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Retrofit Skills Market Analysis

A report for the West of England
Combined Authority



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Executive Summary

Nationally, the retrofit of the UK’s existing building stock is an increasingly urgent challenge that must be addressed in order to achieve the target of net zero carbon emissions by 2050. This has followed the announcement of substantial funding schemes which form part of the Government’s plans for a ‘Green Industrial Revolution’ to recover from the COVID-19 pandemic and a pipeline of future funding schemes to come.

With the growing national attention and emerging opportunities to access funding from national government, the retrofit market represents a key sector for the West of England Combined Authority (WECA). It will play an important role in achieving the target of net zero carbon emissions by 2030 in the region. Doing so will require a radical overhaul across the region compared to the current state of play if the deployment of measures is to increase at the necessary rate. At the current pace of installations in WECA, it would take around 557 years to install the required solid wall insulation and 857 years for the required heat pumps to meet net zero (see graphs below).

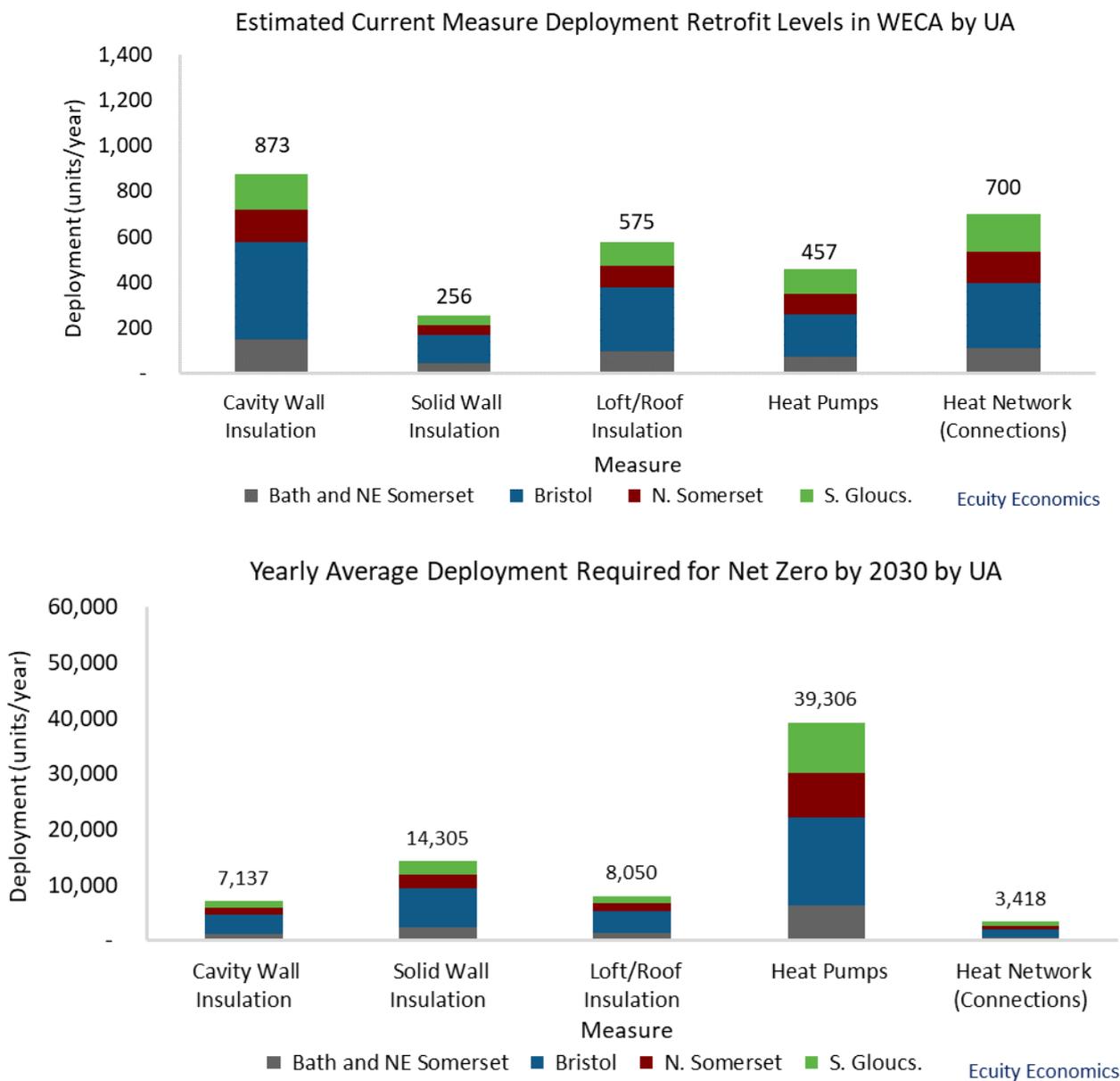
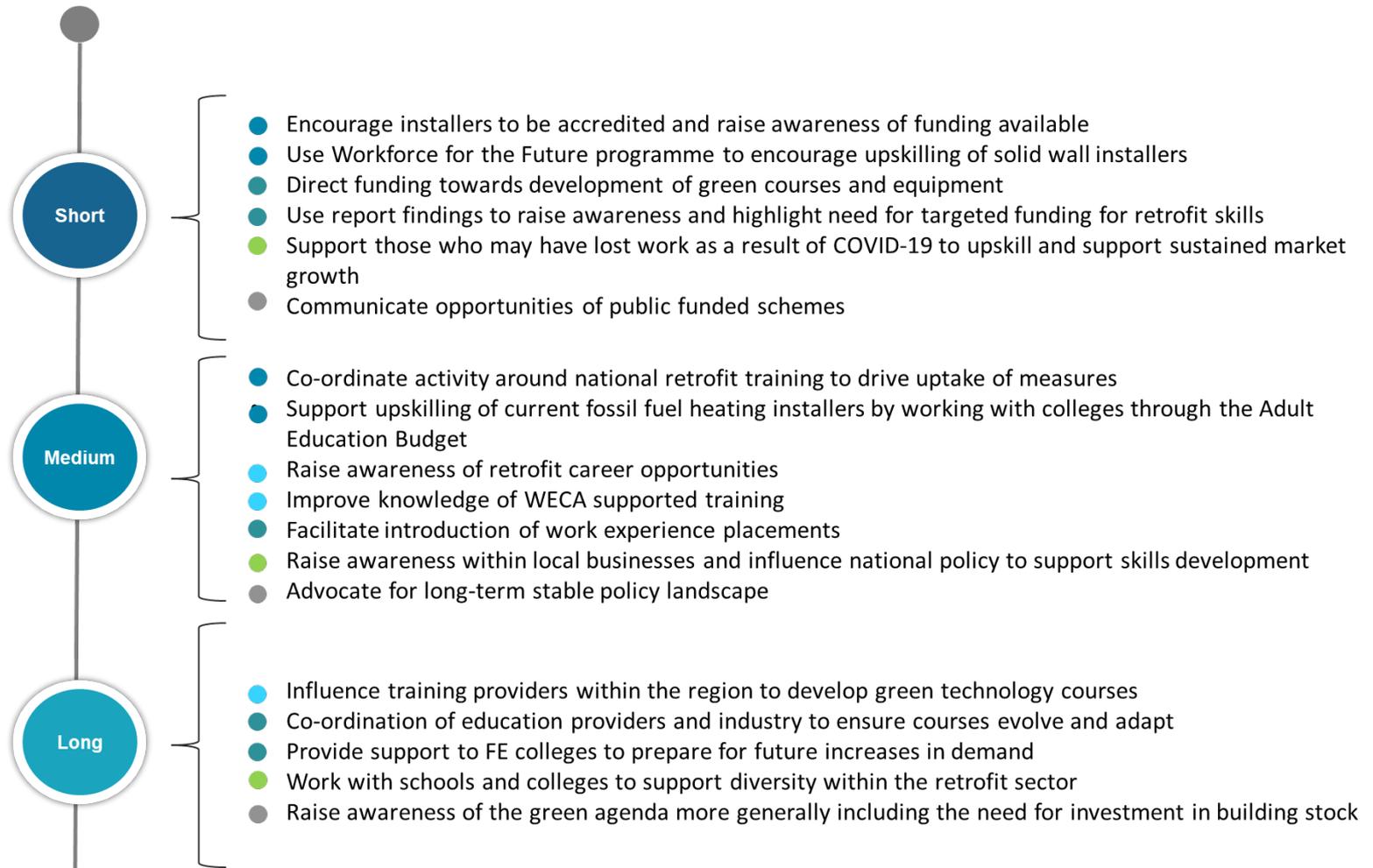


Figure 1 - Comparison of Current Levels of Retrofit Deployment in WECA and Yearly Average Requirement for Net Zero by 2030

Fundamental to the delivery of retrofit measures are the workers who will be manufacturing, designing, installing, and administering these solutions. This represents both a vast challenge and opportunity for WECA. A significant ramp up of jobs is required in order to meet the region's climate change target, which will provide new opportunities for local people. Moreover, doing so could see WECA develop a skills base that could serve as a comparative advantage to deployment both inside and outside of the area for many years to come, providing long-term, skilled employment to people in the region. Under the scenario analysis conducted for this report, it is estimated that solid wall insulation jobs, for example, will need to increase by a minimum of 48-fold compared to current levels, providing a potential for 1300 to 7400 additional jobs in 2030. For low carbon heating, this challenge and opportunity is equally clear, with heat pump jobs needing to increase by a minimum of 100-fold under the scenario analysis compared to current employment levels, with the potential for between 1700 and 7500 additional jobs surrounding the technology.

With WECA's influence over adult education and skills support as well as a role in influencing policy and supporting local actors, the Combined Authority has the chance to play an important part in shaping and developing the skills base for the retrofit sector and to seize the job growth opportunity presented.

The recommendations for WECA are summarised in the below graphic. Each recommendation has been categorised based on the proposed implementation timescale. A short term action should be considered within the next 12 months, a medium term action refers to the next 1-3 years and the long term actions could extend to 5 years. The longer term actions tend to involve the development of policy at a national level or the evolution of skills training or courses. However, given the urgency of action to meet the region's net zero target, these actions should be considered as soon as possible. These recommendations have been shortened for the summary and further detail on them all is presented in the corresponding chapters below.



Key

- Job growth and skills gap assessment
- Available retrofit skills training
- Future training developments
- Near term challenges
- Creating demand

Pathway to Change

WECA Retrofit Market



The West of England Combined Authority

The West of England Combined Authority was formed in 2017 and consists of three local authorities in the region - Bath & North Somerset, Bristol, and South Gloucestershire. The devolution deal was first established to drive clean and inclusive economic growth within the region and address some of its key challenges, including housing, transport, skills and productivity. The combined authority continues to work closely with North Somerset Council and is the accountable body for the West of England Local Enterprise Partnership, with an aim to delivering economic growth for the region and addressing challenges such as productivity and skills, housing and transport.

Where we describe the 'WECA region' within this report, we refer to Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire.

About the Region

The West of England is an economic leader with an economy worth over £38 billion a year¹. With a population of over 1.1 million people, one of the highest rates of employment in the country, and over 45,000 businesses, the region competes on a global scale. The West of England is a place where highly skilled people work, where ideas flourish, and where businesses grow. It is also a place that a diverse population of people call home.

WECA has some key advantages in its labour market when compared to England as a whole prior to the Covid-19 pandemic. However, as we are yet to experience the full economic impact of Covid-19, it is difficult to draw meaningful comparisons about future economic conditions.

In 2018, WECA had a higher proportion of people at NVQ Level 4 or above than England as a whole at 46% in WECA and 39% in England. There was also a higher proportion of individuals with Trade Apprenticeships and a lower proportion of people with no qualifications in the combined authority. Furthermore, the employment rate of each of the four WECA Unitary Authorities was higher than that in England over 2018.

There is growing demand for higher skills in WECA. Based on the Employer Skills Survey data there was a skills shortage vacancy rate of 44% for high skilled workers, compared to 37% in England in 2017. Furthermore, of the vacancies recorded in WECA, 27% were due to skills shortages, much higher than the national rate at 17%². WECA must work to ensure these overall skills shortages do not translate into skills gaps in green jobs.

The unemployment claimant rate has increased significantly since March 2020 across all four of the Unitary Authorities (UAs) within WECA. This increase can largely be attributed to Covid-19 and the subsequent lockdowns to try and control the spread of the virus. Three of the UAs had a lower claimant rate than England in October 2020 with only Bristol performing as badly at 6.3%. The unemployment claimant rate for WECA as a whole was much lower at 5% in October³. While an increase in unemployment is damaging, it presents an opportunity to reskill workers and increase the size of the retrofit sector.

The major cities in the region including Bath and particularly Bristol are viewed as great strengths to the region, with Bristol cited as a leader in sustainability, being the UK's first ever European Green

¹ West of England Combined Authority (2021) [Home](#)

² WECA (2019) [WEST OF ENGLAND EMPLOYMENT & SKILLS PLAN](#)

³ WECA (2020) Redundancy Dashboard

Capital in 2015⁴. The young demographics of the city regions and the large student population were viewed as potential strengths. Cities were also perceived to be a strength in creating potential for delivery of large-scale housing retrofit projects as well as other developments within the low carbon space. One such development cited was Bristol's Heat Network, ; Bristol Council received a £10 million grant as part of the Heat Network Investment Project (HNIP) to expand Bristol's which currently supplies over 1000 properties with low carbon heat⁵. Further to this, by comparison to the national level, the region is perceived to be a relatively "aware" area, with community engagement in the green agenda through initiatives such as sustainability groups and community energy co-operatives.

Net Zero Ambitions

In July 2019, the West of England Combined Authority (WECA) declared a climate emergency and agreed to reach net zero carbon emissions by 2030 - 20 years ahead of the UK government's target. This is in line with constituent local authorities. While the region has lower per capita emissions than the UK average, meeting this ambition represents a significant challenge and requires effective short, medium and long-term action.

The WECA region has seen a 35% fall in carbon emissions between 2005 and 2018 with total emissions falling from 7,927 ktCO₂ (2015) to 5154 k tCO₂ (2018)⁶. Despite this considerable progress, there is still much to be done to ensure that the region achieves carbon neutrality by 2030.

The region must engage in a deep retrofit of domestic, commercial and industrial buildings to improve energy efficiency and maximise the generation of low carbon heat and electricity.

The vast majority of the retrofit needed is within the domestic sector, which has seen a 38% decrease in emissions between 2005 and 2018. Emissions have fallen from 2,386 ktCO₂ (2015) to 1,488 ktCO₂ (2018)⁷. Interest levels from consumers across the region must be ramped up significantly to stimulate the demand for the substantial improvement needed and to boost skill levels and supply chains. Furthermore, it is evident that the local supply chain is not currently sufficient to deliver the scale of retrofit improvements required to meet net zero as demand further increases.

A broad range of central government funding for retrofit exists or has been announced to date and may grow further in the coming years. Every opportunity must be capitalised on by WECA to deliver clean and inclusive growth at the rate its net zero target demands.

The 2030 Net Zero Target offers an opportunity for WECA to become a leader in the UK retrofit market. For example, this ambitious target means that heat pump deployment is likely to need to increase at a faster rate in the region compared to nationally, providing a platform to build a competitive advantage and skilled workforce. Similarly, the building stock in the region is unique with a high proportion of solid wall properties that will need to be carefully retrofitted. This presents an opportunity to develop expertise in the region which could be of interest within other regions.

There are some fundamental changes that are perceived to be important in enabling the transition, both to how the skills base is developed and how consumer demand for retrofit is created.

⁴ Bristol City Council (2017) [Bristol Green Capital](#).

⁵ HNIP [funded projects](#)

⁶ BEIS (2020) [2005 to 2018 UK local and regional CO2 emissions – data tables](#)

⁷ BEIS (2020) [2005 to 2018 UK local and regional CO2 emissions – data tables](#)

Approach

To support the WECA's ambitions to reach net zero by 2030, research has been undertaken to support the development of region-specific recommendations in relation to job growth and skills gaps in the retrofit sector. Two research methods were employed:

- market research including interviews and a literature review was undertaken to provide a better understanding of the existing market, including the challenges faced by key stakeholders and how they might be addressed; and
- scenario modelling was used to assess the skills demand for the retrofit market in the future, the findings of which are outlined in the following sections of this report.

An overview of research methodology and the stakeholders that participated in interviews can be found in Appendix 1.

Introduction to the WECA Region's Current Building Stock

There are just over half a million homes and 33,000 non-domestic buildings in the WECA region. Many of these buildings, the majority of which will still stand in 2030, are heated using fossil fuels and are not energy efficient. Substantial improvements are therefore required over the next decade to near eliminate their emissions.

Domestic and non-domestic Energy Performance Certificates (EPCs), which take detailed information regarding the energy efficiency of a building, have been issued for around 62% of buildings in the WECA region⁸. EPC data for properties in the WECA region was analysed to establish the retrofitting requirements for the WECA building stock. Each EPC is specific to the property and has a list of recommended energy saving measures which correspond with many of the technologies that will be needed to reach net zero.

Domestic Building Stock

The WECA region is home to over 500,000 houses⁹. At least 58% of these homes have an EPC level below band C, with less than 1% holding an A-rating. Our analysis suggests that approximately 250,000 homes will need some form of renovation to align with net zero emissions.

This is important for two reasons. Firstly, the installation of energy efficiency has been recognised as a crucial enabler of cost-effective heat decarbonisation – lowering energy consumption, fuel bills and the cost of decarbonisation generally. The retrofit programme will also involve replacing existing fossil fuel heating systems – such as gas boilers – with low carbon heating systems, such as heat pumps.

This programme of heating system replacement is the most significant shift that needs to occur in domestic buildings in the WECA region. The Figure below shows that approximately half of domestic properties will require a low carbon heating system replacement.

In terms of energy efficiency upgrades, the installation of solid wall insulation and low carbon heating systems represent the biggest need for change in the domestic sector, as shown in the graph below, which highlights the number of EPCs where the improvement measures are required. The breakdown of improvements needed are in general reflective of the proportion of properties in each

⁸ MHCLG (2020) [Energy Performance of Buildings Data](#)

⁹ Valuation Office Agency (2020) [Council Tax: stock of properties, 2020](#)

of the local authorities, with the City of Bristol representing 40%, South Gloucestershire 24%, Bath and North East Somerset 17% and North Somerset 19% of the total housing stock in WECA.

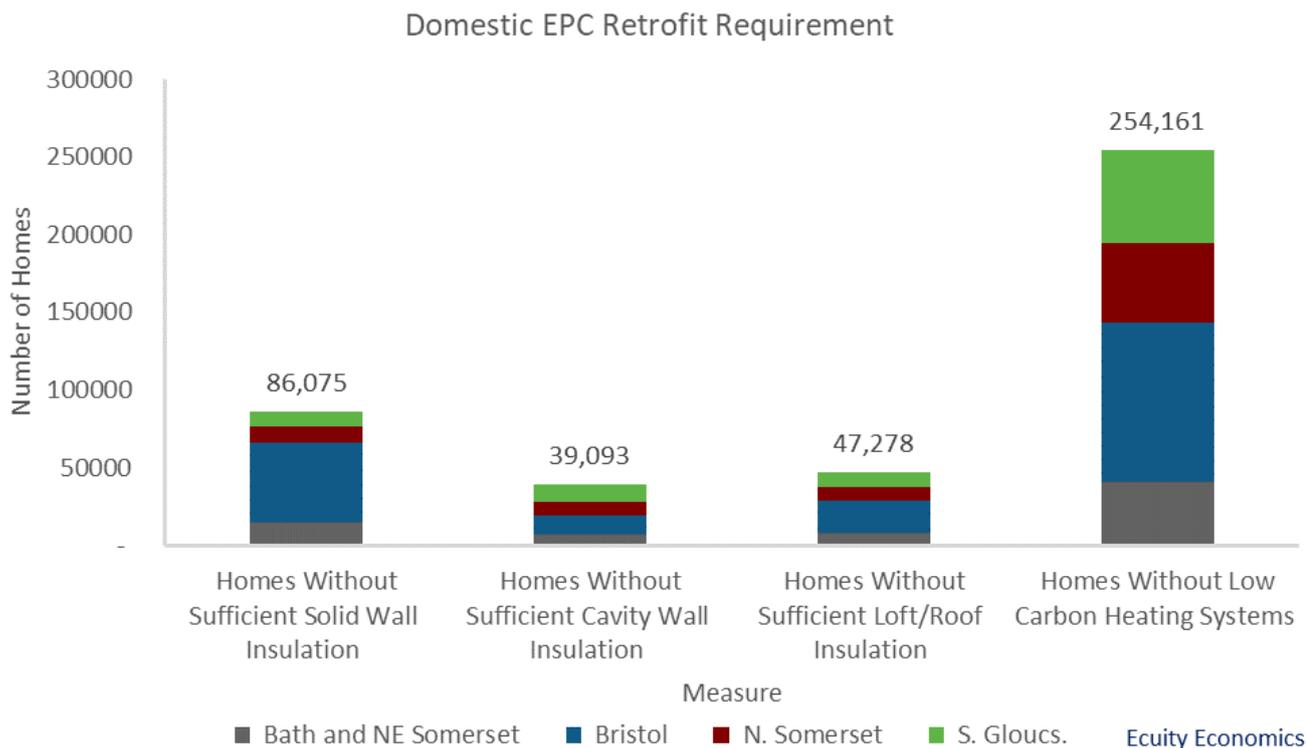


Figure 2 - Domestic EPC Retrofit Requirement

Table 1 - Domestic Retrofit Measures Needed for Net Zero

Table 1	EPC analysis: domestic retrofit measures needed for net zero			
	Solid Wall Insulation	Cavity Wall Insulation	Loft/Roof Insulation	Low Carbon Heating Systems
Bath and NE Somerset	15,071	7,217	7,624	41,186
Bristol	50,854	12,385	20,879	102,160
N. Somerset	10,811	8,489	8,793	51,255
S. Gloucs.	9,339	11,002	9,982	59,560

Non-Domestic Building Stock

There are just over 33,000 non-domestic buildings in the WECA region. Of these 37% require improvements in energy efficiency, particularly focussed on cavity wall insulation. The replacement of fossil fuel heating systems is also required in the non-domestic sector but to a lesser extent than the housing stock; many buildings are already using electricity as their main heat source with around 47% requiring a transition away from fossil fuel use.

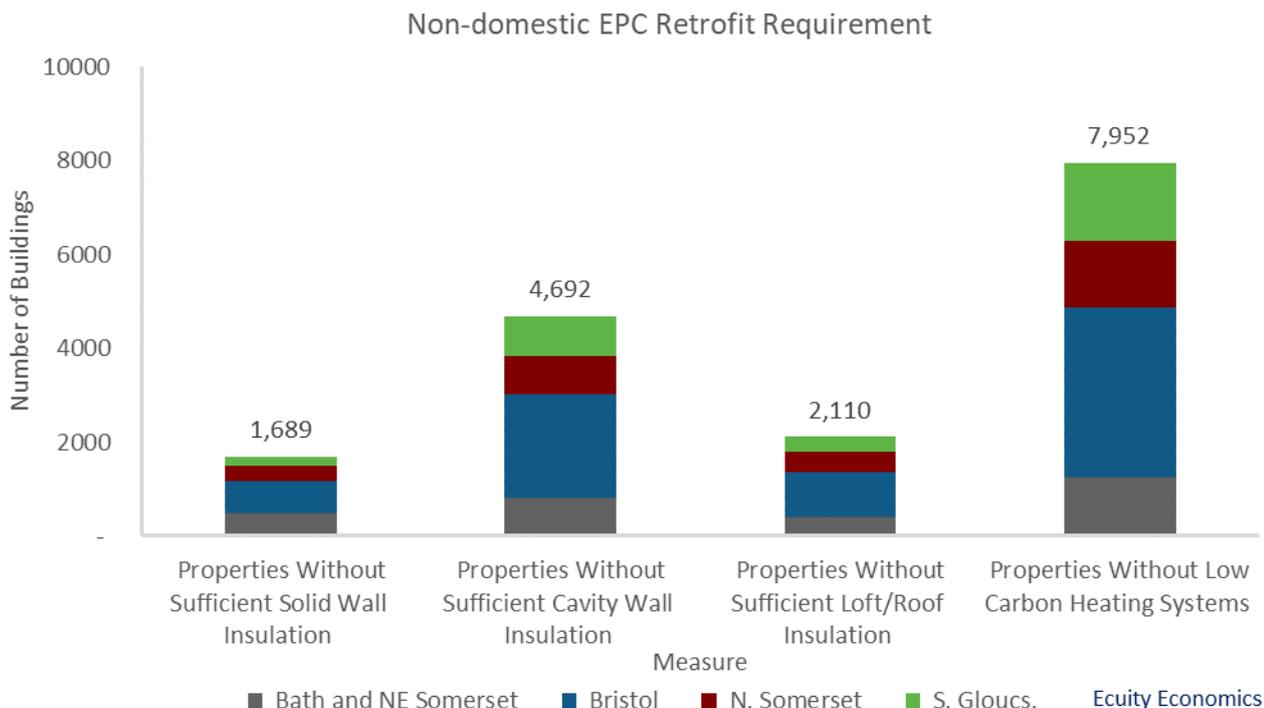


Figure 3 - The Non-domestic EPC Retrofit Requirement

Table 2 - Non-domestic Retrofit Measures Needed for Net Zero

Table 2	EPC analysis: non-domestic retrofit measures needed for net zero			
	Solid Wall Insulation	Cavity Wall Insulation	Loft/Roof Insulation	Low Carbon Heating Systems
Bath and NE Somerset	498	820	402	1,242
Bristol	685	2,194	952	3,640
N. Somerset	312	836	441	1,408
S. Gloucs.	194	842	315	1,662

Improving the Building Stock

WECA’s net zero target necessitates a significant improvement of the building stock, with approximately 41% of buildings in need of energy efficiency improvements and 83% requiring new low carbon heating systems.

In order to assess the improvements required for the existing building stock, a comprehensive analysis was conducted for all EPCs in both the domestic and non-domestic sectors, by local authority. This involved removing any superseded certificates, before then quantifying the number of homes which require the complete installation or upgrade of the outlined improvement measures. Where partial installations of insulation had already occurred, a comparison of that level was made to that required under existing Building Regulation requirements when improving fabric efficiency measures in existing buildings. If the current level was underneath this requirement then it was deemed as necessary for improvement.

Following this analysis for each of the improvement measures, the EPC data was then scaled up to the full WECA building stock, as around 200,000 buildings in WECA do not have EPCs, to identify the number of improvement measures needed to reach net zero, as shown below.

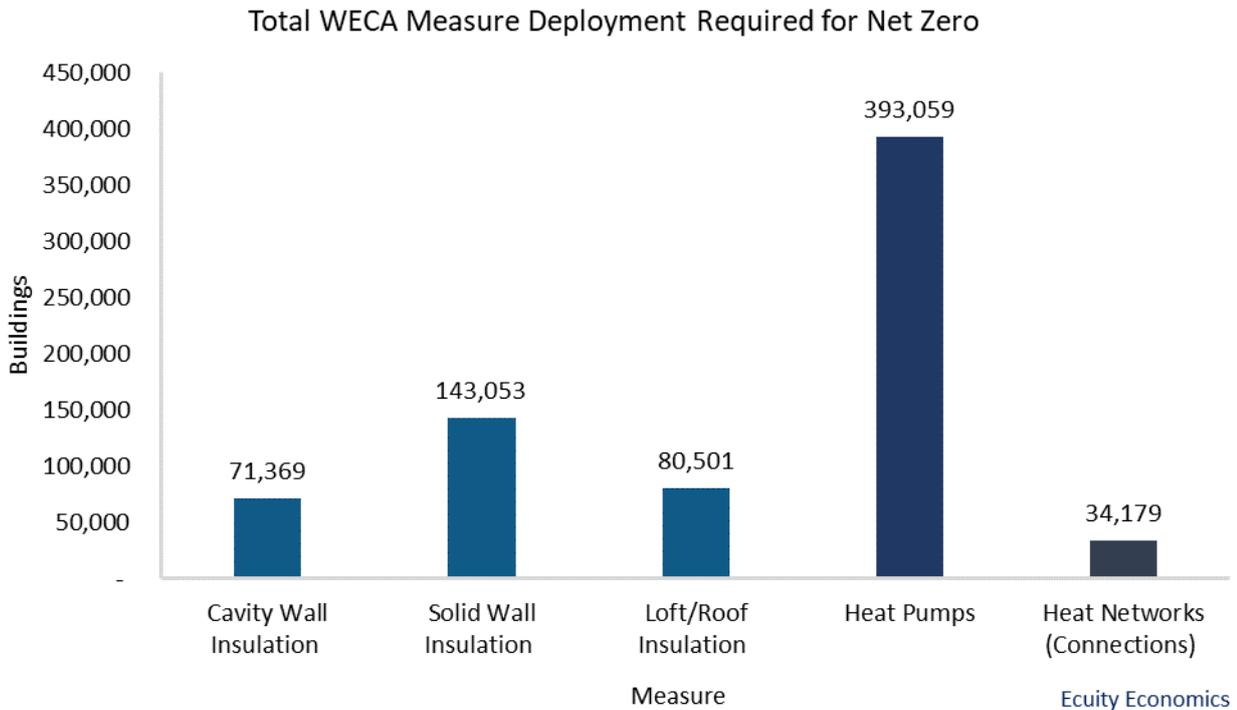


Figure 4 - The Total WECA Measure Deployment Required for Net Zero

As shown in Figure 2 and Figure 3, a vast number of buildings require the installation of low carbon heating technologies. The CCC’s Sixth Carbon Budget Report¹⁰ detailed the types of technologies that could be deployed to decarbonise our heating nationally in the run up to the UK’s 2050 net zero target. Under their ‘Balanced Deployment Pathway’ this is predominantly achieved through heat pumps and heat networks, although this is caveated around the uncertainty of how hydrogen solutions for the sector may develop in the future. As such, the CCC recommends that options are kept open through the deployment of hybrid heat pumps in some parts of the buildings stock until the picture becomes clearer after this decade. This delay though is a luxury that cannot be afforded if WECA is to reach its net zero target by 2030, and so the analysis focusses on the installation of heat pumps and heat network connections as the route to delivering heat decarbonisation. While heat pumps are suitable for the vast majority of homes and climates, in some cases where buildings are very energy inefficient with little scope to improve this, such as heritage homes, they can be unsuitable. This is estimated to be a very small proportion of the housing stock and recent developments have seen the emergence of high-temperature heat pumps which can heat these buildings effectively, although they can cost more upfront and provide heat less efficiently.

These totals were established based on the EPC assessment, mentioned above, to identify the buildings currently heated using fossil fuels and their need to switch to a heat pump or heat network.

¹⁰ Climate Change Committee (2020) [Sixth Carbon Budget](#)

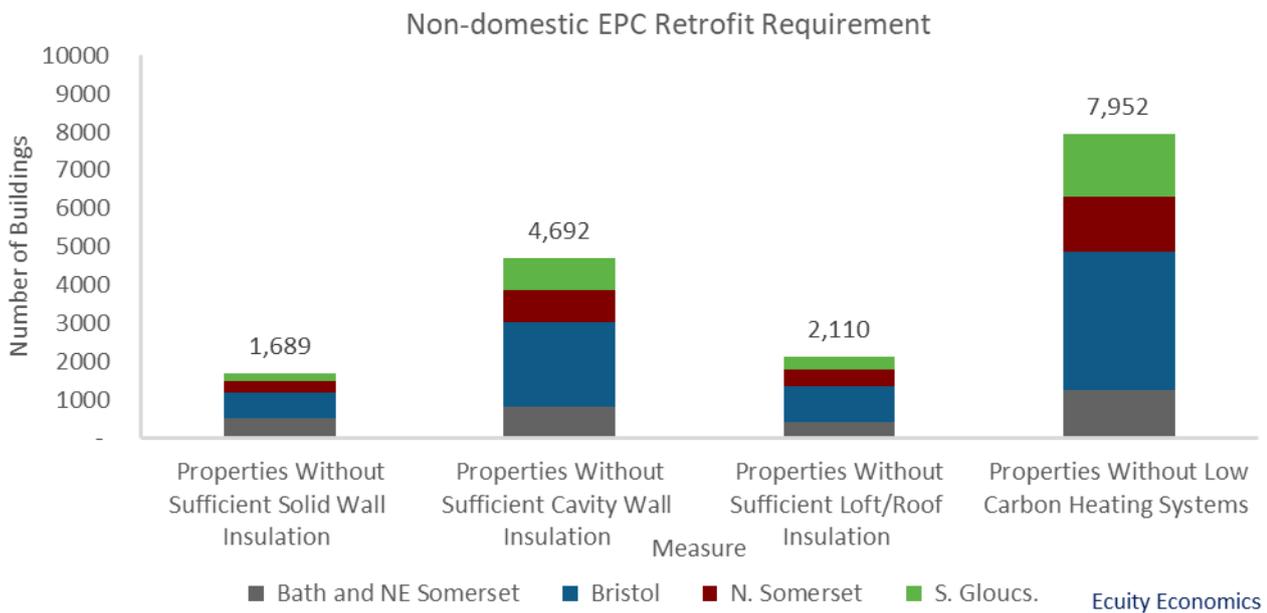
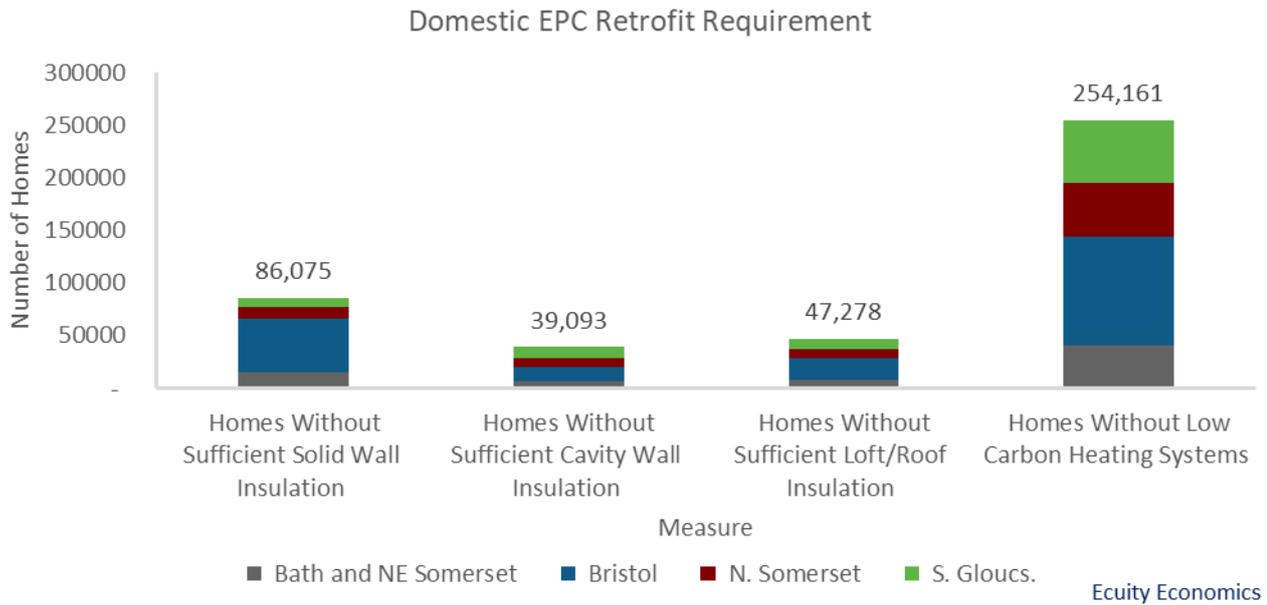


Figure 5 - Comparison of Current Levels of Retrofit Deployment in WECA and Yearly Average Requirement for Net Zero by 2030

Current levels of deployment for each technology within the WECA region are shown above alongside the levels needed for net zero. This comparison demonstrates the vast scale of the challenge ahead over the next decade to reach the target. At the current deployment rates of retrofit in WECA it would take around 81 years to install the required cavity wall insulation, 557 years for solid wall insulation, 140 years for loft/roof insulation, 857 years for heat pumps and 49 years for heat networks.

Existing deployment rates within the WECA region mean that jobs in general for the retrofit sector are also currently low. The increase in deployment required comes hand-in-hand with an accompanied increase in the jobs required for the delivery of higher volumes. These measures are typically quite labour intensive to install. The scaling up of jobs, as well as the type of skills needed, is analysed and discussed further below.

It is worth noting that Bristol already has a relatively well-developed heat network that is set to expand further following the award of funding through the Heat Networks Investment Project¹¹. This means that although jobs will need to considerably increase in heat networks further, current employment is relatively high in comparison to the other retrofit measures considered.

Retrofit Requirement

Retrofit of the existing building stock has a key role to play in the transition to carbon neutrality and will predominantly consist of improving insulation levels and replacing fossil fuel heating systems. At the national level, key retrofit targets include the Government's ambition "for as many homes as possible to be EPC Band C by 2035 where practical, cost-effective and affordable", as outlined in the Government's Clean Growth Strategy, and the Government's target to install 600,000 heat pumps every year by 2028¹². This ambition is extended to the regional level, where there are major developments in the retrofit and housing pipeline with regional targets including Bath and North East Somerset (BANES) Council's priority to retrofit 65,000 homes with a range of measures by 2030¹³. The Innovative Housing Retrofit project in Bristol (funded through the Low Carbon Challenge Fund) will also trial retrofit technologies in 'hard to treat' homes. If successful, this pilot of 25 homes will form the basis of wider ambition to retrofit harder to treat homes.

The Climate Change Committee modelled a 'Balanced Pathway' to Net Zero within its sixth carbon budget which recommends the rapid deployment of core measures, including cavity wall insulation; solid wall insulation measures; roof/loft insulation; and low carbon heating, delivered primarily through heat pumps and heat networks.

Current deployment levels need to be scaled up monumentally in order for the region to meet net zero. To put this into perspective, 30,000 heat pump units are deployed per year, UK wide. This falls short of the number of units needed in WECA alone, meaning net zero targets would not be met even if heat pumps were solely deployed in the region between now and 2030.

Projection Scenarios for Retrofit

A variety of scenarios have been developed to explore the action needed in the retrofit market for WECA to meet its net zero target. The detailed scenarios project the deployment of low carbon heat and insulation measures, on a yearly basis. This deployment requirement is then complemented with the results from the surveys and interviews conducted across the retrofit sector, as well as government data to translate this need through calculations into the number of full-time equivalent (FTE) jobs that are generated to meet such levels of deployment.

The difference in scenarios reflects the uncertainty around future outcomes, with estimated probabilities attached, and can be used to assess potential growth in the retrofit market and provide an indication of what should be done over the coming years. All four scenarios have been developed with the same time horizon (2030) to align with WECA's net zero target by the end of the decade; however, not all scenarios see the target met. A summary of the results from each scenario can be found below. An estimated probability is provided for each scenario to give a guide as to the relative chance of a scenario materialising.

¹¹ HNIP (2020) [Bristol Redcliffe Network](#)

¹² UK Government (2020) [Ten Point Plan](#)

¹³ Bath and North East Somerset Council (2020) [Climate Emergency in B&NES](#)

National Net Zero

The **National Net Zero** scenario is our **baseline** and signifies the development of low carbon industries needed in WECA to meet the UK's 2050 net zero target. This scenario is informed by the expected volume of low carbon goods and services needed to meet net zero in 2050, and is calibrated using key academic and research publications, such as the CCC's 6th carbon budget report. The demand and supply for low carbon goods and services in 2030 is interpolated from the 2050 trend curve.

Net Zero 2030

The **Net Zero 2030** scenario quickens the rate of change and uptake of green goods and services to enable the WECA region to meet its 2030 net zero target. Particularly for the retrofit sector, buildings will need to be upgraded to enable them to operate with net zero emissions for instance.

COVID-19 Scenarios

Two **Covid scenarios** have been developed to reflect the economic challenges experienced by WECA businesses and consumers as a result of restrictions. Both scenarios have been informed by the latest economic forecasts available from Oxford Economics and project a dip in economic growth over the coming months, with activity picking up from 2023. As with previous recessions, a drop in consumer spending is anticipated to feed through and correspond to a dampening of demand for retrofit measures in the near-term.

- The **Covid Slow Recovery** scenario projects that low carbon activity then picks up at a rate consistent with our baseline scenario.
- The **Covid Green Recovery** scenario maintains the push for the region's 2030 target with an accelerated deployment of retrofit measures and consequential demand for retrofit skills.

Table 3 - A Summary of Results from Each Scenario

<u>Scenario</u>	<u>'Net Zero 2030' (alternative growth rate)</u>	<u>'National Net Zero Baseline'</u>	<u>'COVID-Slow Recovery'</u>	<u>'COVID-Green Recovery'</u>
Is net zero achieved by 2030?	✓	×	×	✓
Gross Retrofit Jobs in 2030	14,600 (10,100)	8,300	3,800	15,900
Net Retrofit Jobs in 2030	13,800 (9,700)	7,900	3,600	15,000
Total Low Carbon Heat Deployment (buildings)	427,200	275,800	120,300	427,200
Total Insulation Measure Deployment (units)	294,900	228,900	108,400	294,900

CHAPTER KEY MESSAGES

- It is predicted that employment in the retrofit sector will need to at least double over the next 5 years to meet net zero, analysis shows that job growth needed to meet net zero by 2030 will require an increase well above this rate. The types of roles that could be created are explained in detail in this section and Annex 3.
- Today most roles within the retrofit sector are at the intermediate level and it is expected that this qualification level will see the greatest growth.
- The existing skills deficit is perceived to be the significant barrier to growth.
- There is an opportunity for WECA to target a sharp uplift over the next few years in insulation deployment and jobs, getting ahead of the national rate, to become a 'hub' for these skills and aiding the deployment low carbon heat later in the decade.
- Solid wall insulation and heat pump deployment represent the biggest measure specific challenges with around a minimum 50-fold and 100-fold increase in jobs, respectively.
- There is a clear training route for fossil fuel heating installers to transition to heat pumps, however certainty is needed to drive investment.
- There is a particular need to develop skills in solid wall insulation and heritage properties in the region.
- There is no clear entry route and very specialized qualifications for the heat network sector, with most new entrants having generic skillsets which are developed by the employer to ensure heat network specific knowledge is gained.
- There will be some job losses in the fossil fuel heating sector, although these will be outweighed considerably by job creation in low carbon heating, with many transferable skills current fossil fuel installers could be a good target to help meet the considerable growth needed in low carbon heating installers.
- Jobs will be created at a local level but also nationally to support WECA's net zero ambitions.

CHAPTER RECOMMENDATIONS

- Ensure that insulation and low carbon heating installers are accredited so that they are able to access national funding, this is currently through Trustmark and MCS accreditation. WECA could run a centralised communications campaign to help raise awareness of this funding and need for accreditation. For example, a marketing campaign could be delivered through the Growth Hub and Employability and Skills Portal as well as via key teams, programmes and services delivered by WECA. Education could also be provided through the Workforce for the Future, Careers Hub and Future Bright programmes as well as the Growth Hub and Inward Investment teams.
- Coordinate activity to take advantage of national retrofit funding available and to push central government for further reforms to fill in gaps. Although outside of WECA's direct control, there is the chance for WECA to work with Local Authorities and housing associations in the area through the Senior Management Team in this vein and could use the Planning Strategy to target policies and actions to drive the uptake of insulation and low carbon heating forward at a strategic level.
- Support the upskilling of current fossil fuel installers by promoting courses, such as the Chartered Institute of Plumbing and Heating Engineers' new Level 3 Low Temperature Heating and Hot Water Systems in Dwellings Course and the Heat Pump Association's new heat pump specific courses. These courses will help heating engineers upskill to help meet the demand for heat pumps. WECA could use the Adult Education Budget to target this upskilling.
- Support the deployment of solid wall insulation by improving training provision for installers and energy assessors (course details provided below). WECA could use the Workforce for the Future programme to support those that go through this course and encourage upskilling to at least NQV level 3 as this is likely to become the sector minimum.

This section provides an overview of the existing and emerging skills gaps within the retrofit sector before focusing on the potential for job creation across the insulation and low carbon heat sectors under the four projection scenarios.

Qualification Levels

To provide insight on current skills levels within the retrofit sector, interviewees from industry were asked to quantify the portion of jobs within low, intermediate, and high levels (see Table 4). This demonstrated that the majority of jobs currently in the retrofit market nationally fall in the intermediate or high qualification levels. This can be seen in Figure 6 below. The entry requirement for the insulation sector is an NVQ level 2 course; however there are calls for this to be increased to level 3.

Table 4 - Qualification Levels¹⁴

Qualification Level	Description
Low	Entry Level – No Qualifications NVQ Level 1 Equivalent – 3/4 GCSE Grades D-G NVQ Level 2 Equivalent – 4-5 GCSE Grades A*-C
Intermediate	NVQ Level 3 Equivalent – 2 A Levels NVQ Level 4 Equivalent – Higher Education Certificate/BTEC
High	NVQ Level 5 Equivalent – Higher Education Diploma/ Foundation Degree Degree or Above

The proportion of jobs in the low qualification level may be higher than this in reality as respondents could be referring to their own staff as membership organisations and not the sector as a whole.

Proportion of jobs at different qualification levels

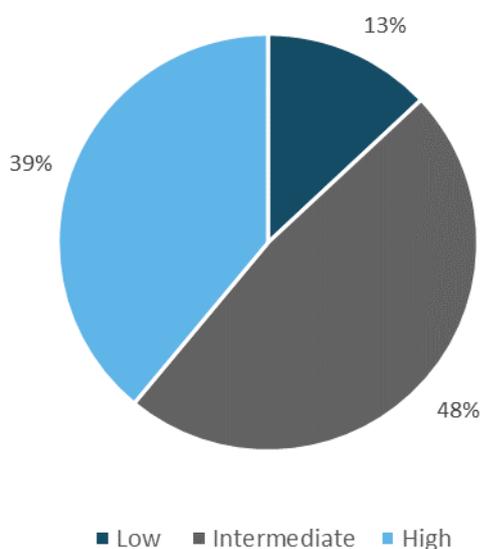


Figure 6 - Proportion of Jobs at Each of the Three Qualification Levels From Industry Survey

Assessment of the Retrofit Sector

An increase in employment in the retrofit sector will be required to meet the net zero target. Figure 7 below shows perceived employment growth levels required for net zero, based on market research. This demonstrates a unanimous perception that growth is necessary, with the majority of respondents of the belief that the growth required would be above 100%.

¹⁴ It is important to highlight that qualification levels do not necessarily capture the skills developed through practical experience within the sector.

What percentage growth in employment do you think will be needed for your company / sector in the next 5 years to meet the net zero target?

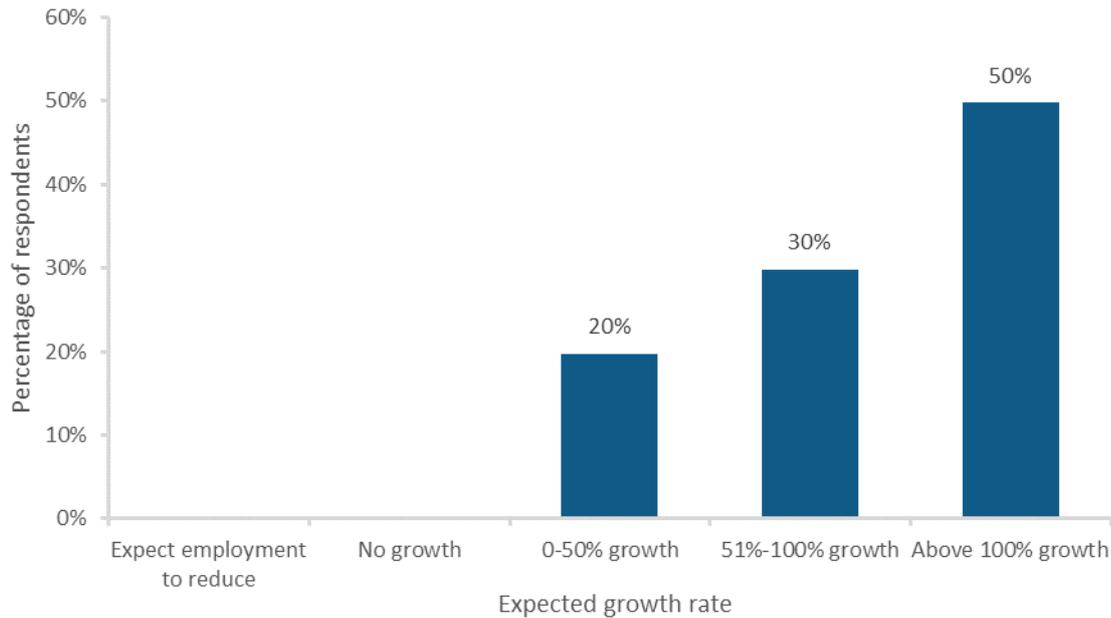


Figure 7 - Percentage Growth in Employment for Retrofit Sector to Meet Net Zero

While respondents suggested that the greatest level of growth would occur at the intermediate level, it is likely to occur across all qualification levels.

Please rank the below qualification levels in terms of growth rate (high, medium, low, no change)?

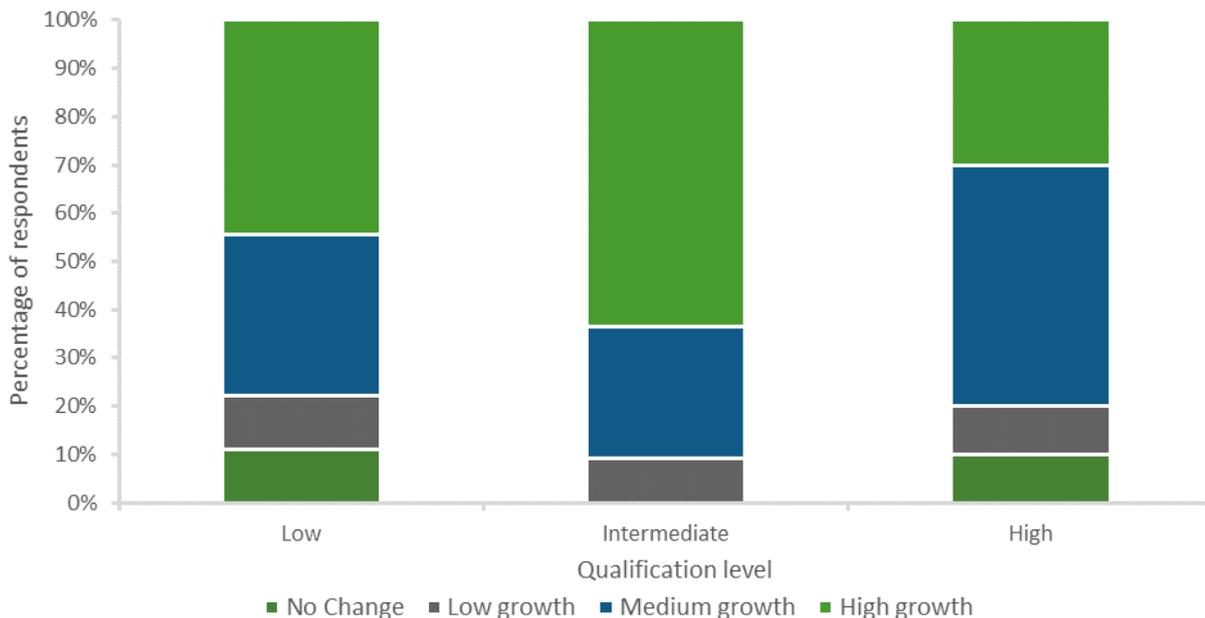


Figure 8 - Expected Growth Rate of Employment in Each Qualification Level for the Retrofit Sector

The projected growth required is likely to present a challenge given that skills shortages currently appear to exist across all qualification levels. The existing skills deficit was, in fact, perceived to be the significant barrier facing the sector. This skills deficit means that consumers often face high costs as existing installers are able to charge a premium for their services, since demand is exceeding available supply. There have been numerous news stories since the launch of the

Government’s Green Homes Grant scheme (see Appendix 5) highlighting that demand is outpacing supply and consumers are facing challenges in identifying registered installers. The scheme also faced numerous administrative challenges and has subsequently been closed to new applicants. Nonetheless, important learnings can be drawn from this scheme particularly as further schemes are expected to require installers to gain similar certifications and registrations to provide services to customers.

To participate in the Green Homes Grant scheme installers must have been TrustMark registered. The below graph provides an overview of the number of registered businesses servicing the Bath and Bristol areas. Note that the number of registered installers continues to change and that many businesses tend to offer multiple services so may be double counted.

Coverage and thus consumer choice varies substantially by solution provided. It is important to note that very few of these businesses, particularly the energy efficiency providers, are based in the region. Many offer services nationally or are willing to travel. For example, whilst there are TrustMark registered external or internal insulation installers that would provide services to households in Bath and Bristol, none appear to be located in the WECA region. There is only a single TrustMark registered cavity wall company and 3 loft insulation firms in close proximity. There is however a strong heat pump installer base in the region. Within 10 miles: Bath (6), Bristol (12), Gloucester (8) and Somerset (3). There are also around 8 heating engineers in the region.

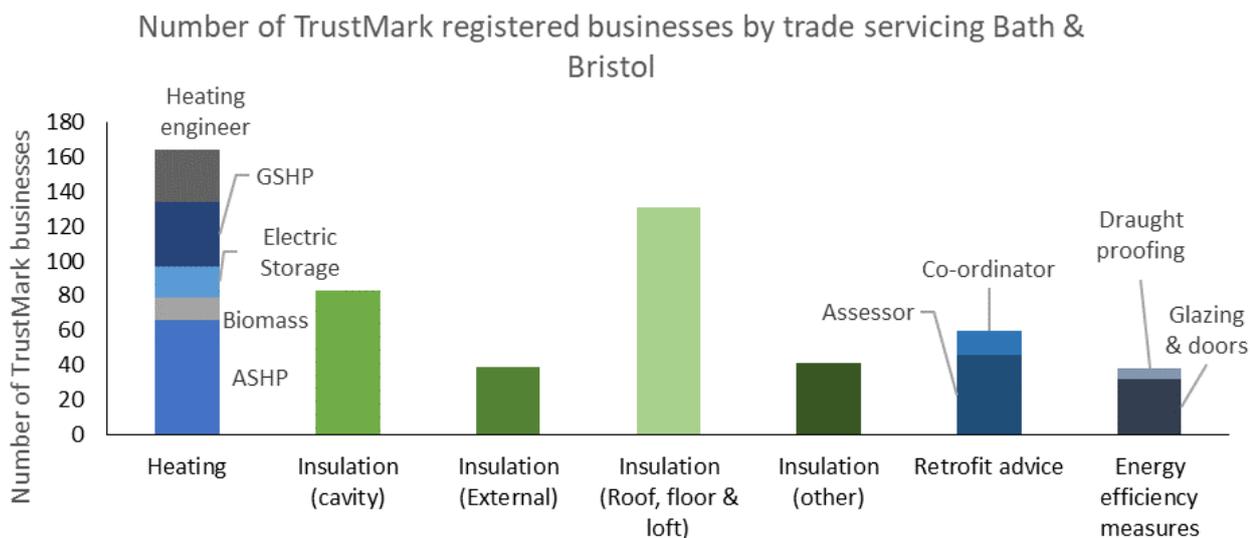


Figure 9 – Review of TrustMark Registered installers Servicing Bath and Bristol (17th February 2021).



Figure 10 – TrustMark Registered Installers Servicing Bath and Bristol Region (17th February 2021).

Based on the current installation rates, availability of TrustMark registered installers and interview feedback, it is estimated that there are currently around 40 full-time equivalent (FTE) jobs in insulation and 95 in low carbon heating in the region. The lack of local installers was highlighted during market research interviews, with the majority of respondents identifying a labour or skills shortage for at least one qualification level. The Intermediate Level (NVQ Level 3 and 4) was most commonly identified as an area of shortage, as shown below.

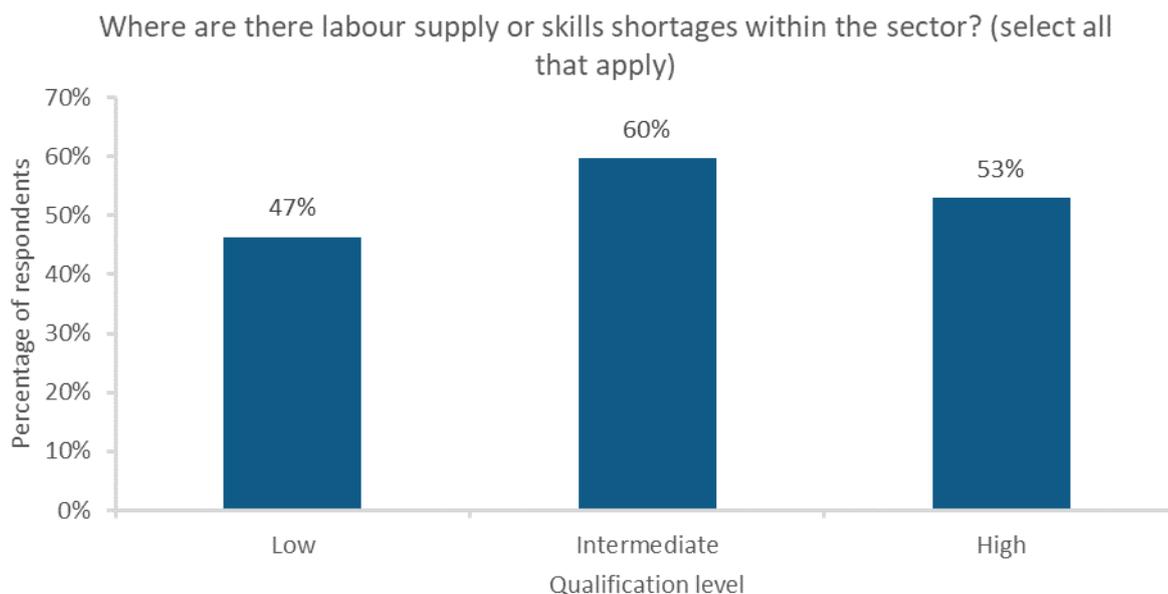


Figure 11 - Labour Shortages at Each Qualification Level in the Retrofit Sector

Despite the existing and rapidly emerging skills gaps within the retrofit sector, there exist “pockets of excellence” and “robust skills within the industry”. In some cases, the focus may be on building upon existing skills within the sector, alongside recruitment drives.

Do you think the existing workforce in your sector is sufficiently skilled to deliver the goods and services needed for a low carbon economy?

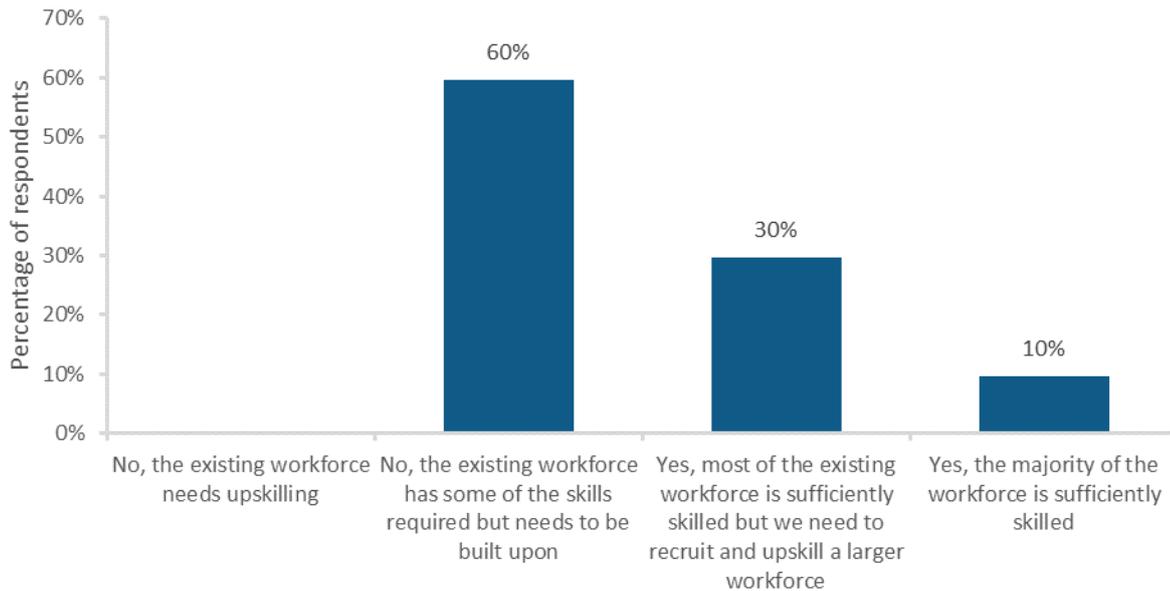


Figure 12 - Level of Upskilling Required to Deliver a Low Carbon Economy

From our research, existing skills shortages are highly specific to individual sectors, as outlined within the relevant sections below. However, some more general skills shortages have also been identified. In many cases, these skills exist but are possessed by those working in other areas of the economy. In the event that a fall in demand occurs within one sector, focus could therefore be directed at enabling individuals to move into the retrofit sector, building upon their existing skills. These core transferable skills, which should be developed regardless of area of expertise and skill level, are:

- Adaptability
- Awareness of and Engagement with Environmental Issues and Sustainability
- Awareness of Policy and Legislation
- Business Management
- Change Management
- Collaboration
- Communication
- Confidence
- Critical Thinking
- Cross-discipline working
- Engagement with Environmental Issues and Sustainability
- Entrepreneurial mindset
- Innovation
- Leadership
- Problem Solving
- Project Management
- Resilience
- Systems thinking
- Understanding of New Technologies and Smart Solutions as well as System Integration

Box 1: The Importance of Communication

As noted above, communication was perceived to be an important skill across all qualification levels. Communication was perceived to be particularly important in the context of energy advice.

At a low and intermediate level, consumer communication and engagement was perceived as particularly important. According to the BEIS Public Attitudes Tracker (Wave 28), 53% of those involved in selecting a new boiler or heating system sought information from their heating system or installer and as such, installers have an opportunity to educate and advise consumers through effectively communicating the benefits of low carbon technologies and energy performance improvements. Installers are perceived to have a key role to play in developing consumer confidence through understanding what consumers need; effective communication and active listening have an important part to play in this.

The importance for communication extends into higher level roles, where effective communication with multiple stakeholders is required in order to successfully manage a project.

Sector Specific Growth

Building Fabric

The installation of insulation measures should be viewed as an infrastructure investment. Unlike low carbon heating, installing insulation does not displace any other technologies directly but simply improves on the current energy efficiency of the building stock. All jobs generated in the building fabric / insulation sector should therefore be viewed as additional as they are not created at the cost of displacing existing jobs.

Many of those currently working in insulation typically spread their time across several of the specific measures discussed further below, which is likely as a result of the relatively low levels of demand to date, creating a multi-skilled workforce. Over time this may change. With increased demand there could be the opportunity for more specialised roles focussing on each of the specific measures.

The growth rate for the insulation measures has been modelled in two ways under the Net Zero 2030 scenario. The first assumes a constant year-on-year growth rate, calibrated according to the levels of deployment that would be expected or required under each scenario. This approach has an advantage of a steady growth rate across the time period but also sees a sharp rise in both installation rates and jobs towards the end of the decade that would then drop significantly after this date.

An alternative growth rate for the Net Zero 2030 Scenario has also been developed to complement the first pathway. As shown below, this sees a rapid rise of insulation installations and jobs over the next few years, before gradually levelling off in the second half of the decade and maintaining a more stable level of jobs. Although the initial growth would be extremely challenging, it would have a few advantages.

Firstly, it would facilitate an easier deployment of low carbon heating in the second half of the decade, with good insulation levels typically a pre-requisite for the installation of heat pumps. By ramping up insulation deployment over the next few years across WECA, it would lessen the challenges and issues surrounded by the deployment of low carbon heating that could arguably be seen as the biggest challenge that WECA faces in the retrofit sector to reach net zero by 2030. The CCC has recommended such a 'fabric first' approach to decarbonising the existing building stock nationally.

This alternative growth rate would also likely see the region moving faster than the rest of the country. Under the year-on-year growth rate, our analysis shows that WECA's insulation deployment would closely follow with that needed nationally according to the CCC, apart from for solid wall insulation. Therefore, by pushing for earlier growth in the next few years, a comparative advantage and 'skills centre of excellence' could emerge for WECA that could then be used to help the following insulation deployment in neighbouring areas and provide greater employment for the region by exporting these skills.

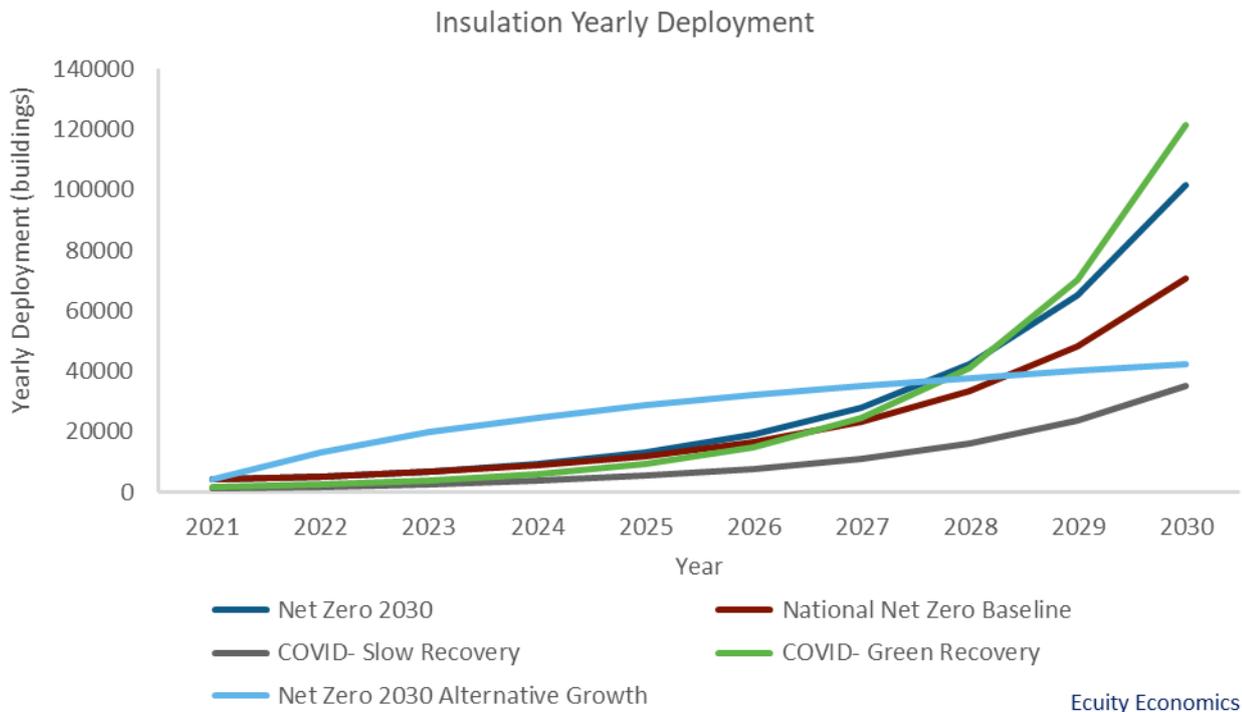


Figure 13 - Insulation Yearly Deployment Under all Scenarios

The graph above gives an impression of the high ramp up, whether immediate or later in the decade, to insulate the building stock within WECA. It shows that insulation deployment will need to increase from the current rate of around 1,700 measures per year to between 42,000 and 122,000 by 2030 to align with the net zero target.

Looking further into the specific measures for insulation shows that while deployment of cavity wall insulation and loft/roof insulation will need to ramp up considerably, it is not labour intensive to install. This means that the high deployment rate needed can be met with an increase in jobs of between 90 and 230 full-time equivalent (FTE) jobs by 2030 for cavity wall insulation and 60-150 jobs by 2030 for loft/roof insulation.

However, solid wall insulation is a highly labour intensive process, typically taking around 10 times the number of working days to install compared to cavity wall insulation. This means that there is the potential for significant job creation opportunities and accompanying skills development in the sector. The below dashboard summarises these findings.

Scenario Analysis Dashboard: Solid Wall Insulation				
Scenario	Net Zero 2030 / (Alternative Net Zero 2030)	National Net Zero Baseline	COVID- Slow Recovery	COVID- Green Recovery
Additional Jobs by 2025	411 / (1,538)	284	106	229
Additional Jobs by 2030	6,253 / (2,326)	2,988	1,373	7,378
Total Deployment 2021-2030 (measures)	142,598	77,055	34,908	142,598

Job Type Share

Administration:

Install:

Manufacture:

Job Skill Level Share

Low skilled:

Medium Skilled:

High Skilled:

Key: Green <25%, Amber 25-50%, Red >50%.

The uptake of solid wall insulation to date has been low due to a longer payback period, higher upfront cost, and greater disruption associated with installations, compared to cavity wall insulation for example. The CCC view the deployment of solid wall insulation to be harder to ramp up than cavity wall insulation; this is reflected in a slower national ramp up than would likely be needed in WECA to reach net zero by 2030 under the Net Zero 2030 and COVID – Green Recovery scenarios.

Current deployment of solid wall insulation in WECA is around 256 buildings per year, supporting an estimated 27 full-time equivalent (FTE) jobs, predominantly focussed on installation. Under the various scenarios, shown below, this will need to increase to between 1,300-7,400 FTE jobs by 2030, representing the biggest challenge for the insulation sector in the skills requirement for net zero.

Solid Wall Insulation Additional Jobs

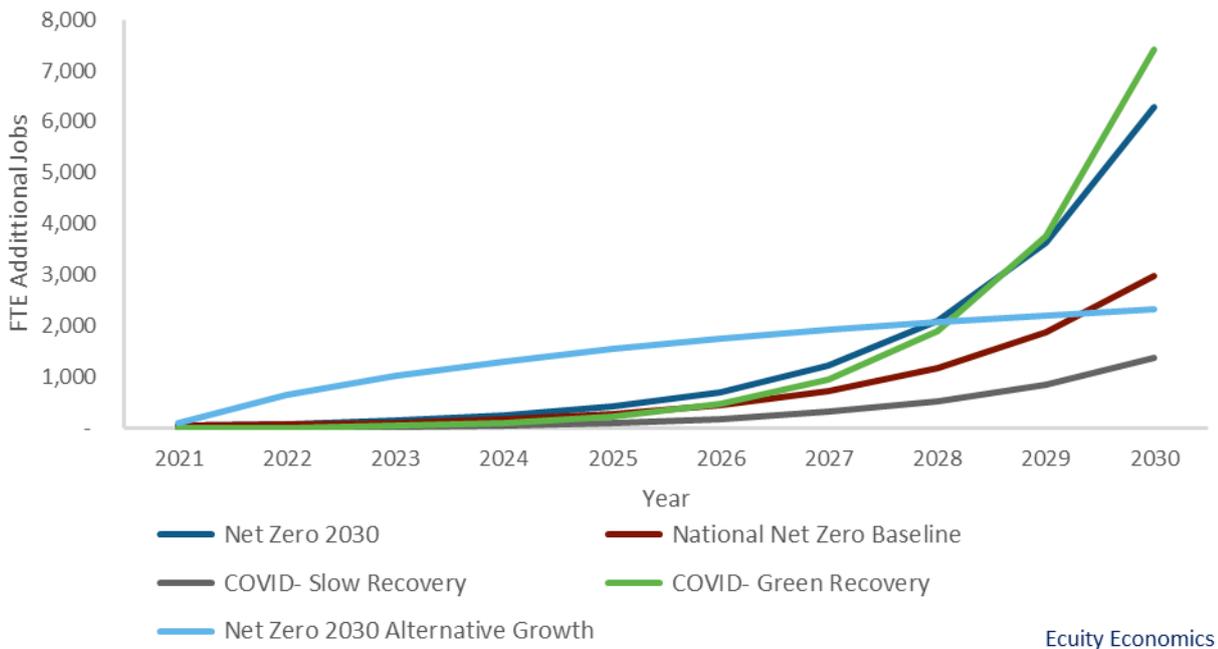


Figure 14 - Solid Wall Insulation Additional Jobs

As shown below, the highest proportion of TrustMark registered insulation installers servicing the region provide flat roof, floor or loft insulation (45%), followed by cavity wall insulation (28%). Just

under 40 TrustMark registered businesses servicing the bath and Bristol area install external wall insulation (13%), none of which are located in the WECA region. Some of these businesses may not be located in the region but could utilise local tradespeople to complete jobs. However, it is not clear how prevalent this is. These figures further illustrate the need to develop a skilled supply chain locally to address the solid wall properties in the region. It is important to note that these figures do not represent the entire industry.

Given TrustMark’s recent introduction into ECO and other government policies, it is likely that there are some qualified installers in the region who are not TrustMark registered. Whilst these companies and individuals may be competent to carry out retrofit work, they may not have the necessary qualifications or registrations to benefit from new incentive schemes. It will be important to ensure that these businesses are aware of the scheme requirements and opportunities to encourage them to invest in upskilling.

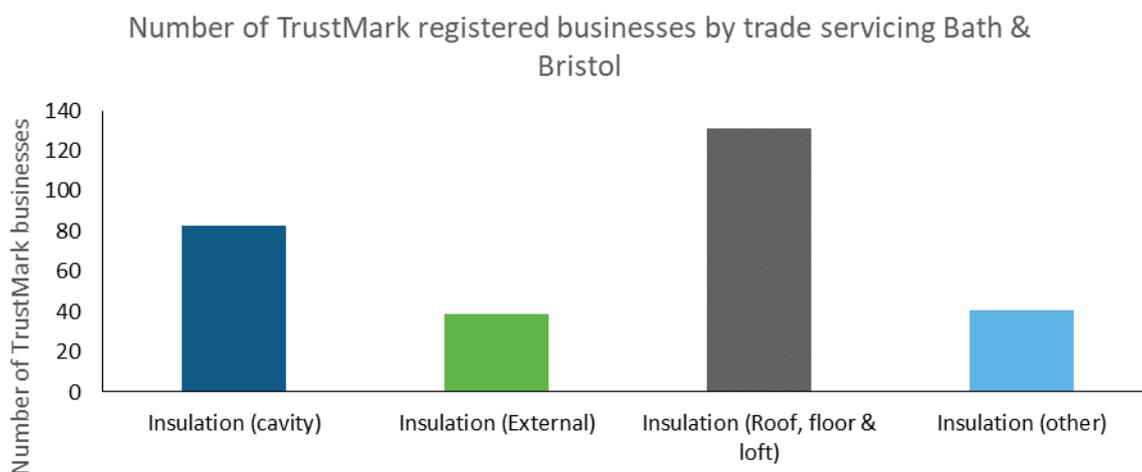


Figure 15 – TrustMark Registered Insulation Businesses Servicing the Region.

Skills Requirement

Increased demand for retrofit has the potential to lead to job creation across a range of roles, and this was highlighted throughout the market research conducted. A list of courses and potential jobs is provided in Appendix 3. There is potential for job creation from product design and manufacture through to installation, with multiple roles required at each stage of the supply chain. In addition to installation and maintenance roles, recent shifts in Government policy have led to the requirement for additional roles in project management, quality assurance, design and advice as outlined in Box 2.

Box 2: The Inclusion of TrustMark in Energy Performance Improvement Works

TrustMark was established in 2005 in consultation with Government, Industry and Consumer Protection Groups. It is a Quality Scheme endorsed by Government and TrustMark registered installers make commitments in line with the delivery of good customer service, technical competence and trading practices. In response to the Each Homes Counts Review, TrustMark was expanded to include all Repair, Maintenance and Improvement (RMI) and energy efficiency and retrofit measures.

As part of efforts to drive up standards within the sector, the Government are seeking to increase the inclusion of TrustMark into energy performance improvement works, most recently through the inclusion of TrustMark within the Green Homes Grant. The Integration of TrustMark and PAS2035 means that ultimately, for Government Retrofit Programmes, several roles are likely to be required for a domestic retrofit project, details of which are outlined in the Figure below.

A greater reliance on PAS2035¹⁵ necessitates a higher number of retrofit advisors, co-ordinators, assessors, designers and evaluators as well as skilled retrofit installers. PAS2035 is also bringing about a greater need for technical skills e.g. interfacing between roof and floor and an understanding of consequential impacts, both of which require some upskilling of the installer base. There are very strong practical skills in the sector but lack of understanding of how to measure the impact of measures on building performance.

¹⁵ PAS2035 is the new over-arching document in the retrofit standards framework introduced following the recommendations of the Each Home Counts review. PAS 2035 essentially provides a specification for the energy retrofit of domestic buildings, and details best practice guidance for domestic retrofit projects. More information can be found [here](#).



Figure 16 - The Roles Required Under PAS2035¹⁶

In the insulation sector, qualified installer roles are seen as increasingly difficult to recruit yet incredibly important in order to ensure that the deployment levels of energy efficiency required to meet net zero are delivered. In addition, retrofit coordinators were cited as a role that is currently difficult to recruit and likely to become increasingly important. Representatives from the solid wall insulation sector stated that the industry is moving towards needing higher skilled tradespeople i.e., engineers, retrofit co-ordinators and or architectural technicians. It is important to note that the improvements to the Building Regulations Part L will increase building thermal performance which increases the risk of condensation if not correctly addressed. There is therefore a need for installers to understand cold bridges, condensation, and airtightness issues. It is apparent that the supply chain has the practical skills required but understanding of elements like cold bridging / detailing is not sufficiently progressed.

There is a move to mandating a minimum NVQ level for insulation installers of level 3 so there will be a need to upskill those who do not meet this level. Industry representatives are working collaboratively to update and improve the relevant NVQs and introduce a more holistic skillset into

¹⁶ The Retrofit Academy (2020) [The Retrofit Toolkit](#)

the sector. Other areas for growth noted include administrative , project management and system design roles, with one respondent noting that design needs to be recognised as a desirable profession.

The insulation sector has been shaped by incentive schemes and policies. The rate of retrofits has been dictated by the availability of funding which has unfortunately led to a boom and bust for some businesses in the sector. There was a previous surge in demand for energy efficiency improvements; the number of major energy efficiency measures installed within properties declined by 80% from 1.74m in 2012 to 340,000 in 2015¹⁷. Due to this contraction of the industry, there are thousands of competent individuals now working in other related parts of the construction sector or out of work who lack the NVQ qualifications required to operate in the retrofit sector. When demand falls, skilled tradespeople leave the sector. However, it is predicted that many of these are likely to come back if a clear opportunity is presented. It is believed that many of the required skills exist, but people are engaged in other segments, for example structural engineers are involved in road development. To encourage these skilled tradespeople to enter or return to the insulation sector, there needs to be a signal from government and a long-term clear trajectory for demand.

There is a clear signal from government that PAS2035 will be introduced across a number of policy mechanisms to improve quality and this will require significant upskilling. There is an understanding that investment is needed and demand is starting to rebound, but this is being met with caution from some within the sector as businesses have invested in training and upskilling before and the opportunity for growth and increased demand was not realised. Moreover, the need to ensure a level playing field was highlighted. Whilst increased requirements within the retrofit sector have been welcomed , there is a risk of skills migration if new builds are not required to meet the same standard.

Sector specific skills include (further details are shown in the flow chart below):

1. Low Level (growth rate: low)
 - a. Understanding retrofit solutions available
 - b. Appreciation of how people interact with energy efficiency measures.
2. Intermediate Level (growth rate: high)
 - a. Plastering and rendering
 - b. Understanding of Energy Efficiency
 - c. Understanding of Home Energy Performance
 - d. Practical Delivery
3. High Level (growth rate: medium)
 - a. Management of a Smart Home
 - b. Engineering
 - c. Building design and science
 - d. Architectural technicians
 - e. Building surveyors
 - f. Structural engineering which is really important for non-traditional buildings
 - g. Performance monitoring and analytics
 - h. Retrofit co-ordinators

All skills levels will need to be able to interact with customers and provide simple energy saving advice. There is a particular need for these soft skills to communicate with more vulnerable customers. It is important that installers are able to conduct themselves appropriately in the home,

¹⁷ Association for the Conservation of Energy (2016) [Home Energy Efficiency 2010-2020](#).

mitigate any hassle or disturbance and clearly convey information to the households in relation to progress. Installers will also need to have a good level of numeracy and literacy to write up reports to enable improved monitoring and meet auditing requirements.

Whilst the growth in low level jobs is expected to be relatively low, the UK's exit from the EU could pose a challenge to growth. A high proportion of rendering professionals come to the UK from Europe for work. The changing immigration rules will change this year and as such there is a risk that the sector could face a skills shortage in the short-term. This does create a longer term opportunity to upskill the domestic workforce. In particular, those currently employed in plastering or rendering professions could be upskilled to work with external wall insulation. The vast majority of plasterers and renders are on construction sites, plastering new / existing homes or student accommodation with a small proportion working on insulation retrofit.

Current NVQs for plastering and rendering could be enhanced with additional modules to ensure that new entrants are appropriately trained. Courses could be bolstered with technical modules to ensure that plasterers and renderers understand the insulation installation route to ensure high quality finishes and performance. Whilst an individual could quickly be trained to do basic work and there are opportunities for training and progression on the job, it is important to note that plastering and rendering is a skilled role. It is likely that it will take an entrant a couple of years of training to reach the desired qualification and experience level.

Retrofitting high rise buildings is seen as a particular skills challenge following Grenfell and the introduction of remedial measures is required to ensure quality. There is a need to build industry to be able to deliver these works on high rise. The sector is currently looking to expand to support technical queries as an increase has been observed. The skills needed to assess product performance and test fire safety is also seen as a challenge area. In addition, there will be need for expertise in on-site inspections and auditing to ensure that installations meet the required standards.

Beyond the changing demand for the manufacture and installation of energy performance improvement measures, it is also important to consider the changing demand for energy assessments. Energy Performance Certificates (EPCs) were first introduced in 2007 as part of the UK's transposition of the EU Directive on the Energy Performance of Buildings (EPBD)¹⁸ and until relatively recently, have only been required at the point of sale or rent. However, the policy landscape is changing and EPCs are likely to become a core part of energy efficiency policy, with notable policy proposals including [Improving the Energy Performance of Privately Rented Homes](#)¹⁹ and [Improving Home Energy Performance Through Lenders](#)²⁰ which is likely to lead to a significant increase in the demand for energy assessments and therefore 'Domestic Energy Assessors' (DEAs). It should be highlighted that in the Non-Domestic Sector, 'Non-Domestic Energy Assessors' (NDEAs) are responsible for producing Energy Performance Certificates (EPCs).

Training Available

The inclusion of industry in the development of training schemes was highlighted as important for key players within the sector; initiatives such as industry 'training the trainer' was cited as one mechanism that could be employed. Importantly, training targeted at insulation sector professionals in particular can be delivered on the road and if there is significant demand in an area, providers will set up a training facility to upskill the workforce locally. Manufacturers and larger installer firms can work with technical colleges to provide bespoke training. As is the case with many construction

¹⁸ BEIS and MHCLG (2018) [Call for Evidence: Energy Performance Certificates for Buildings](#)

¹⁹ UK Government (2020) [Improving the Energy Performance of Privately Rented Homes](#)

²⁰ UK Government (2020) [Improving Home Energy Through Lenders](#)

roles, a lot of training involves practical on-site support and skills are approved through practical assessments.

Achieving PAS2030 requires that any company working in this sector must have qualified installers at NVQ Level 2. The level 2 in Insulation and Building Treatments is an entry level qualification and an essential step in an installer’s journey as it lays the foundations for future progression. The below graphic provides some example pathways that could be taken to enter the market and the upskilling routes. Note that this may not cover all routes and has been created to provide an illustration of the routes and courses available. The courses are explained in more detail in Appendix 3 including pre-requisites and expected outcomes / job profiles.

Energy assessors and co-ordinators are likely to play an important role in improving and verifying property improvements as WECA moves towards net zero. There is a need to grow this segment of the market. Some of the available courses to support this growth are also listed below.

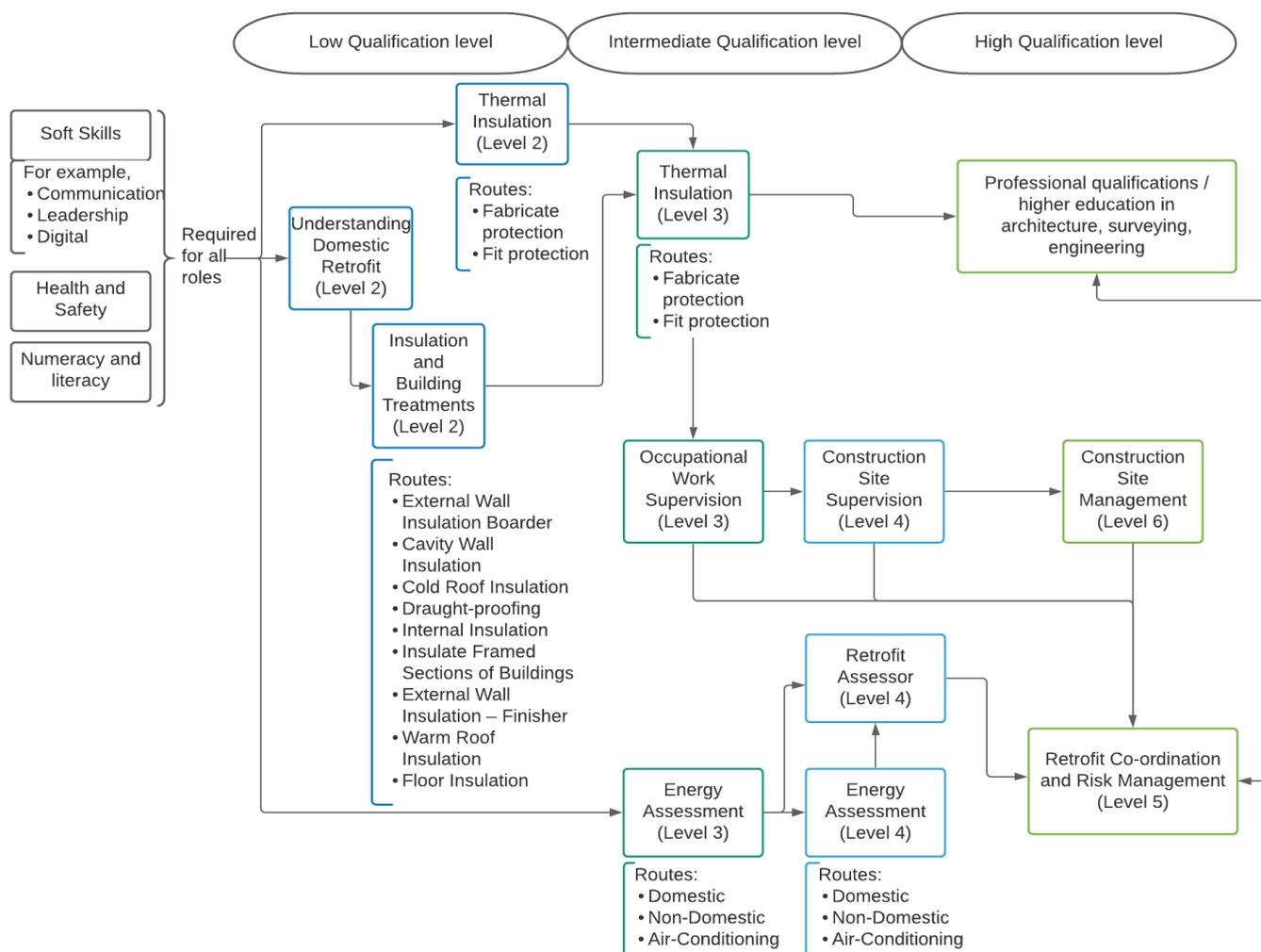


Figure 17 - Illustrative Learner Journey in Insulation and Energy Assessment Sector

Box 3: Case study: Elmhurst Energy

Elmhurst Energy have a training facility in Leicester and operate both on-site and online courses including those to train energy and retrofit assessors, further details of which may be found in Appendix 4. Elmhurst Energy also offer a [Student Membership](#), whereby students studying degrees in the Built Environment can gain access to support and resources. Beyond this, Elmhurst Energy have been involved in a range of collaborative projects with Universities and Colleges including a collaboration with [NPTC Group of Colleges](#), to deliver training for students working in the construction sector.

Elmhurst Energy is also running [Government Funded Domestic Energy Assessor and Retrofit Assessor Courses](#) for unemployed new entrants, funded by BEIS, in partnership with the Midlands Energy Hub.

Box 4: Case study: The Green Register

The Green Register trains construction professionals to develop more sustainable buildings with courses spanning the green construction sector. The Green Register is based in Bristol and is therefore within the WECA region boundaries. The Green Register won funding through the Green Homes Grant Skills Training Competition and further details about the training courses are available are contained within Appendix 4.

Low Carbon Heat

As mentioned previously, the deployment of low carbon heat in the modelling is focussed on heat pumps and heat networks as the existing solutions to heat decarbonisation. Biomass boilers are also an existing technology that is compatible with net zero carbon emissions. However, due to air quality concerns and relatively high upfront costs they are viewed as a solution more suited to large, rural buildings off the gas grid. There have also been biofuel advancements, such as bioLPG in recent years, although volumes of this fuel are relatively very low in the heating sector. For these reasons, the modelling therefore focusses on heat pumps (~92%), which can be widely deployed, and heat networks (~8%, assumed to be in urban areas).

Heat Pumps

Scenario Analysis Dashboard: Heat Pumps					Job Type Share	Job Skill Level Share
Scenario	Net Zero 2030	National Net Zero Baseline	COVID- Slow Recovery	COVID- Green Recovery	Administration:	Low skilled:
Additional Jobs by 2025	360	273	98	369	Install:	Medium Skilled:
Additional Jobs by 2030	7,065	4,061	1,752	10,007	Manufacture:	High Skilled:
Total Deployment 2021-2030 (measures)	391,808	241,619	103,816	391,808	Key: Green <25%, Amber 25-50%, Red >50%.	

As can be seen in the dashboard above, the rate of deployment of heat pumps in WECA will have to considerably outstrip the rate needed nationally for net zero if the 2030 target is to be met. The slower rate nationally is largely as a result of biding some time to see how other solutions, such as hydrogen boilers, develop over the next decade and to also allow for energy efficiency improvements to be made. Heat pumps typically require insulation upgrades to have been made to allow the technology to work efficiently.

However, it may be that WECA cannot afford to wait for such changes to happen and therefore focusses on heat pumps as an existing solution to increase the level of deployment over the coming decade. This will require considerable growth compared to current levels; the market will likely need to grow by an average of 80% each year to hit the Net Zero 2030 scenario level. With such high growth needed, there is much to be done to help to ease the deployment of heat pumps in WECA. For example, insulation deployment in the first half of the decade could be ramped up to ensure that it is largely in place ahead of the main bulk of heat pump installations.

Heat Pumps Additional Jobs

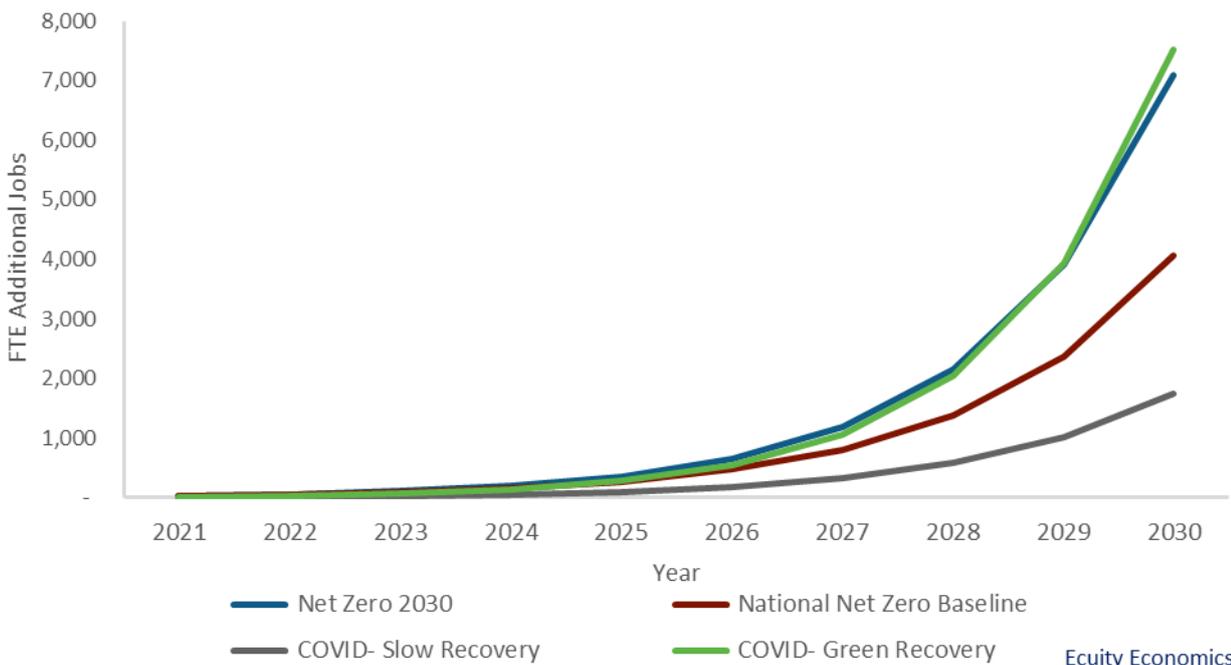


Figure 18 - Heat Pumps Additional Jobs

Skills Requirement

Developing the installer base for heat pumps is fundamental to meeting the above deployment targets. As noted by the Heat Pump Association, “the current route to becoming a heat pump installer is too costly, bureaucratic and confusing, with outdated content still being taught”, although they are currently updating the route to reduce these issues and bring the content up to date (see proposed new route map below). There is therefore a need to address this issue through changes to the course content. The skills needed by heat pump installers are:

1. Intermediate Level
 - a. Understanding of (Low Temperature) Heating Systems.
2. High Level
 - a. Knowledge of Smart Controls and Meter Integration as well as the ability to integrate systems with Demand Side Response (DSR) events.
 - b. Design Skills (including the ability to undertake room by room heat loss calculations).

The below graphic provides some example pathways that could be taken to enter the market and the upskilling routes. Note that this may not cover all routes and has been created to provide an illustration of the routes and courses available. The courses are explained in more detail below.

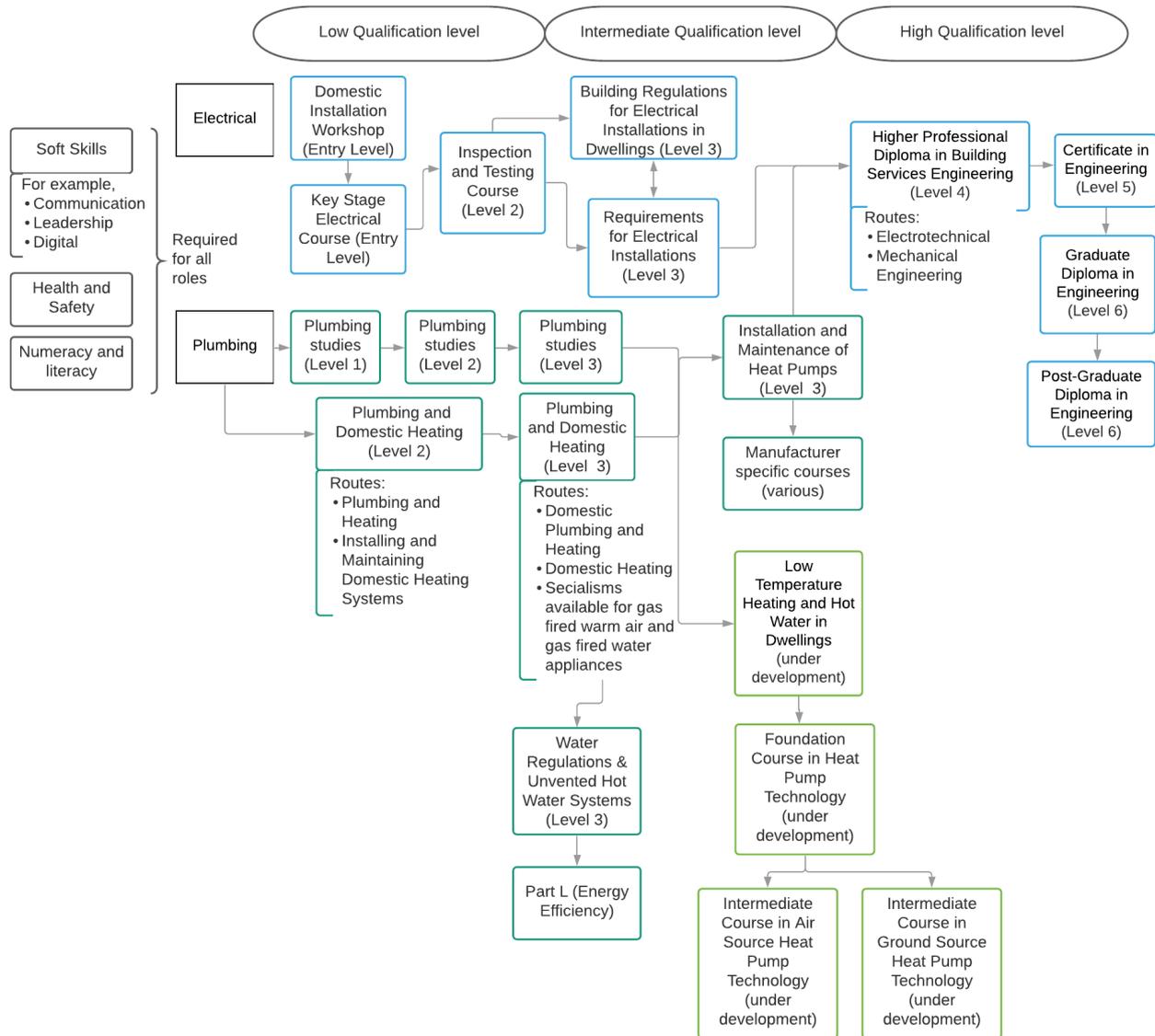


Figure 19 - Illustrative Learner Journey Options in the Heat Sector

An overview of the qualifications highlighted above is provided in Appendix 3 and includes course details, job opportunities and expected salary ranges (where available). Whilst this list is not exhaustive it provides an indication of the role of industry and colleges in training provision.

Box 5: Case study: Exeter University Design Course

The University of Exeter have collaborated with notable industry players, including MCS, in developing a Heat Pump Systems Designer Course. This course is being developed through the European Social Fund Innovation in Higher Level Skills Project and industry expertise has been used in order to identify the scope, course content and delivery style. The Pilot Course is being run from 27 January 2021 to 10 March 2021 and consists of four sessions.

- a. Session 1: Introduction to Heat Pump Systems
- b. Session 2: Heat Pump Variations and Performance Optimisation
- c. Session 3: System Design, Part 1
- d. Session 4: System Design, Part 2

Box 6: Case study: Industry collaboration to develop new training courses to support uptake of low temperature heat

The Chartered Institute of Heating and Plumbing Engineers (CIPHE) and the Heat Pump Association (HPA) have collaborated with other industry bodies to develop a series of training courses specifically designed to upskill fossil fuel installers.

- NVQ Level 3 - Low Temperature Heating and Hot Water in Dwellings
 - 2 day course to provide skills related to heat loss design, heat emitter design, pipe and pump sizing, hydraulic balancing, hot water storage design, system configuration.
- Foundation Course in Heat Pump Technology
 - Two day course. The learner will know the health and safety risks and regulations and standards relating to the installation, testing, and commissioning of heat pump systems. The learner is only fully qualified to install, commission and handover heat pump systems for each particular heat pump technology after completing their individual technology qualification which can be run as a full course or separate modules.
- Intermediate Course in Air Source Heat Pump Technology
 - The air source heat pump course is specifically aimed at existing fossil fuel plumbing and heating engineers and giving them the necessary training to upskill their existing skills to install air source heat pumps.
- Intermediate Course in Ground Source Heat Pump Technology
 - The ground source heat pump course is specifically aimed at existing fossil fuel plumbing and heating engineers and giving them the necessary training to upskill their existing skills to install ground source heat pumps.

Many of the intermediate skills outlined above are already possessed by the existing stock of fossil fuel boiler installers. These skills are therefore transferable to the installation of heat pumps with some upskilling required for the additional knowledge needed to install heat pumps. Given the scale of growth required in this sector and that it will displace fossil fuel heating jobs, the current fossil fuel installers could be well targeted with training courses in particular. The below graphic illustrates the installer journey.

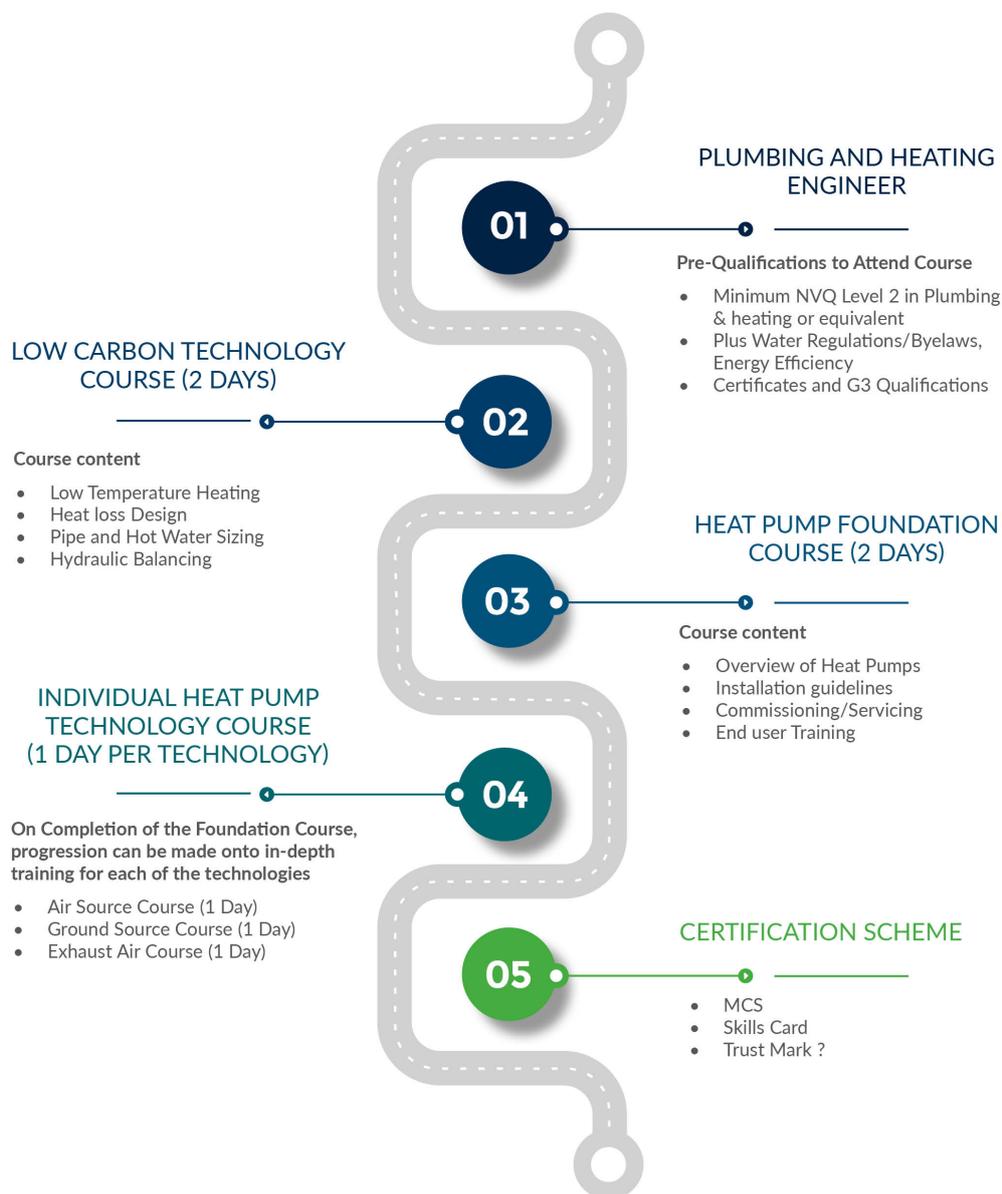
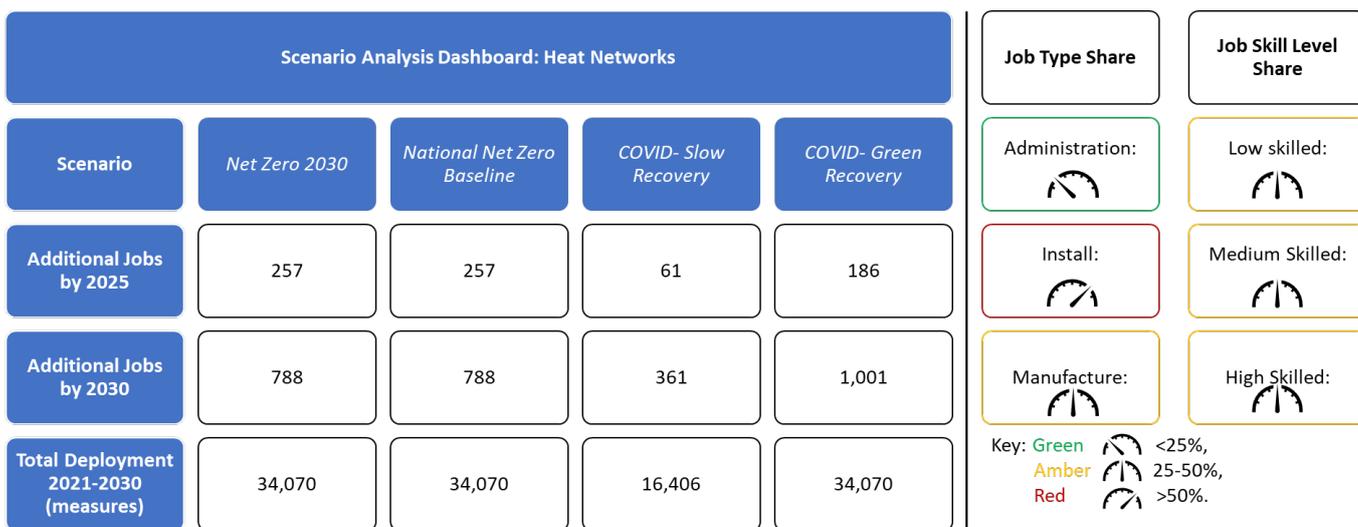


Figure 20 - New Route to Becoming a Heat Pump Installer (Source: Heat Pump Association (2020))

Whilst developing the installer base is an important part of enabling the transition, it is also important to ensure that the availability of a workforce trained in the Operations and Maintenance (O&M) of systems, post installation, which will be hugely important for ensuring consumer confidence is developed and maintained. These roles are likely to require further skills development in areas such as electrics, hydraulics and refrigeration. Whilst the 'warranty workforce' within the manufacturing

sector will have an important role to play in delivering O&M support, there is also a need for a specialised O&M workforce.

Heat Networks



Our interviews highlighted that companies operating in this sector expect to double in size over the next 5 years. There is an established and knowledgeable workforce, but a need to grow numbers throughout the UK to meet the expected demand for heat networks. This is to be expected as heat networks are well-accepted to be a crucial part required for heat decarbonisation. As such, this means that the national increase in deployment is likely to be matched by the rate needed for WECA’s own net zero ambitions, as shown by the level of jobs created across the scenarios below, which aligns in a similar order of magnitude with the feedback received in the interviews.

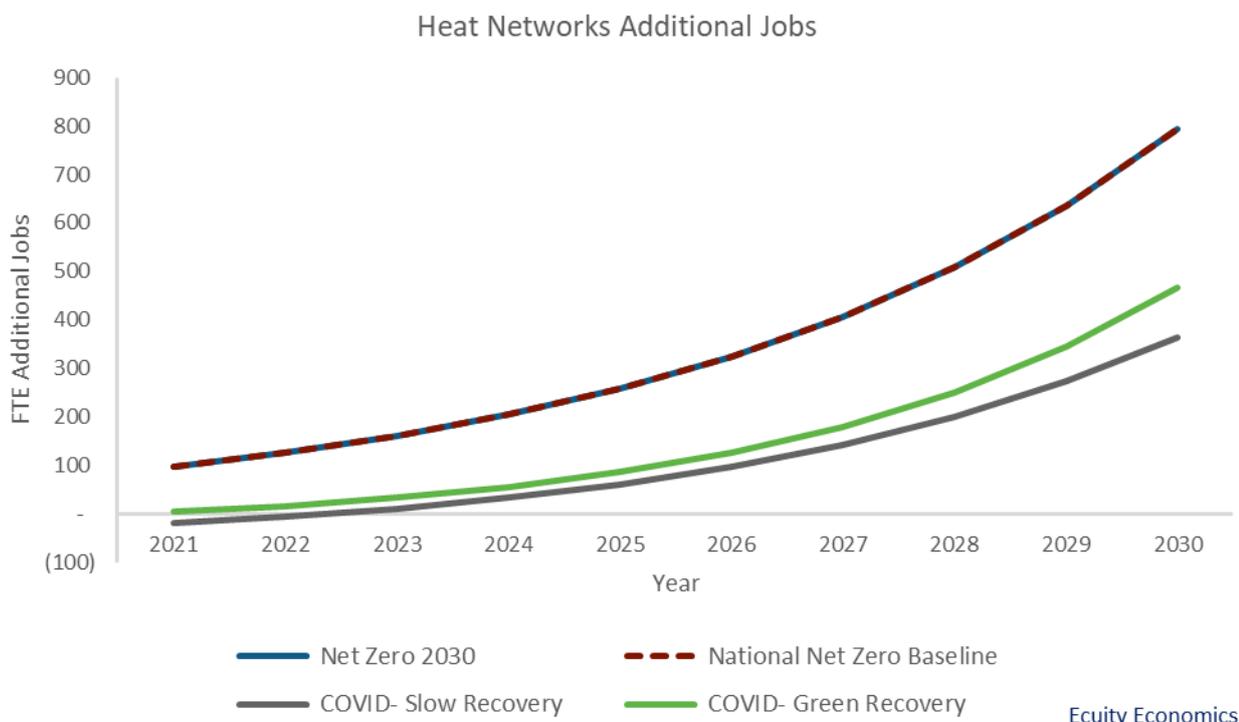


Figure 21 - Heat Networks Additional Jobs

Skills Requirement

Knowledge of heat networks was perceived to be a fundamental skill across all qualification levels due to the unique nature of the industry. The interviews indicated that the heat network design, build, operate and maintenance sub-sector does not face skills or labour shortages currently. However, a recent report commissioned by the Department for Business, Energy and Industrial Strategy (BEIS) found that some organisations already struggle to fill a number of vacancies in some key occupations, particularly senior project management and engineering roles. As shown by the diagram below, the skills required in each heat network development cycle vary with IT skills becoming increasingly important as the project moves from construction to commissioning and legal and financial support required in the early project development and feasibility stages²¹. The heat network sector, unlike the other sectors discussed, sits at the interface between a range of other sectors, including power, engineering, and construction. This means that many of those working in the sector have skill sets that are transferable. For example, legal and financial services firms may advise heat network feasibility and also other energy or construction projects. Engineering skills are required throughout the heat network lifecycle. Moreover, the skills shortage in the sector appears to vary by organisation type with local authorities, social housing providers and property developers finding these skills particularly hard to find.

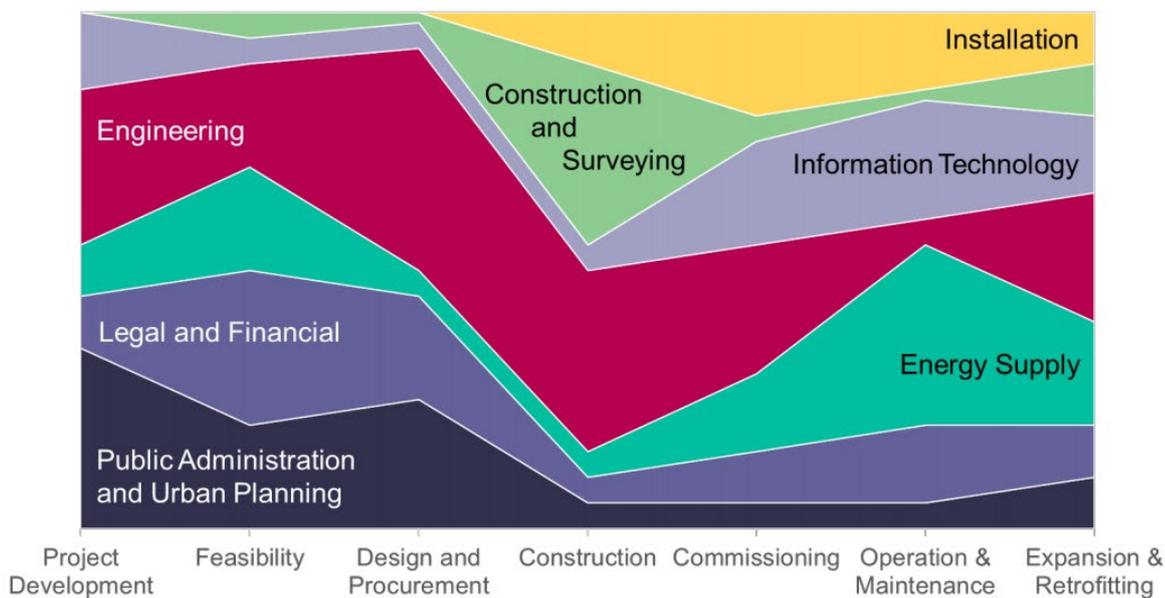


Figure 22 - Heat network project stages: timing of roles of different sectors. Diagram based on depth interviews and workshop outcomes; project stages taken from CIBSE & ADE (2019). Heat networks: Code of Practice for the UK. 2019. Not a quantitative representation - illustrative of scale of roles of sectors at different stages. Excludes Scientific Research, Heat Generation and Manufacturing, since these are not in the defined scope of the research; Manufacturing is also not specific to a project stage. Source: Heat Network Skills Review BEIS (2020)

²¹ BEIS (2020) [Heat Networks Skills Review](#)

There are a few specialised qualifications for those working in the heat network sector and most entry routes are not targeted. Transfer between sub-sectors often occurs at the lower level, such as in roles in construction or installation. The training progression route for the heat network sector is typically:

- Gain professional or vocational qualifications in a general field, i.e. engineering.
- On the job training to gain heat network specific knowledge provided by an employer.
- Supplementary short courses run by the Chartered Institute of Building Services Engineers (CIBSE).

Formal qualifications that are specific to the heat network sector, include:

1. Level 2 or 3 NVQ in a related subject (e.g. building services engineering), ~2 years.
2. Energy Modelling, NVQ Level 3, ~250 hours of study.
3. BEng/Meng Mechanical and Electrical Engineering, 3 or 4 years.
4. CEng, MCIBSE Membership, ~4 years + following university.
5. MCIBSE/CIBSE Certified Low Carbon Consultants (additional 2 days), Heat Network Code of Practice Consultants (examination only).

In addition to the above technical qualifications, management skills are also deemed important as well as business development.

Previous research conducted by BEIS found that there is a need to develop heat network specific training infrastructure at all levels, including in apprenticeships (at Level 4 for construction and construction installation roles and Level 6/7 in engineering and design roles) and in university courses. The role for apprenticeships was confirmed during our interviews and are seen as an important recruitment route for the sector. Heat network providers are looking to expand upon current rates by utilising the Apprenticeship Levy to upskill existing employees to enhance and develop their current skill level to meet the market demands. There is work underway to develop and seek approval for a national apprenticeship scheme which will allow learners to learn skills on the job and in the classroom. In addition, graduate schemes are also used to encourage high-skilled workers into the sector, providing them with a clear training programme and progression route. It is important to note that many undergraduate engineering degrees tend to have at least one module on heat transfer which is applicable to heat networks. Some also offer renewable energy modules, although these tend not to be heat specific²². As such graduate schemes, targeted at undergraduates need to address this lack of heat network specific training. The schemes often combine theory with practice and are spread over multiple years. There are more heat network specific options available at post-graduate level.

It is important to note that as training is provided on a case-by-case basis by employers, there is very little standardisation. BEIS found that “heat network specific knowledge is generally developed through on-the-job training and supplemented by the short training course run by the Chartered Institution of Building Services Engineers (CIBSE).” Progression through the ranks is therefore often based on experience of completed projects rather than via a clear training route. Due to a lack of specialised qualifications and heat network training, transfer between sub-sectors at the higher qualification levels is limited. The severity of the skills gap is highest for project delivery, planning, or development manager roles. Despite this, recruitment appears to focus on low / intermediate roles to offer career progression and enhance skill sets at the lower levels. Most junior engineers that have thermodynamic and hydraulic skills are likely to be able to transfer into the heat network sector with relative ease. It is expected that recruitment at the higher qualification levels will remain

²² BEIS (2020) [Heat Networks Skills Review](#)

consistent. The Heat Network Skills Review conducted by BEIS highlights that there is likely to be a natural movement of skilled labour between non-renewable energy sectors to heat networks²³.

Box 7: Case study: Vital Energi Heat Network Training Centre

Vital Energi’s £2 Million training centre in Blackburn has been developed to help close the skills gap facing the industry. The centre employs digital tools and demonstrative training, with programmes developed and delivered in collaboration with industry partners. The Centre will build upon the relationship that exists between Vital Energy and The City of Liverpool College.

Due to the above challenges and the lack of a standardised approach to training within this sector, it has not been possible to produce a learner journey. Some of the courses outlined within the heat pump learner journey may be relevant here. However, the below graphic provides an overview of the skills and training requirements at each qualification level.

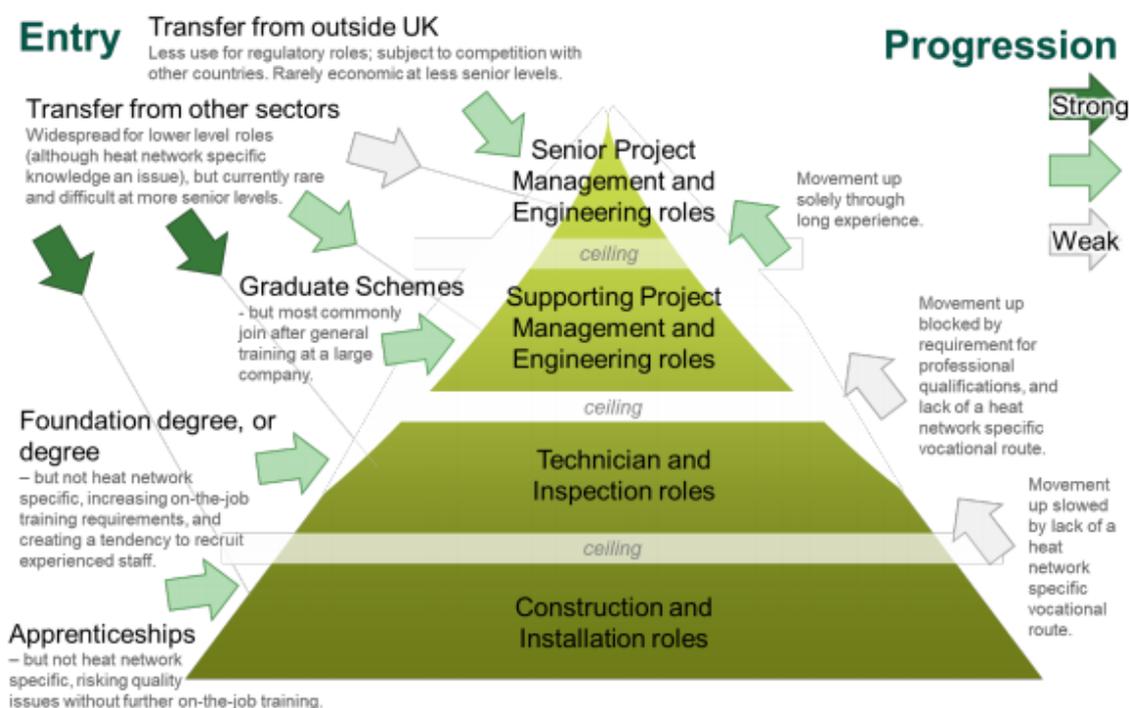


Figure 23 – Representation of entry and progression routes in the heat network sector: Summary of research interviews and workshop participants’ input from BEIS Heat Network Skills Review. The arrows represent flows of people, either into the sector at a particular level (on the left) or progressing upward through the sector (on the right). Grey arrows represent weak flows, while green and darker green arrows represent progressively stronger flows. Finally, the horizontal bars represent barriers or ‘ceilings’ between roles; the paler the colour, the stronger these barriers are.

Fossil Fuel Displacement

The installation of low carbon heating systems will come at the expense of the fossil fuel heating industry. Those currently working in the fossil fuel sector, particularly those who complete installs and maintenance, are likely to see progressively lower amounts of work over the coming decade in WECA.

²³ BEIS (2020) [Heat Networks Skills Review](#)

Despite this, the installation of low carbon heating systems is considerably more labour intensive than the fossil fuel equivalents as things stand. The installation of heat pumps typically requires considerable changes to the heat emitters (radiators) in properties and heat networks require a high degree of upfront investment to develop the infrastructure that can then be used for many years to come.

This means that the job losses in the fossil fuel industry are likely to be fractional compared to the job generation in the low carbon sector, as shown by the example below. As already discussed, many of the skills possessed by the fossil fuel installers are also transferable which could mean that only partial retraining will be needed for the current fossil fuel workers to be able to work on low carbon alternatives. This means that these jobs will not be lost if installers are encouraged to upskill.

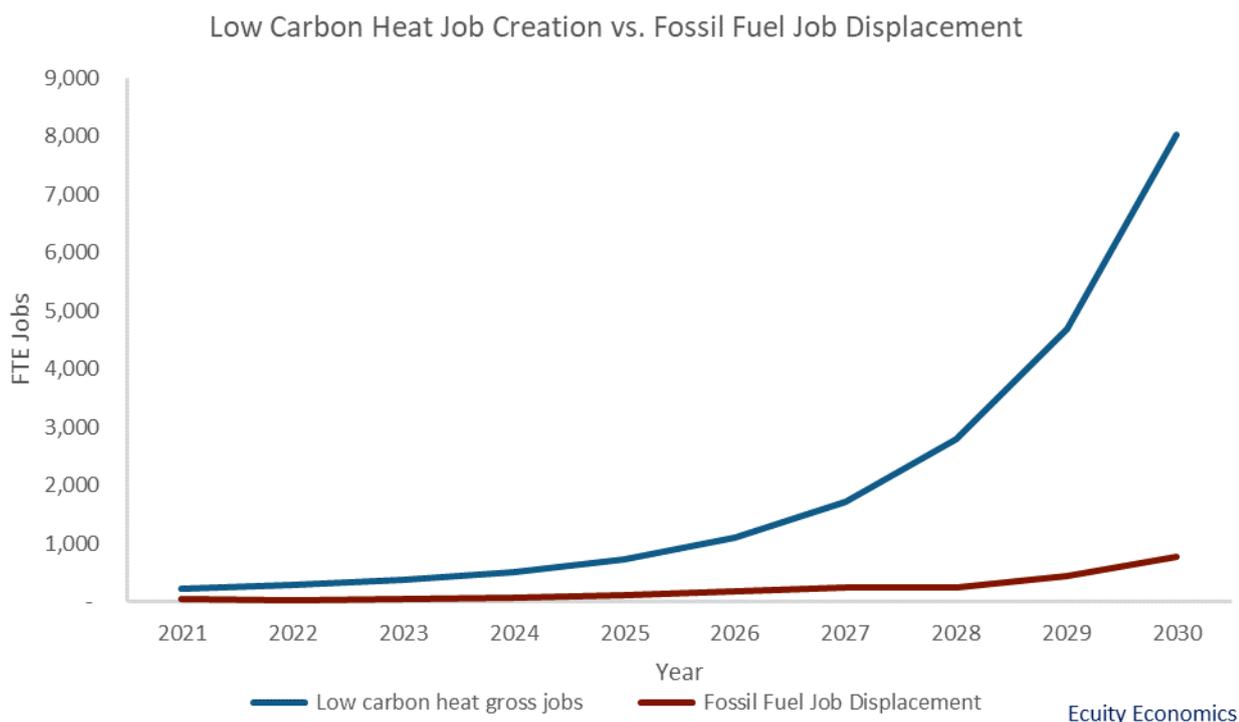


Figure 24 - Low Carbon Heat Job Creation vs. Fossil Fuel Job Displacement

Whilst the analysis above does not predict significant uptake of biomass heating in the WECA region to meet 2030 targets, there may be some deployment in hard-to-treat properties, particularly considering the phase out of oil-fired heating systems.

Increased consumer demand for biomass boilers could lead to job creation potential across the supply chain, including in office and service engineering roles. However, there is an existing and emerging skills gap, with skills cited as being particularly difficult to recruit including an understanding of basic combustion and fundamental heating system understanding. This could be exacerbated by the threat of further skill loss resulting from the closure of the Non-Domestic Renewable Heat Incentive on 31 March 2021²⁴. This could be addressed by installers going through the Low Temperature Heating and Hot Water Systems Course (see Figure 20) where these skills are covered.

²⁴ Biomass Heat Works (2021) [Energy Now](#)

Local Job Creation Potential

The scenario modelling and market research presented within this section provide an indication that there is significant potential for job creation. Many of the jobs forecasted are likely to be created locally. However, it is important to note that some may be generated outside the region and individuals could travel into or out of the area for work. All of the industry representatives interviewed highlighted a need for local jobs but acknowledged that some would be delivered at a national level.

On the manufacturing side, growth opportunities are likely to be centred around manufacturing sites and there are therefore potential growth opportunities for sites situated within the region. However, it should be highlighted that there is a need for industry to ensure national coverage and as such, jobs will be created both within and outside of the region. In the construction sector, it can be observed that some are adopting hub and spoke models where training is provided on smaller onsite facilities close to large project to upskill the workforce locally.

The potential for installer job creation is nationwide. SMEs make up a large proportion of the energy efficiency and low carbon heat installer base, and many are relatively mobile so may travel into and out of the region. However, demand, and thus job creation, is likely to be focused on conurbations. The development and upskilling of a local labour market would help to deliver local specialisms and ensure that local challenges can be addressed. A couple of respondents highlighted that there may be an opportunity for a hub in Bristol that could feed into the wider WECA region.

As with installer roles, the job creation potential for Retrofit Assessor and Domestic Energy Assessor (DEA) roles is nationwide. Individuals working as Retrofit Assessors and DEAs are often self-employed. As with the development of the installer base, there is an opportunity for these individuals to gain familiarity with certain property archetypes common to the region, thus gaining expertise. These roles are seen as “local jobs for local people.” It is important to note that some of the jobs that can be achieved through the energy assessment routes i.e. on construction domestic energy assessors can be mostly desk-based. These assessors work from plans, drawings and specifications which means that they are able to work nationally. Retrofit Co-ordinators typically undertake more desk-based work and as such, there is potential for these to be at a regional level and even a national level, as opposed to a local level. However, domestic energy assessors focusing on retrofit / existing properties are predominantly based around major cities and towns but are willing to travel. Bristol is seen as a hotspot for energy assessors (both domestic and non-domestic) in the region with the vast majority located in the BS1-49 postcode areas.

Whilst the potential job creation opportunities provide an opportunity to support economic recovery and growth, which is particularly important in the context of the Covid-19 Pandemic, the sector as it stands is highly labour intensive. It may be possible to provide the opportunity for individuals within the sector to become multi-skilled in order to drive improvements to workforce efficiency. This ties in well with emerging skills programmes, such as the £2 million WECA Digital Skills programme²⁵ and the national Digital and Technical Bootcamps, which would help to address multi-skilling and drive innovation.

²⁵ West of England Combined Authority [Digital Skills Programme](#)

CHAPTER KEY MESSAGES

- Industry representatives have emphasized the importance of training requirements and standards in ensuring best practice and quality installations. However, currently there is only one provider of the new PAS2035 Retrofit Coordinator qualification in the UK.
- Without confidence in demand, training providers and industry will not invest time and resource in creating and attending courses.
- Whilst the development of incentives is important, ultimately, engaging entrants and the existing workforce is pivotal to creating a self-sustaining market.
- Our research suggests that retrofit industry awareness of WECA-supported training programs could also be improved in the coming months. Local government and training providers have a good awareness of these programs.

CHAPTER RECOMMENDATIONS

- More could be done to widen the availability of new qualifications and training courses in the region. Specifically, WECA could influence training providers within the region as many have stated that courses are not focused on green technology or retrofit. For example, these could include members of the skills advisory panel. Additionally, it is important that WECA engage with national training providers, industry representatives working on technology specific training programmes e.g. the Heat Pump Association, and organisations that collaborate with universities to develop courses e.g. MOBIE to ensure that training is available within the region. There is also the chance for WECA to influence close strategic partners, such as LAs, DWP and strategic delivery partners to encourage them to promote this offering. In particular, there is a need for more Retrofit Assessor and Coordinator roles in the region but training is currently only available through one national provider outside of the region.
- WECA should look to capitalize on the establishment of the Green Jobs Taskforce and the funding available through the National Skills Fund and Green Homes Grant Skills Competition. This could be used to support the growth of solid wall insulation and heat pump installers, where the analysis shows a significant future need for job growth.
- WECA can play a role in raising awareness amongst potential new entrants to support the region's retrofit program. WECA is already home to several training providers that provide courses on heat pumps and biomass. These opportunities could be promoted through the Employability and Skills Portal for example.
- With the chance to improve knowledge of WECA-supported training in the retrofit industry, an information campaign could be run for businesses in the retrofit sector to improve the local understanding of the existing training provision. WECA could lean on the Economic Development Network's good links with local businesses for this.

As well as stimulating demand for insulation and low carbon heat, the supply chain must be rapidly ramped up to meet growing demand. The number of installers of insulation and low carbon heat will need to increase dramatically to meet the installation rates required for net zero, as shown in the analysis above. WECA must focus on both upskilling existing installers and bringing new installers into the sector to address these labour shortages. Residents of the WECA region must be made aware of funding opportunities available for training, particularly in the current climate with high unemployment due to the Covid-19 pandemic.

One major limitation of retrofit schemes historically is a lack of installers with the relevant certification. Several funding opportunities for retrofit skills aim to address these labour shortages through either upskilling existing installers or training new installers (see Appendix 5). Whilst specific training programmes were cited as valuable, as outlined in the section titled 'Job Growth and Skills

Gap Assessment', there is a call from industry to re-introduce more stringent, standardised training requirements to ensure that the aforementioned skills gaps are addressed and that individuals are well equipped to deliver the necessary solutions required to meet net-zero. Standardisation of training is also seen as important to developing the confidence of those wishing to undertake the training.

To deliver the training provision required, there is also a need for the development of new centres, academies, and colleges. One particular challenge identified in this regard is that there is currently only one provider of retrofit co-ordinator training, nationwide. PAS 2035 indicates that a Retrofit Co-ordinator must oversee each retrofit project and hold a Level 5 Diploma in Retrofit Coordination and Risk Management. The Retrofit Academy is the only provider of this qualification²⁶. This standard is being applied across many government-funded retrofit schemes and as such a skills gap is predicted which could limit progress.

Several respondents highlighted the importance of financial assistance to support accredited training provision. Whilst schemes such as the Green Homes Grant Skills Competition (see Appendix 5), Apprenticeship Incentives and the CITB Levy were amongst some of the mechanisms highlighted as valuable to the sector, there was a clear call for further funding.

It is important to highlight that due consideration must be given to how funding is awarded. Not all respondents were supportive of providing free or heavily subsidised training courses. The importance of ensuring training was provided to those committed to a career within the industry was flagged for developing the skills base long term. The benefits of a lengthy career within the sector should therefore be communicated clearly to individuals in order to engage them. It was stressed that whilst the development of incentives is important the engagement piece is pivotal; if people are not engaged in the training opportunities available, then upskilling will be a significant challenge.

Government Support Retrofit Skills Funding

As part of the Green Homes Grant, a skills competition was created to support the energy efficiency and low carbon heating supply chains. 17 applicants from across the country have been successful in this competition to subsidise training for retrofit assessors and insulation or low carbon heat installers and have been awarded a total sum of £6.4 million (see Appendix 5 for further details). A summary of the training available is provided in Appendix 4. Of these, 10 training providers are actively seeking to support the WECA region either through training centres in the South West or online delivery of training.

Green Homes Grant funded training must take place before the end of March 2021. While many of these courses will help installers receive the accreditation necessary to participate in government retrofit schemes, the majority are not open to individuals who are new to the sector. As a result, the skills competition is likely to lead to an upskilling of installers in energy efficiency but is unlikely to significantly increase the number of workers. There will be a greater impact on the low carbon heat workforce as those currently employed in plumbing are eligible for training, meaning that those currently installing fossil fuel systems would be able to build on their skills base to also be able to install low carbon heat. More detail of which organisations have received funding and the courses on offer can be found in Appendix 4.

The Government has also announced £2.5 billion for the National Skills Fund, helping adults to train and improve their employment prospects. As part of this funding, £36 million is available now for technical and digital skills bootcamps, where clean growth is specified as one sector which will

²⁶ The Retrofit Academy (2020) [The Retrofit Academy - FAQs](#)

receive funding²⁷. Full details of specific courses available on the wider scheme and how this funding will be split are due to be released in early 2021. While the National Skills Fund courses span the whole economy, the Green Jobs Taskforce, who are due to publish their action plan in spring 2021, aim to pinpoint skills needed for a low carbon transition, promoting the need to train retrofiters as well as other professionals in the green sector²⁸.

Retrofit funding often requires installers to be TrustMark, PAS or Microgeneration Certification Scheme (MCS) certified (or a combination of the three). For example, the Green Homes Grant required the primary company completing works to be TrustMark registered (although sub-contractors are not required to be), and either PAS (for energy efficiency) or MCS (for low carbon heat) certified. There are similar requirements for the Energy Company Obligation (ECO) (see Appendix 5 for further details). To ensure that installers are eligible to carry out works under these schemes, WECA should take advantage of any subsidised training that certifies installers to these standards.

[Awareness of WECA's Growth and Skills Programmes](#)

WECA support businesses through the West of England Growth Hub which offers dedicated business support including financial advice and training. This platform could help businesses in the region adapt to the net zero transition and access funding / training opportunities. However, awareness of business and skills support is much higher among government representatives and training providers than industry stakeholders. It is important to note that not all the organisations interviewed were based in the region and the sample size was small. However, this finding suggests that there is a need to increase awareness of the support available for industry.

²⁷ DfE (2021) [Skills Bootcamps – Digital & Technical](#)

²⁸ BEIS (2020) [Energy White Paper](#)

CHAPTER KEY MESSAGES

- In order to meet net zero and the retrofitting requirements set out in this report, it is important to be able to attract new entrants into the retrofit market. One route to sector growth is to ensure that entry level training courses are available in the region, particularly to allow the unemployed or workers looking for a career change to enter the sector. Survey respondents also highlighted the importance of apprenticeships.
- Education providers reported that 'green' courses represented a low proportion of the training offered currently, but expected to see substantial growth in the area in the next 5 years.
- All trades involved in property construction will need to be well versed in whole house retrofit and energy efficiency to reduce the risk of unintended consequences.
- Increased digitalisation and the availability of knowledge at the point of use means that behavioural skills are becoming increasingly important and this must feed into traditional training provision.
- Entry level training opportunities and subsequent roles must be accessible, and it is important to ensure the prospect of long-term careers not simply short term, low skilled work.
- Opportunity to develop a centre of excellence and a reputation in retrofitting Georgian properties.
- Training providers require clear direction from national and local government, alongside additional funding to enable them to invest in the development of retrofit qualifications and build training facilities, prior to the anticipated surge in demand.

CHAPTER RECOMMENDATIONS

- For the upskilling of existing building professionals, industry experts highlighted that training must be tailored to existing skill levels and timely. There is potentially a coordination role for WECA in bringing together further education providers, industry, and professionals to better understand training requirements as they evolve over time. This could be achieved through setting up a specific working group to keep abreast of the training requirements as they develop in the long-term.
- WECA could consider directing funding to support the development of green courses and purchasing equipment to enable upskilling.
- WECA could play a role bringing together industry and training providers to develop 'green' courses specifically targeted at the retrofit sector and delivered at the pace needed to achieve the net zero target in the region.
- WECA could facilitate the introduction of work experience placements via colleges and schools in local retrofit businesses to highlight the opportunities to young people (ages 14-16) and showcase the range of roles available, building on the work already done by the Careers Hub.
- The analytical findings of this report could be used to engage people who may be interested in getting a job and making the most of the retrofit opportunity, by highlighting the demand potential. WECA could work to signpost the need for apprenticeship funding for new entrants to the retrofit market to the national government, pushing for more funding targeted at retrofit skills.
- WECA could provide support to further education colleges to allow them to prepare for future increases in demand (in terms of guidance or evidence to facilitate strategic decisions) as many are currently finding it challenging to plan effectively as their priority is reacting to COVID-19 and continuing to support students.

Recruitment Activities

It is clear that key players within the industry are undertaking recruitment activities in order to prepare for the transition. In terms of direct recruitment activities, one industry representative cited the importance of a robust selection process in order to ensure that candidates are well suited to the roles available.

Opportunities provided for new entrants include apprenticeship and graduate schemes. It is clear that apprenticeships play an important role in industrial recruitment activities. One respondent was currently developing an apprenticeship in collaboration with the National Apprenticeship Accreditation, comprising of both 'on and off the job' training, including day release as well as mentoring and continued review against a detailed training plan. Graduate schemes are also perceived to be important, with one respondent highlighting that they operate a 3-year, all-round training programme combining theory and practice to develop the resource base which includes exposure to Design, Engineering, Commercial and Technology Based Disciplines.

In terms of indirect recruitment activities, one respondent active in the low carbon heat sector highlighted that work experience was offered to candidates aged 14-16 and aged 16+ within local educational establishments. These opportunities help students to identify their chosen career path and raise the profile of the sector. A similar programme could be introduced in the WECA region. Information surrounding these work placements is disseminated through local careers fairs, local job centres, collaboration with local educational establishments, external and internal advertising as well as personal communications.

Training Courses Will Need to Adapt

It is clear that existing training courses are insufficient to deliver the skills required for the low carbon transition and that training courses must adapt to deliver the skills required to retrofit the properties of the future. It is also important that training courses consider the different scales within the sector with practical programmes devised considering the requirements of SMEs.

Whilst existing apprenticeships such as plumbing and electrical courses often contain environmental units and there are 'green' elements to some construction apprenticeships, it is believed by some within the sector that these offerings are inadequate. Key industry players are seeking to support the development of sector specific training courses, such as low carbon heat apprenticeships. Such training courses may be targeted towards new entrants and could be developed to encourage increased diversity within the sector.

However, it is also important to ensure that existing trades are brought along in the transition and where appropriate, are provided with the opportunity to transition from traditional fossil fuel technologies to low carbon alternatives. For installers already equipped with the skills required to deliver solutions, such as fossil fuel heating systems and air conditioning, specialist training is required to build upon the existing plumbing and electrical skills that they currently possess.

For upskilling of existing trades, training must be tailored and timely.

1. **Tailored:** There is a risk that applying a one-size-fits-all approach to training provision neglects the existing skills that exist within the industry. One respondent highlighted that in terms of upskilling existing trades, there should perhaps be a focus on "knowledge shortage" as opposed to "skill shortage".
2. **Timely:** Training must be offered when there is assurance that demand will grow; there is a risk that individuals will invest in training and upskilling to find that there is insufficient work

available. SMEs are ultimately seeking secure income and unless there is clear demand for technologies such as heat pumps over fossil fuel boilers, SMEs are unlikely to make the transition.

For trades that may not be directly influenced by the transition, such as plastering, there is a need to ensure that tradespeople are equipped with the skill set required to work with new materials or techniques. Courses should include green skills and ensure that learners have an awareness of whole house retrofit and the importance of energy performance. An approach which does not consider this will lead to negative consequences in terms of property performance and consumer experience. Alternatively, there may be an opportunity to encourage these individuals to upskill and move into the retrofit sector.

It is important to highlight that moving forward, flexibility of training courses is key to success. Rapidly evolving technological innovations as well as changing policy incentives and apprenticeship standards means that training courses must be designed such that they are flexible and adaptable. Increased digitalisation and the availability of knowledge at the point of use means that behavioural skills are becoming increasingly important, and this must feed into traditional training provision.

Finally, the availability of accessible, entry level training provision was perceived to be insufficient and particularly important in addressing long term unemployment within the region. In the provision of entry level training, there is an important balance to strike. Whilst it is important that training opportunities and subsequent roles are accessible, it is important to ensure the prospect of long-term careers rather than simply short term, low skilled work.

Box 8: The Optimised Retrofit Programme

The [Optimized Retrofit Programme](#) is a pivotal part of the Welsh Government's Plans for a Green Recovery. In the first year of operation, the ORP will bring together Housing Associations and Councils to undertake whole house retrofit of at least 1,000 existing social homes and crucially, there will be a focus on the creation of local jobs, training and apprenticeship opportunities. The Welsh Government will also work with the FE sector with the ambition of opening new retrofit academies across Wales.

“We see the Optimised Retrofit Programme as just one part of our plans for a green recovery, creating a low carbon economy for Wales, reducing fuel poverty and tackling the climate emergency. It's about much more than just a one-off scheme. This is an approach that could create a sustainable, long-term retrofit industry that supports thousands of local jobs and training opportunities as we act to meet our 2050 carbon targets... This scheme has the potential to drive up private sector investment, help people develop new skills and provide important training opportunities.” - Minister for Housing and Local Government, Julie James.

Feedback from Training Providers

Colleges are seeking to develop their training provision to deliver the skills required for the retrofit challenge, but there are barriers to delivering these. Training Providers noted that course content is regularly reviewed, and it is clear that efforts are being undertaken to develop the existing training offering. Proposed actions include:

1. Recruiting more trainers and assessors to enable increased delivery; there is a need for 'train the trainer' schemes to ensure the delivery of high-quality training provision.
2. Developing future curriculum plans.

3. Expanding campuses to promote environmental technologies including purchasing equipment and upgrading training facilities.

Multiple respondents noted that they intended to either grow their existing retrofit offering or bring retrofit into their course offering as they perceived it to be a growing area. One specific opportunity for the local area was the potential for the development of a course to train individuals in retrofitting Georgian properties.

Whilst there are specific initiatives to note such as an [‘Eco House’](#) and a [‘Future Technology Centre’](#) at Weston College and specialised training provision for renewable technologies including Ground Source Heat Pumps (GSHPs), potential growth is coming from a relatively low base. A low proportion (less than 50%) of courses offered in the region are targeted at green and retrofit skills. Although starting from a low base, the proportion of skills training with a focus on retrofit is expected to increase significantly.

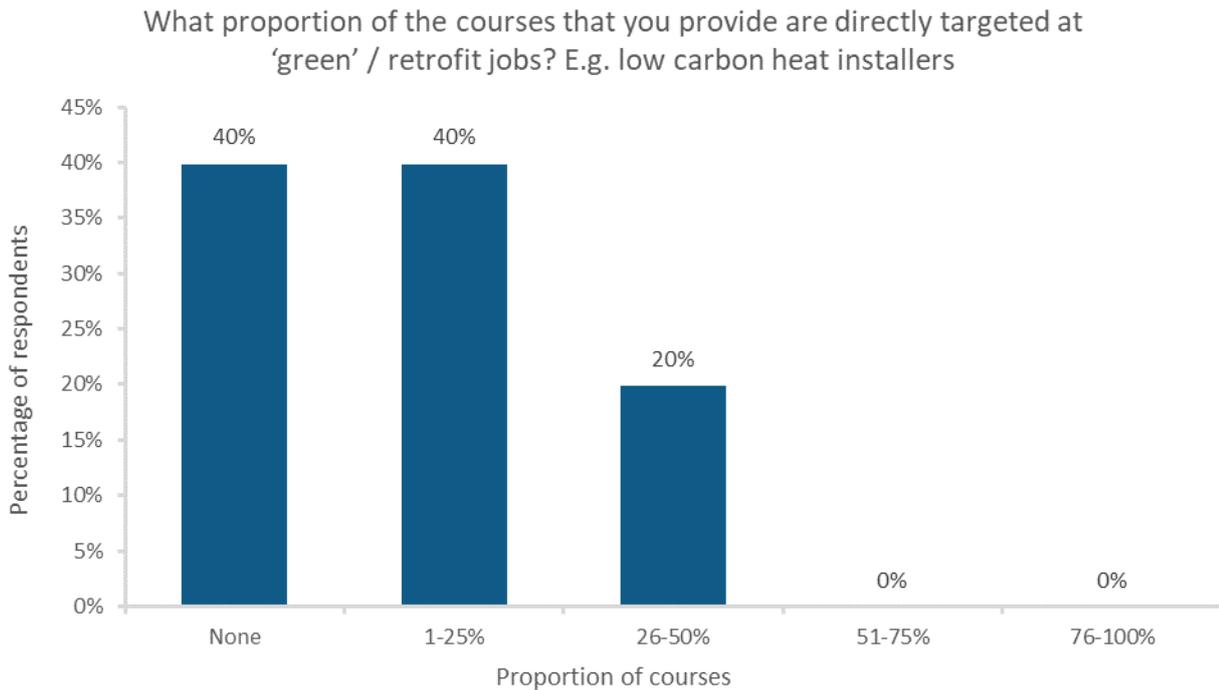


Figure 25 - Proportion of Courses From Training Providers Interviewed That Target Green or Retrofit Jobs

There is consensus that demand for green or retrofit specific courses will need to increase over the next 5 years.

How do you see demand for green / retrofit related courses increasing or decreasing over the next 5 years?

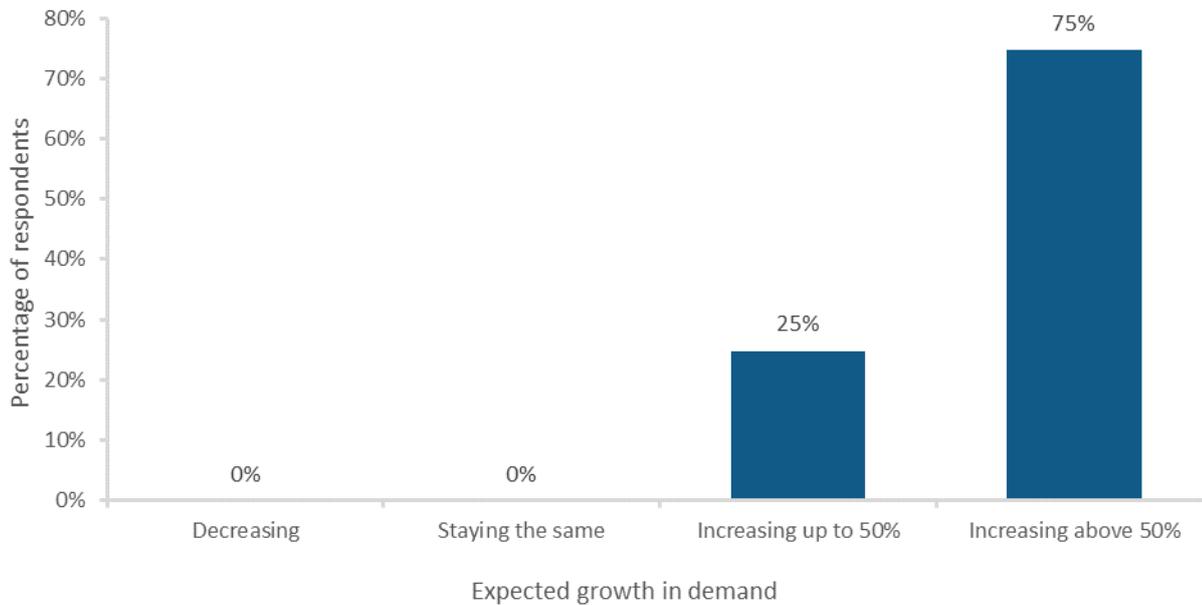


Figure 26 -Expected Growth in Demand for Green or Retrofit Courses

Achieving the growth needed requires training providers to ‘get ahead of the curve’ and develop training courses for which **current** demand remains relatively low. However, it is clear that for at least some Further Education (FE) providers, the current funding model creates constraints. Without additional financial support for training providers to develop courses in advance of need or to purchase technology on-site, available funding is largely based on immediate demand. As such, training providers take on a significant financial risk in developing training courses, without guaranteed uptake from new entrants. Furthermore, in order to receive government funding, courses must be recognised by government. WECA could look to ensure that funding is allocated specifically to support the development of green courses and the purchasing of equipment to enable upskilling.

The challenges associated with the existing funding model have been exacerbated by the uncertainty created by COVID-19. COVID-19 has put a lot of financial pressure on FE colleges as extra funding to support any of the COVID-19 initiatives has not been provided (this has had to come out of the existing budget). One respondent said that “rather than having a 5 year strategy, it may well now become a 10 year strategy” as a result of COVID-19. One college said it has more students this year because of the uncertainty of COVID-19 so is having to spend more but funding for this will be allocated next year so financial pressures are high. However, another training provider highlighted that their ability to provide support and training, where distance or online learning is not suitable, was limited given social distancing restrictions so student numbers have significantly reduced during the pandemic which will impact cashflows. Providing support to FE colleges during this difficult time to allow them to prepare for future increases in demand could be beneficial (in terms of financial support or guidance / evidence to facilitate strategic decisions) as many are currently finding it challenging to plan effectively as their priority is reacting to COVID-19.

Figure 27 provides a summary of the feedback from some of the training providers interviewed about the pathway to course development. Whilst this forms a small part of the bigger picture and would not be an entirely linear process in practice, it offers interesting insight. Broadly speaking, training providers require clear direction from national and local government, alongside additional funding to enable them to invest in the development of retrofit qualifications and build training facilities, prior to the anticipated surge in demand.

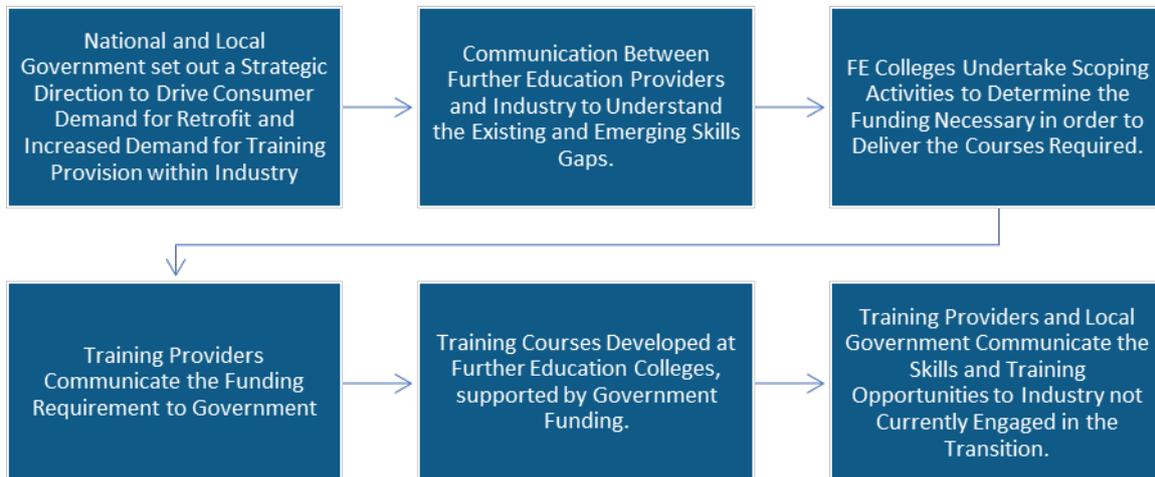


Figure 27 - A Summary of Feedback from Further Education Providers Surrounding the Pathway to Course Development

CHAPTER KEY MESSAGES

- Industry representatives consider that policy stability, interest from the local workforce, and financial capability to be the most important factors in facilitating the upskilling and supply of skilled labour.
- Confidence in demand stability and long-term policy was seen as a barrier to investment.
- The sector itself is undergoing considerable change, and is relatively fragmented, which creates challenges for consumers and new entrants. Training providers are looking to evolve with changing policy and technology requirements.
- COVID-19 and Brexit were also seen as near-term challenges for the sector, however views were mixed in terms of the severity of the impact.
- The lack of diversity and the unattractiveness of the retrofit sector was identified as a barrier to increased growth. A need to change the perception of the sector and encourage a more diverse workforce was emphasized.

CHAPTER RECOMMENDATIONS

- Whilst national government is largely responsible for policy stability and finances, WECA can play a role in raising awareness among the local workforce and influencing policy development to support skills development and job growth locally. This could be done through WECA working with the local Economic Development Network, which has good links with local businesses to raise awareness and adding this as a priority to WECA's Planning Strategy to target policies and support actions to drive this forward at a strategic level.
- The retrofit sector offers a chance for WECA to create jobs, particularly in the installation of heat pumps and solid wall insulation, to help reduce the impact of job losses created by the pandemic. Here, the Community Recovery Fund could support new entrants to the market who may have lost their job during the economic downturn, specifically this could be for City & Guilds 6189 – 02 and 6189 – 03 – Level 2 and 3 Plumbing and Domestic Heating City & Guilds 2399-34 Level 3 Installation and Maintenance of Heat Pump Systems for example. WECA should raise awareness of discounted or free training provision which has been designed to support unemployed individuals upskill and re-enter the job market as a result of COVID-19 (see Elmhurst Energy in appendix 4). WECA could help to ensure that they these courses are not simply a short-term provision as there is a need for sustained growth so should engage with training providers that have secured Green Homes Grant Skills Competition funding to understand how to support long-term training provision in the region after the funding is deployed. Assessing uptake in the local area will be important to identify challenges and opportunities for growth.
- The net zero recruitment drive required offers the opportunity to increase diversity within the sector by making it more attractive to a wider variety of talent pools. WECA could work with schools and colleges to ensure that the retrofit sector is seen as an opportunity and a desirable career path using case studies and encouraging local tradespeople to share their own experiences.

Whilst there have been notable policy announcements concerning the retrofit sector in recent months which have delivered a short-term increase in demand, it is important to highlight that this does not guarantee increased long-term deployment and sustainable job creation. Some of the key challenges currently facing the retrofit sector have been categorised into themes below. It should be highlighted that overlap exists between the themes identified. Respondents were asked to rank the below challenges from most important to least important.

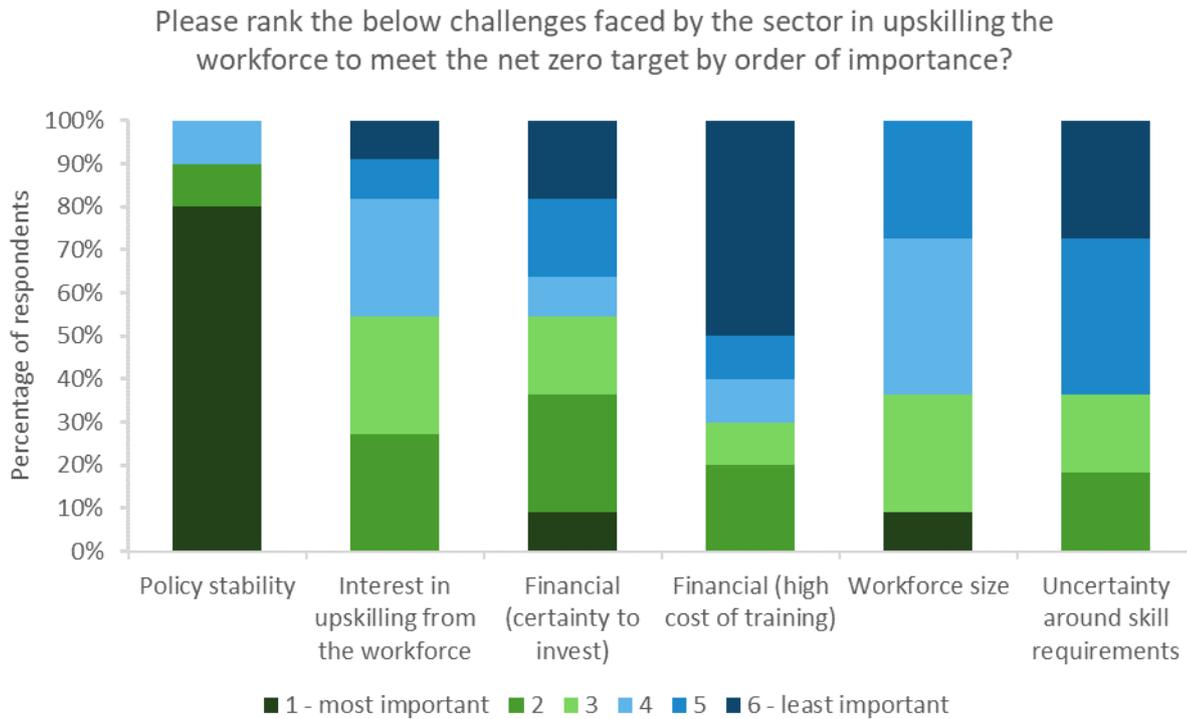


Figure 28 - Industry Representatives Ranking of Importance of Challenges Faced by Retrofit Sector

Policy Stability

The main challenge identified by industry respondents was policy stability which is vital to give the sector the certainty they need to invest in the workforce. Supportive regulation is perceived by many to be very important in ensuring that the training delivered is consistent and of a high quality and to ensure sustainable growth of the retrofit market.

The uncertainty surrounding projected demand growth was highlighted as a particular challenge for the retrofit sector. The construction industry as a whole is relatively lean, when there is security of work upscaling and upskilling occurs. However, when demand falls, resulting from ‘cliff edges’ in government support and market collapse, companies seek to reduce overhead costs by reducing the workforce size and minimising investment in training, thus leading to skill and knowledge losses.

The exploitation of incentive mechanisms in the past has resulted in poor performance as companies are set up to benefit from the schemes. This short-term attitude has reduced confidence in the sector and there is therefore a need for long-term stable policy to drive sustained demand for high quality installations. Concerns were raised about rapid growth having negative implications for quality. That said, it is important that a balance is struck between ensuring high quality installations and creating an enabling market to engage the workforce. One respondent noted that “barriers to entry need to be reduced [and]... it is currently too costly and bureaucratic to get MCS approved for many installers...[which] acts as a big deterrent, particularly for the smaller businesses currently installing fossil fuels”.

Multiple respondents cited historic shortcomings in government support schemes including changing policy incentives and the adverse impact that this has had on the sector. Two specific examples to note include the Green Deal and the Home Information Pack Scheme.

- The Green Deal: The Green Deal was launched in 2013 and was introduced as a pay- as-you-save loan to support the installation of energy efficiency improvements within the able to pay sector. In 2011, the Government projected that the Green Deal would support the retrofit of 14 million properties from 2013-2020, at an average rate of 2 million properties per annum. In March 2016, a total of just 14,000 homes had been retrofit through the Green Deal and the scheme was effectively ended²⁹. The sector had scaled up to support the delivery of this scheme so there is wariness about the longevity of new low carbon / energy efficiency support mechanisms.
- The Home Information Pack Scheme: Home Information Packs were launched in 2007 and were a mandatory requirement for homeowners selling their property. They were the subject of extensive criticism and were ultimately suspended. However, at the time, between 3,000 and 10,000 people were working as trained home inspectors. Whilst EPC assessments continued, thousands of people, who had invested in training were put at risk of losing their jobs almost instantaneously³⁰. The cost of training was high and again this scheme has introduced a nervousness about investing in upskilling.

Whilst there was a clear call for action at the regional level, this was caveated with the need for a consistent approach nationally. The importance of ensuring local initiatives fit with regional objectives and that these align with national policies was emphasised. One respondent highlighted that whilst they supported and were involved in schemes looking to support regional growth, they also noted the importance of co-ordination and collaboration as well as the need to develop a National Retrofit Plan.

Lack of Certainty and Interest in Upskilling

Interest in upskilling from the workforce was perceived to be the next most important challenge faced by industry particularly surrounding a lack of awareness about the roles available and the routes to achieving these. Whilst there is an opportunity for young people engaged in the low carbon agenda to have a long- term career and lasting impact in the retrofit sector, this needs to be demonstrated and better communicated. A lack of interest in upskilling from the workforce was something that has been observed locally by Local Authority Skills Officers, with low take up of training support by local businesses, even in areas such as general workforce development.

Local Authority Skills Officers had slightly different perceptions to industry representatives of the challenges to upskilling the workforce. All government respondents identified financial certainty to invest as a challenge with only half indicating that policy stability was a challenge.

²⁹ Rosenow, J and Eyre, N (2016) [A Post Mortem of the Green Deal: Austerity, Energy Efficiency and Failure in British Energy Policy](#)

³⁰ The Guardian (2010) [Home Information Packs Scrapped](#)

Which of the below challenges do you think the sector faces in upskilling the workforce to meet the net zero target?

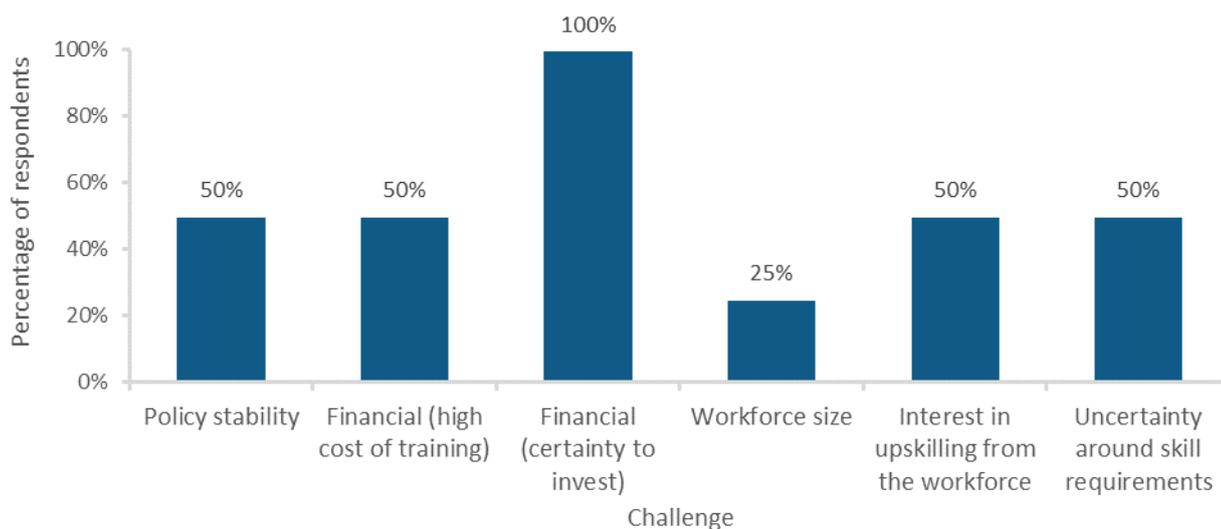


Figure 29 - Government Representatives' Perceptions of Challenges to Upskilling the Workforce

Beyond the challenges identified in the figures above, further challenges have been identified, some of which have been listed below.

The Fragmented Workforce

The sector is fragmented, with several different representative groups. It was noted that the views of the heating installer base are not adequately represented. One notable driver of the skills deficit that was highlighted was the large proportion of Small and Medium Enterprises (SMEs) and self-employed individuals within the sector, which are not very well represented in terms of policy developments. SMEs form 99.9% of UK construction contracting businesses, whilst 40% of the UK construction workforce and 43% of the West of England construction workforce is self-employed³¹. Further to this, the fluidity of the industry and the large proportion of short-term, sub-contracted work means that there exists minimal incentive for large employers to invest in skills development. The lack of demand for upskilling means there is little incentive for training providers to update their training offer, creating a cycle, as depicted in the Figure below.



Figure 30 - The Skills Deficit Cycle

Work has been undertaken within the region to engage SMEs within the construction sector more widely. One example of particular importance to note is On Site, Bristol (See Box 9).

³¹ West of England Combined Authority (2019) [Construction: West of England Local Sector Skills Statement 2019](#)

Box 9: On Site Bristol

[On-site Bristol](#) is seen as a success story and a scheme that may be used to further champion green skills. On Site was founded in 1996 and supports local people in getting jobs within construction. On Site procure training from providers and help local businesses to recruit, shortlist and support apprentices and is a trusted scheme amongst local businesses. The scheme is focused on supporting SME businesses and this has enabled the recruitment of young people and the development of a profile that is different to the national provision.

The Covid-19 Pandemic

The impact of Covid-19 on the retrofit sector was a contested topic and it is clear that the impact of the pandemic remains uncertain. In some areas of the retrofit sector, Covid-19 has had a significant impact on operations and the wider supply chain, with projects being postponed and/or cancelled. It was estimated that the insulation sector's output is currently at about 70% of normal capacity. Larger projects have been able to continue whilst small, single property retrofits have been delayed. This is particularly prevalent for internal wall insulation projects where the installer needs to gain access to the property.

Some production sites were forced to close, or capacity was limited due to reduced numbers of workers on site, leading to challenges surrounding product supply. This has in some cases had significant financial implications and caused delays within the project pipeline. Respondents noted that even with relaxed Covid-19 restrictions, it may still be difficult to gain access to homes and the need to comply with social distancing (e.g., car sharing, fewer people on site) could slow progress.

Where respondents perceived that positive growth of the retrofit sector may arise from the pandemic, the 'building back better' narrative and 'green stimulus' were highlighted as drivers. It was perceived that these narratives could have positive implications in terms of increased consumer demand for retrofit products as well a larger workforce, resulting from increased willingness to engage in the sector. It was highlighted that since the COVID-19 pandemic, the sector has started to see increased interest following years of low uptake and consumers not valuing energy efficiency measures as a result of ECO funding and low cost measures, but the industry is sceptical. One respondent suggested that the insulation sector "would explode once the restrictions are lifted". This was seen over the summer when "demand increase massively, work was completed and businesses hired new staff members". However, the second lock-down has caused concerns. It is anticipated that investment after current restrictions are eased will be lower due to businesses being more cautious. It is important to note however that currently around 30% of the workforce are not active and so the sector could ramp up to meet higher demand without the need for significant investment.

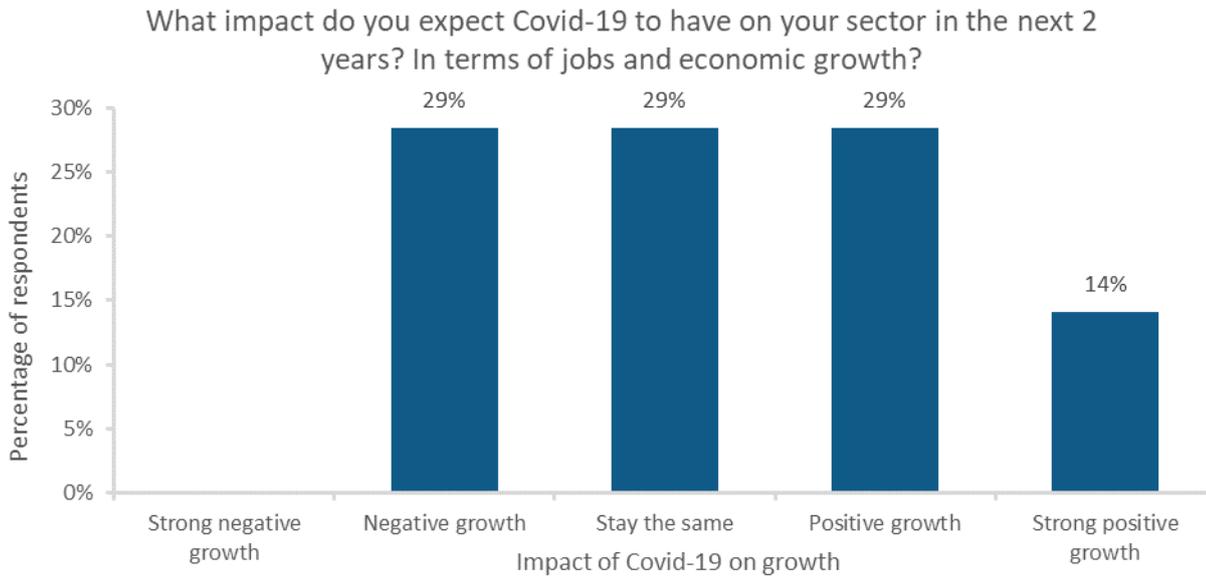


Figure 31 - Expected Economic Growth and Employment Impact of Covid-19 on Retrofit Sector

Looking forward, some respondents noted that Covid-19 may have significant implications beyond direct supply chain impacts, some of which have been highlighted below. These potential impacts are both contested and uncertain but provide an indication of some of the challenges and opportunities that may be faced by the sector.

1. **Current Job Market:** According to one respondent, there exists a lack of available candidates as individuals are concerned about the implications that switching roles may have on their job security. With high rates of unemployment due to the COVID-19 pandemic, some training providers have developed courses and secured funding to support these individuals upskill and re-enter the job market (see Elmhurst Energy in appendix 4). However, there is a need to raise awareness of these courses and ensure that they are not simply a short-term provision as there is a need for sustained growth. The availability of discounted or free entry level courses will be important as the COVID-19 recovery progresses. One respondent explained that they had looked for free entry level courses recently but found none.
2. **Training Provision:** Technical colleges will need to deliver on-site training and social distancing restrictions could be limiting this at present. Further to this, the restrictions make it complex to undertake on-the-job training to a satisfactory standard and remote working adds an additional complexity in terms of performance management and cross-organisation communication. Demand uncertainty due to recurring Covid-19 restrictions also has a negative impact on training as installers may prefer to work when restrictions allow rather than invest in upskilling, particularly if the future demand is changeable. There is therefore a need to provide financial support for training to allow installers to invest time into course attendance without the financial risk.
3. **Greater use of digital platforms:** The need to invest in online and digital resources and platforms as a result of Covid-19 has modernised the sector. The investment in these capabilities will deliver greater efficiencies and higher outputs. The benefit of this transition will be felt long after Covid-19 restrictions are eased.
4. **Future Job Market:** The impact of Covid-19 on school, college and university leavers has led to these individuals missing out on fundamental educational needs, and there are concerns that this may have implications for the future job market. Further to this, Covid-19

has had implications for apprenticeship starts³² (see Figure 32), with some firms reversing decisions surrounding apprenticeship recruitment. However, the approach seems to vary depending on company size and there appears to be increasing interest in upskilling from small firms during the pandemic compared to larger firms.

5. **Willingness to Pay:** In the long term, the Covid-19 Pandemic could have implications for individuals' disposable income resulting from job losses thus leading to a reduction in property transactions which would have implications for energy assessments and for energy performance improvement works.

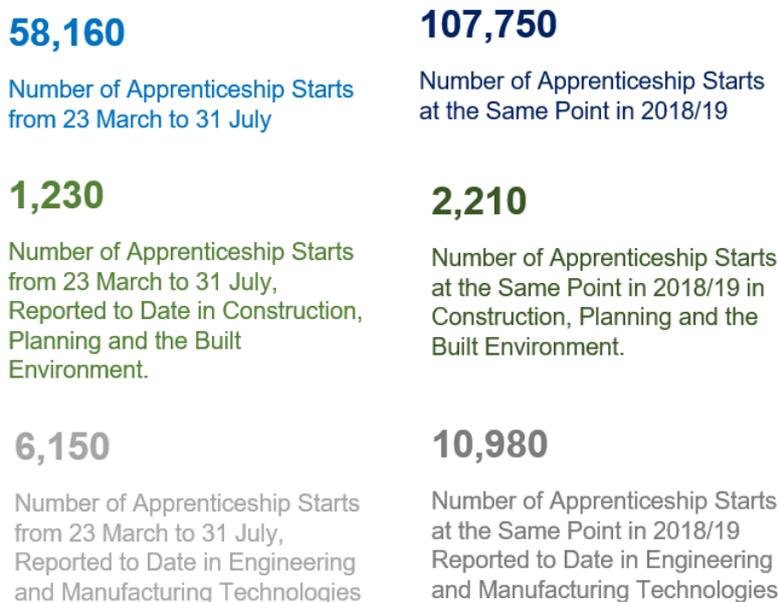


Figure 32 - Apprenticeship Starts 2018/19 versus 20/21

The UK's Exit from the European Union

Brexit has created both short term and long- term uncertainty and is considered to be a challenge facing the retrofit market. In the short term, particularly towards the end of 2020, uncertainty surrounding the status of the trade agreement created a surge in product demand for some sectors within the retrofit industry. However, in the long term there is uncertainty surrounding the impact of Brexit on the UK's Environmental and Energy Policy. Despite the fact that some saw Brexit as a significant challenge and source of uncertainty, others did not.

There are also potential skills challenges associated with Brexit; according to the ONS Labour Force Survey, 8.2% of all construction workers were from EU countries in 2019, slightly less than the figure of 8.6% in 2018. Brexit is believed to have a been a contributing factor to this fall³³. This challenge is particularly acute for the solid wall insulation sector where there is likely to be a need for European labour in the short term to meet demand.

³² Department for Education (2020) [Apprenticeships and Traineeships, England: October 2020](#).

³³ CITB (2021) [Migration in the UK Construction and Built Environment Sector](#).

The Lack of Diversity Within the Sector

There exists a lack of diversity within the sector, with construction often seen as the employment of last choice and a low skill sector. This not only reduces the talent pool but also reduces the overall attractiveness of the sector and limits growth.

Respondents considered that the industry was male-dominated with an ageing workforce. According to the Office for National Statistics (ONS), the UK-born construction workforce is ageing (see Figure 33). This was highlighted by multiple respondents as a challenge facing the construction sector more widely.

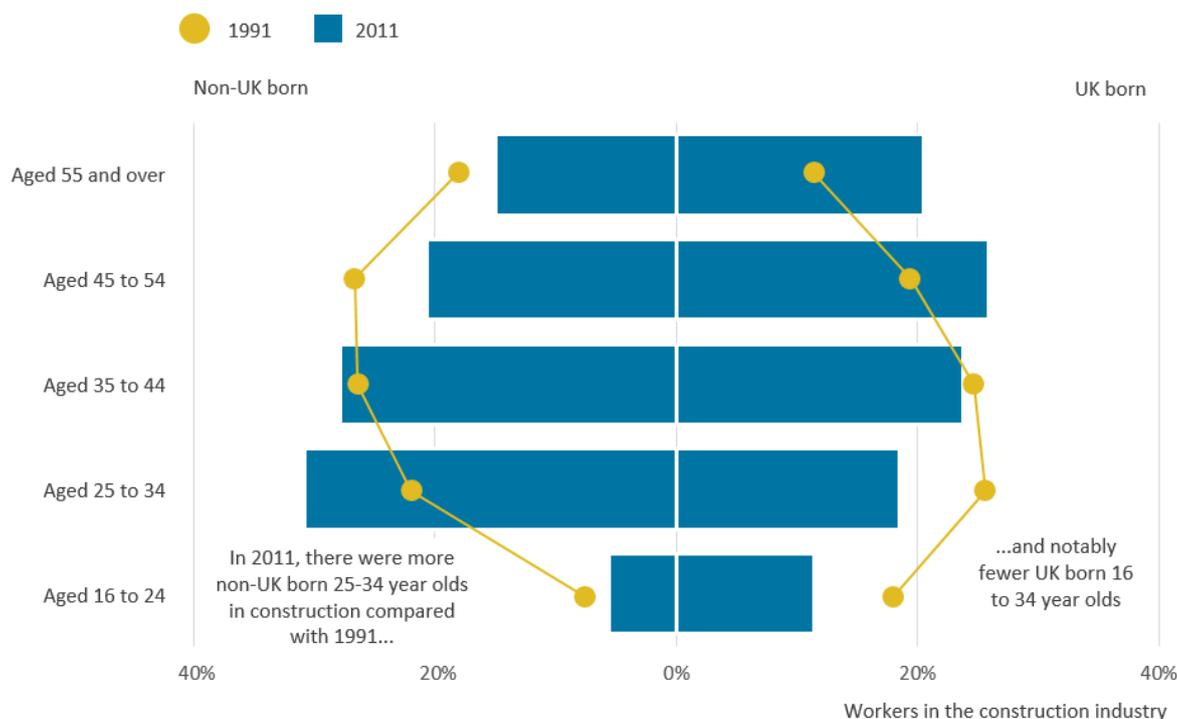


Figure 33 - The Ageing UK Born Construction Workforce (source: ONS (2018))³⁴

Further to this, it would take almost 200 years to achieve gender equality in the construction industry and according to the Office for National Statistics (ONS), in Q4 of 2018, 5.4% of construction workers were from Black and Minority Ethnic (BAME) Groups³⁵. Despite its size, the construction sector is one of the least diverse in the UK.

The net zero recruitment drive required offers the opportunity to increase diversity within the sector by making it more attractive to a wider variety of talent pools. Sustainability is an increasingly important issue for young people and could be used as a hook to attract a more diverse population into the retrofit sector. The transition to a digitally led delivery model, off-site manufacturing and increased need for IT and communications skills within the sector also open up opportunities to further diversify the workforce. This opportunity is already recognised in WECA, with the £2 million Digital Skills fund, and also nationally with the recent launch of Digital and Technical Skills Bootcamps. Some training providers invite ex-students back to share experiences. There is also potential for older and more experienced individuals within the sector to become industry trainers and support on the delivery of training provision for new entrants to the sector. For example, through 'train the trainer' provision for the new route being developed for heat pump installer training.

³⁴ ONS (2018) [Migrant labour force within the construction industry: June 2018](#)

³⁵ GMB (2019) [Construction Industry Just 12.5% Women and 5.4% BAME.](#)

CHAPTER KEY MESSAGES

- Consumer demand for home upgrades and retrofit work will clearly be key to the UK and WECA achieving their net zero targets. Left to the market, it is very unlikely that the building stock will be retrofitted to a low carbon standard.
- The Government has indicated that further funding will be available to support the installation of energy efficiency and low carbon heating systems. It is important that certified installers are available to access these schemes. A comprehensive list of these funding opportunities and the installer eligibility criteria is found in the appendix.

CHAPTER RECOMMENDATIONS

- WECA can support consumer demand by communicating the opportunities from public funded schemes by working closely with LAs to raise awareness of such ongoing schemes and those launched in the future. This could be paired with work done on ensuring that there are enough accredited Trustmark and MCS installers who could be listed as local providers or signposted to the customers interested in the funding schemes.
- WECA could work with the MCA network and via strategic partnerships at a national level to advocate for long-term stable policy which facilitates greater demand for retrofit measures and recognizes the value of these solutions to enable a sustainable market to be created.
- Through working with the local Economic Development Network, which has good links with local businesses, WECA has the ability (and is strategically placed) to raise awareness of the green agenda, the need to invest in the local building stock and the opportunities for growth.

If left to market forces alone, consumers will not demand the installation rates required to meet net zero. This is due to the high capital cost and long payback of some measures, particularly solid wall insulation and heat pumps. These measures provide economic benefit in the long run through reduced energy bills and lower greenhouse gas emissions; however, many consumers simply cannot afford the upgrades that are necessary or do not recognise the benefits. To stimulate the demand in these markets a variety of funding is available, both in the form of grant funding and payments for producing low carbon energy. See Appendix 5 for further details on such schemes.

The funding schemes outlined in Appendix 5 address different segments of the market. WECA must take advantage of all funding available to have any chance of success in achieving net zero by 2030. Ensuring sufficient public awareness of schemes will be critical to reaching deployment required. Furthermore, education of both the climate crisis and the financially and environmental benefits of insulation and low carbon heat will help stimulate this demand. Efforts have been undertaken to engage consumers in existing policy mechanisms such as the Green Homes Grant, with one such example being the work undertaken by North Somerset Council in educating consumers about the scheme.

Box 10: Information Campaign – The Green Homes Grant

North Somerset Council have used a variety of platforms to inform local residents about the Green Homes Grant including through the Council's Website and Facebook Page, as well as [North Somerset Life](#), a magazine that reaches approximately 100,000 households within the area.

Whilst legislation and policy mechanisms may be required at the national level, WECA can certainly play a role in both local and regional promotion of retrofit housing products by:

1. Developing local case studies to showcase successful projects which will help customers seeking out the opportunities. External wall insulation can really transform the neighbourhood. Health benefits of retrofit needs to be recognised and communicated well.
2. Educating people on the environmental impact associated with their property, including their heating system.
3. Providing information surrounding the benefits of technologies, including low carbon heat and retrofit including cost savings, health benefits and environmental benefits.
4. Signposting consumers to support and providing them with information surrounding how to access national schemes, potentially through a central hub to provide free and impartial advice surrounding retrofit to businesses and consumers.
5. Providing dedicated support programmes for the region.
6. Introducing a Community Retrofit Scheme, built upon the model of a Community Energy Scheme whereby local residents engage in a retrofit programme, investing in improvements to their properties whilst indirectly benefitting from others' investment. This approach establishes a critical mass in a specific area to bring down the cost of heating and energy efficiency solutions, enabling consumers access to economies of scale while securing guaranteed demand for local suppliers. See [Delivering and Funding Housing Retrofit Report by Arup³⁶](#) and [Financing Zero Carbon Heat by the Green Finance Institute³⁷](#) for more information. Note that the Green Finance Institute is considering the development of pilot schemes which could present an opportunity for WECA to facilitate this and support a local pilot scheme.
7. Crowdsourcing investment for community-based energy projects to allow retail investors to provide capital for retrofits and receive predictable long-term returns from energy efficient private-rented properties. The Green Finance Institute recently concluded that the potential scalability of such an offering is significant³⁸.

There was also a call from industry to set out detailed local plans for the decarbonisation of the housing stock within the region, including a pathway to heat decarbonisation. Specifically, the pathway should identify the projected technology split as well as an evaluation of the housing stock across all property archetypes to identify a retrofit plan, particularly for fuel poor and vulnerable households. This will enable economies of scale to be unlocked. Retrofitworks was cited by one respondent as an interesting model, from which learnings may be drawn.

Box 11: Retrofitworks

[Retrofitworks](#) is a multi-stakeholder cooperative that brings together contractors including installers, energy assessors, retrofit coordinators and designers with community groups and other local representatives to design and deliver energy efficiency and retrofit programmes, whilst creating local jobs and developing the local skills base.

³⁶ ARUP (2013) [Delivering and Funding Housing Retrofit: A Review of Community Models](#)

³⁷ Green Finance Institute (2020) [Financing energyefficient buildings: the path to retrofit at scale](#)

³⁸ Green Finance Institute (2020) [Financing energyefficient buildings: the path to retrofit at scale](#)

A Lack of Consumer Confidence

The absence of consumer confidence was cited as a barrier to retrofit by respondents within the market research conducted. This finding is supported by research conducted by the Federation of Master Builders (FMB) which found that 32% of homeowners are delaying undertaking major home improvement works due to concerns surrounding the risk of hiring a poor builder and that the UK economy as a whole is losing out on £10 billion of economic activity per annum as a result of this activity³⁹. That said, Government initiatives such as MCS and TrustMark, have been developed to build consumer confidence, and as highlighted by one respondent, this offers an opportunity for further job creation within the sector. One potential mechanism that may be used to build consumer confidence is the development of a 'Low Carbon Skills Card' (See Box 12).

Box 12: A Low Carbon Skills Card

A Low Carbon Skills Card could be used as a mechanism to build consumer confidence. The card could be awarded to those who have undertaken approved training in order to provide consumers with assurance that installers have the skills required to deliver an install within their property. In order to ensure continued skills growth and development, there could be a requirement that registered installers undertake refresher courses as part of the scheme. The concept is further outlined, focused on Heat Pump Installers, in the Heat Pump Association (HPA's) report titled [Building the Installer Base for Net Zero Heating](#).

When a market is forced to mass adopt at pace, everyone becomes the 'early majority'. Typically, early adopters of a technology accept the challenges that may arise but given the rapid pace of technology deployment required, all consumers will need to be engaged. To this end, developing consumer confidence is particularly important. This is particularly pertinent to low carbon heat where consumers will need to be educated about the way in which they control and live with a new heating system.

A Lack of Accountability

Linked to a lack of consumer confidence, there is a challenge associated with accountability within the sector. This is applicable to the construction sector more widely and was highlighted in the Hackitt Review, commissioned following the Grenfell Tower tragedy which noted that "there is ambiguity over where responsibility lies"⁴⁰. Individuals must be held to account but crucially, they must first demonstrate competence and as such, there is a requirement to ensure that training programmes deliver the competencies required.

The absence of accountability extends to energy assessments. Prior to the introduction of [Minimum Energy Efficiency Standards \(MEES\)](#) within the Private Rented Sector (PRS), there was not a financial implication associated with an EPC assessment and there was therefore no significant risk if the assessment was poorly conducted. With the introduction of MEES, and the proposed requirements on [Mortgage Lenders to Improve the Energy Efficiency of their Portfolio](#), there is a financial imperative to ensure assessments are well conducted. As with the construction sector more widely, training programmes must ensure that individuals are adequately trained to deliver accurate assessments.

³⁹ Federation of Master Builders (2019) [Construction Industry Launches Licensing Task Force](#)

⁴⁰ UK Government (2018) [Building a Safer Future](#)

A Lack of Awareness and understanding of the Green Agenda and its Requirements

Whilst efforts have been made to bring the green agenda to the fore, including through the declaration of a Climate Emergency by WECA and the Local Authorities (LAs) within WECA, there remains a belief that consumer and business awareness is a challenge. Through working with the local Economic Development Network, which has good links with local businesses, WECA could raise awareness of the green agenda, the need to invest in the local building stock and the opportunities for growth.

Advertising and marketing were highlighted as important overarching mechanisms to ensure that people are aware of, and engaged with, the initiatives available.

Fabric Efficiency and Low Carbon Heat Joint Retrofit Funding

The fabric efficiency of buildings and low carbon heat are two areas with traditionally low incentives to upgrade and will be addressed nationally through a number of grants aiming to reduce the capital cost burden on individuals and businesses. The Green Homes Grant, provided grants for energy efficiency and low carbon heating⁴¹, the scheme offered support to both fuel poor and able to pay households. Unfortunately, there were been issues with the Green Homes Grant, such as difficulty in finding installers with adequate capacity and delays to installer voucher payments creating liquidity issues for installers⁴². The Green Homes Grant scheme was subsequently closed in April 2021. The funding has been reallocated to the Local Authority Delivery scheme and Social Housing Decarbonisation Fund to support low income households. Part of this will be delivered through local energy hubs, to install energy efficiency and low carbon heating in EPC band D or below homes⁴³. The announcement of further schemes such as the Home Upgrades Grant may give installers the certainty they need to train and employ additional staff.

The Conservative Manifesto pledged to provide £2.5 billion for the Home Upgrades Grant, which will be introduced in early 2021. This funding will upgrade the worst quality off-gas grid homes in England through supporting the installation of energy efficiency measures and low carbon heat with a focus on low-income households⁴⁴.

In addition to these grants, the Government has announced that it will extend the Energy Companies Obligation (ECO) beyond phase 3 (2018–2022) to phase 4 (2022–2026). ECO 3 supports low income, vulnerable and fuel poor households with £640 million of funding a year. This is achieved through replacement of 35,000 broken heating systems per year, replacement of inefficient heating if installed alongside insulation and finally, insulation (at least 17,000 solid wall properties are insulated under ECO per year)⁴⁵. It is likely that ECO 4 will follow a similar basis as ECO 3 with some adjustments, although details of the scheme have not been released.

It is estimated that WECA (including North Somerset) needs 294,000 insulation measures and 426,000 properties fitted with low carbon heat to be net zero carbon. This joint funding can help address both or either of these challenges simultaneously.

⁴¹ BEIS (2020) [Green Homes Grant](#)

⁴² The Guardian (2021) [Green homes grant: UK standards body calls on government to pay up](#)

⁴³ BEIS (2020) [GREEN HOMES GRANT LOCAL AUTHORITY DELIVERY PHASE 1B MEMORANDUM OF UNDERSTANDING](#)

⁴⁴ BEIS (2020) [Energy White Paper](#)

⁴⁵ BEIS (2018) [Energy Company Obligation: ECO3, 2018 to 2022](#)

Fabric Efficiency Retrofit Funding

Improving the fabric efficiency of a property is seen as a “no regrets” option because it reduces thermal energy demand and consequentially reduces greenhouse gas emissions. A property with a better thermal envelope is also better suited to heat pumps, which operate at a higher efficiency when there is low heat loss. In order to be net zero carbon in 2030, WECA will need to install 143,000 solid wall, 71,000 cavity wall and 80,000 loft insulation measures.

The Conservative Manifesto pledged £3.8 billion to the Social Housing Decarbonisation Fund over a ten-year period. The Social Housing Decarbonisation Fund Demonstrator runs from September 2020 to mid-2022, although it is now closed to applicants. This pilot aims to show a cost reduction of 5–30% in bringing social housing to a maximum heat demand of 50 kWh/m²⁴⁶. According to BEIS, the demonstrator precedes the main fund and will be focussed on fabric efficiency of social housing. Full details of the main scheme are yet to be released and are expected in Q3 of 2021.

WECA has a slightly lower proportion of social housing properties than England as a whole at 16% and 17% of the housing stock respectively. However, social housing still represents a considerable number of properties with 64,000 homes falling in this category. Almost 40,000 of these are located in the City of Bristol Unitary Authority which has the highest proportion of social housing at 20%⁴⁷. UAs and RSLs within WECA must make best use of this opportunity to retrofit social housing where it is even less likely consumers will have the capital to install measures without support.

Low Carbon Heat Retrofit Funding

WECA will need to significantly increase deployment of low carbon heat to achieve net zero 2030. This analysis estimates that 392,000 heat pumps and 34,000 properties connected to heat networks are necessary to realise this target. Other technologies such as biomass and biofuels could also be used in hard-to-treat properties; however, due to higher costs of biomass boilers and concerns over readiness of biofuels in 2030 these are likely to only be a small segment of the market.

The Heat Networks Investment Project (2018-2022) and its successor, the Green Heat Networks Fund (2022-2025), provide government funding of £320 million and £270 million respectively and aim to leverage private capital for investment in low carbon heat networks.

The Renewable Heat Incentive (RHI) provides participants with a payment for generating renewable heat over a period of 7 years for domestic and 20 years for non-domestic installations. The scheme runs until the end of March 2021 for non-domestic and March 2022 for domestic installations and will be replaced by the Clean Heat Grant scheme, which aims to overcome some of the limitations to the RHI. The RHI has been criticised for its low uptake as well as poor perceived value for money. Households can achieve economic benefits when participating in the scheme, although few households can afford to participate as there is no reduction to the capital cost of low carbon heating technology. The Clean Heat Grant aims to address these concerns through providing a flat rate grant (proposed to be £4,000) for heat pumps or biomass boilers⁴⁸. This is due to begin in April 2022 and targeted towards homes currently heating with oil, although all types of households are likely to be eligible to apply. Whilst the amount proposed is less than participants typically receive under the RHI, the funds are better targeted and the impact of the grant impact is therefore likely to be greater.

⁴⁶ BEIS (2020) [Social Housing Decarbonisation Fund Demonstrator](#)

⁴⁷ MHCLG (2020) [Table 100: number of dwellings by tenure and district](#)

⁴⁸ BEIS (2020) [Future support for low carbon heat](#)

National Investment Bank

A new National Investment Bank is due to be set up in 2021 which will co-invest alongside the private sector in infrastructure projects. This bank will support the Government's objectives in both levelling up and achieving net zero⁴⁹ and there is potential that there will be funding available for retrofit.

⁴⁹ HM Treasury (2020) [National Infrastructure Strategy](#)

Appendix 1 – Research Methodology

Scenario Modelling

Scenario modelling was carried out to assess the retrofit skills needed within the WECA region to support the transition to net zero by 2030.

This methodology has been used to provide an overview of retrofit solutions, including current deployment levels; and to project a variety of growth scenarios, which each consider the demand for low carbon technologies and services between now and 2030.

In order to assess the skills of the current retrofit sector in the region, this report considers the technologies that fall under the current grant systems and are viewed as required by the Government's official climate advisors (the CCC) in their recent 6th Carbon Budget. This is to ensure alignment with funding opportunities present within the region.

The demand for green skills will be driven by WECA's shift to a net zero economy; as such, this report also considers the core measures outlined by the Climate Change within its 'Balanced Pathway' to net zero, published within the Sixth Carbon Budget. For the purposes of this report, the retrofit market is therefore focused on cavity wall insulation; solid wall insulation; roof/loft insulation; and low carbon heating, primarily delivered through heat pumps and heat networks.

Market Research

Market research was carried out in January 2021, targeting industry, which is seen as pivotal to the delivery of the retrofit challenge; skills and training providers, which will be fundamental to addressing the emerging skills gap; and government representatives, who can provide expertise from a skills and wider development perspective and offer crucial insight on the challenges and opportunities associated with the energy transition.

Three sets of questions were developed for the groups (industry, skills and training providers, and government representatives), and participants were invited to either partake in a semi-structured interview or to complete an online survey.

Industry

A number of key industry players, ranging from Small Medium Enterprises (SMEs) to Major Corporations were interviewed alongside Membership Organisations across several areas of the retrofit market, including energy efficiency and low carbon heat. Consultation focused on a range of issues, including the existing and projected future skills demand, the wider challenges currently faced by the sector and the interventions needed to support future growth.

It is important to highlight that 'industry' is an all-encompassing term and that the retrofit of properties involves a range of different roles. Interviewees included those active within the manufacturing, energy assessment and installation spaces.

A range of companies who specialise in the low carbon retrofit sector were interviewed including across Energy Efficiency, Heat Networks and Wider Low Carbon Heating. For further detail surrounding the type and size of the industry organisations surveyed and interviewed, see Appendix 2. Four organisations represented members and provided a broader view of the sector as a whole.

Skills and Training Providers

Skills and Training Providers from both within and outside of the WECA region were interviewed to provide a better understanding of the existing courses available within the retrofit space, how

providers expect demand for courses to change, and how they are planning to adjust. The training providers surveyed varied in size (see Appendix 2).

Government Representatives

A total of four Local Government representatives were interviewed across three Local Authorities (LAs). The LAs represented were Bristol City Council, Bath and North East Somerset Council (BANES) and North Somerset Council.

It is worth noting that Bristol, BANES and South Glos. are within WECA whilst North Somerset Council is part of the West of England Local Enterprise Partnership (LEP) Board, which is supported by WECA, and closely linked to the authority.

Appendix 2 – Sample Overview

The following graphs (Figures 35 – 38) give some background information on the industry and training provider representatives that were interviewed. A broad range of stakeholders were interviewed to try and capture as much information as possible about the retrofit sector.

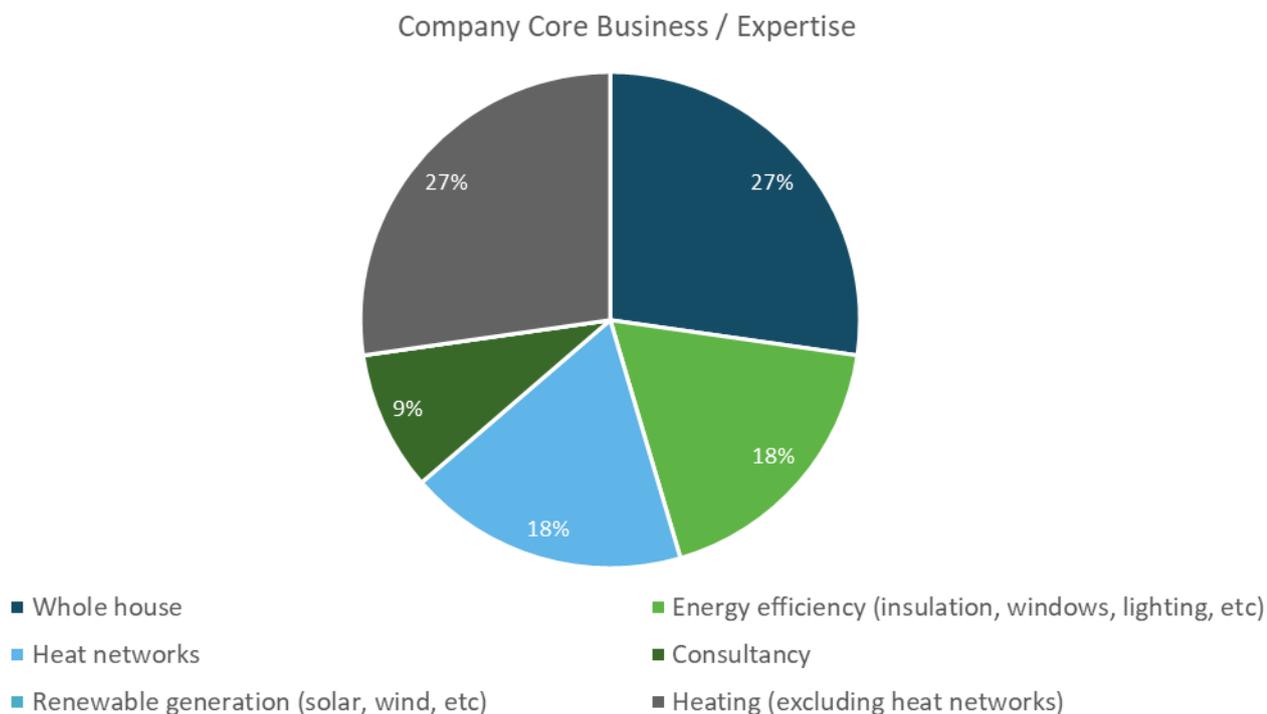


Figure 34 - Core Business of Industry Companies Interviewed

How many employees are there in your company?

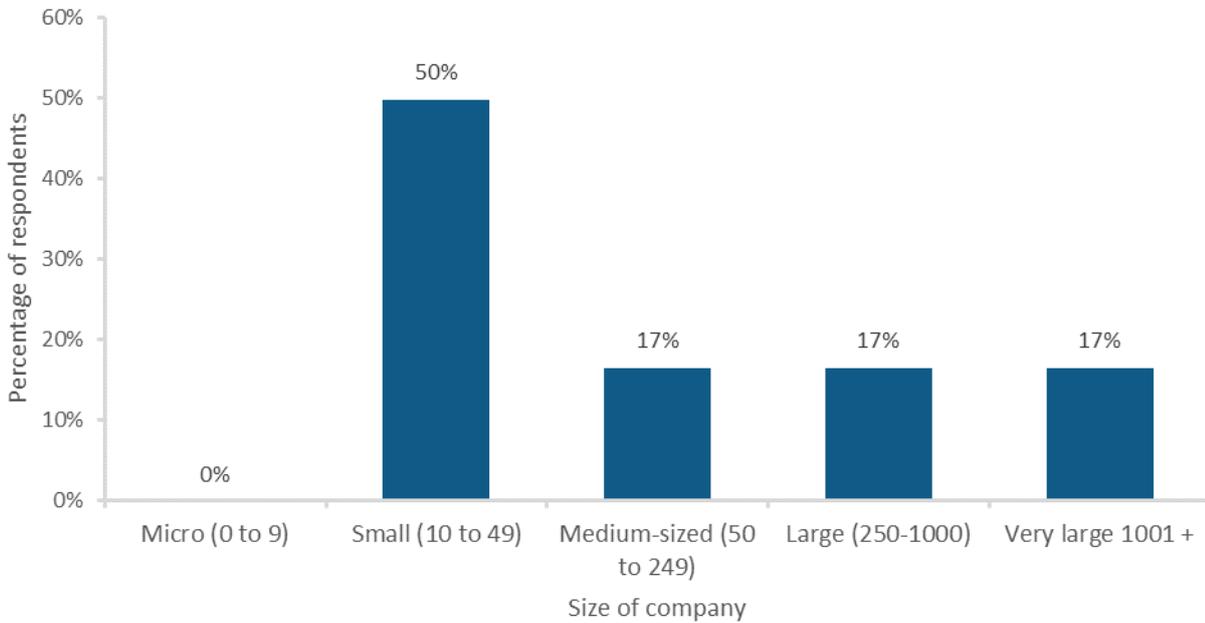


Figure 35 - Size of Industry Organisations Interviewed

If you are representing a member organisation, how many members?

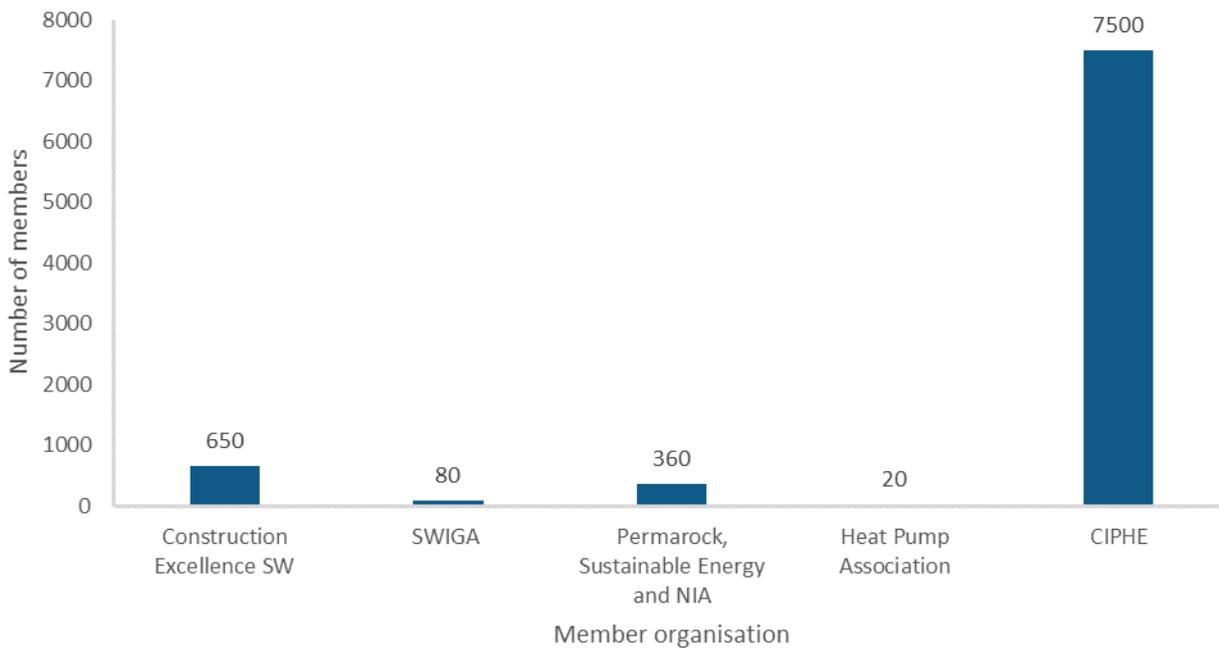


Figure 36 - Number of Members for Industry Member Bodies Interviewed

How many students are enrolled on courses in your organisation?

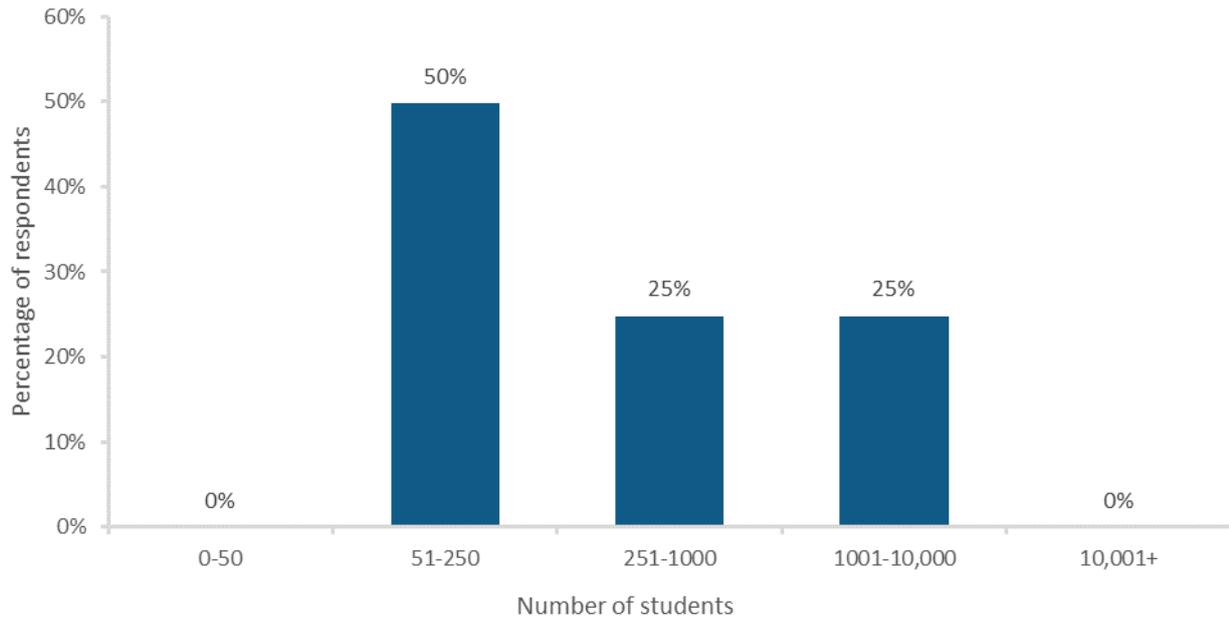


Figure 37 - Number of Students Enrolled on Courses at Training Providers Interviewed

Appendix 3 – Qualifications and Courses

Table 5 - Formal Qualifications within the Insulation and Energy Assessment Sector

Course	Prerequisite	Jobs
<p>NVQ level 2 – Understanding Domestic retrofit</p> <p>Learners will gain an understanding of what retrofit is, what retrofit achieves and how they can have a future in retrofit. This course is based on the full NVQ Level 2 in Insulation and Building Treatments, Building Construction, Defects and Interfaces and completing it will serve as a pre-qualification for the full NVQ.</p> <p>It will provide a comprehensive introduction to understanding domestic retrofit. Delivered in 6 interactive eLearning sessions over a three-day period, encompassing around 18 hours.</p>	<p>Ideal for all those working in the domestic retrofit sector who do not currently hold any relevant domestic retrofit qualifications. Course is aimed at new entrants in the industry with little or no understanding of domestic retrofit</p>	<p>Relevant to a range of roles in domestic retrofit, the course has been designed to give learners the necessary understanding of the PAS 2030 standard for installing energy retrofits for homes.</p>

Course	Prerequisite	Jobs
<p>NVQ Level 2 - Insulation and Building Treatments</p> <p>This provides official recognition of the knowledge and skills needed to install insulation or carry out building maintenance work. Learners can choose from a range of qualifications to match particular specialisms such as external wall insulation or loft insulation. They also form part of an Apprenticeship framework.</p> <p>The certificates comprise three mandatory units including:</p> <ul style="list-style-type: none"> • Conforming to General Health, Safety and Welfare in the Workplace • Conforming to Productive Working Practices in the Workplace • Moving, Handling and Storing Resources in the Workplace. <p>Learners can complete one additional unit from a wide range of units, including:</p> <ul style="list-style-type: none"> • Installing External Wall Insulation in the Workplace • Installing Draught-proofing to Openings in the Workplace • Installing Internal Insulation to Walls, Floors or Ceilings in the Workplace. 	<p>These qualifications are ideal for those working in the construction industry and specialising in insulation and maintenance.</p>	<p>These qualifications can allow learners to progress in a wide range of building maintenance and treatment and insulation roles.</p>
<p>NVQ level 2 – Thermal insulation</p> <p>There are two qualifications available at this level:</p> <ul style="list-style-type: none"> • Level 2 NVQ Diploma in Thermal Insulation - Fabricate Protection (Construction) • Level 2 NVQ Diploma in Thermal Insulation - Fit Protection (Construction). <p>In addition, learners take one other unit, depending on the qualification taken:</p>	<p>Level 2 is ideal for learners working as a thermal insulation engineer and have some relevant knowledge and skills, usually from a role where learners have been supervised.</p>	<p>The NVQ in Thermal Insulation could help learners get a job as a thermal insulation engineer and open up other opportunities within the construction sector.</p>

Course	Prerequisite	Jobs
<ul style="list-style-type: none"> Fabricating Sheet Metal Insulation Protection from Existing Templates in the Workplace Fitting Sheet Metal Insulation Protection in the Workplace. 		
<p>NVQ level 3 - Energy Assessment</p> <p>Learners will gain skills in:</p> <ul style="list-style-type: none"> conducting energy assessments in a safe, effective and professional manner. assessing the energy performance of new build non dwellings once erected using the Simplified Building Energy Model (SBEM). assessing compliance with Buildings Regulations relating to energy performance of new buildings other than dwellings. <p>Choose from the following qualifications available:</p> <ul style="list-style-type: none"> Level 3 Certificate in Domestic Energy Assessment Level 3 Certificate in Non-Domestic Energy Assessment 3 Diploma in Air-Conditioning Energy Assessment 	<p>Anyone interested in energy efficiency and working, or looking for work, as an energy assessor in the construction sector.</p>	<p>These qualifications lead to jobs in Domestic Energy Assessment, Non-Domestic Energy Assessment and Air-Conditioning Energy Assessment.</p>
<p>Level 3 NVQ Diploma in Occupational Work Supervision (Construction)</p> <p>Learners will develop the skills to carry out supervisory responsibilities effectively. Introduction, NVQ induction and health and safety</p> <ul style="list-style-type: none"> Leadership and management <p>Communication and customer care</p> <ul style="list-style-type: none"> Environment and sustainability 	<p>The level 3 Diploma in Occupational Work Supervision is for subcontractor supervisors and gangers.</p>	<p>This qualification could lead to technical, managerial and supervisory roles within the Construction industry. Learners could progress into occupational areas such as team leading and management.</p>

Course	Prerequisite	Jobs
<ul style="list-style-type: none"> • Planning, programming and logistics • Resource management (cost, cash and risk) • Onsite assessment visit • Assessment workshop (if required) <p>The course includes six one-day taught modules, an on-site assessment visit and a follow-up assessment workshop if required.</p>		
<p>NVQ Level 3 (NVQ) Diploma in Thermal Insulation</p> <p>Learners will develop knowledge and skills in working with thermal insulation to an advanced level. Learners can specialise in the Fabricate Protection route or the Fit Protection route. This qualification covers the following areas:</p> <ul style="list-style-type: none"> • confirming work activities and resources for an occupational work area • developing and maintaining good occupational working relationships in the workplace • confirming the occupational method of work • confirming work meets quality standards • resolving indeterminate situations in the workplace • conforming to general health, safety and welfare in the workplace. <p>This qualification is available through colleges and training providers in England and Wales. This qualification is a mandatory component in the Construction Specialist Apprenticeship.</p>	<p>Specific skills, knowledge understanding or other qualification(s) required before taking this qualification include relevant knowledge and skills from working as a thermal insulation engineer. This qualification is mainly taken by individuals employed as thermal insulation engineers.</p>	<p>The Level 3 NVQ Diploma in Thermal Insulation (Construction) can lead to employment within the construction industry as a thermal insulation engineer or to study for higher level qualifications in further education.</p>
<p>Retrofit Assessor</p> <p>This course upskills Domestic Energy Assessors and Green Deal Advisors, who will already have relevant knowledge of energy assessment in existing residential buildings, to undertake domestic</p>	<p>Domestic Energy Assessor or Green Deal Advisors who undertake property assessments of existing dwellings</p>	<p>Retrofit assessor</p>

Course	Prerequisite	Jobs
Retrofit Assessments in-line with PAS 2035. It is a 2-day course.		
<p>NQV Level 4 – Diploma in Construction Site Supervision Learners will gain the confidence to carry out supervisory responsibilities effectively. Introduction, NVQ induction and health and safety Leadership and management Communication and customer care Environment and sustainability Planning, programming and logistics Resource management (cost, cash and risk) Onsite assessment visitAssessment workshop if required</p>	<p>Learners should be working as a site supervisor or assistant site manager in one of these areas:</p> <ul style="list-style-type: none"> • building and civil engineering • highways maintenance and repair • residential development • conservation • demolition. 	
<p>NQV Level 4 - Energy Assessment Course developed to expand knowledge and access wider non-domestic energy markets. Sample units include:</p> <ul style="list-style-type: none"> • Assess compliance with Buildings Regulations relating to energy performance of new buildings other than dwellings • Report on energy assessment of new and existing non-dwellings using Simplified Building Energy Model (SBEM). • Inspect simple/packaged and complex/central air conditioning systems. 	Learners should hold a Level 3 qualification in energy assessment	Learners of Domestic and Non-Domestic Energy Assessment may wish to consider a studying further to pursue a career in Green Deal Advice.
<p>Retrofit Co-ordinator (Level 5 Diploma in Retrofit Co-ordination and Risk Management).</p> <p>This qualification will allow learners already qualified in site management/building project</p>	Learners should hold a professional qualification in a building-related subject such as architecture, surveying, engineering or construction management) or a	On successful completion of the qualification, learners will be able to work as Project Manager/Coordinator for Domestic Retrofit

Course	Prerequisite	Jobs
<p>management to gain a qualification in the project coordination and risk management of domestic retrofit projects as well as providing a route for those already working in a retrofit capacity but lacking specific qualifications.</p> <p>It covers key skills and knowledge relating to design, assessment and project management of a wide range of refurbishment projects, equipping learners with the ability to reduce the incidence of common defects and failures.</p>	<p>National Vocational Qualification (NVQ) at Level 3 or above in a subject related to the management or supervision of construction and domestic construction projects. Learners will also need to be familiar with domestic construction techniques, able to read and understand construction drawings and specifications and be familiar with the Building Regulations and with construction health and safety regulations and practice.</p>	<p>Projects that comply with PAS 2035</p>
<p>NQV Level 6 – Diploma in Construction Site Management Learner will complete modules in:</p> <ul style="list-style-type: none"> • Introduction, NVQ induction and health and safety • Leadership and management • Communication and customer care • Environment and sustainability • Planning, programming and logistics • Resource management (cost, cash and risk) • On-site assessment • Final on-site assessment 	<p>Learners should be working as a construction site manager in one of these areas:</p> <ul style="list-style-type: none"> • building and civil engineering • highways maintenance and repair • residential development • conservation • demolition. 	<p>Once achieved learners can contact CSCS to enquire to apply for a Management CSCS Black Card.</p>

Table 6 - Formal Qualifications within the Heat Pump Sector

Course	Prerequisite	Jobs
<p>Entry Level – Domestic Installation Workshop This 5 day course in domestic electrics will help learners gain the essential grounding and knowledge needed to build an electrical career. This basic understanding will help you to pass the assessments and</p>	<p>Suitable for those with little or no electrical experience</p>	<p>Electrical career</p>

Course	Prerequisite	Jobs
tests in later courses. The perfect starting point for anyone wanting to train in domestic installation coupled with a unique C&G Qualification.		
<p>Entry Level – Key Stage Electrical Course</p> <p>This electrical training course will provide learners with crucial knowledge, skills and competency before taking additional electrical courses that are needed to become a Domestic Installer.</p>	<p>This course is ideal for people who have little or no electrical installation experience and are looking to become a domestic electrician. There are no qualification entry requirements.</p>	<p>Domestic electrician / installer</p>
<p>NVQ Level 1 – Plumbing Studies</p> <p>understanding of Plumbing, Electrical, Engineering, Heating, and Ventilation so you can progress to a Level 2 Diploma.</p>	<p>Entry requirements are two GCSEs at grades 2 or above (or equivalent (to include English or maths), or any one of the following, an Entry 3 qualification, a Certificate in Skills for Working Life or Life Skills, an ESOL Entry L3 qualification.</p>	<p>Steppingstone towards a career within the Plumbing industry and building related services</p>
<p>NVQ Level 2 – Fundamental Inspection, Testing and Initial Verification</p> <p>Learners will be taught how to safely test, inspect and verify newly installed or extended circuits. This course takes place over 5 Days. Learners with no electrical experience should consider attending the key stage electrical course first.</p>	<p>It is ideal for either newcomers to the electrical industry or existing contractors wishing to add this valuable skill set to their qualifications. There are no qualification entry requirements.</p>	<p>Domestic electrician / installer</p>
<p>NVQ Level 2 – Plumbing Studies</p> <p>Learners will gain both the practical skills and the theory to help you find work within the plumbing industry.</p>	<p>This course requires GCSE English & maths Grade 4 (C in the old grading structure) or above & 2 GCSEs at Grade 3 (or Grade D) or above. Relevant Level 1 qualification with GCSE/Level 2 in English & maths.</p>	<p>Help learners gain employment in the plumbing industry.</p>
<p>NVQ Level 2 - Plumbing and heating qualification</p> <p>It provides all the basic domestic heating and plumbing training needed to start work in the industry. There are two pathways available at this level:</p>	<p>Level 2 will suit you if you have some relevant plumbing and heating knowledge and skills, usually from a role where you've been supervised.</p>	<ul style="list-style-type: none"> • Heating and ventilation engineer • Specialised craftsperson (plumber or

Course	Prerequisite	Jobs
<ul style="list-style-type: none"> NVQ Level 2 Diploma in Plumbing and Heating NVQ Level 2 Diploma in Installing and Maintaining Domestic Heating Systems 		heating engineer) <ul style="list-style-type: none"> Project development manager Senior skilled operative.
NVQ Level 3 – Plumbing Studies This qualification is intended for those who want to gain the knowledge and abilities in health and safety, principles and requirements of environmental technology systems, hot and cold water systems etc.	Completion of City and Guilds 6035 Level 2. Minimum grade 4 in English and maths or equivalent	Progress onto a plumbing Apprenticeship program.
NVQ Level 3 - Plumbing and heating qualification It provides all the basic domestic heating and plumbing training needed to start work in the industry. If learners choose gas-related units at Level 3 you will achieve the Gas Safe licence to practise on successful completion of the course.	Learners must have completed the Level 2 qualification or already has some relevant experience and knowledge. Ideal if you are working within the plumbing and heating trade and have a great deal of technical skills and knowledge.	<ul style="list-style-type: none"> Heating and ventilation engineer Specialised craftsperson (plumber or heating engineer) Project development manager Senior skilled operative.
NVQ Level 3 – Electrician Training Assessment of competence and is mandatory for JIB Gold Card status. This Level 3 qualification certifies that the individual has undergone what is required to be recognised as an electrician. Duration 6 weeks.	New entrants into the sector, open to candidates of any age who are fully and relevantly employed by an appropriate electrical employer, with 'off the job' underpinning knowledge & skills	Electrician - the qualification is likely to last around 4 years.
NVQ Level 3 - Water Regulations and Unvented Hot Water Systems Learner will be able to install plumbing systems or water fittings in line with UK Building Regulations.	Working in industry and making complex decisions on a daily basis in line with work requirements.	A plumber or heating and ventilating engineer.
Part L (Energy Efficiency) The BPEC Part L course is designed for central heating installers that need to self-certificate their work via one of the Competent Persons Schemes (CPS). Provides practicing heating installers with the knowledge required to advise	Applicants should be experienced installers of gas, oil, solid fuel domestic central heating systems or Renewable Energy Engineers	Certificates are normally valid for 5 years.

Course	Prerequisite	Jobs
customers on how to get the best from their central heating system.		
<p>NVQ Level 3 – Requirements for Electrical Installations</p> <p>Ensures learners are up-to-date with the latest industry regulation on wiring and the safe use and operation of electrical equipment and systems.</p>	Practising electrician with specific qualifications, who needs to update your certification to meet the latest edition of the IET Wiring Regulations. Alternatively, you're a newly qualified electrician who needs to gain this certificate.	Progression in career with the opportunity to develop the skills necessary to carry out job roles and responsibilities associated with the Electrotechnical industry.
<p>Energy Efficiency for Domestic Heating</p> <p>Enables operatives to “self certificate” as required by the Approved Document L1A and L1B and the Domestic Building Services Compliance Guide 2018</p>	Candidates are required to hold a recognised qualification in a conventional fuel.	
<p>WRAS Water Regulations</p> <p>For heating and plumbing installers who need to gain the knowledge of the Water Regulations (1999).</p>	Candidates should have two years plumbing experience.	
<p>NVQ Level 3 – Installation and Maintenance of Heat Pump Systems</p> <p>Domestic heat pump training covers both ground to water and air to water technologies. The heat pump course meets the training entry requirements for the Microgeneration Certification Scheme (MCS).</p>	<p>In order to attend the course, operatives must hold one of the following:</p> <ul style="list-style-type: none"> • A Level 2 or Level 3 NVQ or SVQ in plumbing / heating & ventilation / gas / oil – Installation and Maintenance qualification • A valid Core Gas Safety (CCN1) certificate • An OFTEC Oil certificate • A valid HETAS certificate <p>Operatives must also hold all of the following qualifications:</p> <ul style="list-style-type: none"> • WRAS Water Regulations • Energy Efficiency for Domestic Heating 	Designed for experienced heating installers who wish to fit heat pumps in domestic and small commercial properties.

Course	Prerequisite	Jobs
<p>Accelerated Electrician Training Learners may be able to accelerate training to gain the necessary qualifications needed to earn your ECS Gold Card.</p>	<p>To be eligible as a time-served electrician, you must have a minimum of 5-years of experience in the industry and hold older qualifications. As a part-qualified electrician, you may already hold qualifications such as Level 2 or 3 diplomas. In order to gain this, you will need to hold your NVQ level 3 and current wiring regulations.</p>	
<p>NVQ Level 3 - Low Temperature Heating and Hot Water in Dwellings (under development) 2 day course to provide skills related to heat loss design, heat emitter design, pipe and pump sizing, hydraulic balancing, hot water storage design, system configuration.</p>	<ul style="list-style-type: none"> • Level 2/3 Plumbing / Heating • Heating installers with substantial relevant experience 	<p>Low carbon installer</p>
<p>Foundation Course in Heat Pump Technology (under development) Two day course. The learner will know the health and safety risks and regulations and standards relating to the installation, testing, and commissioning of heat pump systems. The learner is only fully qualified to install, commission and handover heat pump systems for each particular heat pump technology after completing their individual technology qualification which can be run as a full course or separate modules.</p>	<ul style="list-style-type: none"> • Level 2/3 Plumbing / Heating • Heating installers with minimum 3 years of experience • Low Temperature Heating and Hot water Systems in Dwellings 	<p>Heat Pump installer</p>
<p>Intermediate Course in Air Source Heat Pump Technology (under development) The air source heat pump course is specifically aimed at existing fossil fuel plumbing and heating engineers and giving them the necessary training to upskill their existing skills to install air source heat pumps.</p>	<ul style="list-style-type: none"> • Level 2/3 Plumbing / Heating • Heating installers with minimum 3 years of experience • Low Temperature Heating and Hot water Systems in Dwellings 	<p>Air Source Heat Pump installer</p>

Course	Prerequisite	Jobs
	<ul style="list-style-type: none"> • Foundation Course in Heat Pump Technology 	
<p>Intermediate Course in Ground Source Heat Pump Technology (under development)</p> <p>The ground source heat pump course is specifically aimed at existing fossil fuel plumbing and heating engineers and giving them the necessary training to upskill their existing skills to install ground source heat pumps.</p>	<ul style="list-style-type: none"> • Level 2/3 Plumbing / Heating • Heating installers with minimum 3 years of experience • Low Temperature Heating and Hot water Systems in Dwellings • Foundation Course in Heat Pump Technology 	Ground Source Heat Pump installer
<p>NVQ Level 4 - Higher Professional Diploma in Building Services Engineering</p> <p>This is a 480 guided learning hours programme deliverable most probably part-time, but possibly as a full-time programme</p>	<p>Designed primarily for those in work, or with access to work experience as the specifications are vocationally relevant to the needs of the sector. They will have acquired one of the following:</p> <ul style="list-style-type: none"> • Building Services Engineering sector at Level 3 • Other Level 3 vocational qualification in Building Services engineering 	The qualification provides a strong foundation for career progression to Senior Technician status within the Building Services Engineering sector

Appendix 4 – Training provision under the Green Homes Grant Skills Competition

Table 7 below shows the winners of the Green Homes Grant Skills Competition who may be able to upskill the workforce in WECA either through training centres in the South West or through online delivery of training. WECA should engage with these training providers to help them recruit suitable candidates for courses as well as promoting retrofit courses more generally.

Table 7 - Green Homes Grant Skills Competition Grant winners who may be relevant to WECA

Name of Organisation	Geographical Coverage	Training Offered	Subsector Addressed	Link to Website
Elmhurst Energy	England	Retrofit assessor training Domestic energy assessor (DEA) training Retrofit assessor accreditation Retrofit coordinator accreditation	Retrofit assessment	www.elmhurstenergy.co.uk
North West Skills Academy	North West, North East, Midlands, Yorkshire & Humber, South West and South East	City & Guilds Level 2 NVQ in Insulation and Building Treatments: <ul style="list-style-type: none"> • cavity wall insulation • internal insulation • external wall insulation • cold roof insulation • wall tie replacement • wood preserving and damp proofing • cold and warm room insulation • floor insulation • insulate framed sections of buildings 	Fabric efficiency	https://www.nwskillsacademy.co.uk/
Optimum UK	South West and Midlands	Support to gain TrustMark registration and/or MCS certification to guide them through the MCS Process from application through to inspection from one of the MCS Certification bodies. Training in the installation of low carbon heating measures (predominantly heat pumps) which are supported by the voucher scheme.	Heat pumps and solar thermal	https://www.optimum.uk.com/ghg-myg121
Retrofit Academy	England	The Open College Network West Midlands Level 5 Diploma in Retrofit Coordination and Risk Management to individuals who will practice under the Energy Company Obligation, the Green Homes Grant and any successor schemes delivered under the BSI PAS2035 Standard. A new Level 2 Certificate in Insulation and Building Treatment based upon	Retrofit coordination and fabric efficiency	https://www.retrofitacademy.org/

Name of Organisation	Geographical Coverage	Training Offered	Subsector Addressed	Link to Website
		the latest national occupational standards across cavities, lofts, external and internal walls and underfloor		
Think Construction Skills	England	TCS will provide NVQ Level 2 in Insulation and Building Treatments. It will enable numerous small and medium-sized enterprises to upskill their workforce and meet the PAS certification. TCS will deliver training across a range of insulation measures.	Fabric efficiency	https://www.thinkconstructionskills.com/green-homes-grant-funding/
GTEC MCS	England	The courses delivered by GTEC MCS focus on heat pumps and solar thermal and offer Level 3 RQF qualifications in both heat pumps and solar thermal.	Low carbon heat	https://www.rhitss.co.uk/
Heat Geek Ltd	England	Heat Geek will offer training on: heat pumps and solar thermal heating and hot water controls	Low carbon heat	https://heatgeek.com/courses/
The Green Register	South West	building physics assessing retrofit moisture movement within buildings ventilation strategies air-tightness best practice detailing insulation (solid walls, floors and roofs) low carbon technologies including heat pumps using natural materials to promote healthy buildings and occupants and presenting the key principles of PAS2035.	Fabric efficiency, retrofit assessment and low carbon heat	https://www.greenregister.org.uk/futureproof
Windhager	Midlands and South West	Windhager offers a course for heat pumps and solar thermal that is HETAS certified and successful individuals will be certified to MCS standards.	Low carbon heat	https://www.windhager.co.uk/training/windhager-training-courses/windhager-

Name of Organisation	Geographical Coverage	Training Offered	Subsector Addressed	Link to Website
				courses-overview/
Hampshire Training and Assessments	South West	Essential Electrics and Safe Isolation of Electrical Equipment certified as a CPD qualification by LCL Awards. Level 3 Award in Energy Efficiency for Gas fired and Oil Fired Domestic Heating and Hot Water Systems. Hot Water Systems & Safety (including un-vented hot water).	Heating controls	https://www.htaa.co.uk/course/part-l-energy-efficiency/ https://www.htaa.co.uk/course/hot-water-systems-and-safety-training/

Appendix 5 – Retrofit Funding Available

Table 8 below shows the retrofit funding available to the WECA region. Funding detail and deadline dates should be examined to establish which funding schemes WECA can support though both delivery of funding and raising consumer awareness of opportunities to improve their properties.

Each of the schemes have been ranked by the total value of funds available, the length of the scheme and its decarbonisation impact to give a score between 0 and 125. The schemes which score the highest are likely to give the greatest emissions reduction for the region. Schemes score 0 if either the deadline for new applicants has passed or the decarbonisation impact of the scheme is negligible.

Installer qualification requirements for each scheme are also shown to help indicate which qualifications are most in demand and therefore where skills training is required. There are limitations to the information in the table due to details of some funds not yet being available.

Table 8 - Detail and Impact of Retrofit Funding Available to WECA

Scheme Name	Scheme Description	Timings	Deadline for Applications if Announced	Budget Allocated	Scheme Detail	Expected Deployment	Installer Qualifications Required	Value	Length	Emission Reduction	Impact (Score of 0 - 125)	Justification of Matrix Scores
Social Housing Decarbonisation Fund	Deep retrofit	TBC - 10 year scheme (potentially from start of demonstrator which would mean main fund begins in 2022 and ends in 2030)	N/A	£3.8 billion in Conservative manifesto	The detail of the Social Housing Decarbonisation Fund is yet to be announced but the Conservative manifesto committed £3.8 billion of new funding to this scheme over 10 years. It is likely to begin once the demonstrator is complete.	TBC	No detail yet	5	5	5	125	large amount of high impact funding which is of suitable length to give training and delivery certainty
Home Upgrades Grant	Energy efficiency and low carbon heat	2021-2026 (TBC)	N/A	£2.5 billion in Conservative Manifesto	Upgrading the energy performance of the worst-quality off-gas grid homes in England by supporting the installation of energy efficiency measures and low-carbon heating with a focus on low income households.	TBC	No detail yet	5	5	5	125	Large amount of high impact funding available over a 5 year period
Energy Company Obligation 3	Energy efficiency	ECO3: 3rd December 2018 - 31st March 2022	N/A	£640 million per year	Supporting low income, vulnerable or fuel poor households through: 1. Replacement of 35,000 broken heating systems per year 2. Replacing inefficient heating systems if installed alongside insulation 3. At least 17,000 solid wall insulation per year	220,000 measures in 2019	TrustMark (or equivalent) and any if a measure is referred to in PAS 2030 the installation of the measure must be carried out by a PAS certified installer.	5	5	4	100	Large amount of high impact funding however replacing fossil fuel boilers reduces decarbonisation impact of scheme

Scheme Name	Scheme Description	Timings	Deadline for Applications if Announced	Budget Allocated	Scheme Detail	Expected Deployment	Installer Qualifications Required	Value	Length	Emission Reduction	Impact (Score of 0 - 125)	Justification of Matrix Scores
Energy Company Obligation 4	Energy efficiency	ECO4: 2022-2026	N/A	£1 billion per year	Detail of scheme yet to be released but targeting fuel poor homes in a similar way to previous ECO phases. The Energy Company Obligation (ECO) will be extended until 2026, with its value boosted from £640 million to £1 billion a year.	TBC	Assumed to be the same requirement as ECO3 i.e. TrustMark (or equivalent) and any if a measure is referred to in PAS 2030 the installation of the measure must be carried out by a PAS certified installer.	5	5	4	100	Large amount of high impact funding however replacing fossil fuel boilers reduces decarbonisation impact of scheme
National infrastructure bank	Loans for infrastructure projects	2021 onwards	N/A	N/A	The National Infrastructure Bank will provide private organisations with capital required to construct infrastructure projects. Details on how this bank will operate and what investments will be made remains to be seen.	TBC	N/A	5	5	4	100	High amount of funding for investment, however little clarity of which projects will receive funding reduces decarbonisation score
Green Homes Grant – Public	Energy efficiency and low carbon heat	September 2020 – March 2021	Vouchers must be redeemed and work carried out by 31st March 2021	£1.82 billion	Covering 2/3rds of cost up to £5,000, or 100% of cost for low income homes up to £10,000. Scheme closed early and funding redistributed to the Local Authority Delivery scheme and Social Housing Decarbonisation Fund.	600,000 homes + 100,000 jobs in combined Green Homes Grant	All work must be completed by a TrustMark-registered installer who is also registered for the scheme. The installer will also need to meet PAS and MCS standards when installing measures.	5	3	5	75	Large amount of funding but concerns of delivery length not providing adequate certainty to train staff

Scheme Name	Scheme Description	Timings	Deadline for Applications if Announced	Budget Allocated	Scheme Detail	Expected Deployment	Installer Qualifications Required	Value	Length	Emission Reduction	Impact (Score of 0 - 125)	Justification of Matrix Scores
Clean Heat Grant Scheme	Heat pumps and a smaller number of biomass boilers	April 2022-March 2024	N/A	£100 million across the scheme	Proposed to be a £4,000 up front grant to help with the capital cost of a heat pump or biomass boiler for households or small non domestic buildings (up to 45kW).	25,000 units across the scheme	No detail yet	3	3	5	45	Moderate amount of funding available for just under two years, assumed to be higher impact than RHI due to the removal of capital cost barriers
Heat Network Transformation Project	Low carbon heat	2021 - 2022	N/A	£122 million	Very little detail on this funding to date, however funding mentioned in Energy White Paper and Spending Review	TBC	No detail yet					
Green Heat Networks Fund	Low carbon heat	2022-2025	N/A	£270 million	BEIS are currently consulting on scheme design. May look similar to it's predecessor, Heat Networks Investment Project.	TBC	No detail yet	3	3	5	45	Moderate amount of high impact funding available for around 3 years
Renewable Heat Incentive	Low carbon heat	New applicants deadlines are 31st March 2022 (domestic) and 31st March 2021 (non domestic).	Domestic - 31st March 2022, Non-domestic - 31st March 2021	£1 billion current committed spend	Payments made for low carbon heat generation over a period of 7 (domestic) or 20 (non-domestic) years.	10,895 domestic, 678 non-domestic in 2019	Installer must be MCS certified	3	3	4	36	Moderate estimated funding available for over a year, however concerns over value for money and uptake of RHI

Scheme Name	Scheme Description	Timings	Deadline for Applications if Announced	Budget Allocated	Scheme Detail	Expected Deployment	Installer Qualifications Required	Value	Length	Emission Reduction	Impact (Score of 0 - 125)	Justification of Matrix Scores
Smart export guarantee	Low carbon electricity generation export tariff	1st January 2020 onwards	N/A	No government funding	Obligation for licensed electricity suppliers to offer a tariff (currently 1.5-5.6p/kWh) to small-scale (up to 5MW or 50kW for CHP) low-carbon generators (PV, wind, CHP, Hydro and AD) for electricity exported to the National Grid	N/A	N/A	2	5	3	30	Small monetary incentive for a long time period, however much lower rates than the FIT (predassessor scheme)
Heat Networks Investment Project	Low carbon heat	October 2018 - March 2022	December 2021	£320 million	Grants, corporate loans and project loans are available to public, private and third sector in England and Wales for the capital cost of constructing heat networks.	Fund over 100 projects, leveraging around £1bn of private & local investment	Applicants will need to confirm that the preparation and briefing, feasibility and design sections of the CIBSE ADE Heat Network Code of Practice CP1:2015 (CoP) were used in the design process.	3	2	5	30	Moderate amount of high impact funding available, however less than one year for applications
Green Homes Grant – Local Authority Delivery Scheme Phase 2	Energy efficiency and low carbon heat	2021 - March 2022	Likely to be end of 2021	£300 million	Local authority funding administered through Local Energy Hubs to install energy efficiency and heating measures that will improve the EPC Band D, E, F or G low income homes	600,000 homes + 100,000 jobs in combined Green Homes Grant	Trustmark is not a requirement although will be viewed favourably. Installations must meet PAS:2030 as a minimum, PAS:2035 is considered best practice.	3	2	5	30	Moderate amount of high impact funding delivered over a period of around 1 year

Scheme Name	Scheme Description	Timings	Deadline for Applications if Announced	Budget Allocated	Scheme Detail	Expected Deployment	Installer Qualifications Required	Value	Length	Emission Reduction	Impact (Score of 0 - 125)	Justification of Matrix Scores
ESOS - Energy saving opportunity scheme	Identifying energy saving opportunity for large businesses and non-profits	Phase 3 end 5th December 2023	N/A	No funding	Companies with over 250 employees or a turnover of €50 million and annual balance sheet total in excess of €43 million are obligated to carry out an energy audit and identify areas of cost effective energy saving every 4 years.	The scheme is estimated to lead to £1.6bn net benefits to the UK	N/A	1	5	4	20	No funding but monetary value set at 1 to reflect the monetary benefit of cost effective energy efficiency improvements
Green Homes Grant – Local Authority Delivery Scheme Phase 1	Energy efficiency and low carbon heat	September 2020 – 30 th September 2021	4th December 2020	£200 million	Local authority funding to install energy efficiency and heating measures that will improve the EPC Band D, E, F or G low income homes	600,000 homes + 100,000 jobs in combined Green Homes Grant	Trustmark is not a requirement although will be viewed favourably. Installations must meet PAS:2030 as a minimum, PAS:2035 is considered best practice.	3	0	5	0	Application deadline passed
Public Sector Decarbonisation Scheme	Energy efficiency and heat decarbonisation	September 2020 – 30 th September 2021	11th January 2021	£1 billion	Grants for public sector bodies to fund up to 100% of the cost of energy efficiency and heat decarbonisation measures	30,000 skilled jobs, unknown deployment	Unclear	5	0	5	0	Application deadline passed
Public Sector Low Carbon Skills Fund	Public Sector Decarbonisation Scheme access assistance	September 2020 – 31st March 2021	11th January 2021	£32 million	Grant for public sector bodies for project development support, project delivery support and heat decarbonisation plan support to assist in a bid for Public Sector Decarbonisation Scheme support	N/A	N/A	1	0	3	0	Application deadline passed

Scheme Name	Scheme Description	Timings	Deadline for Applications if Announced	Budget Allocated	Scheme Detail	Expected Deployment	Installer Qualifications Required	Value	Length	Emission Reduction	Impact (Score of 0 - 125)	Justification of Matrix Scores
Social Housing Decarbonisation Fund Demonstrator	Demonstrate cost reduction in social housing deep retrofit	30 th September 2020- 30 th June 2022	12th November 2020	£50 million	Projects must show how a cost reduction of 5-30% can be achieved when bringing social housing to a deep retrofit standard of a maximum 50kWh/m ² thermal energy demand.	17 projects	Installers must be Trustmark and MCS certified and installations must meet PAS:2035 standards	2	0	3	0	Application deadline passed
Warm homes discount	Reduced energy bill cost	2011 - 2026	N/A	£350 million per year	A £140 bill reduction for pensioners and low income households	Assistance provided to 2-3 million households.	N/A	3	5	0	0	Moderate funding available but no real decarbonisation impact, however fuel poverty is addressed

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