installed increases by sevenfold over an 8-year period, from 266,155 in 2020 to nearly 1.9 million in 2028, before rising further to 9.5 million by 2035. The number of heat pumps increases substantially, with an increase of 7.65 million between 2028 and 2035. This represents an average growth of just over 1 million heat pumps per year over this 7-year period.

⁷³ Data from 2019 onwards is derived from heat pump sales data submitted by HPA members. Estimates for the total heat pump stock pre-2019 are based on Statista data, source: Statista (2023). Annual amount of heat pumps in operation in the United Kingdom (UK) from 2013 to 2019. Available at: <https://www.statista.com/statistics/740491/heat-pumps-in-operation-uk/>.

Figure 23 models the projected HPTO workforce that will be needed to maintain the total volume of heat pumps set out in Scenario 2.



In Scenario 2, the sector will need to train a total of 5,776 HPTOs by 2028 to meet maintenance workforce requirements. This equates to 4,284 trained and active individuals and 3,092 FTE. This represents 8% of the total FTE heat pump workforce requirement and 19% of the HPTO requirement for 2028. Between 2023 and 2028, the HPTO maintenance workforce requirement increases by 140% in terms of total trained individuals, 191% in terms of trained individuals and 335% in terms of FTE roles, reflecting again, an increase in the number of installed heat pumps driving up the maintenance requirement for installed heat pumps.

A significant maintenance workforce requirement of 29,451 HPTOs will need to be trained by 2035. This translates to 21,842 trained and active HPTOs and 15,763 FTE. This represents 13% of the total heat pump workforce requirement and 30% of the HPTO requirement for 2035. Between 2023 and 2035, the workforce requirement increases by 1,125% for total trained individuals, 1,382% for trained and active individuals and 2,120% in terms of FTE roles. The lower rate of required increase for total trained individuals reflects the fact that the labour utilisation rate – the proportion of time an individual spends working on heat pump maintenance – is expected to increase between 2023 and 2035, as more people become HPTOs on a full-time basis. There is a significant increase in maintenance workforce requirements over the course of Scenario 2 by all workforce metrics.

REGIONAL WORKFORCE PROJECTIONS

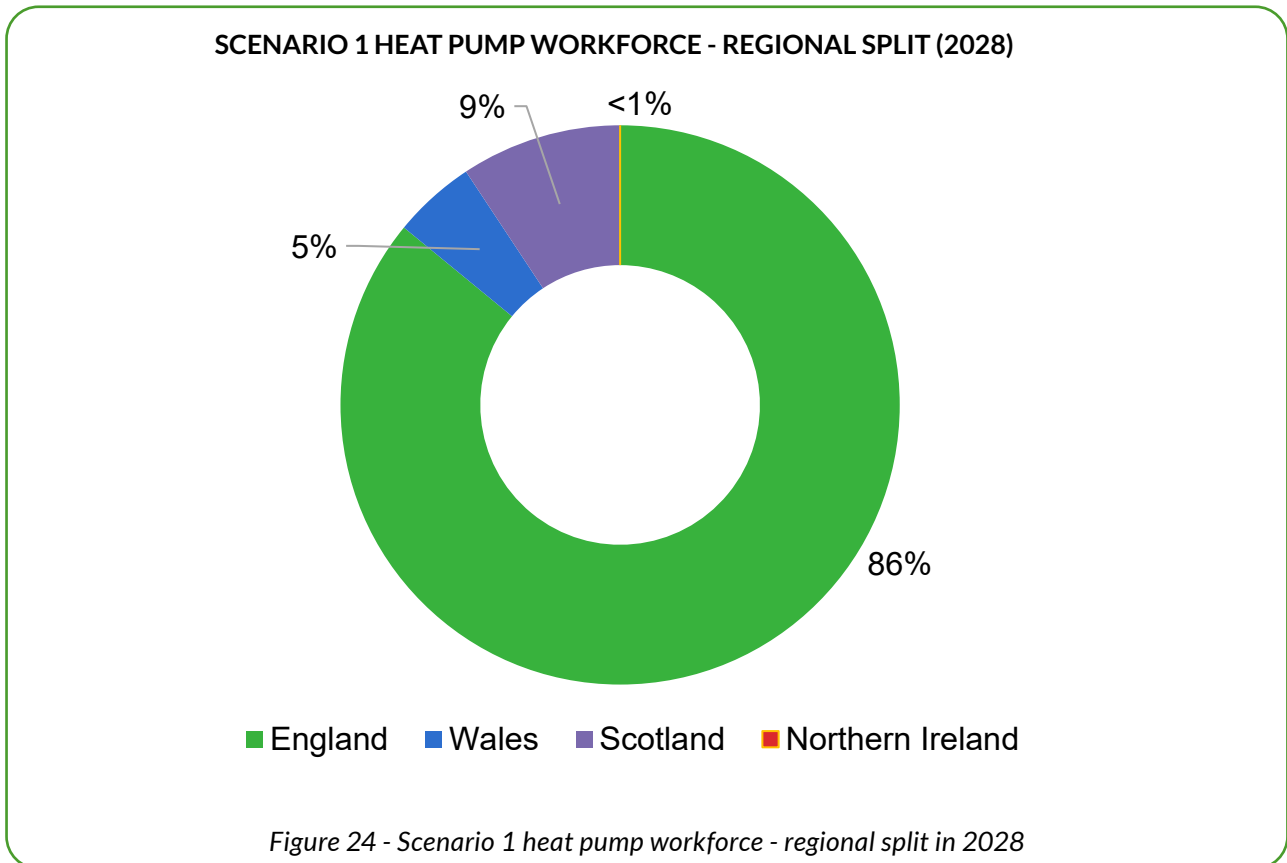
This section of the report addresses regional workforce projections for each of the two scenarios. Regional in this context means the four nations of the UK - England, Scotland, Wales and Northern Ireland

The importance of regional workforce is clear given that heating policy is partly devolved to Wales, Scotland and Northern Ireland. These devolved nations also make up a sizable minority of the UK population at a combined 15.3%⁷⁴.

SCENARIO 1 – CURRENT AND FUTURE POLICY MIX

Scenario 1 models heat pump installation and workforce requirements based on the current and future policy mix within the UK, covering England, Scotland, Wales and Northern Ireland.

Figure 24 shows the expected total heat pump workforce⁷⁵ split between the three nations within the UK for Scenario 1.



This split is based on the relative volume of properties and associated installation projections in each country and is assumed to remain constant throughout the period covered by Scenario 1. Out of the total workforce requirement in the UK, the majority (86%) will be needed in England, with 9% required in Scotland, 5% in Wales, and less than 1% in Northern Ireland. In this scenario, 86% of the required PHTO workforce and ETO workforce are in England. The heat pump workforce in England, Scotland and Wales is roughly proportionate

⁷⁴ Office for National Statistics (2024). Population estimates for the UK, England, Wales, Scotland, and Northern Ireland: mid-2022. Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/annualmidyearpopulationestimates/mid2022>

⁷⁵ Total heat pump workforce means all of the roles in scope of this report. These roles are set out in Table 1.

to their share of the UK building stock⁷⁶. For example, Wales’s population is approximately 4.5% of the UK total, and Scotland’s is 8%⁷⁷. For Northern Ireland, the proportion of the heat pump workforce is lower than their proportion of the building stock because the underdeveloped policy framework means that heat pump deployment is projected to be slower in Northern Ireland than the rest of the UK.

Table 3 –Total workforce requirements for England, Scotland, Wales and Northern Ireland in the peak year 2028 for Scenario 1⁷⁸

	ENGLAND	SCOTLAND	WALES	NORTHERN IRELAND ⁷⁹	ROLE TOTAL (FTE)
PHTO	8,128	879	452	2	9,460
ETO	2,242	243	125	1	2,611
GTO	2,147	232	119	1	2,499
Administrator	1,807	195	100	1	2,104
Salesperson	1,014	110	56	1	1,182
HPTO	10,003	1,082	556	2	11,643
Country Total Workforce	25,341	2,741	1,408	8	29,498

Across the four nations, the projected workforce that will be required by 2028 in Scenario 1 is 25,341 FTE in England, 2,741 FTE in Scotland, 1,408 FTE in Wales and 8 FTE in Northern Ireland. Across all four countries combined, the largest role requirement is for HPTOs. This represents 39% of the total workforce requirement, with 10,003 FTE needed in England by 2028, 1,082 FTE in Scotland, 556 FTE in Wales and 2 FTE in Northern Ireland. The next largest requirement is for PHTOs at 32% of the total workforce requirement by 2028 across the four countries equating to 8,128 FTE in England, 879 FTE in Scotland, 452 FTE in Wales and 2 FTE in Northern Ireland. The remaining 29% of the workforce is split relatively evenly between ETOs, GTOs, administrators and salespeople.

⁷⁶ Devolved nation figures are a percentage of the UK total. All the devolved policies considered contribute to the UK whole. Where policies are UK-wide, we lacked sub-regional data to map impact and deployment per nation. Where specific devolved schemes exist, impact assessments were limited in their time scope meaning that it was difficult to map accurately the distribution over time and risked underestimating the workforce requirements.

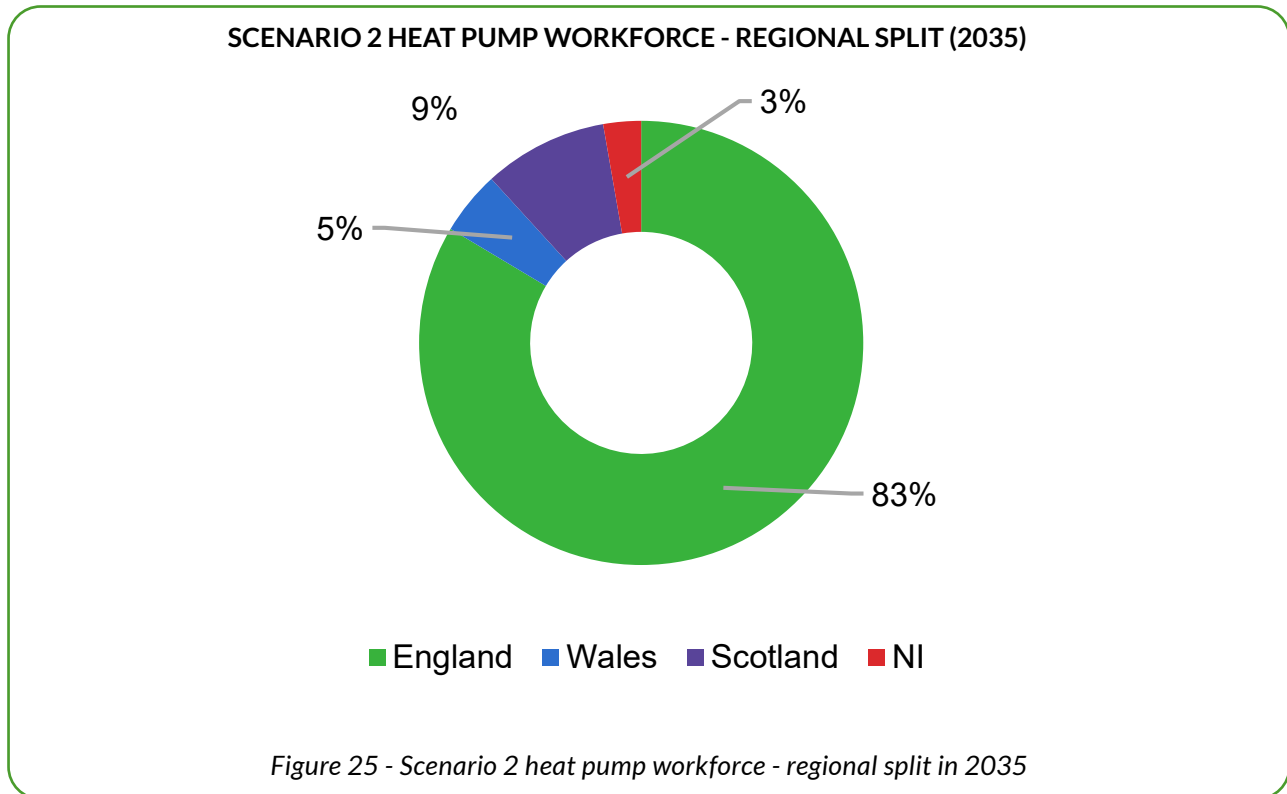
⁷⁷ Office for National Statistics (2024), Population estimates for the UK, England, Wales, Scotland, and Northern Ireland: mid-2022. Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/annualmidyearpopulationestimates/mid2022>

⁷⁸ PHTO = Plumbing and heating technical operative, ETO = Electrical technical operative, GTO = Groundworks technical operative, HPTO = Heat pump technical operative.

⁷⁹ According to the MCS Data Dashboard, there are only 9 MCS certified heat pump contractors in Northern Ireland (as of October 2024). MCS data is derived from MCS (2024). The MCS Data Dashboard. Available at: <https://datadashboard.mcscertified.com/InstallationInsights>

SCENARIO 2 – UK GOVERNMENT INSTALLATION TARGETS

Scenario 2 is based on UK-wide Government heat pump installation targets. Therefore, this scenario includes heat pump installation projections and workforce requirements for all four nations of the UK. Figure 25 shows the expected heat pump workforce split between the four nations within the UK for Scenario 2.



This split is based on the relative volume of properties in each country. Out of the total UK workforce requirement, the majority (83%) will be needed in England, with 9% required in Scotland, 5% in Wales and 3% in Northern Ireland. This split is expected to remain constant throughout the period covered by Scenario 2. The populations are proportionate to the overall populations. Northern Ireland has a population size of 2.8% of the UK population⁸⁰ and 3% of the workforce. Table 4 shows the total workforce requirement for England, Scotland, Wales and Northern Ireland in the peak year 2035 for Scenario 2.

⁸⁰ Office for National Statistics (2024), Population estimates for the UK, England, Wales, Scotland, and Northern Ireland: mid-2022. Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/annualmidyearpopulationestimates/mid2022>

Table 4 – Total workforce requirement for England, Scotland, Wales and Northern Ireland for 2035 for Scenario 2⁸¹

	ENGLAND	SCOTLAND	WALES	NORTHERN IRELAND	ROLE TOTAL (FTE)
PHTO	30,962	3,348	1,720	1,017	37,047
ETO	9,095	983	505	299	10,883
GTO	7,759	839	431	255	9,284
Administrator	6,904	746	384	227	8,261
Salesperson	4,086	442	227	134	4,889
HPTO	43,679	4,723	2,427	1,435	52,263
Country Total Workforce	102,485	11,081	5,694	3,367	122,627

Across the UK, the required heat pump workforce in Scenario 2 is 102,485 FTE in England, 11,081 FTE in Scotland, 5,694 FTE in Wales and 3,367 FTE in Northern Ireland. In all countries, the largest role requirement is for HPTOs, representing 43% of the overall heat pump workforce requirement. This means that 43,679 FTE are needed in England by 2035, 4,723 FTE in Scotland, 2,427 FTE in Wales and 1,435 FTE in Northern Ireland. The next largest requirement is for PHTOs which constitute 30% of the total workforce required by 2035 across the four nations of the UK. This translates into a PHTO workforce requirement of 30,962 FTE in England, 3,348 FTE in Scotland, 1,720 FTE in Wales and 1,017 FTE in Northern Ireland. The remaining 27% of the workforce is divided between ETOs, GTOs, administrators and salespeople.

81 PHTO = Plumbing and heating technical operative, ETO = Electrical technical operative, GTO = Groundworks technical operative, HPTO = Heat pump technical operative.

CONCLUSIONS

The purpose of this report is to determine the number of individuals needed within the domestic heat pump workforce to deliver the heat pump installations projected under two deployment scenarios:

Scenario 1: Current and future policy⁸². This scenario models heat pump deployment in the period 2023-2028 according to current policies already in place, as well as proposed policies that are set to come into force in future, for example, the FHS⁸³ and CHMM⁸⁴. It considers the heat pump workforce that will be required to deliver this level of deployment.

Scenario 2: UK Government Installation targets⁸⁵. This scenario considers the workforce that will be required to meet the following Government targets for heat pump deployment:

To install 600,000 heat pumps per year by 2028⁸⁶.

To install 1.6 million heat pumps per year by 2035⁸⁷.

Both Scenario 1 and Scenario 2 cover the United Kingdom, including England, Scotland, Wales, and Northern Ireland⁸⁸.

The report models deployment scenarios as a tool to determine the training requirement for the heat pump workforce under certain conditions. It does not consider:

- **The heat pump manufacturing workforce:** The report does not consider roles in the broader heat pump supply chain such as manufacturing and assembly of heat pumps.
- **Additional training drivers:** To achieve the necessary net growth in workforce, training demand will be greater than workforce need. This will be due to 5 yearly re-training cycles required by some courses and need for CPD, together with a need to train to replace those who leave a given role for a variety of reasons (such as retirement, health, career change, promotion, etc.).

⁸² These are either current policies which are already in place or ones that are expected with a reasonable degree of confidence to be implemented, for example those where the Government has set out a clear timeline for introduction (e.g. FHS) or has already consulted on them. This reflects the policy landscape at the time of development in July 2024.

⁸³ Department for Levelling Up, Housing and Communities (2023) The Future Homes Standard 2023 consultation on the energy efficiency requirements of the Building Regulations affecting new and existing dwellings. Available at: https://assets.publishing.service.gov.uk/media/65cc90e139a8a7000f60d508/Future_Homes_Standard_consultation_stage_impact_assessment.pdf

⁸⁴ DESNZ (2023). Clean Heat Market Mechanism. Available at: https://assets.publishing.service.gov.uk/media/6424154560a35e000c0cb07f/clean_heat_market_mechanism.pdf

⁸⁵ Please note that these targets were announced by the previous Conservative Government. As of the time of writing of this report, these are assumed to remain in place, as there has no indication to the contrary from the new Labour Government. Nonetheless, the report does not account for any changes that may be implemented by the new Government between then and the publication date of this report. The same applies to all subsequent references to these targets in the report.

⁸⁶ HM Government (2020). The Ten Point Plan for a Green Industrial Revolution. Available at: https://assets.publishing.service.gov.uk/media/5fb5513de90e0720978b1a6f/10_POINT_PLAN_BOOKLET.pdf

⁸⁷ HM Government (2023). Responding to the Climate Change Committee's (CCC) 2023 Annual Progress Report to Parliament. Available at: <https://assets.publishing.service.gov.uk/media/666c1642fed5bd09e5195a4b/ccc-annual-progress-report-to-parliament-2023-government-response.pdf>

⁸⁸ Northern Ireland has a negligible impact on deployment in Scenario 1 of this report because the policy landscape for heat pump deployment is currently minimal. The only dedicated policy that will apply there (from April 2025) is the Clean Heat Market Mechanism, meaning it is challenging to accurately model policy-driven deployment for Northern Ireland. Analysis of MCS data suggests that Northern Ireland installations only accounted for 0.02% of UK installations in 2023. Therefore, the inclusion of Northern Ireland data in UK-wide figures has a negligible impact on the findings.

- **Non-domestic heat pump installations:** This report focusses on the domestic heat pump workforce. While there will be some inevitable overlap between the non-domestic and domestic heat pump workforces, the non-domestic workforce and any overlap is not modelled in this report.

The approach to the report recognises the relative overlap in practice between the HPTO and PHTO roles. It therefore considers a range of training requirements depending on upper and lower estimates of this overlap and presents an average training requirement within this range. However, due to the exclusion of additional training drivers and non-domestic heat pump installations, the true workforce requirement will be larger than the one presented in this report.

WORKFORCE FINDINGS

TRAINING REQUIREMENTS FOR INDIVIDUALS TRAINED TO INSTALL HEAT PUMPS

The heat pump sector is currently ahead of the minimum training rate required to meet projected workforce requirements in Scenario 1 – the current and future policy mix. The heat pump sector is projected to need a workforce of 30,590 individuals qualified to install heat pumps by 2028. This means that 21,537 additional individuals will need to be trained between 2023 and 2028 at an annual training rate of 4,307. The sector trained 7,856 individuals in 2023⁸⁹, therefore it is 82% ahead of the annual training rate needed under Scenario 1.

To meet the target heat pump installation rates set out in Scenario 2 (600,000 installations annually by 2028 and 1.6 million installations annually by 2035) an additional 123,199 individuals trained to install heat pumps are required in the 12 years from 2023-2035. This figure is the average between an upper estimate of 155,530 and a lower estimate of 90,868. Different training rate profiles could deliver this target, Table 5 summarises the three different possible profiles for training the required individuals:

Table 5 - Scenario 2 training rate profiles

TRAINING PROFILE	ANNUAL TRAINING RATE	
	2023-2028 (5 years)	2028-2035 (7 years)
Scenario 2 modelled training rate	6,620	12,871
Maintain current training rate to 2028 then ramp up after 2028	7,856	11,990
Maintain a constant training rate to 2035	10,267	10,267

The current training rate of 7,856 individuals who successfully completed a recognised training course in 2023⁹⁰ shows that the sector is on track to have the trained workforce needed to install 600,000 heat pumps in 2028. This would exceed the minimum required rate of 6,620 by 19%. However, the current rate would still be insufficient to train the workforce needed to install 1.6 million heat pumps in 2035.

89 HPA 'Statistics' - 2023 training data (accessed July 2024). Available at: <https://www.heatpumps.org.uk/resources/statistics/>

90 HPA 'Statistics' - 2023 training data (accessed July 2024). Available at: <https://www.heatpumps.org.uk/resources/statistics/>

The degree to which rates would have to increase in each of the above profiles is as follows:

- **Scenario 2 modelled training rate.** If the minimum training requirement needed to meet both the 2028 and 2035 targets was followed, it would mean reducing current training rates, from 7,856 per year to 6,620 per year in the period 2023 and 2028. This annual training rate would then need to increase by 94% after 2028 to 12,871 per year between 2028 and 2035. This could result in short term capacity challenges for the sector.
- **Maintain current training rate to 2028 then ramp up after 2028.** Maintaining the current 2023 training rate of 7,856 for the period from 2023 to 2028 would mean that a 53% increase in training rates is still required for the period 2028-2035.
- **Maintain a constant training rate to 2035.** The sector could maintain a constant annual training rate between 2024 and 2035. In this profile, training rates would need to increase by 31% from 2024 onwards (based on 2023 levels) and then remain constant thereafter. This profile will enable the workforce requirement for 2028 to be exceeded by 43% and the 2035 target to be met.

Maintaining a constant training rate across the period would have the advantage of avoiding the need for a significant increase in training rates after 2028, which could result in short term workforce shortages for the sector. It would also enable the sector to build on its current annual training rates which are already ahead of the rate required to meet the 2028 target. In this way, the sector can both maintain its current momentum and avoid training levels becoming a limiting factor in heat pump installation.

ROLE REQUIREMENTS

- **Individuals qualified to install heat pumps. The two roles with the greatest workforce requirement are HPTO and PHTO roles.** HPTOs represent between 39% and 43% of the workforce, whereas PHTOs constitute between 30% and 32%. Taken together, this means that individuals qualified to install heat pumps consist of between 69% to 75% of the heat pump workforce, so efforts for training and recruitment will need to be prioritised for HPTO and PHTO roles.
- **ETOs represent the third largest workforce requirement** at 8% of the total heat pump workforce (as of 2023). In both scenarios, this is projected to rise slightly to 9% of the total workforce by 2028. In Scenario 2, the proportion of the total workforce made up by ETOs is expected to remain steady at 9% until 2035.

RETROFIT AND NEW BUILD

- **Retrofit is the sector with the biggest demand for workforce**, with a size of between 65% and 90% of all installations. A combination of labour intensity, policy, and the size of the retrofit sector means that the workforce requirement for retrofit is significant. At its highest, the new build workforce requirement is still smaller than the retrofit requirement, with a workforce of between 10% and 35% of installations, depending on the scenario and year.

- **New build workforce growth is significant between 2027 and 2028.** When the FHS is fully phased in from 2027 onwards, this accelerates growth in the new build workforce. In both scenarios, the FTE workforce is projected to grow by 75% in one year - from 5,954 FTE in 2027 to 10,438 FTE in 2028.

INSTALLATION AND MAINTENANCE WORKFORCE

- **The maintenance workforce is small, but exclusively consists of HPTOs.** The percentage of the workforce attributed to maintenance varies between 8% and 16% of the workforce. Most maintenance happens in Scenario 2 accounting for the high number of heat pumps installed over the duration of the period. While the numbers are small in absolute terms, because the only role involved in maintenance is HPTO, the maintenance requirement has a significant implication for this group. For example, under Scenario 2 in 2035, the maintenance workforce requirement represents 30% of the total HPTO workforce.
- **The installation workforce drives almost all the heat pump workforce growth.** Between 84% to 92% of the heat pump workforce can be attributed to installation. There is a huge growth in the estimated workforce which grows by between 6 and 10 times between 2023 and 2028 in Scenario 1 and 2 respectively. 68,811 FTE or two thirds of the workforce growth in Scenario 2 is projected to occur between 2028 and 2035, largely driven by the additional 7.65 million installations over the period.

REGIONAL WORKFORCE

- **In Scenario 1, out of the total workforce requirement for the UK, the majority (86%) will be needed in England,** with 9% required in Scotland, 5% in Wales, and less than 1% for Northern Ireland. In this scenario, 86% of the required PHTO workforce and 86% of the required ETO workforce are based in England.
- **In Scenario 2, out of the total UK workforce requirement, a substantial majority of the workforce (83%) will be needed in England,** with 9% required in Scotland, 5% in Wales and 3% in Northern Ireland. In this scenario, the workforce is proportionate to the underlying populations. The workforce roles are distributed in the same way across all four nations of the UK.

OVERALL FINDINGS

All the findings outlined above have implications for the heat pump workforce. In all scenarios, a significant increase on current levels is required in both heat pump installations and the size of the workforce. Most of this additional workforce requirement is for individuals qualified to install heat pumps (HPTOs and PHTOs), nonetheless significant numbers of additional ETOs, GTOs, salespeople and administrators will be needed to support and expand heat pump deployment.

ANNEX

LIST OF ACRONYMS IN THIS REPORT

Table 6 - List of acronyms used in this report

ACRONYM	DEFINITION
AtAHP	Air-to-Air Heat Pump
AWHP	Air-to-Water Heat Pump
BUS	Boiler Upgrade Scheme
CCC	Climate Change Committee
CHMM	Clean Heat Market Mechanism
CPD	Continuous Professional Development
CPS	Competent Person Scheme
DESNZ	Department for Energy Security and Net Zero
EAHP	Exhaust Air Heat Pumps
ECO	Energy Company Obligation
ETO	Electrical Technical Operative
FHS	Future Homes Standard
FHS IA	Future Homes Standard Impact Assessment
FTE	Full Time Equivalent
GSHP	Ground Source Heat Pump
GTO	Groundworks Technical Operative
HPA	Heat Pump Association
HPTO	Heat Pump Technical Operative
MCS	Microgeneration Certification Scheme
NVQ	National Vocational Qualification
PHTO	Plumbing and Heating Technical Operative
SGL	Shared Ground Loop
SNBHS	Scottish New Build Heat Standard
SVQ	Scottish Vocational Qualification
UK	United Kingdom

REFERENCES

1. These are either current policies which are already in place or ones that are expected with a reasonable degree of confidence to be implemented, for example those where the Government has set out a clear timeline for introduction (e.g. FHS) or has already consulted on them. This reflects the policy landscape at the time of writing.
2. Department for Levelling Up, Housing and Communities (2023) The Future Homes Standard 2023 consultation on the energy efficiency requirements of the Building Regulations affecting new and existing dwellings. Available at: https://assets.publishing.service.gov.uk/media/65cc90e139a8a7000f60d508/Future_Homes_Standard_consultation_stage_impact_assessment.pdf
3. DESNZ (2023). Clean Heat Market Mechanism. Available at: https://assets.publishing.service.gov.uk/media/6424154560a35e000c0cb07f/clean_heat_market_mechanism.pdf
4. Please note that these targets were announced by the previous Conservative Government. As of the time of writing of this report, these are assumed to remain in place, as there has no indication to the contrary from the new Labour Government. Nonetheless, the report does not account for any changes that may be implemented by the new Government between then and the publication date of this report. The same applies to all subsequent references to these targets in the report.
5. HM Government (2020). The Ten Point Plan for a Green Industrial Revolution. Available at: https://assets.publishing.service.gov.uk/media/5fb5513de90e0720978b1a6f/10_POINT_PLAN_BOOKLET.pdf
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7. Different businesses may have different models meaning that sometimes one person may do many, or all of these roles.
8. This is why along with HPTOs PHTOs are referred to in this report as 'individuals qualified to install heat pumps'.
9. Northern Ireland has a negligible impact on deployment in Scenario 1 because the policy landscape for heat pump deployment within Northern Ireland is currently minimal. The only dedicated policy that will apply there (from April 2025) is the CHMM, meaning it is challenging to accurately model policy-driven deployment for Northern Ireland. Analysis of MCS data suggests that Northern Ireland installations only accounted for 0.02% of UK installations in 2023. Therefore, Northern Ireland data has a negligible impact on UK-wide figures. MCS data is derived from MCS (2024). The MCS Data Dashboard. Available at: <https://datadashboard.mcscertified.com/InstallationInsights>
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16. This includes all heat pumps installed in the UK, including those installed prior to the dates covered in this report.
17. Maintenance in this report refers to an annual service and any required maintenance which may be needed alongside that. It does not include replacement of existing heat pumps.
18. In this context, installation workforce means the range of roles required to install a heat pump (including supporting roles) set out in detail in Table 1.
19. BEIS (2019). UK becomes first major economy to pass net zero emissions law. Available at: <https://www.gov.uk/government/news/uk-becomes-first-major-economy-to-pass-net-zero-emissions-law>
20. BEIS (2021). Heat and Buildings Strategy. Available at: https://assets.publishing.service.gov.uk/media/61d450eb8fa8f54c14eb14e4/6.7408_BEIS_Clean_Heat_Buildings_Strategy_Stage_2_v5_WEB.pdf
21. CCC (2023). Progress in reducing emissions: 2023 Report to Parliament. Available at: <https://www.theccc.org.uk/publication/2023-progress-report-to-parliament/>
22. DESNZ (2023). Heat pump investment roadmap: Leading the way to net zero. Available at: <https://www.gov.uk/government/publications/heat-pump-net-zero-investment-roadmap/heat-pump-investment-roadmap-leading-the-way-to-net-zero>
23. Emissions savings calculated using historical heat pump efficiencies taken from the following trials and extrapolated: DECC (2012) Detailed analysis from the first phase of the Energy Saving Trust's heat pump field trial, DECC (2013) Detailed analysis from the second phase of the Energy Saving Trust's heat pump field trial, UCL (2017) FINAL REPORT ON ANALYSIS OF HEAT PUMP DATA FROM THE RENEWABLE HEAT PREMIUM PAYMENT (RHPP) SCHEME, ESC (2023) Electrification of Heat - Interim Heat Pump Performance Data Analysis Report. Future efficiency increases according to CCC (2020) Sixth Carbon Budget. Emissions factors according to DESNZ (2023) Green Book.
24. CCC (2020). The Sixth Carbon Budget. Pg 115. Available at <https://www.theccc.org.uk/wp-content/uploads/2020/12/The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero.pdf>

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27. HPA 'Statistics' - 2023 training data (accessed July 2024). Available at: <https://www.heatpumps.org.uk/resources/statistics/>
28. HPA (2020). Building the Installer Base for Net Zero Heating. Available at: https://www.heatpumps.org.uk/wp-content/uploads/2020/06/Building-the-Installer-Base-for-Net-Zero-Heating_02.06.pdf
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30. MCS (2024). MCS Dashboard. Available at: <https://datadashboard.mcscertified.com/InstallationInsights>
31. MCS (2024) Research highlights heat pump business size. Available at: <https://mcscertified.com/research-highlights-heat-pump-business-size/>
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33. Gas Safe Register (2024). At a Glance Report 2023/24. Available at: <https://www.gassaferegister.co.uk/media/c5ag1xjo/2023-24-gas-safe-register-at-a-glance.pdf>
34. Gas Safe Register (2017) The Decade Review. Available at: <https://www.gassaferegister.co.uk/media/2490/decade-review.pdf>
35. HPA (2024). Heat Pump Association – Projecting the Future Domestic Heat Pump Workforce: Background and Methodology Report. Available at: <https://www.heatpumps.org.uk/wp-content/uploads/2024/11/HPA-Projecting-the-Future-Domestic-Heat-Pump-Workforce-Background-and-Methodology.pdf>36. Ibid
37. The retrofit archetype outlined in this report covers two sub-archetypes: retrofit average and retrofit large. These sub-archetypes are considered purely for analytical purposes. For more detail on this please see the Background and Methodology Report. This can be accessed at:
HPA (2024). Projecting the Future Domestic Heat Pump Workforce: Background and Methodology Report. Available at: <https://www.heatpumps.org.uk/wp-content/uploads/2024/11/HPA-Projecting-the-Future-Domestic-Heat-Pump-Workforce-Background-and-Methodology.pdf>
38. In scope technologies include air-to-air heat pumps, air-to-water heat pumps, ground source heat pumps and hybrid heat pumps. Shared Ground Loops (SGL) and Exhaust Air Heat Pumps (EAHP) are included as part of the ground source heat pump and air to water heat pump categories respectively.
39. HPA (2024). Projecting the Future Domestic Heat Pump Workforce: Background and Methodology Report. Available at: <https://www.heatpumps.org.uk/wp-content/uploads/2024/11/HPA-Projecting-the-Future-Domestic-Heat-Pump-Workforce-Background-and-Methodology.pdf>
40. MCS (2024) 'Research highlights heat pump business size.' Available at: <https://mcscertified.com/research-highlights-heat-pump-business-size/>
41. This labour utilisation rate represents the average percentage of their time a typical individual qualified to install heat pumps would spend on installing and maintaining heat pumps. It is worth noting that this percentage might vary depending on an organisation's business model. For instance, in a smaller installation company, an individual might spend a greater proportion of time doing other tasks, such as general administration, sales and accounting. In a larger employer, there are likely to be dedicated personnel for admin, sales, accounting and other supporting activities, thereby enabling qualified individuals to spend a higher proportion of time on the core heat pump installation.
42. MCS (2024) Data Dashboard. Available at: <https://datadashboard.mcscertified.com/Welcome>
43. HPA (2024) Sales Data. Available at: <https://www.heatpumps.org.uk/resources/statistics/>
44. The accompanying Background and Methodology Report provides a detailed overview of the methodology, including insight into the underpinning analysis to this report. This can be accessed at:
HPA (2024). Projecting the Future Domestic Heat Pump Workforce: Background and Methodology Report. Available at: <https://www.heatpumps.org.uk/wp-content/uploads/2024/11/HPA-Projecting-the-Future-Domestic-Heat-Pump-Workforce-Background-and-Methodology.pdf>
45. These estimates at Figure 5 for Scenario 1 are based on Gemserv's interpretation of heat pump deployment projections. The modelling combines both policy driven and non-policy driven heat pump sales derived from HPA sales data. Policy deployment projections are derived from the latest publicly available impact assessment at the time of publication in autumn 2024. It should be noted that some of these impact assessments are several years old. These figures are liable to change, if the policy framework changes.
46. In practice, this is unlikely to be the case, given that many individuals have multiple skillsets. The follow section ([HPTO workforce requirements by labour utilisation rates](#)) takes this factor into account for the HPTO role.
47. A fuller explanation of the labour utilisation rate and how it was calculated can be found in the methodology section of this report.
48. HPA (2024). Statistics. Available at: <https://www.heatpumps.org.uk/resources/statistics/>
49. PHTO = Plumbing and heating technical operative, ETO = Electrical technical operative, GTO = Groundworks technical operative, HPTO = Heat pump technical operative.
50. To be sufficient to meet workforce requirements, this would require that 100% of individuals trained install heat pumps in some capacity. This conversion rate from training into delivery is likely to be lower in practice. For example, assuming a conversion rate of 75% from training into roles would require training 10,667 individuals per year for 8,000 heating installers. This issue is explored further in the [Labour activity rate](#) section.
51. PHTO = Plumbing and heating technical operative, ETO = Electrical technical operative, GTO = Groundworks technical operative,

52. The current new build workforce was calculated by utilising historic new build heat pump deployment taken from the EPC database and then applying the new build labour intensity figures to get a resultant workforce in FTE. For a full breakdown of the new build deployment, please see HPA (2024). Heat Pump Association – Projecting the Future Domestic Heat Pump Workforce: Background and Methodology Report. Available at: <https://www.heatpumps.org.uk/wp-content/uploads/2024/11/HPA-Projecting-the-Future-Domestic-Heat-Pump-Workforce-Background-and-Methodology.pdf>
53. Low Energy Transformation Initiative (LETI). Climate Emergency Retrofit Guide. Available at: <https://www.leti.uk/retrofit#:~:text=Around%2018%25%20of%20our%20annual,homes%20have%20already%20been%20built.>
54. PHTO = Plumbing and heating technical operative, ETO = Electrical technical operative, GTO = Groundworks technical operative, HPTO = Heat pump technical operative.
55. BEIS (2022). Future Support for Low Carbon Heat: Boiler Upgrade Scheme Impact Assessment. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1055336/boiler-upgrade-scheme-final-impact-assessment.pdf
56. BEIS (2022). Final stage Impact Assessment ECO4. Available at: <https://assets.publishing.service.gov.uk/media/6246c8f88fa8f527785ed18a/eco4-final-ia.pdf>
57. PHTO = Plumbing and heating technical operative, ETO = Electrical technical operative, GTO = Groundworks technical operative, HPTO = Heat pump technical operative.
58. DLUHC (2023). Future Homes Standard Consultation Stage Impact Assessment. Available at p22 https://assets.publishing.service.gov.uk/media/65cc90e139a8a7000f60d508/Future_Homes_Standard_consultation_stage_impact_assessment.pdf 2023 consultation on the energy efficiency requirements of the Building Regulations affecting new and existing dwellings. Available
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60. PHTO = Plumbing and heating technical operative, ETO = Electrical technical operative, GTO = Groundworks technical operative, HPTO = Heat pump technical operative.
61. Office for National Statistics (2023). Census 2021: how homes are heated in your area. Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/housing/articles/census2021howhomesareheatedinyourarea/2023-01-05#:~:text=Mains%20gas%20central%20heating%20was,more%20on%20other%20heating%20sources.>
62. This scenario models routine maintenance which can be carried out by a HPTO – it involves an annual service and any required maintenance which may be needed alongside that. This routine maintenance requirement does not include specific issues that may arise with the electrical system or plumbing and hot water system, which could require an ETO or PHTO to carry out repairs.
63. PHTO = Plumbing and heating technical operative, ETO = Electrical technical operative, GTO = Groundworks technical operative, HPTO = Heat pump technical operative.
64. Data from 2019 onwards is derived from heat pump sales data submitted by HPA members. Estimates for the total heat pump stock pre-2019 are based on Statista data, source: Statista (2023). Annual amount of heat pumps in operation in the United Kingdom (UK) from 2013 to 2019. Available at: [https://www.statista.com/statistics/740491/heat-pumps-in-operation-uk/.](https://www.statista.com/statistics/740491/heat-pumps-in-operation-uk/)
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67. Devolved nation figures are a percentage of the UK total. All the devolved policies considered contribute to the UK whole. Where policies are UK-wide, we lacked sub-regional data to map impact and deployment per nation. Where specific devolved schemes exist, impact assessments were limited in their time scope meaning that it was difficult to map accurately the distribution over time and risked underestimating the workforce requirements.
68. Office for National Statistics (2024), Population estimates for the UK, England, Wales, Scotland, and Northern Ireland: mid-2022. Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/annualmidyearpopulationestimates/mid2022>
69. PHTO = Plumbing and heating technical operative, ETO = Electrical technical operative, GTO = Groundworks technical operative, HPTO = Heat pump technical operative.
70. According to the MCS Data Dashboard, there are only 9 MCS certified heat pump contractors in Northern Ireland (as of October 2024). MCS data is derived from MCS (2024). The MCS Data Dashboard. Available at: <https://datadashboard.mcscertified.com/InstallationInsights>
71. PHTO = Plumbing and heating technical operative, ETO = Electrical technical operative, GTO = Groundworks technical operative, HPTO = Heat pump technical operative.
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73. Department for Levelling Up, Housing and Communities (2023) The Future Homes Standard 2023 consultation on the energy efficiency requirements of the Building Regulations affecting new and existing dwellings. https://assets.publishing.service.gov.uk/media/65cc90e139a8a7000f60d508/Future_Homes_Standard_consultation_stage_impact_assessment.pdf

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76. HM Government (2020). The Ten Point Plan for a Green Industrial Revolution. Available at: https://assets.publishing.service.gov.uk/media/5fb5513de90e0720978b1a6f/10_POINT_PLAN_BOOKLET.pdf
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78. Northern Ireland has a negligible impact on deployment in Scenario 1 of this report because the policy landscape for heat pump deployment is currently minimal. The only dedicated policy that will apply there (from April 2025) is the Clean Heat Market Mechanism, meaning it is challenging to accurately model policy-driven deployment for Northern Ireland. Analysis of MCS data suggests that Northern Ireland installations only accounted for 0.02% of UK installations in 2023. Therefore, the inclusion of Northern Ireland data in UK-wide figures has a negligible impact on the findings.
79. HPA 'Statistics' - 2023 training data (accessed July 2024). Available at: <https://www.heatpumps.org.uk/resources/statistics/>
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About The MCS Foundation:

Our vision is to make every UK home carbon-free. The MCS Foundation helps drive positive change to decarbonise homes heat and energy through our work programmes, grants and advocacy. We support engagement programmes, fund research and facilitate innovative solutions to drive widespread adoption of renewables to help achieve a Net Zero future. In addition, the Foundation oversees the Microgeneration Certification Scheme (MCS) which defines, maintains and improves quality standards for renewable energy at buildings scale.

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Any recommendations or positions taken in this report are the responsibility and reflect the views of the Heat Pump Association and not of Gemserv Ltd.

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