CLOSING THE RETROFIT SKILLS GAP

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EXECUTIVE SUMMARY

This is our second report on retrofit skills and it looks at what changed between 2023 and 2024. The urgency for an annual update was underscored by the Climate Change Committee's summer 2024 assessment that retrofit skills remained "significantly off track".[1] The longer this skills deficit continues, the greater the risk to the UK's ability to reach net zero by 2050, and to nearer-term targets, including the new government's mission to deliver clean electricity by 2030.

This report is based on 11 interviews with providers (nine further education (FE) colleges and two independent training providers) and an analysis of Local Skills Improvement Plan (LSIP) progress reports that were signed off by the Department for Education (DfE) in summer 2024.

The key findings about the state of play in England in 2024 were:

1. Demand for retrofit skills was rising because of the ongoing roll-out of government-funded retrofit schemes.
2. More FE colleges were gearing up to deliver retrofit skills training by developing new facilities and courses.
3. It was proving difficult for colleges to recruit tutors with up-to-date knowledge, and take-up of courses was low.
4. Construction employers – 99% of which are small to medium-sized enterprises (SMEs) – still lacked awareness about retrofitting and about net zero more generally. Their preference was for very short courses so they could minimise loss of earnings while attending training.
5. These firms offered few apprenticeships or work placements.
6. Some FE colleges were establishing industry partnerships with major manufacturers and housebuilders, which had the potential to be mutually beneficial but also brought potential risks.
7. More strategic cross-sector partnerships were being developed in some areas of England, bringing together employers, local government, housing providers and schools to consider how to improve local retrofit skills.

The following key policy recommendations came from the research (see the Recommendations section for more details):

1. The next iteration of the UK government's industrial strategy, due in spring 2025, should recognise the growth that is needed in the construction sector to deliver its net zero targets.
2. The Department for Energy Security and Net Zero (DESNZ) should develop a national retrofit strategy to meet net zero and support the government's policy missions on clean power, health and growth. The strategy needs to coordinate supply-side policy interventions, demand-side interventions and quality standards, at national and local level.

1 Climate Change Committee (2024) *Progress in reducing emissions: 2024 report to parliament*. p.63.

3. Skills England should forecast the full range of retrofit skills needed to fulfil DESNZ's retrofit strategy.
4. Skills England should ensure that all qualifications for the construction sector are updated to include relevant retrofitting and building physics content (e.g. energy efficiency, heating and cooling, moisture management, new technologies), and that they are regularly updated.
5. Skills England must ensure the process for routinely updating qualifications, including apprenticeship standards and accrediting courses, is timely and is aligned with DESNZ's retrofit strategy and targets.
6. Training needs to be made mandatory for all individuals involved in retrofitting (including the changeover to low carbon heating), to improve quality and prompt businesses to take up training. DESNZ should consult with the relevant sector bodies on the best approach to making training mandatory and how to phase this in.
7. Public procurement should be used to ensure that construction firms working on government-funded schemes support considerably higher numbers of construction apprenticeships and T-level work placements for students than they currently do.
8. Funding for FE college tutors should be increased to acknowledge the pay gap between teaching and industry roles. Colleges should be able to pay tutors a premium where necessary.

INTRODUCTION

It will be impossible to meet the UK's net zero target without decarbonising virtually all buildings.[2] This will mean the mass retrofitting of homes and other buildings, including fabric improvements and changeover to low carbon heating. Recruiting the workforce to carry out retrofitting – and training these workers to a high standard – is therefore a mission-critical task for reaching net zero by 2050.

Retrofitting can also be seen as critical to several of the UK Labour government's nearer-term policy missions. For example, it can contribute to the government's Clean Power 2030 mission[3] by maximising energy generation from existing homes through solar panels and batteries, and reducing heat loss, so that new heat pumps and heat networks can be sized appropriately and not consume excessive amounts of electricity. Mass retrofitting would also support Labour's health and growth missions over this parliament and deliver tangible health and economic benefits to households.[4]

The urgency of developing retrofit skills has increased since the publication of our first report, *Ready for Retrofit? An Analysis of Local Skills Improvement Plans*.[5] Between 250,000 and 500,000 workers were expected to be needed to retrofit the UK's homes by 2050.[6] However, with each passing year in which little progress is made, more buildings will need to be retrofitted in a shorter period. The UK must not wait for the electricity supply to be fully decarbonised first, because the growth that is needed in the retrofit workforce and in its skills will take time. The Climate Change Committee has been clear that this needed to begin in the early 2020s and has deemed progress on its key skills metrics as "significantly off track".[7]

A diverse range of skills will be needed.[8] All construction trades engaged in retrofitting or new build will need enhanced knowledge of building physics, including energy efficiency, low carbon heating and moisture management. Those who liaise with households will need communication skills to be able to understand their needs and to explain how to operate their retrofitted homes. For new technologies, such as heat pumps, plumbers, electricians and their teams will need to be upskilled so they can select, install and optimise them for different settings. Workers in many other roles will also need to be upskilled and to stay up to date with new technologies. These will include retrofit coordinators, local commissioners, planners, building inspectors and architects. To be ready for mass retrofitting in England, we will need a combination of new entrants to the workforce learning these skills, the existing workforce to be upskilled and workers from other industries to be reskilled. Skilled immigration is another factor.

2 Climate Change Committee (2019) *UK housing: Fit for the future?* p.11.

3 DESNZ (2024) *Clean Power 2030 action plan: A new era of clean electricity*.

4 For Labour's five missions for government, see The Labour Party (accessed February 2025) *Mission-driven government*.

5 Ravenscroft, C. (2024) *Ready for retrofit? An analysis of Local Skills Improvement Plans in England*. Report to the Gatsby Foundation.

6 Workforce estimates vary depending on their scope and timeframe. For example, at the lower end are estimates of 230,000 fabric retrofitters plus 60,000 heat pump installers in Magrath, D. (2021) *Green jobs taskforce*. Report to government, industry and the skills sector. Department for Business, Energy and Industrial Strategy (BEIS), p.20 and p.24. At the upper end are estimates of 515,000, including indirect roles, in Brown, D., Wheatley, H., Kumar, C., Marshall, J. (2020) *A green stimulus for housing: The macroeconomic impacts of a UK whole house retrofit programme*. New Economics Foundation, p.4.

7 Climate Change Committee (2024) *Progress in reducing missions: 2024 report to parliament*. p.63.

8 For fuller lists see Palmer, P. and Gillich, A. (2023) *Retrofit skills: Building the local net zero workforce in the Borough of Lambeth*. Revised 10th June 2022, reissued July 2023; Heat Pump Association (2024) *Projecting the future domestic heat pump workforce*, pp.5-6.

Unfortunately, every month there are news stories about retrofits that have gone wrong because they have been carried out by contractors without the right skills or without adequate quality controls. Poor quality retrofitting exposes households to unacceptable health risks and it risks compromising the UK's goal of reducing emissions. Taking shortcuts on retrofit skills or quality standards is counterproductive.[9]

Previous governments have largely relied on the market and local providers to develop retrofit skills, which has not worked. Where they made policy interventions, they were solely focused on either the demand side or the supply side. Previous schemes to boost demand for retrofitting (e.g. the Green Homes Grant) failed because the short timescales did not allow time to develop the workforce.[10] Whereas LSIPs were a supply-side intervention, which asked employers what training they wanted. Unfortunately, as our previous study revealed, in 2023 most construction employers lacked awareness of net zero and wanted to minimise time spent training. Accordingly, many employer representative bodies (ERBs), who were the authors of LSIPs, asked colleges to create very short courses, perpetuating the risk of poor-quality retrofitting.

The Labour government has set out a more ambitious agenda for net zero and made a start on retrofitting. It has relaunched the Social Housing Decarbonisation Fund as the Warm Homes Plan and has indicated that funding for retrofitting will be devolved to strategic mayoral authorities from 2028.[11] However, it has yet to publish an overarching retrofit strategy or a plan for securing retrofit skills. This is important because the government needs to provide longer-term policy direction to encourage investment in these skills by construction firms and education providers. Any plan for retrofit skills needs to carefully coordinate:

- stimulating demand for retrofitting, by funding schemes like the Warm Homes Plan, with
- increasing the supply of training opportunities, through LSIPs and FE funding, and
- quality assurance mechanisms to boost employer take-up of training and secure public confidence

DESNZ, Skills England and local partners will need to work together to get this right. Otherwise, outcomes will remain poor, with the government continuing to deliver low-quality retrofitting schemes that later need remedying,[12] or where training is made available but either not taken up or not put into practice.[13]

9 For the avoidance of doubt, compromises may be needed when selecting retrofit solutions based on the overall housing condition, the cost and convenience for occupants. But this makes it even more important that the retrofit workforce has the skills and knowledge to select appropriate solutions and deliver them to a high-quality standard to optimise outcomes.

10 National Audit Office (2021) *Green Homes Grant Voucher Scheme* and Sasse, T. and Thomas, A. (2022) *Better policy making*. Institute for Government, p.18.

11 Ministry of Housing, Communities & Local Government (2024) *English devolution white paper*. p.48.

12 For example: BBC (18 November 2024) *Lenders reject homes with spray foam insulation* which was installed under the Green Homes Grant and DESNZ (2024) *Social Housing Decarbonisation Fund (SHDF) wave 1: Process evaluation report* where only two-thirds of residents were satisfied with the work done under the SHDF scheme. Close to half had received no support or guidance on their installed retrofit measures and residents reported ongoing issues, for example, with draughts because only single insulation measures had been fitted.

13 For example, the Heat Pump Association recently reported 39% of those who have heat pump training are not currently actively working in the sector, but did not confirm reasons for this. Heat Pump Association (2024) *Projecting the future heat pump workforce*.

In this report, we give an update on the policy landscape and the current state of play for retrofit skills as seen through the lens of the 2024 LSIP progress reports and new interviews with leading colleges and independent training providers. We conclude with policy recommendations to support the new government to get UK retrofit skills back on track.

METHODS

This report builds on our earlier study, *Ready for Retrofit? An Analysis of Local Skills Improvement Plans in England,* published by the Gatsby Foundation in June 2024.[14] The earlier report included a literature review of the key issues in retrofitting and analysis of the 2023 LSIPs.

This new report has been jointly commissioned by three organisations: the Gatsby Foundation (which paid for the study), Ashden Climate Solutions and the National Retrofit Hub.

The following methods were used for this study:

- Semi-structured interviews with 11 interviewees: nine FE colleges and two independent training providers. Interviewees were selected because they were known to already have or to be developing retrofit provision. They came from eight of the nine English regions. Their responses were anonymised to enable them to speak candidly.
- Documentary analysis of LSIP progress reports, which were published in summer 2024. Not all progress reports were available online at the time of writing: 34 were reviewed, compared to the 38 original LSIPs.

To respond to some of the issues raised in the interviews, a supplementary question was included in the interviews to ask the colleges and independent training providers if they would be interested in using a new building physics module that would be free at the point of use. The results were positive and the Gatsby Foundation, the National Retrofit Hub and Ashden Climate Solutions were considering their next steps on this at the time of writing.

14 Ravenscroft, C. (2024) *Ready for retrofit? An analysis of Local Skills Improvement Plans in England*. Report to the Gatsby Foundation. Please refer to this earlier report for a literature review of key issues for retrofit skills including more background on the skills needed for retrofitting, forecasts and market dynamics.

BACKGROUND

SUMMARY OF THE PREVIOUS REPORT

Our earlier report established the extent to which retrofit skills were being planned for and delivered across England during 2023.[15]

Analysis of the 2023 LSIPs[16] showed a mixed picture on retrofit skills. Whereas some LSIPs described retrofitting as a priority and committed to developing new provision, others made no mention of it.

The majority of LSIPs reported that construction employers – 99% of which are SMEs – were not aware what decarbonisation or net zero would mean for their business. Most were not planning to access retrofit training because they thought there was low customer demand, and because of the associated costs and time involved.

More widely, the LSIPs highlighted existing labour and skills shortages in the construction sector. Most firms had enough business-as-usual work, as well as major new projects coming on stream, which limited their interest in upskilling their workers for retrofitting. There was also concern about the lack of apprenticeships being offered by employers, limiting the potential to reduce these skills gaps over time.

Notwithstanding these issues, several FE colleges were investing in new construction or retrofit training facilities, using the Local Skills Improvement Fund (LSIF) or the Strategic Development Fund (SDF) from the DfE. The main funding available at the time was capital funding, hence the focus on facilities. Other funding streams were short term and competitive, making it hard for colleges to plan ahead.

The analysis of LSIPs was complemented by expert interviews. The experts did not consider the 2023 LSIPs to be effective vehicles for retrofit skills planning. They recommended that medium-term retrofit skills forecasts needed to be developed through consultation with local authorities and housing associations, not just employers. Extrapolating forecasts from employer interest or current employment datasets would not work, particularly given the lack of engagement from most construction firms to date. Quality should be a priority.

These findings led to a series of recommendations, including:

- a national retrofit strategy that would connect several elements:
  1. stimulating demand for retrofitting through procurement for social housing and financial incentives for homeowners
  2. support for skills development, delivered through FE colleges and independent training providers
  3. quality requirements, that would prompt employers to take up training
- developing LSIP governance to ensure that ERBs involve local authorities and social sector organisations in identifying local skills needs

15 Ravenscroft, C. (2024) *Ready for retrofit? An analysis of Local Skills Improvement Plans in England*. Report to the Gatsby Foundation.

16 Local Skills Improvement Plans were introduced by the Post-16 Education and Skills Act in 2022. Drawn up by ERBs in consultation with local employers, these plans were intended to highlight priority skills needs that FE colleges should respond to.

PUBLICATION OF LSIP PROGRESS REPORTS

One year on from the publication of the LSIPs in 2023, each ERB produced an LSIP progress report. These progress reports were mostly approved under the previous Conservative government, but their publication was held until after the general election in July 2024. In August 2024, the majority of LSIP progress reports were published, giving a first look at what had changed across England in the year since our previous research.

RETROFIT SKILLS STATISTICS

A wide range of roles and skills are needed to deliver mass retrofitting and at present there is limited data available on these. For a list of roles, see Palmer and Gillich (2023)[17] and for further analysis, see the literature review in our previous report.[18]

In 2022, the Climate Change Committee used two main proxies for the development of the retrofit workforce: number of retrofit coordinators and number of heat pump installers.[19] It has subsequently reported on the number of heat pump installers, describing it as a "key enabler of the transition".[20] However, its earlier recommendation that government needs to track a wider range of roles should not be lost.

In July 2024, it stated that progress was "significantly off track" with an estimated 5,000 trained heat pump installers nationally.[21] [22] This compares to its sixth carbon budget which forecast a need for 13,500 heat pump installers by 2024, rising to over 50,000 by 2028.[23]

In November 2024, the Heat Pump Association published an estimate of there being between 4,000 and 10,000 active heat pump installers nationally, but they noted that over 17,000 had completed heat pump training. This suggests that around 39% of those with training were not active in the workforce at that point.[24] However, these estimates were based on some broad assumptions.

THE LABOUR GOVERNMENT'S POLICY ANNOUNCEMENTS

The Labour government has made several policy announcements that are relevant to retrofit skills planning. These policies provide important context for the findings and recommendations included in this report. Relevant announcements include:

- Warm Homes Plan – This plan committed the government to upgrading the heating and insulation in 300,000 properties over the next year, through a range of funding and incentives. The Warm Homes: Social Housing Fund is a relaunch of the previous government's Social Housing Decarbonisation Fund. The Warm

17 Palmer, P. and Gillich, A. (2023) *Retrofit skills: Building the local net zero workforce in the Borough of Lambeth*. Revised 10th June 2022, reissued July 2023. pp.28-29.

18 Ravenscroft, C. (2024) *Ready for retrofit? An analysis of Local Skills Improvement Plans in England*. Report to the Gatsby Foundation. pp.5-10.

19 Climate Change Committee (2022) *Progress in reducing emissions: 2022 report to parliament*. p174.

20 Climate Change Committee (2024) *Progress in reducing emissions: 2024 report to parliament*. p.63.

21 Climate Change Committee (2024) *Progress in reducing emissions: 2024 report to parliament*. p.63.

22 Climate Change Committee (2024) *Progress in reducing emissions: 2024 report to parliament – Charts and data*. Tab 3.6. (see column AO).

23 Climate Change Committee (2020) *The sixth carbon budget – Charts and data in the report*. Buildings tab, figure 3.2.g.

24 Heat Pump Association (2024) *Projecting the future domestic heat pump workforce*. See pp.5-6 for a list of roles, p.8 for the estimated current workforce and p.23 for the labour activity rate.

Homes: Local Grant replaces the local authority delivery scheme. These funds are likely to boost demand for retrofit skills in areas that secure funding.

- Skills England – A new non-departmental public body was announced that will take the lead for skills planning across government. Its predecessor, the Institute for Apprenticeships and Technical Education (IfATE), will transfer its functions to Skills England. If the UK is to achieve net zero, Skills England will need to take a more sophisticated approach to forecasting future skills needs, such as retrofit skills. It will need the power to ensure the quality of these skills by setting higher standards and coordinating with both central government and local actors. Its remit and independence will therefore need to be broader and stronger than IfATEs has been.

- Industrial strategy – A green paper, *Invest 2035: The UK's Modern Industrial Strategy*, was launched in October 2024 and set out eight industrial sectors that the government believed would drive growth over the coming years.[25] It did not identify construction or retrofit, but it did state that further work would be done to consider investment in "foundational" industries.[26] Notably, by December 2024, Skills England had announced that it would develop skills forecasts for the eight industrial sectors from *Invest 2035*, plus construction and health and social care.

- The *English Devolution White Paper*[27] – The government set out its plan for strategic authorities (akin to the current combined mayoral authorities) to cover England in this white paper launched in December 2024. Strategic authorities would have responsibility at a local level for developing Local Growth Plans to support the industrial strategy. They would also have joint responsibility for LSIPs, alongside the ERBs that currently lead on LSIPs.[28] From 2028, funding for retrofitting would be devolved to strategic authorities as part of their integrated funding settlements. These changes offer potential for more joined-up retrofit roll-out and retrofit skills planning at a local level.

- House building targets – In November 2024, the government reiterated its plans to build 1.5 million new homes during the five-year parliamentary term. It intends to drive this by making changes to the National Planning Policy Framework and through new investment. Ensuring new homes are built to higher energy and environmental standards – so they do not later need further retrofitting – will require many of the skills discussed in this report.

- Clean Power 2030 – The government's target to deliver 95% of power by clean sources by 2030. This target will be extremely challenging to meet, given that electricity demand is expected to more than double by 2050.[29] If done well, scaling up retrofitting could help, as noted in the introduction to this report. But this too depends on setting higher-quality standards that prompt take-up of high-quality retrofit training.

25 UK Government (2024) *Invest 2035: The UK's modern industrial strategy*.

26 "'Foundational' sectors: These are the sectors which provide critical inputs and infrastructure to our growth-driving sectors". UK Government (2024) *Invest 2035: The UK's modern industrial strategy*. p.20.

27 Ministry of Housing, Communities & Local Government (2024) *English devolution white paper*.

28 This change goes some way to reflecting the recommendations of our earlier report, which had recommended diversifying the governance of LSIPs, given that local government and social sector organisations will often have earlier sight of future skills needs for their local areas – such as retrofitting – than private sector employers.

29 DESNZ (2024) *Clean Power 2030 action plan: A new era for clean electricity*. p.39.

As noted in our previous report, widespread shortages in construction labour and skills were reported across the country in the 2023 LSIPs. Considering the list of new policy commitments, it seems obvious that there will be challenges in scaling up the workforce to deliver retrofitting, while simultaneously scaling up the workforce for housebuilding and clean power. This is even before considering the workforce required to deliver other national infrastructure projects, including net zero projects, envisaged in the industrial strategy.

Yet, there are also synergies between these policy goals, as growing and developing the construction workforce is at the heart of them all. This makes it all the more important for Skills England to develop constructive relationships across government, so that it can anticipate the priority skills needs and negotiate solutions with the right actors (e.g. across Whitehall, ERBs, strategic authorities, education providers and awarding bodies) to address them.

THE STATE OF PLAY IN 2024

This section outlines the findings from analysing the LSIP progress reports and the interviews with FE colleges and independent training providers. It describes the state of play for colleges, construction employers and wider partnerships in 2024. It includes two case studies of emerging good practice.

DEMAND FOR RETROFIT SKILLS

It has long been expected that demand for retrofit skills would increase during the early 2020s.[30] However, only a few of the 2023 LSIPs identified retrofit skills as a priority.[31] In the 2024 progress reports, several areas noted that they were seeing increased demand for these skills, as net zero targets drew nearer and government retrofitting schemes began scaling up:

> *There is likely to be increasing demand for this across GL&R [Greater Lincolnshire and Rutland] over the next three years as Net Zero targets for 2030 and 2050 approach.*
>
> (Greater Lincolnshire and Rutland LSIP Progress Report, p.20)

> *The future demand will require the current workforce to quadruple in size purely to meet the requirements of Government funded schemes, let alone privately financed solutions. It is forecasted that a further 107,000 building fabric and retrofit professionals will be required by 2030.*
>
> (South East Midlands LSIP Progress Report, Annex 1, p.24)

> *Green Construction agenda has seen a speedy rise in the demand within construction for staff trained in retrofit and renewables. The technology has outpaced the understanding of the career path and availability of training, causing a severe shortage of entrants into the sector.*
>
> (Marches LSIP Progress Report, p.14)

> *The significant demand for construction skills has been maintained and there is increasing demand for specialist skills in retrofit, not least from the social housing sector.*
>
> (North of Tyne LSIP Progress Report, p.5)

> *The LSIP focused on the Net Zero sector … because of the incredibly significant impact it will have on the economy over the next five years … [particularly] construction skills for large-scale industrial developments and retrofit as two key sub-sets of growth.*
>
> (Tees Valley LSIP Progress Report, p.11)

The significant opportunity for individuals and businesses that make early investment in developing these skills was also noted:

> *I think there's a huge gap. [A local charity] are telling me there's hundreds of clients want their houses retrofitted … but there's nobody to do the actual retrofitting. That includes heat pump installation.*
>
> (Interviewee 7)

30 Climate Change Committee (2020) *The sixth carbon budget: The UK's path to net zero*. p.123.

31 Ravenscroft, C. (2024) *Ready for retrofit? An analysis of Local Skills Improvement Plans in England*. Report to the Gatsby Foundation, p.19.

> *Retrofits are being done but often badly. Companies training up in these skills now can benefit from being an early adopter … there should be plenty of work for years to come within the sector as it is a priority for national and local government.*
>
> (Future of Green Skills Sussex, p.31)[32]

Overall, it appeared that awareness about the need for retrofit skills had increased since 2023.

COLLEGES

MORE FE COLLEGES ARE GEARING UP TO DELIVER RETROFIT SKILLS

FE colleges and independent training providers will need greater capacity to deliver retrofit skills training over the coming years. This section looks at their readiness to do so.

The 2023 LSIPs indicated that most areas were at an early stage of investigating green skills needs and few mentioned retrofit in any depth. The 2024 LSIP progress reports showed many were still scoping future needs, for example, by convening working groups or further investigatory work on these topics.

However, at least 24 (out of the 34 reviewed) LSIP progress reports mentioned planning new provision that appeared potentially relevant for retrofitting. The three main actions described in LSIP progress reports were building new facilities, embedding relevant content into construction courses and offering new short courses to upskill the existing workforce.

New facilities

Of the 24 LSIP progress reports planning new provision, many focused on building or enhancing physical facilities at FE colleges using LSIF and/or SDF capital funding. Facilities are important for developing retrofit skills because most learners will need practical training using up-to-date equipment and methods:

> *A new* **green construction centre** *will be opened on the B&P [Bournemouth & Poole] College Poole campus before Christmas.*
>
> (Dorset LSIP Progress Report, p.11, emphasis added)

> *The* **Retrofit Centre** *which is being currently built will address the employer identified need for skills in retrofitting existing building stock to meet Net Zero targets.*
>
> (Kent & Medway LSIP Progress Report, section 5.21, emphasis added)

> *Over £2m in capital and resources being invested in a state-of-the-art* **Low Carbon Technology Training Centre** *facility.*
>
> (Marches LSIP Progress Report, p.15, emphasis added)

As these examples show, the scope of new facilities varied and they were mostly still in development during 2024. Therefore, it is hard to tell the extent to which LSIF-funded facilities will boost retrofit training capacity.

32 Fleming, D. (2024) *Future of green skills Sussex*, p.31. There was no Sussex LSIP progress report available online at the time of writing, however, this report was available on the Future skills Sussex LSIP website.

Even where major capital projects had been undertaken with the specific intention of rolling out retrofit skills courses, interviewees said it was still early days:

> *It's quite new to everyone, other colleges are at early stages. I haven't come across one up and running yet.*
>
> (Interviewee 10)

> *The centre's just finished [being built] last week so we haven't actually delivered yet but we do plan in the next couple of months to have our first cohort.*
>
> (Interviewee 7)

In addition to new facilities, the LSIP progress reports mentioned launching new retrofit "hubs" or "centres", some of which appeared to be repurposing existing facilities or capacity; launching a new "retrofit academy" which could refer to a licensing arrangement with an external provider; and launching various new construction facilities or initiatives that may or may not be relevant for retrofitting. Therefore, it was difficult to count new facilities or training capacity from the progress reports because of the diversity of approaches.

Embedding retrofit skills into the curriculum for all construction learners

Reaching entrants who are new to the construction workforce is vital to improving the quality and energy efficiency of the UK's overall housing stock. This includes those who will work on new builds and those who will renovate and retrofit existing homes. It will require relevant knowledge and skills to be embedded into all construction courses.

As one interviewee described:

> *Training the trades is essential. Can't just have lots of retrofit advisors. Unless you have the trades who know how to do the work, it's not going to happen.*
>
> (Interviewee 8)

So far, only a small minority of colleges appear to be embedding relevant training into their main construction courses, and a few others are aspiring to this approach. Two case studies of colleges that were already doing this are included later in this section.

> *We're delivering retrofit skills through every qualification we deliver, because there are things that [for example] plasterers need to know … For every level and every qualification, we ask what do they need to know for the future of housing or whatever aspect of construction they're going into.*
>
> (Interviewee 9)

> *Providers are now reporting full integration of relevant green skills … These are now an integral and compulsory component of courses …*
>
> (Derbyshire and Nottinghamshire LSIP Progress Report, p.16)

> *Our longer term plan is to have a structured curriculum that will form part of every course we offer to every learner, with headline building physics and basic awareness around retrofit.*
>
> (Interviewee 6)

A small number of colleges and LSIP progress reports mentioned introducing new apprenticeships and T-levels that would offer significantly more in-depth training in relevant skills:

> *We're delivering the low carbon heating technician apprenticeship from January.*
>
> (Interviewee 9)

This type of in-depth training, that includes time spent with an employer as well as learning at an FE college or other training provider, accords more closely with what retrofit experts say is needed to ensure high-quality retrofitting.[33]

Retrofit courses

Compared to the small minority of FE colleges updating their whole curriculums, a higher number of FE colleges had begun offering discrete retrofit courses to fulfil PAS 2035 (a retrofit building standard) requirements. Different approaches had been taken to delivering these types of retrofit courses.

Three of the 11 interviewees for this study[34] had delivered them in conjunction with an external provider that offered elements of online delivery. One explained why:

> *So we developed training provision for retrofit: Level 2 understanding domestic retrofit; Level 3 retrofit advisor; Level 4 retrofit assessor; Level 5 retrofit coordinator. In order to do that we have a license agreement with [an external provider] … We're working with [them] because the challenge is to get competent trainers.*
>
> (Interviewee 2)

However, other interviewees had concerns about cost and quality assurance of external courses and were intending to offer their own face-to-face retrofit courses:

> *We've worked with a company that has developed online material – but it's not fit for purpose.*
>
> (Interviewee 8)

> *The cost has been prohibitive to work with other external providers. Also we want our courses to be in person face-to-face as much as possible and not self-led study. We think that's more meaningful, high quality.*
>
> (Interviewee 1)

Other than PAS 2035 courses, some colleges were in the process of delivering or planning to deliver new installer courses e.g. for heat pumps, solar PV (solar panels) or insulation, for the existing workforce. In general, the design of these courses reflected employer preferences for very short continuing professional development courses:

> *Short courses in Green Skills - Air Source Heat Pumps, Solar PV.*
>
> (Berkshire LSIP Progress Report, p.10)

33 Ravenscroft, C. (2024) *Ready for retrofit? An analysis of Local Skills Improvement Plans in England*. Report to the Gatsby Foundation.

34 The selection of the interviewees for this study was based on our awareness that they were already engaged with retrofitting, so the sample is not representative of all colleges.

> *London South East Colleges is collaborating with a group of 23 providers, employers, and an Awarding Body to develop 50 micro credentials to upskill employees in key sectors (e.g. training on heat pumps for a plumber who only needs updating on the latest technology, not wider green training).*
>
> (London LSIP Progress Report, p.22)

> *WYCA [West Yorkshire Mayoral Combined Authority] have commissioned Green Skills for Construction Bootcamps.*
>
> (West Yorkshire LSIP Progress Report, p.8)

> *Continue to develop Green curriculum and offer funded or free short upskilling and training programmes, against specific skills needs i.e. Installation and maintenance of sustainable construction.*
>
> (Dorset LSIP Progress Report, p.19)

Some colleges were also developing short introductory net zero or sustainability awareness courses, aimed at employers. While not retrofit-specific, these could be seen as a prerequisite for stimulating their interest in accessing other courses:

> *Identify or develop a short course or a series of short courses to increase the awareness of net-zero.*
>
> (Buckinghamshire LSIP Progress Report, p.14)

> *Develop and implement industry specific "Achieving Net Zero" online/ workshop-based programmes for staff and managers, with a focus on relevant occupations.*
>
> (Derbyshire and Nottinghamshire LSIP Progress Report, p.9)

ISSUES FACING COLLEGES

Tutor shortages

Almost all the interviews with colleges and the LSIP progress reports highlighted college tutor shortages as a major challenge to expanding their retrofit provision. There was a general shortage of tutors in construction, but especially those with up-to-date knowledge of net zero and new technologies:

> *The person from [a sector body] had to explain even to some of the tutors, it's like a blanket around your house.*
>
> (Interviewee 4)

Low FE sector pay was believed to be the main cause of tutor shortages, as there was considerable disparity with industry earnings:[35]

> *We can't get tutors. Our pay is about £33 per hour, for FE teaching, but on site they can get 5-7 times more.*
>
> (Interviewee 1)

35 NFER (2024) *Building a stronger FE college workforce*. Industry earnings and potential earnings growth were higher than in FE for construction professionals. For top performers the median pay difference was around 12%. However, this is likely to be an understatement because the National Foundation for Educational Research (NFER) could not take account of the earning potential of self-employed workers. See pages 38 and 52.

Colleges had grappled with their recruitment challenges in different ways. Several were upskilling their existing tutors, although this was not a guarantee of retention:

> *Every time we train a teacher they move on because they can go and get that money elsewhere.*
>
> (Interviewee 10)

> *Construction department is notoriously bad for turnover because people can always get better jobs.*
>
> (Interviewee 11)

Others were trying to find workarounds: ways to boost pay, doing deals with local industry, collaborating with other colleges (e.g. sharing a tutor across a geographical region), collaborating with manufacturers or external providers.

> *We're doing a trade-off with companies, getting in industry experts in exchange for free places on our courses. It's taken a year to get set up.*
>
> (Interviewee 1)

> *We also have a partnership with a small local charity. They've funded a post for the college to deliver retrofit skills to all of our full-time students.*
>
> (Interviewee 9)

> *We trialled 'golden hellos' just recently … Say we can only pay them £23 an hour, we've given them £2,000 for two years and it equates to £40 an hour if they deliver all of the courses.*
>
> (Interviewee 10)

> *The implementation of a 'scarce skills' policy to increase the remuneration for tutors in Agriculture, Construction and Engineering.*
>
> (Hull & East Yorkshire LSIP Progress Report, p.15)

Recent research has looked at how colleges have worked with industry associates as guest lecturers and what would be needed to support these roles on a larger scale.[36]

Course take-up

Colleges that had offered relevant courses during the 2023/24 academic year had found take-up to be low or patchy. The difficulty this presented for colleges was that small cohorts do not cover the costs of delivering the courses. This likely reflected the low appetite of employers, which is discussed in the next section.

> *Take up in terms of classroom – it is quite low. Within the construction industry, they're short on time … even though we run some programmes now on the weekend and take up's been better, it's quite slow.*
>
> (Interviewee 10)

> *Even though they're free, we've had to put in work to get [the courses] filled … Building professionals won't search our college's website or look at our directory of part time courses. You have to hunt them down …*

36 York Consulting LLP (2023) *The role of industry associates in further education.*

> *I'm spending quite a bit of time networking with wholesalers, building merchants and manufacturers to get the word out to their customers.*
>
> (Interviewee 6)

> *On heat, Low Carbon Heating Engineer [Apprenticeship] was pushed by [the standards organisation] MCS, but take-up was low.*
>
> (Interviewee 3)

As government programmes like the Social Housing Decarbonisation Fund were rolled out, it might have been expected to prompt higher take-up of courses. However, the providers interviewed had not found that to be the case so far.

There are examples of better coordination between government procurement and colleges boosting take-up. Such as in Coventry, where contractors were partnering with the local FE college to upskill the workforce[37] and Building Plymouth, where the council has used its capital procurement to support construction training and skills.[38]

EMPLOYERS

LIMITED AWARENESS AND TAKE-UP OF RETROFIT SKILLS TRAINING BY SMEs

Awareness and engagement

Ninety-nine per cent of construction firms are micro or small businesses.[39] The 2024 LSIP progress reports reiterated what was said in the original LSIPs; that many of these employers lacked awareness of retrofit, and of net zero and green skills more generally:

> *Challenge is to engage with employers as green skills not seen as an immediate priority.*
>
> (Cornwall and Isles of Scilly LSIP Progress Report, p.13)

> *… there needs to be a better understanding of the upskilling needed for green skills and roles, and more clarity for employers.*
>
> (Swindon & Wiltshire LSIP Progress Report, p.13)

The LSIP progress reports also highlighted limited engagement with apprenticeships by these employers, even though they are one of the main training routes into the construction sector:

> *Apprenticeship starts are struggling, in particular as a route for 16–19 year-olds entering the workplace. There is more interest in starting an apprenticeship than there are opportunities being offered by employers.*
>
> (Lancashire LSIP Progress Report, p.19)

Unless employers engage with apprenticeships and new T-levels, it will detrimentally affect the pipeline of skilled entrants to the construction sector, which already has labour shortages. This will have a knock-on effect for retrofitting and other net zero projects.

37 Citizen Housing (October 2023) *We're working with partners to train students in retrofitting as part of our social housing decarbonisation project.*

38 Building Plymouth (accessed January 2025) *Our vision.*

39 BEIS (2021) *Business population estimates for the UK and regions 2021: Statistical release.*

Employer preferences

Where employers were potentially interested in taking up training, their preference continued to be for very short courses to minimise time away from site:

> *There has been a clear preference towards short, sharp training courses, as opposed to longform training such as apprenticeships, when looking at Green Skills provision in the county.*
>
> (Gloucestershire LSIP Progress Report, p.16)

> *For employers, it has to be as short as possible.*
>
> (Interviewee 11)

> *… develop 50 microcredentials to upskill employees …*
>
> (London LSIP Progress Report, p.22)

The preference of employers to minimise time spent on training had not changed since the 2023 LSIPs and remained in conflict with what experts say is needed to ensure high-quality retrofitting.

In other countries, construction training takes longer and is more holistic, whereas in the UK, training tends to be task-oriented, for example bricklaying.[40] This was of concern to the experts interviewed for our previous study because of the interconnected processes required for effective retrofitting,[41] where tradespeople ideally need an understanding of how a building functions overall, and the skills to work effectively together and with households.

Colleges are legally required to respond to the employer preferences set out in the LSIPs, so many were developing new short courses in 2024. The risk is that this approach may not secure the breadth and depth of skills necessary to deliver high-quality retrofitting.

Industry partnerships

In contrast to the limited engagement of most employers, the LSIP progress reports note a number of partnerships between colleges and larger industry players – such as manufacturers and housebuilders:

> *Partnering with Northern Renewables has enabled the College to ensure its skills training is aligned to the domestic market skills needs.*
>
> (Tees Valley LSIP Progress Report, p.11)

> *… Carlisle College working in partnership with Worcestershire Bosch to install domestic green energy technology …*
>
> (Cumbria LSIP Progress Report, p.13)

> *… Gloucestershire College's partnership with Beard Construction for a £5 million sustainable construction centre …*
>
> (Gloucestershire LSIP Progress Report, p.7)

40 Killip, G. (2020) A reform agenda for construction education and practice. *Buildings & Cities*, 1(1), p.531.

41 Ravenscroft, C. (2024) *Ready for retrofit? An analysis of Local Skills Improvement Plans in England.* Report to the Gatsby Foundation, p.7.

> … *world-leading heating manufacturer Vaillant, with its Belper-based UK headquarters, have worked with Derby College to deliver the UK's first low carbon heating technician apprenticeships.*
>
> (Derbyshire and Nottinghamshire LSIP Progress Report, p.17)

> … *Daikin partnered with GMColleges [Greater Manchester Colleges]* …
>
> (Greater Manchester LSIP Progress Report, p.9)

Similar in-kind contributions of equipment and training-the-trainer support were described by interviewees for this study and were understandably well-received by colleges. While these large firms share an interest in developing the workforce, it is important that their involvement does not crowd out other firms in these regions. For example, where installers have only been trained on installing one manufacturer's product, there could be a risk they would be less confident in deploying or recommending other solutions.

STRATEGIC PARTNERSHIP WORKING

In a few areas, more strategic partnerships were being forged between colleges, companies, councils, housing associations and schools to develop retrofit skills, or green skills more widely.

In 2024, these partnerships were at differing stages. Some of the early wins involved co-designing new retrofit provision, creating new forums for engagement with employers, engaging with young people, and updating local procurement policies to specify that larger firms must support colleges and offer training placements.

It is still early stages for these partnerships, so it is yet to be seen whether they will lead to a significantly higher take-up of training opportunities by employers. Nonetheless, the early signs are that these partnerships appear to be prioritising more in-depth, integrated, hands-on training – more in line with what experts say is needed.

The following two case studies illustrate these approaches.

CASE STUDY: NORTH EAST INSTITUTE OF TECHNOLOGY (NEIoT)

"Employers at one of our Construction advisory board meetings raised the need for hands-on, face-to-face retrofit training in the north-east to meet the predicted skills gaps across our region", says Sharon Grant, the director of the NEIoT, a collaboration of FE colleges, universities and businesses in the north-east.

Retrofitting had become a high priority for the north-east's councils and social housing landlords. So, employers raised the need for more training at the NEIoT construction board. As a result, the four FE colleges in the NEIoT partnership have integrated sustainability modules into all their plumbing and electrical courses, and introductory level content into their existing apprenticeships. The sustainability modules cover technical topics such as renewable energy systems, energy efficiency techniques and low carbon technologies. In plumbing courses this includes training in the installation and maintenance of heat pumps, solar thermal systems and

rainwater harvesting. For electrical courses, the modules include solar PV installation, battery storage systems and electric vehicle charging points.

The NEIoT partnership has also developed three new accredited face-to-face retrofit courses. One of these courses focuses on customer liaison (retrofit advisor), another on undertaking technical whole-house assessments (retrofit assessor) and there is also a course for individuals who will oversee larger projects, mainly for housing associations (retrofit coordinator).

Sharon says that feedback from employers will be used to evolve the offer over time, particularly because they are finding that there is an overlap of the roles and skills needs on the ground.

"Take customer service", says Ashley Deane, head of school at New College Durham. "Residents are cold, scared to put their heating on, but they're still nervous about retrofitting, so we need a lot of customer service and communications skills at every level."

And safeguarding. "Safeguarding is a massive issue. Operatives going into homes do not know what they are going to find, and we need to keep the operatives and the occupants safe. You quickly become the trusted person if you're in someone's home for days at a time."

Given how important it is to have these kinds of skills, as well as the technical know-how, Sharon and Ashley believe training will be needed across the construction industry to meet retrofitting targets. "Ultimately, a large number of people will need training. Maybe we're a bit early, but we'd rather be ready."

CASE STUDY: EXETER COLLEGE

Exeter has over 40,000 homes that will need retrofitting if the city is to reach net zero. Yet, like many areas, it suffers from labour and skills shortages. This realisation led to the establishment of the Green Construction Advisory Panel in the south-west, bringing together building services, housing and construction businesses with government agencies, charities and training providers. This partnership steered the development of new provision across the south-west over the past few years and, as its remit has broadened, is now known as the Green Skills Advisory Panel (GSAP).

Luke Moss, Exeter College's skills and employer project manager, explains what this has meant for the college:

> *Our training provision is directly shaped by the priorities of our valued stakeholders. Using insights gathered through GSAP Summits and skills surveys, we have developed a clear skills strategy focused on key areas such as retrofit, insulation, renewable technologies, and water conservation.*
>
> *We've designed entirely new courses, including our insulation programmes, tailored for the existing workforce requiring upskilling to meet PAS:2030 standards. By collaborating with industry bodies such as INCA, SWIGA, and*

NIA, along with the awarding body NOCN, we have created programmes that reduce barriers to training while fostering accreditation.

Additionally, at Exeter College and other Further Education colleges throughout the UK, we have integrated retrofit modules into the construction curriculum for our 16-18 provision. This covers a variety of topics including what is retrofit and why is it needed, jobs and careers, understanding of PAS:2035 and an introduction to renewables.

This not only equips students with foundational knowledge of domestic retrofit but also addresses industry concerns by attracting new talent to the sector. It helps raise awareness of the diverse career opportunities in construction, the built environment, engineering, and manufacturing.

As Luke says, the work that the south-west GSAP began has been influential, with 20 other regions across the UK establishing their own GSAPs. The purpose of these panels is to encourage, improve and develop education and training opportunities for the sustainable housing, green construction, engineering and manufacturing industries. Thereby, helping to close the skills gap and provide entry routes into green-related careers.

More recently, GSAP has also launched a National Partnership Board that presented a timely opportunity to establish the strategic vision for GSAP. The GSAP ambition is to establish a UK-wide framework to upskill the current workforce and educate new entrants to adopt emerging technologies, consider the environmental impact of construction activity and identify how industry can help meet net zero targets. It is an approach that is attracting interest internationally, and new partnerships are being forged through the British Council.

POLICY ISSUES

Several policy issues emerged from the interviews for this study and from the review of LSIP progress reports. These are explored here and corresponding recommendations are made at the end.

RETROFIT STRATEGY

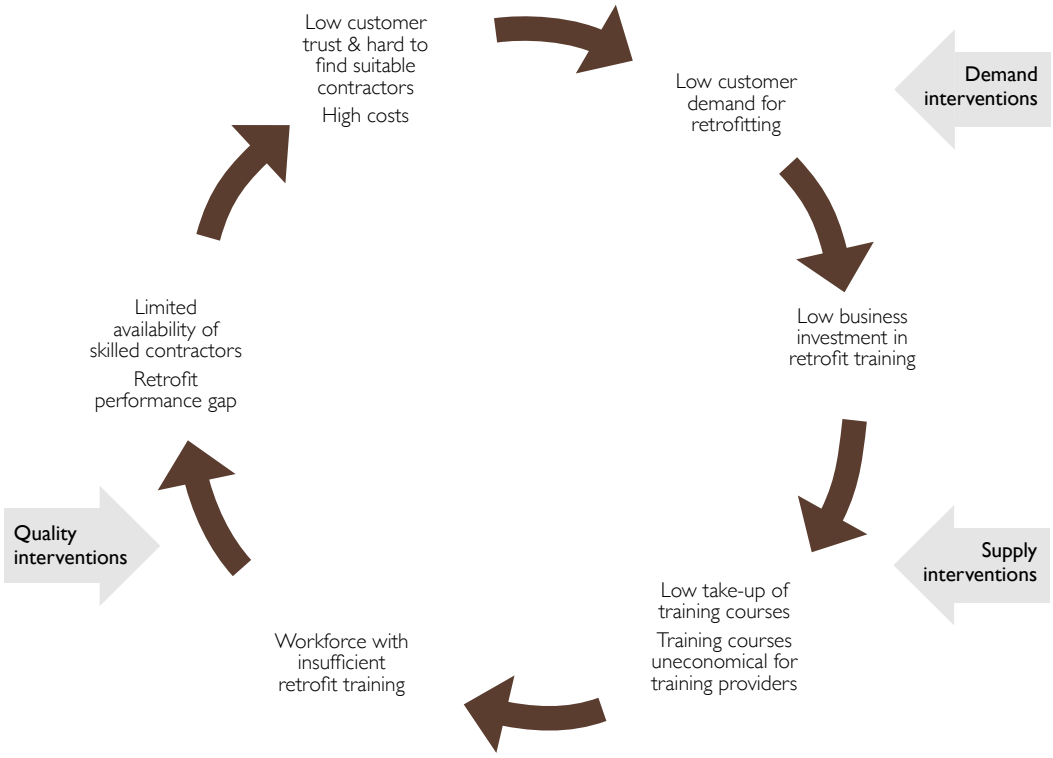
Given the need to roll-out retrofitting at scale over the coming years, there needs to be a joined-up strategy to ensure that retrofit skills are being developed in time.

Leaving it to the market has not worked: previous government schemes have been criticised for failing to develop the supply chain and for their stop-start nature, which has undermined employer confidence. Meanwhile, numerous stories have emerged where poor-quality retrofitting has caused negative outcomes. This is particularly worrying for vulnerable customers. These stories highlight that it is not just a question of the availability of the construction workforce: retrofitting requires more in-depth skills and knowledge.

The findings from 2024, illustrate that colleges were increasingly anticipating the need to develop retrofit skills across the construction workforce because of the roll-out of major government-funded retrofitting schemes. Yet there was little incentive (neither carrot nor stick) for employers to take up training or to offer training places. Where employers expressed an interest, it was to try to minimise training requirements, particularly those that require time off site. As a result, colleges were steered by LSIPs to primarily offer short courses that were delivered remotely, even though interviewees for this report recognised that this could involve compromising the depth of the training.

Given the decarbonisation ambitions of the Labour government and their establishment of Skills England, there is considerable opportunity to deliver a more effective strategic approach to retrofitting than has been the case in the recent past. This needs to marry up supply- and demand-side interventions with higher-quality standards than we have at present. In our previous report, we illustrated the vicious cycle of low retrofit skills, here we use the same diagram to show where interventions are needed.

Figure 1. Where coordinated policy interventions are needed to break the vicious cycle of low retrofit skills.



Source: Ravenscroft, C. (2025)

To reiterate, simply boosting demand – such as through financial incentives for households – will not work if there is not a skilled workforce available to meet increased demand. And the main drivers for firms and individuals to access training are confidence that it will pay off for them and quality standards that mean they will not be able to access these contracts or opportunities without adequate training. We now turn to these quality aspects in more detail.

MANDATING TRAINING REQUIREMENTS

The interviewees for this and the previous study were unanimous in saying that quality standards needed to be addressed in retrofitting. Without this, retrofitting will not achieve its goal to reduce emissions. It will also not reap mutual benefits such as improved occupant health for householders or new employment:[42]

> *Cowboy builders is the worst thing that could ever happen to retrofit.*
> (Interviewee 8)

At present, there is essentially a voluntary approach to quality and training: firms decide whether to bid for statutory contracts that require additional training or certification. Beyond these contracts, there is little incentive to take up training.

42 International Energy Agency (2014) *Capturing the multiple benefits of energy efficiency.*

There is undoubtedly a need to raise employer awareness about decarbonisation and net zero in general, as well as retrofitting specifically. However, raised employer awareness is likely to take a long time if it is left to the ERBs. Colleges developing their own introductory net zero courses (as the LSIP progress reports showed some were doing in 2024) will also not result in the high-quality, relevant training needed.

The majority of interviewees for this study therefore felt that some level of training would need to be made mandatory for those involved in retrofitting. This needs to be done in consultation with sector bodies and it needs to take into account the current educational levels of those already in and of those joining the construction workforce. While it may be necessary to phase in mandatory requirements over time, the longer it takes to do means the ongoing risks remain.

There are precedents that could be built on: Gas Safe engineers must be certified; construction workers must hold an up-to-date Construction Skills Certification Scheme card; and procurement can already be used to specify higher-quality standards. At present, procurement has been used to specify firm-level certification, primarily through TrustMark. However, on its own this has not been enough to secure consistently positive outcomes.

Further consultation is needed to find the best way to make training mandatory, or else credible alternative approaches to securing higher-quality retrofitting outcomes need to be proposed.

FUNDING TO ADDRESS THE BARRIERS TO RETROFIT SKILLS

Piecemeal and stop-start funding has created barriers for employers and colleges alike on retrofit skills. There are a number of funding issues that need to be addressed.

Our earlier study found that the introduction of the LSIF in 2023 was positively received compared to competitive, location-based funding schemes. Yet by 2024, it was clear that while it had led to a growth in building projects, its ability to address other barriers was limited:

> *It should be noted that the inability to extend revenue funded activities beyond the end of March 2024 has had a limiting impact on what could be achieved within these projects.*
>
> (West Midlands and Warwickshire LSIP Progress Report, p.12)

Funding was already available to cover the costs of some retrofit skills training, but this was short term and came with strings attached:

> *[DESNZ] funding has to change. We've gone through two months bidding process to get five months' delivery funding. But we can't deliver like that, it takes six months to recruit a tutor. The funding is also tied to postcodes so we can only offer some learners and not others.*
>
> (Interviewee 1)

For FE colleges, low pay makes it difficult to attract construction tutors (see the Tutor Shortages section) and short-term funding for courses does not help them overcome this barrier.

The independent training providers interviewed for this study also stated that the funding attached to relevant courses for adults did not cover the costs of delivery. They were also unable to offer some courses because of the capital investment needed. They felt FE colleges were better placed to attract this investment.

For SMEs, the main cost concern about training was the loss of income, even when courses were funded. The training providers interviewed were sympathetic to the position of SMEs and felt that additional financial support may be needed for them to access training.

If funding gaps persist, particularly for FE colleges, it will continue to limit the capacity and demand for retrofit skills training. This will be detrimental to retrofit outcomes – particularly if it means learners have limited opportunities to get hands-on practical training to develop proficiency.

AWARDING BODY PROCESSES

The lengthy process for getting new courses and qualifications recognised by awarding bodies was another policy concern. This was highlighted in the interviews and the LSIP progress reports:

> *Qualification approval has a long timeline – There are a number of qualifications and apprenticeships which are coming on stream extremely slowly. In some cases, employers have been involved in their development, but they are not due to be introduced in the short-term. Similarly, higher technical qualifications submitted to the IfATE are not due to be approved for 18 months.*
>
> (Buckinghamshire LSIP Progress Report, p.18)

> *The technology is moving faster than the awarding bodies. We need modular learning packages to bolt-on to existing courses.*
>
> (Interviewee 3)

> *We're waiting on accreditation of Level 2 retrofit content.*
>
> (Interviewee 5)

> *Qualifications don't keep up to date with what's needed, which can be difficult. The pace of change in the industry is not reflected in the qualification, so there's things that are then delivered in addition to qualifications, because we know they need them.*
>
> (Interviewee 9)

Some awarding bodies were described more favourably than others in terms of working with colleges. It was also evident from the LSIP progress reports that a proliferation of similar new courses were being developed by colleges, which may be exacerbating this issue.

RECOMMENDATIONS

As a result of the policy issues highlighted in this report, we offer the following national policy recommendations to enable retrofit skills to be delivered at greater scale and pace in England:

1. The next iteration of the UK government's industrial strategy, due in spring 2025, should calculate the growth that is needed in the construction sector to deliver its net zero targets. A key component of that growth will be investment in the skills of the construction workforce to retrofit existing buildings and to develop more sustainable buildings in future.

2. DESNZ should develop a national retrofit strategy for England, that sets out the roles of national and local actors, and coordinates demand-side policy interventions (funding for retrofitting) with supply-side interventions (scaling up training capacity) and quality interventions (to prompt the take-up of the training). DESNZ needs to develop its strategy in collaboration with Skills England, alongside other stakeholders, to ensure that a skilled workforce will be available to deliver its plans for mass retrofitting. The strategy must be consistent with meeting the UK's net zero target.

3. Skills England should forecast the full range of skills needed to decarbonise the UK's buildings, consistent with fulfilling DESNZ's retrofit strategy (see recommendation 2) and meeting relevant targets. This should draw on expert advice, including from the Energy Systems Catapult, the National Retrofit Hub and education providers. In conjunction with DfE and DESNZ, it should develop a plan to meet these retrofit skills needs, which could form part of a wider net zero skills plan.

4. Skills England should ensure that all qualifications, including apprenticeships related to the construction industry, are updated to include relevant content on building physics, net zero and retrofitting. This is necessary to raise standards in the construction sector and to reduce the need to retrofit new buildings.

5. Skills England must ensure the process for routinely updating qualifications, including apprenticeship standards and accrediting courses, is timely and aligned with DESNZ's retrofit strategy and targets. This is necessary because education providers currently report delays.

6. Appropriate training should be made mandatory for those retrofitting or installing relevant technologies in homes. The first step should be more stringent training requirements to work on government-funded schemes.[43] Funding should also be made available to SMEs to enable them to undertake training. Beyond these schemes, there are different routes to making relevant training mandatory and the best approach should be confirmed through consultation with sector representatives, education providers, local government and housing associations.

43 See the Course Take-Up section and footnotes 38 and 39 for examples of how councils have already begun using procurement to prompt take-up of training.

7. Public procurement should be used to ensure that large construction firms working on government-funded schemes support considerably higher numbers of construction apprenticeships and T-level work placements for students than they currently do.
8. Funding for FE college tutors should be increased to acknowledge the pay gap between teaching and industry roles. Colleges should be able to pay tutors a premium where necessary.

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