



GATSBY

READY FOR RETROFIT?
AN ANALYSIS OF LOCAL SKILLS
IMPROVEMENT PLANS IN ENGLAND

A REPORT TO THE GATSBY FOUNDATION

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EXECUTIVE SUMMARY

Decarbonising England's homes will require millions of homes to be retrofitted with fabric measures and low-carbon heating. Hundreds of thousands of people will need to be trained in retrofitting and related skills. The scale of the mobilisation needed has been described as “unprecedented in peacetime”.¹ However, to date, the UK government has no national retrofit strategy. At a local level, this makes it difficult for employers and education providers to foresee future skills needs and plan accordingly.

This report is based on an original research study carried out between September 2023 and January 2024 analysing 38 Local Skills Improvement Plans (LSIPs) from across England.² LSIPs are employer-led and largely reflect the views of local employers. Recent legislation means FE colleges must take LSIPs into account when planning their training provision.

This policy report presents the research findings on local readiness for retrofitting and considers whether LSIPs will be sufficient to deliver the necessary step change in skills.

THE KEY FINDINGS

- There was wide variation in the extent to which the 2023 LSIPs referenced retrofitting.
- Existing widespread labour and skills shortages in the construction sector could create a bottleneck for retrofitting and other major net zero projects.
- The LSIPs showed that many employers do not yet understand the skills required to achieve decarbonisation.
- There was limited demand for upskilling from construction employers – and this was mainly for short courses.
- The majority of LSIPs did not include quantified estimates of the retrofit roles or skills that would be needed – but some had considered existing research or intended to undertake further research.
- Only a minority of LSIPs included estimates of retrofit skills and labour requirements and these appeared higher than previous estimates.
- The main actions included in the LSIPs to develop retrofit skills were creating short introductory-level courses, integrating new content into existing qualifications, and developing new facilities. However, there was a lack of consistency, which means some areas are likely to be better placed to engage with government retrofitting schemes than others.

This analysis shows that LSIPs alone will not deliver the retrofit skills needed to decarbonise England's homes. But retrofitting is essential for the UK to reach net zero, and major programmes like the Social Housing Decarbonisation Scheme are ramping up, so it should be a priority for both national and local government to take action now to ensure there are enough people with retrofit skills and to raise quality standards in the construction industry.

¹ Eunomia (2019) *Building skills for net zero*. Report prepared by Eunomia for CITB, p.iii.

² Ravenscroft, C. (2024) *Ready for retrofit? An analysis of Local Skills Improvement Plans in England*. MSc Dissertation, Centre for Alternative Technology/University of East London. Submitted January 2024.

THE KEY RECOMMENDATIONS

See [Recommendations to build retrofitting skills](#) for the full recommendations.

In the short term:

- the UK Government should mandate appropriate retrofit and/or broader green skills frameworks to support planning by local areas (employer representative bodies (ERBs) or other bodies such as net zero hubs)
- the Department for Education (DfE)/Department for Energy Security and Net Zero (DESNZ) should brief ERBs to enhance their knowledge of retrofitting skills and enable those ERBs with the greatest focus on developing retrofitting skills to share their learning with others
- DESNZ should evaluate the quality assurance approaches used in its current retrofitting schemes to determine their viability for the wider market
- DfE should encourage the FE sector to coordinate and share good practice nationally on developing retrofit training facilities and courses

Longer-term recommendations call for:

- a national retrofit strategy that reflects national decarbonisation targets and guides the development of local area-based plans
- commensurate levels and length of funding, which will provide employers and FE colleges with the long-term confidence they need to invest
- a new approach that will raise quality standards in the construction industry and prompt employers to take up training
- a communications strategy to boost employer, learner and public awareness
- updating all relevant qualifications for the construction sector to include building physics and retrofitting content

INTRODUCTION

The UK cannot meet its climate targets without near-complete decarbonisation of its buildings.³ Over the next 20 years, most of our 29 million homes will require a combination of fabric retrofitting and changeover to low-carbon heating. It has been estimated that this will require a workforce of 250,000-500,000, mainly in construction trades.⁴ These workers will need to be well trained, because retrofitting will alter the physics of our homes: how we heat and cool them, how we ventilate them and how we live in them. The rewards of getting it right are widely acknowledged: cheaper energy bills; warmer homes in winter; an end to problems with damp, mould and draughts; associated improvements in health and mental health that will save the NHS billions each year; and the creation of new jobs in every area.⁵

To reap these rewards, it is vital for the education sector to know what skills will be needed so that it can train tomorrow's workforce. FE colleges will play a crucial role in this, as they need to recruit tutors, develop and scale-up appropriate training, and attract a growing and diverse cohort of learners each year. Since the Skills and Post-16 Education Act was introduced in 2022, FE colleges must take their steer from employer-led LSIPs when planning their provision.

This study looks at the 38 LSIPs published in England in 2023 and provides new insights into England's readiness for mass retrofitting. On the one hand, it is bad news: the LSIPs suggest retrofitting is far from a priority for most of today's construction employers. On the other, the findings and recommendations of this study should help policymakers, education leaders and retrofit experts address this skills gap in the coming years.

Learning the lessons from LSIPs is particularly important because:

- The next waves of the government's Social Housing Decarbonisation Fund roll out in 2024 alongside other retrofitting incentives, eg ECO, HUG, BUS, the Public Sector Decarbonisation Scheme and forthcoming Future Homes standard.⁶ The success of these multibillion pound programmes will depend on the availability of a trained workforce to deliver them at scale.
- DESNZ launched its own retrofit skills planning process through regional net zero hubs in 2024. For this to be effective it is important that this process connects with, and draws on, the learning from LSIPs.
- With a general election imminent, the findings of this paper will be relevant for the next government, because their decarbonisation plans will be dependent on the availability of an appropriately skilled workforce.

This paper is the first independent analysis of LSIPs to be published and provides new insights and recommendations to guide those that take up the skills challenge from here.

³ Climate Change Committee (2019) *UK housing: Fit for the future?* p.11.

⁴ Workforce estimates vary depending on their scope and timeframe. For example, at the lower end, estimate 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: BEIS, p.20 & p.24. At the upper end, estimate of 515,000 including indirect roles in Brown, D., Wheatley, H., Kumar, C. and Marshall, J. (2020) *A green stimulus for housing: The macroeconomic impacts of a UK whole house retrofit programme*. New Economics Foundation, p.4.

⁵ International Energy Agency (2015) *Capturing the multiple benefits of energy efficiency*.

⁶ A list of schemes is available from: DESNZ and HMT (2023) *Families, business and industry to get energy efficiency support*. Press release, 18 December.

METHODOLOGY

The research was undertaken as part of a MSc at the Centre for Alternative Technology/University of East London between September 2023 and January 2024. The full dissertation was formally submitted in January 2024 and disseminated to key politicians, policymakers and retrofit industry groups in early February 2024. A copy of the full dissertation is available on request.

The research involved:

- a literature review on retrofit skills (a summary is included in [Key issues in retrofitting](#))
- a keyword search of LSIPs, to explore the extent to which they mentioned retrofitting (the results are included in [Research findings](#))
- a thematic analysis of LSIPs, to analyse their content in more depth (see [Research findings](#)). Only the main LSIP document for each area was reviewed because of time limitations. Collectively, these main LSIP documents numbered over 1,000 pages
- semi-structured interviews with seven retrofit and skills experts to inform the analysis and recommendations (see [What is the significance of these findings?](#) and [Recommendations to build retrofit skills](#)). Interviewees were selected from public and voluntary sectors, FE and HE

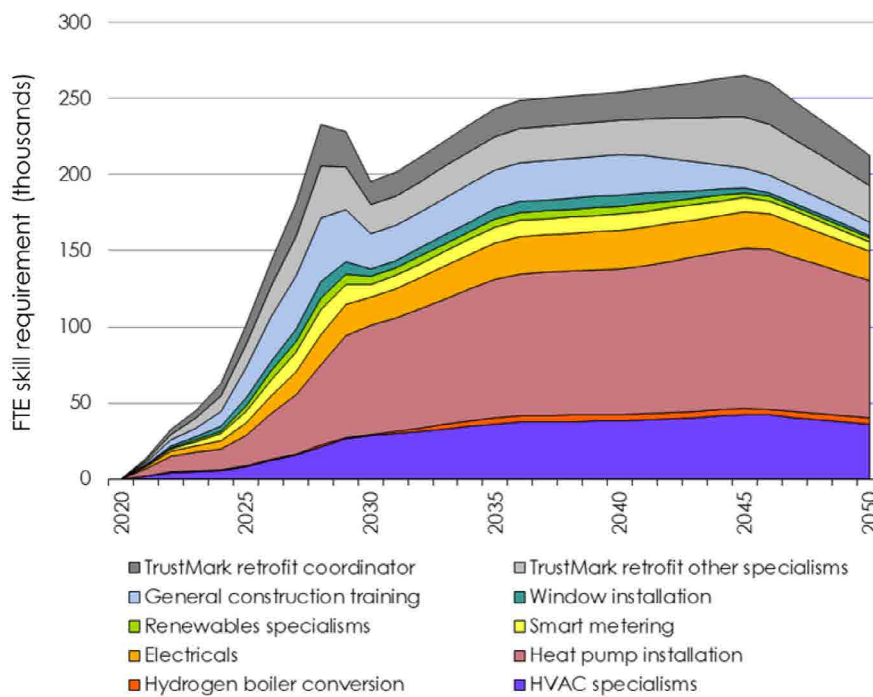
KEY ISSUES IN RETROFITTING: VITAL CONTEXT FOR THE SKILLS WE NEED

Unless we understand the key issues affecting the successful delivery of retrofitting, the education and skills system will not deliver effective provision. This section presents summary findings from a literature review on retrofit skills.

THE SCALE AND BREADTH OF THE RETROFIT SKILLS CHALLENGE

The workforce that will be needed to retrofit UK homes has been estimated at between 250,000-500,000,⁷ a mobilisation that has been described as “colossal”⁸ and “unprecedented in peacetime”.⁹ This is likely to require a combination of skilling new recruits, upskilling and reskilling the existing workforce,¹⁰ and immigration. The UK’s Climate Change Committee has projected a rapid rise in the workforce in the 2020s.

Figure 1. Retrofit workforce estimates



Source: CITB (2020) *Building Skills for Net Zero (draft report)*; CCC analysis.

Notes: Figures adjusted to represent a 2-year rolling average. ‘TrustMark retrofit other specialisms’ includes retrofit designers, installers, advisers and assessor. FTE equivalent by skills do not sum exactly to equivalent numbers by trade due to mapping.

Copyright of the Committee on Climate Change (2020) *The sixth carbon budget: The UK’s path to net zero*. p. 123.

7 Workforce estimates vary depending on their scope and timeframe. For example, at the lower end, estimate of 230,000 fabric retrofiters plus 60,000 heat pump installers in: Magrath, D. (2021) *Green jobs taskforce*. Report to government, industry and the skills sector: BEIS, p20 & p24. At the upper end, estimate of 515,000 including indirect roles in: Brown, D., Wheatley, H., Kumar, C. and Marshall, J. (2020) *A green stimulus for housing: The macroeconomic impacts of a UK whole house retrofit programme*. New Economics Foundation, p.4.

8 House of Commons Environmental Audit Committee (2021) *Energy efficiency of existing homes: Fourth report of session 2019-2021*. p.5.

9 Eunomia (2019) *Building skills for net zero*. Report prepared by Eunomia for CITB, p.iii.

10 Bray, R., Montero, A.M. and Ford, R. (2022) *Skills deployment for a ‘just’ net zero energy deployment*. *Environmental Innovation and Societal Transitions*, 42, pp.395-410.

The skills this workforce will need are wide ranging. Retrofitting typically involves fabric measures – which includes draughtproofing, insulation, ventilation, upgrading windows and lighting – and the changeover to low-carbon heating and cooling, for example through heat pumps or networks. Retrofitting can also include the introduction of energy-efficient appliances and energy generation and storage, for example solar panels and batteries.

Given the urgency of decarbonisation, some are questioning whether the long-standing ‘fabric first’ approach to retrofitting is best and instead suggest heat pump roll-out should take priority.^{11 12} Others caution that heat pumps can be costly in under-insulated homes¹³ and suggest the air-to-water models currently favoured in the UK may not be the most suitable as the climate warms.¹⁴ This debate is relevant here because it affects which specific skills will be needed, where and when – and consequently, what education provision will be needed.

Many retrofit skills sit within the traditional trades and construction sector, such as plumbing and electrical, but not all. Some plumbers will retrain to install heat pumps, but a still larger installer workforce is likely to be needed.¹⁵ The retrofitting building standard PAS 2035 establishes some new roles: retrofit advisor, assessor, coordinator, designer and evaluator. Different archetypes of homes need different techniques, for example pre-1919 solid wall houses often require heritage skills.¹⁶ Modern methods of construction and novel retrofit solutions (such as Energiesprong¹⁷ or Envirup¹⁸ wrap-arounds), could potentially decrease on-site labour requirements while increasing off-site factory-based and digital roles.¹⁹ Local authorities and housing associations will need the skills to effectively procure mass retrofitting^{20 21} and to support residents through the process, particularly vulnerable residents.²² Customer service skills and digital skills will be required so that households can be helped to use newly installed technologies.²³

The review of LSIPs showed there was no widely used typology of retrofit skills in 2023. However, more recently Palmer and Gillich (2023) published an overview of a broad range of retrofit roles;²⁴ the Institute for Apprenticeships and Technical

11 Eyre, N., Fawcett, T., Topouzi, M., Killip, G., Oreszczyn, T., Jenkinson, K. and Rosenow, J. (2023) *Fabric first: Is it still the right approach?* *Buildings and Cities*, 4(1), p.967.

12 Wang, Y., Qu, K., Chen, X., Zhang, X. and Riffat, S. (2022) *Holistic electrification vs deep energy retrofits for optimal decarbonisation pathways of UK dwellings: A case study of the 1940s’ British post-war masonry house.* *Energy*, 241, p.122935.

13 Owen, A. and Wade, F. (2022) *Heat pumps without insulation could raise bills and overload the grid.* Priestly Centre for Climate Futures blog, 30 November.

14 Khosravi, F., Lowes, R. and Ugalde-Loo, C.E. (2023) *Cooling is hotting up in the UK.* *Energy Policy*, 174, p.113456; Hepple, R., Du, H., Feng, H., Shan, S. and Yang, S. (2023) *Sustainability and carbon neutrality in UK’s district heating: A review and analysis.* *e-Prime*, 4, p.100133.

15 Heating and HotWater Industry Council (2023) *Skills, training and the future of heat.*

16 Eunomia (2019) *Building skills for net zero.* Report prepared by Eunomia for CITB, p.19.

17 “Energiesprong is a whole house approach to retrofit ... using offsite manufactured wall and roof panels in conjunction with pre-assembled ‘energy pods’...” Energiesprong UK (accessed 2024) *How does Energiesprong work?*

18 Envirup is an innovative external wall insulation product. “The Envirup Insulation System is made from a patented design of high optical polycarbonate with UV protective coating.” Envirup (accessed 2024) *Our product.*

19 Rodrigues, L., White, J., Gillott, M., Braham, E. and Ishaque, A. (2018) *Theoretical and experimental thermal performance assessment of an innovative external wall insulation system for social housing retrofit.* *Energy and Buildings*, 162, pp.77-90.

20 Mazumdar, S., Thakker, D., Hayes, J., Matos, N. and Bate, P. (2023) *Towards achieving net zero by 2050 in the UK – Stakeholder perspectives in integrated urban planning.* *Futures*, 152, p.103197.

21 Wade, F., Webb, J. and Creamer, E. (2022) *Local government capacities to support net zero: Developing comprehensive heat and energy efficiency strategies in Scotland.* *Energy Research & Social Science*, 89, p.102544.

22 Calver, P., Mander, S. and Abi Ghanem, D. (2022) *Low carbon system innovation through an energy justice lens: Exploring domestic heat pump adoption with direct load control in the United Kingdom.* *Energy Research & Social Science*, 83, p.102299.

23 Energy Systems Catapult (2021) *Foresighting skills for net zero homes.* A report for the Gatsby Foundation.

24 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.

Education (IfATE) published a Heat and Buildings occupation map;²⁵ and the National Retrofit Hub, a checklist for retrofit skills planning.²⁶ These resources should enable those involved in planning to take a broader view of the skills needed in the future.

Throughout this study, unless otherwise stated, the terms ‘retrofit’ and ‘retrofit skills’ will be used to refer to the broad range of skills needed to decarbonise homes, including the installation of low-carbon heating.

QUALITY IS ABSOLUTELY CRITICAL IN RETROFITTING – AND LONG-STANDING PERFORMANCE GAPS MUST BE ADDRESSED

The persistent “gap between design and operational performance” in UK construction projects is a risk to retrofitting outcomes.²⁷ For example, installing insulation without adequate ventilation can cause damp.

This performance gap means serious consideration must be given to skills planning because it suggests a need for more in-depth training than is the norm in the UK. In other countries, construction training takes longer and is more holistic, whereas in the UK, training tends to be task-oriented, for example bricklaying.²⁸ This is a critical concern given the interconnected processes required for effective retrofitting. Moreover, it is not just a question of individual qualifications, but broader industry standards and practices:

*Energy standards for buildings need to be supported by occupational standards, so that the desired outcomes are achieved in practice. Significant gaps between design intent and real-life energy performance are due in part to industry training and culture: a lack of technical knowledge; poor communication skills; and unclear roles and responsibilities ...*²⁹

One approach to quality assurance that is being used in social housing procurements is to require retrofit coordinators to oversee projects. However, more comprehensive approaches have been suggested, including firm-level accreditation and/or monitoring quality based on outcomes using smart meters or building control inspections.^{30 31 32}

While individual qualifications undoubtedly have a role to play, the experts interviewed for this study cautioned against overemphasising them as the basis for quality control. This is because they are typically taken at the start of career journeys and do not always reflect significant on-site experience. However, the experts all agreed that construction qualifications should include retrofitting content to raise industry standards over time.

25 IfATE (accessed 2024) *Occupational maps: Heat and buildings*.

26 National Retrofit Hub (2024) *Regional retrofit skills taskforce checklist*.

27 Eunomia (2019) *Building skills for net zero*. Report prepared by Eunomia for CITB, p.74.

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

29 Killip, G., Fawcett, T., Jofeh, C., Owen, A., Topouzi, M. and Wade, F. (2021) *Building on our strengths: A market transformation approach to energy retrofit in UK homes*. Federation of Master Builders/Centre for Research into Energy Demand Solutions, p.26.

30 Killip, G., Fawcett, T., Jofeh, C., Owen, A., Topouzi, M. and Wade, F. (2021) *Building on our strengths: A market transformation approach to energy retrofit in UK homes*. Federation of Master Builders/Centre for Research into Energy Demand Solutions, p.27.

31 Energy Systems Catapult (2021) *Foresighting skills for net zero homes*. A report for the Gatsby Foundation, p.9.

32 Eunomia (2019) *Building skills for net zero*. Report prepared by Eunomia for CITB, p.75.

ENGLAND'S MARKET-BASED APPROACH HAS NOT DELIVERED THE STEP CHANGE NEEDED IN RETROFITTING SKILLS

To date, the development and supply of retrofit skills in England has largely been left to market mechanisms. This has not delivered the step change that is needed: there are estimated to be just 4,100 trained heat pump installers³³ and fewer than 3,000 retrofit coordinators in the UK.³⁴

England's market-based system means that limited customer demand for retrofitting has made it uneconomical for businesses to invest in retrofit skills.³⁵ ³⁶ The construction sector is dominated by SMEs with limited training budgets,³⁷ where only mandatory requirements are expected to be met.³⁸ Larger housebuilding companies have also reportedly been reluctant to engage while retrofitting has been voluntary,³⁹ too "heterogeneous" (as each property requires individual assessment) and therefore not profitable enough.⁴⁰ One large housebuilder's recent account of their experience of wave 1 of the Social Housing Decarbonisation Fund suggests that, while some major companies have now engaged, they still have concerns about the complexity and cost.⁴¹

For training providers – particularly FE colleges that have increasingly been operated on a market basis themselves⁴² – it is uneconomical to host courses for small cohorts.⁴³ ⁴⁴ ⁴⁵ And when training is provided, learners' skills may still atrophy if not used regularly.⁴⁶ ⁴⁷ Thus, the market has become stuck, with low demand for, and low supply of, retrofit skills.⁴⁸ ⁴⁹ ⁵⁰

33 Climate Change Committee (2023) *Progress in reducing emissions: 2023 report to parliament*. p.147.

34 Jenkinson, C. (2023) *Retrofit skills shortage undermines plan to upgrade 1.9m homes*. PBC Today blog, 18 April.

35 Eunomia (2019) *Building skills for net zero*. Report prepared by Eunomia for CITB. p.31.

36 Energy Systems Catapult (2021) *Foresighting skills for net zero homes*. A report for the Gatsby Foundation, p.19.

37 Killip, G. (2020) *A reform agenda for construction education and practice*. *Buildings & Cities*, 1(1), p.526.

38 Heffernan, E., Pan, W., Liang, X. and de Wilde, P. (2015) *Zero carbon homes: Perceptions from the UK construction industry*. *Energy Policy*, 79, p.35.

39 Heffernan, E., Pan, W., Liang, X. and de Wilde, P. (2015) *Zero carbon homes: Perceptions from the UK construction industry*. *Energy Policy*, 79, p.24.

40 Gooding, L. and Gul, M.S. (2017) *Enabling a self-sufficient energy efficient retrofit services sector future: A qualitative study*. *Energy and Buildings*, 156, p.307.

41 Yale, C. (2023) *Lessons learned: Making SHDF wave 2 a success*. Public Sector Build Journal blog.

42 Keep, E. (2018) *Market or system – what's the best model for FE?* FE Week blog, 16 April.

43 Magrath, D. (2021) *Green jobs taskforce*. Report to government, industry and the skills sector. BEIS, p.61.

44 Green, A. (2016) *Low skill traps in sectors and geographies: Underlying factors and means of escape*. Institute for Employment Research, Warwick University for the Government Office for Science, p.3.

45 Eunomia (2019) *Building skills for net zero*. Report prepared by Eunomia for CITB. p.30.

46 Killip, G. (2020) *A reform agenda for construction education and practice*. *Buildings & Cities*, 1(1), p.528.

47 Energy Systems Catapult (2021) *Foresighting skills for net zero homes*. A report for the Gatsby Foundation, p.9.

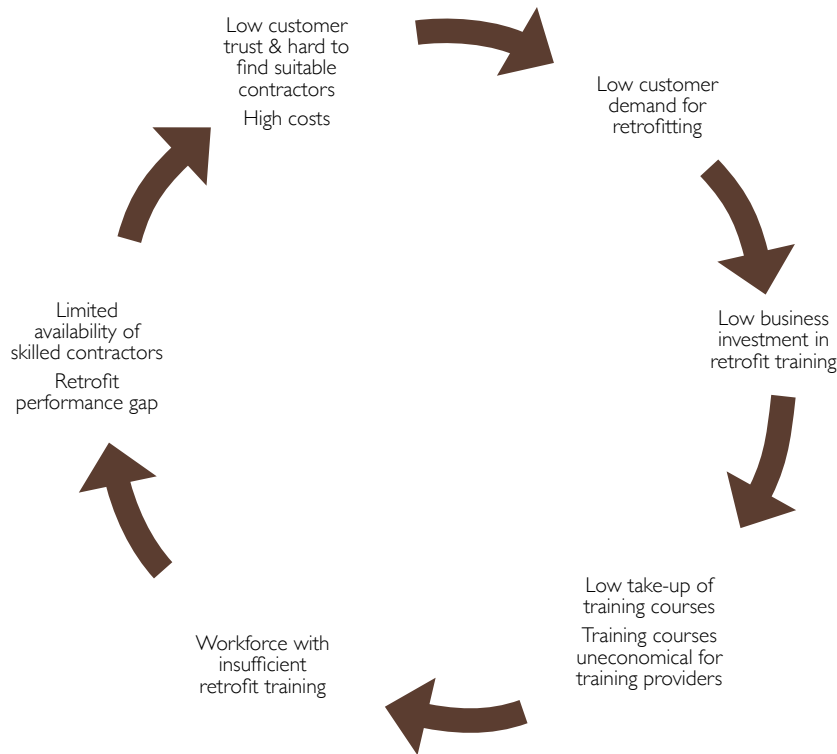
48 Green, A. (2016) *Low skill traps in sectors and geographies: Underlying factors and means of escape*. Institute for Employment Research, Warwick University for the Government Office for Science.

49 CIPD (2019) *Productivity and place: The role of LEPs in raising the demand for, and use of, skills at work*, p.10.

50 Killip, G. (2020) *A reform agenda for construction education and practice*. *Buildings & Cities*, 1(1), p.534.

Figure 2 brings together the findings from the literature. Despite there being more than a decade of literature describing these dynamics, it is clear that little has changed and that intervention is necessary.

Figure 2. Vicious circle of low demand, low skills, low quality in a market-based system



Source: Ravenscroft, C. (2024) *Ready for retrofit? An analysis of Local Skills Improvement Plans in England*. MSc Dissertation, Centre for Alternative Technology/University of East London. Submitted January 2024.

THE NEED FOR COORDINATED GOVERNMENT INTERVENTION THAT SUPPORTS SUPPLY, DEMAND AND QUALITY

There is broad consensus in the literature that government must intervene if mass retrofitting is to become a reality. However, previous government programmes aimed at boosting retrofitting have had limited impact. This is often because they have tackled the issue from only one side – demand or supply – and have frequently been short-lived.

The Green Homes Grant is an example of a demand-side approach, which was criticised for neglecting the supply side:

Local authorities were “pulling their hair out” over the development in 2020 of the Green Homes Grant – a subsidy scheme for retrofitting homes, which followed on from the failed Green Deal. The Treasury insisted on imposing very short deadlines on the scheme, despite warnings from local authorities that local supply chains would not have enough time to develop to take advantage of the funding. The scheme was closed down a year early, in March 2021, after just five months due to low take-up.⁵¹

51 Sasse, T. and Thomas, A. (2022) *Better policy making*. Institute for Government, p.18.

Whereas skills planning through Local Enterprise Partnerships (LEPs) was a supply-side initiative, which was criticised for neglecting the demand side:

[LEPs prioritise] skills supply over attempts to influence demand. While LEPs vary widely, many operate within low-skills equilibriums, that is, supply of and demand for low-level skills, which creates a negative cycle of firms operating low-road approaches and failing to invest in the workforce and their skills.⁵²

LSIPs are a new supply-side intervention (for more detail see [Background to LSIPs](#)). While the LSIPs coincide with the roll-out of some major demand-side initiatives (see [Introduction](#)), this study shows that these interventions have again not been coordinated.

The conclusion drawn from the literature is therefore that a national strategy is needed to better coordinate demand- and supply-side interventions. A national strategy could also offer long-term funding, and regulatory and policy clarity to the education sector; employers and local commissioners. The previous calls for this are reiterated in the recommendations made in this study.⁵³

RETROFITTING OFFERS THE OPPORTUNITY TO CREATE ENVIRONMENTALLY BENEFICIAL JOBS IN ALL PARTS OF THE COUNTRY, BUT MUST ATTRACT A WIDER DEMOGRAPHIC TO FILL THEM

Retrofitting has been widely championed for its potential economic benefits^{54 55} and its potential to support levelling up, as jobs would be widely dispersed across the country.⁵⁶ But the construction workforce is dominated by white men, and for retrofit to be delivered at scale, a wider and more diverse cohort of learners must be recruited:

Women and ethnic minorities represent an untapped talent pool that could help address both the labour and skills shortage.⁵⁷

Making this a reality requires consideration in the skills planning process – it will not happen by default. For example, the limited representation of women at senior executive levels in existing firms affects employer-led approaches to skills planning such as LSIPs.⁵⁸ There is a growing community retrofit sector that emphasises community upskilling and empowerment,⁵⁹ however it is unclear to what extent these groups have engaged with the LSIP process.

52 CIPD (2019) *Productivity and place: The role of LEPs in raising the demand for, and use of, skills at work*. p.2.

53 For example: Climate Change Committee (2019) *UK housing: Fit for the future?*; Energy Systems Catapult (2021) *Foresighting skills for net zero homes*. A report for the Gatsby Foundation; Brown, D., Brisbois, M.C., Lacey-Barnacle, M., Foxon, T., Copeland, C. and Mininni, G. (2023) *The Green New Deal: Historical insights and local prospects in the United Kingdom (UK)*. *Ecological Economics*, 205, p.107696; Magrath, D. (2021) *Green jobs taskforce*. Report to government, industry and the skills sector; BEIS: London; Morgan, J., Chu, C.M. and Haines-Coran, T. (2023) *Competent retrofitting policy and inflation resilience: The cheapest energy is that which you don't use*. *Energy Economics*, 121, p.106648; National Housing Federation (2020) *BEIS Select Committee: Decarbonising heat in homes. National Housing Federation response*.

54 Brown, D., Wheatley, H., Kumar, C. and Marshall, J. (2020) *A green stimulus for housing: The macroeconomic impacts of a UK whole house retrofit programme*. New Economics Foundation.

55 Webb, J., Emden, J. and Murphy, L. (2020) *All hands to the pump: A home improvement plan for England*. IPPR.

56 Jung, C. and Murphy, L. (2020) *Transforming the economy after Covid-19: A clean, fair and resilient recovery*. IPPR, p24.

57 Kizilcec, V. and Caiger-Smith, D. (2023) *Increasing diversity in the heating sector to address the skills shortage and meet net zero*. Energy Systems Catapult/Live Work, p.3.

58 Mininni, G. and Hiteva, R. (2023) *Place-based solutions for net zero: Gender considerations on 'green' skills*. International Conference on Gender Research, 6(1), p.188.

59 Bolton, E., Bookbinder, R., Middlemiss, L., Hall, S., Davis, M. and Owen, A. (2023) *The relational dimensions of renovation: Implications for retrofit policy*. *Energy Research & Social Science*, 96, p.102916.

BACKGROUND TO LSIPs

Introduced in England in 2023, LSIPs are a new policy mechanism that aim to put employers at the heart of the post-16 skills planning system. Under the Skills and Post-16 Education Act 2022, FE colleges are legally required to take local employers' priorities (expressed in the LSIPs) into account when deciding which courses to offer.

The Department for Education (DfE) designated employer representative bodies (ERBs) to lead the process of creating each LSIP. The ERBs were usually existing bodies such as local Chambers of Commerce. Statutory guidance for ERBs includes an expectation that LSIPs should:

... describe how skills, capabilities and expertise required in relation to jobs that directly contribute to or indirectly support Net Zero targets, adaptation to Climate Change or meet other environmental goals have been considered.⁶⁰

However, it is left to ERBs to determine locally what is in scope for this requirement – decarbonising buildings is not mentioned in the guidance.

After eight trailblazer pilots, the LSIPs process began in all 38 areas. The plans were submitted to DfE for approval in Spring 2023 and published in Summer 2023.

The LSIPs varied widely in format and content because they were prepared by individual ERBs. This affected how they could be analysed, as it was not possible to aggregate quantitative data on skills needs across the plans. Instead, content and thematic analysis was completed.

It is important to keep in mind that by design the LSIPs largely report local employers' views and they are therefore not necessarily an accurate reflection of everything going on in local areas. The ERBs were required to consult widely, but the Local Government Association formally raised concerns that local authorities had been overlooked in the DfE guidance: "Outside of devolution areas, councils' role is almost entirely omitted".⁶¹

The findings that follow raise an important question: are ERBs and local employers sufficiently well placed to foresee future retrofit skills needs? This point is discussed further in [Retrofit skills planning must engage all the relevant stakeholders](#).

60 DfE (2022) *Local Skills Improvement Plans: Statutory guidance for the development of a Local Skills Improvement Plan*, p.4.

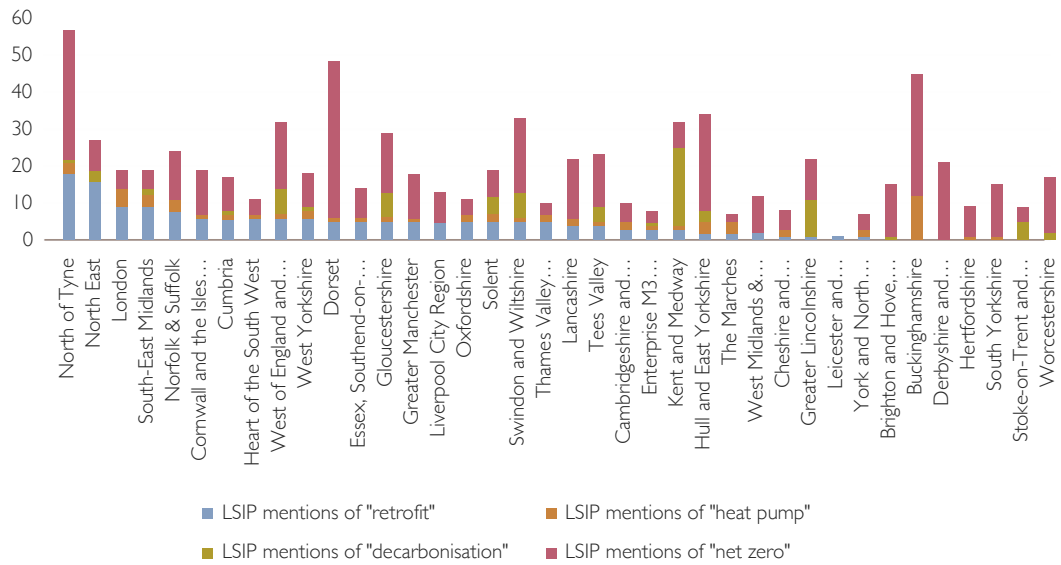
61 Local Government Association (2022) *Local Skills Improvement Plans statutory guidance: Submission from the LGA*.

RESEARCH FINDINGS

Finding 1: There was wide variation in the extent to which the LSIPs referenced retrofitting

We conducted an initial keyword search of the 38 LSIPs to determine the extent to which they addressed retrofitting skills. Figure 3 shows the results of an initial search for 'retrofit' and other relevant terms.

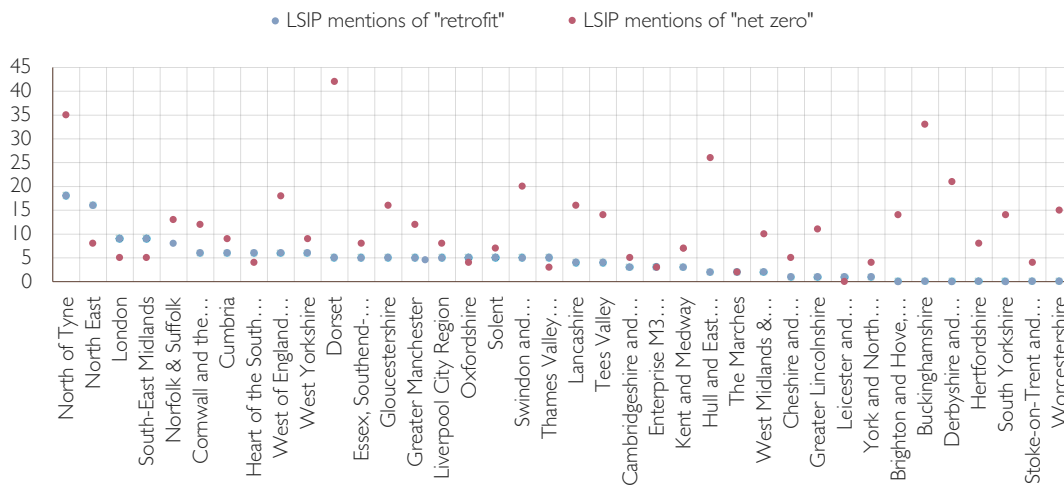
Figure 3. LSIP mentions of retrofit



Source: Ravenscroft, C. (2024) *Ready for retrofit? An analysis of Local Skills Improvement Plans in England*. MSc Dissertation, Centre for Alternative Technology/University of East London. Submitted January 2024.

In theory, if an LSIP was very concerned about decarbonisation/net zero, it might be expected to have more references to measures such as retrofitting or heat pumps that could help fulfil that ambition. It was therefore notable, as shown in Figure 4, that there was no relationship ($r=0.15$) between the extent to which LSIPs mentioned net zero and the extent to which they mentioned retrofit.

Figure 4. LSIP mentions of retrofit and net zero



Source: Ravenscroft, C. (2024) *Ready for retrofit? An analysis of Local Skills Improvement Plans in England*. MSc Dissertation, Centre for Alternative Technology/University of East London. Submitted January 2024.

Given the limitations of searching for individual terms, a full manual review and thematic analysis of all the main LSIP documents was then undertaken. The findings were as follows, with illustrative examples for each point.

Finding 2: Existing widespread labour and skills shortages in the construction sector could create a bottleneck for retrofitting and other major net zero projects

Almost all the LSIPs highlighted existing labour shortages affecting the construction sector (and, indeed, other sectors). These were attributed to a range of factors including an ageing workforce, a lack of diversity in the industry, Brexit (in particular the loss of European workers), the Covid-era and related declines in physical and mental health, and negative perceptions of the industry. Declining apprenticeship starts were a particular concern in many areas, with a 31% decrease nationally since 2015/16.⁶²

Historically high percentages of employers are reporting having difficulty recruiting new staff members ... It leads to an uncertain future for a number of sectors with deep concerns over how they will be able to keep operating, never mind achieve their full potential to grow.

(Lancashire LSIP, p.10)

Severe lack of young people choosing a career in construction.

(Buckinghamshire LSIP, p.10)

Many LSIPs listed specific existing roles (or skills) that were difficult to recruit to, such as electricians, and/or where they anticipated future needs, such as heat pump installation. However, these lists were presented in different formats – some long,

62 CIPD (2023) *Devolution and evolution in UK skills policy*.

some short, some using SOC codes⁶³ or IfATE's occupational maps, some using narrative descriptions from employers such as "building windows/doors". Some LSIPs signposted to annexes or other documents for more details. Overall, the lack of a standard skills typology and reporting format for LSIPs made it impossible to aggregate a detailed list of existing shortages or future skills needs from them.

Construction employers expressed concerns about new and typically younger recruits who they felt did not have enough on-site experience and had other skills deficits.⁶⁴ To a lesser extent there were also concerns about older workers sometimes lacking interest in upskilling in new technologies.⁶⁵

Many LSIPs mentioned major new infrastructure projects that would require significant numbers of additional construction workers, such as renewable energy projects, the HS2 rail line, hydrogen and carbon capture and storage (CCS) facilities, housebuilding and more. These would be in addition to any retrofitting requirements – suggesting significant demands on the construction workforce that is already experiencing labour and skills shortages.

Several LSIPs felt the combined effect of these challenges presented a high risk to their plans:

The construction sector is projected to become Dorset's second biggest employment growth sector by 2035, currently the eighth. Recruiting enough employees to fulfil need will be arguably its greatest challenge.
(Dorset LSIP, p.8)

Ageing workforce, and replacement hiring of around 1,500 per year is needed. Potential investment in large-scale infrastructure projects can disrupt skills availability. Emerging retrofit requirements will stretch skills availability further ...
(North East LSIP, p.17)

Finding 3: The LSIPs showed that many employers do not yet understand the skills required to achieve decarbonisation/net zero

The overwhelming majority (99%+) of construction firms are SMEs, mostly micro or small businesses.⁶⁶ LSIPs reported that these firms were, understandably, focused on their own immediate priorities and cash flow. Many of these employers did not have an understanding of decarbonisation and net zero imperatives, or of specific retrofit skills needs:

There is currently a lack of knowledge and understanding of Net Zero within the construction sector regarding practices, new skills, and technologies. For example, the impact of the retrofit agenda on the UK's Net Zero target is poorly understood.
(North of Tyne LSIP, p.9)

Due to immediate economic pressures facing all businesses, we consistently found that horizon-scanning for many organisations did not extend beyond 3-6 months ...

63 Standard Occupational Classification codes are used by the Office for National Statistics to identify job roles. Office for National Statistics (accessed 2024) *Standard Occupational Classification (SOC)*

64 See Cornwall and Isles of Scilly LSIP, p.30 and Tees Valley, LSIP, p.9.

65 See London LSIP, p.41 and South Yorkshire LSIP, p.8.

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

and

When asked about Green Skills for the future most businesses (95%) highlighted recycling as a priority skill ... [Actions] that require higher investment ... came much lower in their priorities ...

(Liverpool City Region LSIP, p.6 & p.24)

Finding 4: There was a limited demand for upskilling from construction employers – and this was mainly for short courses

Even where there was basic awareness of decarbonisation, there were other reasons why construction firms were reportedly reluctant to access training:

While there is no mandatory requirement in law, many do not see it as a priority and therefore do not have it as part of their plans either in upskilling their current workforce or recruiting for roles ...

(Lancashire LSIP, p.23)

... there is a need, but until there is increased consumer demand for retrofitting, employers – most of which are SMEs – are reluctant to invest in training.

(Enterprise M3 (including all of Surrey) LSIP, p.12)

Where there was employer interest in training (whether on retrofit or other topics), the main preferences expressed were for shorter, flexible courses. This was consistent across the LSIPs:

Employers overwhelmingly request flexible, modular and rapid provisional responses to needs ...

(West of England LSIP, p.20)

Many businesses are reluctant to sign up for long, high level courses 'cold' and prefer to have short introductory courses to confirm that it is what they want. They like to build confidence with the training provider without unnecessary outlay in time or money.

(York and North Yorkshire LSIP, p.10)

Finding 5: The majority of LSIPs did not include quantified estimates of the retrofit roles or skills that would be needed – but some had considered existing research or they intended to undertake research

Notable by their absence from most LSIPs were quantified estimates of retrofitting roles needed. In many cases, the LSIPs simply reported limited employer interest, as described in finding 4.

However, among those LSIPs that did not give estimates, several ERBs had critically examined existing research and found it wanting, because past trends would not be a sufficient guide to the future retrofit skills needs:

*The most recent analysis conducted by the New Anglia Local Enterprise Partnership (LEP) looking at sector growth, **based on historic trends**, is a mixed picture from a low carbon heating and energy efficiency perspective. A modest increase in related construction jobs is positive, but much more will be needed to meet the region's Net Zero objectives.*

(Norfolk and Suffolk LSIP, p.10, emphasis added)

*The [2023 Local Skills Report forecasts] for Cumbria need to be treated carefully as they are in effect **business as usual projections** and assume the past relationships between the national economy and patterns of jobs continue ...*
(Cumbria LSIP, p.45, emphasis added)

Others had already undertaken foresighting research and had identified further tensions between the expressed preferences of construction employers and future needs:

While Construction & Retrofit employers didn't generally consider there to be an upskilling requirement in digital skills right now, the CloS LEP 'deep dive' into construction shows that construction workers of the future will need to be digitally literate ...
(Cornwall and Isles of Scilly LSIP, p.19)

According to labour market data ... there is a specific need for workers with skills in energy efficiency and low-carbon transition within sectors like construction ... However, feedback from employers in the region indicates a limited awareness and understanding of climate literacy.
(Derbyshire and Nottinghamshire LSIP, p.20)

Several LSIPs stated an intention to conduct further research and forecasting at the next stage of the process in 2024. This forthcoming work was not available at the time of writing.

Finding 6: Only a minority of LSIPs included estimates of retrofit skills and labour requirements and these appeared higher than previous estimates

Only a minority of LSIPs provided initial quantified estimates in their 2023 plans. Those estimates came from areas with elected mayors who had convened relevant taskforces outside of the LSIP process, suggesting these areas had carried out additional modelling:

It is estimated that over 880,000 homes and 2,700 public buildings will need some form of retrofit with no estimates available yet for commercial property. This is likely to create 90,000 new jobs.
(Greater Manchester LSIP, p.7)

30k workforce needed just for retrofitting.
(West Yorkshire LSIP, p.19)

London buildings contribute three quarters (76%) of the capital's emissions ... By 2050, 10% of all jobs in London are forecasted to be green jobs in construction for both homes and buildings.
(London LSIP, p.28)

These estimates were higher than implied by previous upper end national estimates, suggesting they have been underpinned by different assumptions. This would warrant further study.

Two substantial retrofit skills forecasting reports signposted in LSIPs – by the West of England Combined Authority⁶⁷ and the Greater South East Net Zero Hub⁶⁸ – may be useful examples for LSIP areas undertaking more detailed research.

A few other LSIPs included quantitative forecasts for green/net zero skills or for the whole of their local construction sector. However, it was not clear whether retrofitting had been factored into these estimates. For example:

[Decarbonisation and green skills jobs] set to grow by another 20,000 in coming years.
(Greater Lincolnshire and Rutland LSIP, p.32)

Finding 7: The main actions included in the LSIPs to develop retrofit skills were creating short introductory-level courses, integrating new content into existing qualifications, and developing new facilities

In their action plan sections, several LSIPs focused on creating short introductory courses to bring employers up to speed. Some were either developing or buying in specific retrofit short courses from independent training providers (such as the Retrofit Academy). Some were also intending to integrate relevant content into a range of their existing courses. For example:

Identify or develop a range of short courses for delivery to the existing workforce. This should include technical areas, including heat pump installation and maintenance, net zero management and awareness and supervisory and management skills.
(Buckinghamshire LSIP, p.22)

We have outlined in intended deep dive activity for Stage 2 further explicit and additional foci attached to green jobs, green skills and the integration of these needs into both core curriculum delivery and short modular training provision.
(Gloucestershire LSIP, p.35)

Develop Retrofit curriculum.
(North East LSIP, p.25)

Two areas that had already carried out quantitative forecasting had more advanced plans:

Green Skills Service (WYCC) offers 40+ courses at various levels ... Many of the providers have developed add-ons to existing apprenticeships and L2/L3 provision. WYCA plans for a Regional Green Skills Academy, involving the FE colleges through WYCC ... Whilst the apprenticeship standards are changing to reflect the needs for the green economy, they are not changing fast enough, so in the interim, the focus needs to be on adding pathways to existing qualifications.
(West Yorkshire LSIP, p.19)

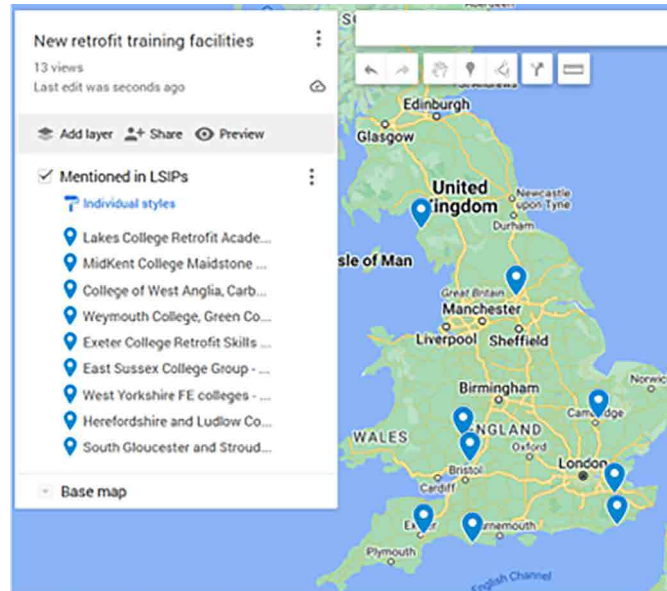
Deliver a London policy to scale retrofit ... establishing robust local delivery plans.
(London LSIP, p.56)

67 Ecuity (2021) *Retrofit skills market analysis*. A report for the West of England Combined Authority.

68 Greater South East Net Zero Hub (2023) *Domestic retrofit market intelligence and skills assessment*.

At least nine new or enhanced retrofit training facilities were mentioned in LSIPs. These are mapped in Figure 5.

Figure 5. New or enhanced retrofit training facilities mentioned in LSIPs



Source: Ravenscroft, C. (2024) *Ready for retrofit? An analysis of Local Skills Improvement Plans in England*. MSc Dissertation, Centre for Alternative Technology/University of East London. Submitted January 2024. Using: Google Maps. Map data ©2024 GeoBasis DE/BKG (©2009) Google Inst. Geogr. Nacional.

A few LSIPs indicated that they planned to develop capital projects, but these were still in the early stages of development at the time of writing.

Even where new courses and training facilities were in development, there were notes of caution. Their success would rely on employer take-up, which in turn would depend on boosting demand for retrofitting:

Employers will themselves be key to the better communication of industry opportunity and in translating ‘expressed demand’ for (for example) additional short course provision into ‘revealed preference’.
(Kent and Medway LSIP, p.6)

There is an element of market failure and raising demand from the perspective of employers – turning demand signals into economic certainty for business is a high priority to improve uptake of provision ...
(Swindon and Wiltshire LSIP, p.22)

WHAT IS THE SIGNIFICANCE OF THESE FINDINGS FOR FUTURE RETROFIT SKILLS POLICY AND DELIVERY?

The readiness for mass retrofit varies widely across different areas

There was huge variation between LSIPs, suggesting different levels of preparedness to undertake mass retrofitting. While some plans contained whole sections on retrofitting and/or identified it as an “urgent priority”,⁶⁹ others omitted it or gave it only a passing reference.

This variability was of serious concern to expert interviewees, given existing labour and skills shortages in the construction sector and many other major projects that will place further demands on the available workforce. In this context, skilling up for mass retrofitting is unlikely to happen organically. Rather, securing the necessary workforce for retrofitting is likely to be a significant challenge in every area, but particularly in areas that have not yet made it a priority.

The differences between the LSIP areas could have implications for future policy and investment decisions. Interviewees contrasted national funding streams that were based on either:

- competition between areas, such as the Home Decarbonisation Skills Training Competition,⁷⁰ which meant FE providers and businesses did not know ahead of time whether their area would secure funding, making it difficult to recruit trainers and learners; or
- available to all areas, notably the Local Skills Improvement Fund,⁷¹ which provided a greater degree of confidence so stakeholders could plan ahead, however the latest round was only for capital funding

Based on learning from previous government schemes, long-term funding for all areas would be preferred. However, if some areas are not yet prioritising retrofitting in their LSIPs and allocate their Local Skills Improvement Fund money to other priorities, this could have knock-on impacts for their area’s readiness to engage with forthcoming national government programmes like wave 2 of the Social Housing Decarbonisation Scheme. The problem may not become apparent until later, but it risks creating inequality of outcomes. Some areas would become well placed to develop retrofit skills, leading to better availability and quality of work, while other areas would remain undersupplied and at greater risk of performance gaps.

Overall, even taking the limitations of the LSIPs into account, the high degree of variability in the LSIPs suggests that much clearer guidance and coordination will be needed to ensure workforce readiness for retrofit in all areas of England. As one expert interviewed put it:

So we're not seeing a kind of coordinated approach on retrofit skills still, despite the local skills plans ... Different areas will have different skills, needs and priorities, but retrofit is required everywhere. That's just a fact. So I would like to see it given an even level of priority in every area.

(Interviewee #1)

⁶⁹ Greater Manchester LSIP, p.17.

⁷⁰ DESNZ and BEIS (2023) *Home decarbonisation skills training competition: Phase 1*.

⁷¹ DfE (2024) *Local Skills Improvement Plans (LSIPs) and Local Skills Improvement Fund (LSIF)*.

Retrofit skills planning must engage all the relevant stakeholders – not just current employers

An issue with the LSIPs approach is that, by design, it prioritises the views of current employers, even though several ERBs noted that employers did not appear well informed about future retrofit needs. The experts interviewed were concerned about this approach:

The trouble is ... the employer view is very much: what do we need in the next six months ... So if employers say what we're short of is scaffolders, let's spend some money on some scaffolder training ... You're not gonna solve retrofit by every six to 12 months saying: "Right, what's the shortage that we can foresee on the horizon?" You need to take a long term strategic view and you need to take the industry with you over a period of at least five years, probably 10 or longer.

(Interviewee #2)

Retrofit experts were particularly disappointed that employers involved in LSIPs seemed unaware of, or lacked confidence in, major government-funded decarbonisation schemes:

We've known about things like Social Housing Decarbonisation Fund money coming for maybe two years and you wonder: did employers not believe in it? ... That level of understanding of what's coming down the track with retrofit clearly isn't there yet.

(Interviewee #4⁷²)

Beyond employers, other voices were far less prominent in the LSIPs process. Very little mention was made in the LSIPs of local authorities, local housing providers, social sector groups or local communities – even though some of these stakeholders may have been involved.

Diversifying the governance involved in local skills planning to include local authorities and social sector groups who are likely to have greater insights into local needs could help to overcome some of the limitations of market-based approaches. This should not diminish the role of employers but by providing greater intelligence about future retrofit needs it could give firms greater confidence to invest in training.

The full range of net zero skills needs to be articulated better. Existing workforce shortages mean there is potential for competition, which needs to be factored into cross-government policymaking

This study of LSIPs has highlighted significant concerns about widespread labour and skills shortages. These shortages could potentially affect and involve trade-offs between different decarbonisation projects unless robust action is taken. Further analysis of the LSIPs could be undertaken to assess the quality of skills planning for other net zero priorities, such as renewable energy deployment or carbon capture. Unless sufficient attention is given to the availability of skilled workers to deliver the various necessary strands of decarbonisation, the UK will be at risk of missing its climate targets.

Ultimately, further policy consideration needs to be given to the governance and mechanisms for net zero skills planning if, as this study suggests, LSIPs are not currently responding to these challenges.

72 Please note: the numbers assigned to the interviewees correspond with those used in the original research. Not all interviewees are included in this report. A copy of the full dissertation is available on request. Ravenscroft, C. (2024) *Ready for retrofit? An analysis of Local Skills Improvement Plans in England*. MSc Dissertation, Centre for Alternative Technology/ University of East London. Submitted January 2024.

RECOMMENDATIONS TO BUILD RETROFITTING SKILLS

The following recommendations are based on the literature review, LSIP analysis and interviews with experts. At the time of writing, a UK general election was imminent, so the recommendations have been split into short and long-term actions.

Short term:

- **The UK Government should mandate appropriate retrofit and/or broader green skills frameworks to support planning by local areas** (ERBs or other bodies such as net zero hubs).
- **DfE/DESNZ should brief ERBs to enhance their knowledge of retrofitting skills** and enable those ERBs more focused on developing retrofitting skills to share their learning with others.
- **DfE should direct ERBs to engage with local authority housing leads (and any major social housing providers in their areas) to increase their understanding of imminent retrofitting requirements for their local housing stock.**
- **All ERBs should develop estimates of near-future (eg next 1-2 years) retrofitting skills needs**, to meet the demand likely to be generated locally by existing funding and incentive schemes, such as the Social Housing Decarbonisation Fund.⁷³ These estimates should be communicated by ERBs to local training providers, employers and schools, to support their decision-making.
- **DESNZ should evaluate the quality assurance approaches used in its current retrofitting schemes to determine their viability for the wider market.**
- **DfE should encourage the FE sector to coordinate and share good practice nationally on developing retrofit training facilities and courses.** Several case studies are already available.⁷⁴

Long term:

- **A cross-government national retrofit strategy should be developed setting out a long-term approach to decarbonising England's housing stock.** This should include a public consultation and ensure local authority, housing and social sector input. Without a clear national strategy, skills planning at a local level – currently done through LSIPs – will have limited impact and new local skills provision risks being undermined by lack of demand.
- **A quality assurance approach should be included in the national retrofit strategy, so that appropriate training can be developed.** This could build on existing schemes or introduce new standards for individuals, firms and/or outcomes. It should include specific protections for vulnerable customers. It is important to set out the approach to quality, so that suitable skills training can be developed by providers and taken up by employers and learners. If quality standards are not confirmed, course content may not meet future needs and employers may have little incentive to take up training, even when it is funded.

⁷³ DESNZ and HM Treasury (2023) *Families, business and industry to get energy efficiency support*. Press release, 18 December.

⁷⁴ For example, Ashden (2022) *Retrofit: Solving the skills crisis* and Devon and Somerset LSIP, p.51.

- **The long-term national retrofit strategy should include a communications plan to raise awareness among employers and learners of forthcoming opportunities in this sector.** For example, the US Government's American Climate Corps⁷⁵ is a national recruitment campaign aimed at attracting new entrants into emerging fields. Communications will be crucial in redressing the recent decline in apprenticeship starts, attracting new entrants from a more diverse talent pool, and convincing employers to invest in upskilling.
- **Long-term local plans to decarbonise housing (separate to LSIPs) should be developed by local authorities working with a wide range of stakeholders including housing providers, residents, social sector organisations and employers.** Similar local area plans already piloted include local heating and energy efficiency strategies in Scotland⁷⁶ and Local Area Energy Plans.⁷⁷ Planning may already be underway as local authorities prepare for the Social Housing Decarbonisation Fund and Future Homes standard, but it needs to be continually reviewed to take account of policy changes. These plans should consider the local housing stock, existing local decarbonisation targets and the needs of local communities.
- **Detailed forecasts of local skills requirements should come from the local plans described in the previous recommendation.** If LSIPs remain in place, ERBs should develop long-term workforce and skills forecasts based on local decarbonisation plans instead of extrapolating previous industry growth or relying solely on employer surveys. Several of the LSIPs identified that previous research does not provide sufficient guidance for local skills planning in 2024 and beyond, "... all stakeholders need to stop thinking in terms of what has been done before, and start thinking in terms of what is required."⁷⁸
- **If LSIPs remain in place as the vehicle for local skills planning, their governance should evolve to ensure broader input.** It is essential that a wider range of voices are involved in skills planning, given that many local employers lack awareness of national policy priorities and thus into future retrofitting skills needs. Diversifying the governance of LSIPs and/or requiring that they seek broader input, from social housing providers, community retrofit organisations and young people, could help ensure learning routes are tailored to a wider demographic of future learners.
- **Long-term funding should be provided on a non-competitive basis to resource local decarbonisation plans and skills plans.** This will increase the confidence of businesses, providers and learners in the future demand for skills in these areas. Additional funding may be needed to support sole traders and SMEs to access relevant training and achieve new standards.
- **All existing and new qualifications aligned to roles in the construction sector – such as apprenticeships, T-levels, Skills Bootcamps – should include appropriate content on the need for decarbonisation and the key concepts/ techniques of high-quality retrofitting.** This will begin to increase the baseline knowledge and capacity of the workforce. Those developing and delivering training and qualifications should consider the need to attract a broader, more diverse workforce. They must be proactive in ensuring that opportunities meet the needs of all future learners.

75 American Climate Corps (accessed 2024) *About the American Climate Corps*.

76 Wade, F., Webb, J. and Creamer, E. (2022) *Local government capacities to support net zero: Developing comprehensive heat and energy efficiency strategies in Scotland*. Energy research & social science, 89, p.102544.

77 Energy Systems Catapult (accessed 2024) *Local Area Energy Planning*.

78 Eunomia (2019) *Building skills for net zero*. Report prepared by Eunomia for CITB, p.6.

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