NORFOLK & SUFFOLK RETROFIT SKILLS ANALYSIS

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WRITTEN BY GEMSERV

Gemserv

Norfolk County Council

Suffolk County Council

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EXECUTIVE SUMMARY

To deliver the UK's net zero targets for 2050, local authorities such as Norfolk and Suffolk County Council are adapting their skills strategies to align with greener growth. Without an adequately trained workforce, low carbon technologies such as insulation or heat pumps won't be deployed in sufficient numbers. Given their unique insight, councils are well placed to grow the green skills their communities need. The *Independent Review of Net Zero* led by Chris Skidmore MP reinforced this view, urging the UK government to publish an action plan for Net Zero skills that includes a comprehensive roadmap of when, where, and in which sectors there will be skills needs specific to net zero. To achieve this, the report underlined the need to swiftly develop robust regional green jobs statistics.

One of the key policy mechanisms to enable councils to deliver this ambition are local devolution deals announced by central government. In December 2022, Norfolk and Suffolk were recipients of devolution deals, giving them a route to developing greater control over the adult education, skills development, and the green jobs agenda. To inform the creation of Norfolk and Suffolk's local skills improvement plan, and as part of a wider agenda of further devolution of skills policy, Gemserv has analysed the future green skills requirements needed for the region to achieve net zero by 2030.

This report comprises of a forecast of future green jobs, a skills gap assessment followed by a set of tangible recommendations to enable a smooth low-carbon transition. This Phase 1 report focuses on the skills needed to in the energy efficiency and low carbon heating sectors, broadly defined in this report as the retrofit sector. This represents a hard sector to decarbonise for local councils, both in terms of technical difficult as well as the intersection with social issues such as fuel poverty. Despite these challenges, local councils are in an unrivalled position to enact change, often a leading stakeholder in raising awareness and enabling the local installer base to transition.

Figure 1: Housing stock retrofit requirements (%)

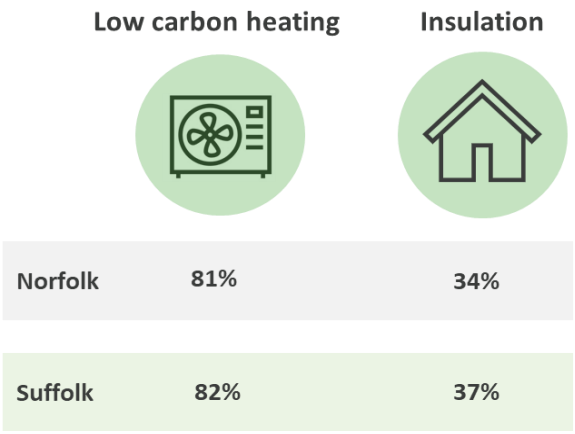
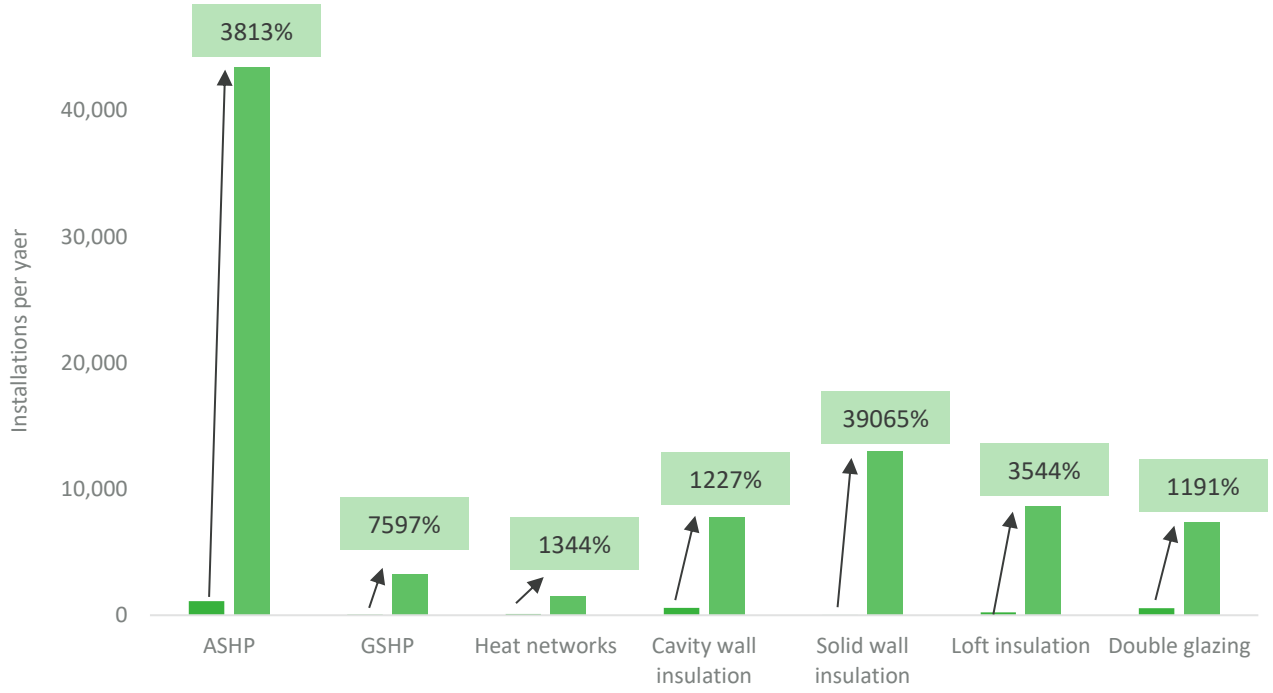


Figure 1 demonstrates that a significant number of retrofit installations are needed to meet the 2030 deployment targets. Based on a bottom-up housing stock analysis, 81% of Norfolk's and 82% of Suffolk's housing stock will require retrofitting with a low carbon heating installation. The model also indicates 34% of Norfolk's and 37% of Suffolk's housing stock will need some form of insulation measure.

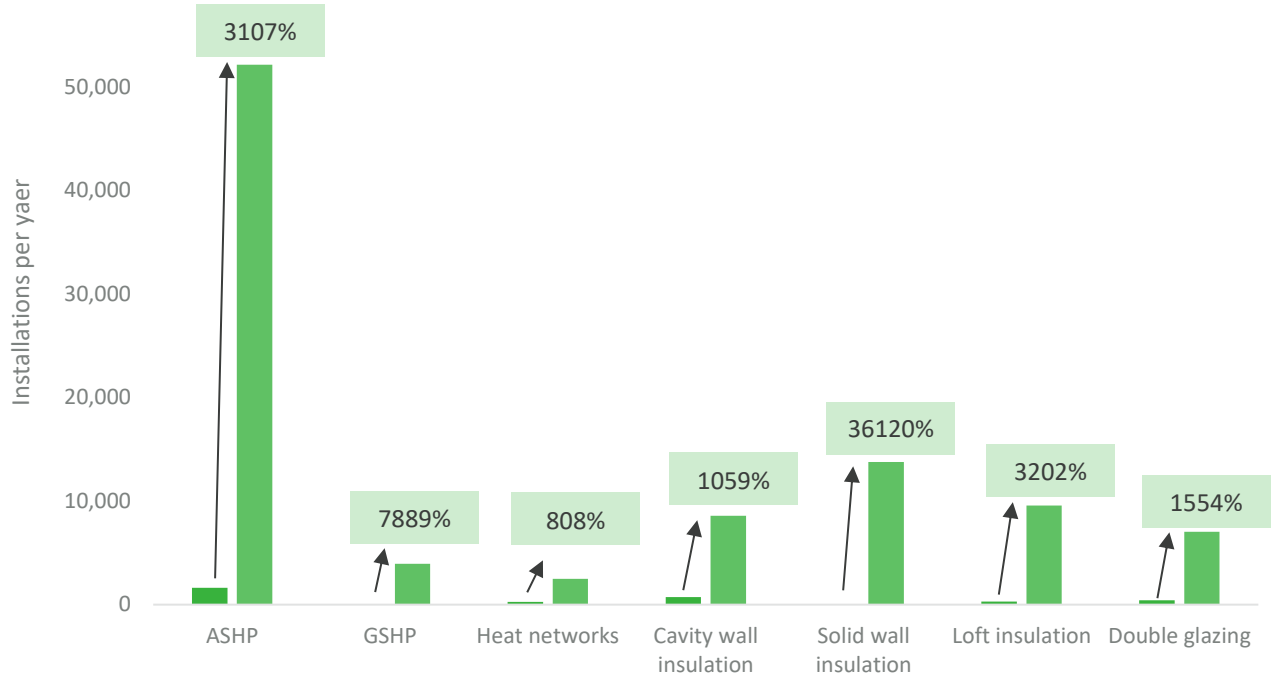
To highlight the scale of the challenge, **Figure 2** and **Figure 3** illustrate the existing and required annual installation of energy efficiency and low carbon heating measures. Air source heat pumps and solid wall insulations across both Norfolk and Suffolk require rapid increases in annual instalments to meet a 2030 net zero target. For Suffolk annual installations rates for air source heat pumps needs to rise from an estimated 1,100 installations per year today to around 43,500 per year to meet the 2030 net zero target. Even more pronounced is the need to increase solid wall insulation installations. Annual solid wall installations are estimated to be around 33 today needing to rise dramatically to around 13,000 to meet the local council's 2030 target.

Figure 2: Current and required installation rates for retrofit measure in Suffolk, with total growth



The model also projects a similar scenario for Norfolk. Existing installations rates for air source heat pumps are higher at around 1,600 per year, but the required installations are higher at around 52,000 per year due to the larger housing stock. Like Suffolk, Norfolk's solid wall insulation installations are also low. Norfolk's annual solid wall installations are estimated to be around 38 today, needing to accelerate to around 13,750 based on Gemserv's internal modelling.

Figure 3: Current and required installation rates for retrofit measures in Norfolk, with total growth

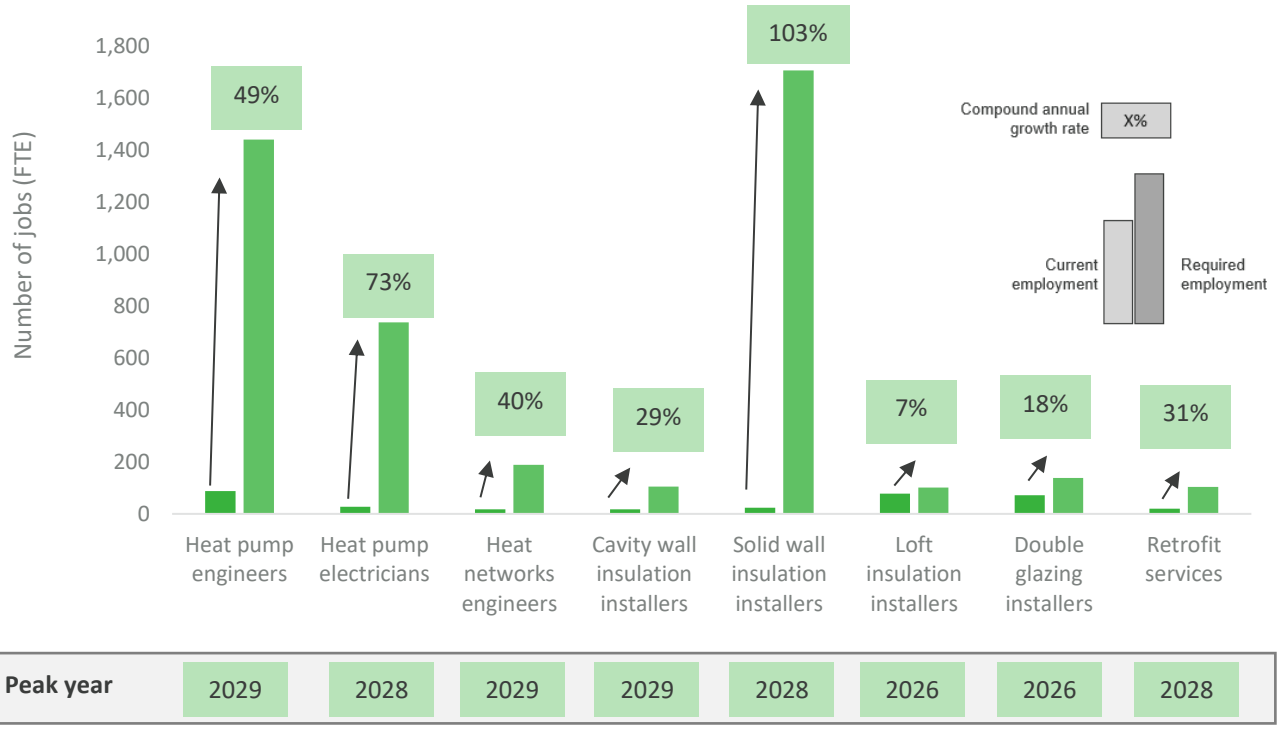


To support these installation rates, the installer base across Norfolk and Suffolk also needs to grow considerably.

Figure 4 and **Figure 5** show the number of jobs associated with existing installation rates vs the year employment is expected to reach its peak[1]. Areas that are particularly challenging for both regions in terms of job creation include solid wall insulation and heat pumps. Installers of solid wall insulation will require a compound annual growth rate of 76% across Norfolk, with Suffolk requiring a consistent 103% rise each year, a doubling of the workforce every year.

[1] Different measures reach peak employment rates at different times. The scenarios used for Figures 3 & 4 represent the gradual ramp up requirements.

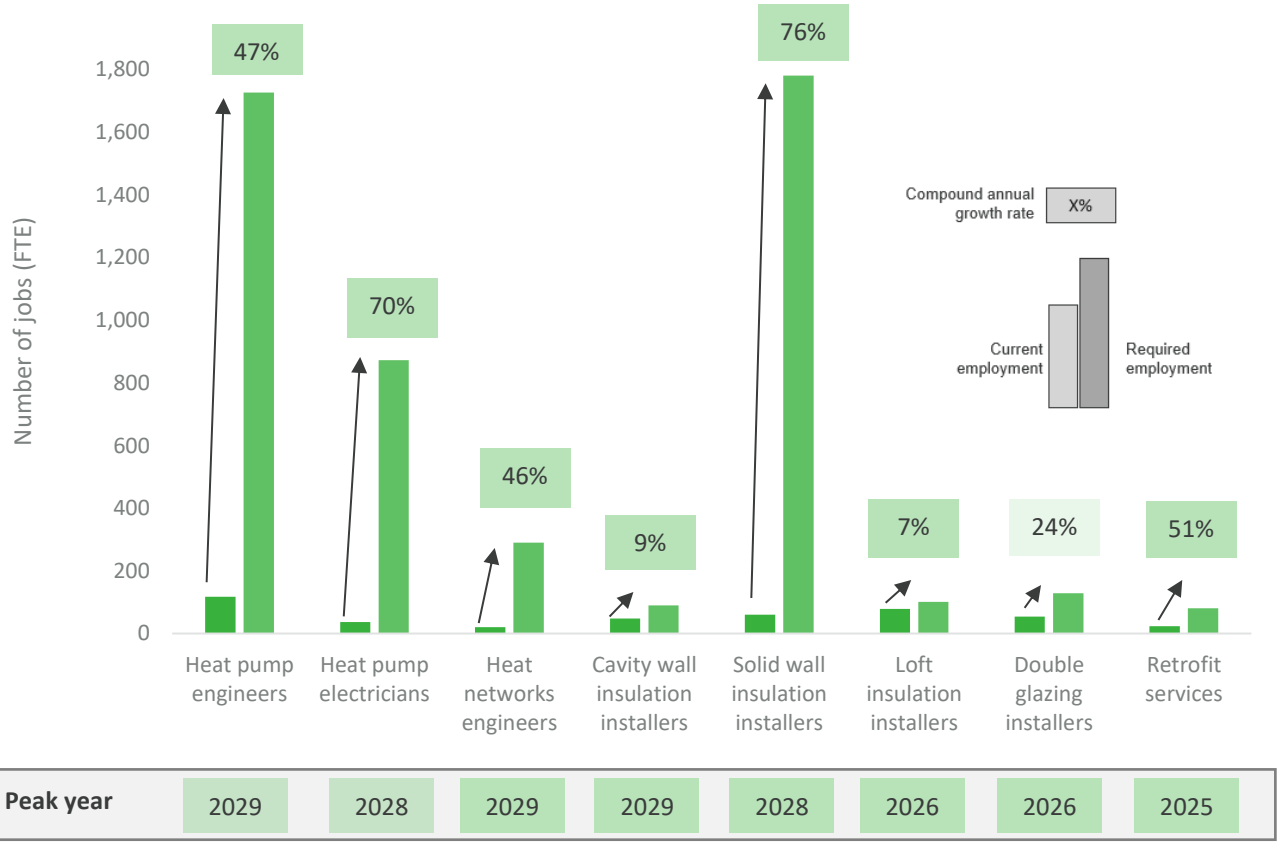
Figure 4: Current and required employment for each retrofit measure in Suffolk, with CAGR



Heat pumps are another area that requires strong annual growth rates in job creation. Growth in heat pump electricians need to achieve a 70% annual growth rate in Norfolk and 76% in Suffolk, with heat pump engineers needing a 47% annual growth rate in Norfolk and 49% annual growth rate in Suffolk. A final area which requires a significant increase in employment are retrofit services. This category encompasses assessors and co-ordinators involved in assessing and evaluating properties before and after work is

conducted. Norfolk will require a 51% compound annual growth rate in these jobs whereas Suffolk's increase is less pronounced at 31%.

Figure 5: Current and required employment for each retrofit measure in Norfolk, with CAGR

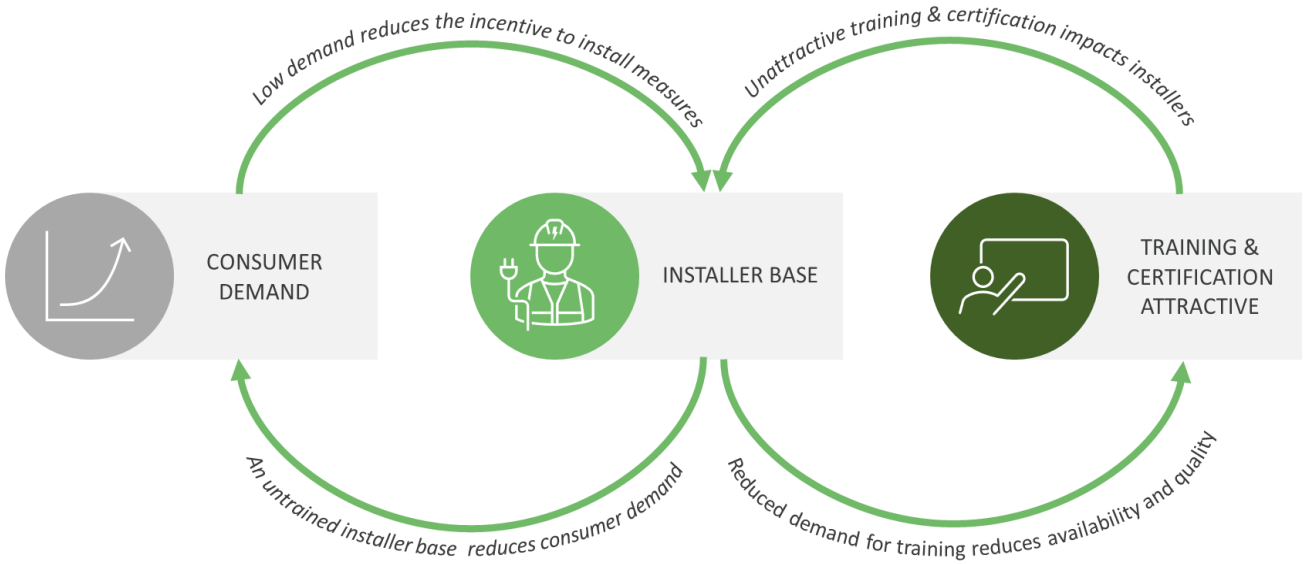


To reach the high levels of retrofit installations across Norfolk and Suffolk Councils, various interventions need to occur simultaneously across different areas. From the economic analysis, stakeholder engagement process and desk research, three broad themes emerged. They can be summarised as follows:

- Accelerating consumer demand
- Building a future installer base
- Making training and certification attractive

These three themes mutually reinforce each other in a constant cycle and is represented in **Figure 6**. Consumer demand is crucial to give confidence to the installer base to train and ideally become accredited. But training (and accreditation) will only occur if the installer base feels it attractive to do so. If the installer base isn't incentivised to train or become certified, or a new stream of talent isn't entering the industry, then training courses won't be provided. This then affects demand as not enough trained people are available to promote retrofit measures and provide the high standard installations required to instil confidence in the technology. All these factors contribute to a vicious cycle which generate inertia in the system.

Figure 6: Negative interplay between consumer demand, installer base & training availability



To overcome this inertia, each theme therefore has a set of broad themes alongside more specific recommendations for the council to consider. Each specific recommendation is given a timeline, the list of main partners the Council needs to engage with and an action type. The action type broadly indicates how active the Council should be, ranging from direct local government intervention right through to encouraging others to act.

Activity Type: A = Local policy intervention; B = National policy delivered locally; C = Brokering relationships; D = Encouraging others
Timeline: Short Term = 1 year; Medium term – 1-3 years; Long term 3 years +

RECOMMENDATIONS	SUB-RECOMMENDATIONS	TIMELINE	PARTNERS	ACTIVITY TYPE
Creating a prioritisation strategy to concentrate Norfolk's and Suffolk's efforts on the vulnerable and difficult to retrofit properties to provide locally administered support.	Develop an internal tool that links the local housing stock energy efficiency and dwelling characteristics with social factors such as Index of Multiple Deprivation to co-ordinate and prioritise local authority efforts.	Short Term	LAs, housing associations	A
	Develop a retrofit programme for public buildings and social housing that takes a street-by-street approach to low carbon heating and energy efficiency measures.	Medium Term	Council, LAs	A or B
Linking private and community finance mechanisms with local installers to accelerate the roll out of energy efficiency and low carbon heating system.	Work with local community lenders to help the most vulnerable in the region access financing options to pay for low carbon heating and energy efficiency measures.	Medium Term	Community lenders, housing associations	C
	Forge partnerships with larger financial institutions to work in partnership with the local installer base to provide financial services to the able to pay market such as landlords.	Medium Term	Banks, lenders, Council, installers	C or B
Local awareness campaigns to promote the benefits and reduce concerns around energy efficiency measures and low carbon heating.	Launch a co-ordinated information campaign across the local authorities on the benefits of retrofit across different property archetypes and heating systems.	Short Term	Council, LAs, installers	A
	Make households aware of potential national changes in requiring off-gas grid dwellings to install low-carbon heating systems by 2026.	Medium Term	Public, LAs	A or B
	Increase consumer confidence in the local supplier network by promoting locally certified installers to raise their profile beyond word of mouth.	Short Term	Installers, Council, LAs	A

Activity Type: A =Local policy intervention; B = National policy delivered locally; C = Brokering relationships; D = Encouraging others

Timeline: Short Term = 1 year; Medium term – 1-3 years; Long term 3 years +

RECOMMENDATIONS	SUB-RECOMMENDATION	TIMELINE	PARTNERS	ACTIVITY TYPE
Prioritise bringing through a new generation of low carbon and insulation installers by leveraging Norfolk's & Suffolk's network of colleges and universities.	Promote a local "pool" of installer trainers that colleges in the region can access to help stagger training and ensure the optimum number of installers are trained.	Medium Term	Council, colleges, LAs	A
	Support training providers by creating an energy efficiency and low carbon heating course implementation guide.	Short Term	Installers, training providers, LAs	A
	Targeted campaigns at 14–25-year-olds, promoting the need for low carbon heating and energy efficiency installers demonstrating it's a job for life and aligned with climate action.	Short Term	Council, LAs, schools, career charities	A or B
Leverage both national and local skills development programmes to upskill the existing network of gas engineers and insulation providers.	Conduct a lesson's learned assessment of the existing New Anglia Green Skills Bootcamp to inform future iterations of targeted solid wall insulation and heat pump boot camps.	Short Term	Councils, colleges, LAs	A
	Apply for additional national skills funding to set up dedicated Heat Pumps and Solid Wall Insulation Skills Bootcamps to increase the installer base in the short term.	Medium Term	BEIS, training providers, installers	B
	Ringfence a portion of Norfolk's and Suffolk's Adult Education Budget to retrain existing gas and off-gas installers in ground and air source heat pumps via shorter, specialised courses.	Medium Term	DfE, training providers, Council, LAs	A
	Ringfence a portion of Norfolk and Suffolk's Adult Education Budget to rapidly upskill existing insulation businesses to install solid wall insulation, via shorter, specialised courses.	Medium Term	DfE, training providers, Council, LAs	A
	Provide targeted support for sole traders who tend not to benefit from apprenticeships and face costs for training.	Medium Term	Installers, training providers, LAs	A

Activity Type: A = Local policy intervention; B =National policy delivered locally; C = Brokering relationships; D = Encouraging others

Timeline: Short Term = 1 year; Medium term – 1-3 years; Long term 3 years +

RECOMMENDATIONS	COUNCIL ACTIONS	TIMELINE	PARTNERS	ACTION TYPE
Incentivise specialist training providers to expand their course provision through closer ties with industry to increase trainee throughput.	Norfolk and Suffolk Council should facilitate and target national heat pump manufacturers to work in partnership with local training providers to accelerate installer training.	Medium Term	Heat pump manufacturers, training providers	C
	Create a local Norfolk and Suffolk "pitch deck" to attract heat pump manufacturers to install show room and smaller training / upskilling facilities.	Short Term	Council, LAs, heat pump manufacturers	D
	Engage with local insulation manufacturers about providing training in partnership with local training providers to accelerate the adoption of solid wall insulation.	Medium Term	Insulation manufacturers, training providers	C
Facilitate knowledge sharing between local authorities, the installer base and training providers to share best practice and minimise duplication of effort	Norfolk and Suffolk Council should convene a quarterly "Energy Efficiency and Low Carbon Heating Skills" action group for the region.	Short Term	LAs, Council, training providers, manufacturers, installers	A

Activity Type: A = Local policy intervention; B =National policy delivered locally; C = Brokering relationships; D = Encouraging others

Timeline: Short Term = 1 year; Medium term – 1-3 years; Long term 3 years +

RECOMMENDATIONS	COUNCIL ACTIONS	TIMELINE	PARTNERS	ACTION TYPE
Actively promote relevant training courses to local installers to reduce the search cost burden and tackle perceived risks in engaging in training.	Provide targeted support to sole traders and small businesses via training vouchers to support upskilling, focusing first on companies servicing the off-gas areas	Medium Term	Council, LAs,	A or B
	Facilitate the transfer of apprenticeship levy between large heat pump and insulation manufacturers with local installers to drive up training	Medium Term	Industry, installers	C
Encourage local installers to be accredited in order to gain work via local and national funding mechanisms.	Raise awareness of the benefits of being a certified trainer to the local installer base, forging a relationship with relevant accreditation bodies to guide local installers through the process	Short Term	Installers, LAs, accreditation organisations	A
	Require retrofit work that's funded by Norfolk and Suffolk Council to only carried out by certified installers.	Short Term	Council, accreditation organisations	A
Incentivise innovative models of training either through hybrid online courses, shorter and part time courses or training provision via trade associations.	Encourage the introduction of short courses specifically focused at upskilling the local workforce.	Medium Term	Training providers, LAs, Council, installers	A or B
	Work with colleges and other training providers to accelerate the use of AI and online learning to maximise the use of face-to-face learning	Long Term	Colleges, training providers, industry	D
	Explore more business led models of training provision either through a relevant trade association or local industry body	Medium Term	Trade associations, industry bodies	D

NORFOLK & SUFFOLK OVERVIEW

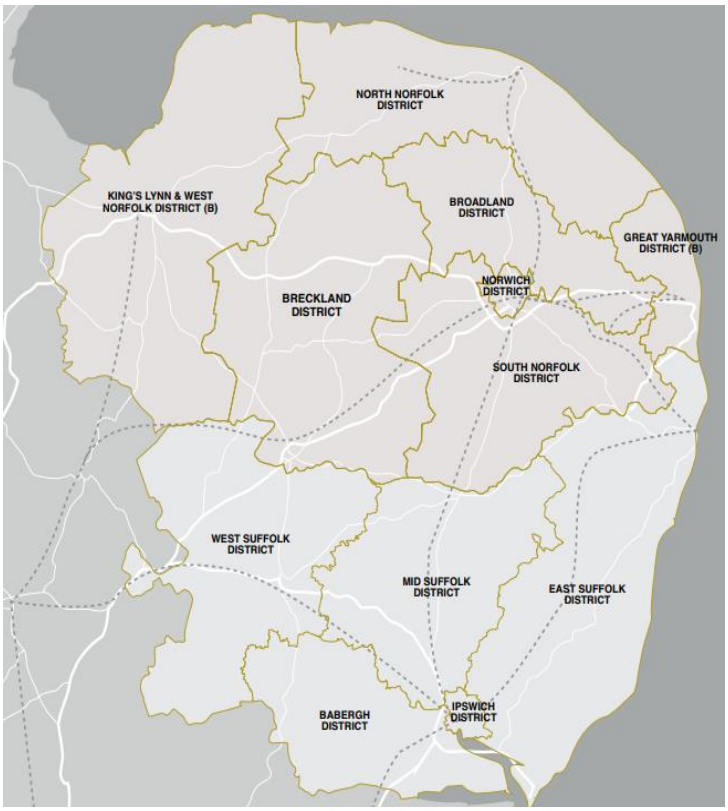
NORFOLK AND SUFFOLK REGION

Despite Norfolk and Suffolk possessing local nuances, given their proximity there are many similarities in demographics, industries, and priorities. This section provides a brief overview of Norfolk and Suffolk, homing in on aspects of the region that could influence retrofit technology deployment and the associated green skills development.

Local Geography

Norfolk and Suffolk are situated in the East of England comprising of 12 districts as shown in **Figure 7**[2]. The two biggest population centres are Norwich (Norfolk) and Ipswich (Suffolk). Other notable towns include Kings Lynn and Great Yarmouth in Norfolk and Lowestoft and Bury St Edmunds in Suffolk. Both Norfolk and Suffolk are coastal regions which has attracted numerous energy companies to the region. Historically oil, gas and nuclear companies entered the region to capitalise on North Sea reserves, but more recently offshore wind has become a big part of the local economy. New Anglia is also home to Felixstowe Port in Suffolk, the largest container port in the UK and is vital for UK trade[3].

Figure 7: Local authority map of Norfolk and Suffolk

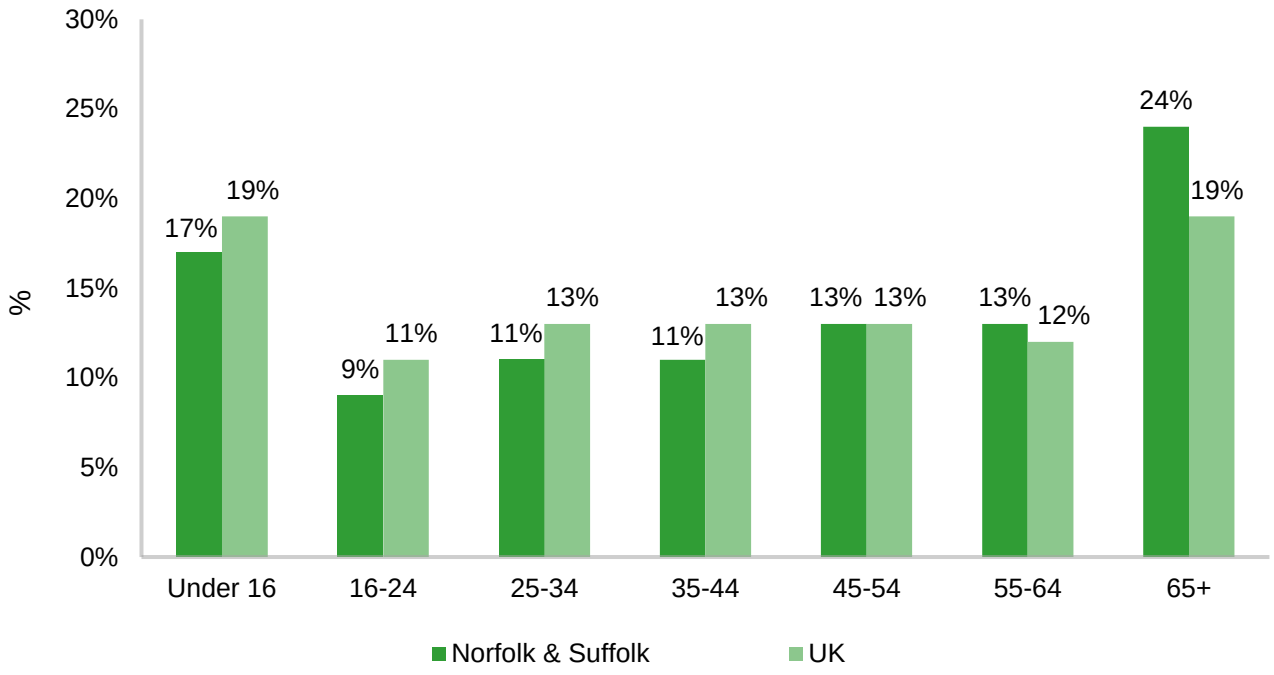


[2] https://newanglia.co.uk/wp-content/uploads/2022/01/FINAL-New-Anglia-Local-skills-Report-Update-Jan-22.pdf
[3] https://www.ukports.com/what-are-the-10-largest-ports-in-the-uk

Demographics

Figure 8 shows how Norfolk and Suffolk's population is older than the average for England, with 44% of their population over 50 years old compared to 38% of the general population[4]. This difference becomes more profound when looking at the proportion of the population that is over 65 with 24% of Norfolk and Suffolk's population over 65 compared to 18.5% for England.

Figure 8: Population by age group (%)



ONS internal migration flows data for Norfolk and Suffolk also shows there is a spike in migration into the region between the ages of 55-64. The ramifications of this are that attracting a steady flow of young talent to replace a retiring work force is important for Suffolk and Norfolk. Despite a significant emigration of 15–19-year-olds across Norfolk and Suffolk as people move for higher education, academic institutions like the University of East Anglia are effective in attracting a pipeline of young talent. However, ONS data also suggests a high exit rate of 25–39-year-olds in university areas such as Norwich, suggesting graduate retention could be improved[5].

[4] https://newanglia.co.uk/wp-content/uploads/2022/01/LSR-Annex-A-B-1.html
[5] https://newanglia.co.uk/economic-strategy/

Economy

Norfolk and Suffolk contributed around £38bn in GVA for the UK economy in 2019[6]. This has steadily been increasing over the years, in line with the national trend. As shown in **Figure 9**, Norfolk and Suffolk are home to multiple and value add sectors, ranging from AI and digital companies through to energy and agricultural technology[7]. The region has emerging strengths in low carbon energy, hosting offshore wind farms, hydrogen production and established nuclear power facilities giving it unique expertise in a range of energy sources.

Figure 9: Map of Norfolk and Suffolk with key industry capability

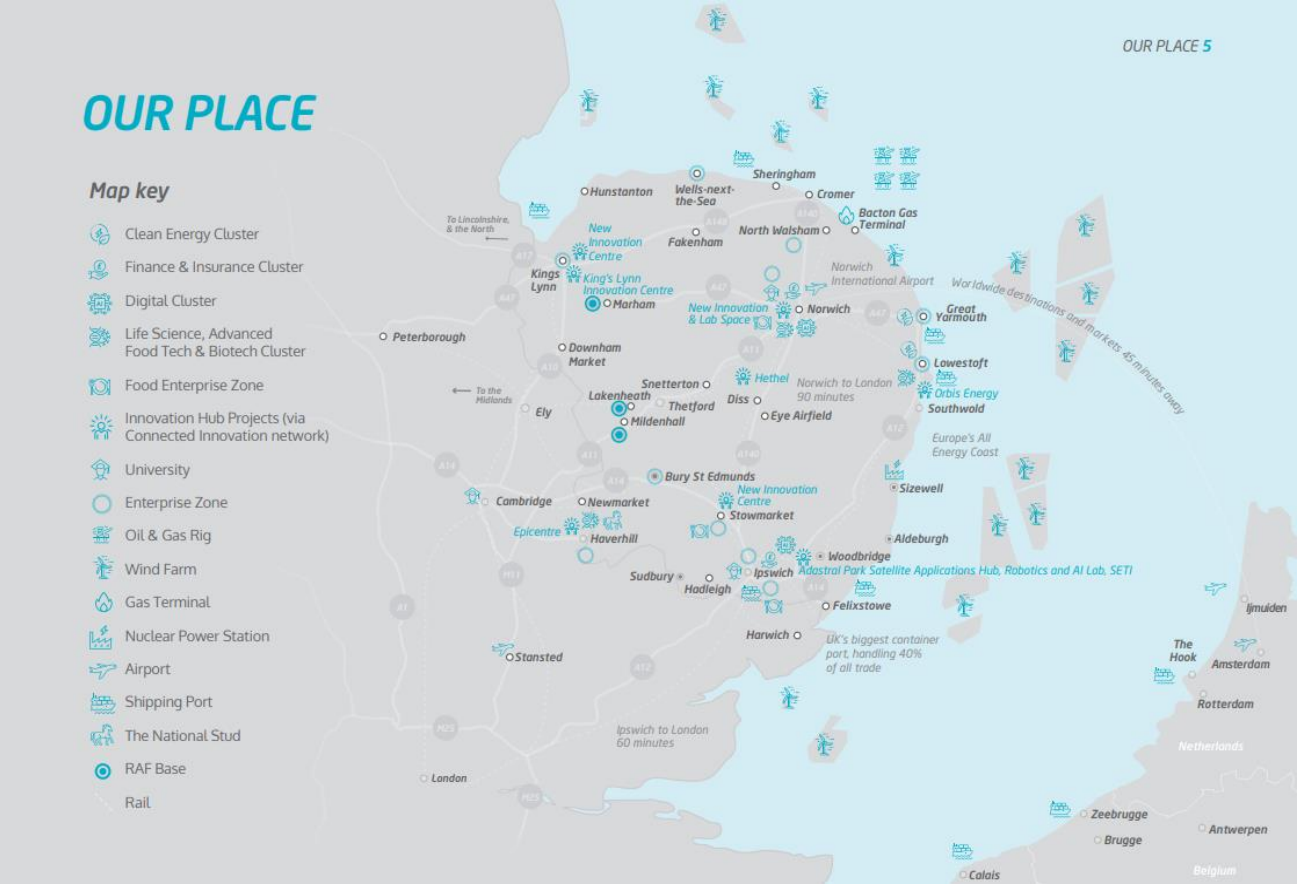
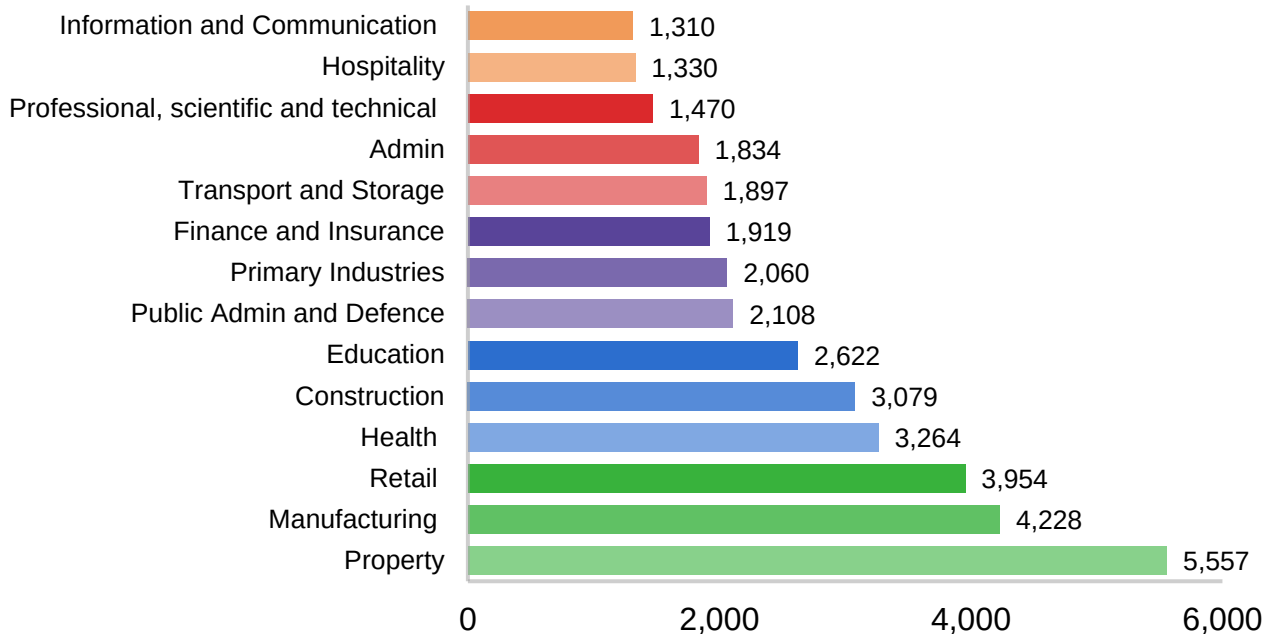


Figure 10 demonstrates the top contributing sectors to GVA are evenly split between services like property, retail and health alongside other sectors such as manufacturing and construction[8]. Norfolk and Suffolk's business base is largely dominated by SMEs and micro businesses (99.7%) which is consistent with the rest of England.

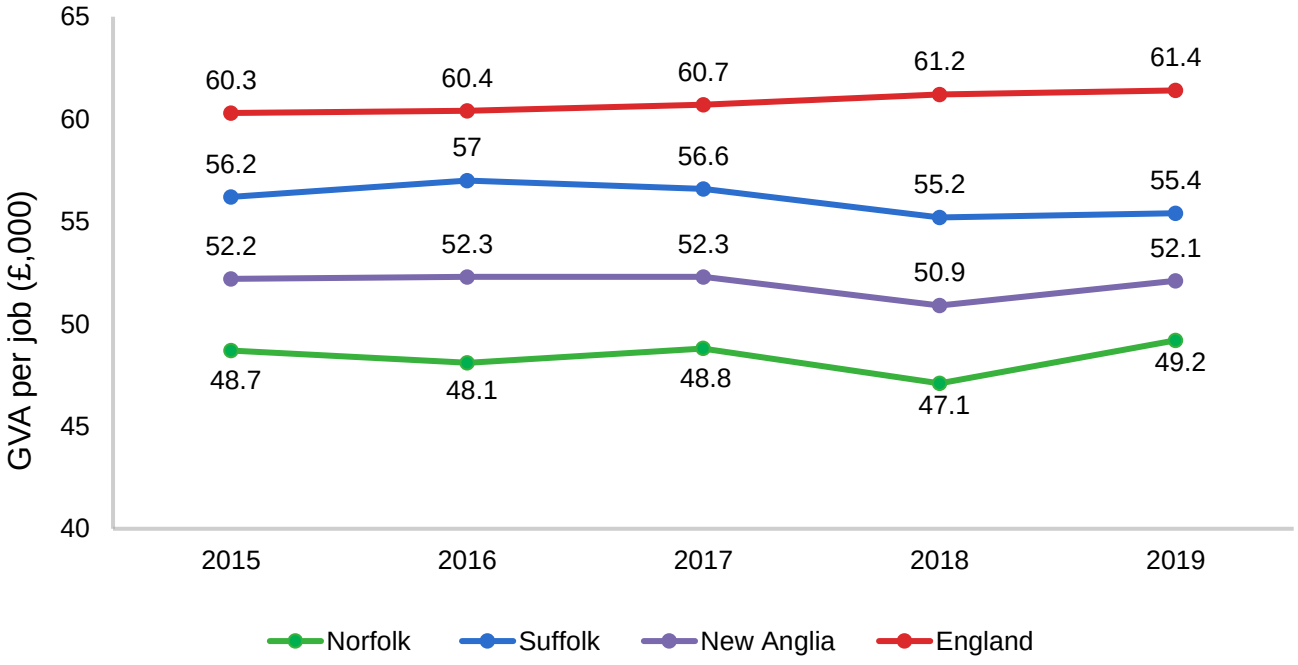
[6] https://newanglia.co.uk/wp-content/uploads/2022/01/FINAL-Norfolk-and-Suffolk-economic-strategy-Jan-2022.pdf
[7] https://newanglia.co.uk/wp-content/uploads/2022/01/FINAL-Norfolk-and-Suffolk-economic-strategy-Jan-2022.pdf
[8] https://newanglia.co.uk/economic-strategy/

Figure 10: GVA by SIC07 Code



Norfolk and Suffolk's productivity expressed as GVA per job is below the England average, as shown in **Figure 11**. Norfolk is significantly below the average with Suffolk comparable to the nationala average. Suffolk has witnessed a slight decrease in job productivity from 2015 to 2019, whereas Norfolk increased productivty. Evidence also indicates that median gross weekly wages for full-time workers in Norfolk and Suffolk (£565) are also considerably lower than in England (£613)[9].

Figure 11: GVA per job over time (£,000)

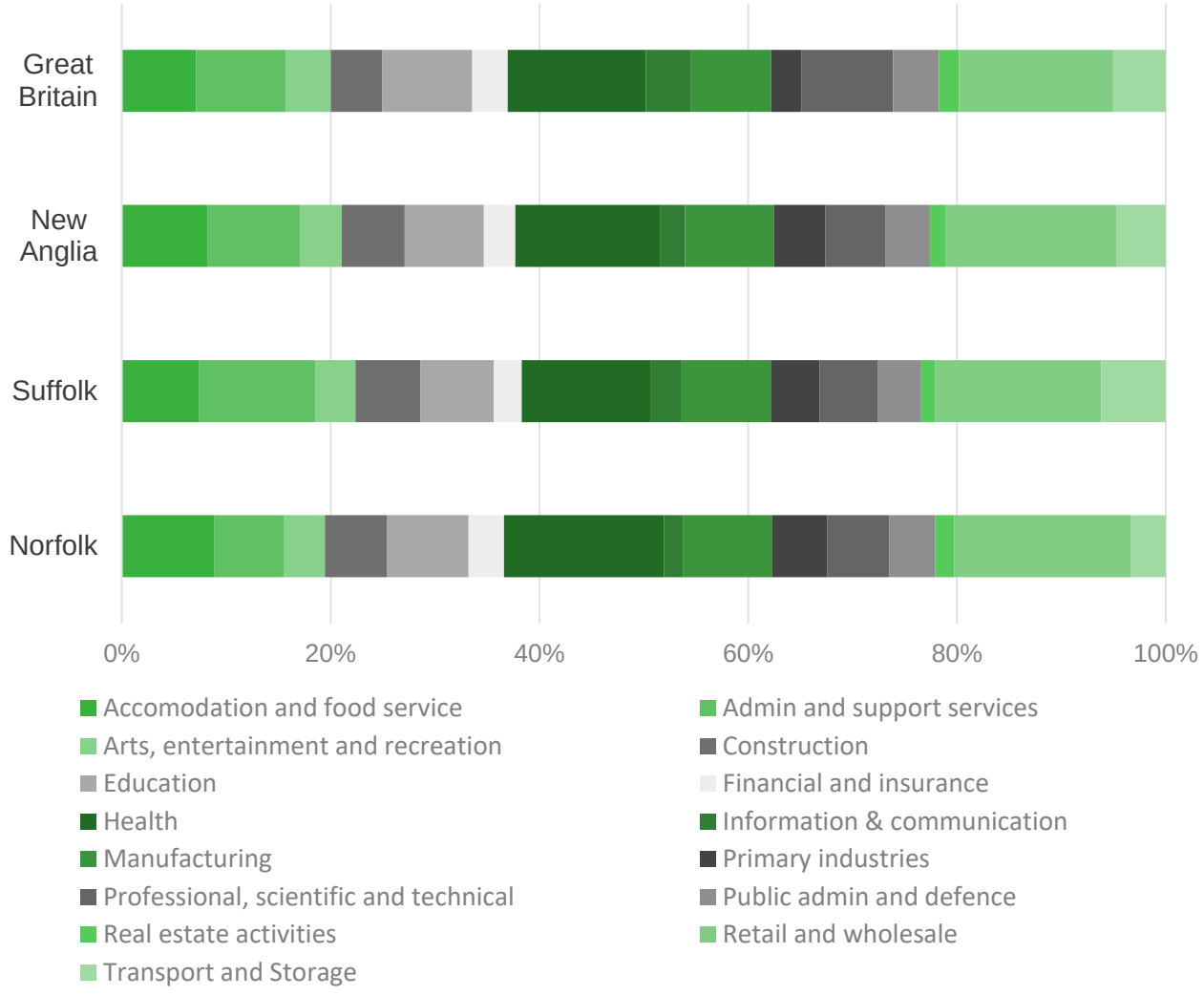


[9] https://newanglia.co.uk/wp-content/uploads/2022/01/LSR-Annex-A-B-1.html

Wider Jobs & Skills Base

Figure 12 shows employment trends by sector across Norfolk and Suffolk are broadly in line with the average in Great Britain. One significant difference is the greater proportion of Norfolk's workforce in healthcare relative to Great Britain and Suffolk, largely attributable to Norfolk's ageing population. Other differences include a higher percentage of Norfolk workers being in the manufacturing sector whereas both Norfolk and Suffolk have lower percentages of professional and scientific roles than Great Britain. Suffolk has a much greater proportion of its workforce than Norfolk and Great Britain in admin and support services.

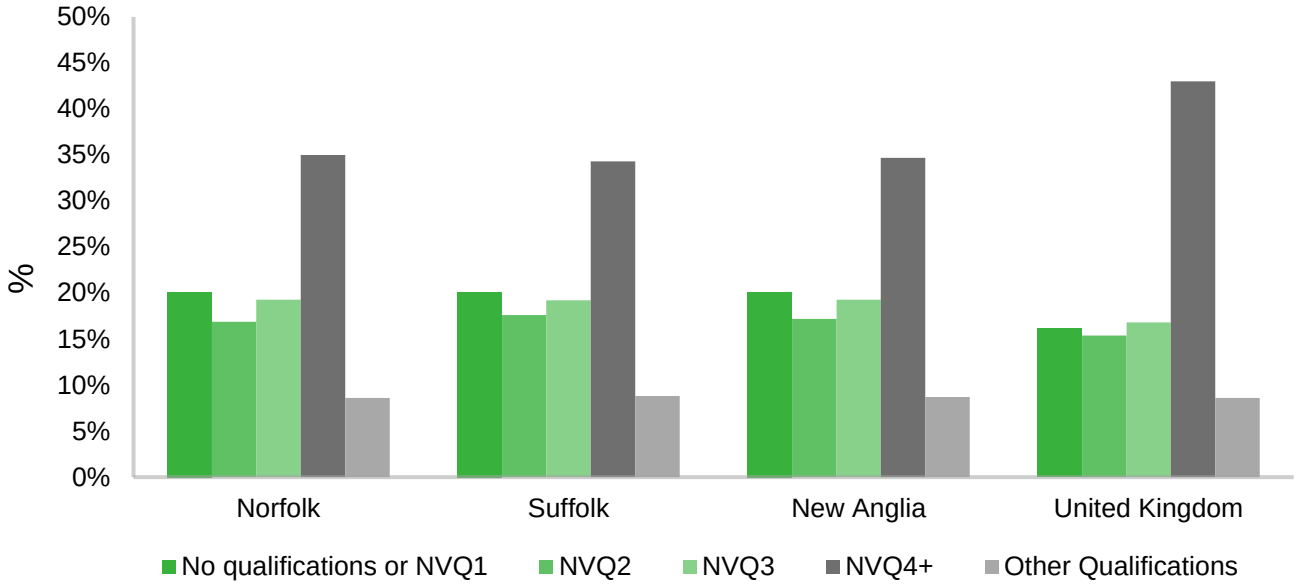
Figure 12: Total employment by sector (%)



A contributing factor that impacts the sector make up of a local region is the underlying education and skill level. **Figure 13** illustrates Norfolk and Suffolk possess an economy which is skewed towards occupations requiring lower-level qualifications. 43% of the population in the United Kingdom have a NVQ4+ compared

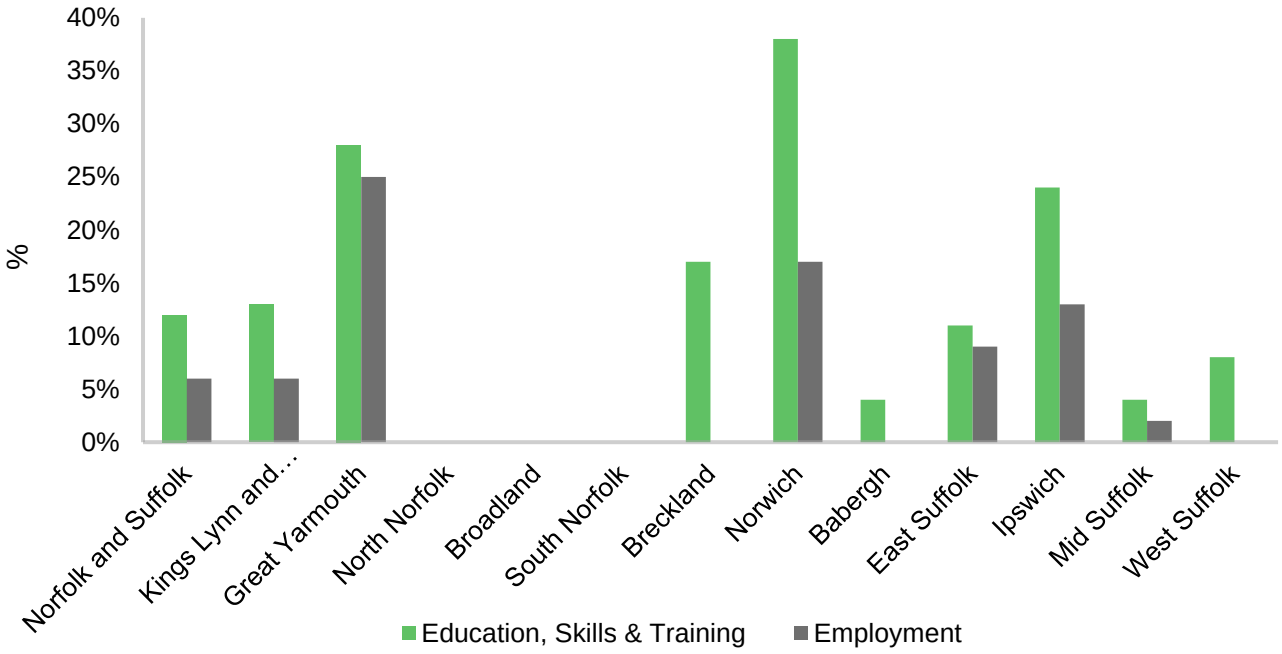
to 35% in Norfolk and 34.3% in Suffolk. Similarly, both Norfolk and Suffolk also have a higher proportion of the workforce with no qualfications to NVQ3 compared to the UK average.

Figure 13: Working age population split by qualification level



This is also reflected in the Employment and Education, Skills and Training metrics which make up the Index of Multiple Deprivation scoring[10]. **Figure 14** indicates a significant number of local authorities in Norfolk and Suffolk experience deprivation in Education, Skills and Training, especially Great Yarmouth, Norwich, Ipswich

Figure 14: Proportion of the local authority population that falls into the 10% most deprived nationally.

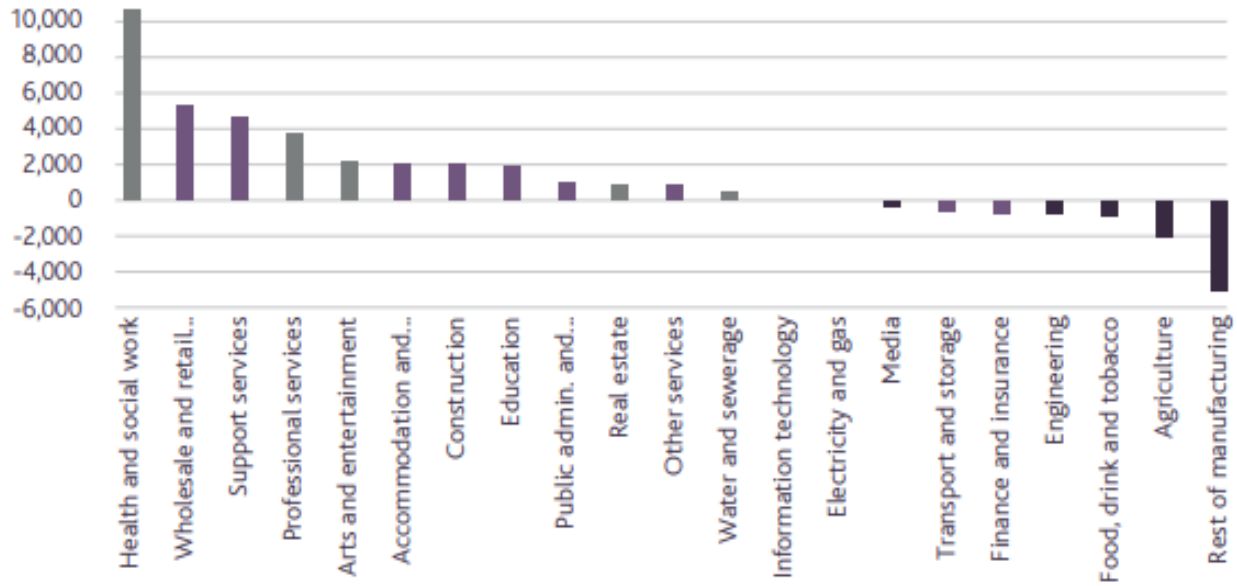


[10] https://newanglia.co.uk/wp-content/uploads/2022/01/LSR-Annex-A-B-1.html

and Breckland. The situation looks more encouraging for employment levels, possibly reflecting roles in the region needing lower skill levels so not having as profund an impact. This demonstrates there is significant room for local and national government to improve the training provsion nationally.

The most recent analysis conducted by the New Anglia LEP looking at sector growth based on historic trends is mixed from a low carbon heating and energy efficiency perpsective[11]. **Figure 15** highlights increases in construction jobs which is positive but much more will be needed to meet the region's zero objectives. Perhaps a more challenging aspect is the expected flat lining of electricity and gas jobs. This is concerning given the rapid need to install energy efficiency measures and heat pumps over the coming years.

Figure 15: Growth and decline sectors across Norfolk and Suffolk



Sectors by absolute forecast employment growth in Norfolk and Suffolk (colour coded by the top 5 highest (grey) and lowest (dark purple) sectors by percentage forecast employment growth), *Working Futures: 2017-2027, 2017 SAP boundaries.*

[11] https://newanglia.co.uk/wp-content/uploads/2022/01/FINAL-New-Anglia-Local-skills-Report-Update-Jan-22.pdf

NORFOLK AND SUFFOLK POLICY OVERVIEW & LANDSCAPE

NATIONAL NET ZERO POLICY LANDSCAPE & CONTEXT

In June 2019, legislation was passed in Parliament requiring the Government to reduce the UK's net zero greenhouse gas emissions by 100%, compared to 1990 levels, hereinafter referred to as 'net zero' by 2050[12] which followed a recommendation from the Committee on Climate Change that a net zero target would enable the UK to deliver on its commitments to the Paris Agreement[13]. Following the UK's net zero commitment, in December 2020, the UK submitted its most recent Nationally Determined Contribution, announcing a target to reduce UK emissions by at least 68% by 2030[14].

The introduction of the UK's net zero target encouraged Local Authorities to revise climate policy with vigour, to move in line with national and global climate targets. The national drive towards net zero now urges Local Authorities to consider their climate strategies and budgets in a way that makes way for societal change.

The requirement to reach Net Zero is underpinned by another commitment: to ensure that the necessary skills are developed, and the relevant sectors grown to allow us to reach this goal. A specific focus for the Government is investment in developing skills and qualifications required for the Net Zero transition, which is reflected in the integration of jobs and skills requirements into relevant Net Zero strategies, nationally and regionally. A brief overview of national strategies is included in the appendices, and a short summary of regional commitments and efforts is included in the following sections.

MISSION ZERO: NET ZERO REVIEW

In January 2023, Chris Skidmore MP launched *Mission Zero: Independent Review of Net Zero* which aimed to comprehensively review UK policies across departments on achieving net zero. The need to ensure there's a secure pipeline of secure skills to transition the UK economy was a core pillar of the review. The report concluded that the Government should publish an action plan for Net Zero skills that includes a comprehensive roadmap of when, where, and in which sectors there will be skills needs specific to net

[12] Institute for Government. (2019). UK Net Zero Target.
[13] Climate Change Committee. (2019). Net Zero - The UK's Contribution to Stopping Global Warming.
[14] UK Government. (2020). UK Sets Ambitious New Climate Target Ahead of UN Summit.

zero.[15] If acted upon, this exercise should be aided by the recommendation from the Review of Net Zero that the Government should significantly expand public reporting on net zero on key progress indicators.[16] Refined data will help to define the extent to which existing skills will be transferable and where upskilling or retraining needs to take place. **Figure 16** below outlines the specific recommendations related to skills, 60 has relevance to local councils such as Norfolk and Suffolk and reinforces the need to conduct local skills assessments and forecasts.

Figure 16: Mission Zero recommendations relevant for skills development

Number	Mission Zero Recommendations	Timing
59	Government should drive forward delivery of the recommendations of the Green Jobs Taskforce and the commitments from the Net Zero Strategy. Government to publish an action plan for Net Zero skills that includes a comprehensive roadmap of when, where, and in which sectors there will be skills needs specific to net zero. Government should look to report on progress made to delivering the recommendations on a regular basis, starting by mid-2023	2023
60	To monitor progress against the just transition, Government should swiftly develop robust regional green jobs statistics (ideally at local authority level, at least for England), breakdowns of green jobs considering protected characteristics, and publish information about salary levels	2023
61	Government and the Green Jobs Delivery Group should explore a variety of targeted options, including: • Increasing the flexibility of the Apprenticeship Levy, and assessing whether the Levy aligns with Government net zero and growth priorities, whether shorter, more intensive courses should be available alongside exploring the role of T levels • Options for retaining talent within businesses and access to international labour	2023

[15] Review of Net Zero - January 2023
[16] Review of Net Zero - January 2023

LOCAL DEVOLUTION DEALS

In December 2022, Norfolk[17] and Suffolk[18] were awarded devolution deals as part of the UK government's push towards further localisation. Both deals give Norfolk and Suffolk the possibility of gaining greater control of the skills budget, with the following elements potentially being relevant for retrofit skill sector:

- Control of a £16 million (Suffolk) & £20 million (Norfolk) per year allocation of investment funding over 30 years, 40% capital and 60% revenue, to be invested by both Councils to drive growth and take forward its priorities over the long term.
- New powers to better shape local skills provision to better match the needs of the local economy and local people, including devolution of the core Adult Education Budget, as well as input into the new Local Skills Improvement Plans.
- Specific mention of green skills: *"Through the Green Jobs Delivery Group, the Government is working to ensure that workers, businesses and local areas… are supported through the net zero transition… [and have] the opportunity to deliver green skills interventions at a local level through having a greater role in delivering the Adult Education Budget and UKSPF"*

RETROFIT INSTALLATION FUNDING FOR NORFOLK & SUFFOLK

Funding for installations of retrofit measures such as energy efficiency and low carbon heating systems have typically been administered to regions via central government. Councils typically bid for an allocation of funding attached to certain retrofit targets associated to them. Prominent examples include the Social Housing Decarbonisation Fund, Warmer Homes and Home Upgrades Grant. Other measures such as the Energy Company Obligation, is a consumer facing fund whereby Councils play a role in assisting and means testing. For example, under ECO4 Flex, a participating local authority can refer private tenure households that it considers to be living in fuel poverty or on a low income and vulnerable to the effects of living in a cold home.

[17] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1122222/Norfolk_Devolution_Deal.pdf
[18] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1122693/Suffolk_Devolution_Deal.pdf

Figure 17 and **Figure 18** below outlines the main funding programmes awarded to Norfolk and Suffolk

Funding	Amount	Norfolk Regions Involved	Time
Local Authority Delivery 3	£450,856.00	Breckland, Broadland, King's Lynn and West Norfolk, North Norfolk, South Norfolk	December 2021
Home Upgrade Grant Phase 1	£3,401,788.29	Breckland, Broadland, King's Lynn and West Norfolk, North Norfolk, South Norfolk	December 2021
Social Housing Decarbonisation Fund Wave 1	£1,900,000.00	Broadland District Council	February 2022
Social Housing Decarbonisation Fund Wave 1	£900,000	Norwich City Council	February 2022
Social Housing Decarbonisation Fund Wave 1	£1,600,000	Great Yarmouth	February 2022
Phase 3a Public Sector Decarbonisation Scheme	£211,155	King's Lynn and West Norfolk (Fermoy Art Gallery and the Enterprise Works Building)	November 2022
Norfolk Warm Homes	-	Breckland, Broadland, King's Lynn and West Norfolk, North Norfolk, South Norfolk, Norwich & Great Yarmouth	2021

across the national schemes. Certain mechanisms such as the Local Authority Delivery, Warmer Homes and Home Upgrade Grant are delivered in synergy with other local authorities. Other mechanisms such as the Social Housing Decarbonisation Fund are competitive amongst local authorities.

Norfolk Specific Funding

Figure 17: Recent retrofit funding allocated to Norfolk

Funding	Amount	Norfolk Regions Involved	Time
Local Authority Delivery 3	£450,856.00	Breckland, Broadland, King's Lynn and West Norfolk, North Norfolk, South Norfolk	December 2021
Home Upgrade Grant Phase 1	£3,401,788.29	Breckland, Broadland, King's Lynn and West Norfolk, North Norfolk, South Norfolk	December 2021
Social Housing Decarbonisation Fund Wave 1	£1,900,000.00	Broadland District Council	February 2022
Social Housing Decarbonisation Fund Wave 1	£900,000	Norwich City Council	February 2022
Social Housing Decarbonisation Fund Wave 1	£1,600,000	Great Yarmouth	February 2022
Phase 3a Public Sector Decarbonisation Scheme	£211,155	King's Lynn and West Norfolk (Fermoy Art Gallery and the Enterprise Works Building)	November 2022
Norfolk Warm Homes	-	Breckland, Broadland, King's Lynn and West Norfolk, North Norfolk, South Norfolk, Norwich & Great Yarmouth	2021

Suffolk Specific Funding

In addition to national funding, via Warm Homes Suffolk, local funding was allocated to create a new Fuel Poverty Retrofit Team, helping the most affected by the cost-of-living crisis with retrofit measures[19].

Figure 18: Recent retrofit funding allocated to Suffolk

Funding	Amount	Suffolk Regions Involved	Time
Local Authority Delivery 3	£2,162,496.25	Babergh, East Suffolk, Ipswich, Mid Suffolk, West Suffolk	December 2021
Home Upgrade Grant Phase 1	£5,011,393.70	Babergh, East Suffolk, Ipswich, Mid Suffolk, West Suffolk	December 2021
Social Housing Decarbonisation Fund Wave 1	£1,800,000	West Suffolk Council	February 2022
Warm Homes Suffolk	-	Suffolk County Council, Babergh and Mid Suffolk Councils, West Suffolk Council, East Suffolk Council and Ipswich Borough Council	2021

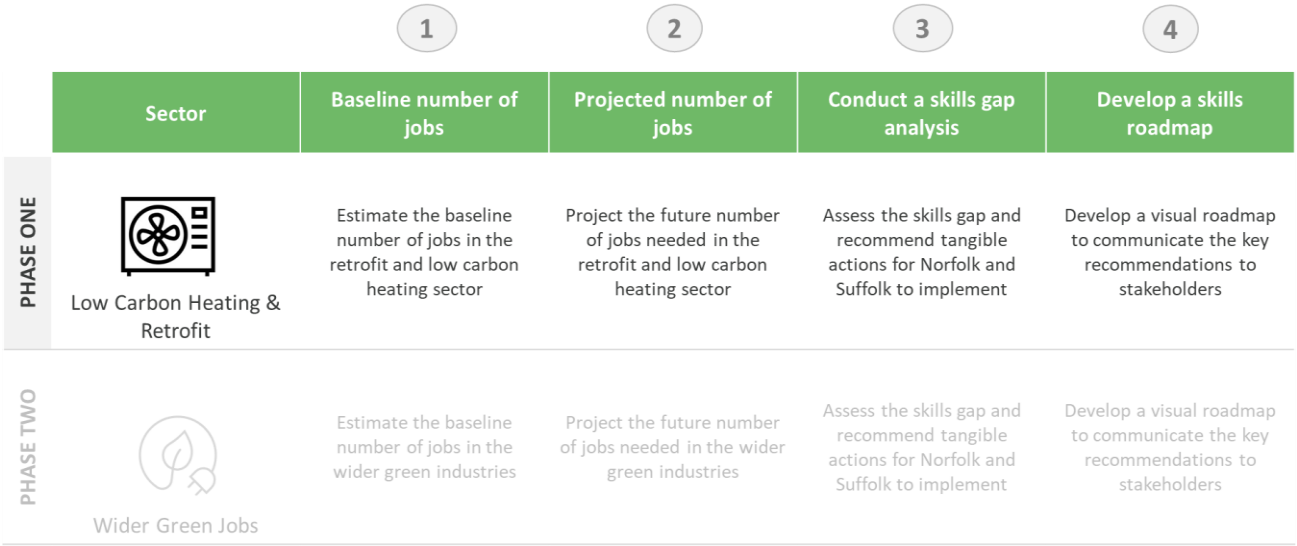
[19] https://www.westsuffolk.gov.uk/news/pr220930ws01.cfm

STUDY APPROACH

The study methodology is detailed in **Figure 19**. The analysis is separated into two parallel streams: low carbon heating and retrofit (Phase 1 report) and wider green jobs (Phase 2 report). Both streams follow the same methodology which consists of four key steps:

1) Assessing the baseline number of jobs and low carbon technology deployment in Suffolk and Norfolk
2) Produce scenarios on the number of jobs needed by 2030 based on Gemserv's technology uptake models
3) Conduct a skills gap analysis, using surveys and interviews, that underline the challenges in achieving future skills growth
4) Create a visual roadmap that articulates the actions Norfolk and Suffolk should take to ensure the necessary skills growth

Figure 19: Study methodology



Steps 1 and 2 use economic modelling to assess the skills demand for the retrofit market in the future. Using illustrative scenarios developed by Gemserv, the analysis shows different retrofit and low carbon heating adoption rates to 2030 and how that impacts future job creation. Step 3 uses online surveys, interviews, and a literature review to provide a better understanding of the sector specific issues in Norfolk and Suffolk. The aim was to collect feedback on the challenges faced by installers, training providers and local authorities and give respondents the chance to voice their opinions on how gaps could be addressed. For more information on Gemserv's study approach, an overview of research methodology can be found in Appendix 1.

BASELINING NORFOLK'S AND SUFFOLK'S BUILDING STOCK

Gemserv used a wide variety of public data sources and internal modelling capability to quantify the scale of the retrofit challenge. A primary data source to achieve this was through detailed EPC analysis to understand the characteristics of Norfolk's and Suffolk's building stock. EPCs were introduced in 2007 as a benchmarked way of determining energy efficiency of a property, supported by the Standard Assessment Procedure. The EPC register is continually updated with new and refreshed EPCs for properties and is the best source of data to determine the efficiency of a regions housing stock.

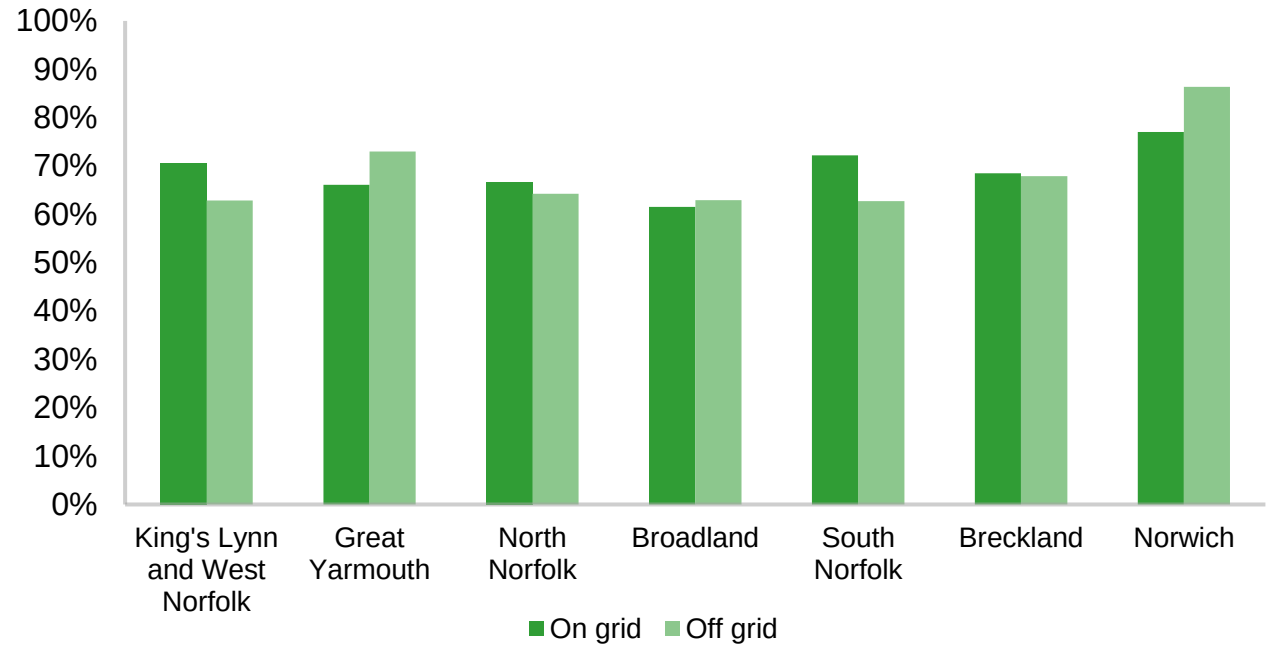
The register contains a mix of newly built or converted dwellings and existing properties that did not previously have an EPC. As properties are given an EPC record when sold, constructed, or have an insulation measure installed in them, properties with an EPC record, by default, tend to be newer and better insulated than those without. To account for this selection bias, a stratified sample was formed by duplicating records of select properties to match the breakdown of properties given in data on all properties in the area. By matching the number of properties by size, access to the gas grid and age, a representative sample of the entire building stock in the area was formed accounting for any selection bias through targeted stratification.

NORFOLK'S BUILDING STOCK & DEPLOYMENT NEED FOR 2030

Introduction to Norfolk's Building Stock

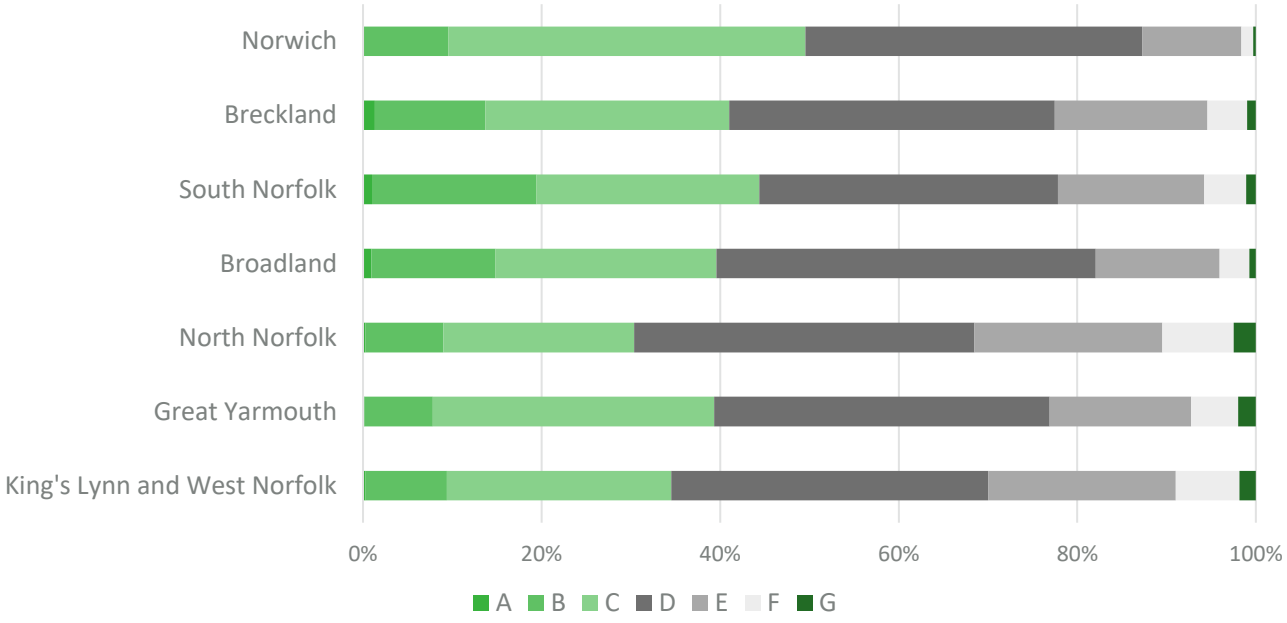
A thorough analysis of EPC data across Norfolk was carried out to estimate the potential range of low carbon measures as well as the key characteristics of the domestic building stock that may influence further analysis. The EPC analysis was carried out on adjusted sample of data with the results shown in **Figure 20**. Only 68% of domestic properties have an EPC record although more urban areas tend to have greater EPC coverage, for example nearly 80% of domestic properties in Norwich have an EPC record.

Figure 20: Percentage of properties with an EPC record



An EPC analysis of Norfolk's private housing stock reveals it to be less efficient than the rest of England. **Figure 21** shows on average 43.5% of properties in England have EPC ratings of A-C[20] compared to 39.9% in Norfolk, with all local authorities in Norfolk apart from Norwich and South Norfolk having a lower proportion of A-C band properties compared to the average across England. North Norfolk had the lowest proportion of well insulated homes with only 30.4% of properties having an EPC rating of A-C.

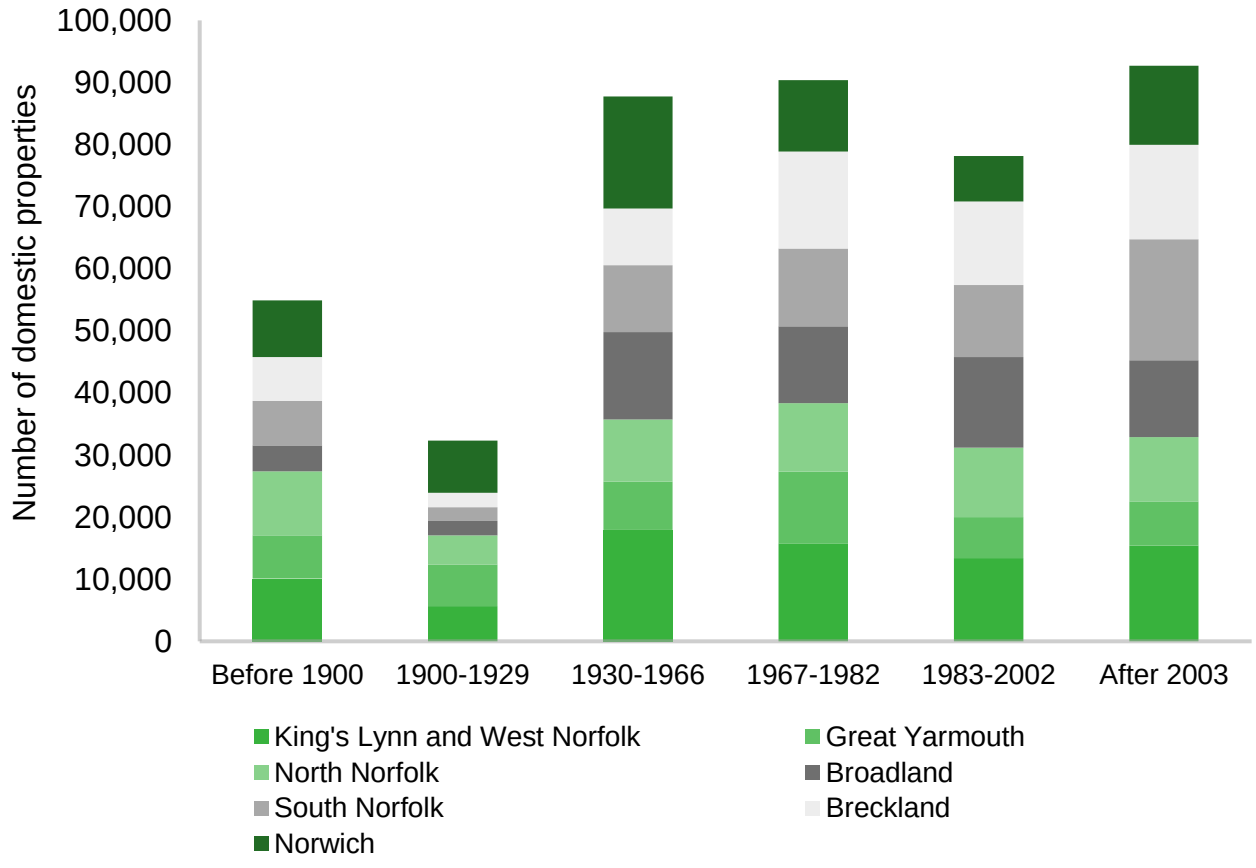
Figure 21: EPC ratings of domestic properties in Norfolk



[20] ONS (2022) Energy efficiency of Housing, England and Wales, country and region

Research led by the ONS suggests there is a strong correlation between the building age and energy efficiency[21]. As improved building techniques and more regulations have been introduced, buildings have generally become more efficient. For example, most houses built from 2012 and onwards achieve an EPC rating of A-C. This is due to measures such as loft insulation, double glazing and PVC doors now being standard practices. As well as initially being built with fewer considerations regarding energy efficiency, older dwellings are also more likely to depreciate over time, gradually reducing their energy efficiency with condition. These older houses, as well as usually being less energy efficient, can be more expensive to repair and often prove more difficult to retrofit, requiring greater considerations of interventions and suitable measures. Higher percentages of these homes will add to the challenge faced in reaching net zero. **Figure 22** shows the distribution of construction age of domestic properties in Norfolk. Around 14.5% of homes in Norfolk were built before 1900, which is broadly in line with the England average of 15%.

Figure 22: Construction age of domestic properties in Norfolk

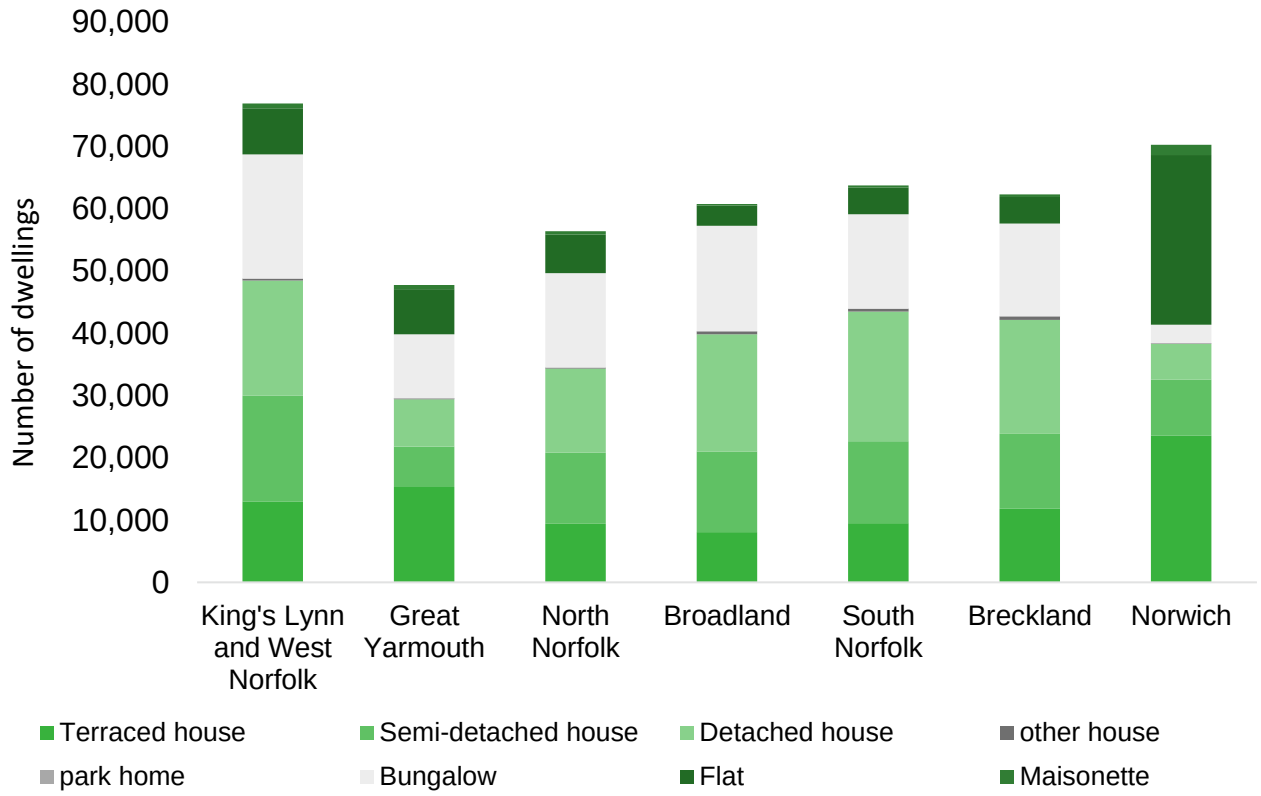


Property archetype is another significant factor that can determine both a buildings energy efficiency and viable retrofit measures. According to national ONS analysis, flats and maisonettes are more likely to achieve

[21]https://www.ons.gov.uk/peoplepopulationandcommunity/housing/articles/ageofthepropertyisthebiggestsinglefactorinenergyefficiencyofhomes/2021-11-01

higher EPC ratings, whereas detached homes were least likely to be rated C or higher[22]. In terms of retrofit options, while a detached house could consider investing in floor insulation and solar thermal panels, a mid-floor urban apartment will be more limited in their choice of building fabric and heating system upgrades. **Figure 23** shows the spread of domestic property types in Norfolk which indicate different localised strategies. For example, the high proportion of flats in Norwich for example indicates it could be more suitable for heat networks.

Figure 23: Types of domestic properties in Norfolk



Another important characteristic of Norfolk's housing stock is it has one of the largest "off-gas" areas in the UK. **Figure 24** shows that Norfolk has 36.9% of domestic dwellings off the gas grid with Norwich the only local authority with a lower proportion of off grid homes than the GB average. All other local authorities in Norfolk are considerably above both the Great Britain and East of England average for off-gas properties. In some local authorities such as Kings Lynn and West Norfolk, over half the properties are off the gas grid. This could significantly impact the trajectory for Norfolk to develop low carbon heating skills as off-gas grid properties are viewed by national government as an immediate priority. For example, as part of the UK's *Phasing out the installation of fossil fuel heating in homes off the gas grid* consultation, government

[22]https://www.ons.gov.uk/peoplepopulationandcommunity/housing/articles/ageofthepropertyisthebiggestsinglefactorinenergyefficiencyofhomes/2021-11-01

proposed ending new fossil fuel heating installations in homes off the gas grid from 2026. Their suggested approach was a "heat pump first" strategy, only considering other heating systems where heat pumps cannot reasonably or practicably be installed[23].

Figure 24: Percentage of Norfolk properties that are off the gas grid

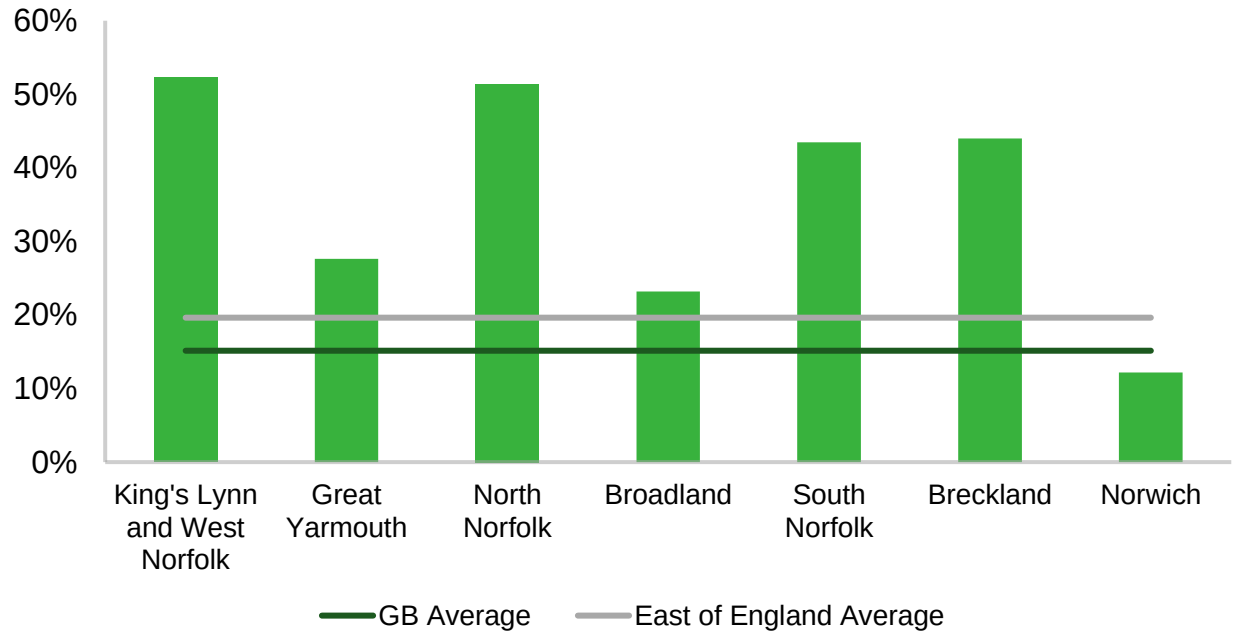
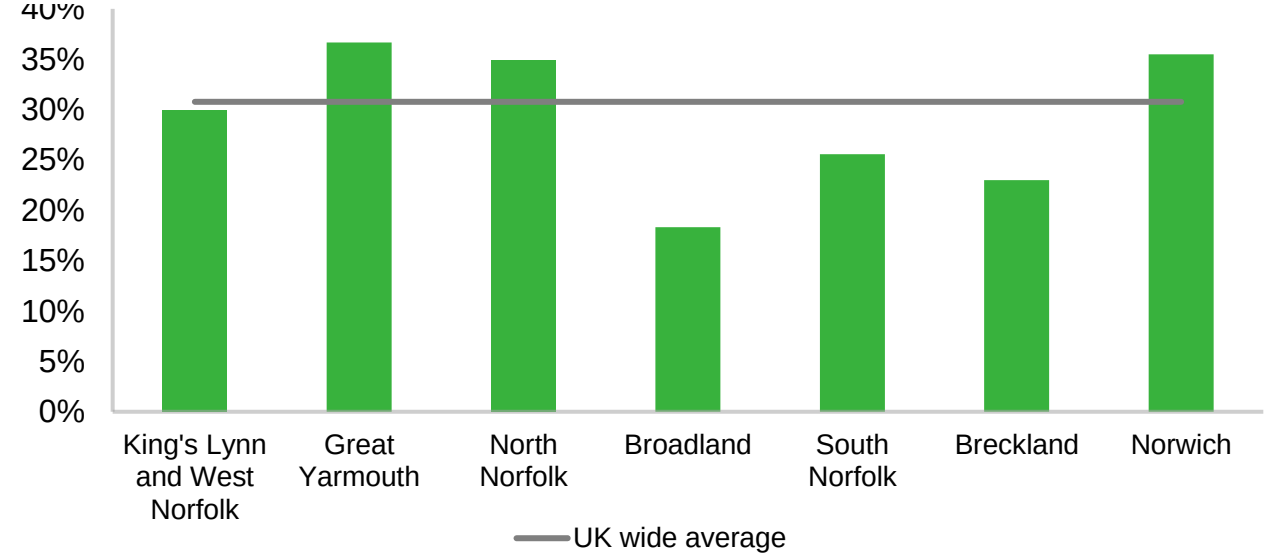


Figure 25 suggests that around 29% of properties in Norfolk have solid walls, just lower that the UK average of 31% although this difference is likely due to the selection bias present in EPC data. The prevalence of solid walled properties is a key influencing factor when assessing routes to decarbonising the building stock.

Figure 25: Percentage of domestic properties with solid walls in Norfolk



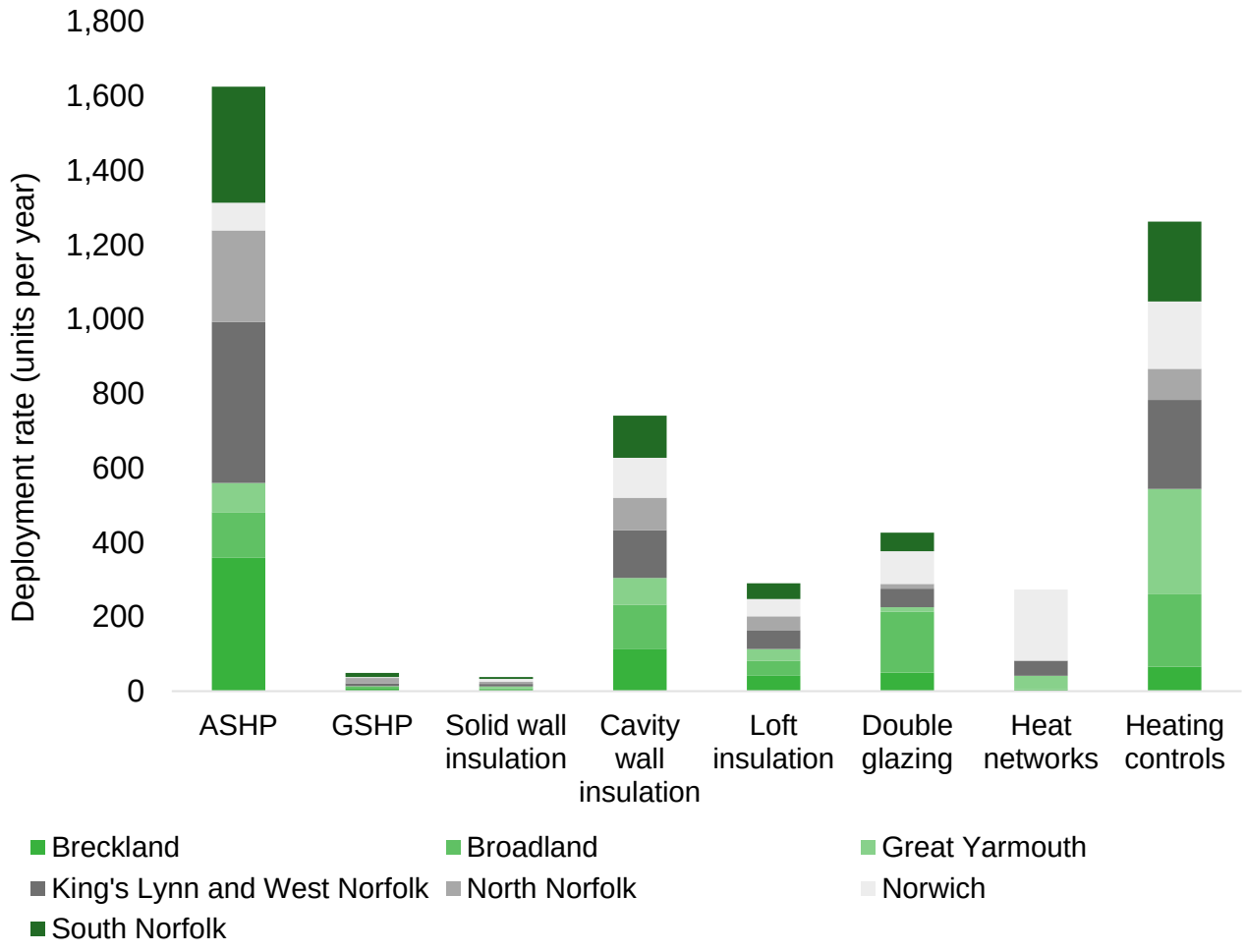
[23] https://www.gov.uk/government/consultations/phasing-out-fossil-fuel-heating-in-homes-off-the-gas-grid

Traditionally, older properties have solid walls as opposed to cavity walls found in more modern properties. Solid walled properties are more difficult and expensive to insulate requiring external or internal solid wall insulation due to the long installation time of around 20 days. As a result, solid walled properties have tended to be neglected by previous efforts to improve the energy efficiency of the building stock resulting in a large stock of poorly insulated solid walled properties.

Norfolk's Current Retrofit and Low Carbon Heating Deployments

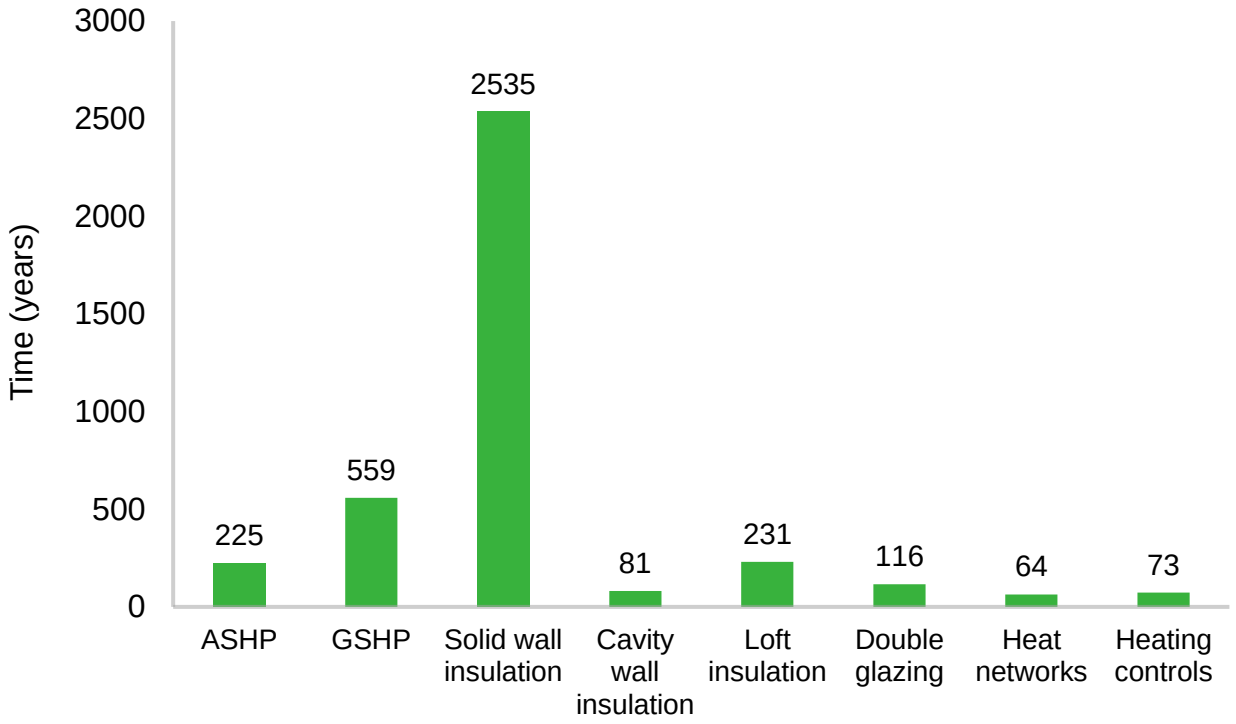
Current deployment rates across a range of energy efficiency and low carbon heating technologies are mixed. Data presented in **Figure 26** shows Norfolk has a good level of air source heat pump, cavity wall and heating controls installations but very low solid wall and ground source heat pump installations. This reflects the relative expense of these measures, with solid wall and ground source heat pumps being much more expensive options compared to the other measures. It's also worth noting the high level of heat network installations in Norwich, possibly due to the high number of flats which are suited to this heating type.

Figure 26: Current deployment of retrofit measures in Norfolk



Based on the existing installation rates, it would take Norfolk 225 years to install enough air source heat pumps and over 2500 years to install enough solid wall insulation. This is driven by the very low number of installations being carried out.

Figure 27: Estimated time to meet required installations at the current rate



Retrofit Projections for Norfolk to Meet a 2030 Net Zero Target

Figure 28 represents the total number of installations needed in energy efficiency and low carbon heating technologies for Norfolk to reach net zero in domestic and non-domestic buildings respectively. As **Figure 29** illustrates, domestic buildings make up most of the installations. For low carbon heating for example, approximately 350,000 air source heat pump installations are needed to meet the Norfolk's net zero target which is considerably more than any other measure. The high level of solid will insulation is also interesting vs cavity wall insulation, loft insulation and heating controls which suggests the easier wins in insulation have been completed. Based on the housing stock analysis, Gemserv estimated 38% of the housing stock needs at least one insulation measure installed for the county to meet its net zero requirements. However, in some areas this figure is higher with over half of properties in Great Yarmouth requiring at least one insulation measure.

Figure 28: Total required installations in Norfolk (domestic & non-domestic)

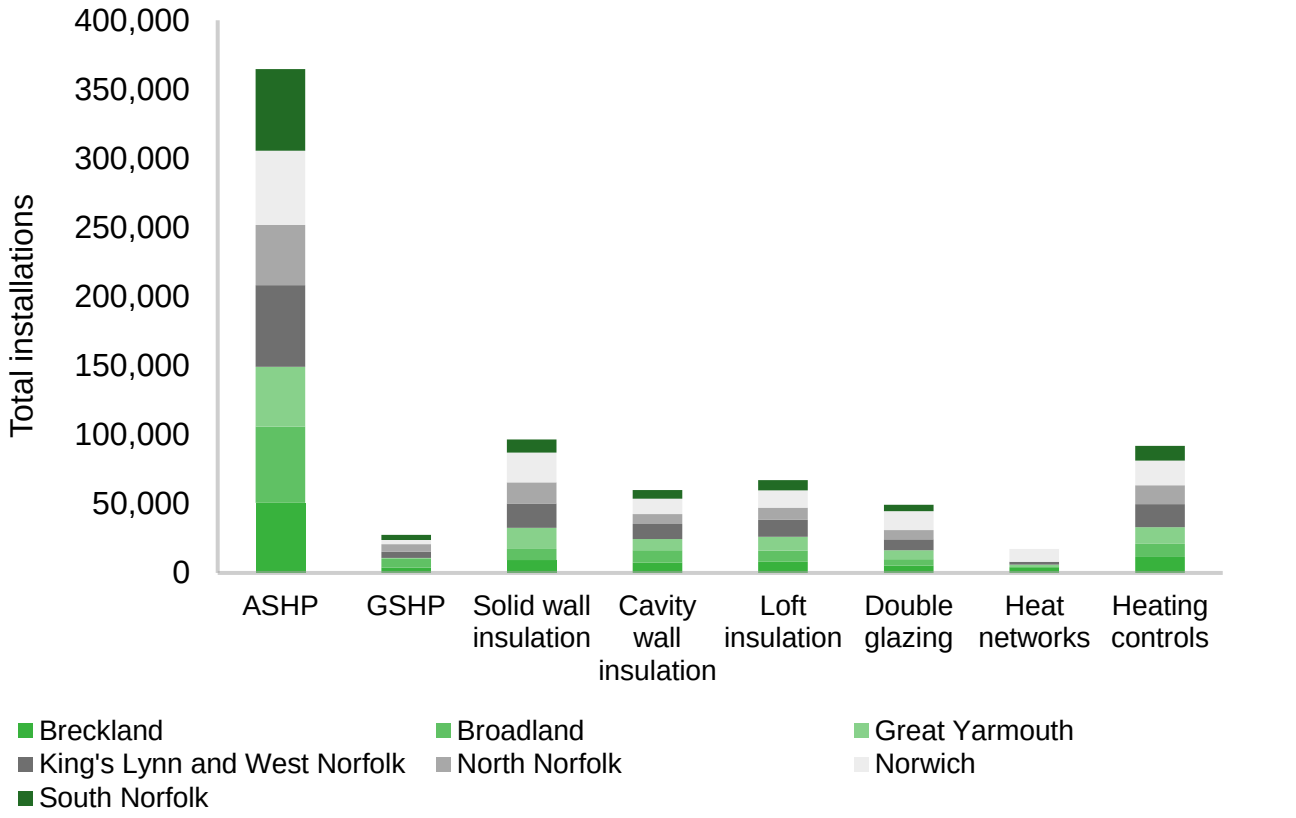


Figure 29: Total required domestic installations (Norfolk)

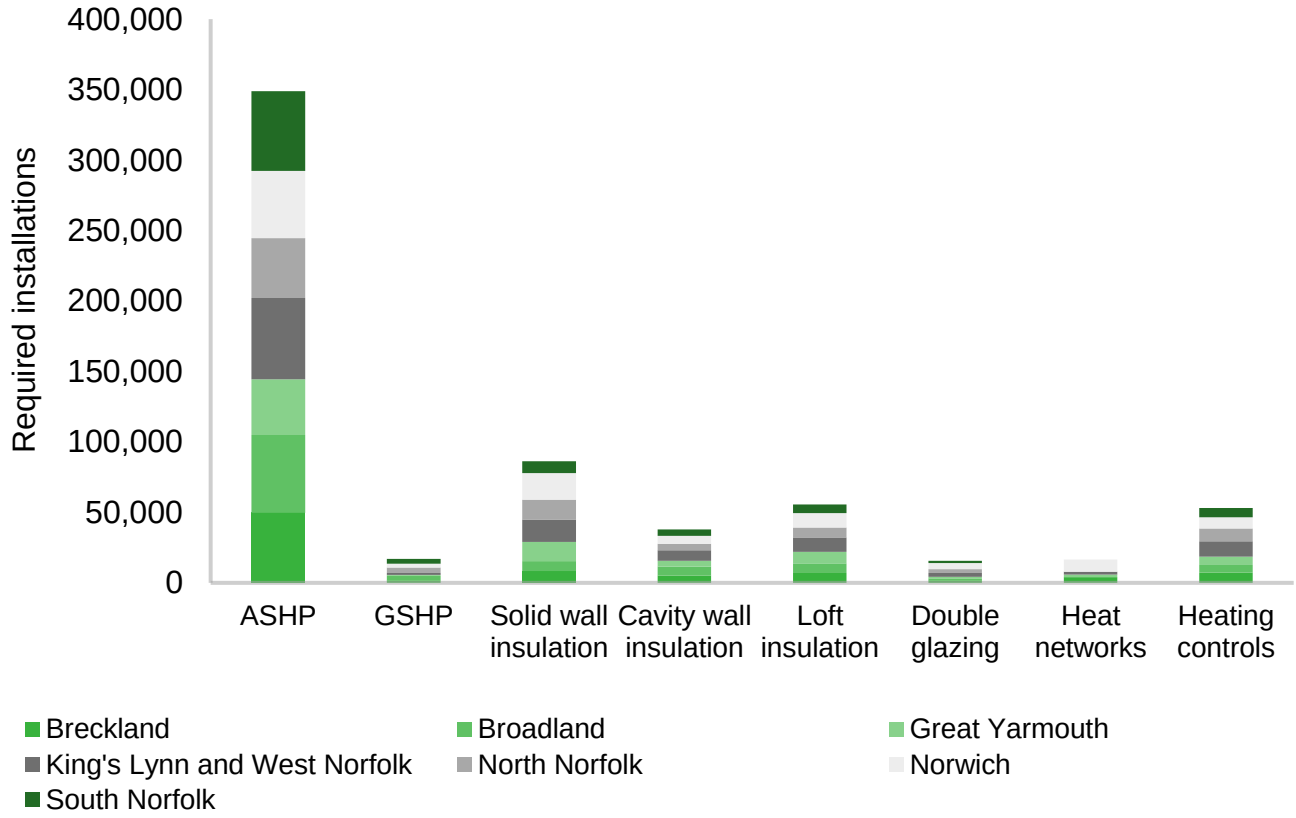
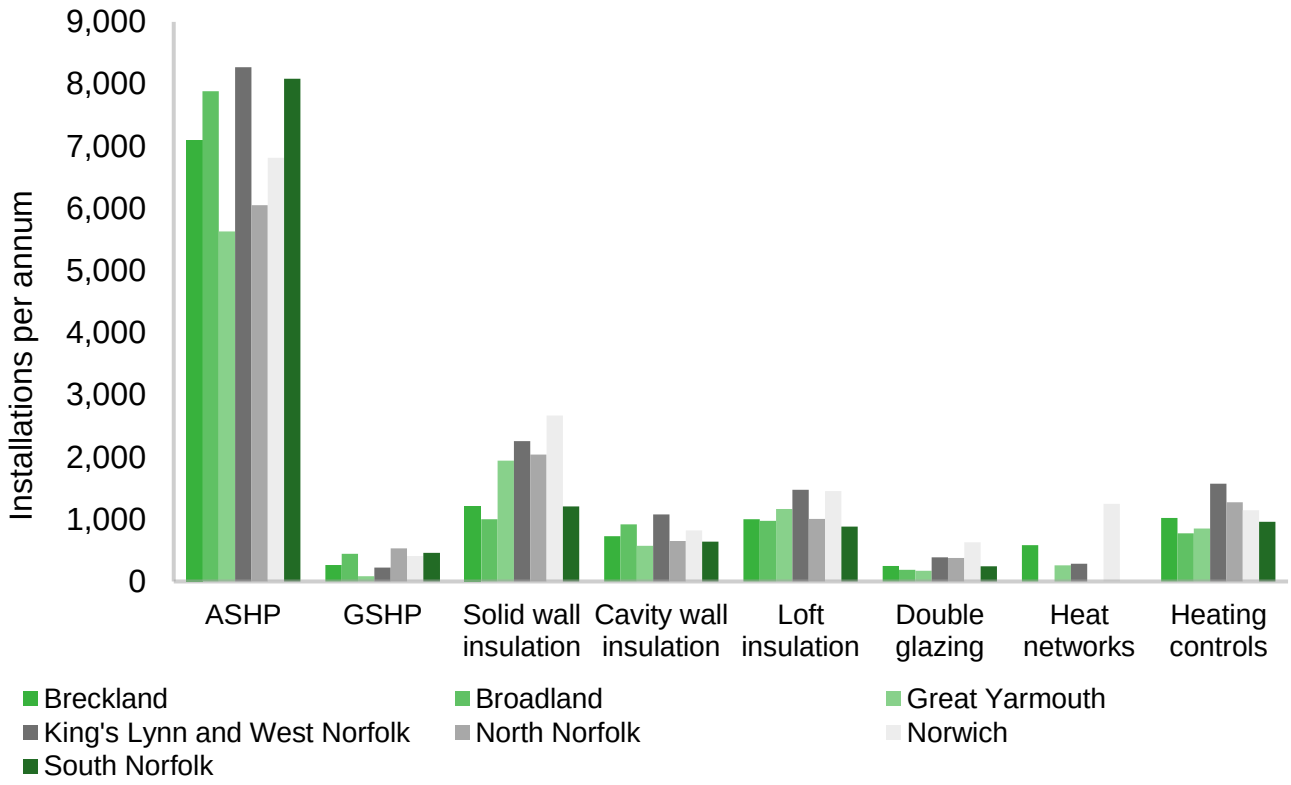


Figure 30 uses linear installation rate of heat pumps to provide a rough heat pump installation rate per year. The numbers suggest this would equate to around 45,000 installations per year from 2023 to 2030 – or just over 120 installations per day. There are some local authority differences, with Great Yarmouth requiring lower levels of air source heat pump installations compared to Broadland or South Norfolk. Whereas Norwich requires a high number of heat network and solid wall insulation installations vs Broadland or Breckland. These nuances can help local authorities adequately plan their retrofit activities and understand what they're local installer base should be skilled for.

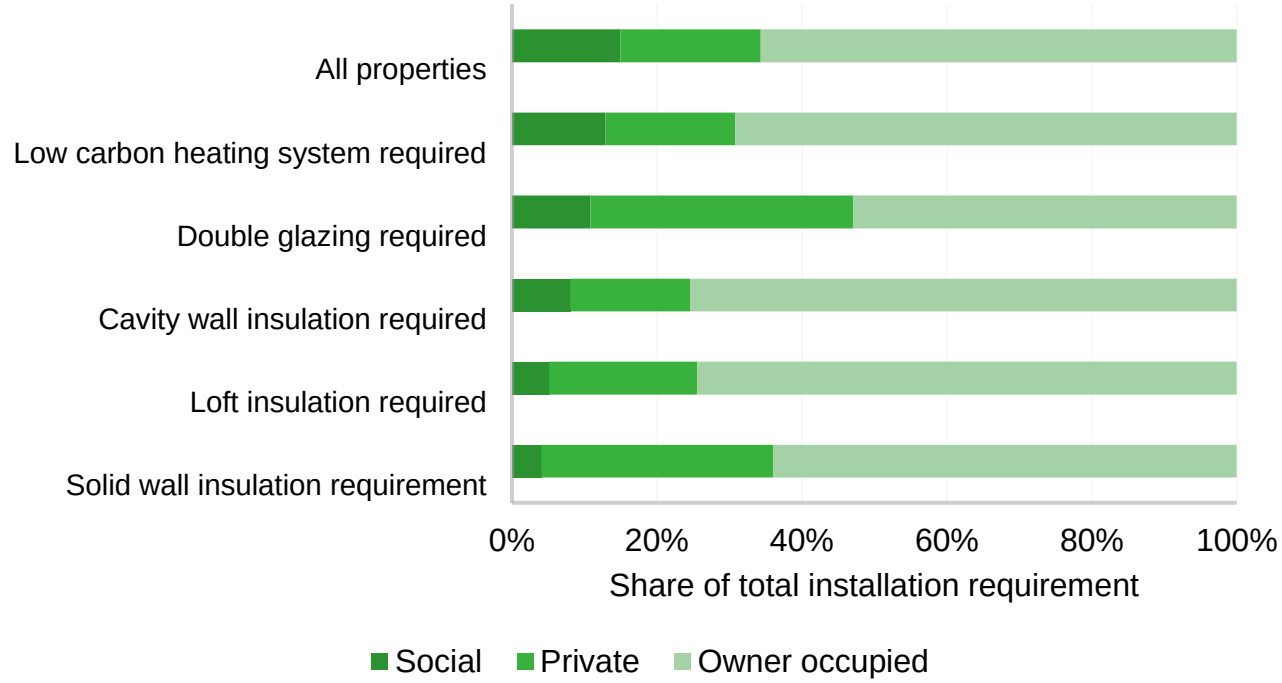
Figure 30: Annual installations needed to decarbonise domestic buildings by 2030



Gemserv also conducted a separate analysis to understand the retrofit requirement by tenure type. Based on the EPC analysis, **Figure 31** shows that 15% (56,677) of the domestic property stock are socially rented[24]. Of the social housing stock, 71% require retrofitting with a low carbon heating system and 17% with energy efficiency measures. This is lower than the share for owner occupied homes, with 40% of owner-occupied homes requiring insulation measures and 86% requiring low carbon heating systems. Similarly for private rented properties, the requirements are higher as a proportion of all private rented domestic properties when compared with socially rented homes. Over 50% of privately rented properties require insulation measures and 76% require a low carbon heating system.

[24] Note that this is based only on homes with a valid tenure response in their EPC record.

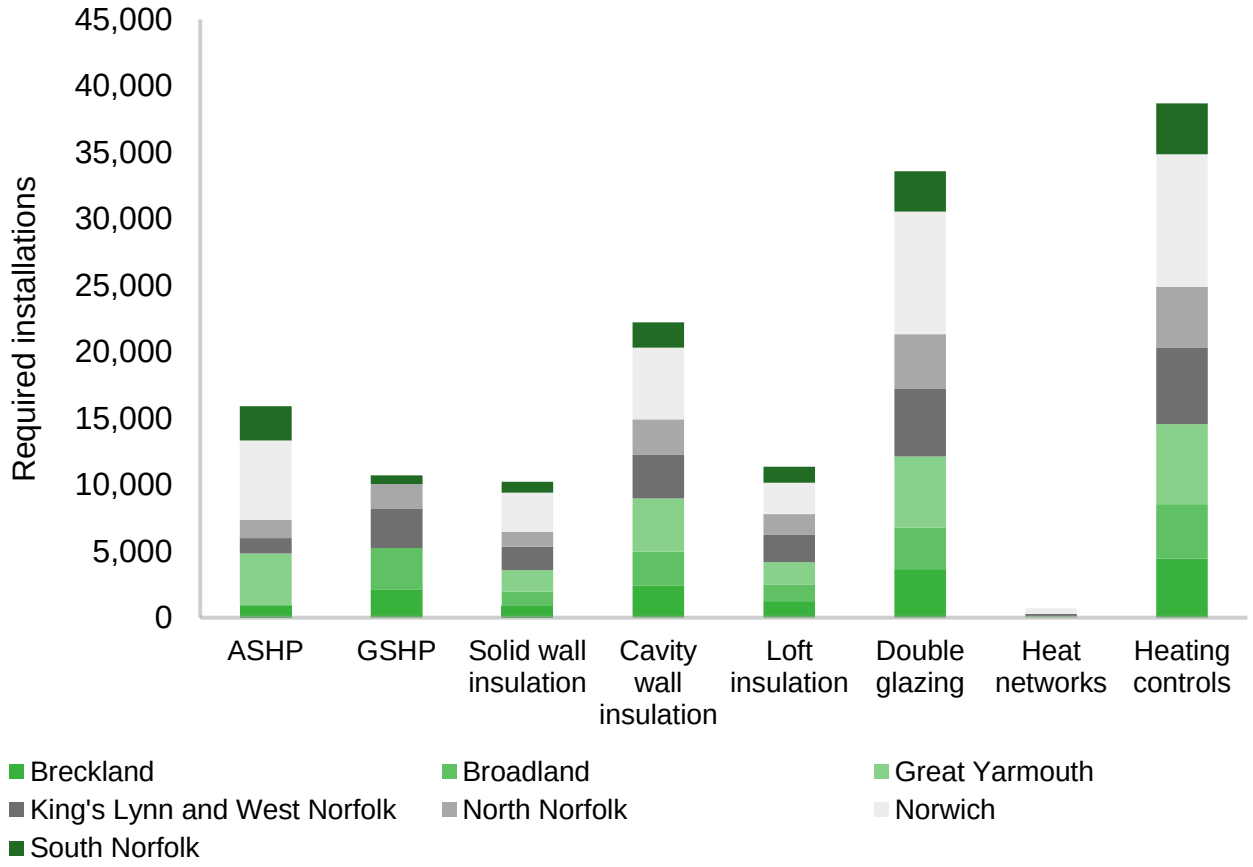
Figure 31: Requirement for retrofit measures by tenure



These results appear logical as councils and social housing providers are incentivised to retrofit properties due to their obligations towards tenants and their net zero commitments. The high share of privately rented properties requiring retrofit is potentially due to misaligned incentives for the private tenants and landlords to retrofit the property. As for owner-occupied properties, the high level of retrofit can be explained by lack of awareness, access to adequate private finance mechanisms and conflicting consumer purchasing priorities.

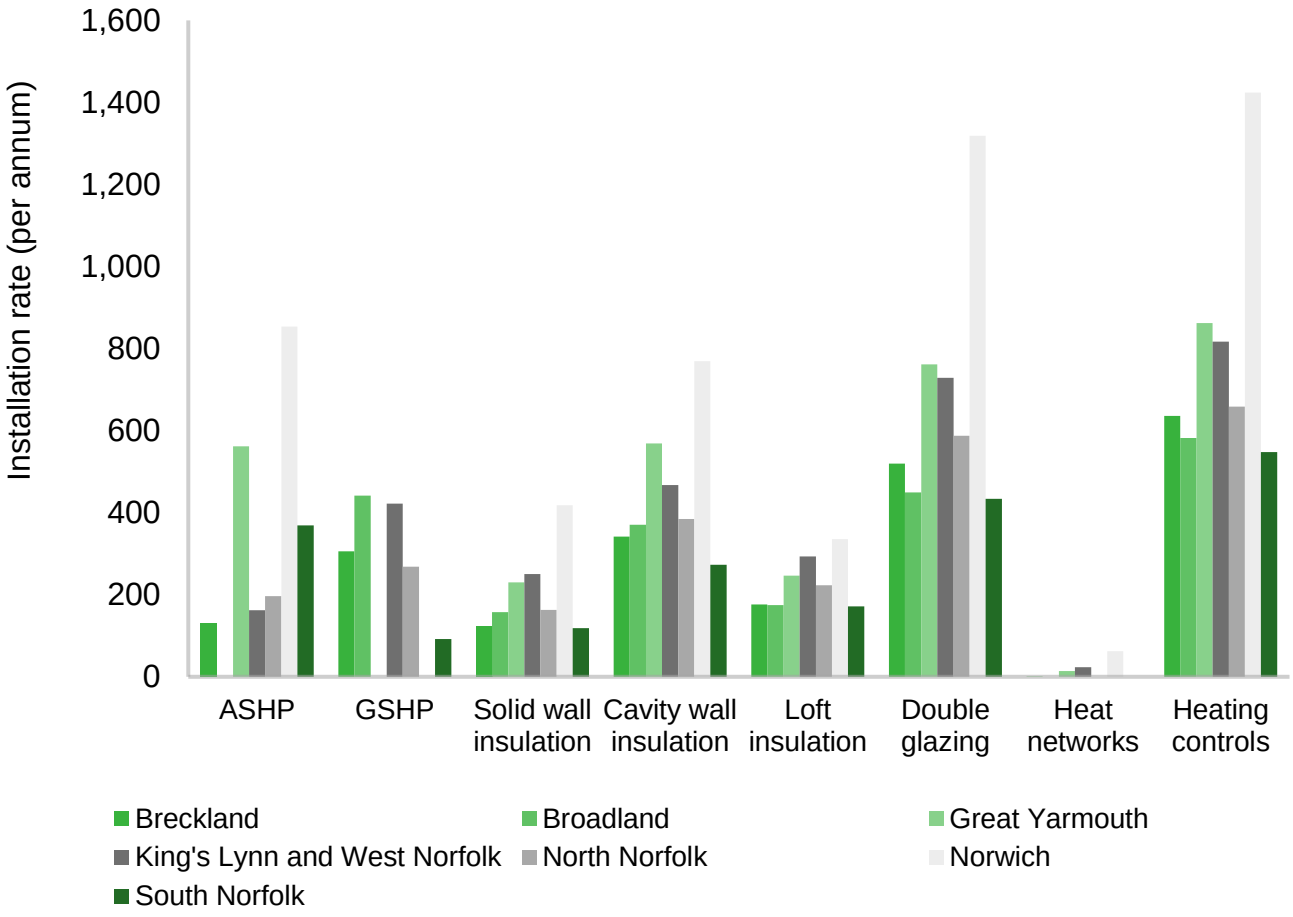
The non-domestic building stock makes up a much lower proportion of the total building stock than domestic building. This includes buildings such as retail offices, factories and schools which often have their own retrofitting challenges. Unlike domestic properties, easier to install measures such as cavity wall insulation, double glazing and heating controls dominate the numbers. Another interesting difference is the prevalence of ground source heat pumps, reflecting the typically large building sizes.

Figure 32: Required installations to decarbonise non-domestic buildings



Annual installation rates vary massively across local authorities. Air source heat pumps are more popular in Norwich, potentially due to space constraints being an urban area. Ground source heat pumps are more common in rural areas with more space. Norwich also requires a higher proportion of easier to adopt energy efficiency measures such as cavity wall insulation, double glazing, and heating controls.

Figure 33: Annual installations to decarbonise non-domestic buildings by 2030

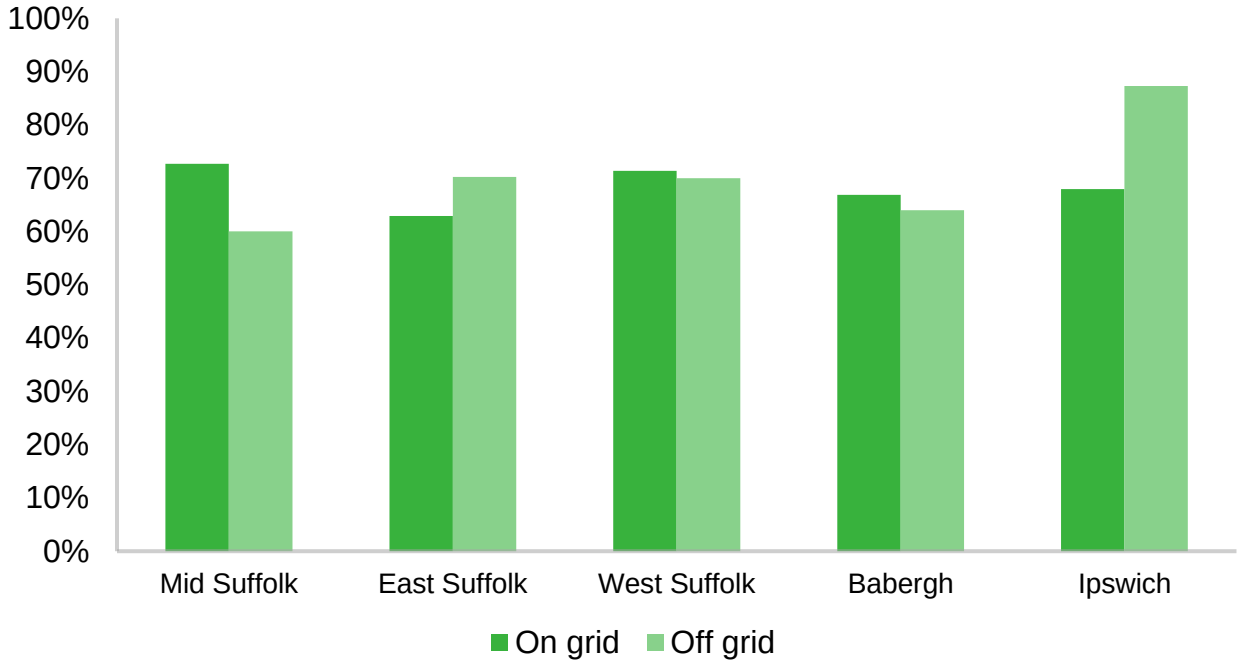


SUFFOLK'S BUILDING STOCK AND DEPLOYMENT NEED FOR 2030

Introduction to Suffolk's Building Stock

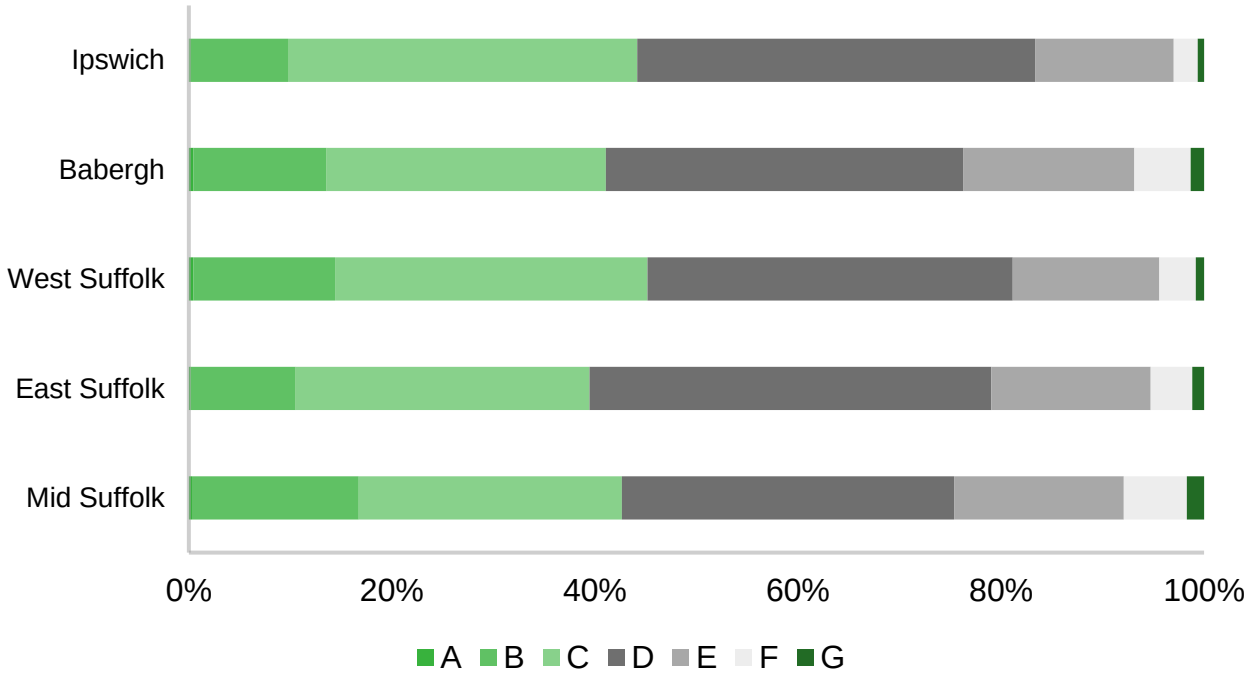
Figure 34 shows the EPC analysis that was carried out on adjusted sample of data. Only 67% of domestic properties have an EPC record although more urban areas tend to have greater EPC coverage, for example around 71% of domestic properties in Ipswich have an EPC record.

Figure 34: Percentage of properties with an EPC record



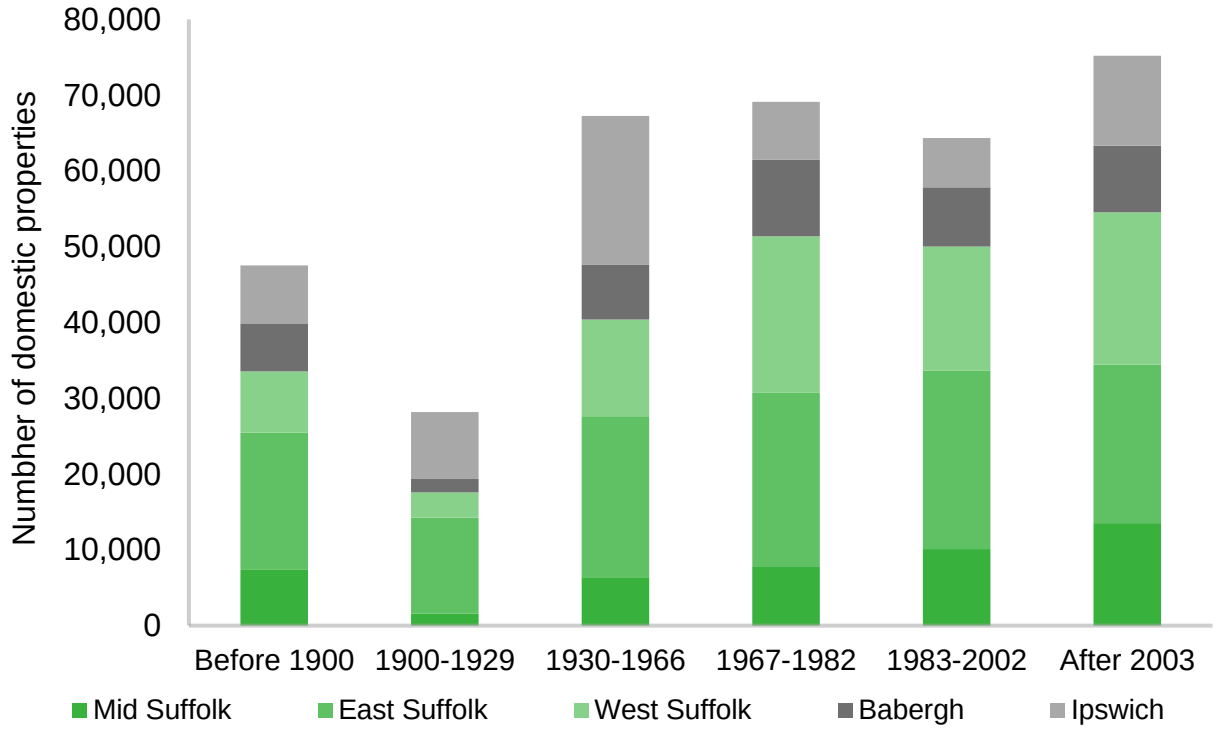
An evaluation of the housing stock that do have EPCs revealed that Suffolk's private housing stock has comparable levels of efficiency to the UK average. **Figure 35** shows 42% of properties have an EPC rating of A-C compared to 44% over the whole of the UK. West Suffolk has the highest share of well insulated homes with 45.2% properties having an EPC rating of A-C compared to East Suffolk with the lowest share at 39.5%.

Figure 35: EPC rating of properties in Suffolk



Research led by the ONS suggests there is a strong correlation between the building age and energy efficiency[25]. As improved building techniques and more regulations have been introduced, buildings have generally become more efficient. For example, most houses built from 2012 and onwards achieve an EPC rating of A-C. This is due to measures such as loft insulation, double glazing and PVC doors now being standard practices. Furthermore, older dwellings are also more likely to depreciate over time, reducing their energy efficiency over time. **Figure 36** shows the spread of construction age of domestic properties in Suffolk, with 17% of homes in Suffolk were built before 1900 which is slightly higher than the England average of 15%.

Figure 36: Construction age of domestic properties in Suffolk

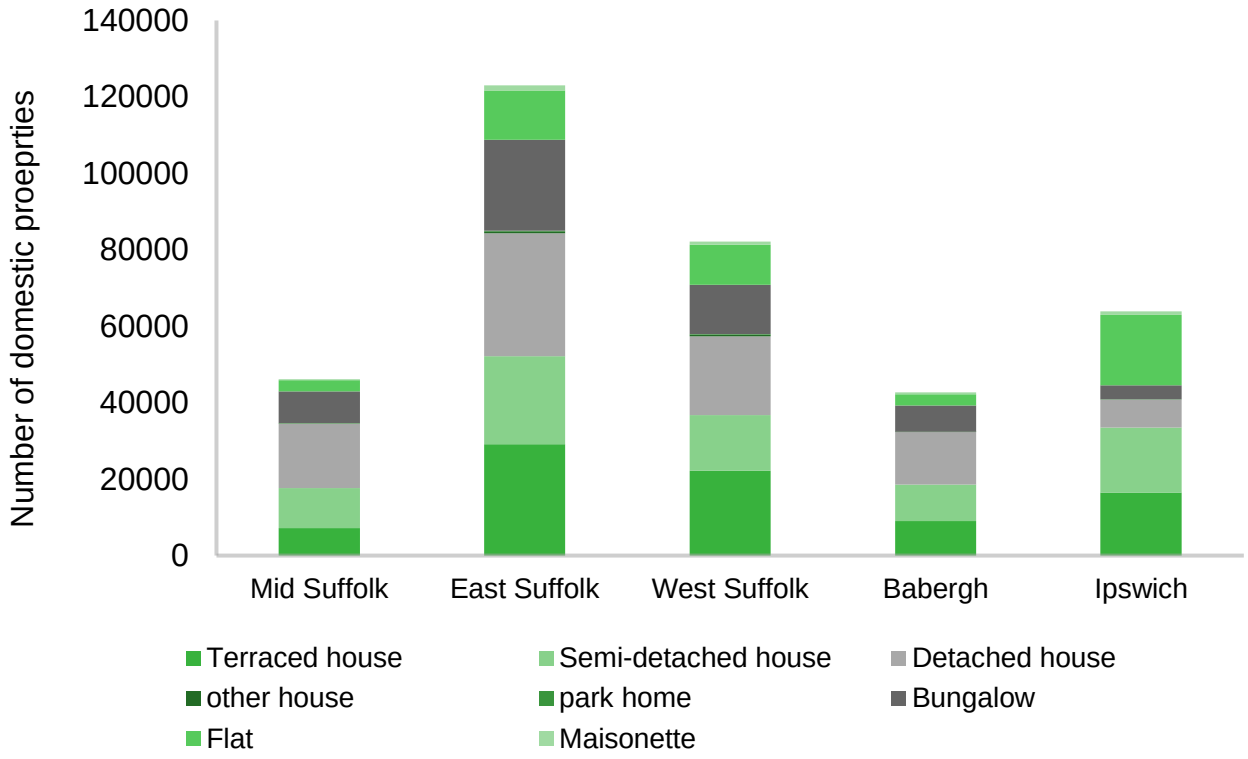


Property type is another significant factor that can determine both a dwelling's energy efficiency and possible retrofit measures. According to national ONS analysis, flats and maisonettes are more likely to achieve higher EPC ratings, whereas detached homes were least likely to be rated C or higher[26]. In terms of retrofit options, while a detached house could consider investing in floor insulation and solar thermal panels, a mid-floor urban apartment will be more limited in their choice of building fabric and heating system upgrades. **Figure 37** shows Ipswich has a high proportion of flats potentially making it more suitable

[25]https://www.ons.gov.uk/peoplepopulationandcommunity/housing/articles/ageofthepropertyisthebiggestsinglefactorinenergyefficiencyofhomes/2021-11-01
[26]https://www.ons.gov.uk/peoplepopulationandcommunity/housing/articles/ageofthepropertyisthebiggestsinglefactorinenergyefficiencyofhomes/2021-11-01

for heat networks whereas East Suffolk's high proportion of detached houses and bungalows could make ground and air source heat pumps viable if correctly insulated.

Figure 37: Types of properties in Suffolk

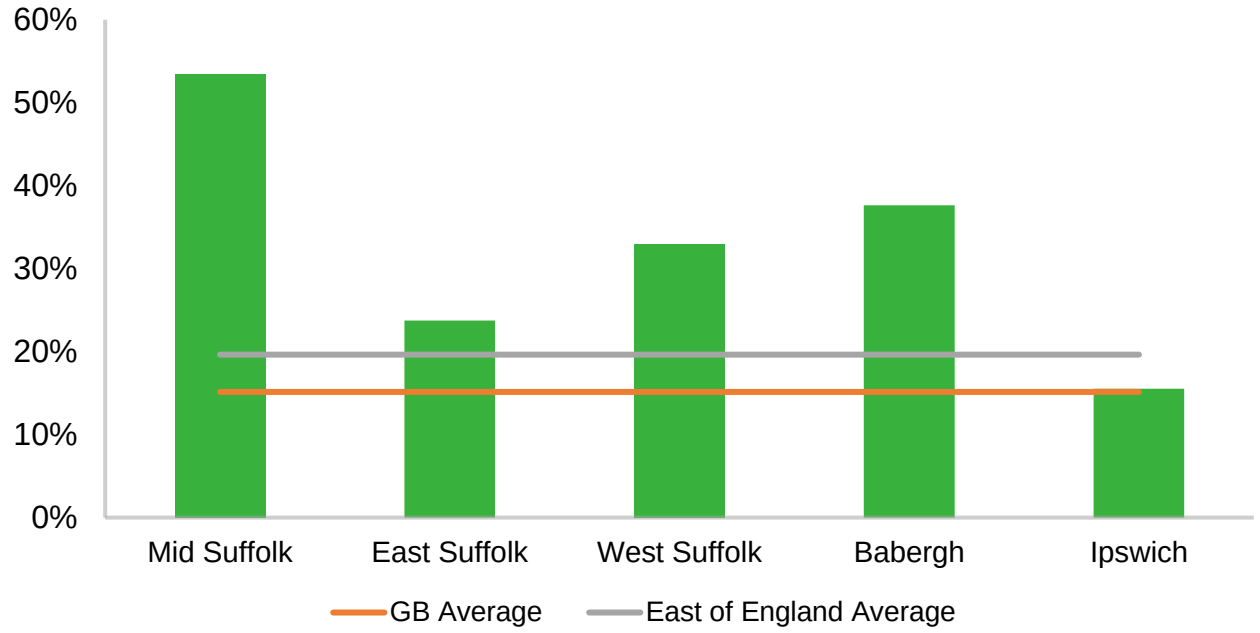


Another important characteristic of Suffolk's housing stock is it has one of the largest "off-gas" areas in the UK. **Figure 38** highlights that 30% of the domestic properties are off the gas grid, twice as high as the average for Great Britain standing at around 15%. Nearly all local authorities have a share of off-grid properties greater than the average for Great Britain and the average for entire East of England except for the more urban area of Ipswich. Mid Suffolk have over 50% off-gas grid households making the need to transition to alternate heating systems particularly pronounced.

This could impact the trajectory for Suffolk to develop low carbon heating skills as off-gas grid properties are viewed by national government as an immediate priority. For example, as part of the UK's *Phasing out the installation of fossil fuel heating in homes off the gas grid* consultation, government proposed ending new fossil fuel heating installations in homes off the gas grid from 2026. Their suggested approach was a "heat pump first" strategy, only considering other heating systems where heat pumps cannot reasonably practicably be installed[27]

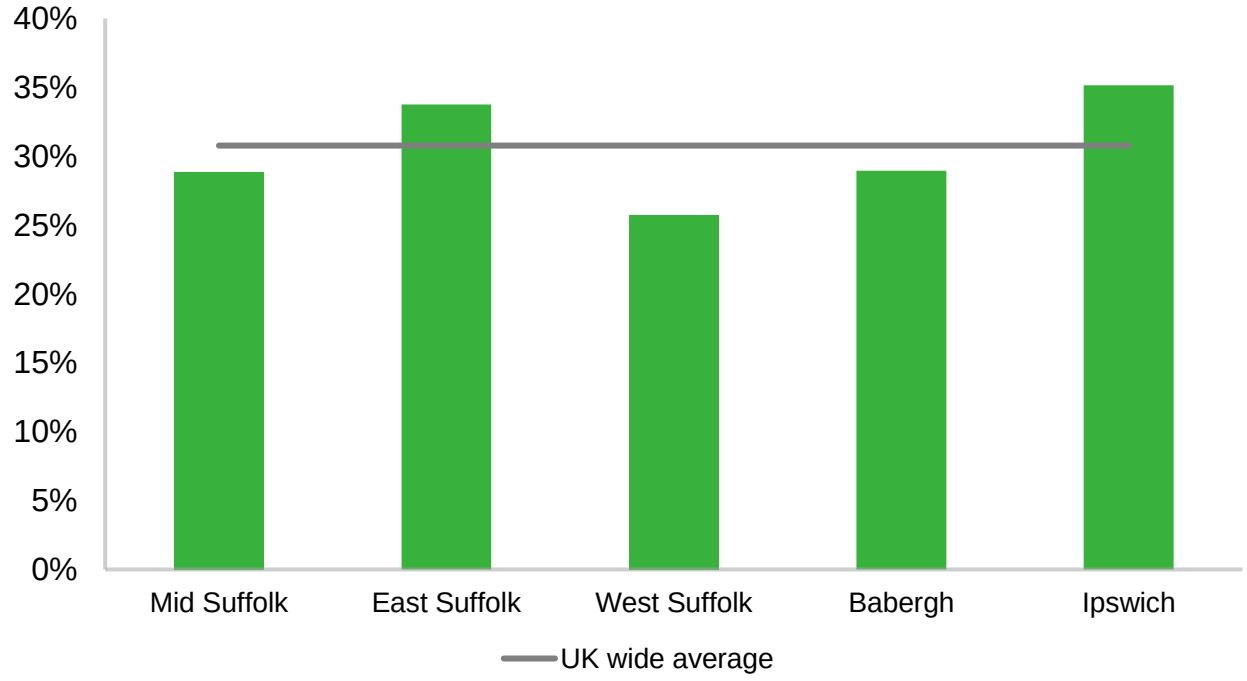
[27] https://www.gov.uk/government/consultations/phasing-out-fossil-fuel-heating-in-homes-off-the-gas-grid

Figure 38: Percentage of Suffolk properties that are off the gas grid



The prevalence of solid wall properties is another important factor and often comes with having an older building stock. Solid walled properties tend to be harder to insulate than cavity walled properties and so have historically been neglected when it comes to insulation roll out. Housing stock data shows 31% of properties in Suffolk have solid walls which is the exact same as the UK average. As **Figure 39** shows, areas like Ipswich and East Suffolk are above the UK average whereas West Suffolk are considerably below.

Figure 39: Percentage of properties with solid walls



Suffolk's Current Retrofit and Low Carbon Heating Deployments

***Figure 40** shows the current deployment rates across a range of energy efficiency and low carbon heating technologies are low. Based on the existing installation rates outlined in*

Figure 41, it would take Suffolk 2742 years to install enough solid wall insulation and 274 years to install enough air source heat pumps. However, compared to the UK average, Suffolk's low carbon heating installation rates are above the national average with 23 MCS accredited installs of low carbon heating systems per 1000 households compared to the national average of 7.

Figure 40: Current deployment of retrofit measures in Suffolk

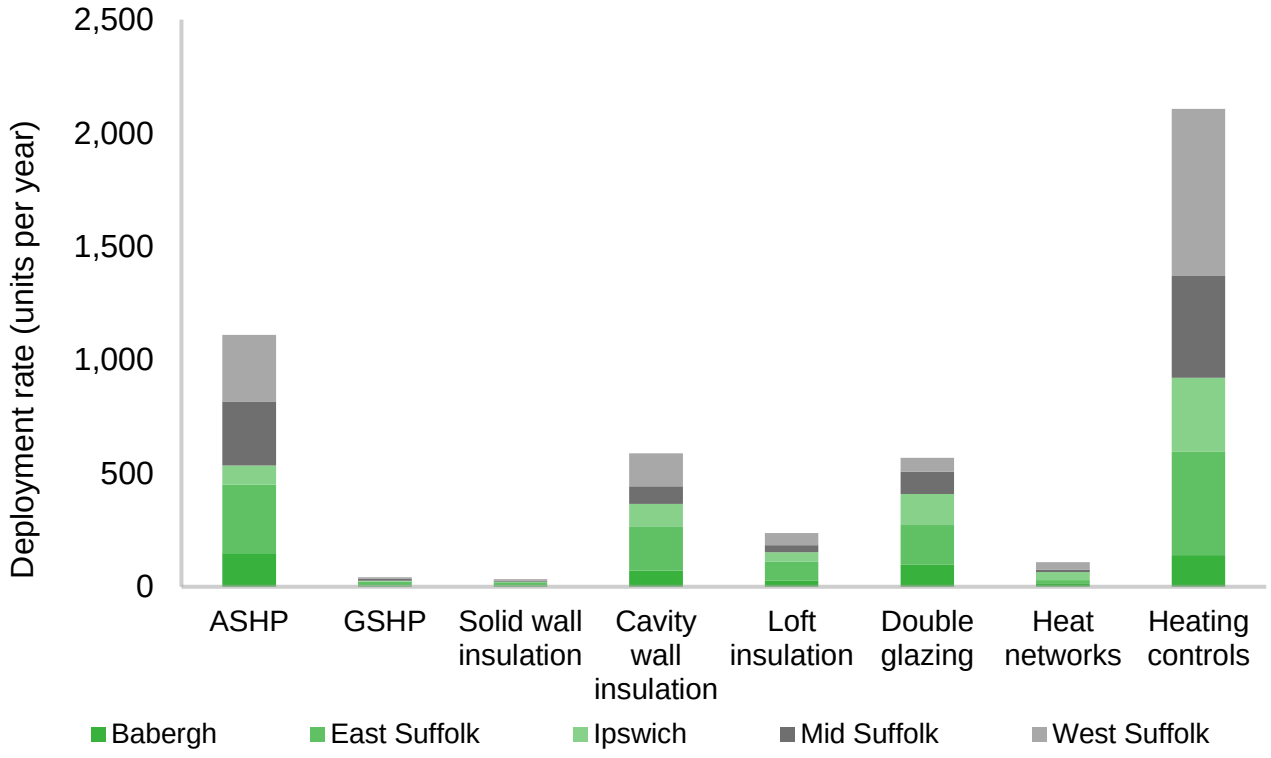
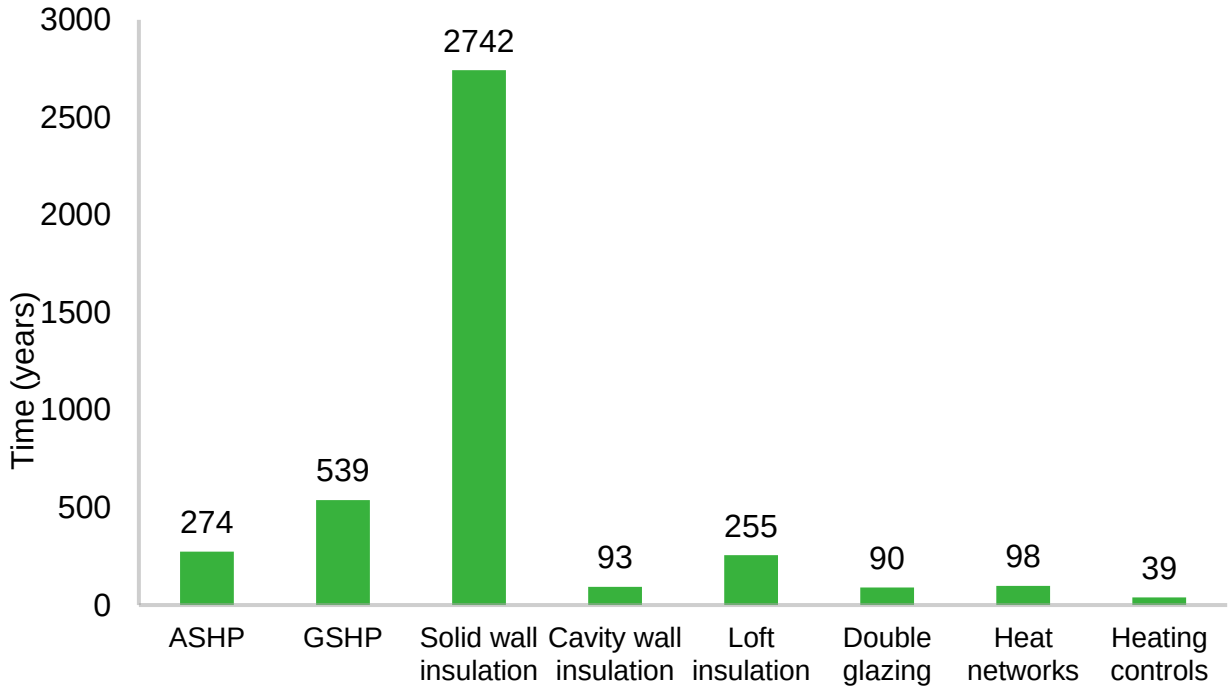


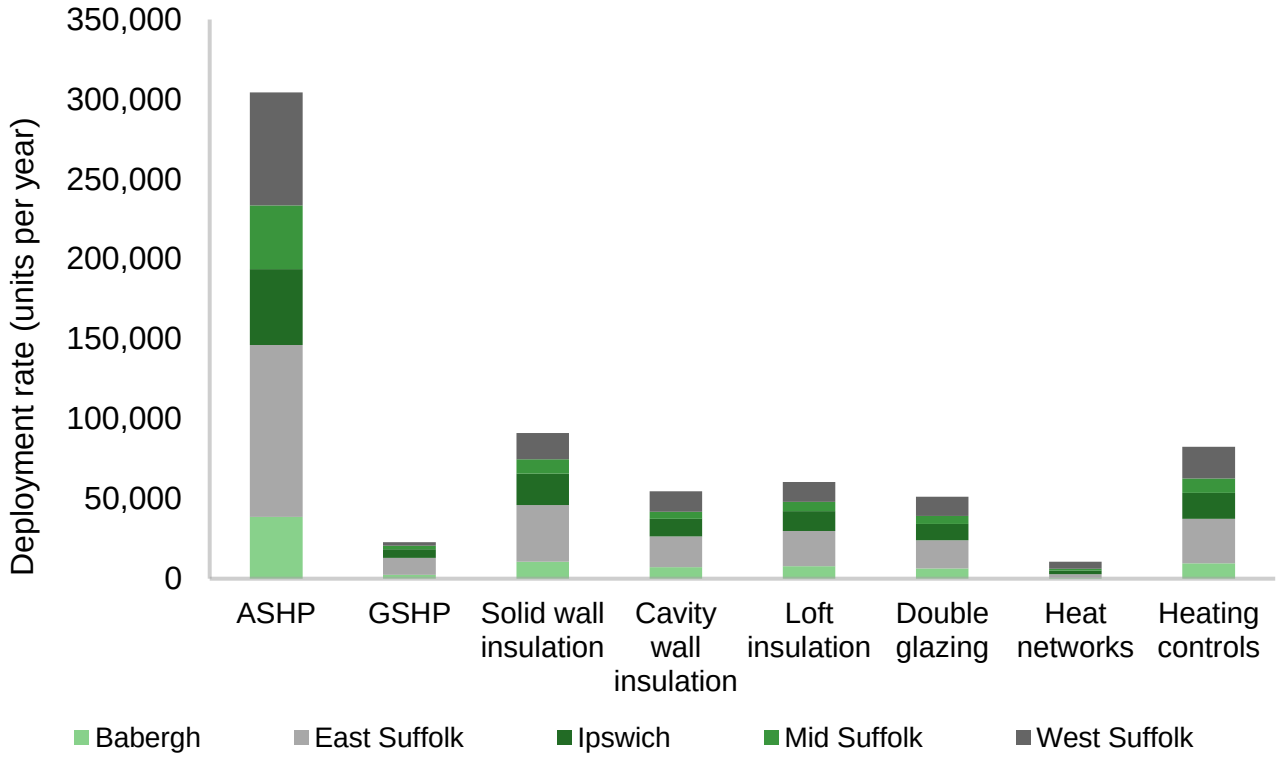
Figure 41: Time taken to decarbonise the building stock in Suffolk at the current rate



Retrofit Projections for Suffolk to Meet a 2030 Net Zero Target

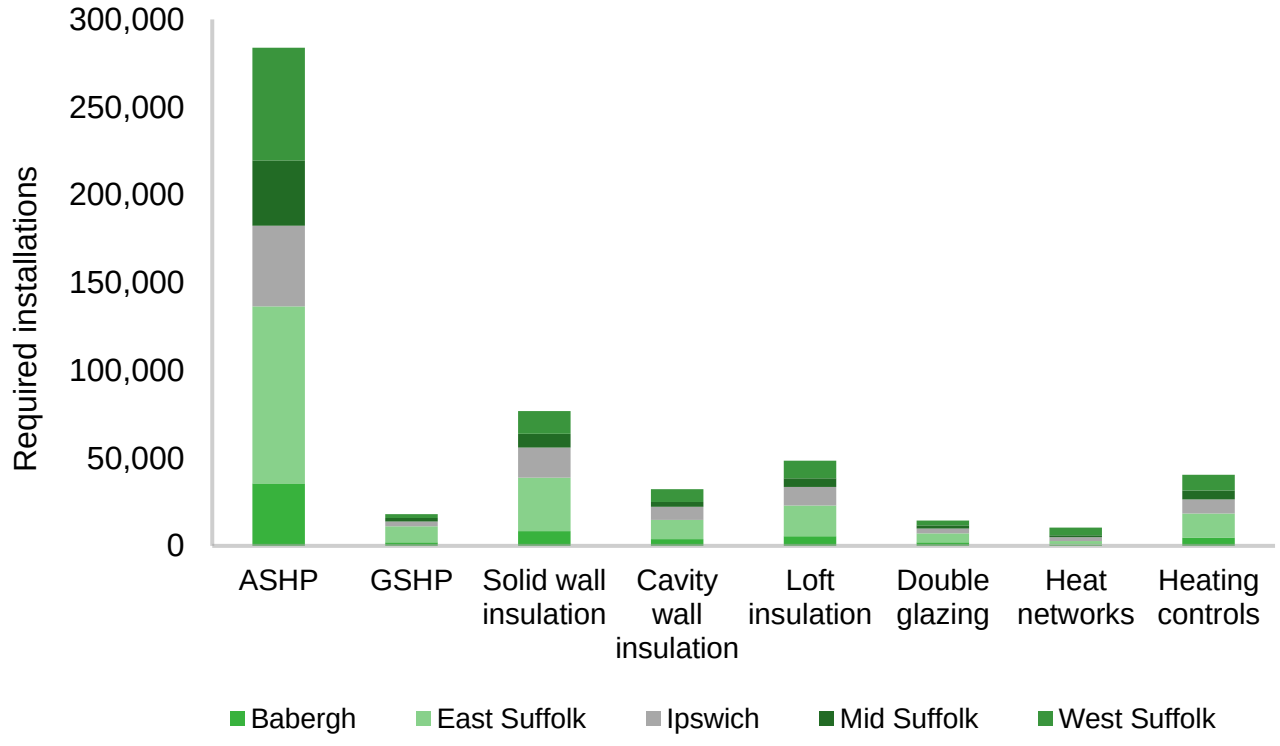
Figure 42 outlines the total number of installations needed in energy efficiency and low carbon heating technologies for Suffolk to reach net zero in domestic and non-domestic buildings respectively.

Figure 42: Total required installations in Suffolk (domestic & non-domestic)



For domestic buildings, **Figure 43** shows that over 250,000 air source heat pump installations are needed to meet the Suffolk's net zero target which is considerably more than any other measure. The high level of solid wall insulation is also interesting vs slightly lower cavity wall insulation, loft insulation, double glazing and heating controls.

Figure 43: Total domestic installations required in Suffolk

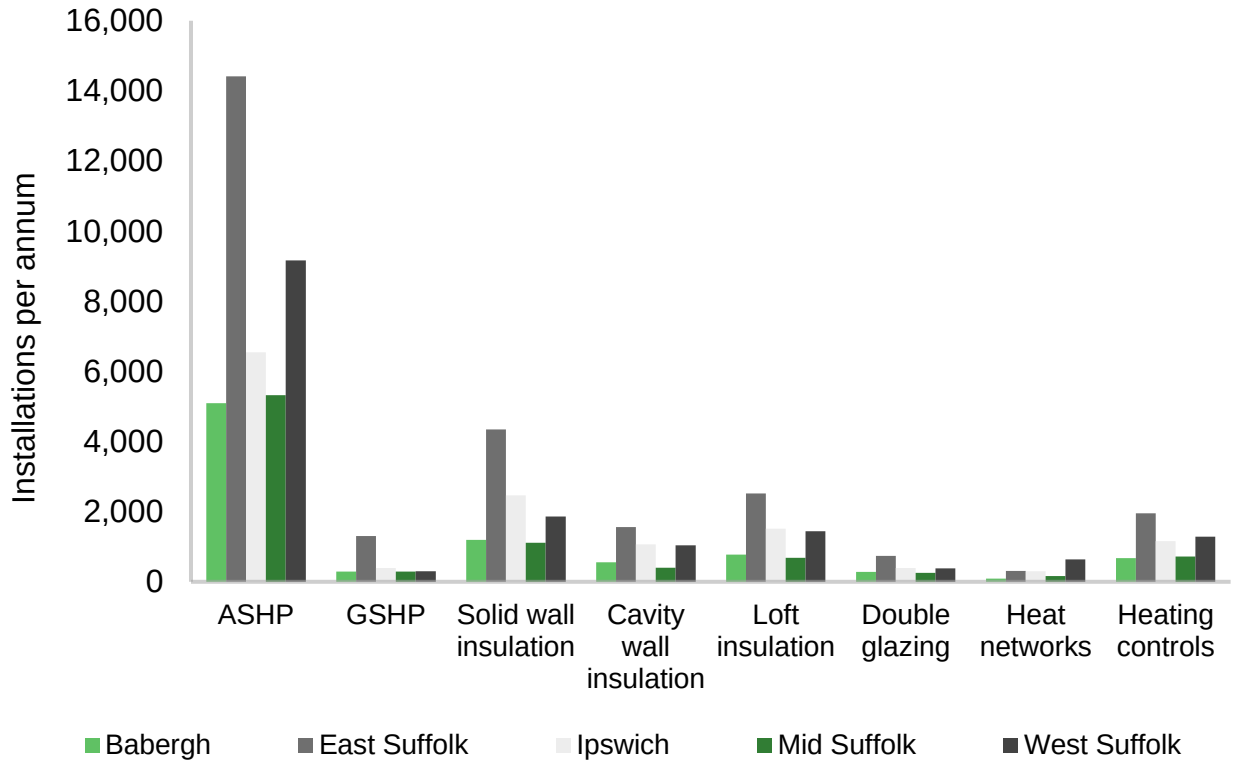


This suggests there's some scope for easier wins in insulation, especially in heating controls, but solid wall will be a challenge, especially in East Suffolk. Gemserv estimates that 43% of the housing stock will need at least one insulation measure installed for the county to meet its net zero requirements. In some areas this is even higher with over half the properties in Ipswich requiring at least one insulation measure.

Analysis represented in

Figure 44 shows that a linear installation rate of heat pumps would equate to over 30,000 installations per year from 2023 to 2030. This means just over 80 installations would need to occur per day until 2030. East Suffolk stands out prominently as requiring the most installations across all the retrofit measures apart from heat networks. These nuances can help local authorities adequately plan their retrofit activities and understand what they're local installer base should be skilled for.

Figure 44: Annual installations to decarbonise domestic buildings by 2030

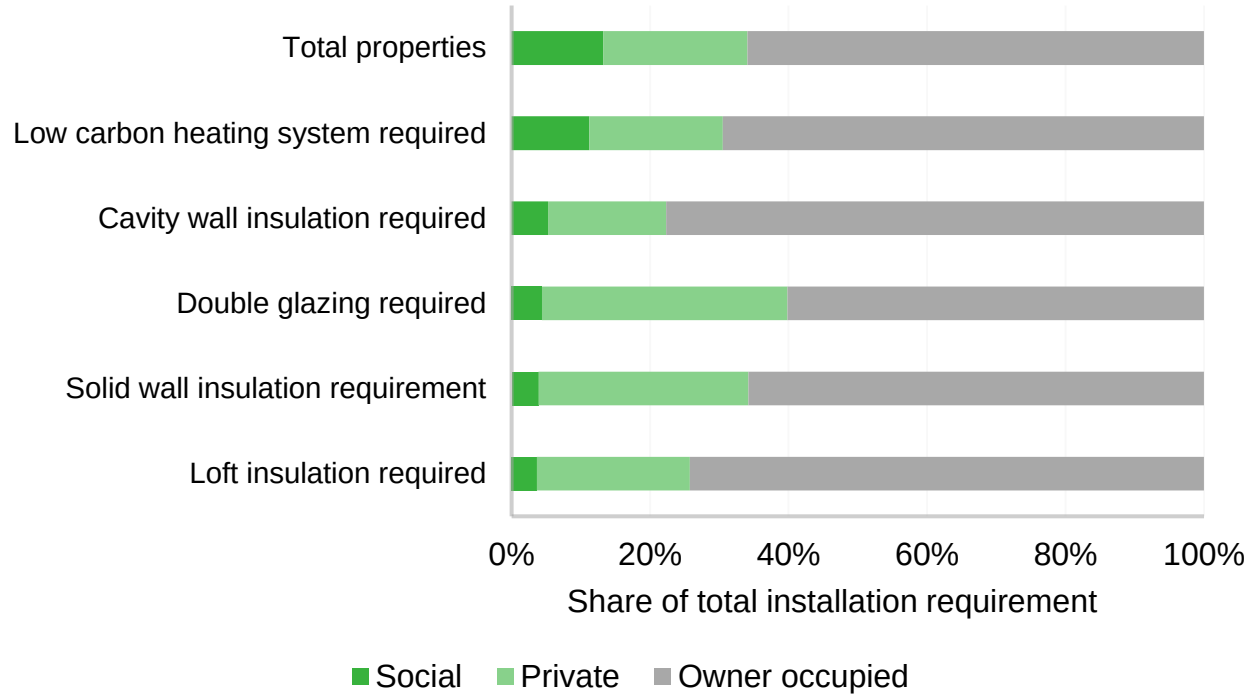


Gemserv's analysis of the retrofit requirement by tenure type, shown in

Figure 45, result suggests that 13% (41,711) of the domestic properties in Suffolk are socially rented[28]. Of the social housing stock, 70% require retrofitting with a low carbon heating system and 15% with energy efficiency measures. This is lower than the share for owner occupied homes, with 43% of owner-occupied homes requiring insulation measures and 87% requiring low carbon heating systems. Similarly for private rented properties, the requirements are higher as a proportion of all private rented domestic properties when compared with socially rented homes. Nearly 50% of privately rented properties require insulation measures and 76% require a low carbon heating system. This high share of privately rented properties requiring retrofit is potentially due to the lower incentive possesses by private tenants and landlords to insulate the property. As for owner-occupied properties, the high requirements can be explained by lack of awareness, access to financing and priorities. Councils have a higher incentive to retrofit properties due to obligations and net zero commitments.

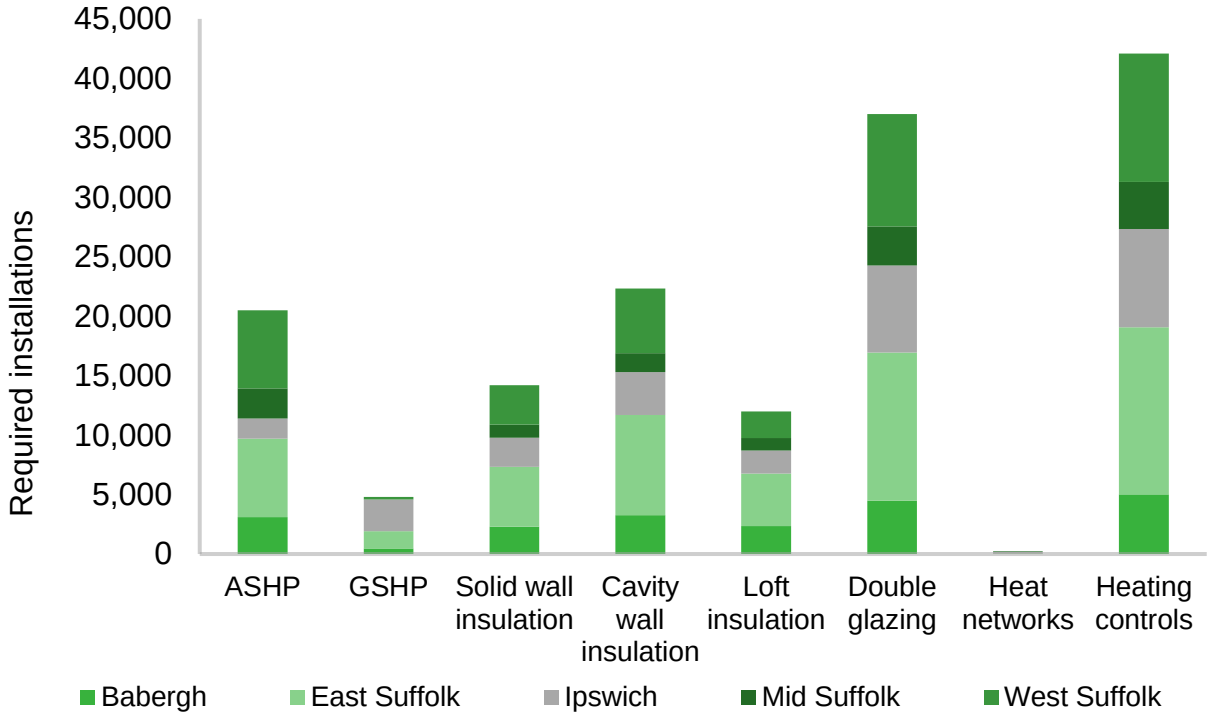
[28] Note that this is based only on homes with a valid tenure response in their EPC record.

Figure 45: Retrofit requirements by tenure type



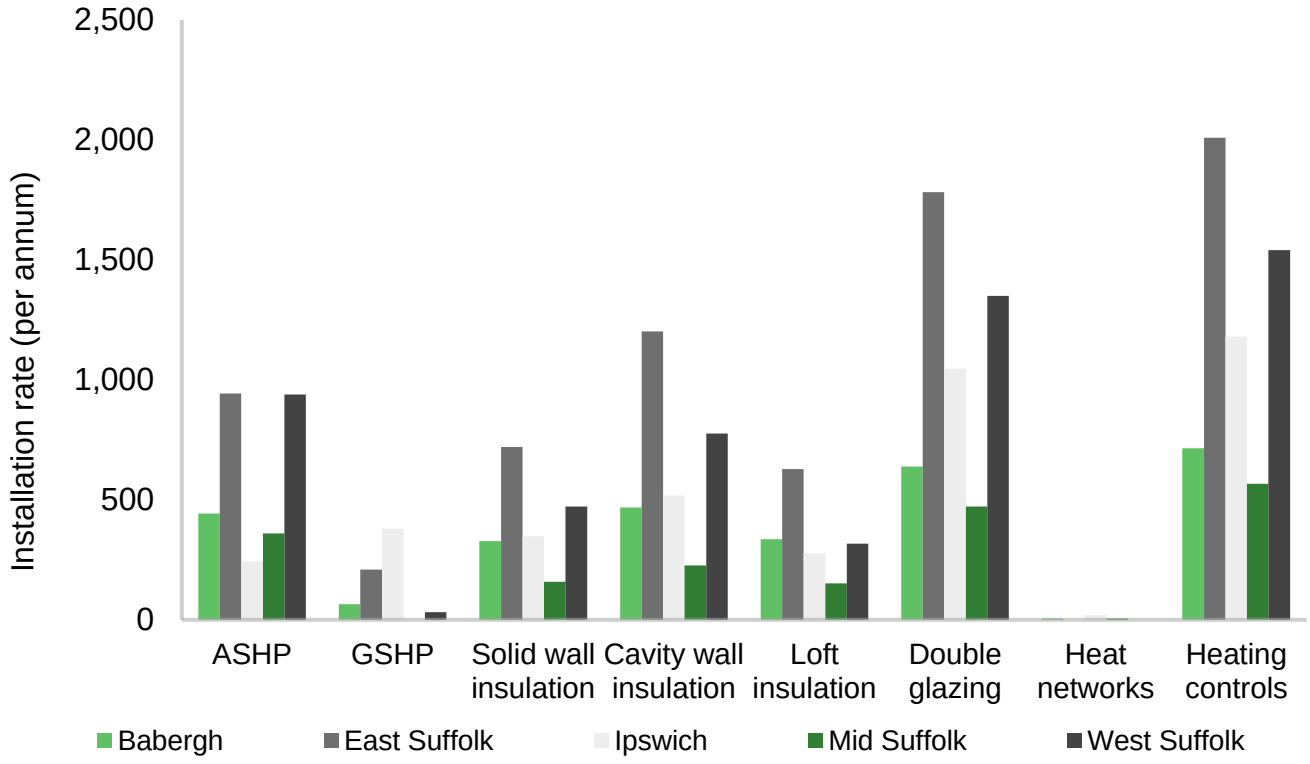
The non-domestic building stock makes up a much lower proportion of the total building stock than domestic building. This includes buildings such as retail offices, factories and schools which often have their own retrofitting challenges. Unlike domestic properties, easier to install measures such as cavity wall insulation, double glazing and heating controls dominate the numbers. Air source heat pumps also dominate vs ground source heat pumps, a significant difference from Norfolk.

Figure 46: Required retrofit installations to decarbonise non-domestic buildings



Annual installation rates vary massively across local authorities. Installation rates are consistently lower across local authorities such as Mid-Suffolk with high installation rates needed across a range of measures in East Suffolk.

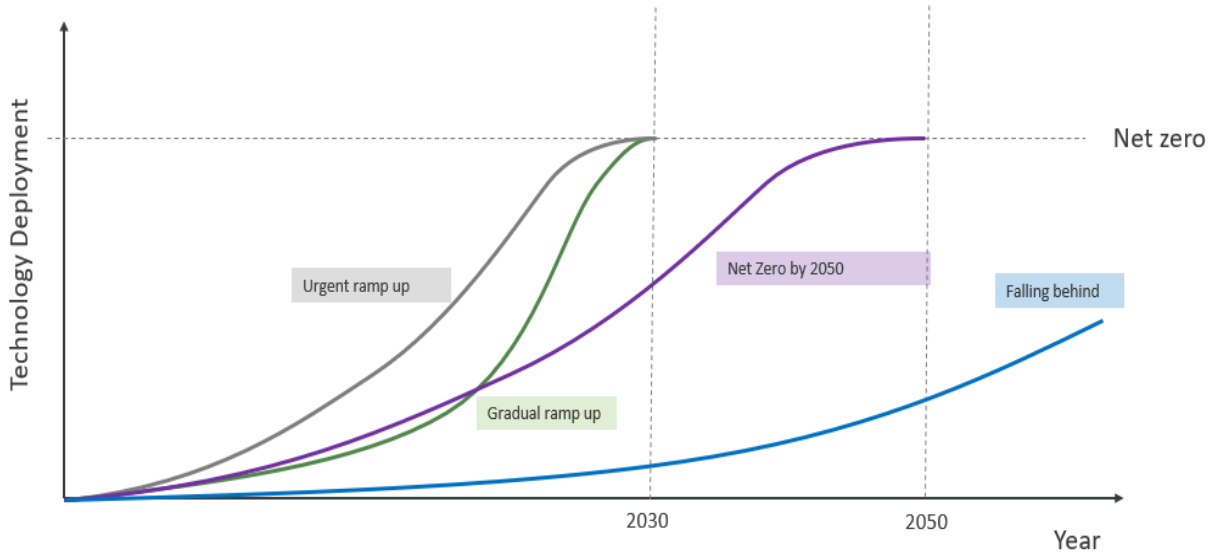
Figure 47: Annual installation rate needed to decarbonise non-domestic buildings by 2030



DEPLOYMENT SCENARIOS FOR ENERGY EFFICIENCY AND LOW CARBON HEATING

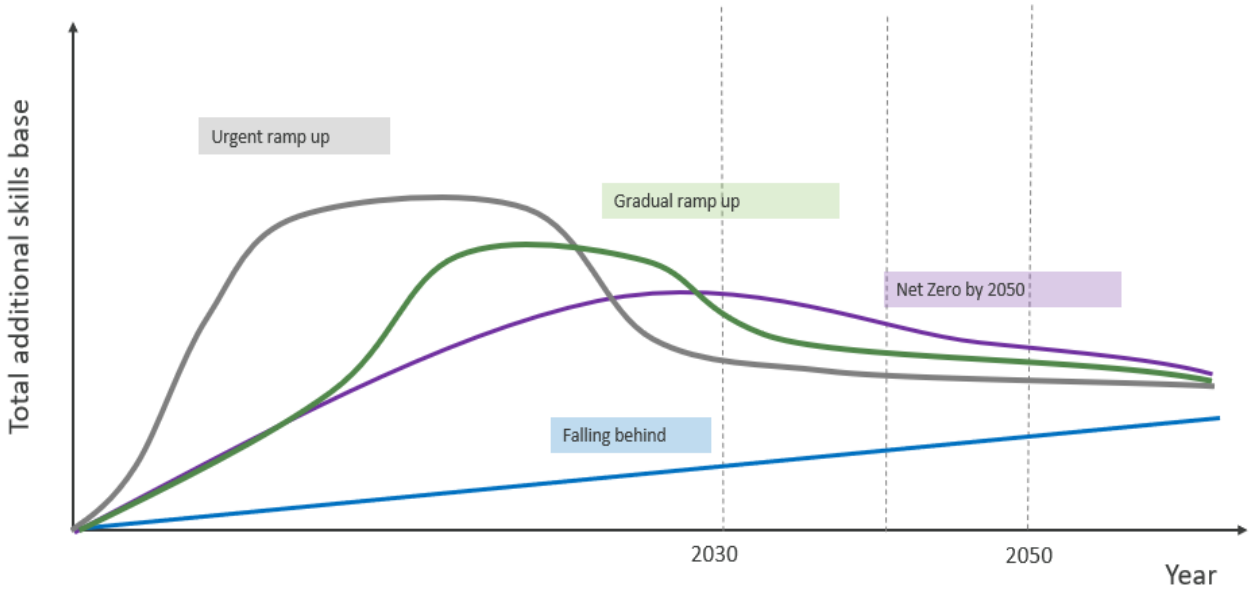
Figure 48 is an illustrative representation of all the scenarios used as part of the Norfolk & Suffolk retrofit analysis. It should however be noted that the exact shape of scenario curves is indicative. Slight differences will occur due to regional requirements, current skills provisions, and deployment optimisation. In general, the scenarios have been designed to minimise major short-term distortions to the labour market, although some degree of distortion is unavoidable with a cut-off in labour requirement once all measures are installed. The various skills deployment curves are shown in **Figure 49**. A skills bell curve is optimal as it gives time for the labour market to ramp up and down and minimises the potential for under or over training. Literature suggests that having a peak deployment rate (and hence skills base) roughly halfway between the start and end data is optimal[29].

Figure 48: The technology deployment scenarios used for the economic analysis



[29] https://es.catapult.org.uk/report/domestic-retrofit-market-intelligence-skills-assessment/

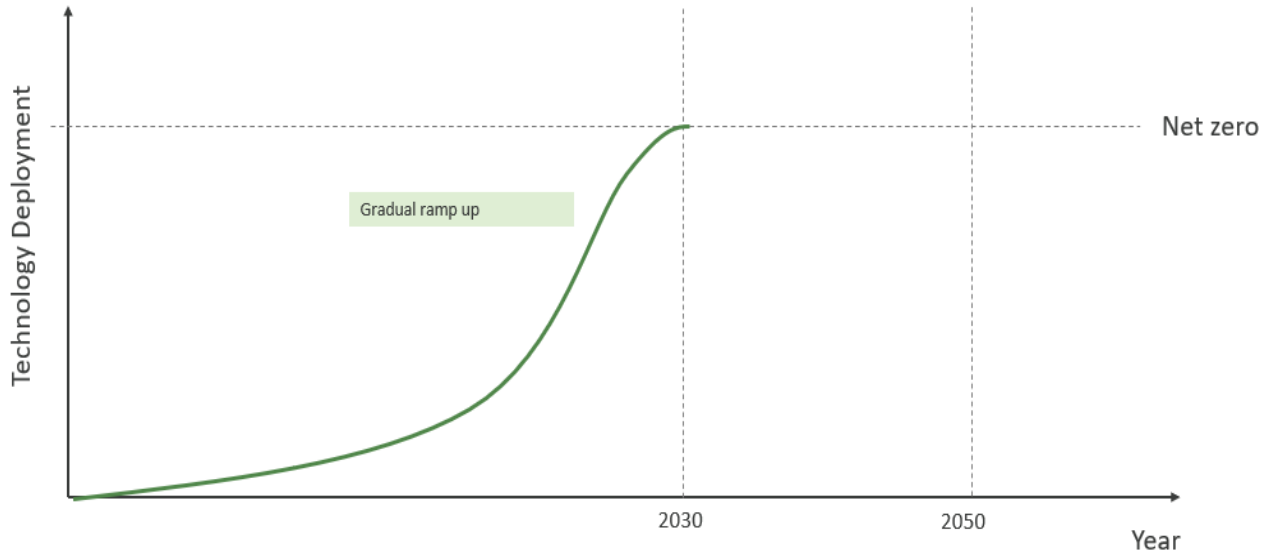
Figure 49: Skills deployment curve associated with technology deployment



SCENARIO 1 – GRADUAL RAMP UP

The gradual ramp up scenario assumes a balanced approach towards reaching net zero by 2030 with the deployment rate growing gradually as installer base increases. As the skills base develops, the deployment rate peaks around 2028 with a slight loss in employment as the demand for new installations drops after 2030 and labour is mostly required to maintain, replace, and operate installed technology. The slower ramp up gives appropriate time for measures to be put in place to train new labour and the 2030 target is in line with both council's. This scenario will assume that current labour provision in the area is able to quickly operate at a high operating capacity.

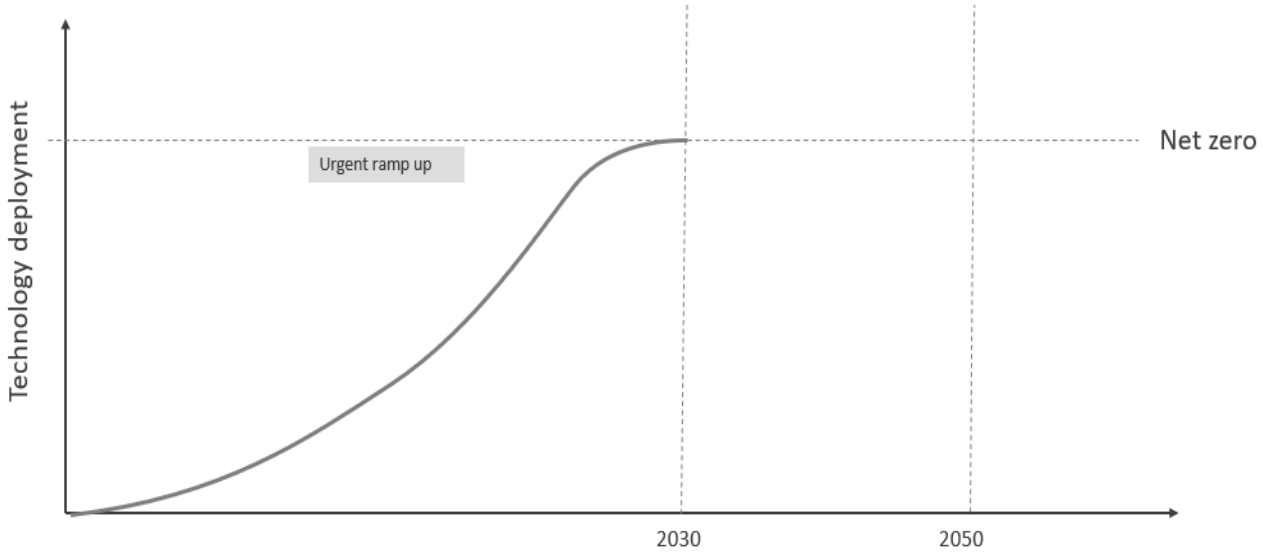
Figure 50: Scenario 1 - Gradual ramp up



SCENARIO 2 – URGENT RAMP UP

The urgent ramp up scenario assumes major short-term action is made to rapidly expand the skills base in the region and stimulate demand. The second scenario is like the first with net zero reached in 2030 and deployment following an "S" shape in order to give a skills bell curve. The key difference is that the initial ramp up in deployment is faster than the first scenario, with the deployment rate peaking around 2026. This scenario would require significant short-term action to develop the skills base required to deploy the technology at the required rate. This scenario has been included to demonstrate the impact a greater urgency would have on the relative carbon savings, job creation and economic indicators relevant to the low carbon heating and retrofit sectors. Additionally, the inclusion of this scenario allows potential distortive employment requirements to be compared. This scenario will assume that current labour provision in the area is able to quickly operate at a very high operating capacity.

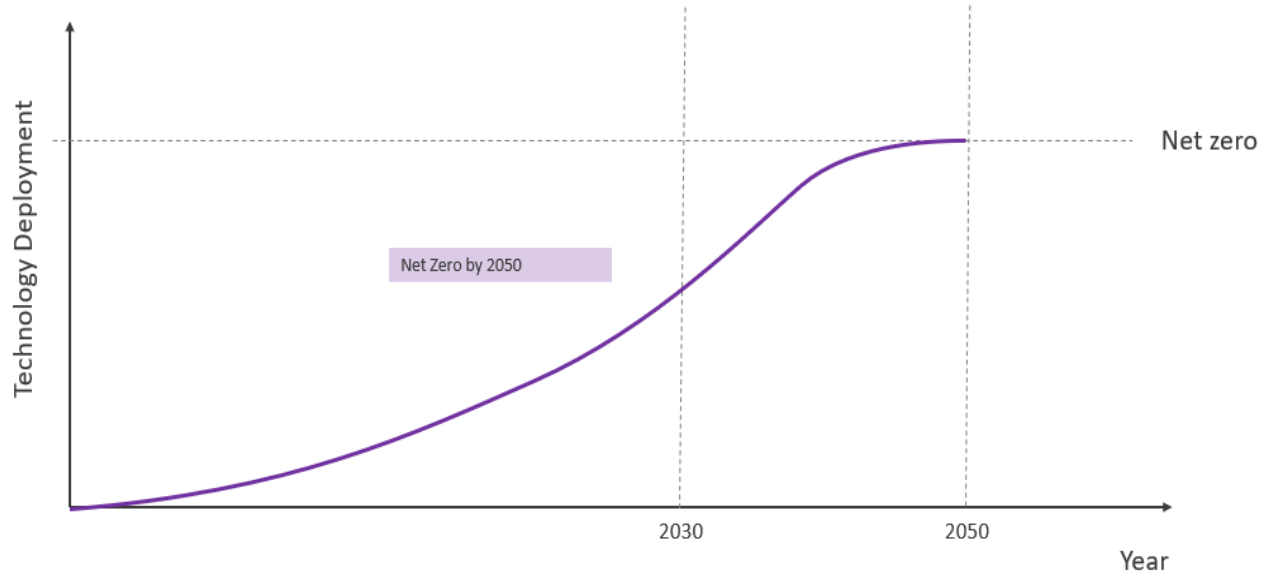
Figure 51: Scenario 2 - Urgent ramp up



SCENARIO 3 – NET ZERO BY 2050

The net zero by 2050 scenario assumes that all local authorities reach net zero by 2050, in line with UK wide targets, through balanced approach with deployment rates peaking around 2035. As this target is consistent with national targets, the results will be comparable with other commonly used scenarios such as those produced by the Climate Change Committee or by National Grid ESO. Additionally, the greater time for deployment to take place means a less severe skills cut off, avoiding over training, and minimising the requirement to significantly reskill labour once net zero is reached. The greater time frame also makes this scenario more achievable and allows additional room for optimisation. This scenario will assume that current labour provision in the area is able to initially operate at an average operating capacity.

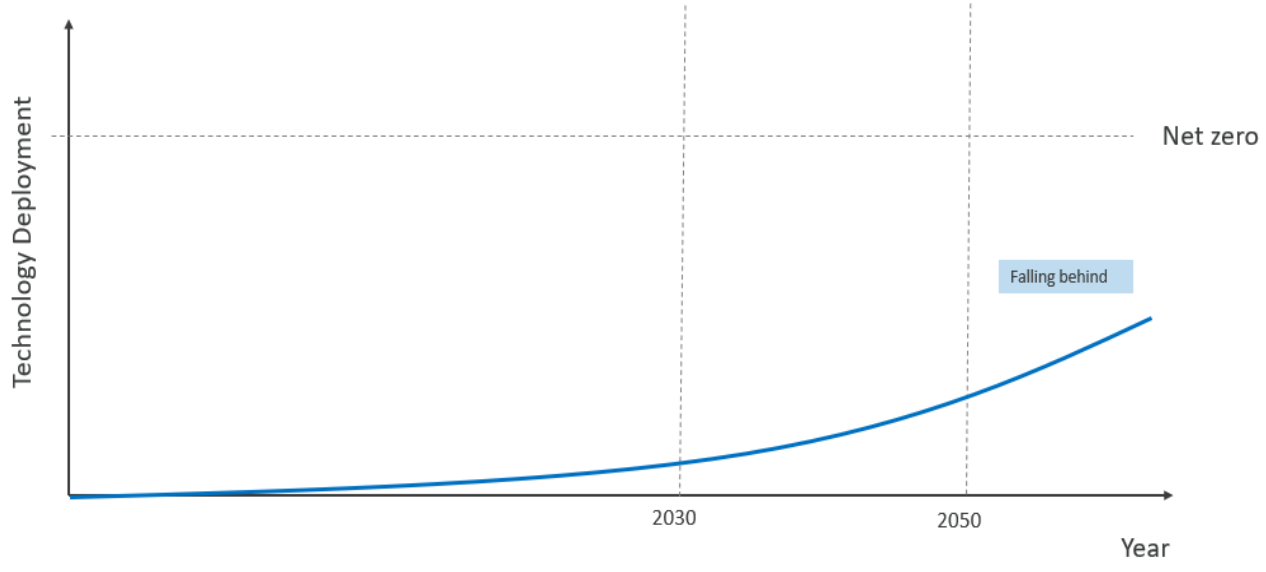
Figure 52: Scenario 3 - Net zero by 2050



SCENARIO 4 – FALLING BEHIND

The falling behind scenario assumes that no significant action is made and net zero targets are not reached by 2050. By tracking historic trends, we have estimated the potential deployment and required skills if no substantial action is taken to decarbonise the building stock in Norfolk and Suffolk. Net zero is not reached by 2050 with significant deployment still required. This scenario has been produced as a clear counterfactual and allows comparisons to be made, in terms of carbon savings and employment, with the previous three scenarios.

Figure 53: Scenario 4 - Falling behind



NORFOLK'S AND SUFFOLK'S CURRENT SKILLS BASE AND FUTURE NEED

This section provides an overview of Norfolk's and Suffolk's existing energy efficiency capabilities and installer base. The insight draws on survey and interview output as well as local installer data from a wide of publicly available data sources such as MCS. To gauge the current qualification levels in both region's retrofit sectors, installers were asked to quantify the portion of jobs within low, intermediate, and high levels. Definitions of qualification levels can be found in **Figure 54** and align with previous research conducted by Gemserv and standard industry definitions.

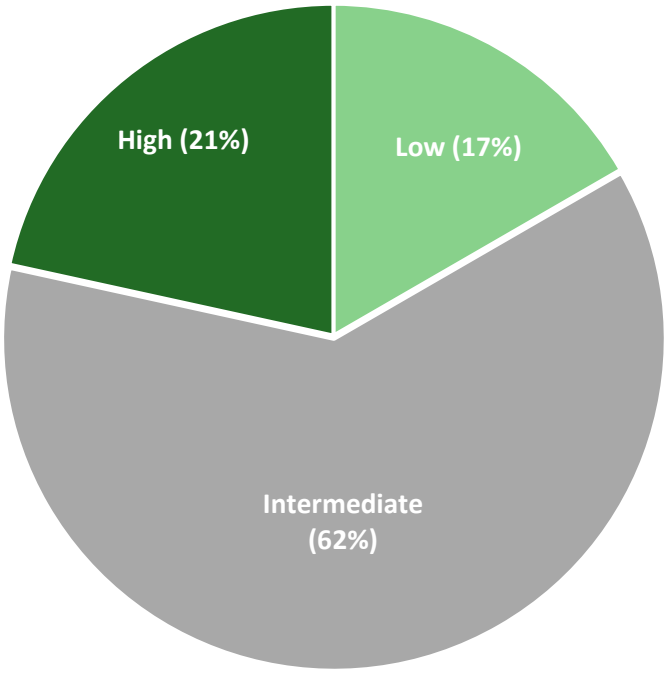
Figure 54: Table of qualifications

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

NORFOLK'S EXISTING INSTALLER CAPABILITY, QUALIFICATION LEVELS AND PERCEIVED SHORTAGES

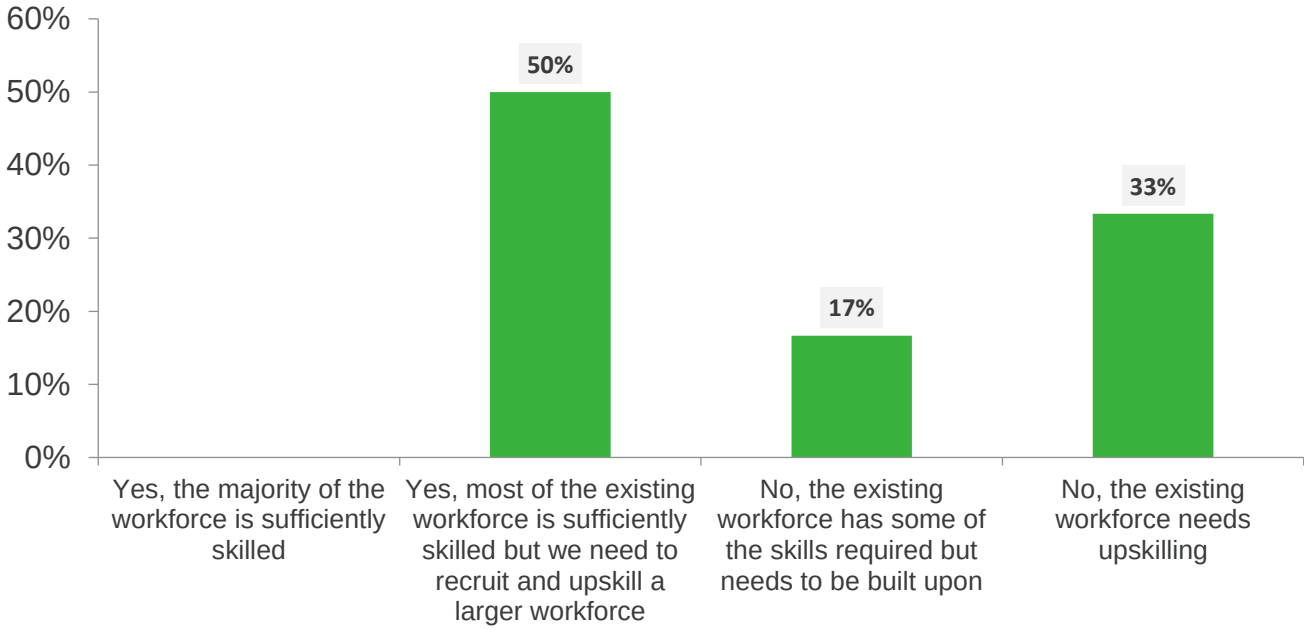
Figure 55 shows the current qualification level for retrofit installers in Norfolk. From the sample Gemserv surveyed, a high proportion of those employed required intermediate qualification levels. This potentially reflects the need for heat pump and solid wall insulation installers who typically require NVQ Level 3 qualifications to be adequately trained and certified.

Figure 55: What proportion of your business' jobs require the following qualification?



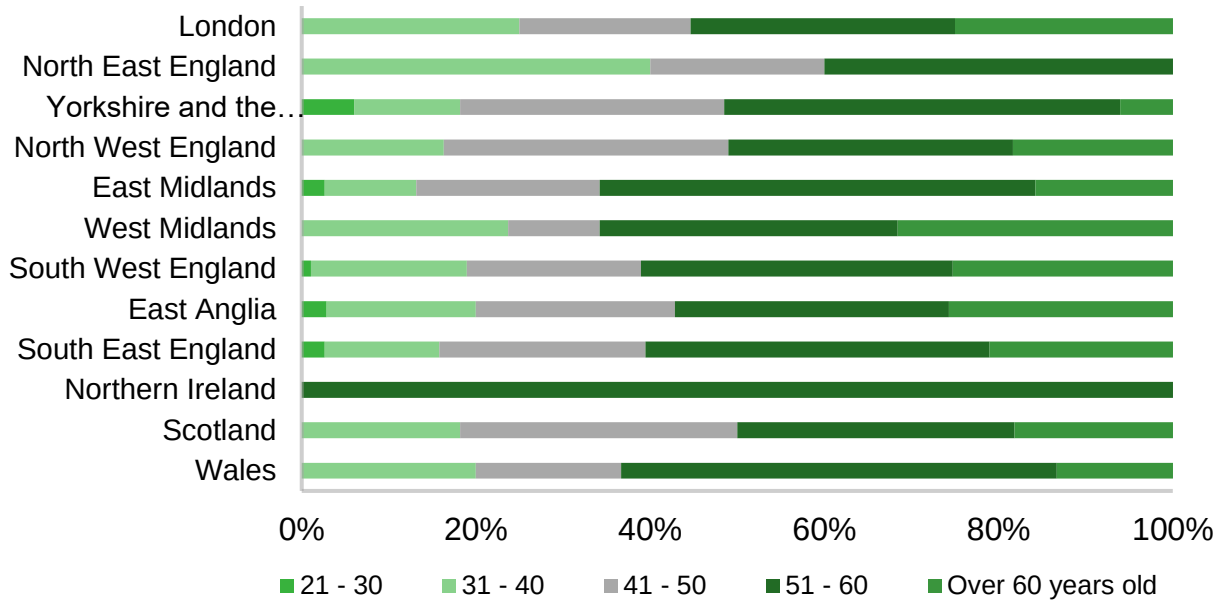
Interestingly, when installers were asked about the existing skill sets in their sector, there was a mix of views as shown in **Figure 56**. All the respondents agreed that there was some need to upskill a larger workforce, where 50% indicated that the existing workforce is not sufficiently skilled. Additional insights from interviews indicate that upskilling the existing workforce is a challenge due to the need for new labour in the industry, as upskilling is difficult in an ageing population who do not see the need to re-train. For those that agree that there is a skilled workforce present, they also noted that there are new skills that need to be developed to accelerate the net zero journey.

Figure 56: Do you think the existing workforce in your sector is sufficiently skilled to deliver on the goods and services needed for a low carbon economy?



The concerns expressed about an aging population in the stakeholder engagement activity is reinforced by the age distribution of heating installers. Separate research conducted by Gemserv suggested East Anglia has the second highest share of heating engineers over the age of 60 with 25.7% of engineers, second only to the West Midlands with over 50% of the installers being over 50 (see **Figure 57**). This is a concern as older engineers may not only be less open to retraining as well as taking on and mentoring apprentices but may retire sooner reducing the available transferable skills base in the region.

Figure 57: Age of heating installers by region



When asked about labour supply or skills shortages, respondents articulated a shortage in intermediate skill levels, with 67% of the participants highlighting this as a gap (see **Figure 58**). 50% of the responses indicate that the participants believe there are skills shortages in low- and high-level qualifications. Insight from interviews has described that most gaps are within the installer base for skills such as low-carbon heating system installations. Attendees noted that intermediate qualification levels are generally required for these roles and why there is the largest gap.

Figure 58: Where are the labour supply or skills shortages within the sector

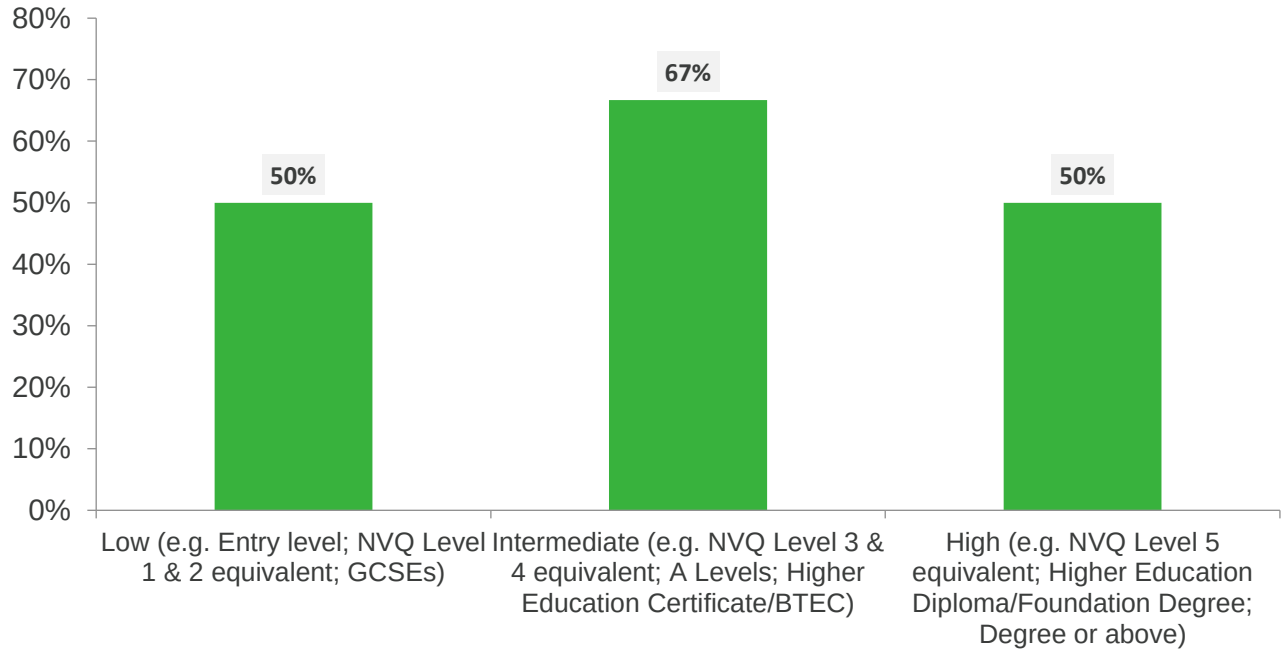
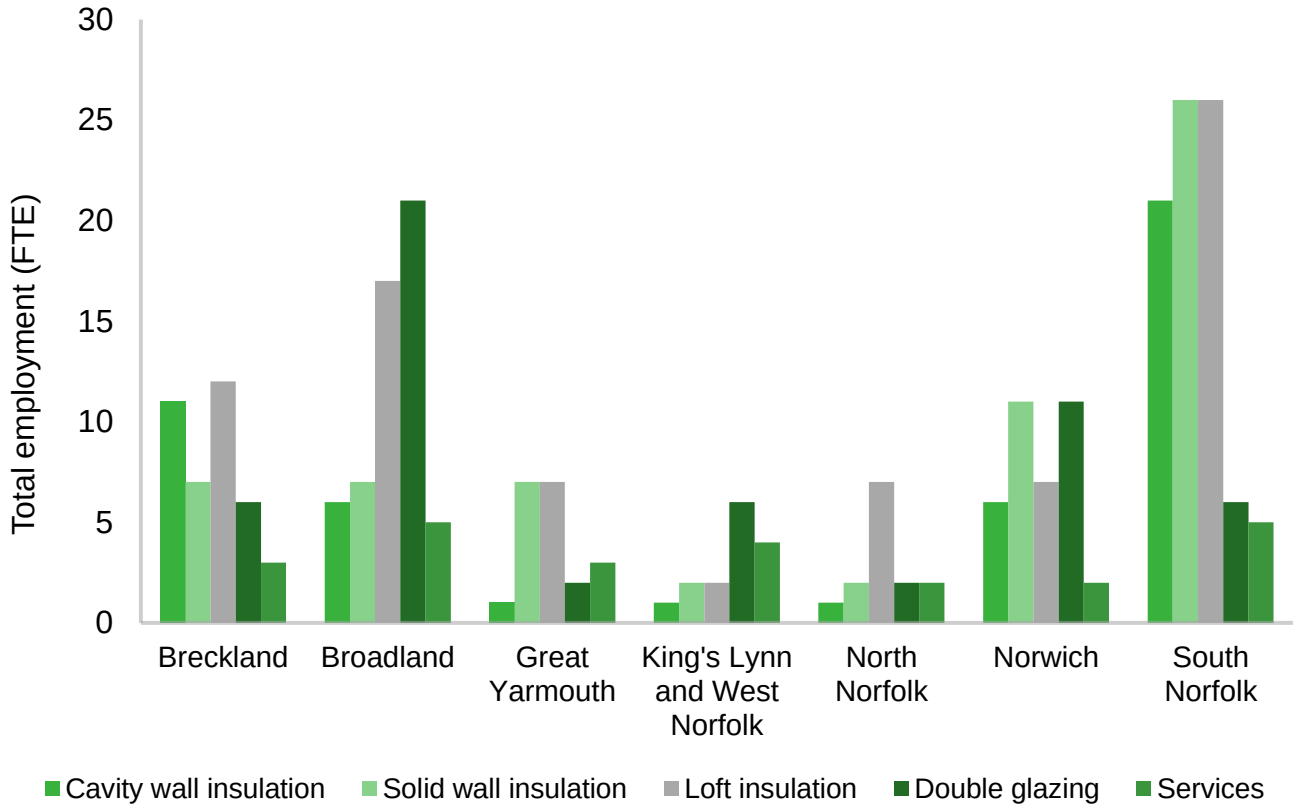


Figure 59 offers Gemserv's best estimate of the current retrofit skills base in the region[30]. The current skills provision in the energy efficiency sector is formed by taking the number of registered businesses from multiple accreditation bodies and trade associations and combining it with ONS estimates for employment in the energy efficiency sector within the region[31]. The collated data used on the number of businesses in the region can be found in Appendix 2. The number of registered installers is continuously updated and that many businesses tend to offer multiple services and so the results have been given in terms of full time equivalent (FTE) labour. Coverage and thus consumer choice varies substantially by solution provided however the data suggests that the loft insulation and double-glazing measures are more well covered than solid wall insulation. In terms of current skills provision, South Norfolk is the leading local authority in the region with an estimated 84 jobs in terms of FTE across the construction and servicing of insulation.

[30] The given numbers for skills provision assumes a 20% leakage rate between local authorities. Services is defined as a catch all term for retrofit coordinators, retrofit assessors and retrofit inspectors.
[31] https://www.trustmark.org.uk/; https://www.theiaa.co.uk/installer-list/; https://www.nia-uk.org/; https://www.ons.gov.uk/economy/environmentalaccounts/methodologies/lowcarbonandrenewableenergyeconomylcreesurveyqmi

Figure 59: Estimates of the current skills provision in the energy efficiency sector

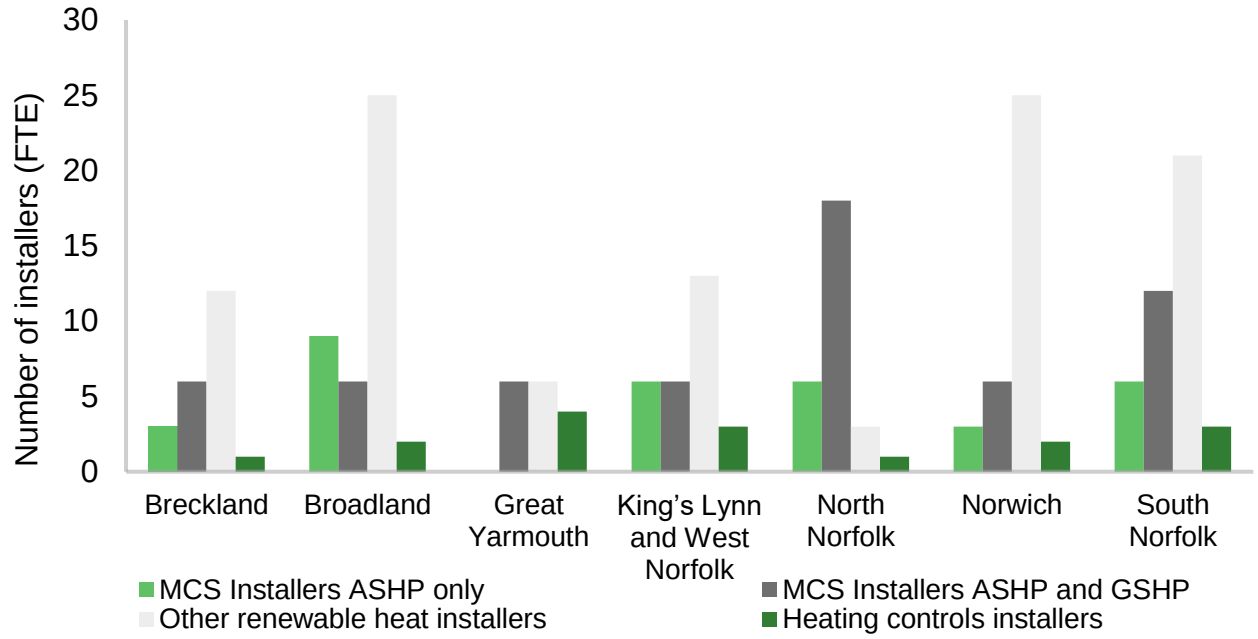


Similarly, **Figure 60** gives a baseline estimation for skills provision in the low carbon heating sector within Norfolk. To estimate the number of low carbon heating installers, data was taken from a combination of sources and supported with Gemserv survey data to convert into full time equivalent[32]. The raw number of accredited installer businesses by local authority is in Appendix 2. Data on heat network installers is not freely available due to the nascency of the heating solution however the other renewable heat installers will include heat network installers as well as non-accredited heat pump installers. Furthermore, there is likely to be significant crossover between heat pumps and heat networks with some heat networks using ground source heat pumps with shared ground loop arrays[33]. Similarly, to with insulation skills, Great Yarmouth is falling behind the rest of Norfolk with only around 19 jobs across the low carbon heating trades in terms of FTE.

[32] https://www.ons.gov.uk/economy/environmentalaccounts/methodologies/lowcarbonandrenewableenergyeconomylcreesurveygmi; https://mcscertified.com/about-the-mcs-data-dashboard/; https://gemserv.com/our-thoughts/heating-system-installers-share-their-views-on-the-opportunities-and-risks-they-face-in-the-transition-to-low-carbon/

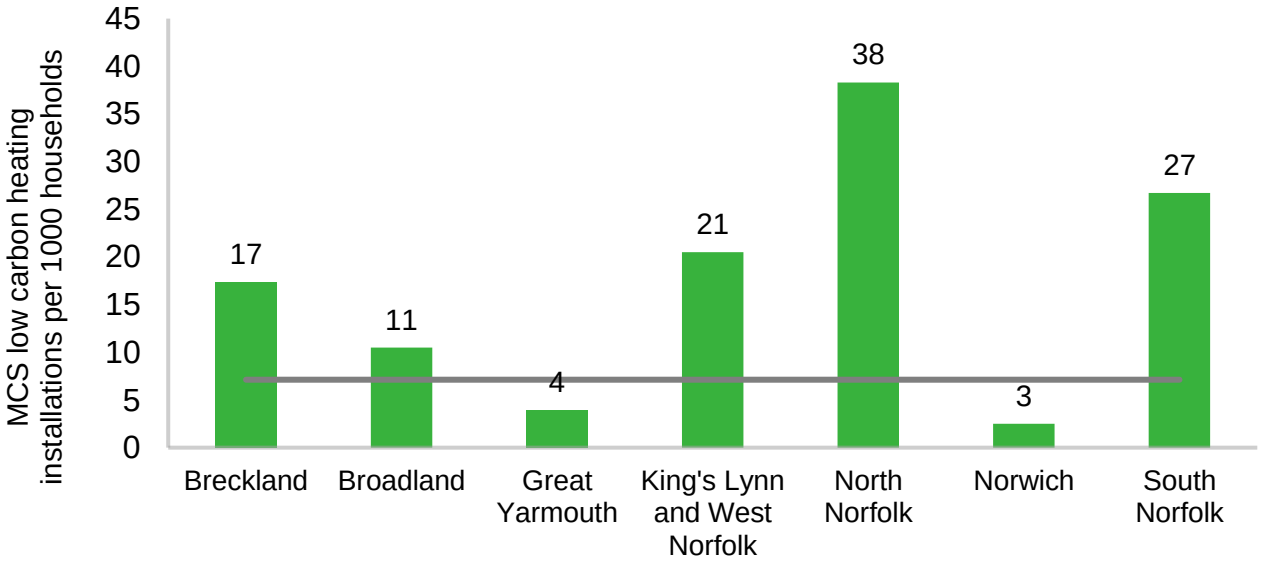
[33] https://www.kensaheatpumps.com/social-housing/district-ground-source-heat-pumps-installation-in-tower-blocks/

Figure 60: Estimate of the current skills provision for low carbon heating installers



Encouragingly data from MCS suggests that Norfolk's installer base for low carbon heating systems is active. Almost all the local authorities in Norfolk, apart from Norwich and Great Yarmouth, achieve more accredited installs than the UK average of 7 installs per 1000 households with 17 installs per 1000 households (see **Figure 61**). North Norfolk and South Norfolk are particularly active with 38 and 27 installs per 1000 households respectively. This is in line with the general trend of heat pump installation rates being greater in off grid areas compared to predominantly on grid ones, as can be seen from the lowest installation rate in the region being Norwich.

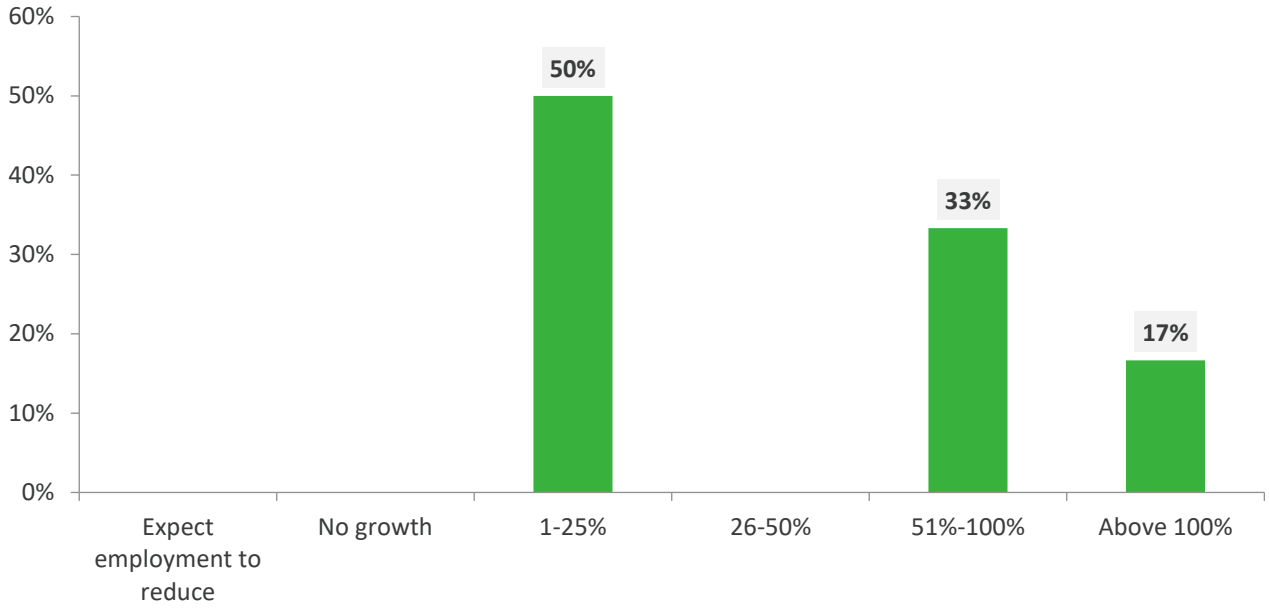
Figure 61: Deployment rate of MCS accredited low carbon heating installations in Norfolk



GROWTH AMBITIONS OF NORFOLK'S INSTALLER BASE IN RETROFIT SKILLS

The local skills shortage evidenced in the economic analysis and stakeholder engagement coupled with the need to low annual installation rates demonstrate a need to grow the local workforce rapidly. **Figure 62** below shows expected employment growth levels installers need to hit to achieve net zero by 2030. This demonstrates that all the stakeholders recognise that some level of growth is required to meet net zero targets within their business. Interestingly, the comments within the survey indicate that some of these responses reflect personal business growth being slower but there is the need for their supply chain and external installer base to ramp up in growth rate. Those companies that selected a lower growth rate were typically large organisations at the top of the supply chain that are manufacturing measures. Comments around growth in the supply chain therefore refer to the local installer base in Norfolk.

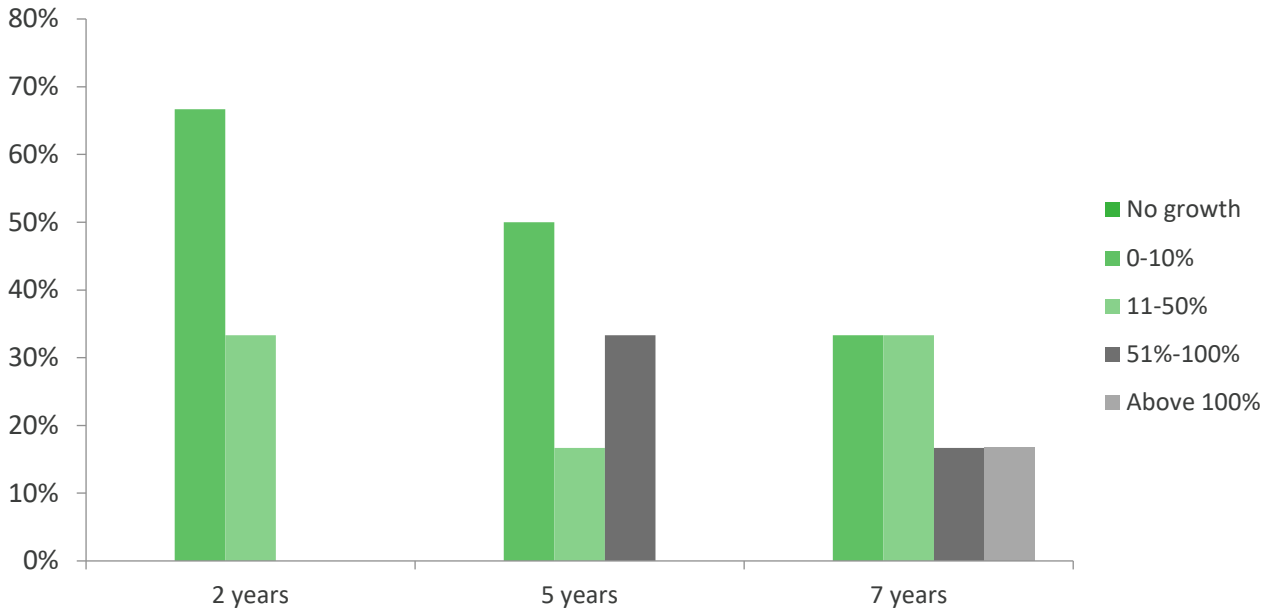
Figure 62: What percentage growth in employment do you think will be needed for your company in the next 7 years to meet a net zero target by 2030?



Despite installers needing rapid growth over the period, some expressed reservations about achieving that growth. A third of installers claimed that under existing local and policy mechanisms many didn't expect to achieve their required growth. Another third also believed they could achieve the required growth while the remaining third were unsure. Interviews suggested that the current lack of a skilled workforce would hinder growth rates so demand will not be met. Other issues raised during the interviews include highlight pathways into the industry from a young age, futureproofing the industry for those thinking about upskilling and the financial stimulus to provide training resources.

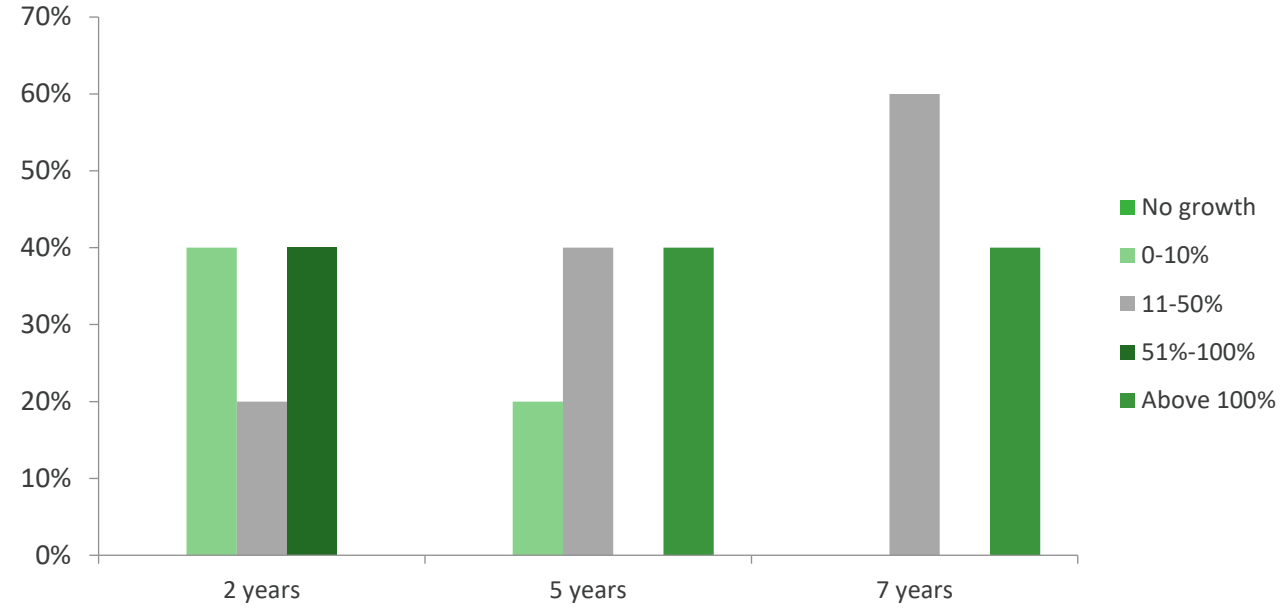
Figure 63 shows the anticipated growth rate their organisation expects in 2, 5 and 7 years to reach net zero in the retrofit sector. The graphs show that many of the respondents see the need for a ramp up in growth to reach net zero, with a higher response rate for over 100% growth after 5-7 years.

Figure 63: What percentage growth in your sector does your organisation anticipate over the following time periods in Norfolk under today's conditions.



Respondents often reported that sector wide growth rates needed to be higher than the individual company growth rates. There are two explanations for why this disparity exists. The first reason is that a few of the larger organisations Gemserv engage with, like manufacturers of technology, expressed a desire for the supply chain of local installers to grow quicker. The second reasons is that smaller installers know the growth rate needs to be quicker from an industry perspective, but were limited in their growth potential by the local skills shortage and lack of national or local policies.

Figure 64: What percentage growth in employment in your sector do you think is required for Norfolk to meet net zero by 2030 over the following time periods



Drilling down into the expected growth rates by low, medium, and high qualification levels, respondents felt that high growth rates would be required in the intermediate level qualifications as shown in Figure 65, Figure 66 and Figure 67. The lowest growth would be anticipated in the high-level qualifications. This reflects the economic analysis which shows the greatest growth in solid wall insulation and air source heat pump installation which typically require NVQ level 3 equivalent to install.

Figure 65: Low level qualifications (e.g., NVQ Level 1 & 2; GCSEs)

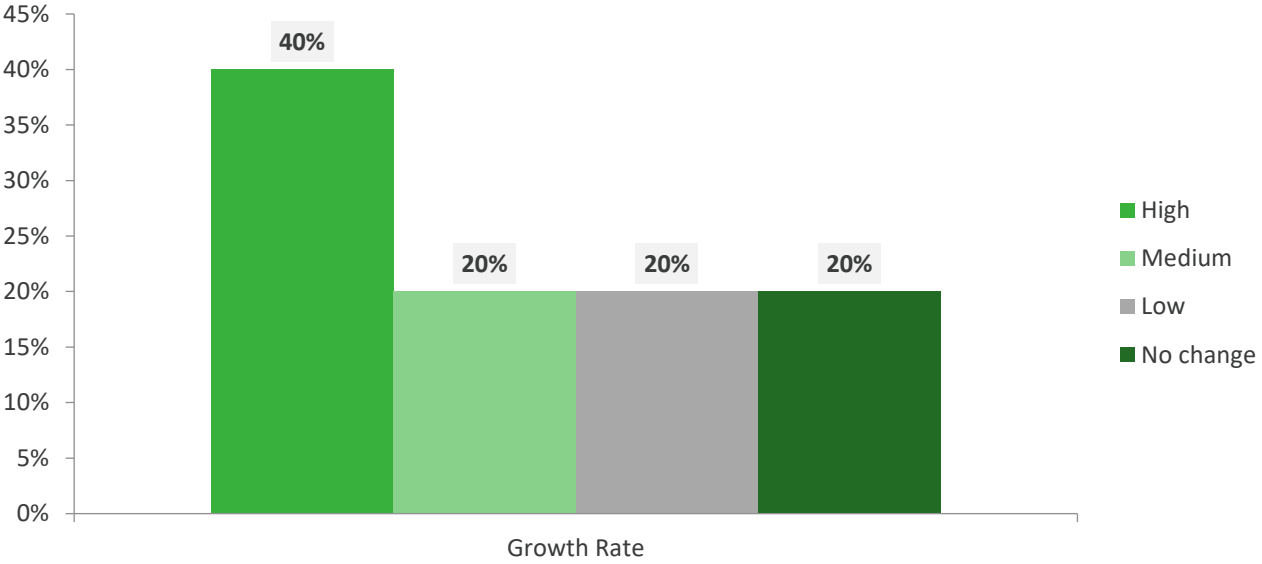


Figure 66: Intermediate level qualifications (e.g., NVQ Level 3&4; A-Levels; BTECs)

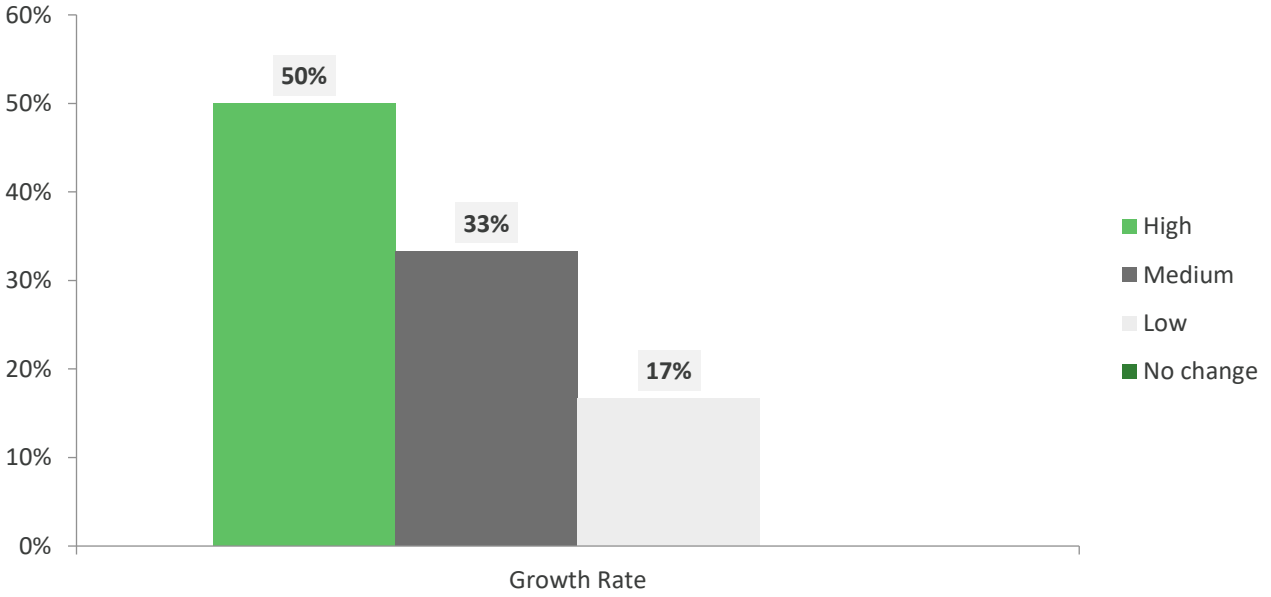
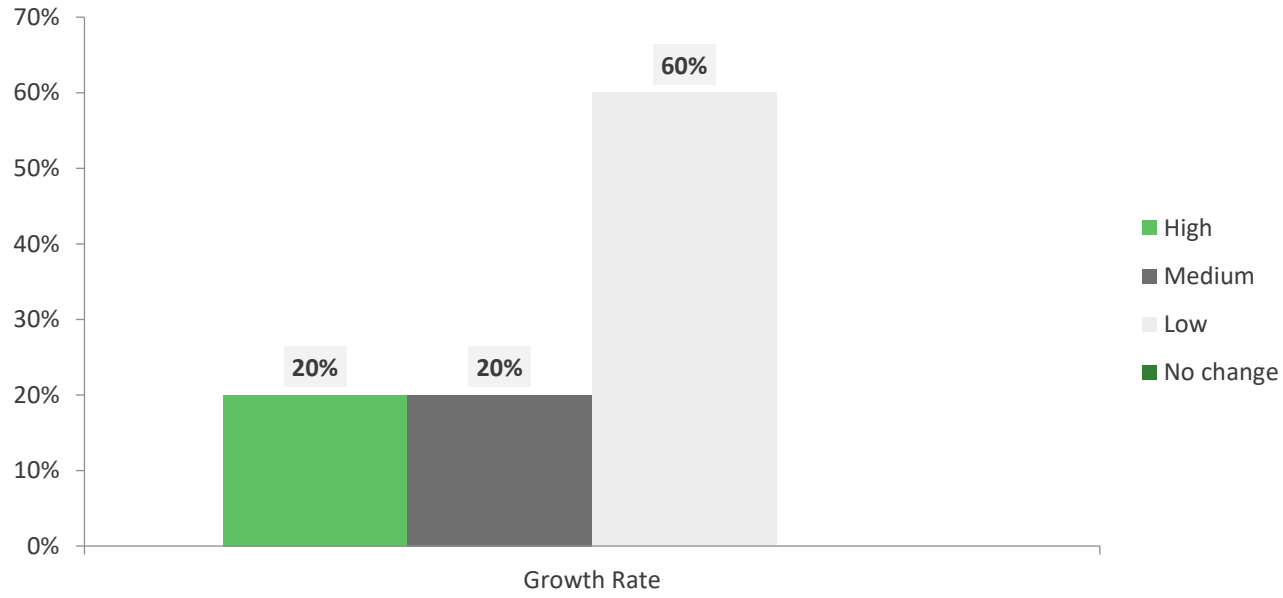


Figure 67: High level qualifications (e.g., NVQ Level 5+; Higher Education Diploma; Degree)

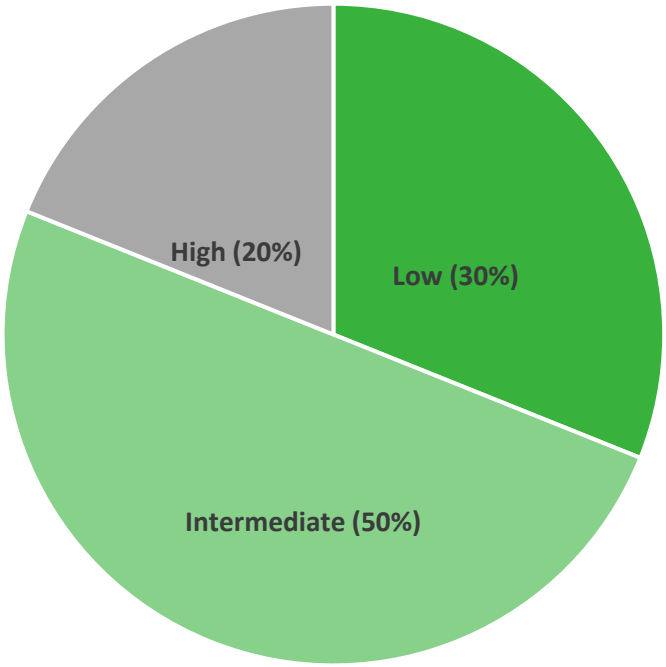


Despite existing retrofit skills shortages being highly specific, some more general skills shortages were also identified. In many cases these skills exist in other areas of the economy so can be redirected. However, a key challenge is attracting talent into the retrofit sector in the first place. Examples from the surveys and interviews highlight that stakeholders feel there is a lack of interest from those under 18 when deciding their career path or for those in similar professions who could potentially transition to low carbon heating. Therefore, attracting a new pipeline of installers for the retrofit market will rest on promoting the benefits regarding long term job security and positive climate impacts.

SUFFOLK'S EXISTING INSTALLER CAPABILITY, QUALIFICATION LEVELS AND PERCEIVED SHORTAGES

Figure 68 shows the current qualification level for retrofit installers in Suffolk. From the sample Gemserv surveyed, a high proportion of those employed required Intermediate qualification levels, equivalent to NVQ Level 3 and 4. This corresponds to the qualification levels of typical installers of retrofit measures, either insulation or low carbon heating systems.

Figure 68: What proportion of your businesses' jobs require the following qualification

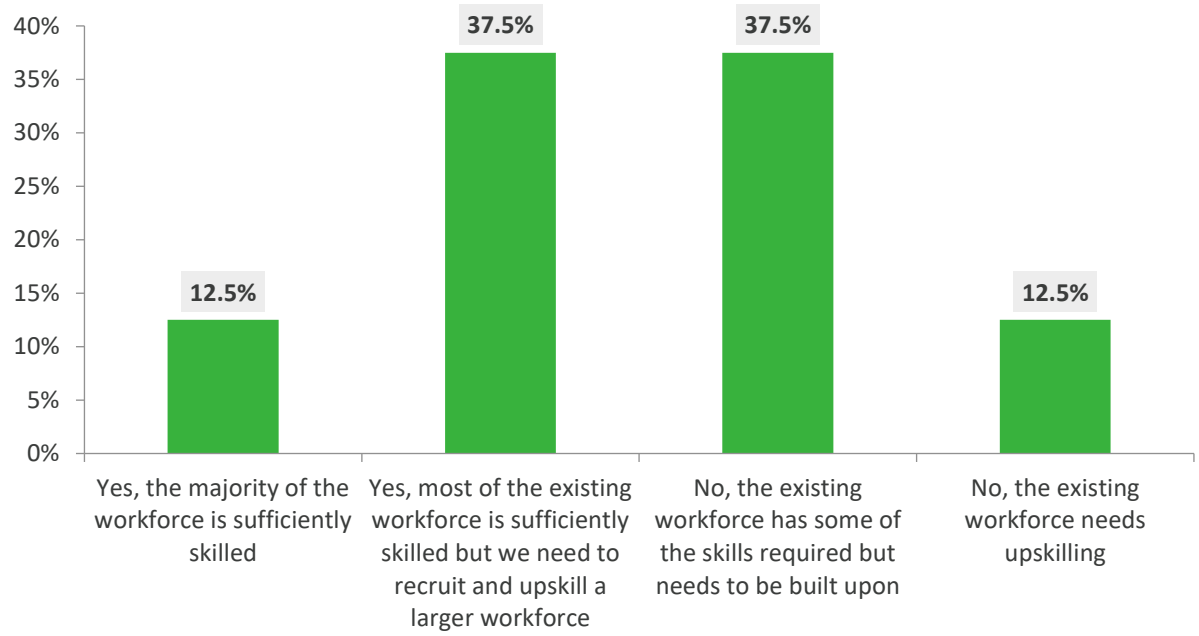


Additional insights from the interviews demonstrated that the engineering profession required qualifications that were intermediate or above and most companies interviewed stated that people with intermediate level qualifications accounted for over 50% of their business. Employees with low level qualifications accounted for an average of 30% of the workforce and high-level including management level qualifications accounted for around 30%. Respondents also mentioned there are new skills that need to be developed to accelerate the net zero journey.

Interestingly, when installers were asked about skill levels in their sector there was a mix of views (**Figure 69**). Most respondents felt there was at least some base level of skills there that could be built upon. 50% felt positive about the workforce, claiming that either the skills were there, or most of the skills were there but the size of the workforce needs to grow to meet net zero. However, 37.5% were more pessimistic about

the existing workforce, stating they felt that there were some skills in the industry, but the current workforce needed to be significantly upskilled to achieve a net zero economy. 12.5% of respondents stating most of the work force needed upskilling.

Figure 69: Do you think the existing workforce in your sector is sufficiently skilled to deliver the goods and services needed for a low carbon economy



When asked about labour supply or skills shortages, respondents clearly articulated a shortage in intermediate skill levels, with 86% of the participants highlighting this as a gap (**Figure 70**). This corresponds with the desk research around the urgent need for installers who are typically NVQ Level 3-4 qualified, especially for heat pump installation and solid wall insulation. However, feedback from the interviews suggested there is a real skills shortage across all levels. Some respondents mentioned Brexit as being a driver for the low and intermediate level skilled workers. Shortage of high-level skills mentioned suitably qualified retrofit assessors and co-ordinators. One interviewee mentioned the urgent need for installers to be G3 accredited which enables them to safely install hot water cylinders needed for heat pump installation. Another interviewee also mentioned that the transition to combi boilers means the workforces familiarity with cylinder installation has reduced, requiring a familiarisation with this skillset again.

Figure 70: Where are there labour or skills shortages within the sector

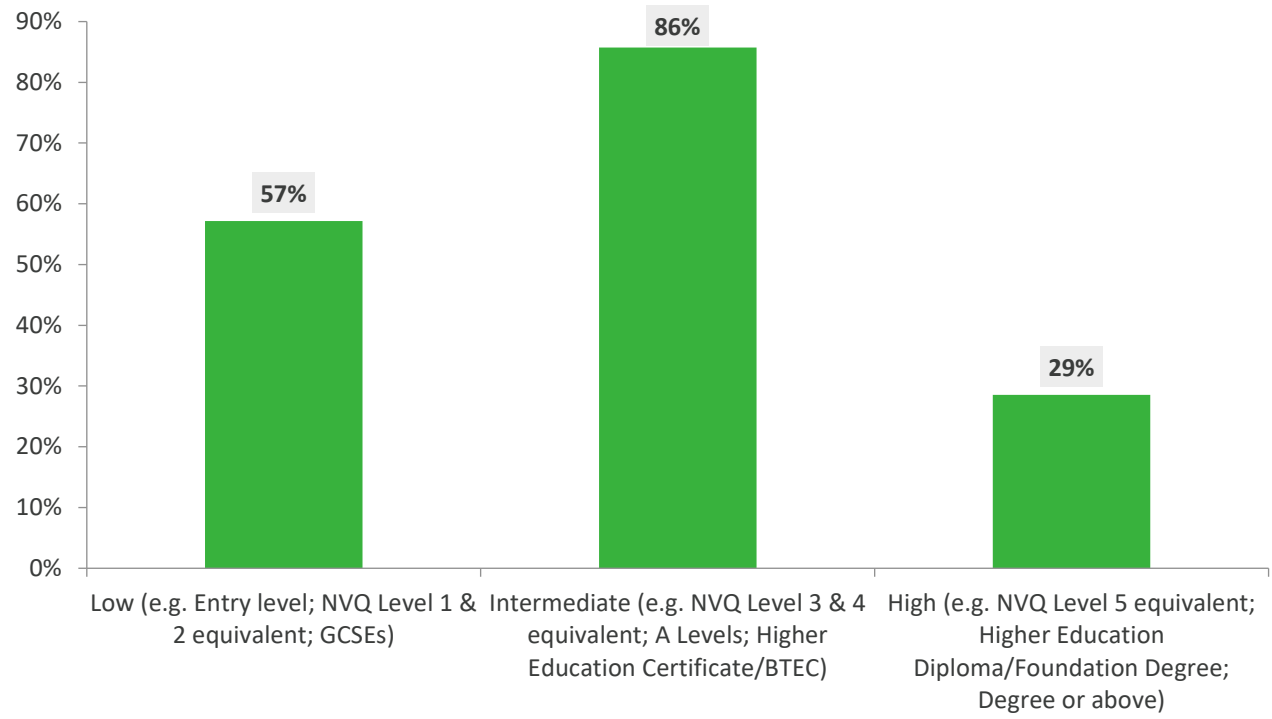
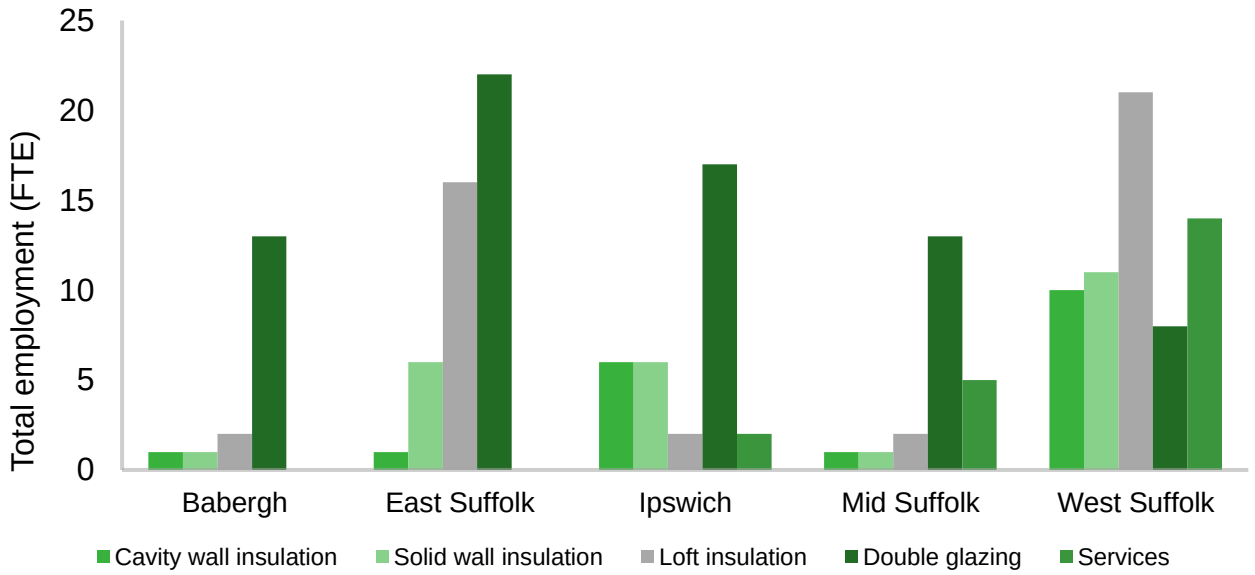


Figure 71 provides Gemserv's estimate of the current energy efficiency skills base in Suffolk as of November 2022[34]. The current skills provision in the energy efficiency sector is formed by taking the number of registered businesses from multiple accreditation bodies and trade associations and combining it with ONS estimates for employment in the energy efficiency sector within the region[35]. The collated data used on the number of businesses in the region can be found in Appendix 2. The number of registered installers is continuously updated, and many businesses tend to offer multiple services and so the results have been given in terms of full time equivalent (FTE) labour.

[34] The given numbers for skills provision assumes a 20% leakage rate between local authorities. Services is defined as a catch all term for retrofit coordinators, retrofit assessors and retrofit inspectors.
[35] https://www.trustmark.org.uk/; https://www.theiaa.co.uk/installer-list/; https://www.nia-uk.org/; https://www.ons.gov.uk/economy/environmentalaccounts/methodologies/lowcarbonandrenewableenergyeconomylcreesurveyqmi

Figure 71: Estimate of the current skills provision in the energy efficiency sector



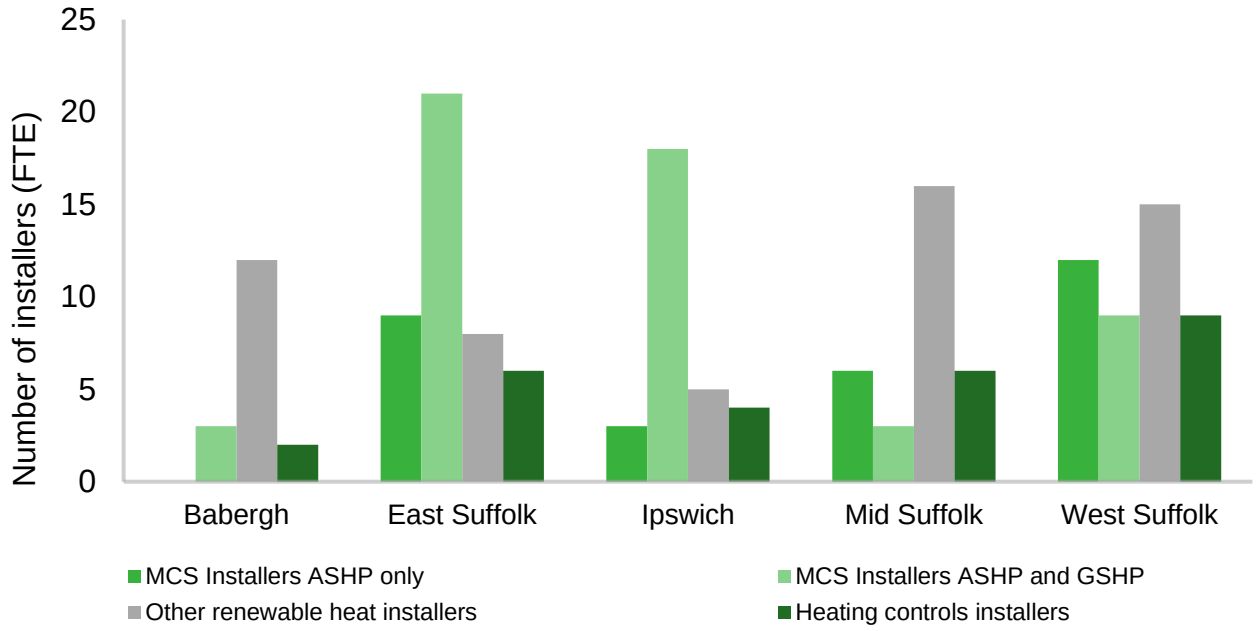
Coverage and thus consumer choice varies substantially by solution provided however the data suggests that the loft insulation and double-glazing measures are more well covered than solid wall insulation with 73 FTE in double glazing installers, nearly 3 times the number for solid wall insulation. In terms of current skills provision, West Suffolk is the leading local authority in the region with an estimated 64 jobs in terms of FTE across the construction of insulation but more significantly the servicing of insulation with most of Suffolk's retrofit assessors and retrofit coordinators being based in the area.

Similarly, a baseline estimation for skills provision in the low carbon heating sector within Suffolk was formed (**Figure 72**). To estimate the number of low carbon heating installers, data was taken from a combination of sources and supported with Gemserv survey data to convert into full time equivalent[36]. The raw number of accredited installer businesses by local authority is in Appendix 2. Data on heat network installers is not freely available due to the nascency of the heating solution however the "other renewable heat installers" will include heat network installers as well as non-accredited heat pump installers. Furthermore, there is likely to be significant crossover between heat pumps and heat networks with some heat networks using ground source heat pumps with shared ground loop arrays[37]. Babergh is behind the other local authorities in Suffolk with respects to low carbon heating skills with 17 FTE across the categories, just over a third of 45 FTE in employment across West Suffolk. East Suffolk is shown to have a comparative strength in heat pump skills with 30 FTE of the 84 FTE accredited heat pump jobs in Suffolk.

[36] https://www.ons.gov.uk/economy/environmentalaccounts/methodologies/lowcarbonandrenewableenergyeconomylcreesurveygmi; https://mcscertified.com/about-the-mcs-data-dashboard/; https://gemserv.com/our-thoughts/heating-system-installers-share-their-views-on-the-opportunities-and-risks-they-face-in-the-transition-to-low-carbon/

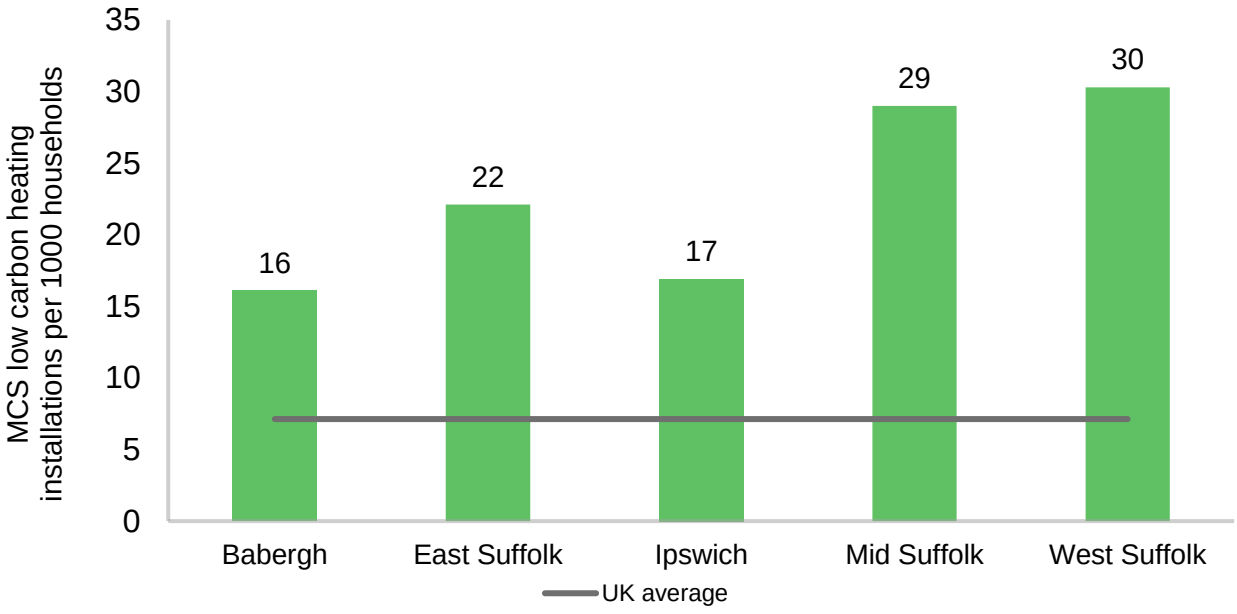
[37] https://www.kensaheatpumps.com/social-housing/district-ground-source-heat-pumps-installation-in-tower-blocks/

Figure 72: Estimate of the current skills provision of low carbon heating installers



Encouragingly data from MCS suggests that Suffolk's installer base for low carbon heating systems is active (**Figure 73**). All the local authorities in Suffolk achieved more accredited installs than the UK average of 7 installs per 1000 households. Mid Suffolk and West Suffolk are particularly active with 29 and 30 installs per 1000 households respectively however the average in Suffolk over 23 installations per 1000 households is also high and over 3 times the national average. This is in line with the general trend of heat pump installation rates being greater in off grid areas compared to predominantly on grid ones, as can be seen from the lowest installation rates in the region being in Ipswich.

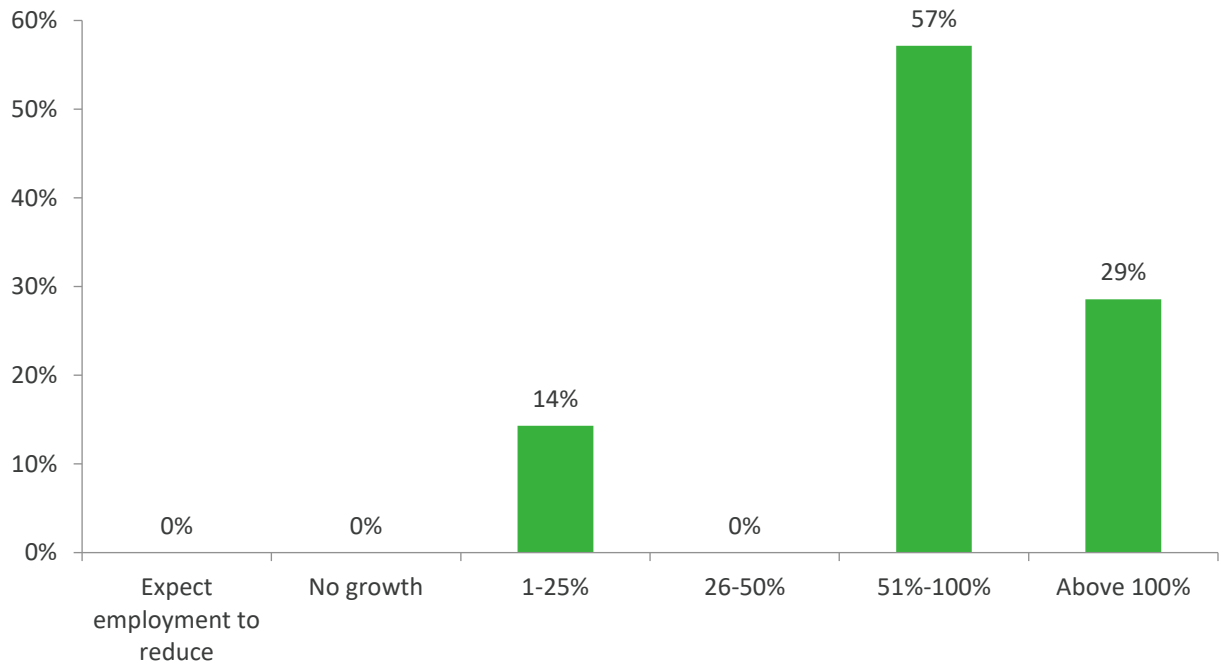
Figure 73: Accredited low carbon heating installations in Suffolk



GROWTH AMBITIONS OF SUFFOLK'S INSTALLER BASE IN RETROFIT SKILLS

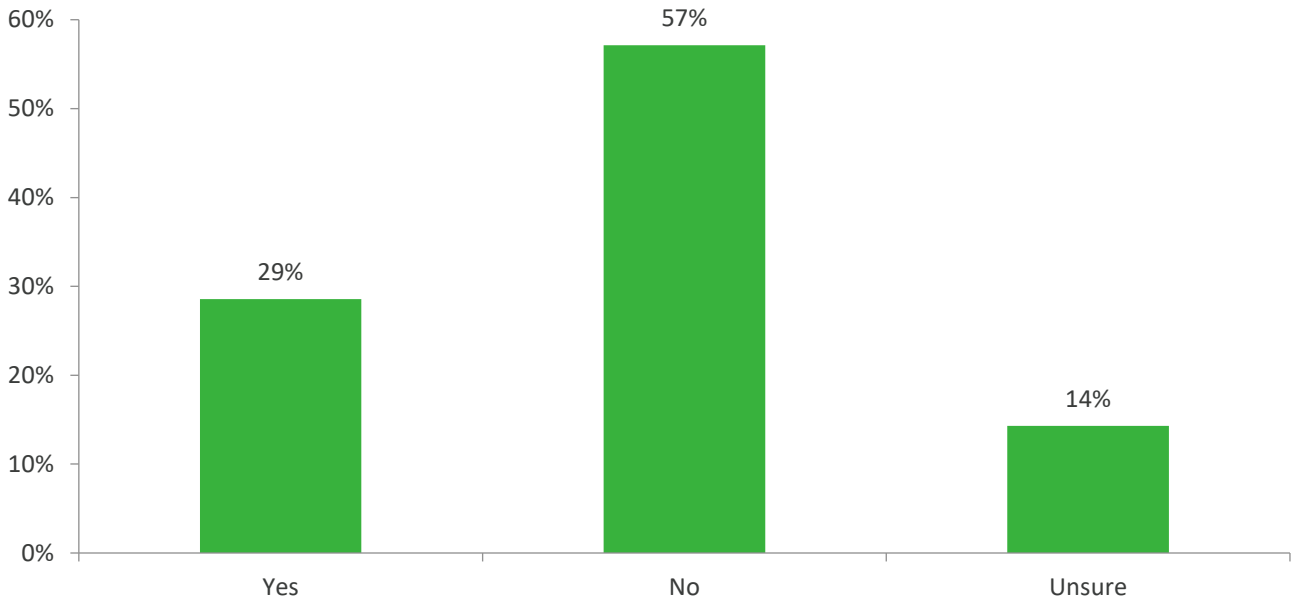
The profound local skills shortage coupled with the low levels of annual retrofit measures in Suffolk demonstrates a need to both upskill and grow the local workforce rapidly. **Figure 74** below shows expected employment growth levels installers need to hit to achieve net zero by 2030. An overwhelming majority of respondents expect significant increases in their growth to 2030. Over half the businesses and installers expected to grow between 51-100% up to 2030, with just under 30% expecting to grow above 100%. Those who expressed a growth rate of 1-25% tended to be larger companies operating in the local area who would naturally have lower growth rates. Interestingly, the survey indicates that some of these responses reflect personal business growth being slower but there is the need for their supply chain and external installer base to ramp up in growth rate.

Figure 74: What percentage growth in employment do you think will be needed for your company in the next 7 years to meet a net zero target by 2030



Despite installers needing rapid growth over the period, many expressed reservations about achieving that growth (**Figure 75**). Most respondents (57%) they were unlikely to meet this growth target under existing support mechanisms, while 29% said yes and 14% said unsure.

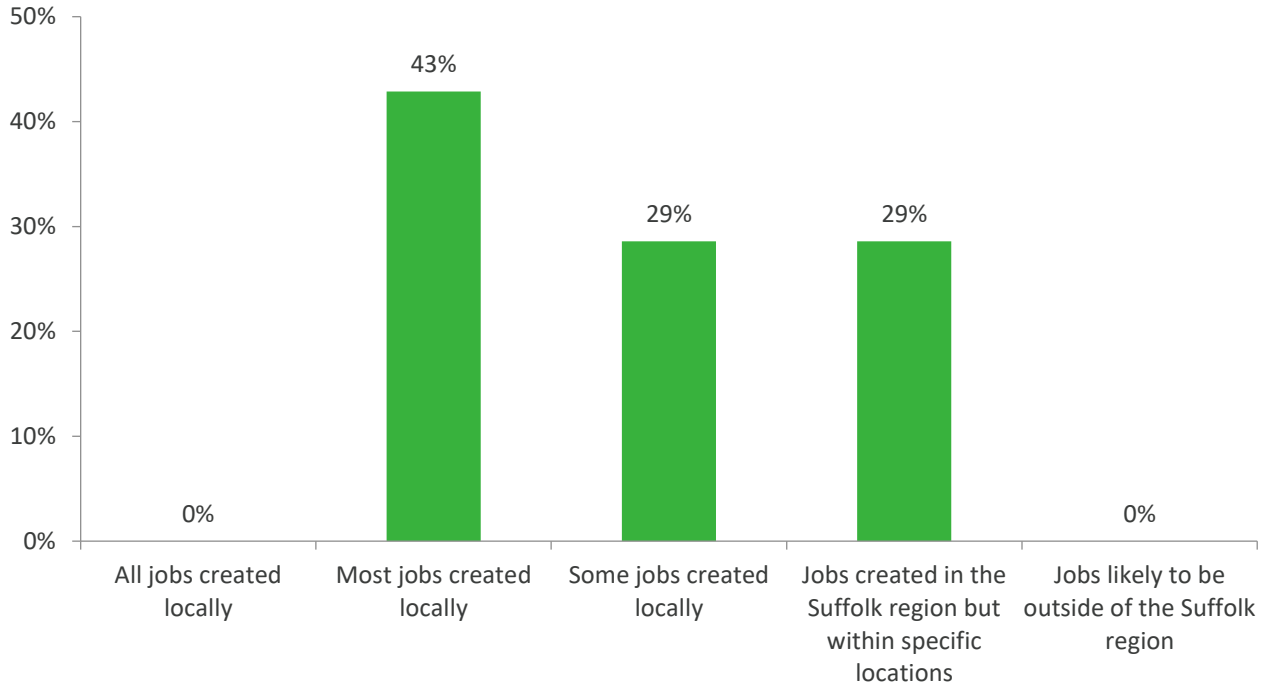
Figure 75: If you noted that there would be expected employment growth, is this growth achievable under existing local and national support mechanisms



Barriers to growth cited by respondents centred around the existing training routes being slow and not fit for purpose. One respondent mentioned the pre-requisites needed to complete heat pump training is extensive and too onerous on installers. Instead, they're trying to work with accredited training providers to deliver bespoke pre-requisites via a portfolio of work approach. Ranging from 6 months to 2 years, once an installer has developed the portfolio, they would be a viable candidate for training. This would significantly accelerate the training of heat pump installers. Additional insights from interviews indicate that upskilling the existing workforce is a challenge due to the need for new labour in the industry, as upskilling is difficult in an ageing population who do not see the need to re-train. For those that agree that there is a skilled workforce present, they also noted that there are new skills that need to be developed, such as electrical training for heat pump installation, to accelerate the net zero journey.

Many local employers believe that many of the jobs will be created locally as several of the larger companies have operations within the region (**Figure 76**). From the 2021 Census data, we can deduce that Suffolk has an aging population as people typically move to the area to retire and the younger population relocate for university or to pursue careers outside of the region. As Suffolk has an aging population, employment opportunities, schemes and educational courses should be created so that the younger generation are enticed to stay in the region.

Figure 76: Do you expect new jobs to be geographically dispersed and local, or agglomerated around certain parts of the country



Additional insight from the interviews suggested that there should be a regional drive at schools during the later stages of GCSEs, reinforcing to students there is a job for life in the area. Another respondent suggested people often "fall into" being an installer rather as an aspiration which should also be addressed. The concerns expressed about an aging population in the stakeholder engagement activity is reinforced by the age distribution of heating installers. **Figure 77** highlights East Anglia has the second highest share of heating engineers over the age of 60 with 25.7% of engineers, second only to the West Midlands with over 50% of the installers being over 50 This is a concern as older engineers may not only be less open to retraining as well as taking on and mentoring apprentices but may retire sooner reducing the available transferable skills base in the region.

Figure 77: Age of heating installers by region

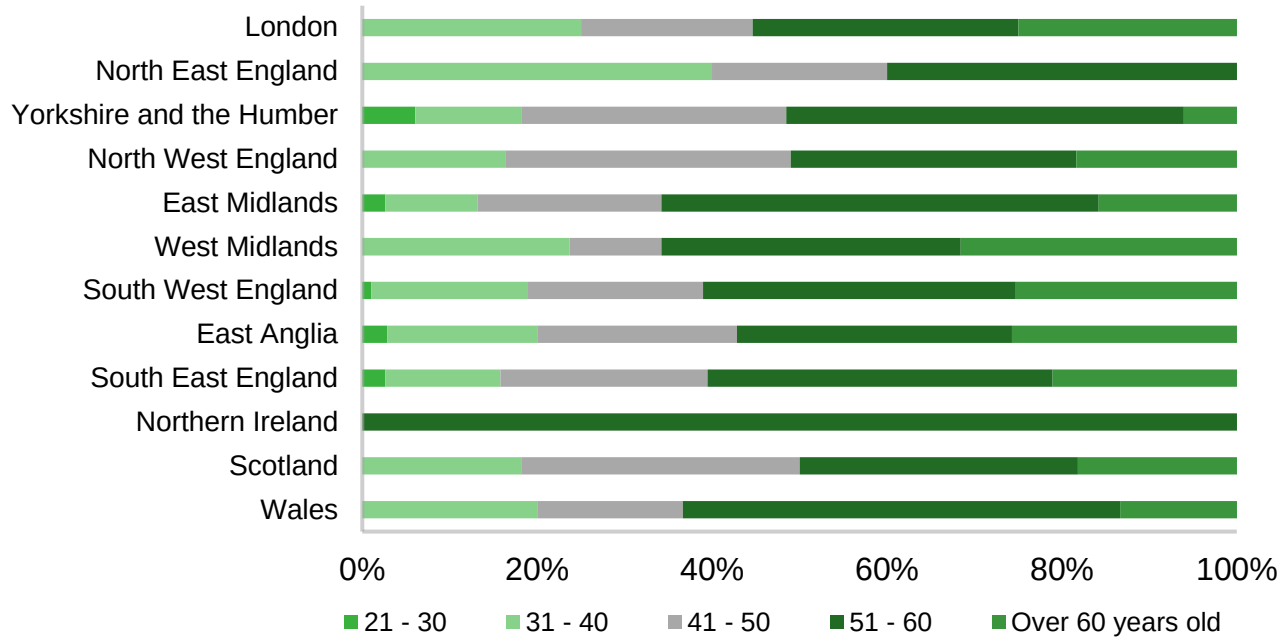
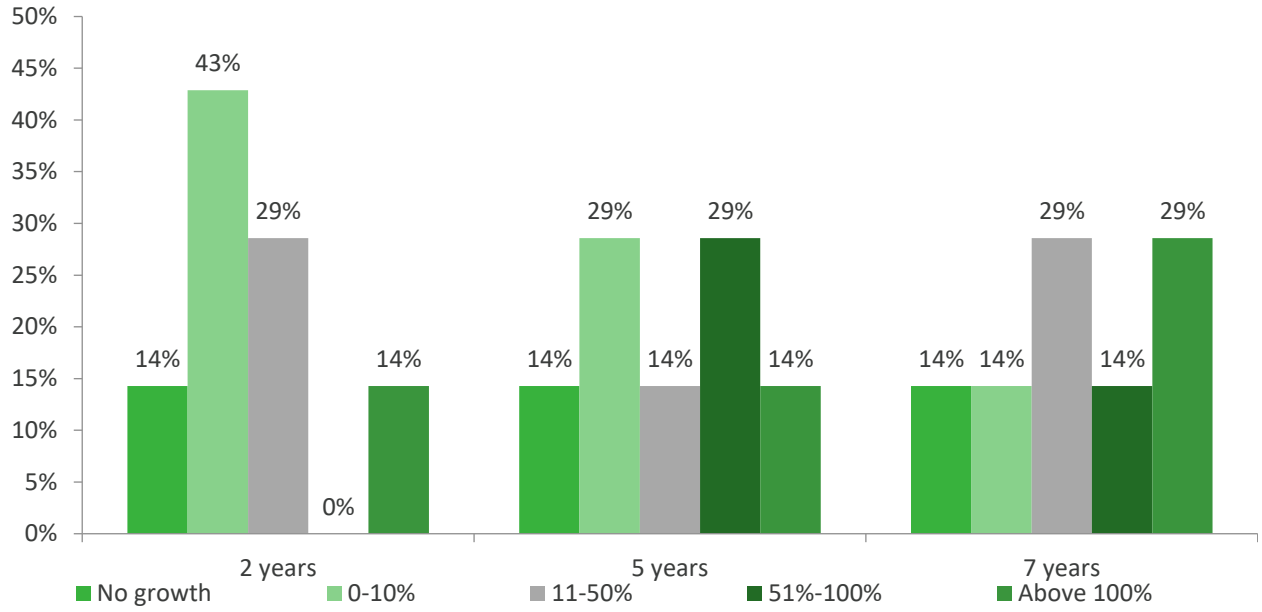


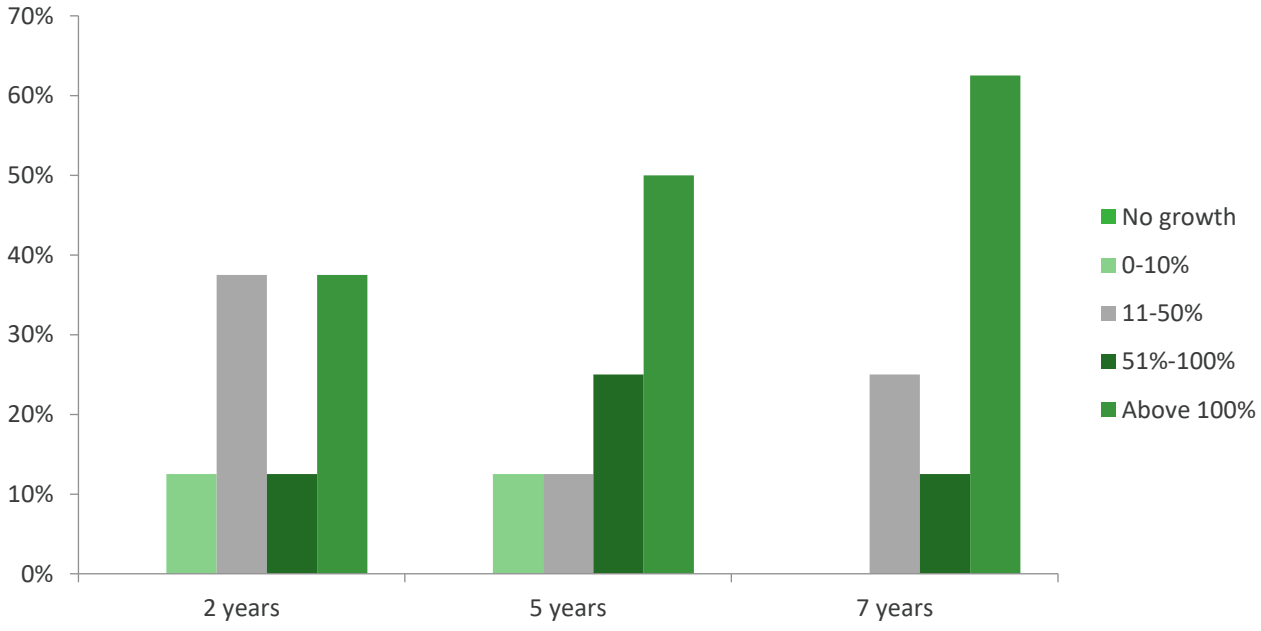
Figure 78 shows the anticipated growth rate their organisation expects in 2, 5 and years to reach net zero in the retrofit sector. The graphs show that many of the respondents see the need for a ramp up in growth to reach net zero, with a higher response rate for over 100% growth after 5-7 years.

Figure 78: What percentage growth in employment does your organisation anticipate over the following time periods in Suffolk under today's conditions?



Interestingly, the growth rates were reported as needing to be higher when respondents commented on the growth rates as industry (**Figure 79**). There are two reasons for this. First is that some larger organisations, like manufacturers of technology, expressed a desire for the supply chain of local installers to grow quicker. The second reason is that smaller installers knew the growth rate needs to be quicker from an industry perspective but were limited in their own growth potential by the local skills shortage and lack of national or local policies.

Figure 79: What percentage growth in employment in your sector do you think is required for Suffolk to meet net zero by 2030 over the following time periods



Drilling down into the expected growth rates by low, medium, and high qualification levels, there was no clear consensus on which level of qualifications was needed to grow the most (Figures 80-82). The mixed responses in the survey and interviews could be due to some larger manufacturers skewing the sample. These organisations tend to hire higher skilled labour such as project management and engineering professionals. Local installer base tends to need to intermediate qualifications. This is reflected in the subsequent economic analysis which shows the greatest growth in solid wall insulation and air source heat pump installation which ideally require NVQ level 3 equivalent to install the measures to a good standard.

Figure 80: Low level qualifications (e.g., NVQ Level 1&2; GCSEs)

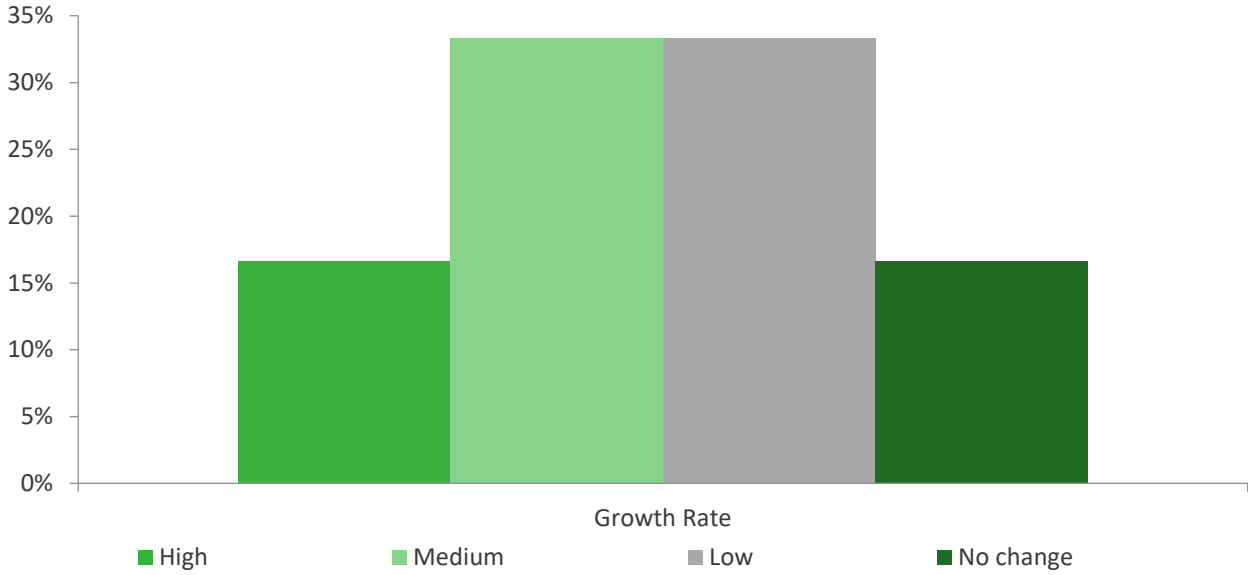


Figure 81: Intermediate level qualifications (e.g., NVQ Level 3&4; A-Levels; BTECs)

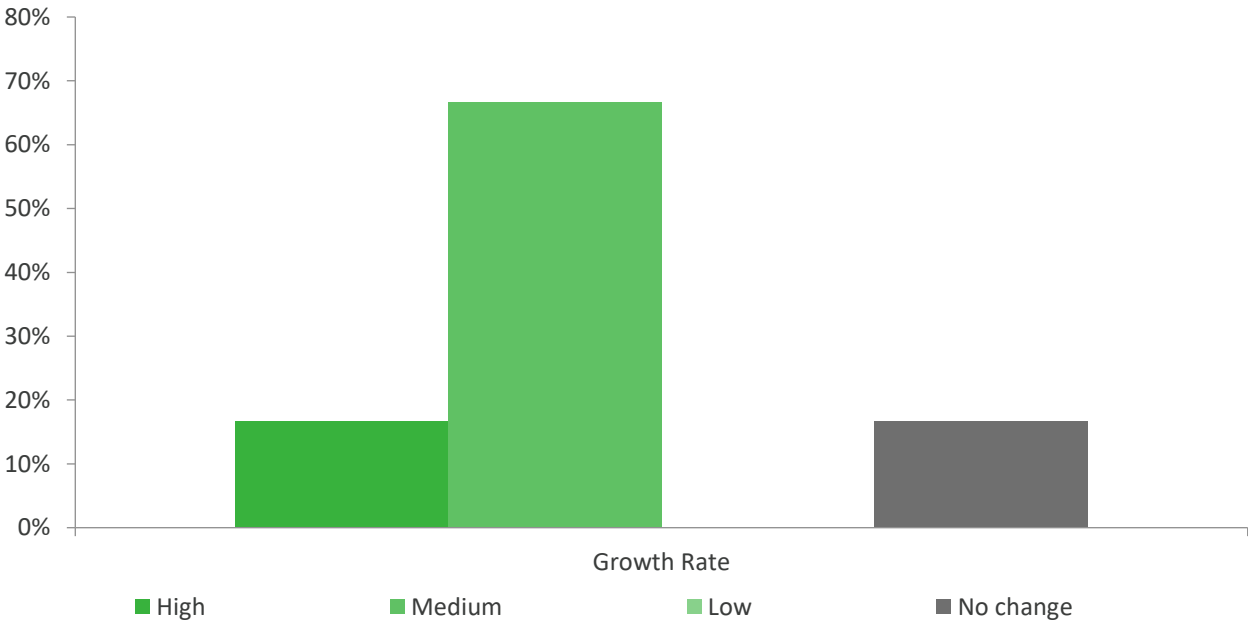
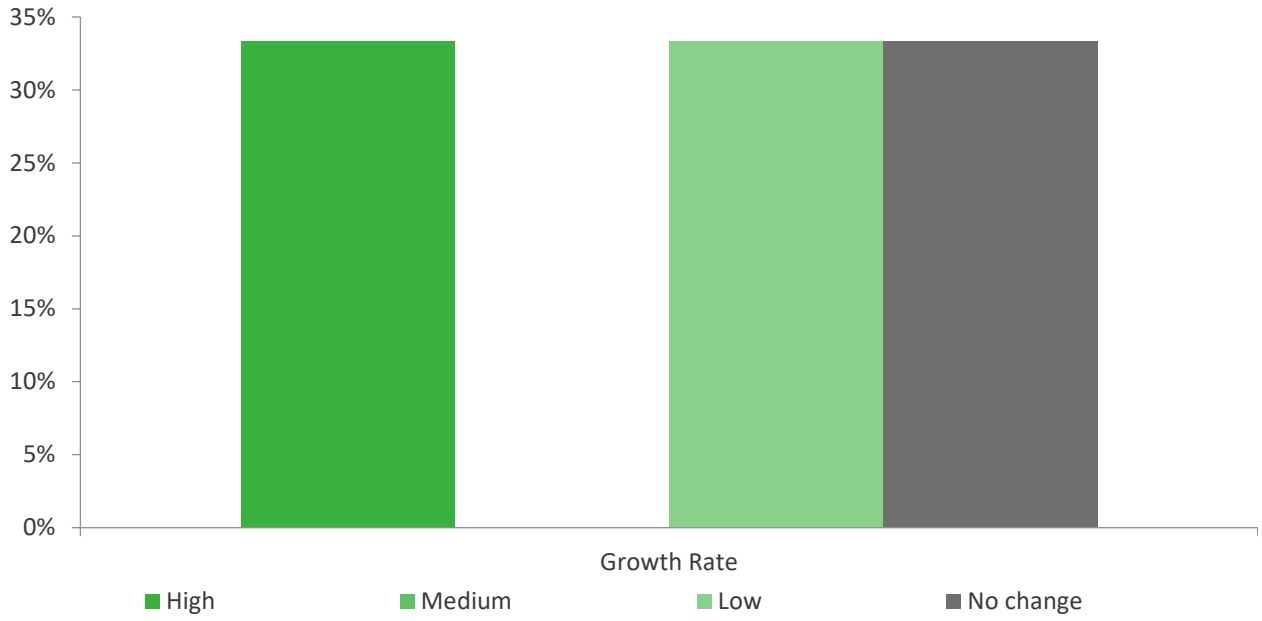


Figure 82: High level qualifications (e.g., NVQ Level 5; Higher Education Diploma; Degree)



In terms of the skills demand, employers found that the skills that are hardest to develop within a business are those that require the full completion of a qualification or apprenticeship in electrical, renewables or practical labour. Furthermore, employers cited that people with building regulation qualifications are increasingly hard to find. Lastly, a smaller number of employers advised that finding people with project management level qualifications or the desire to pursue project management were hard to recruit for.

Despite existing retrofit skills shortages being highly specific, some more general skills shortages were also identified. A prominent example, especially for new starters in the installer industry, were sales and communication skills. This was not only to help promote further business but to ensure work being carried out is communicated to the customer clearly to build up trust. In many cases these skills exist in other areas of the economy, such as generic construction and building qualifications for retrofit assessors and co-ordinators. Therefore, if a fall in demand occurs within one sector, focus could therefore be directed at enabling individuals to move into the retrofit sector, building upon their existing skills.

However, a key challenge is attracting talent into the retrofit sector in the first place. Examples from the surveys and interviews highlight that stakeholders see that there is a lack of interest from those under 18 when deciding their career path and for those who have the potential to upskill. Therefore, attracting a new pipeline of installers for the retrofit market will be promoting the benefits regarding long term job security and positive climate impacts. A full list of key words and qualification types mentioned during the surveys and interviews is provided in Figure 83.

Figure 83: Keywords mentioned in interviews and surveys on qualifications

High	Intermediate	Low
Degree - Construction Management	Level 3 NVQ	
Management Diplomas	Level 3 NVQ – Construction Management	
	NVQ - Electrical	
	NVQ - Plumbing	
	Gas – OFTEC Qualifications	
	Air Source Heat Qualifications	

GROWTH IN ENERGY EFFICIENCY MEASURES TO ACHIEVE NET ZERO

The installation of energy efficiency measures should be viewed as an infrastructure investment. Unlike low carbon heating, installing insulation does not displace any other technologies but simply enhances the energy efficiency of the existing building stock. All jobs generated in the building fabric / insulation sector should therefore be viewed as additional as they are not created at the cost of displacing existing jobs. Many of those currently working in insulation typically spread their time across several installation measures. A multi-skilled workforce therefore may be a result of relatively low levels of demand to date. Over time this may change as increased demand could result in specialised firms and job roles focussing on specific measures.

The measures within the scope have been included as they are the most widespread and cost-effective solutions and offer the potential for vast energy consumption reductions across the building stock. Door and floor insulation measures could also play a role however their widespread technical and economic feasibility and more limited than the measures chose:

- **Cavity wall insulation** – Assumed to be installed in cavity walled properties with either no insulation or thermal transmittance greater than 0.55 W/m2k from the property's walls.

- **Solid wall insulation** – External or internal wall insulation assumed to be installed in solid walled properties with no wall insulation.

- **Loft insulated** – Assumed to be installed in all apartments that are not maisonettes or flats with no loft insulation, loft insulation thickness below 100mm or roof thermal transmittance above 0.18W/m2k.

- **Double glazing** – Assumed to be installed in properties with an EPC windows energy rating of "very poor", 0% of windows double glazed and available for window renovation (i.e. not a listed or protected building).

INSTALLATIONS REQUIRED TO MEET NET ZERO FOR NORFOLK

***Figure 84** and*

Figure 85 demonstrate the rapid growth in insulation installations required to reach net zero in Norfolk by 2030. This is especially seen in the urgent ramp up scenario where there is a large short-term deployment in measures, especially loft and solid wall insulation.

Figure 84: Total energy efficiency installations (Gradual ramp up)

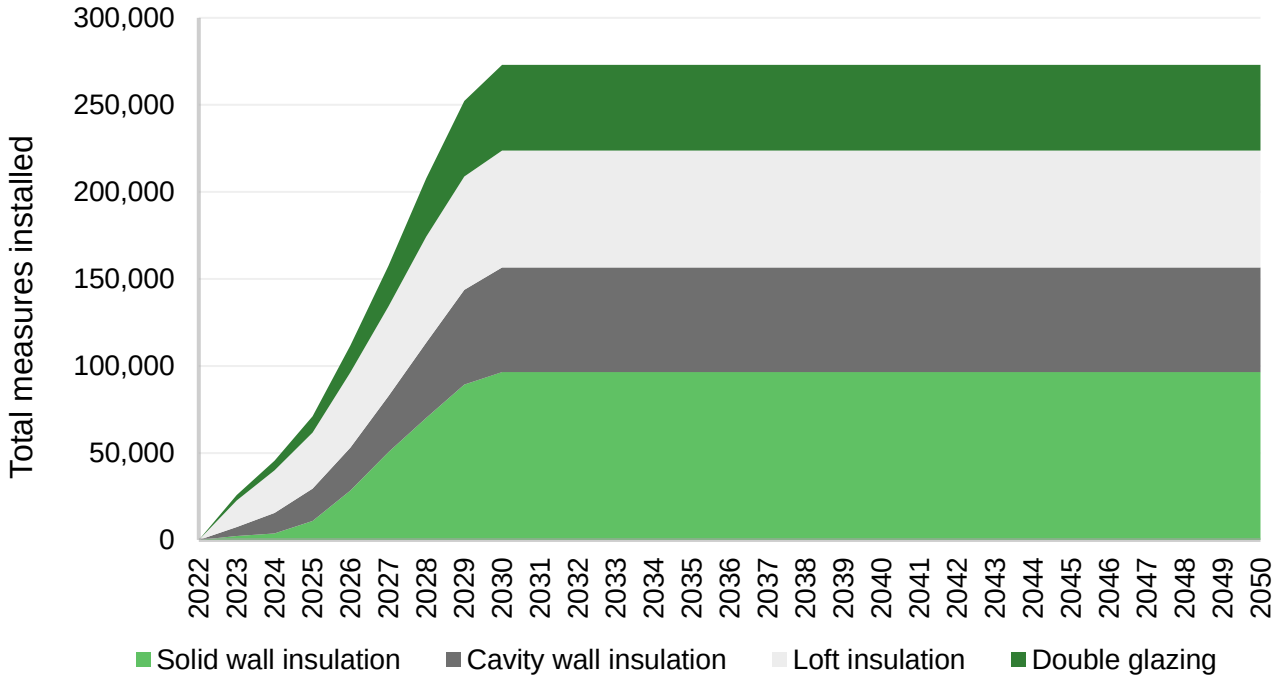


Figure 85: Total energy efficiency installations (Urgent ramp up)

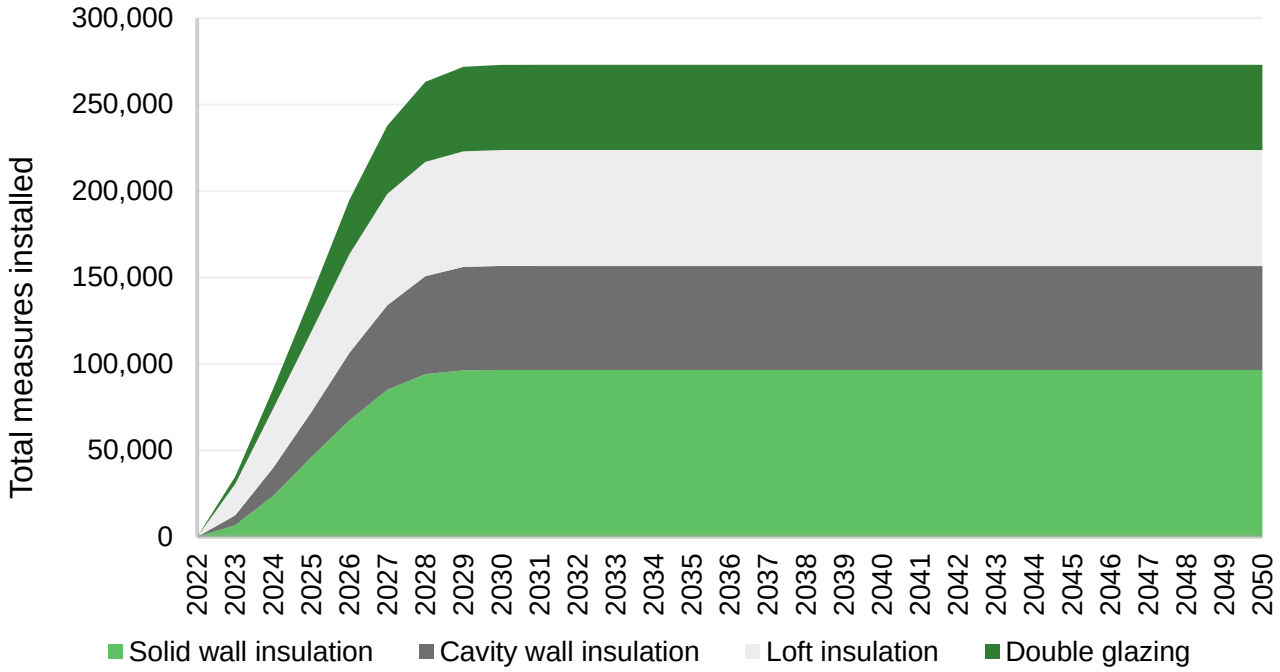


Figure 86 and **Figure 87** provide two different counterfactuals, where the net zero by 2050 hits insulation targets by 2050. The latter represents insulation rates under a status quo scenario called falling behind.

Figure 86: Total energy efficiency installations (Net zero 2050)

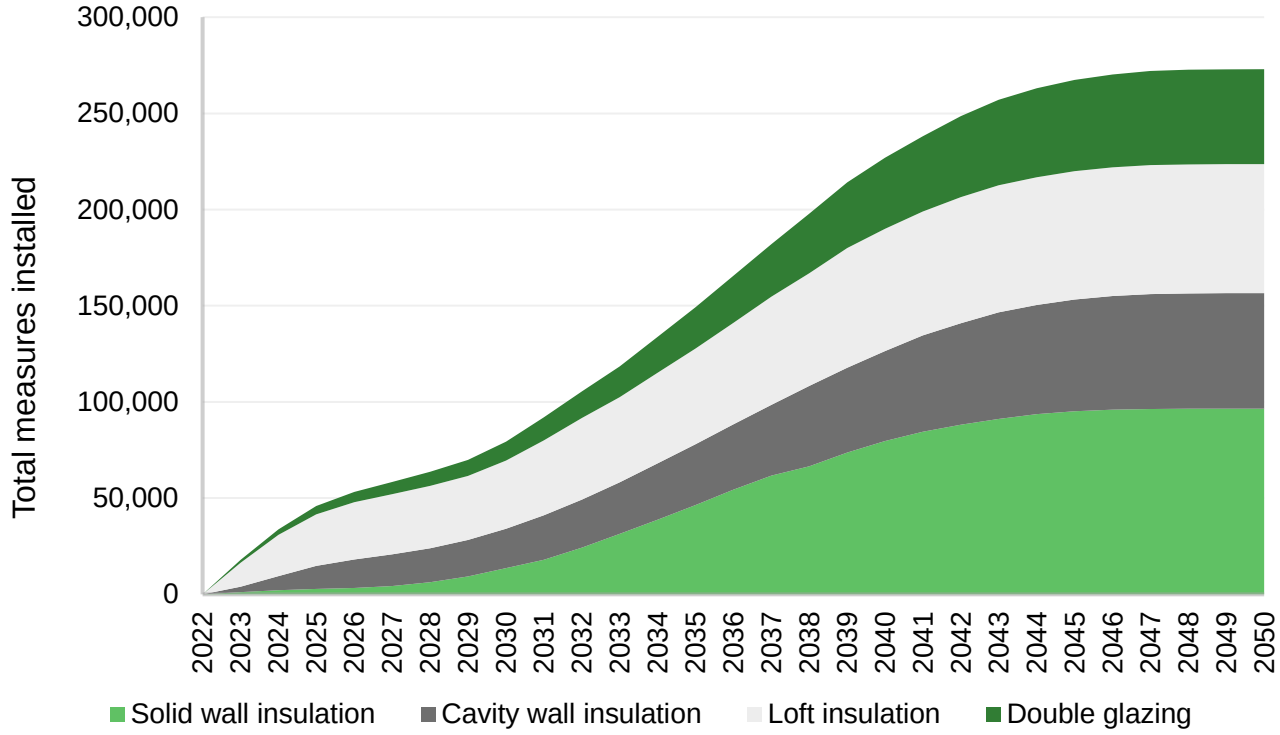
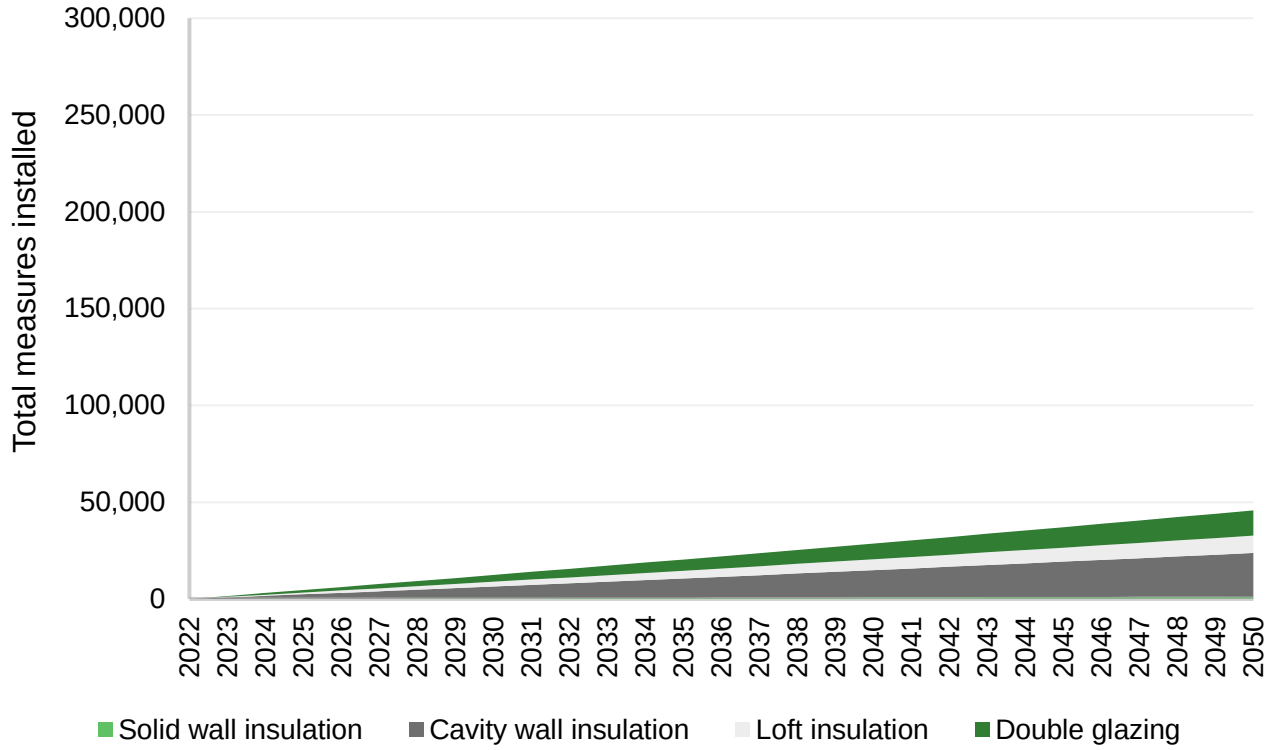


Figure 87: Total energy efficiency installations (Falling behind)



The short-term installation rates required under the net zero by 2050 scenario are far less drastic than the gradual and urgent ramp up scenarios with peak deployment at 16,494 insulation units installed per year compared to 56,582 and 50,292 for the urgent ramp up and gradual ramp scenarios respectively. In some areas the deployment rate was especially high with over 8,000 solid wall insulation installations in North Norfolk and Norwich in 2025 and 2026 in the urgent ramp up scenario.

To prioritise insulation measures that offer the best return on time and investment, the model developed selected homes to insulate based on those with the lowest payback time maximising short term carbon reductions and bills savings whilst leaving homes with less vital insulation requirements till later in the period. This meant the installations in the area optimised the potential of current installation capacity in the region shown by a large short-term reduction in annual bills faced by consumer homes. Graph X shows how across all scenarios, bills faced by domestic consumers are drastically reduced across all scenarios with around £110 million in annual bills reduction across Norfolk once all necessary measures are installed, and £21 million in both King's Lynn and West Norfolk and Norwich respectively.

Figure 88: Reduction in bills from domestic properties due to installation of insulation measures

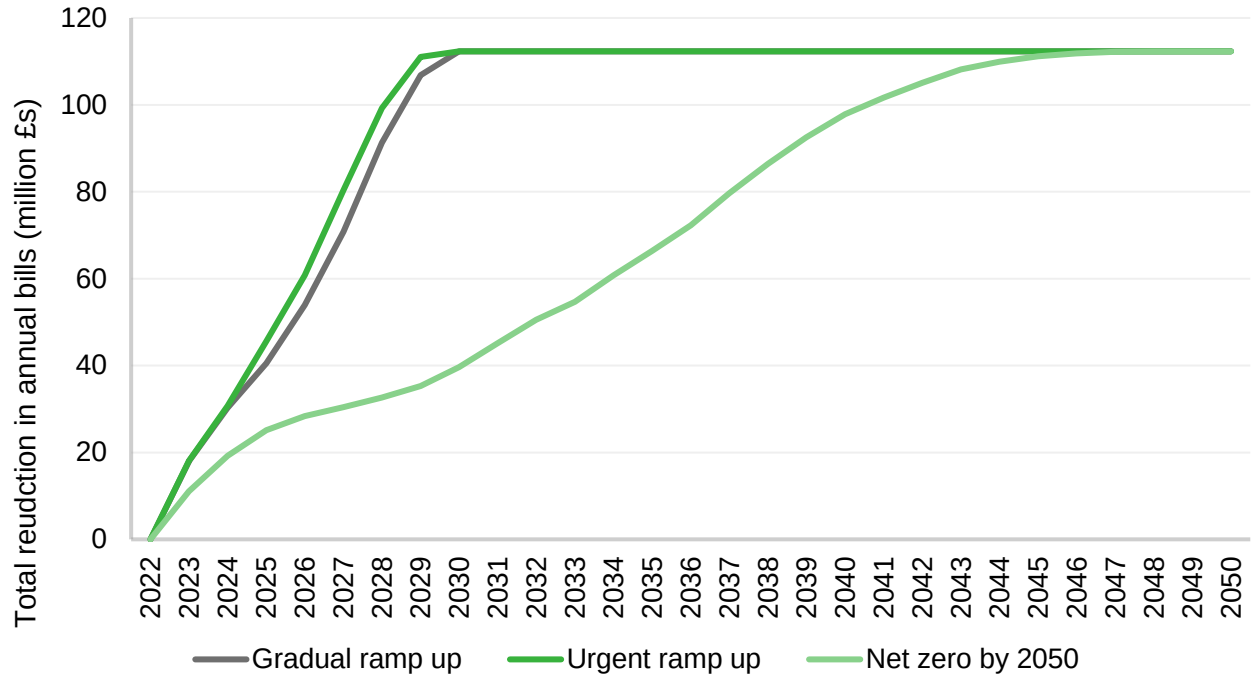
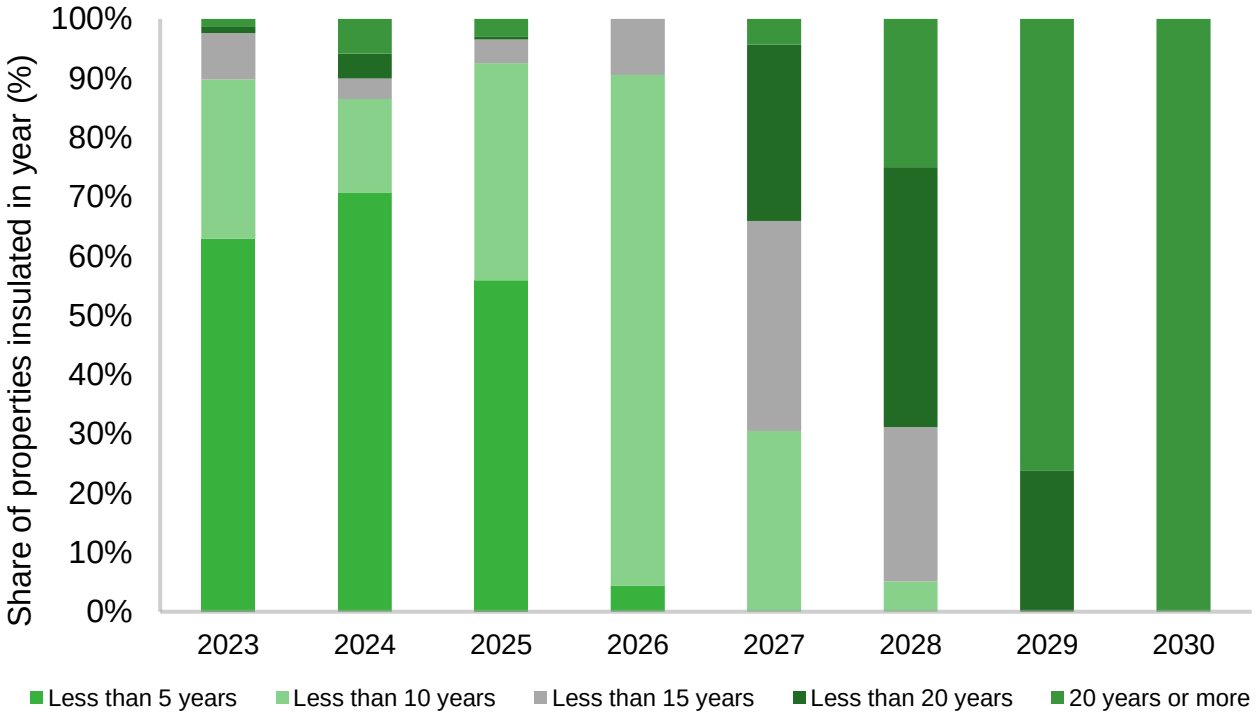


Figure 89 demonstrates this prioritisation of shorter payback period installations, with a significantly higher share of measures with payback periods less than 5 years in the first period than the last year. The average payback period in 2023 under the urgent ramp up scenario was 4.4 years, 10 times smaller than the average payback time in 2030.

Figure 89: Percentage of properties insulated in each year sorted by payback time (Urgent ramp up)



NORFOLK SKILLS REQUIREMENT FOR ENERGY EFFICIENCY

Figures 90-92 underscores that irrespective of the deployment scenario, job growth across the Norfolk region will likely be dominated by solid wall insulation installers. This is due to the current low skills provision in the region, the substantial installation time and solid wall properties historically being neglected by efforts to insulate the housing stock. Across the net zero compliant scenarios, there is a need for significant training of insulation construction and services. In the gradual ramp up scenario, 1,726 new solid wall installers must be trained by 2027 with 1,910 required by 2025 under the urgent ramp up scenario and 575 required by 2036 under the net zero by 2050 scenario. This is especially prevalent in Norwich, where around a quarter of these installers will be required. Solid wall insulation makes up most of the skills requirements and reflects the labour intensity associated with insulating solid wall properties.

The skills gap across other insulation measures is less severe, with very few new loft insulation installers required across all scenarios owing to the short installation time, relatively high current skills provision and the lower overall requirement for loft insulation. The need for new loft insulation installers is concentrated across a few local authorities with a maximum of around 23 needed in the urgent ramp up and gradual ramp up scenarios across Great Yarmouth, North Norfolk and Norwich. There is a need for some training of double glazing and cavity wall insulation installers with 63 additional cavity wall installers and 100 additional double-glazing installers required by 2026 in the urgent ramp up scenario as well as 66 additional cavity wall insulation installers and 91 double glazing installers required by 2029 and 2028 respectively under the gradual ramp up scenario. Once more this is geographically concentrated with around a half of the additional double glazing installer requirements in Norwich and King's Lynn and West Norfolk and over half the requirement for cavity wall insulation installers in the same local authorities.

To support the installation of new insulation measures, new retrofit services will be required to assess homes for required measures and to coordinate the widespread of installation of new measures. Under the urgent ramp up scenario, 47 additional retrofit assessors and 12 additional retrofit coordinators are required by 2025, 38 additional retrofit assessors and 10 additional retrofit coordinators are required by 2028 under the gradual ramp up scenarios and 9 additional retrofit assessors and 2 additional retrofit coordinators are required by 2023 under the net zero by 2050 scenario. It should be noted that the skills cut-off will be less severe in practice than that shown in the below graphs with the transition of retrofit skills towards construction new build properties. However, with the short-term nature of reaching net zero by 2030 and the fact that insulation does not require significant levels of replacement or maintenance, some degree of skills surplus is unavoidable. It should also be noted that there are no major requirements for training under the falling behind scenario due to the limited demand for insulation measures.

Figure 90: Total job requirement for energy efficiency measures (Gradual ramp up)

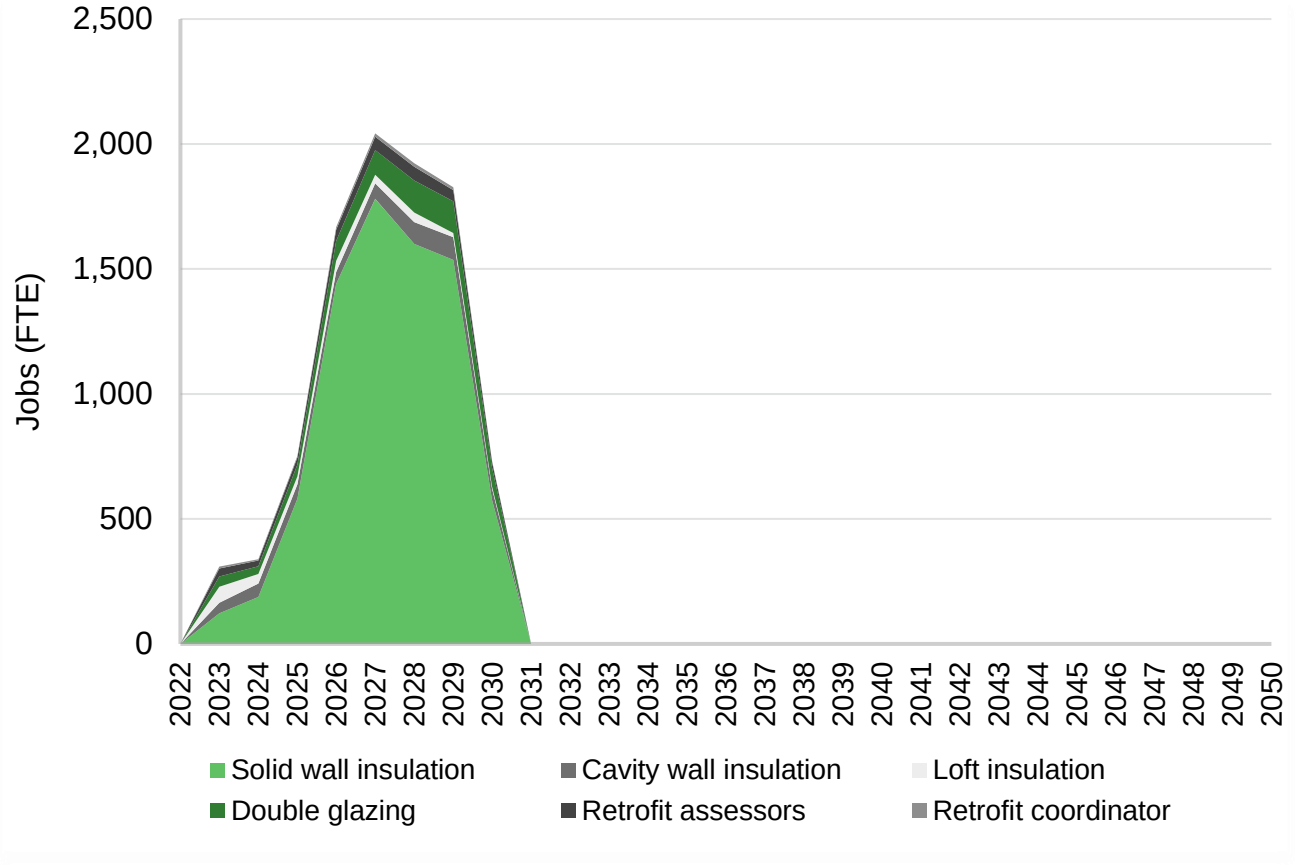


Figure 91: Total job requirements for energy efficiency measures (Urgent ramp up)

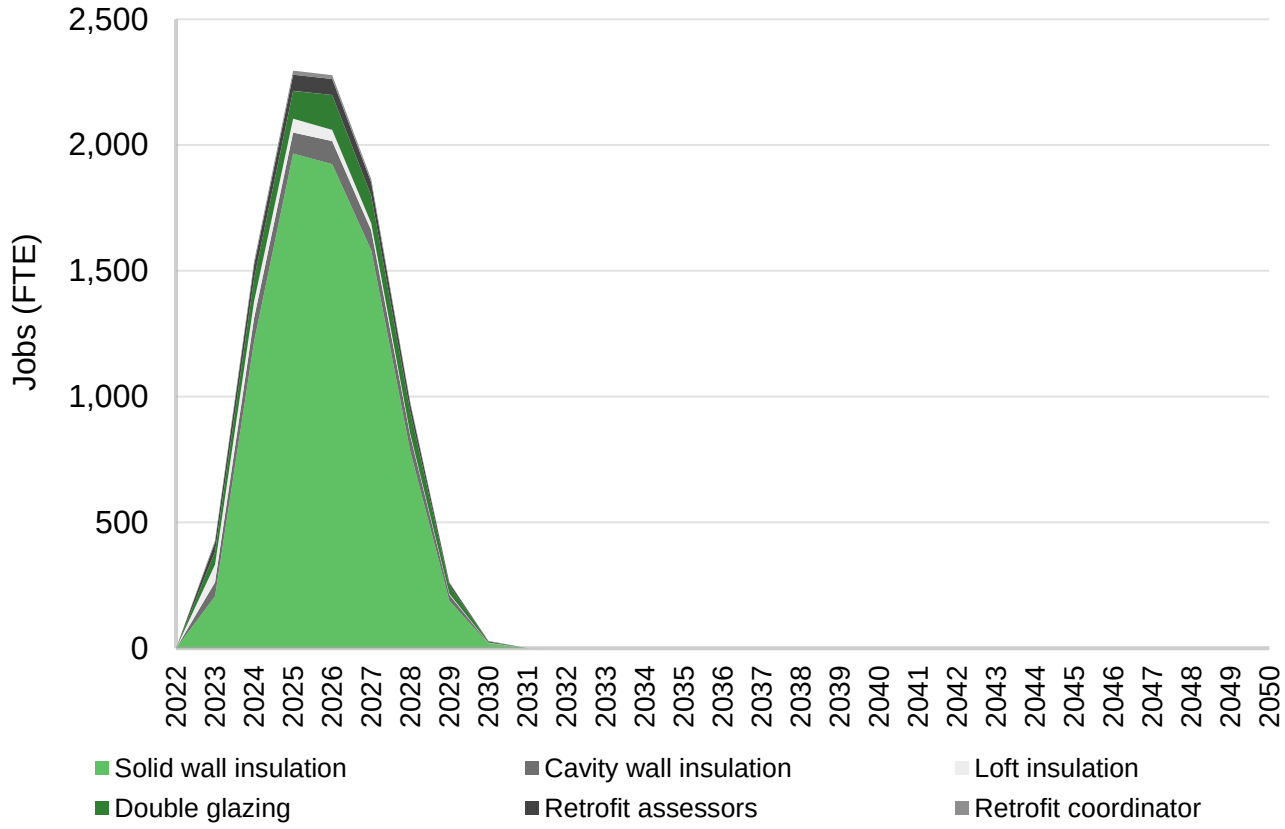


Figure 92: Total job requirements for energy efficiency measures (Net zero by 2050)

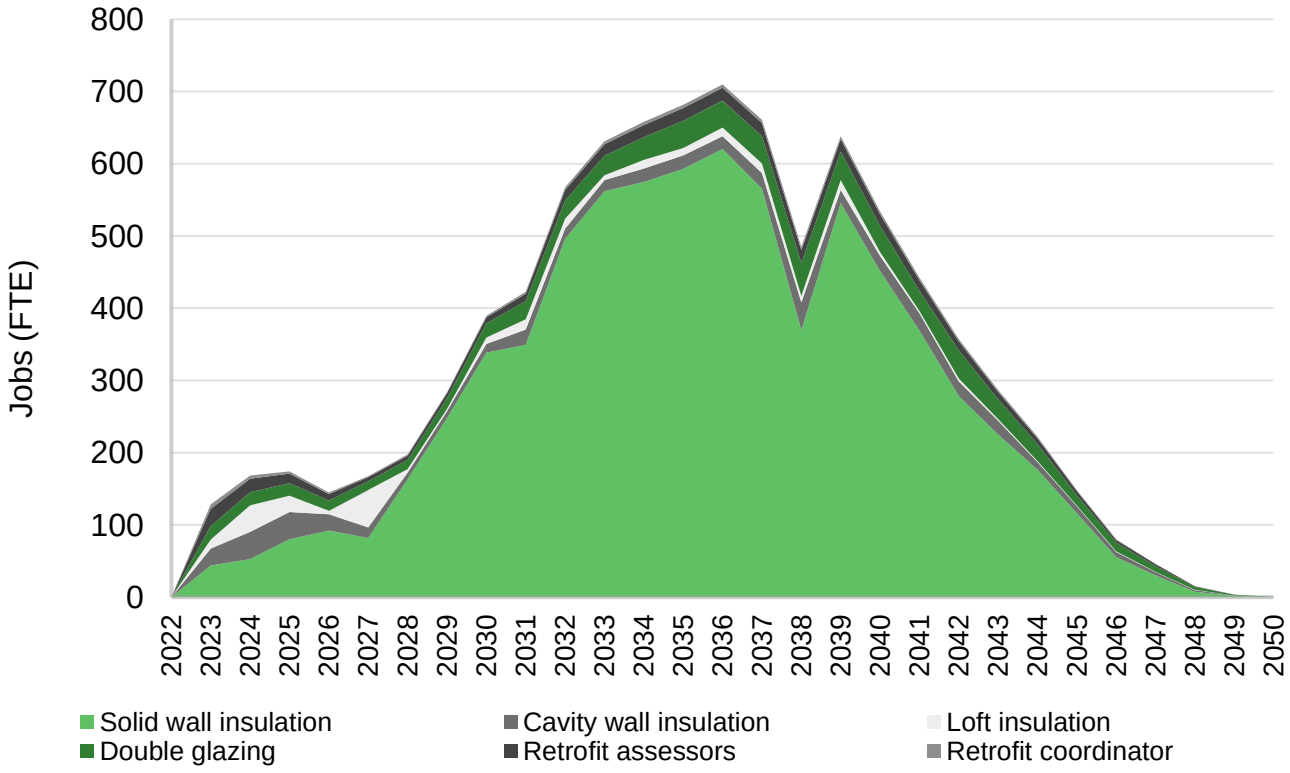
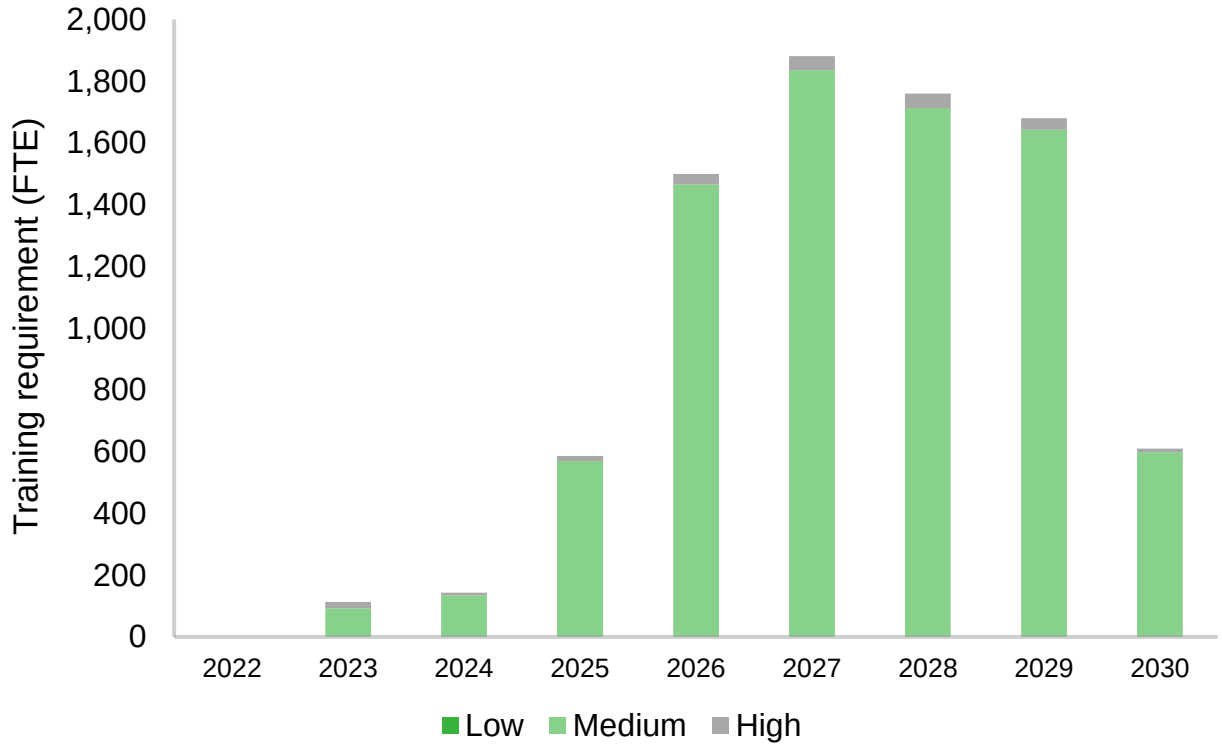


Figure 93 shows how the skills required to facilitate the construction of energy efficiency measures are overwhelmingly medium level roles. Those involved directly in the installation process require level 2-3 qualifications to ensure the quality of the install raises the energy efficiency profile of the house by a significant amount. For those assessing the retrofit requirements and coordinating the delivery of a range of retrofit measures, high level skills will be required. The below graph demonstrates the training requirement in terms of additional jobs broken down by skill. The gradual ramp up scenario is displayed; however, the remaining scenarios can also be found in Appendix 5. Under the gradual ramp up scenario, across Norfolk, 1,836 medium level qualifications will be required by 2027 and 48 high level qualifications by 2028 to effectively insulate the housing stock.

Figure 93: Training requirements by skill level in Norfolk (Gradual ramp up)



Additional analysis conducted by Gemserv (Figure 94) also demonstrates how the installation of insulations measures will generate spill over benefits. New economic opportunities will be developed across the retrofit supply chain, from the installation and manufacture of insulation measures to the wholesale trade of building supplies. The below chart summarises some key estimated economic snapshots of the retrofit sector in Norfolk across the four scenarios and shows how a short-term boom can be expected in the retrofit economy if 2030 targets are met. These snapshots are taken from the year that the market is at its largest however it should be noted that the economic impact will be more long term under the net zero by 2050 scenario compared to the gradual/urgent ramp up scenarios.

Figure 94: Spill over benefits generated across the different energy efficiency deployment scenarios (Norfolk)

Scenario	Peak year	Construction GVA (million £s p.a)	Manufacture GVA (million £s p.a)	Services GVA (million £s p.a)	Wholesale and trade GVA (million £s p.a)
Gradual ramp up	2027	88.6	45.0	3.8	8.0
Urgent ramp up	2025	104.1	57.0	4.5	9.8
Net zero 2050	2035	27.5	14.0	1.1	2.4
Falling behind	2050	0.9	1.5	0.2	0.1

INSTALLATIONS REQUIRED TO MEET NET ZERO FOR SUFFOLK

Figure 95 and **Figure 96** show the gradual ramp up and urgent ramp up to net zero by 2030 scenarios. Both scenarios project rapid growth in insulation installations required to reach net zero in Suffolk, especially in the urgent ramp up scenario where there is a large short-term deployment in measures, especially loft and solid wall insulation.

Figure 95: Total energy efficiency installations (Gradual ramp up)

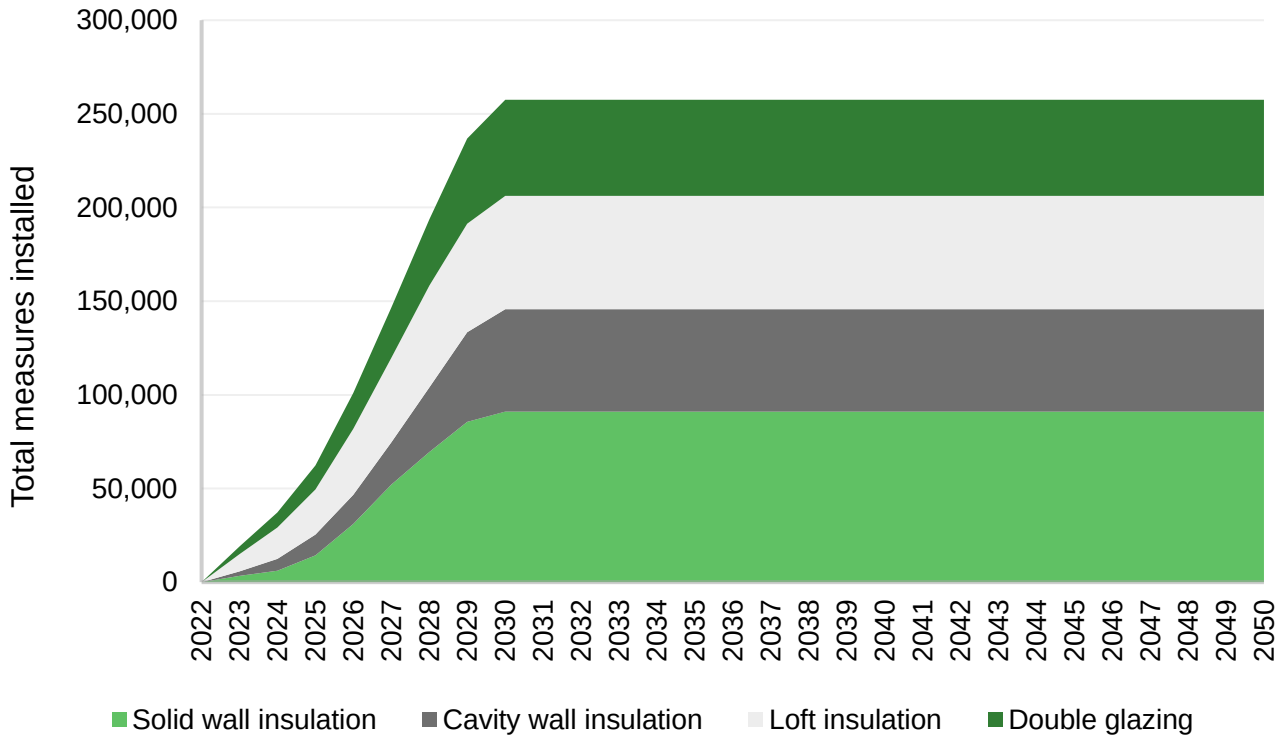


Figure 96: Total energy efficiency installations (Urgent ramp up)

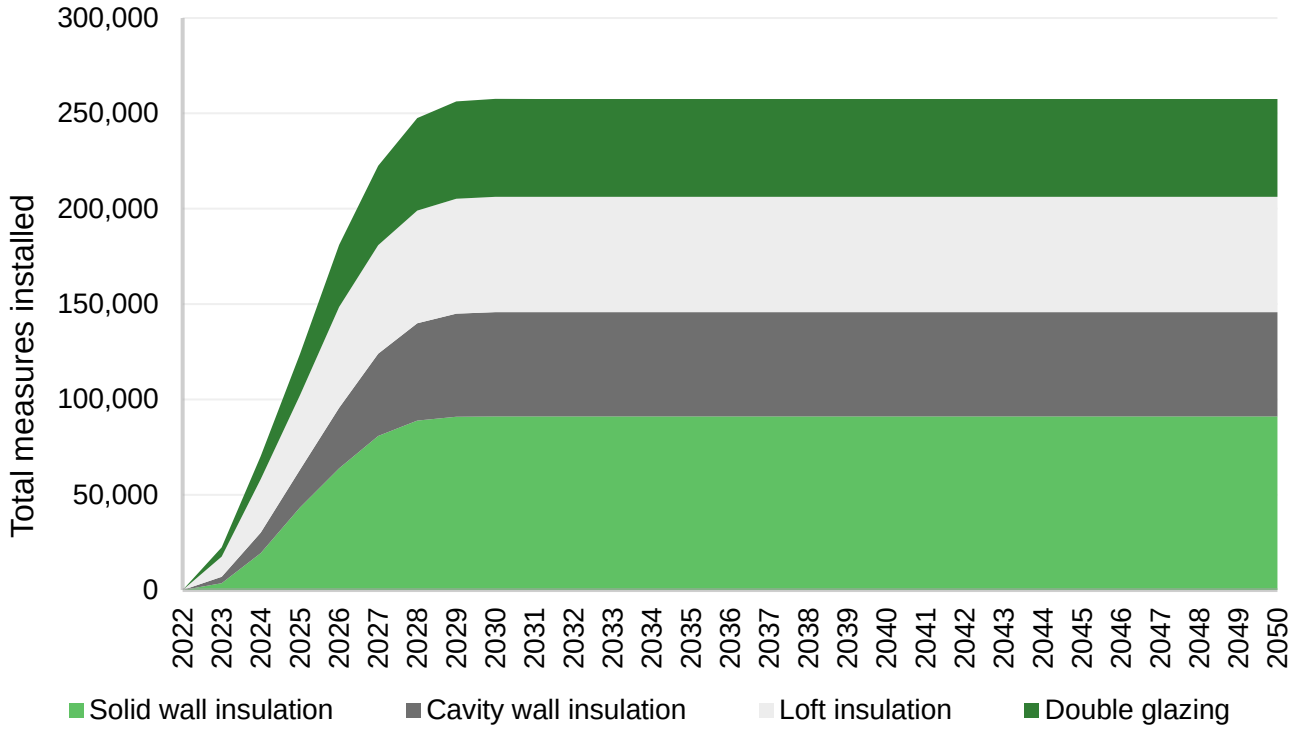


Figure 97 and **Figure 98** provide two different counterfactuals, where the net zero by 2050 hits insulation targets by 2050. The latter represents insulation rates under a status quo scenario called falling behind.

Figure 97: Total energy efficiency installations (Net zero by 2050)

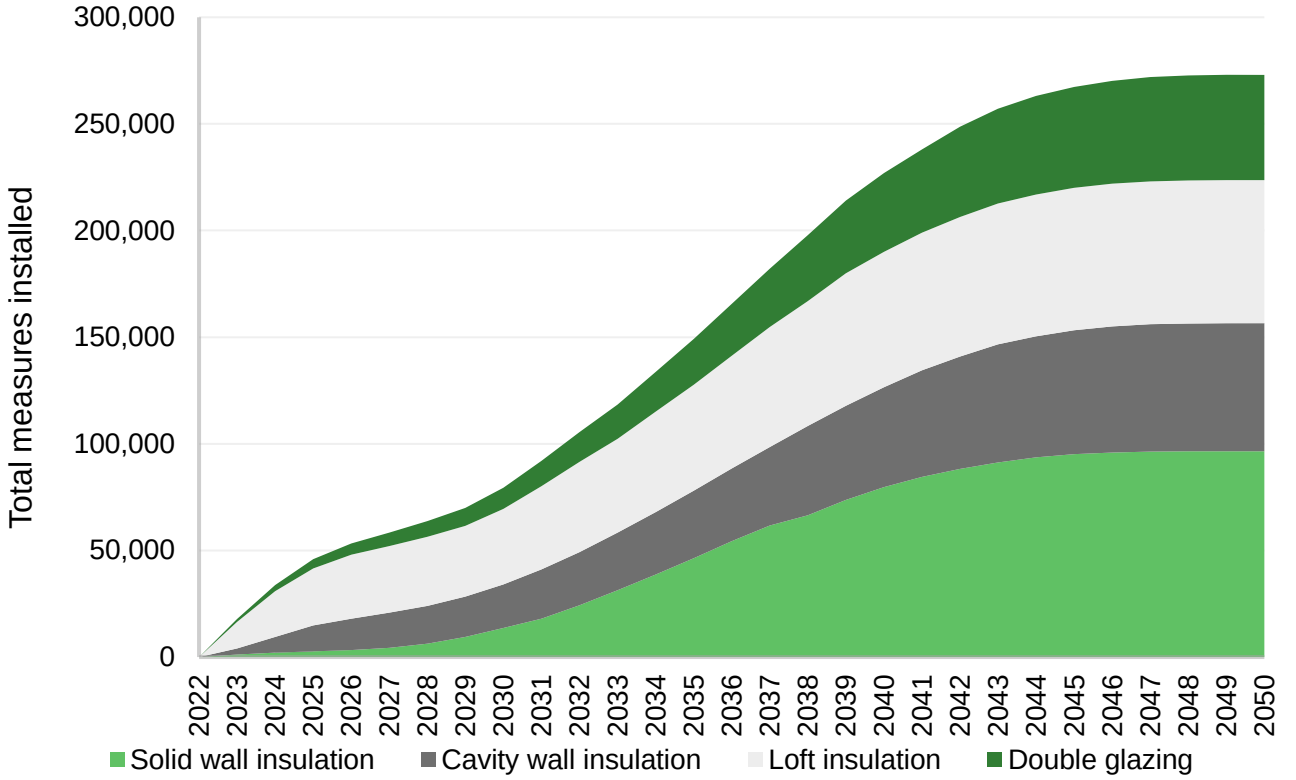
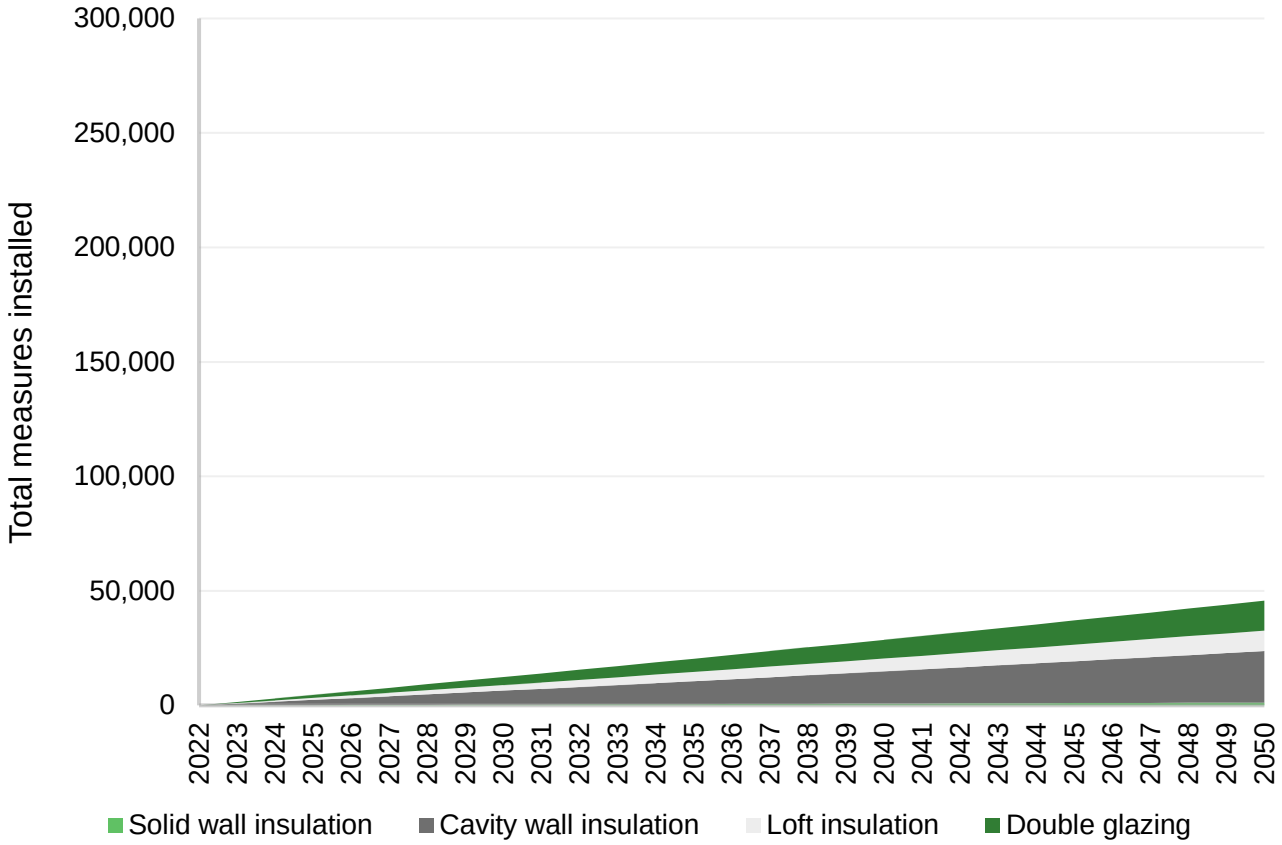


Figure 98: Total energy efficiency installations (Falling behind)



The short-term installation rates required under the net zero by 2050 scenario are far less drastic than the gradual and urgent ramp up scenarios with peak deployment at 16,699 insulation units installed per year compared to 57,025 and 47,114 for the urgent ramp up and gradual ramp scenarios respectively. In some local authorities, this high deployment is especially obvious with 8,638 installations in 2027 in East Suffolk alone.

To prioritise insulation measures that offer the best return on time and investment, the model developed selected homes to insulate based on those with the lowest payback time maximising short term carbon reductions and bills savings whilst leaving homes with less vital insulation requirements till later in the period. This meant the installations in the area optimised the potential of current installation capacity in the region shown by a large short-term reduction in annual bills faced by consumer homes. **Figure 99** shows how across all scenarios, fuel bills are significantly reduced in the short term, with annual heating bills being reduced by £102 million across Suffolk, with £39 million in East Suffolk alone.

Figure 99: Reduction in bills from domestic properties due to the installation of energy efficiency measures

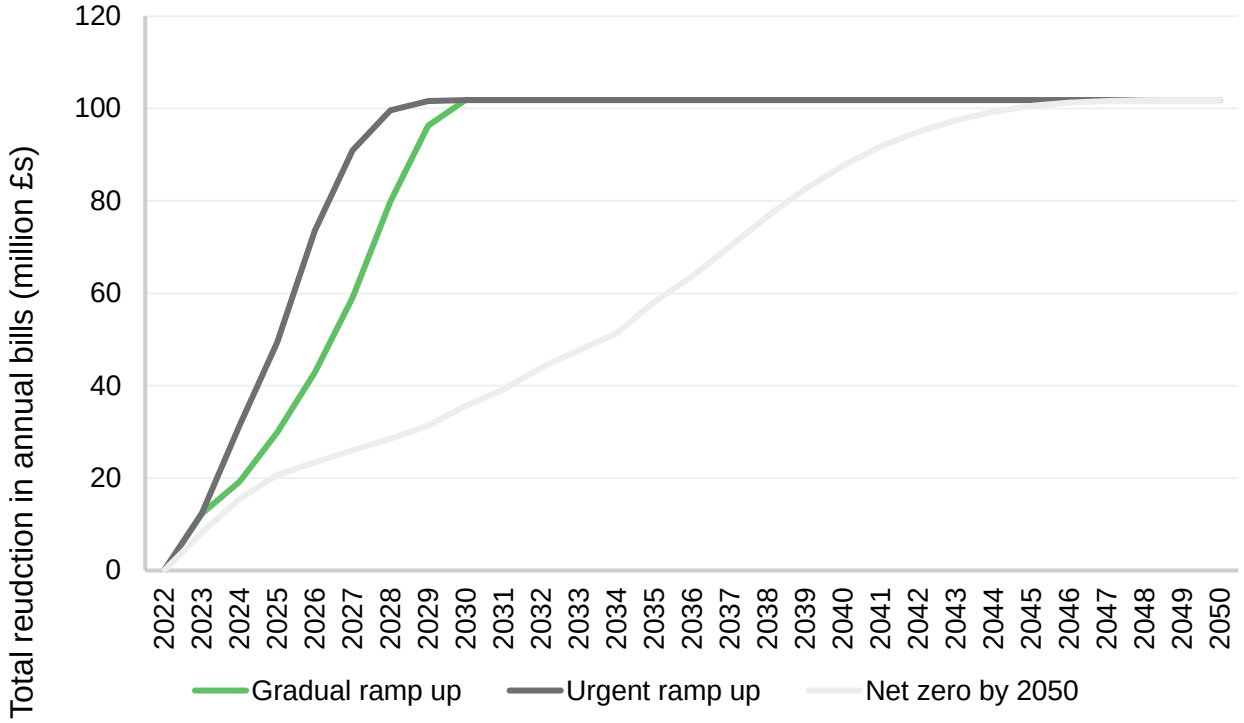
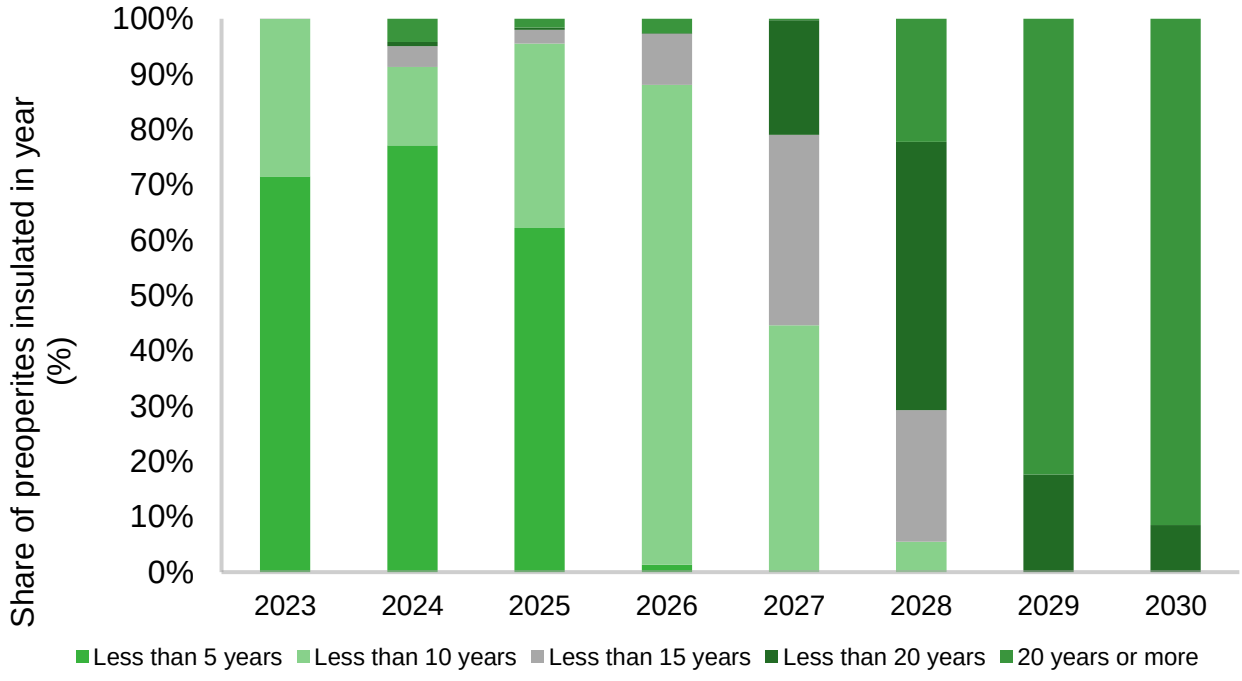


Figure 100 demonstrates this prioritisation of shorter payback period installations, with a significantly higher share of measures with payback periods less than 5 years in the first period than the last year. The average payback period in 2023 under the urgent ramp up scenario was 4.2 years, 10 times smaller than the average payback time in 2030.

Figure 100: Percentage of properties insulated in each year by payback time (Urgent ramp up)



SUFFOLK SKILLS REQUIREMENT FOR ENERGY EFFICIENCY

Figures 101-103 project that future skills requirements across Suffolk is likely to be dominated by solid wall insulation installers. 1954 additional installers are projected to be required by 2025 under the urgent ramp up scenario, with 1683 required by 2027 under the gradual ramp up scenario. The need for short term employment growth in the net zero by 2050 scenario is more muted with 571 installers required by 2036. This employment requirement is also geographically concentrated with around 40% of this additional labour required in East Suffolk. Solid wall insulation makes up most of the skills requirements and reflects the labour intensity associated with insulating solid wall properties as well as the historical neglect of insulating solid walled properties.

The challenge in upskilling sufficient labour across other measures is less difficult. 81 additional cavity wall insulation installers will be required by 2026 under the urgent ramp up scenario with 89 required by 2029 under the gradual ramp up scenario and 21 by 2039 under the net zero by 2050 scenario. East Suffolk also dominates the need for additional cavity wall insulation installers with 37 of the 89 additional jobs required under the gradual ramp up scenario needed there owing to the low starting provision in the area. For other areas, the challenge is less significant with only 8 additional installers required in Mid Suffolk. Due to the low installation time for loft insulation, the relatively high historic deployment of it, and the high current provision of skills, the requirement for additional loft insulation installers is no higher than 36 across all scenarios. Over half of the 23 additional loft insulation installers required in Suffolk by 2026 in the gradual ramp up scenario are in Ipswich. The current provision of double-glazing installers in Suffolk is strong however to reach net zero by 2030, 73 additional installers will be required by 2026 under the urgent ramp up scenario and 69 by 2029 under the gradual ramp up scenario with nearly half of these required in East Suffolk.

To support the installation and deployment of insulation measures, retrofit coordinators and retrofit assessors will be needed also although the scale of the training requirement is far lower. 46 retrofit assessors and 11 retrofit coordinators will be required by 2025 under the urgent ramp up scenario and 38 retrofit assessors and 10 retrofit coordinators will be required by 2029 under the gradual ramp up scenario. Just an additional 11 retrofit assessors and 3 retrofit coordinators will be required by 2037 under the net zero by 2037 scenario. Half of this additional labour will be required in East Suffolk and nearly a third in Ipswich. It should be noted that the skills cut-off will be less severe in practice than that shown in the below graphs with the transition of retrofit skills towards construction of new build properties with around 55,000 expected new build properties in Suffolk by 2050. However, with the short-term nature of reaching net zero by 2030 and the fact that insulation does not require significant levels of replacement or maintenance, some

degree of skills surplus is unavoidable. It should also be noted that there is no major requirements for training under the falling behind scenario due to the limited demand for insulation measures.

Figure 101: Total job requirement for energy efficiency measures (Gradual ramp up)

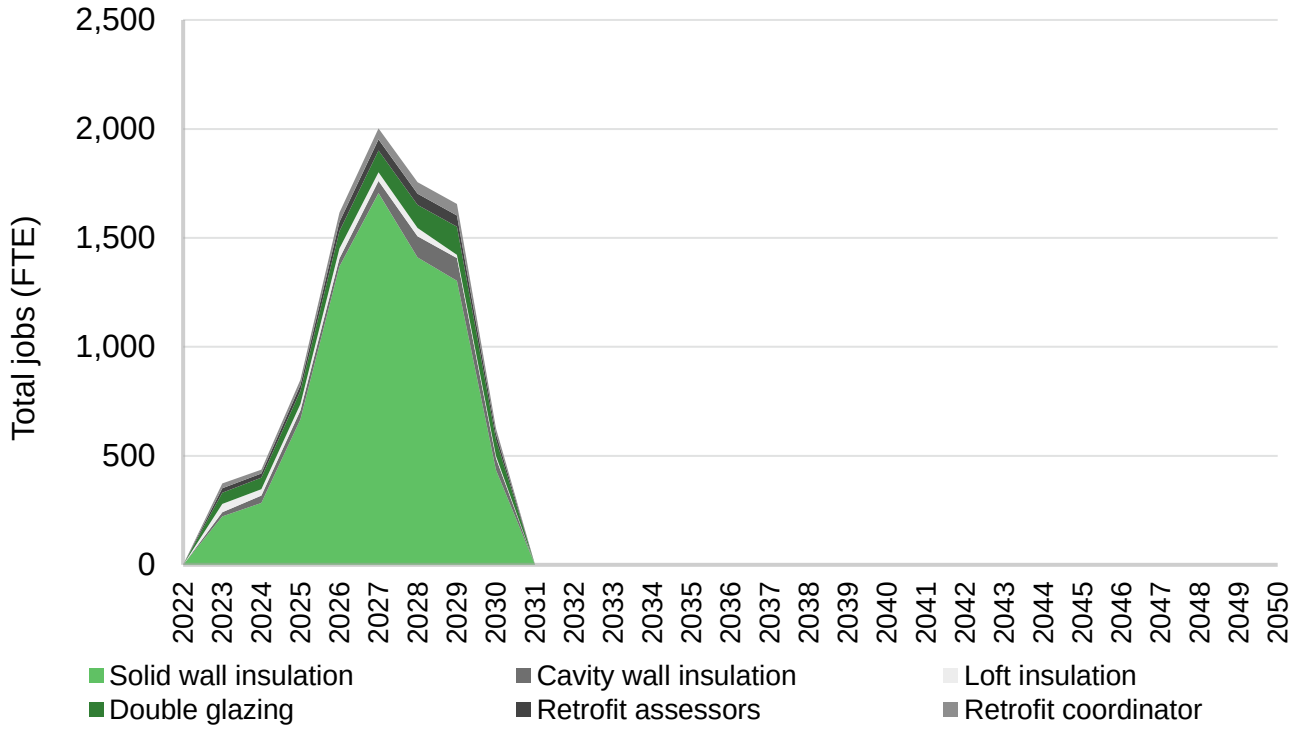


Figure 102: Total job requirement for energy efficiency measures (Urgent ramp up)

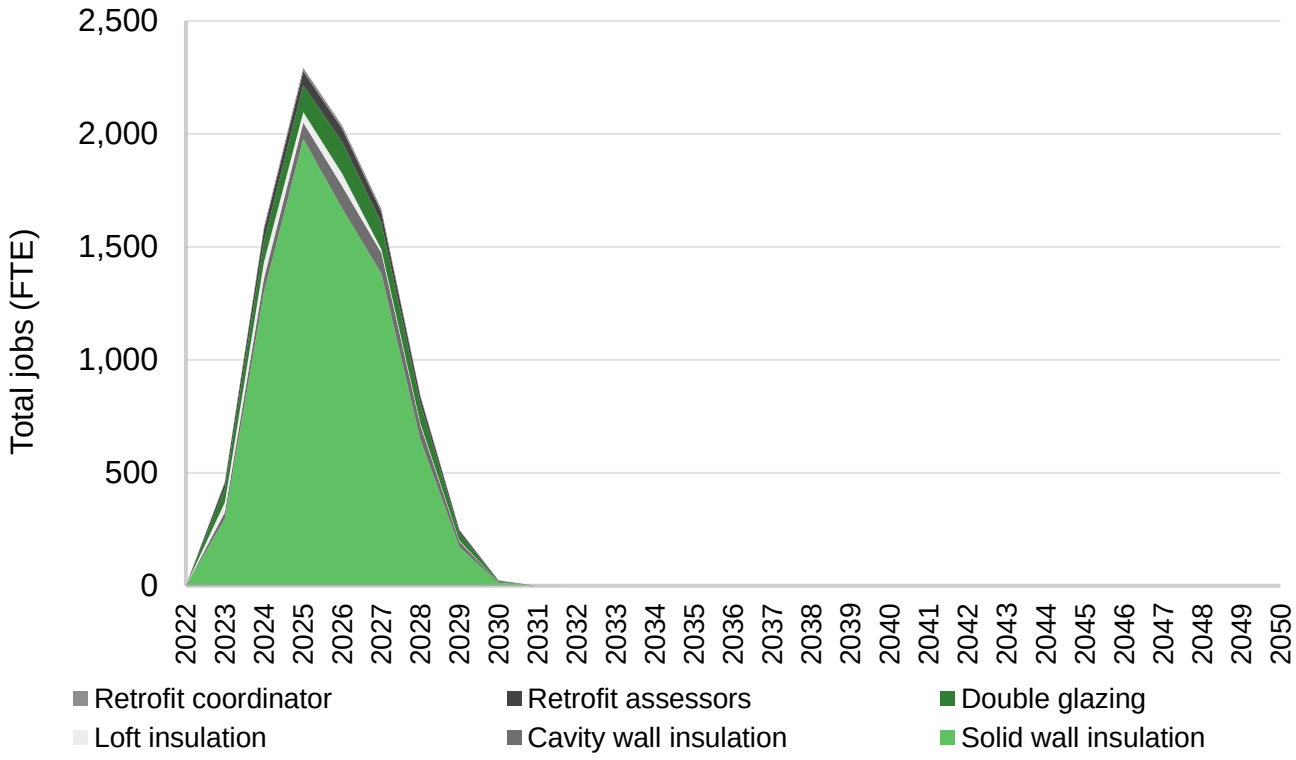
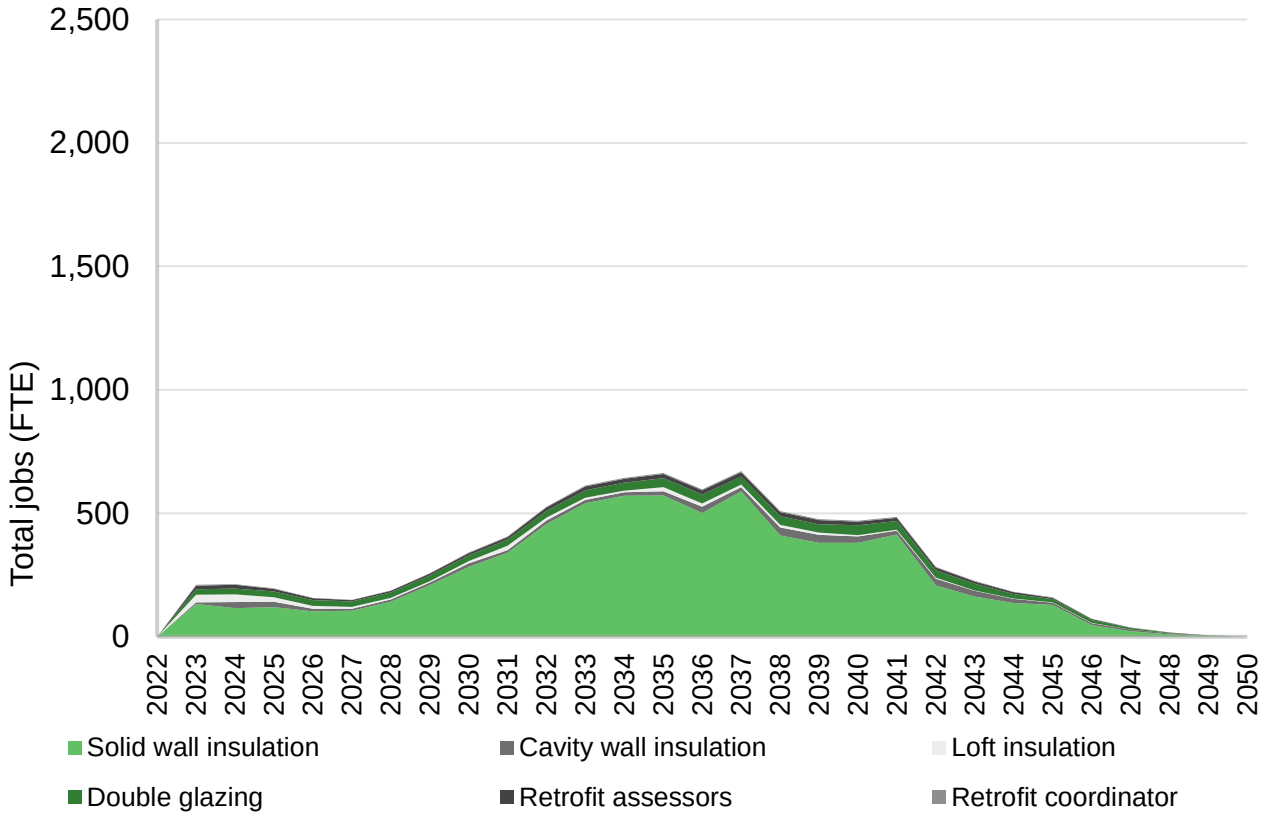
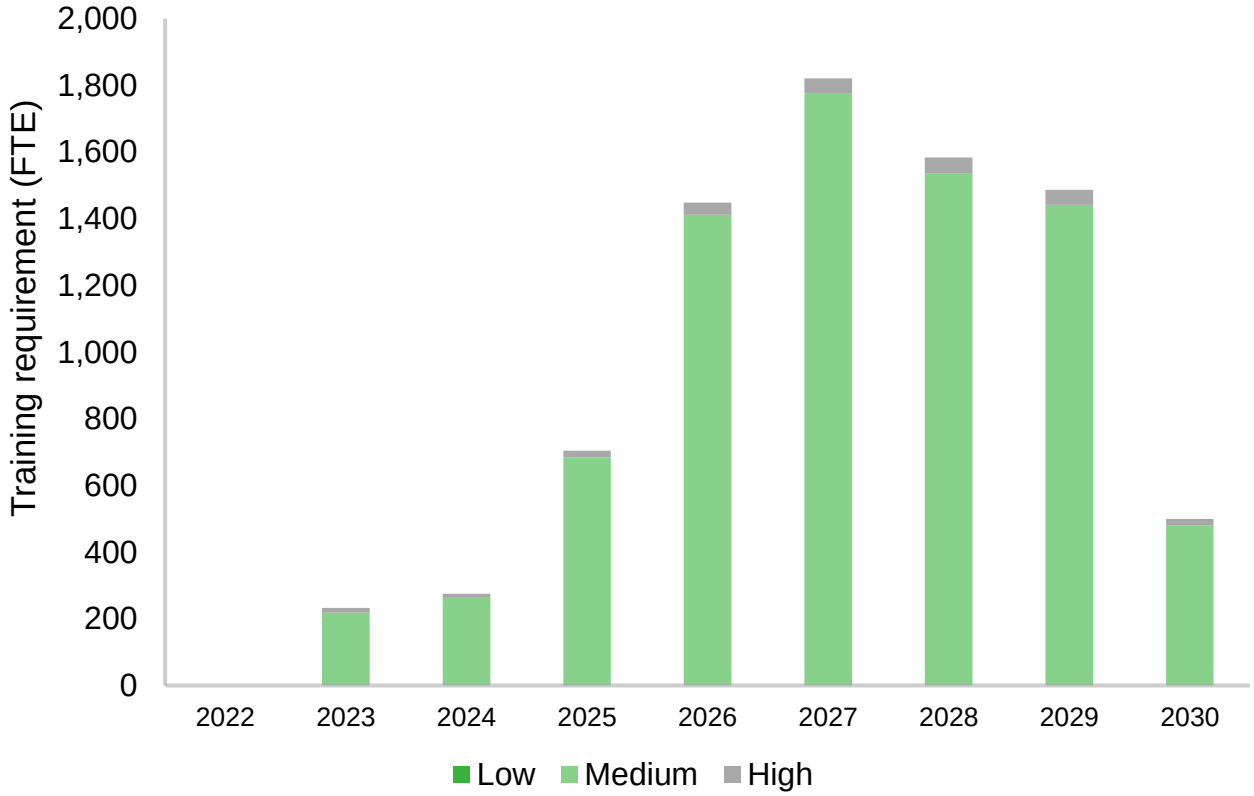


Figure 103: Total job requirement for energy efficiency measures (Net zero by 2050)



The skills required to facilitate the construction of energy efficiency measures are mainly medium level (**Figure 104**). Those involved directly in the installation process require level 2-3 qualifications to ensure the quality of the install raises the energy efficiency profile of the house by a significant amount. For those assessing the retrofit requirements and coordinating the delivery of a range of retrofit measures, high level skills will be required. The below graph demonstrates the training requirement in terms of additional jobs broken down by skill. The gradual ramp up scenario is displayed; however, the remaining scenarios can also be found in Appendix 5. Under the gradual ramp up scenario, across Suffolk, 1,775 medium level qualifications will be required by 2027 and 47 high level qualifications by 2028 to effectively insulate the housing stock.

Figure 104: Training requirement by skill level in Suffolk (Gradual ramp up)



The additional job creation will spur the development of a thriving retrofit economy. New economic opportunities will be developed across the retrofit supply chain, from the installation and manufacture of insulation measures to the wholesale trade of building supplies. The below chart summarises some key estimated economic snapshots of the retrofit sector in Suffolk across the four scenarios. These snapshots are taken from the year that the market is at its largest however it should be noted that the economic impact will be more long term under the net zero by 2050 scenario compared to the gradual/urgent ramp up scenarios. The manufacture of insulation has been identified as a key strength of the Suffolk with the potential to service not only domestic demand but demand in the wider East of England region. Assuming manufacture can scale at the same rate as construction, over £300 million in annual GVA could be in the manufacture of insulation with this concentrated in the Ipswich area. Suffolk could continue to foster this industry by servicing the insulation materials need in surrounding regions as well as for new build properties after they reach their 2030 net zero target.

Figure 105: Spill over benefits generated across the different energy efficiency deployment scenarios (Suffolk)

Scenario	Peak year	Construction GVA (million £s p.a)	Manufacture GVA (million £s p.a)	Services GVA (million £s p.a)	Wholesale and trade GVA (million £s p.a)
Gradual ramp up	2027	94.6	283.1	3.6	9.3
Urgent ramp up	2025	110.2	323.0	4.3	10.4
Net zero 2050	2036	28.6	92.0	1.2	2.7
Falling behind	2050	0.9	1.5	0.2	0.1

GROWTH IN LOW CARBON HEATING MEASURES TO ACHIEVE NET ZERO

Around 37% of UK emissions are from heating and about 17% from heating and cooling of buildings and so changing the way we heat our homes, offices and shops is vital in reducing emissions[38]. The rollout of low-carbon heating measures is therefore one of the primary ways that a significant proportion of domestic emissions can be reduced and to do this, a sizeable skills base, capable of installing, maintaining, and replacing low-carbon heating measures will be needed.

Our analysis of Norfolk and Suffolk predominantly focuses on the need for air source heat pumps, ground source heat pumps, heat networks and heating controls. These technologies were seen as the low carbon heating systems with the most widespread technical and economic feasibility. Hydrogen boilers were not included because they would require hydrogen networks which are unlikely to develop in time to meet both the impending 2030 net zero targets. Biomass and solar thermal may also play a role in the future of low carbon heating however their role was deemed as less significant than the chosen measures. There have also been biofuel advancements, such as bioLPG in recent years, although volumes of this fuel are relatively very low in the heating sector. Hybrid boilers may also play a role in the future of heating and have featured prevalently in government's recent consultation on boiler efficiency[39]. These were not included as they are seen as an interim with an impact assessment finding that hybrids would expect to be replaced with a standalone heat pump by 2050 under its high electrification scenario[40]. Additionally, it is likely that the skills required to install hybrid will be largely like those needed to install a standalone heat pump so just heat pump skills are included in this analysis.

The chosen measures offer low carbon solutions to a wide range of properties, so we were able to accommodate the decarbonisation of Norfolk's building stock. They include:

- **Air source heat pump –** Suitable for most properties given that there is sufficient space and ventilation as well as no significant noise constraints.

[38] https://es.catapult.org.uk/guide/decarbonisation-heat/
[39] https://www.gov.uk/government/consultations/improving-boiler-standards-and-efficiency
[40] https://www.gov.uk/government/consultations/improving-boiler-standards-and-efficiency

- **Ground source heat pump –** For larger properties and those unable to fully insulate, potentially due to being listed or facing restrictive planning permissions, however, require large amounts of space so more suitable for larger off grid homes.
- **Heat networks –** Most suitable for densely populated areas when used in blocks of flats, apartments, or other areas where heating systems can be shared or there is access to waste heat such as near industrial centres. These too could be ground source heat pumps if a ground loop array is shared between multiple users.
- **Heating controls –** Accompanies other measures to allow users to fluctuate heat usage in line with prices, needs and grid carbon intensity.

The job roles assessed as part of Gemserv's scenarios were chosen as they are the most relevant in delivering the rollout of the chosen technologies:

- **Heat pump engineer** – The primary installer of both ground and air source heat pumps, preparing the unit and completing heat loss calculations and other design measures. It should be noted that this includes both ground and air source installers. Our analysis shows that most installers are able to install both and no installers only install ground source, so reaching the total requirement for heat pumps will be able to service both the larger demand for air source and the lower demand for ground source.
- **Heat pump electrician** – Responsible for configurations for to the wiring required to install heat pumps. Predominantly required for retrofit heat pumps as opposed to new builds, refits and maintenance.
- **Groundworkers** – Manual labour required to install ground loops for ground source heat pumps and some heat networks.
- **Heat networks engineer** – Engineer responsible for installing and maintaining heat network connections.
- **Heating controls installers** – Installer responsible for fitting heating controls such as smart thermostats.

The requirement for labour was determined by 4 stages of the system lifetime:

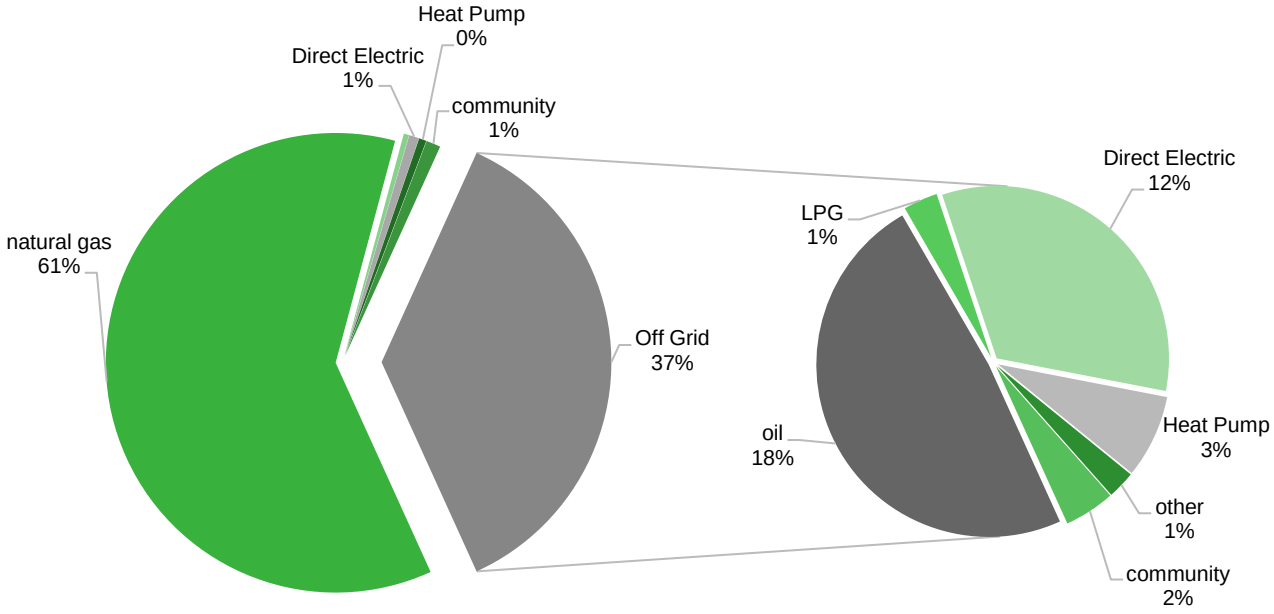
- **Retrofit –** Replacing a high carbon heating system with a low carbon one.
- **New builds –** Installing a low carbon heating system in a newly constructed property.
- **Maintenance –** Servicing and repair of low carbon heating systems.

- **Refits –** Replacement of low carbon heating systems with new low carbon heating systems upon the end of the systems lifetime.

NORFOLK'S GROWTH IN LOW CARBON HEATING FOR NET ZERO

The current makeup of heating systems in Norfolk is dominated high carbon fuels such as natural gas in on grid areas and a large share of oil and LPG due to the high rates of off grid properties in the county.

Figure 106: Heating systems used in off and on gas grid properties (Norfolk)



The deployment required to reach net zero across all scenarios is shown below. **Figure 107** and **Figure 108** show the gradual ramp up and urgent ramp up to net zero by 2030 scenarios. Both scenarios forecast rapid growth in low carbon heating systems installations that's dominated by air source heat pumps.

Figure 107: Total low carbon heating installations (Gradual ramp up)

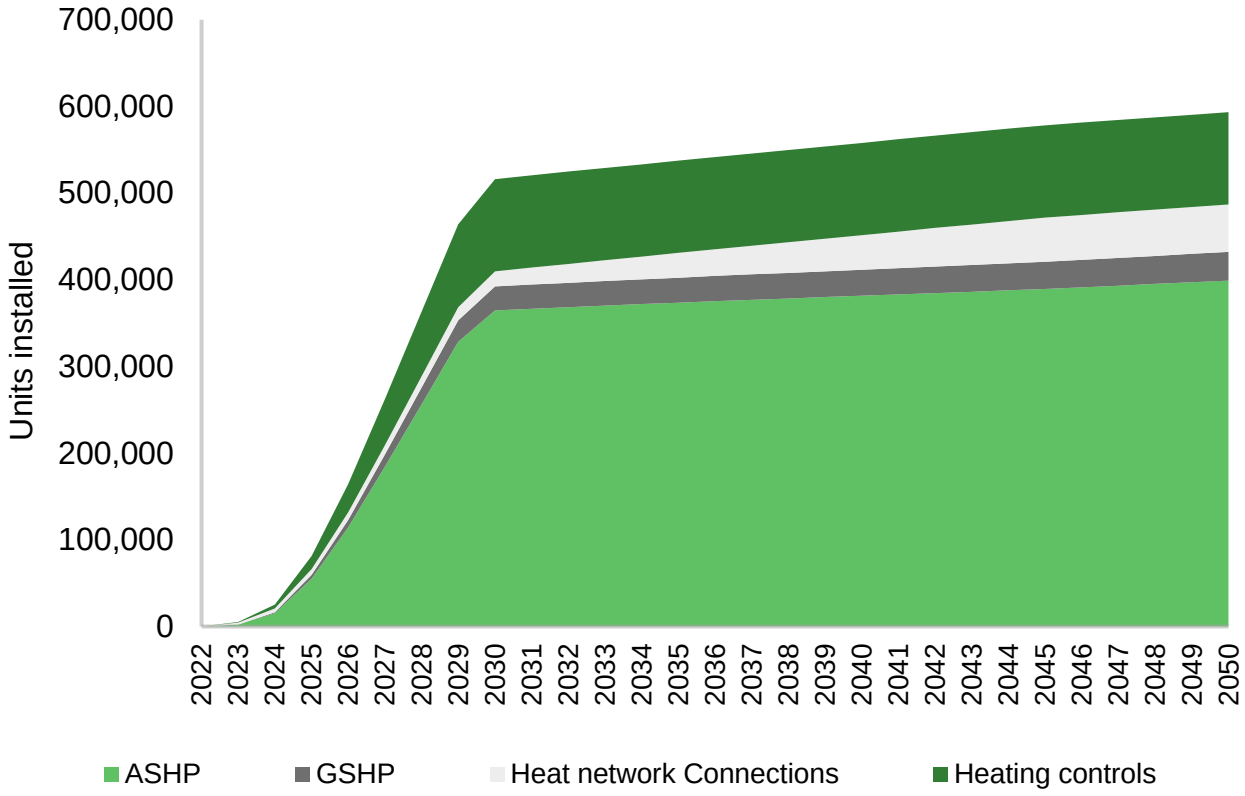


Figure 108: Total low carbon heating installations (Urgent ramp up)

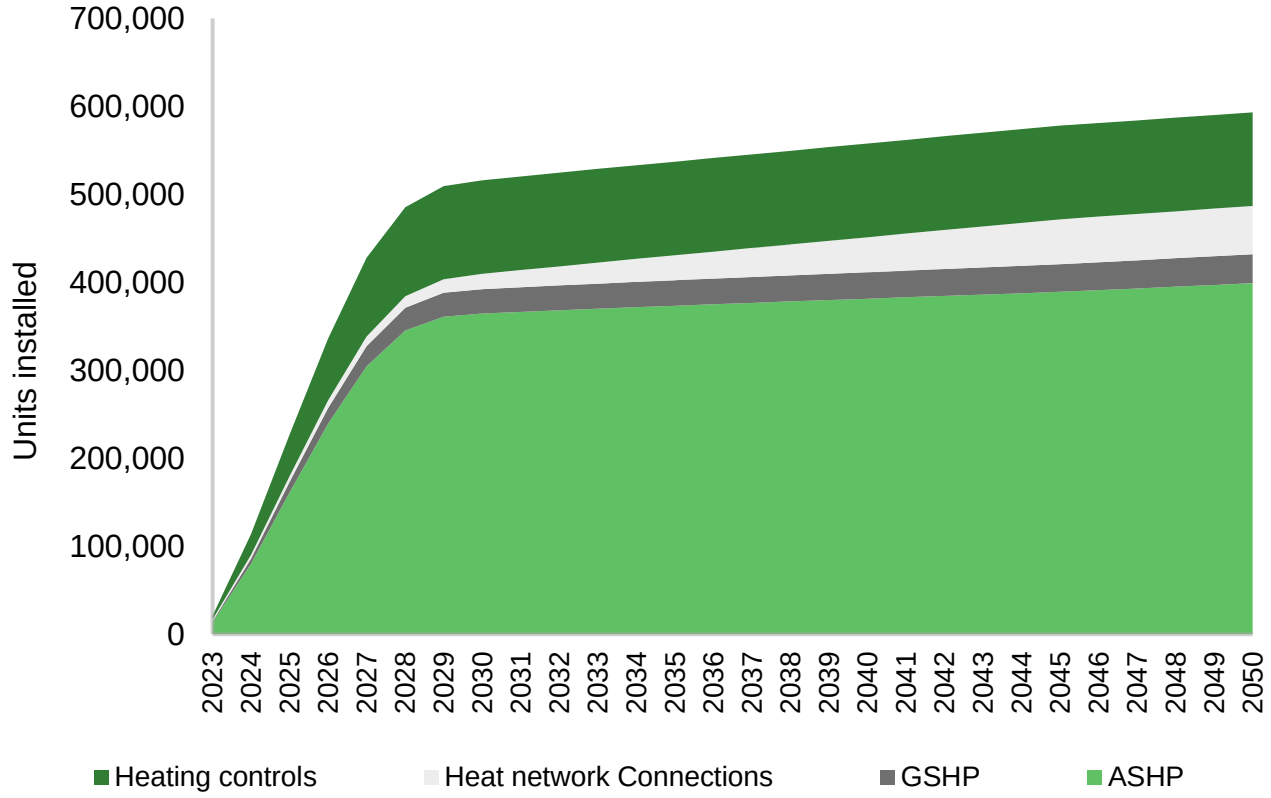


Figure 109 and **Figure 110** provide two alternative scenarios. One is where the net zero target is hit a lot later in 2050 with the latter representing low carbon heating installations occurring under a status quo scenario called falling behind.

Figure 109: Total low carbon heating installations (Net zero by 2050)

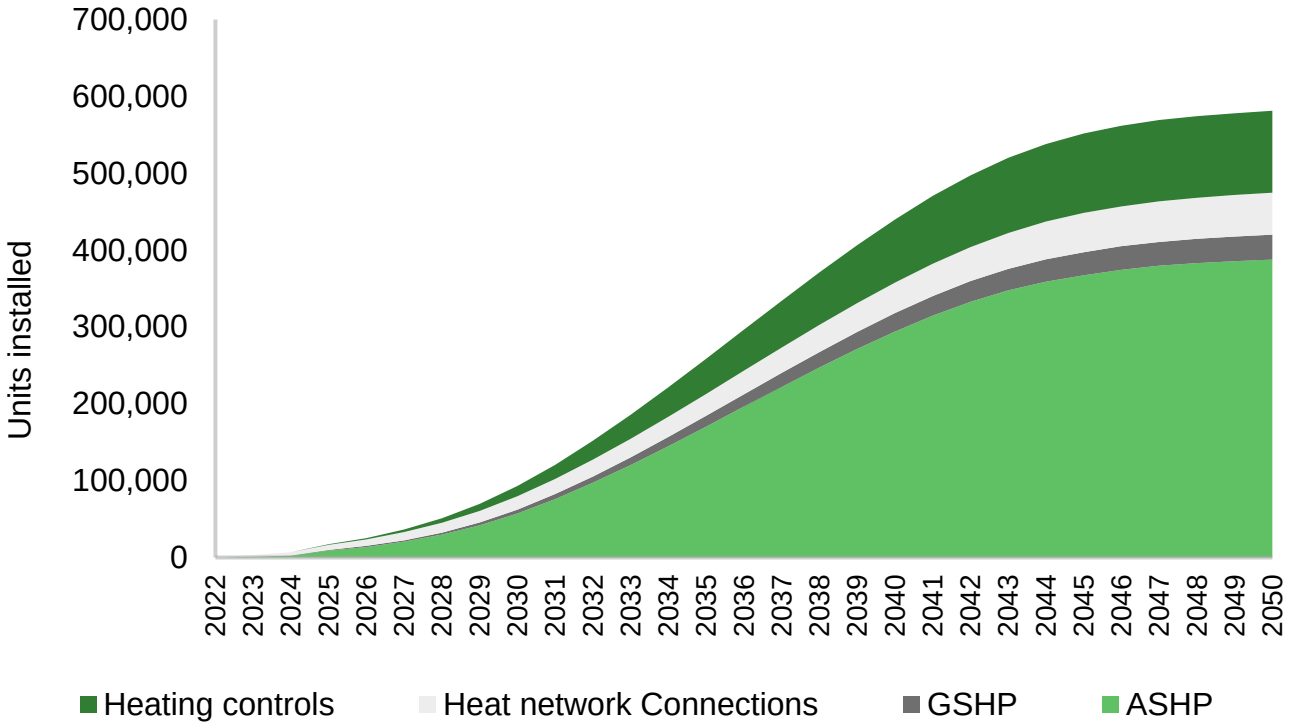
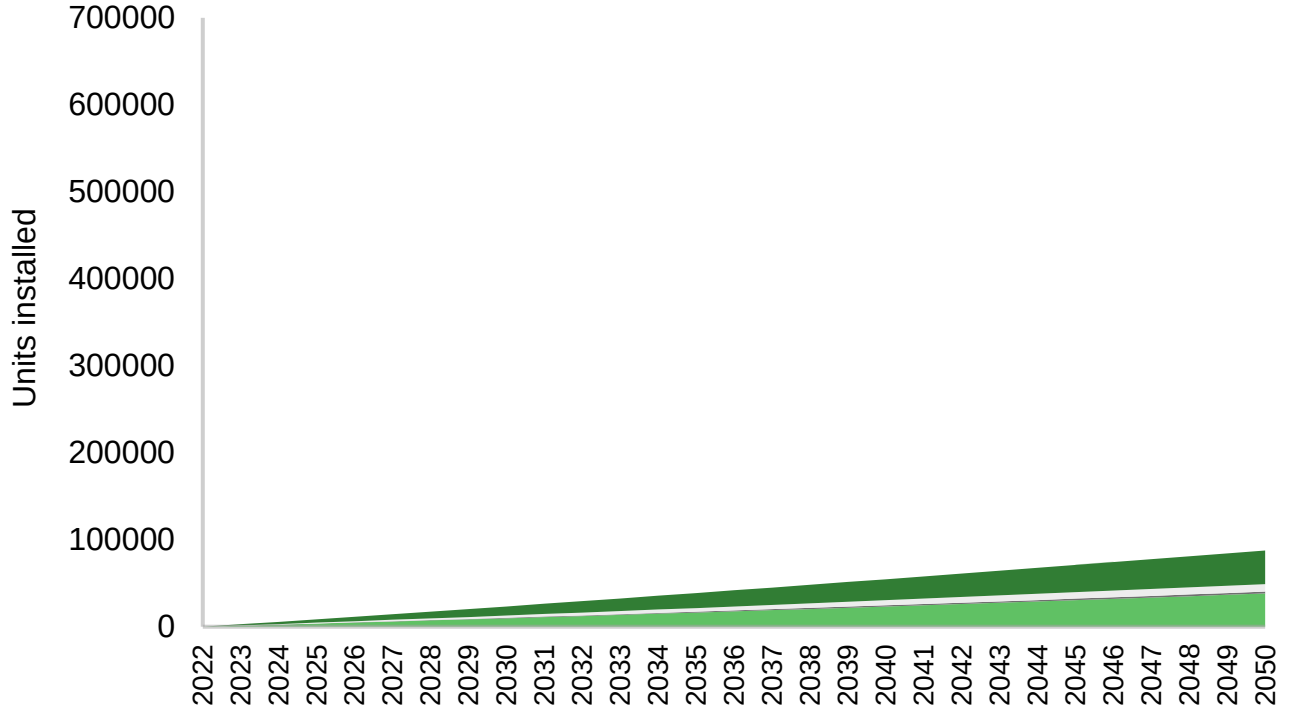


Figure 110: Total low carbon heating installations (Falling behind)



Across all net zero compliant scenarios there is significant need for the rollout of low-carbon heating measures. The deployment rate required under the urgent ramp up and gradual ramp up scenarios peak far higher than that for net zero by 2050 with peak deployment rates of 113,000 and 101,000 low carbon heating measures per year under the urgent ramp up and gradual ramp up scenario compared to 38,000 in the net zero by 2050 scenario.

In the gradual and urgent ramp up scenarios, demand for low carbon heating systems is sustained after meeting net zero in 2030, with significant demand from new builds, especially in South Norfolk where there will an estimated 22,000 new build properties by 2050. The deployment of heat networks was concentrated in more urban areas, with around 29,000 heat network connections deployed between 2022 and 2050

NORFOLK'S SKILLS REQUIREMENTS FOR LOW CARBON HEATING

Across all scenarios, the most significant training requirement was for heat pump engineer with them being the primary installer for heat pumps, through maintenance, refits and installations both through retrofit and in new builds (Figures 111-113). In the urgent ramp up scenario, 2400 heat pump engineers are required by 2026 and in the gradual ramp up scenario, 1625 heat pump engineers by 2029. The requirement for refits and maintenance builds up more gradually in the net zero by 2050 scenario meaning peak demand for heat pump engineers is in 2040 where 1238 engineers are required.

In the urgent and gradual ramp up scenarios, after the initial wave of installations between 2022 and 2030, there is another wave of demand as heat pumps reach the end of their lifetime around 2040 and roughly 1500 additional heat pump engineers will be required compared to current levels to service the second wave of demand. Across the urgent ramp up and gradual ramp up scenarios, just over half of the initial demand for heat pump engineers can be met by upskilling current gas and oil heating engineers in the region however due to retirement, around 65% of the heat pump engineers required to service the second wave of demand will be new entries to the heating labour market.

The need for heat pump electricians is less urgent with 978 additional electricians required by 2025 in the urgent ramp up scenarios and 840 required by 2028 under the gradual ramp up scenario. As heat pump electricians are not as vital for the maintenance of heat pumps, the requirement for them falls off as all current properties are retrofitted with heat pumps. Under the net zero by 2050 scenario, 270 additional electricians are required by 2036.

The requirement for groundworkers is predominantly in more rural areas where ground source heat pumps are more suitable, with over 100 of the 241 groundworkers jobs required by 2029 in the gradual ramp up scenario in Broadland and North Norfolk alone. Across the other scenarios, 245 groundworkers are required by 2026 in the urgent ramp up scenario and 113 groundworkers are required by 2039 in the net zero by 2050 scenario.

In comparison, the demand for heat network engineers is concentrated in urban areas. Around half of the 290 heat network engineers required by 2029 in the gradual ramp up scenario are in Norfolk with this common across all scenarios. The demand for heating control installers is far lower due to the lower installation time of heating controls and the lower overall deployment requirement. Less than 5 additional heating control installers are required across all scenarios.

Figure 111: Total job requirement for low carbon heating (Gradual ramp up)

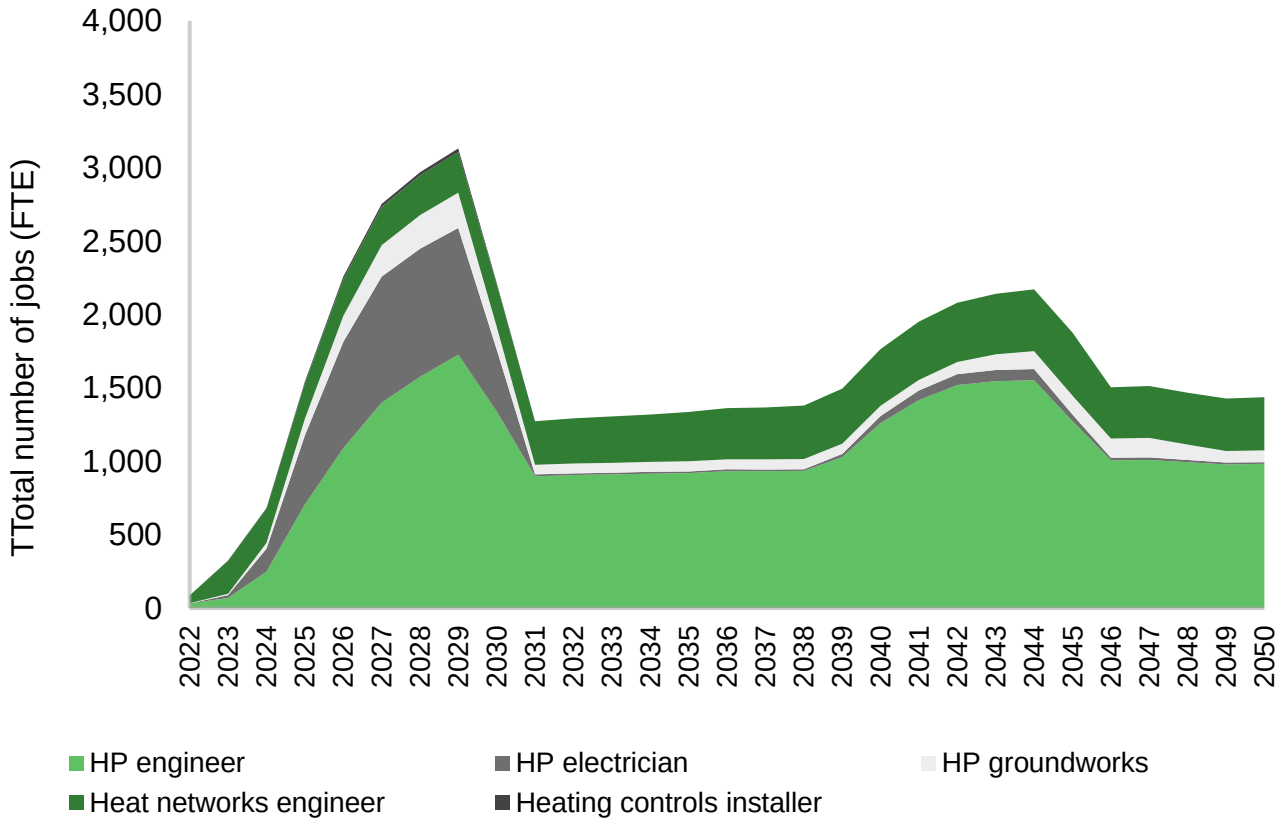


Figure 112: Total job requirement for low carbon heating (Urgent ramp up)

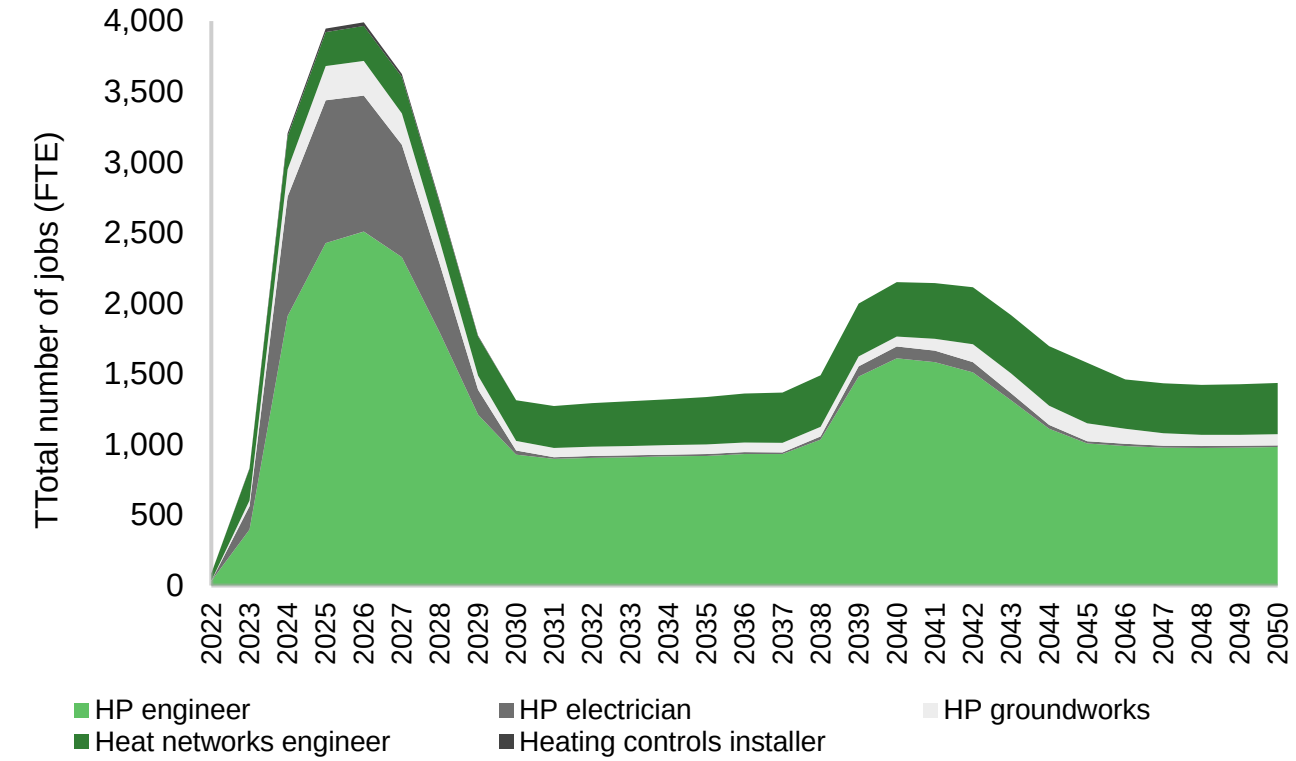
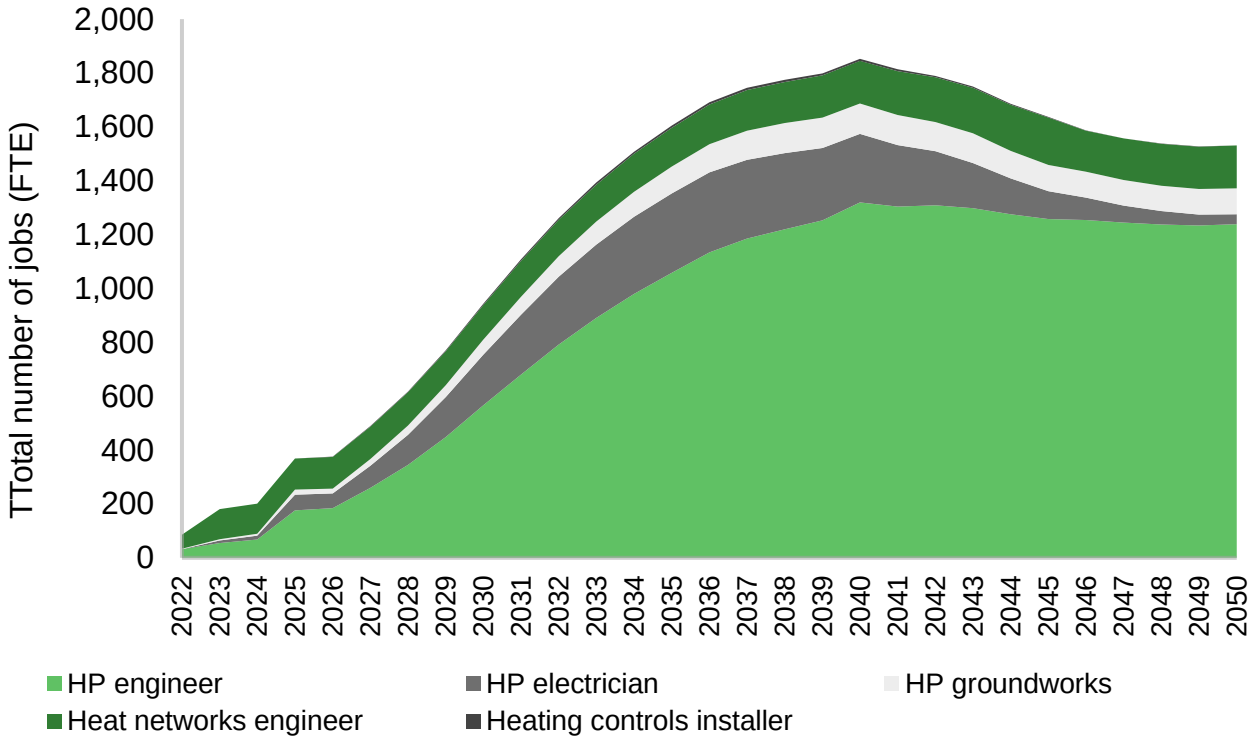
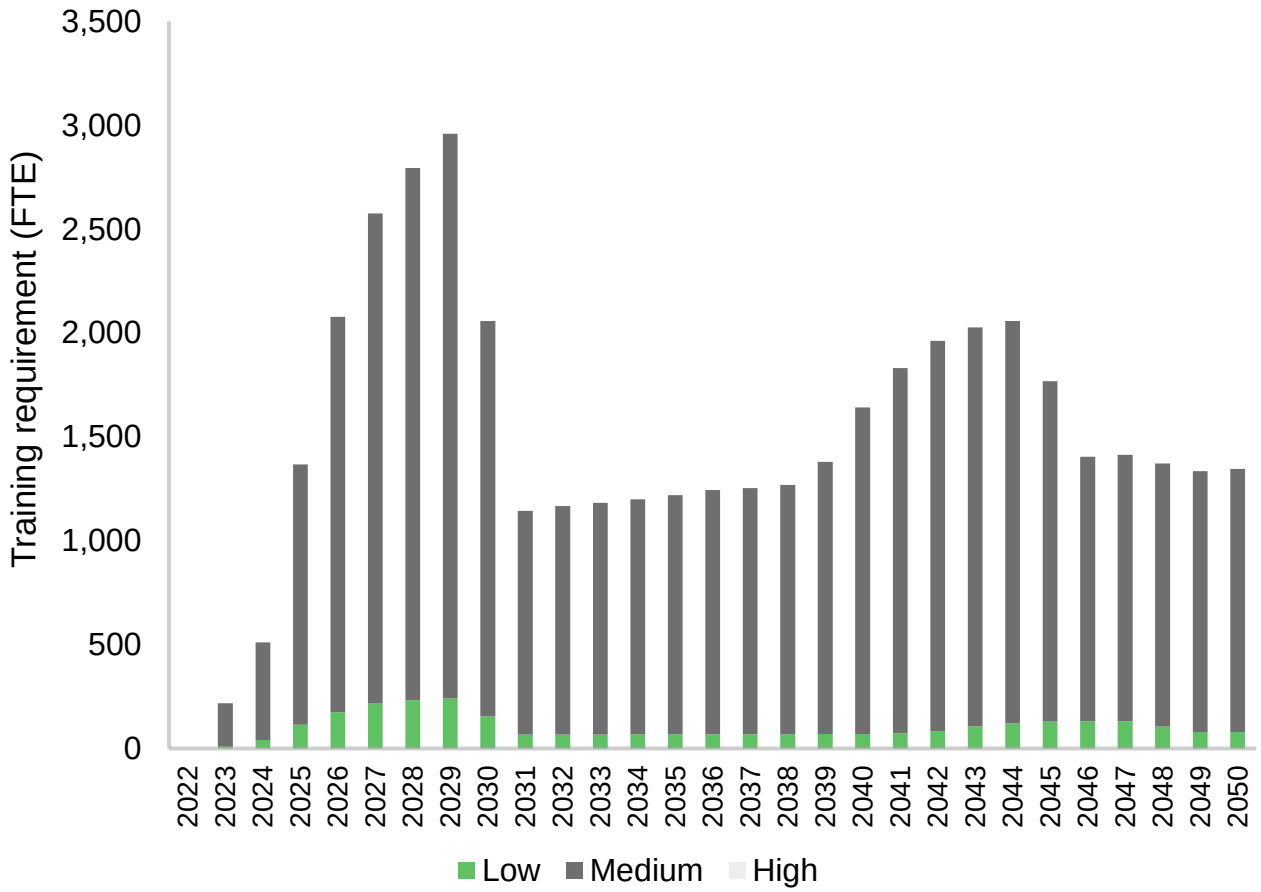


Figure 113: Total job requirement for low carbon heating (Net zero by 2050)



The required skills can be divided into low, medium, and high categories, with low referring to level 1-2 qualifications, medium referring to level 3 qualifications and high referring to degree level qualifications and above (**Figure 114**). The skills detailed below are for the direct construction of low carbon heating measures only and therefore, are predominantly low and medium level skills. However, it should be noted that some high-level skills may be required indirectly. For example, the design and engineering of heat network systems will likely require degree level qualifications or above. Due to the nascency of the technology, it is difficult to determine the high-level skills requirement for the construction of heat networks. However, assuming that for every 10 construction workers, one degree level engineer is required, 27 high level jobs will be required by 2030 under the gradual ramp up scenario. A breakdown of the training requirement in terms of additional skills[41] needed under the gradual ramp up scenario is shown below. The same can be found for the remaining scenarios in Appendix 2. Under the gradual ramp up scenario, 2,717 medium level qualifications will be required by 2029 as well as 241 low level skills.

Figure 114: Training requirement by skill level in Norfolk (Gradual ramp up)



[41] Additional skills compared to current provision.

Deployment of low carbon heating technology has the potential to stimulate a substantial spill over benefits to the Norfolk region (Figure 115). Unlike the insulation sector, demand for heat pumps will be more sustained due to the need for refits as well as maintenance of new low carbon heating systems. Across the heat pump, heat network and heating control supply chains, Norfolk could harness the potential economic impact of new green industrial supply chain. A snapshot of the potential low carbon heating economy across the supply chain is presented below.

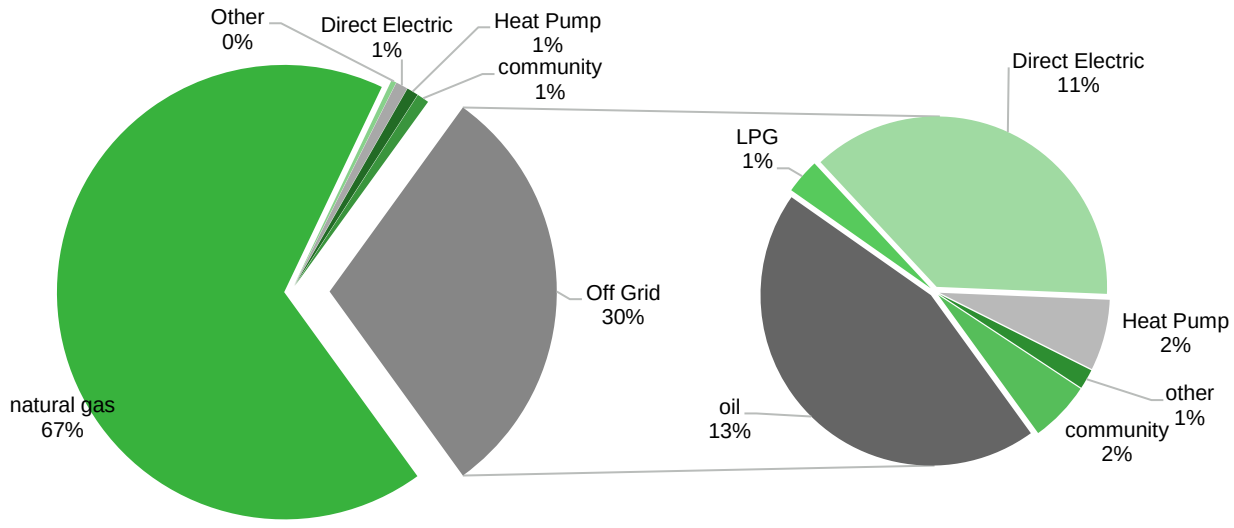
Figure 115: Spill over benefits generated across the different low carbon heating deployment scenarios (Norfolk)

Scenario	Peak year	Renewable heat construction[42] GVA (million £s p.a)	Renewable heat Manufacture GVA (million £s p.a)	Renewable heat Services GVA (million £s p.a)	Heating controls (million £s p.a)
Gradual ramp up	2029	128.2	43.8	15.4	2.8
Urgent ramp up	2026	163.6	55.9	19.6	3.6
Net zero 2050	2040	76.1	26.0	9.1	1.0
Falling behind	2050	9.5	3.2	1.1	0.2

SUFFOLK'S GROWTH IN LOW CARBON HEATING FOR NET ZERO

The current makeup of heating systems in Suffolk is dominated high carbon fuels such as natural gas in on grid areas and a large share of oil and LPG due to the high rates of off grid properties in the county.

Figure 116: Heating systems used in off and on gas grid properties (Suffolk)



[42] Renewable heat following the definition provided in the ONS's Low Carbon and Renewable Economy Estimates.

The deployment required to reach net zero across all scenarios is shown below. **Figure 117**and **Figure 118** show the gradual ramp up and urgent ramp up to net zero by 2030 scenarios. Both scenarios forecast rapid growth in low carbon heating systems installations that's dominated by air source heat pumps.

Figure 117: Total low carbon heating installations (Gradual ramp up)

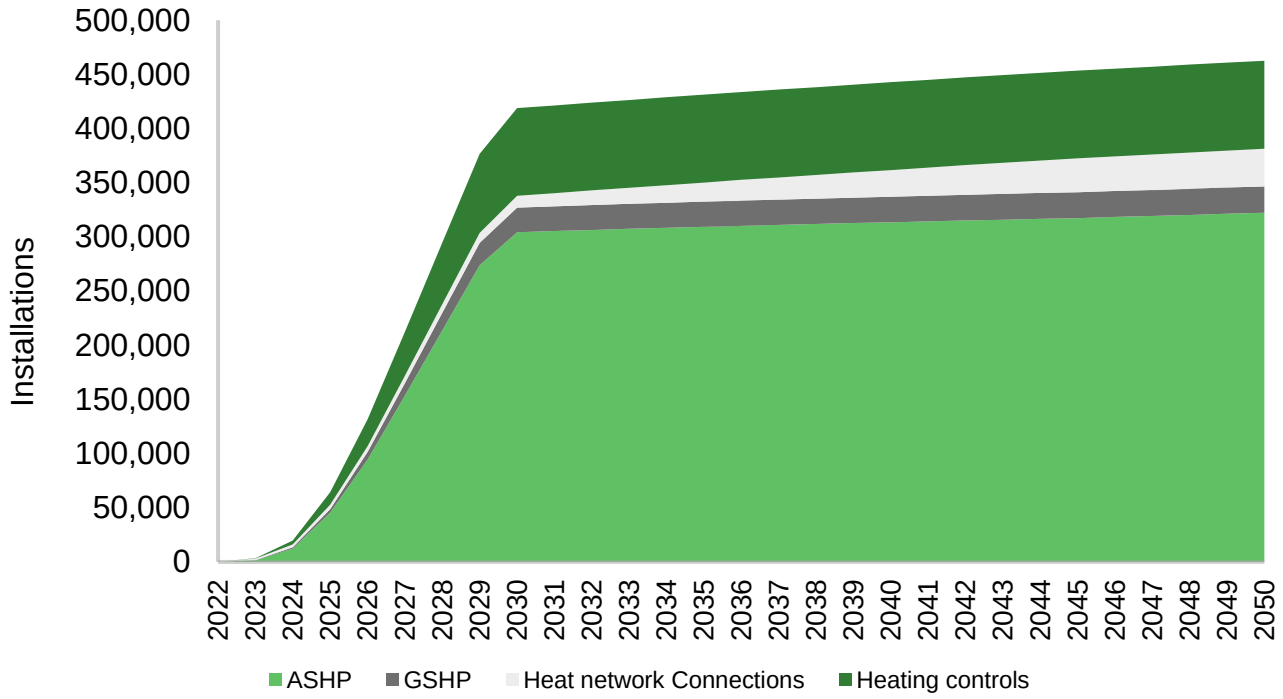


Figure 118: Total low carbon heating installations (Urgent ramp up)

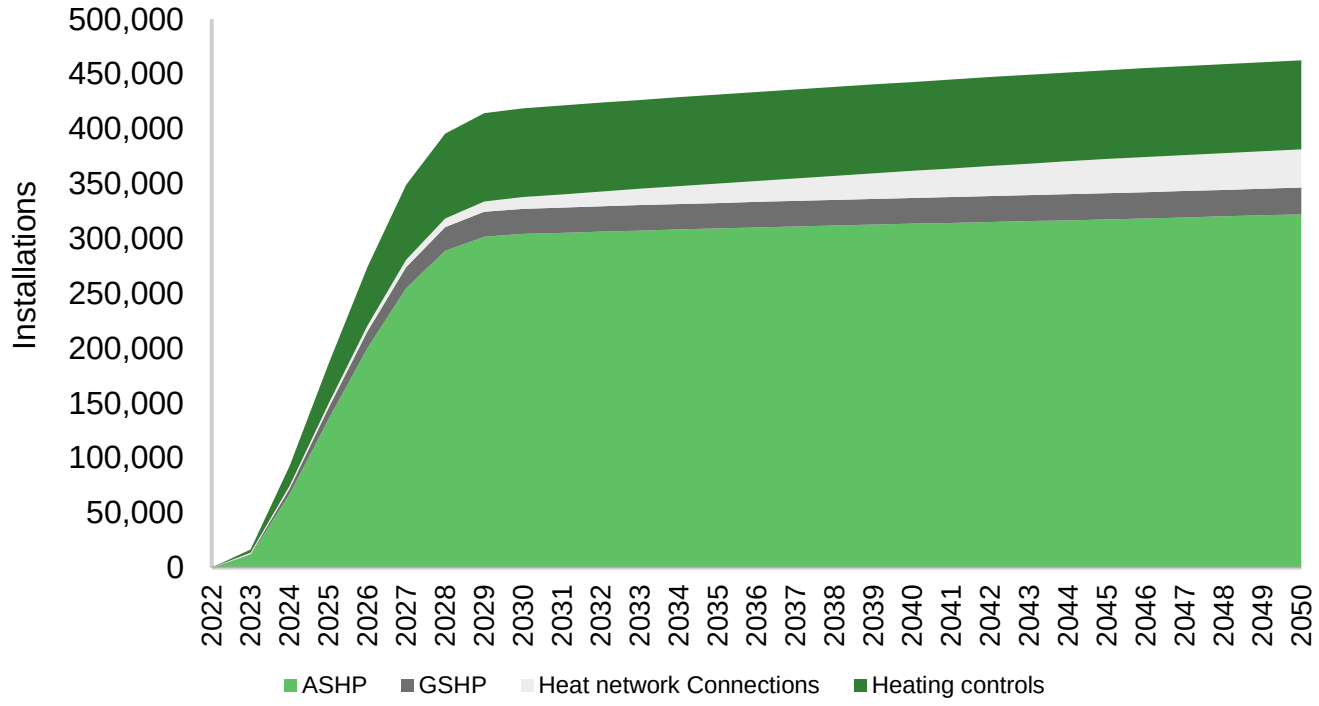


Figure 119 and **Figure 120** provide two alternative scenarios. One is where the net zero target is hit a lot later in 2050 with the latter representing low carbon heating installations occurring under a status quo scenario called falling behind.

Figure 119: Total low carbon heating installations (Net zero by 2050)

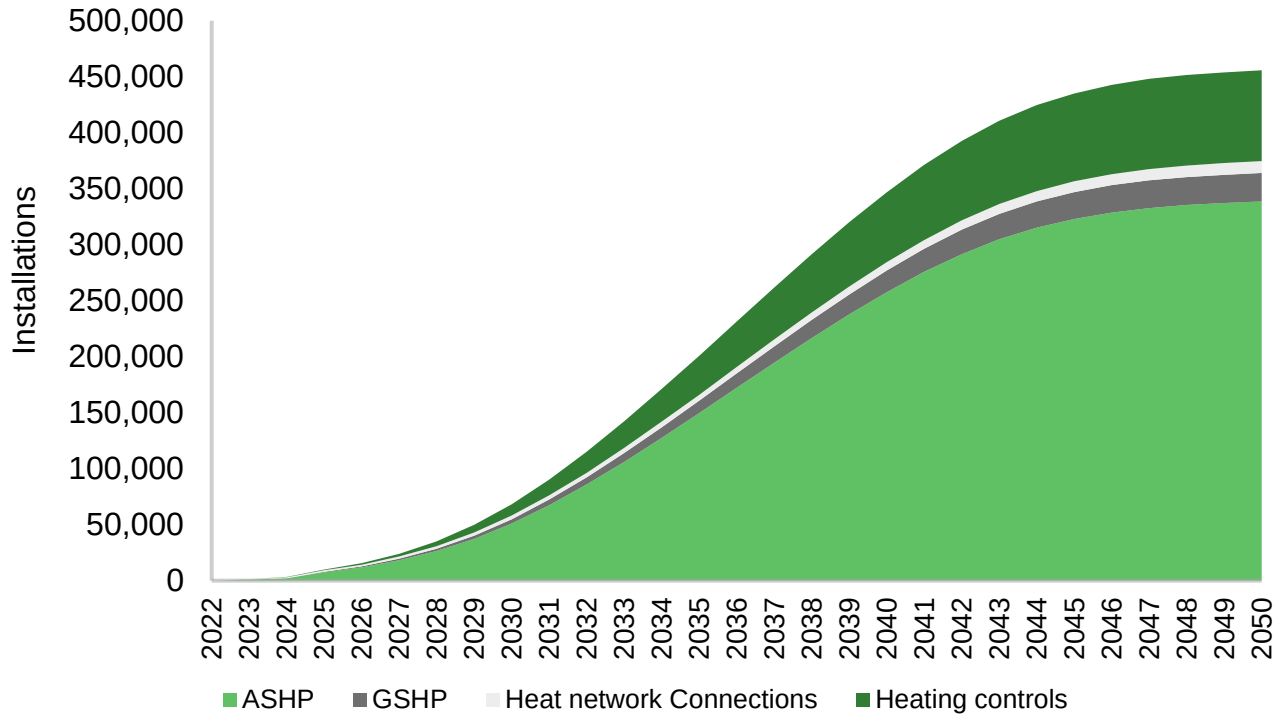
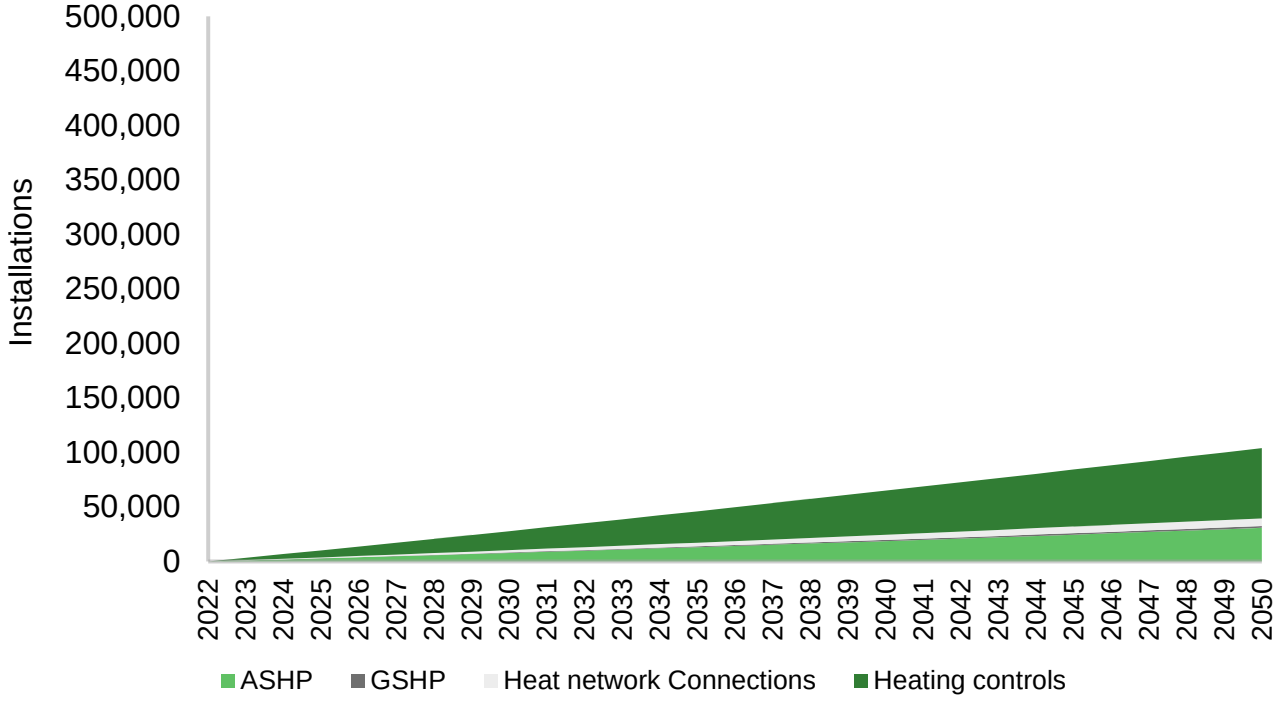


Figure 120: Total low carbon heating installations (Falling behind)



Across all net zero complaint scenarios there is significant requirement to grow the low deployment rate in the county. The deployment rate required under the urgent ramp up and gradual ramp up scenarios is significantly higher than that of the net zero by 2050 scenario with peak deployment rates of 92,469 and 82,350 low carbon heating measure units respectively compared to 30,453 under the net zero by 2050 scenario. The deployment of air source heat pumps is consistently high across all scenarios and regions however the deployment of ground source heat pumps is more geographically focused with 2,097 ground source heat pumps installed in East Suffolk in 2028 under the gradual ramp up scenario compared to only 493 in Babergh.

Conversely, the deployment of heat networks is concentrated in more urban areas with around 3 quarters of the 1,487 of the heat network connections installed in 2027 under the gradual ramp up scenario in Ipswich and West Suffolk. In the gradual and urgent ramp up scenarios, demand for low carbon heating systems is sustained after meeting net zero in 2030, with significant demand from new builds, especially in East Suffolk where there will an estimated 23,000 domestic new build properties by 2050.

SUFFOLK'S SKILLS REQUIREMENTS FOR LOW CARBON HEATING

Across all scenarios, the most significant training requirement was for heat pump engineer with them being the primary installer for heat pumps, through maintenance, refits, and installations both through retrofit and in new builds (Figures 121-123). 2,027 additional heat pump engineers are required by 2026 under the urgent ramp up scenario with 1,363 required by 2029 under the gradual ramp up scenario. The requirement for refits and maintenance builds up more gradually in the net zero by 2050 scenario meaning peak demand for heat pump engineers is in 2040 where 1,005 engineers are required. The requirement for heat pump engineers is relatively equal across all local authorities and is roughly in line with the different sizes of the dwelling stocks.

In the urgent and gradual ramp up scenarios, after the initial wave of installations between 2022 and 2030, there is another wave of demand as heat pumps reach the end of their lifetime around 2040 and roughly 1,200 additional heat pump engineers will be required compared to current levels to service the second wave of demand. As well as training new engineers to enter the heating industry, this demand can be met by upskilling current gas and oil heating engineers in the region. Just over half of the initial demand for heat pump engineers required before 2030 under the gradual ramp up and urgent ramp up scenarios can be fulfilled through upskilling current fossil fuel heating engineers in the region. However, due to the high retirement rate caused by the aging workforce, over 60% of the additional workforce required to service the second wave of demand will need to be new entrants into the market.

The skill with the second highest training requirement is heat pump electricians however as engineers are the predominant skill required for servicing of the existing heat pump stock, the demand for electricians falls off as the entire building stock is switched to low carbon heating. 825 heat pump electricians are required by 2025 under the urgent ramp up scenario and 711 are required by 2028 under the gradual ramp up scenario. In the net zero by 2050 scenario, 227 additional heat pump electricians are required by 2036.

The requirement for heat pump groundworkers follows the locations where a high share of ground source heat pumps is installed and to a lesser extent, heat networks. 90 additional groundworkers are required by 2039 under the net zero by 2050 scenario, 203 are required by 2029 under the gradual ramp up scenario and 208 are required by 2026 under the urgent ramp up scenario. Special effort will be required to ensure the groundworker labour is in place in areas such as Ipswich and East Suffolk where around three quarters of the requirement is owing to the high penetration of ground source heat pumps and heat networks. The demand for groundworkers falls off drastically after 2030 under the urgent ramp up scenario and gradual ramp up scenario as retrofit installations are completed with demand for groundworkers coming from refits and new builds after. These labour-intensive skills however are transferable across other areas of construction. The build-up of heat networks is more gradual over the scenarios with peak training requirements for heat network engineers of around 170 by 2029 in the urgent ramp up and gradual ramp up scenarios. Under the net zero by 2050 scenario, peak requirement is 107 by 2045 however around 80 will be required by 2030. As heat networks are more suited to urban areas where there is a high concentration of apartment blocks or flats, over half of the requirement for heat network engineers is in West Suffolk and Ipswich. Due to the lower labour intensity of installing heating controls, less than 5 additional installers are required across all scenarios and therefore demand side policy should be more of a focus for this technology.

Figure 121: Total job requirement for low carbon heating installations (Gradual ramp up)

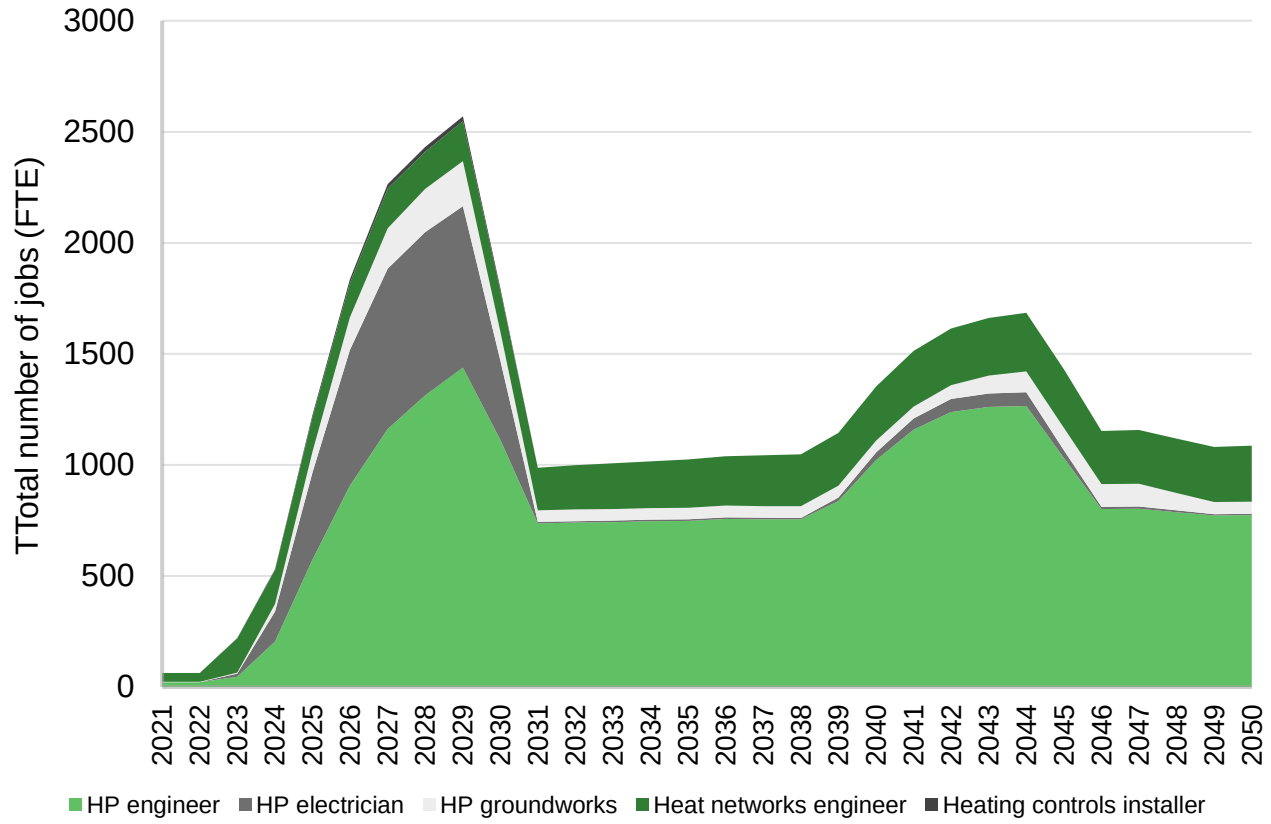


Figure 122: Total job requirement for low carbon heating installations (Urgent ramp up)

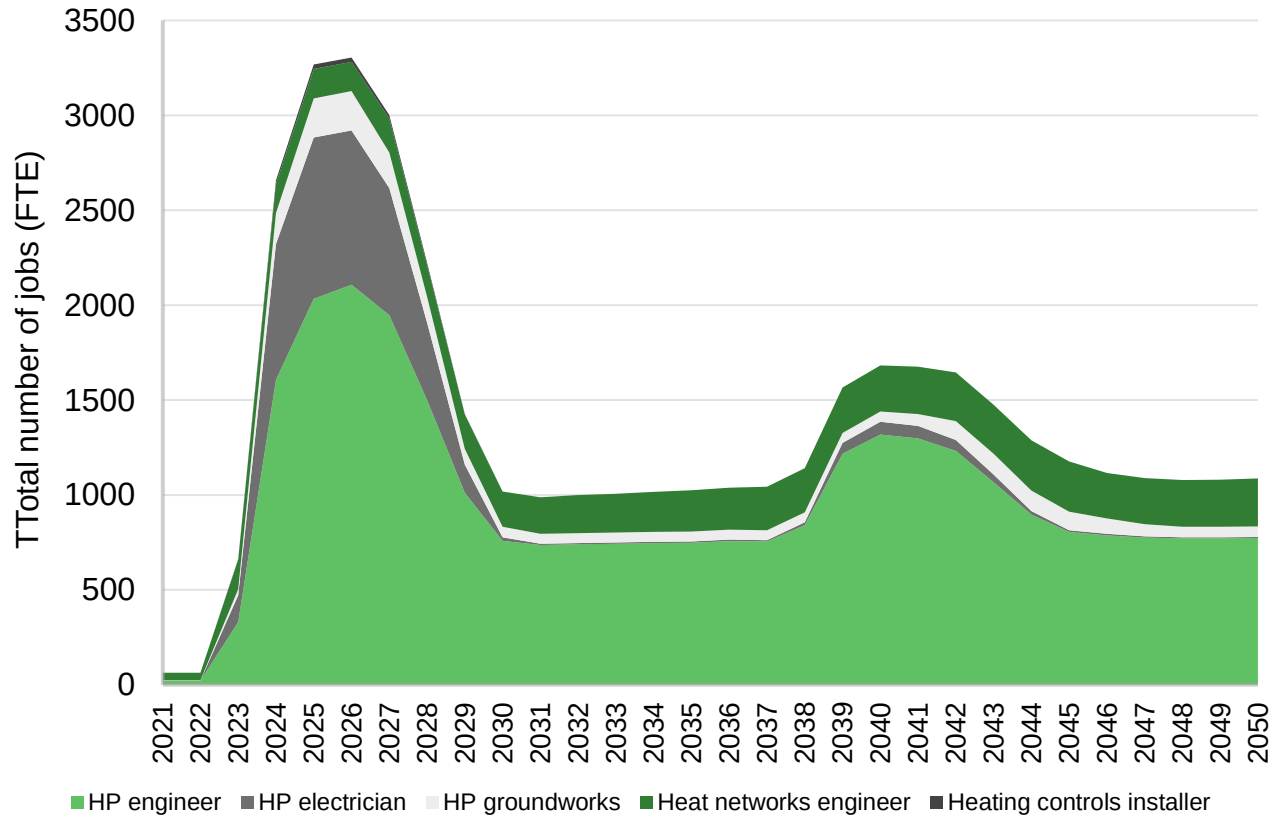
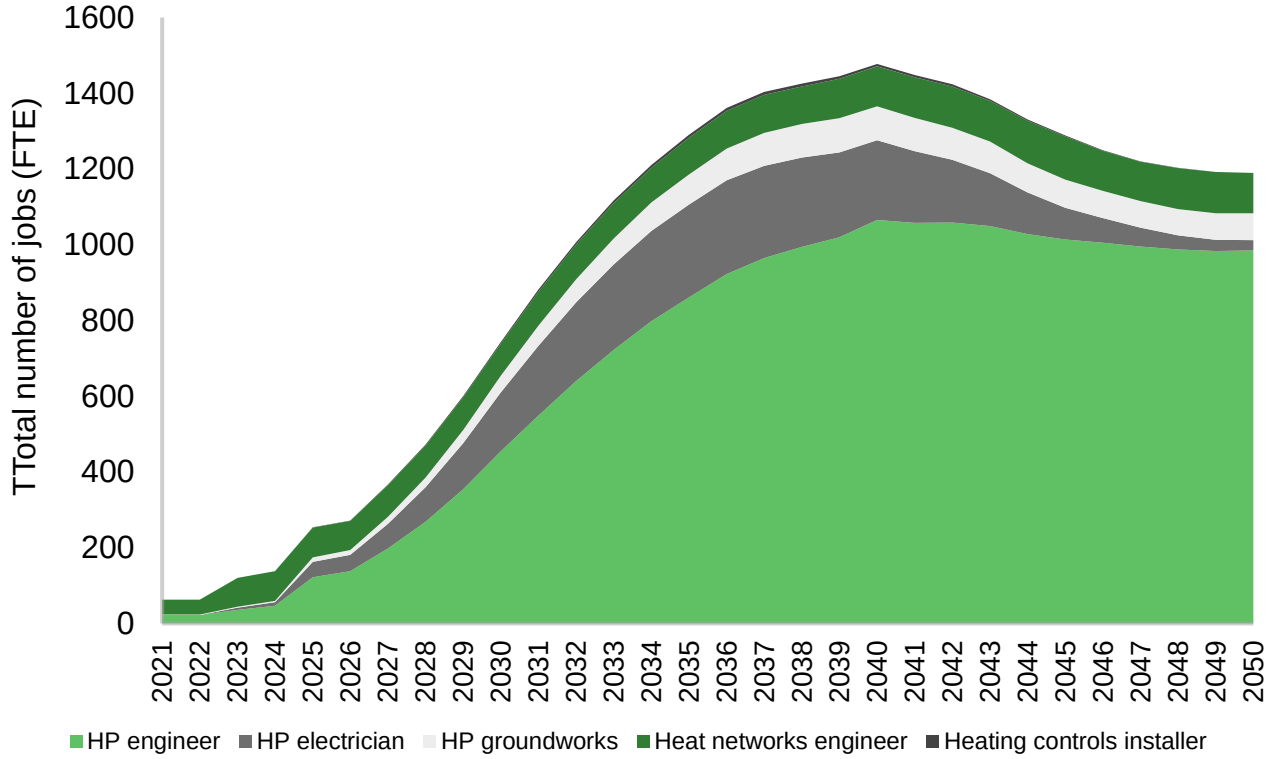


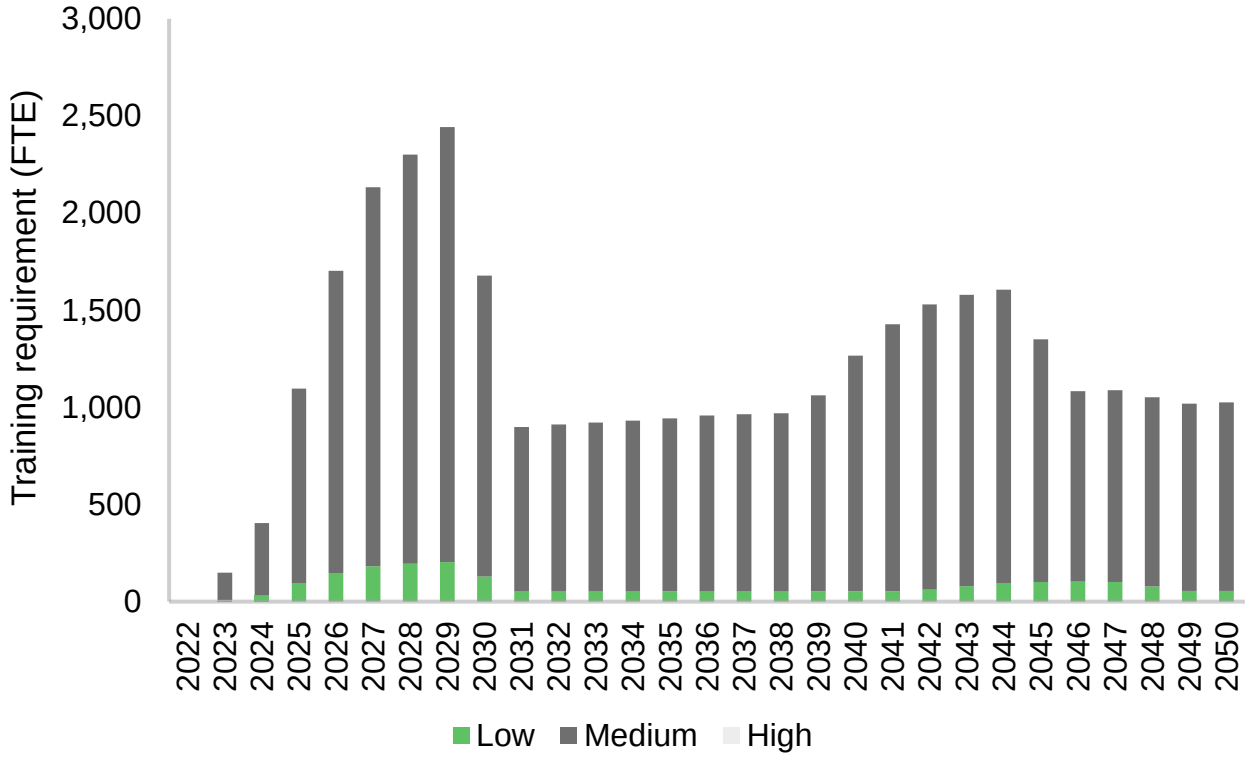
Figure 123: Total job requirement for low carbon heating installations (Net zero by 2050)



The required skills can be divided into low, medium, and high categories, with low referring to level 1-2 qualifications, medium referring to level 3 qualifications and high referring to degree level qualifications and above (Figure 124). The skills detailed below are for the direct construction of low carbon heating measures only and therefore, are predominantly low and medium level skills. However, it should be noted that some high-level skills may be required indirectly. For example, the design and engineering of heat network systems will likely require degree level qualifications or above. Due to the nascency of the technology, it is difficult to determine the high-level skills requirement for the construction of heat networks. However, assuming that for every 10 construction workers, one degree level engineer is required, 18 high level jobs will be required by 2030 under the gradual ramp up scenario. A breakdown of the training requirement in terms of additional skills[43] needed under the gradual ramp up scenario is shown below. The same can be found for the remaining scenarios in Appendix 2.

[43] Additional skills compared to current provision.

Figure 124: Training requirement by skill level in Suffolk (Gradual ramp up)



Low carbon heating technology installations will be cyclical compared to insulation due to the need for refits and maintenance so the economic impact of additional low carbon heating activity will continue beyond 2030 (Figure 125). The economic contribution of the low carbon heating industry will be dominated by the construction industry with most of the value added in the region through the installer. There may be scope for contribution to the economy of surrounding areas if short term targets are met with surplus labour able to construct low carbon heating systems elsewhere. Jobs in the low carbon heating services will be fewer but may contribute to the local economy also as well as those in the trade of renewable heat technology. Assuming a relatively high proportion of the demand for low carbon heating systems is met through domestic manufacture, around £40 million in annual GVA could be stimulated in Suffolk through the manufacture of renewable heat technology[44].

[44] Renewable heat defined in ONS Low Carbon and Renewable Energy Economy Estimates and includes heat networks and heat pumps.

Figure 125: Spill over benefits generated across the different low carbon heating deployment scenarios (Suffolk)

Scenario	Peak year	Renewable heat construction GVA (million £s p.a)	Renewable heat Manufacture GVA (million £s p.a)	Renewable heat Services GVA (million £s p.a)	Heating controls (million £s p.a)
Gradual ramp up	2029	105.1	35.9	12.6	2.5
Urgent ramp up	2026	135.4	55.9	16.3	3.3
Net zero 2050	2040	60.7	20.7	7.3	0.9
Falling behind	2050	7.5	2.6	0.9	0.2

RELEVANT TRAINING AND CERTIFICATION

THE IMPORTANCE OF CERTIFICATION

Following the Each Home Counts Review, which investigated consumer protection and advice surrounding the installation of energy efficiency measures and renewable energy in homes, there has been an increasing focus on quality assurance and consumer protection under Government funded schemes. As a result, retrofit funding often requires installers to be TrustMark, PAS or Microgeneration Certification Scheme (MCS) certified (or a combination of the three). Increasing the number of PAS 2030 certified and TrustMark registered contractors is crucial. For installers to fit energy efficiency and low carbon heating measures in homes funded through government schemes (and increasingly other institutions), certification to one or a combination of all three is a necessity. Figure 126 provides examples of the funding schemes needing certification.

Figure 126: Overview of retrofit funding schemes that require installer certification

Scheme	Description
Private Finance Initiatives	Initiatives launched by financial institutions aimed at the able to pay market. Barclays for example are running the Greener Home Award scheme which offers money towards home improvements. Barclays requires Trustmark certification for the work to be eligible.
Social Housing Decarbonisation Fund (SHDF)	The Social Housing Decarbonisation Fund is available for social housing providers to improve the energy efficiency of social homes that are currently below Energy Performance Certificate (EPC) C
Energy Company Obligation (ECO 4)	The fourth wave of the Energy Company Obligation is aimed at lower income homes that need multiple energy efficiency measures installed to help them combat fuel poverty
ECO Plus	ECO+ will be an addition to the current ECO scheme to deliver rapid installation of energy efficiency measures to a wider pool of households, including those on the lowest income and those in the least energy efficient homes in the lower council tax bands.

Local Authority Delivery (LAD)	Local Authority Delivery (LAD) – currently under the third phase, LAD schemes are managed by local authorities to target low-income homes in their area. Regional hubs use local knowledge and regional expertise to identify those households which are most likely to require support, and which would best benefit from energy efficiency upgrades.
Home Upgrade Grant (HUG)	The HUG scheme is designed for the improvement of energy performance and heating systems for off gas grid homes in England.

MANDATORY TECHNICAL COMPENTENCIES

As discussed above, funding mechanisms generally require installers to be part of an installation monitoring programmes in addition to installations being installed as per the relevant competent person scheme in England & Wales[45]. Following on from Grenfell disaster the Building Safety Act 2022 - Section 35: Industry Competence has been updated:

13. Building regulations do not currently make any particular provision relating to competence of persons carrying out building work. Regulation 7(1)(b) provides that "building work shall be carried out in a workmanlike manner", but this is focused on the quality of the work rather than the competence of the person doing it.

Currently DLUHC are reviewing the minimum technical competences to ensure mandatory competency for a number industry area, these include:

- installation of insulation in existing buildings;
- installation of combustion appliances;
- installation of electrical installations in dwellings;
- installation of plumbing, water supply, heating and hot water systems;
- installation of mechanical ventilation and air conditioning systems;
- installation of replacement windows, doors, roof windows or roof lights;
- installation of replacement of roof covering on a pitched and flat roofs as necessary additional work (not including the installation of solar panels);
- installation of micro generation and renewable technologies

[45] https://www.niceic.com/join-us/competent-persons-scheme

A key outcome that's expected from this review is that the mandatory technical competencies will be enforced at some point in 2024. Furthermore, the qualifications will need to be Ofqual approved. All training providers will therefore need to engage with a suitable awarding body that offers Ofqual approved courses. It is expected that a minimum of Level 3 qualification will be required to carry out the installation of low carbon heating and retrofit activities.

TRAINING FOR INSTALLING INSULATION AND ENERGY EFFICIENCY MEASURES

PAS 2035 is the over-arching standard for delivering domestic retrofit. Sponsored by BEIS and designed by the British Standards Institute (BSI), it was created in response to recommendations from the landmark Each Home Counts Review.

Figure 127: PAS 2035 Roles and Descriptions

The PAS 2035 standard sets out the process to be followed for the provision of advice, assessment, co-ordination, design, installation, and monitoring of domestic retrofit projects. Is it used in conjunction with PAS 2030 certification. PAS 2030: 2019 is a certification concerning the commissioning, installation and handover of domestic retrofit projects. Businesses undertaking retrofit measures should be certified to PAS 2030 standards.

The PAS 2035 standard introduced newly defined and qualified roles necessary for retrofit projects including the Retrofit Coordinator. 'PAS2035: Retrofitting Dwellings for Improved Energy Efficiency' is a core part of a framework of new and existing standards on how to conduct effective energy retrofits to existing buildings. PAS2035 covers a range of areas including how to access dwellings for retrofit, identify the improvement options required, design and specify energy efficiency measures and monitor retrofit projects. The standard aims to drive a 'whole house' and 'fabric first' approach to retrofit.

Other industry standards tend to be aligned to the PAS Framework. For example, MCS can be used to demonstrate equivalence to PAS 2030 for the installation of microgeneration measures such as heat pumps and solar PV. Business registered with Trustmark must demonstrate full compliance with PAS 2035 and PAS 2030 including the registration of measures in the Data Warehouse to underpin compliance and enforcement framework. The table below lists each role under PAS 2035, the required qualifications to conduct the role and the relevant accreditations.

Figure 128: PAS2035 role, required qualification and accreditation

Role	Required Qualifications	Required Accreditations
Retrofit Advisor	C&G Energy Awareness & Advice Green Deal Advisor Level 5 Diploma in Retrofit Co-ordination and Risk Management	Membership of TrustMark Approved Retrofit Co-ordinator Scheme
Retrofit Assessor	**Low Risk** Level 5 Diploma in Retrofit Co-ordination and Risk Management **Medium and High Risk** Domestic Energy Assessor Specialist Level 3 – 6 Awards in Traditional Buildings (for protected buildings)	Certified DEA by UKAS Accredited Assessor Body. Membership of a TrustMark Approved Scheme

Retrofit Co – Ordinator	Open College West Midlands Level 5 Diploma in Retrofit Co-ordination and Risk Management Demonstration of prior experience in competence in professional practices such as contract and project management, customer service etc.	Membership of a TrustMark Approved Retrofit Co-ordinator Scheme
Retrofit Designer	**Low Risk** Level 5 Diploma / MCIAT **Medium Risk** Level 5 Diploma / MCIAT Registered Architects, Construction Managers and Building Surveyors **High Risk** Level 5 Diploma / MCIAT Registered Architects, Construction Managers and Building Surveyors CIBSE Members who also hold Level 5 Diploma or Specialist Traditional Building Qualifications.	Membership of a TrustMark Approved Retrofit Co-ordinator Scheme
Retrofit Installer	**As Per PAS 2030:2019 - See Below Illustrative Pathways for Fabric Efficiency Measures** [5]	Membership of TrustMark Approved Scheme.
Retrofit Evaluator	Level 5 Diploma in Retrofit Co-ordination and Risk Management	Membership of a TrustMark Approved Retrofit Co-ordinator Scheme

As PAS2035 develops several new retrofit roles, the costs associated with this standard framework are greater than PAS 2030. The cost, as well as effort required to become PAS2030 and PAS 2035 certified, is often viewed as a barrier to installers and was touched upon during the stakeholder engagement process. PAS 2030 also sets competency requirements to ensure installers are suitably qualified to install under PAS 2030 schemes. Appendix 4 highlights the qualification journey for insulation installers to confirm competence for PAS 2030 installations.

LOW CARBON HEATING

Home Based Heating

TrustMark is the Government Endorsed Quality Scheme that covers work a consumer chooses to have carried out in or around their home. Tradespeople carrying out energy improvements under Government funded schemes in England and Wales must be TrustMark registered and adhere to the TrustMark

Framework Operating Requirement (FOR) to provide greater levels of assurance and protection to homeowners. MCS certifies low-carbon products and installations used to produce electricity and heat from renewable sources. MCS create and maintain standards that allow for the certification of products, installers, and installations. MCS is a mark of quality and membership of MCS demonstrates adherence to industry standards highlighting quality, competency, and compliance. There are four key elements to becoming an MCS certified installer:

- Commitment to quality workmanship.
- Commitment to customer care.
- Demonstrate competency.
- Commitment to continual improvement through the development of an effective management system.

With regards to proving competency there are two key routes which an installation company may take:

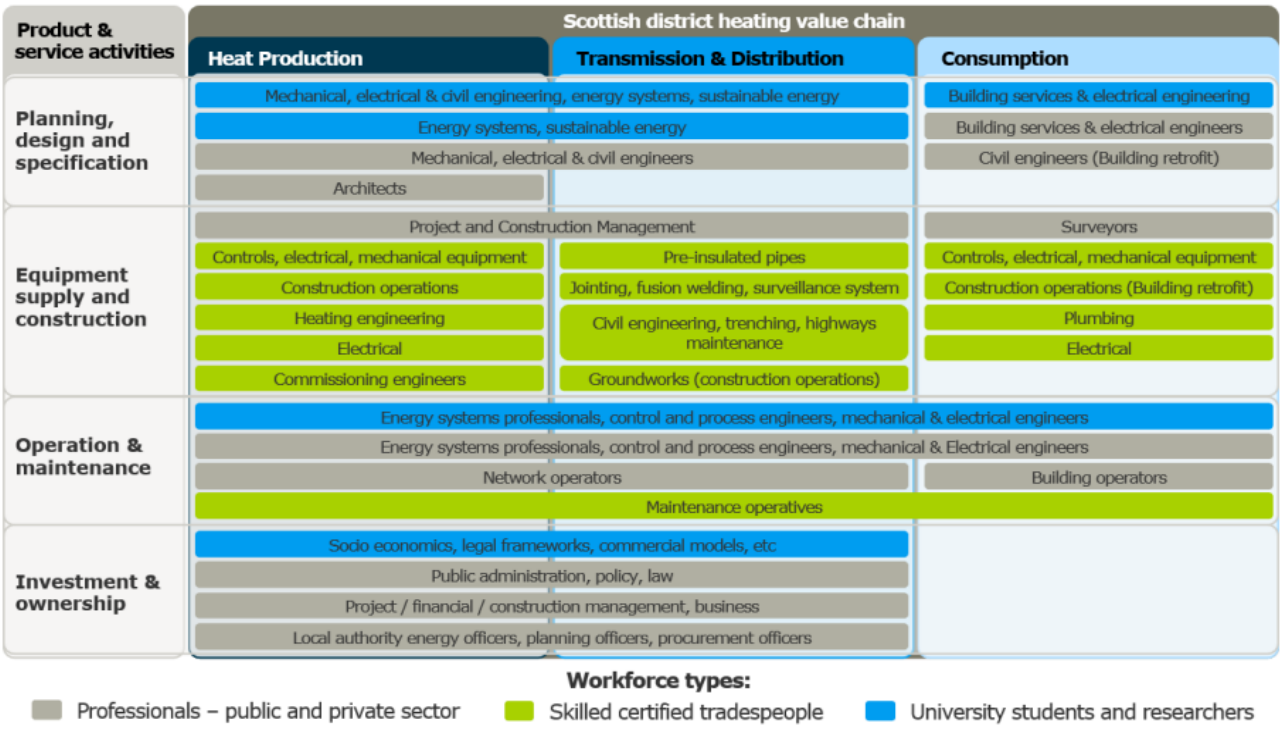
- Provide evidence of qualifications held and/or short courses attended (the current list of accepted courses, correct as of February 2023 for selected measures are outlined in Appendix 4).
- Prove competency via demonstrating experience to MCS certification body.

Heat Networks

Knowledge of heat networks requires skills across all qualification levels due to the unique nature of the industry. A 2021 report by the Energy Savings Trust[46] on behalf of Scotland demonstrates the range of skills and competencies need to successfully deliver heat networks across the value chain (**Figure 129**).

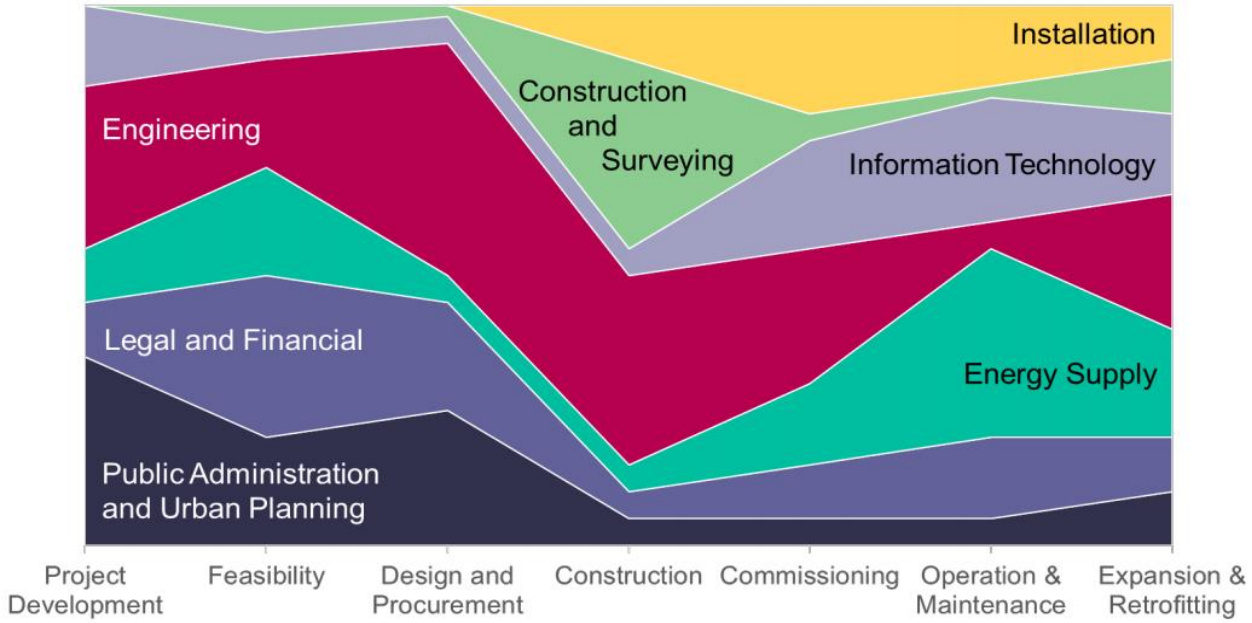
[46] https://energysavingtrust.org.uk/wp-content/uploads/2020/10/Heat-Network-Skills-Initiative-PDF-1.pdf

Figure 129: Heat networks skills requirement matrix



The research also demonstrates that co-operation across multiple disciplines such as certified tradespeople, professionals and university and researchers. A recent report commissioned by the Department for Business, Energy and Industrial Strategy (BEIS) found that some organisations already struggle to fill a number of vacancies in some key occupations, particularly senior project management and engineering roles.

Figure 130: Skills required at different stages of the heat network project phase



As shown in **Figure 130**, the skills required in each heat network development cycle vary with IT skills becoming increasingly important as the project moves from construction to commissioning and legal and financial support required in the early project development and feasibility stages[47]. The heat network sector, unlike the other sectors discussed, sits at the interface between a range of other sectors, including power, engineering, and construction. This means that many of those working in the sector have skill sets that are transferable. For example, legal and financial services firms may advise heat network feasibility and other energy or construction projects. Engineering skills are required throughout the heat network lifecycle. Moreover, the skills shortage in the sector appears to vary by organisation type with local authorities, social housing providers and property developers finding these skills particularly hard to find. More details on skills issues regarding heat networks can be found in Appendix 3.

[47] BEIS (2020) Heat Networks Skills Review

EXISTING RETROFIT SKILLS TRAINING IN OR NEAR NORFOLK & SUFFOLK

The following section starts by providing an overview of the relevant training providers operating in and around the Norfolk & Suffolk area. The section covers both Norfolk and Suffolk has training providers tend to cover large regional areas rather than confined to a council. Survey and interview feedback is then presented to illustrate how local training providers expect demand for courses to rise.

CURRENT PROVISION BY LOCAL TRAINING PROVIDERS

From the research conducted by Gemserv, there are a limited number of specialised training providers in Norfolk, Suffolk and surrounding areas such as Essex. **Figure 131** lists the courses provided by the specialised training institutions that were found. Only four specialist training providers were found offering low carbon heating or energy efficiency courses across the whole of Norfolk, with a further 2 identified in Essex.

Figure 131: Specialist training providers and courses identified in and around the local region

Course	Ofqual Certified	Norfolk & Suffolk Training Providers	Training Providers in Surrounding Areas
City and Guilds Level 2 Diploma in Refrigeration, Air Conditioning and Heat Pump Systems	Yes	None identified	Colchester Institute Sheepen Road Colchester Essex CO3 3LL
Bpec Heat Pumps	No	Norwich Gas Centre 19 Mahoney Green Rackheath Norwich NR13 6JY	CB Heating Limited Stephenson Road West Clacton-on-Sea Essex CO15 4TL
City and Guilds Insulation and Building Treatments (5931)	Yes	None identified	None identified

LCL Awards Level 3 Award in the Installation and Maintenance of Heat Pump Systems (non-refrigerant circuits)	Yes	Combined Heating Services Ltd[48] 24 White Lodge Business Estate Hall Road Norwich Norfolk NR4 6DG	None identified
Engineering and Manufacturing - Level 3 Award in the Installation and Maintenance of Heat Pump Systems (Non-refrigerant Circuits) | EAL Awards	Yes	None identified	None identified
OFT21-504A - Installation, commissioning, and servicing of Air Source Heat Pumps	No	Anglia Heating Training Unit 407 Copper Smith Way Wymondham Norfolk NR18 0WY	
OFT21-504D - Design of Heat Pump systems	No	Anglia Heating Training Unit 407 Copper Smith Way Wymondham Norfolk NR18 0WY	

In addition to training providers that specialise in low carbon heating and retrofit courses, more established education institutions such as Universities and Colleges can also offer training courses and apprenticeships relevant for to the sector. **Figure 132** lists all the local colleges and universities alongside the courses available on their website. Only the College of West Anglia provides courses relating to heating systems and energy efficiency. The courses provided by the College of West Anglia is a broader domestic heating course, where heat pumps are only one element of a broader qualification and an ERS certified energy efficiency course.

Figure 132: List of colleges and universities and the courses they offer

Institution	Energy Efficiency Courses	Low Carbon Heating Courses
Cambridge Regional College	None	None

[48] Based in Norwich and provides a course but its not mentioned on their website.

City College Norwich	None	None
College of West Anglia	ERS approved energy efficiency course	Plumbing and Domestic Heating Apprenticeship: Level 3 – Encompassing heat pumps
East Coast College	None	None
Suffolk New College	None	None
University of East Anglia	None	None
University of Suffolk	None	None
West Suffolk College	None	None

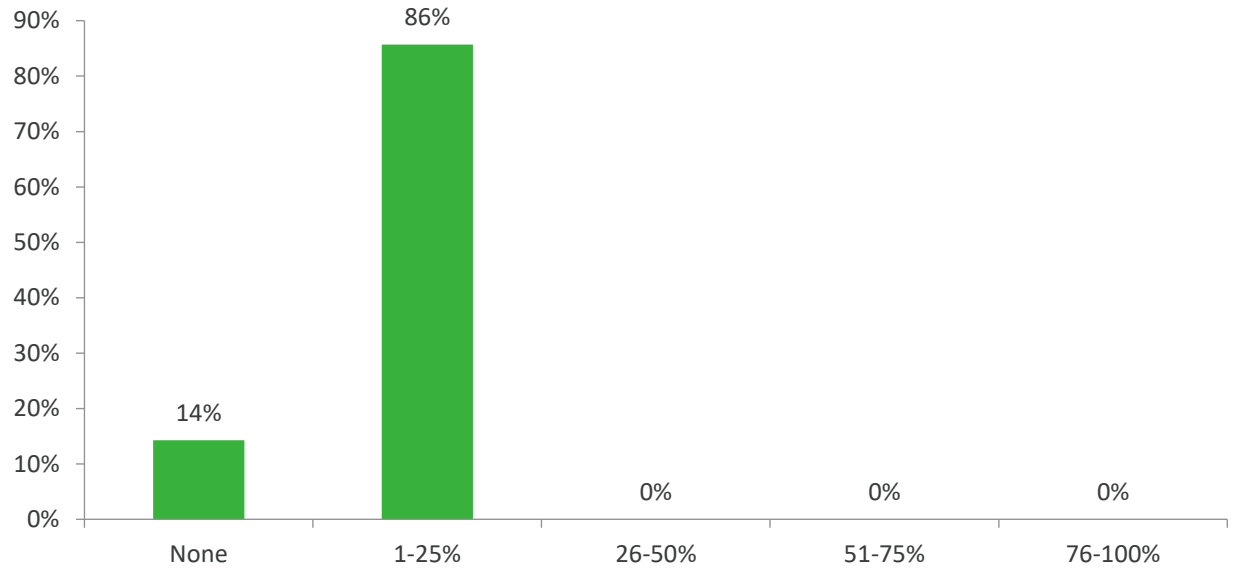
Other training provision includes Norfolk and Suffolk's partnership with the Retrofit Academy. Through a mixture of local Norfolk and Suffolk training providers and online courses, the Retrofit Academy provide the following courses to relevantly trained people:

- **Level 3: Award in Domestic Retrofit Advice:** A Retrofit Advisor has a customer service focussed role, they can give independent advice to homeowners or residents, with a view to help them understand retrofit and the impact it will have on their property.
- **Level 4: Award in Domestic Retrofit Assessment:** The role of a Retrofit Assessor is to survey properties and prepare a report in-line with a Retrofit Coordinator's requirements. Learners will be provided with full training and support on how to conduct a detailed retrofit assessment.
- **Level 5: Diploma in Retrofit Coordination & Risk Management:** Retrofit Coordinators manage the PAS 2035 process throughout a project. Crucially, the Retrofit Coordinator ensures compliance with the procurement, specification, and delivery of measures in all domestic retrofit projects.

The findings from the desk research are also supported by the survey and interview feedback from training providers. Figure x shows the proportion of courses targeted at low carbon heating and energy efficiency qualifications by local training providers in Norfolk and Suffolk, where all the respondents stated only 1-25%

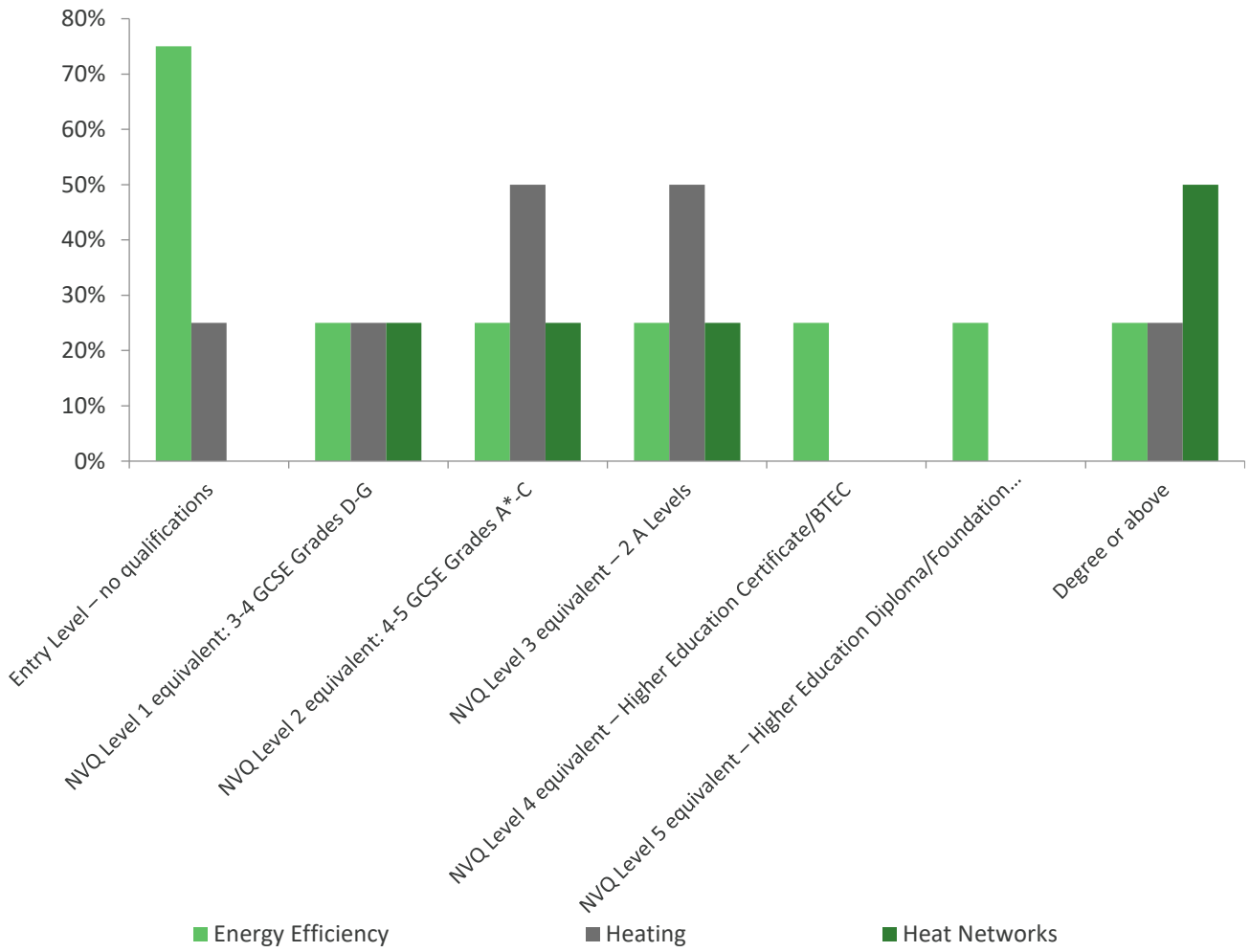
of their courses have a 'green'/retrofit element to them, or none. As shown in the above graph, these proportions are very low further emphasising the lack of courses and training providers servicing the local area.

Figure 133: What proportion of the courses that you provide have a green or retrofit element (Norfolk and Suffolk)



Of those respondents who do offer related or somewhat related courses, the course levels varied from entry level and up to degrees as shown in Figure x below. As the survey only received 4 respondents, these results are limited to the small number of training providers that offer specific courses.

Figure 134: For the courses that you offer with at least some retrofit content, what level of qualification do you offer (Norfolk and Suffolk)

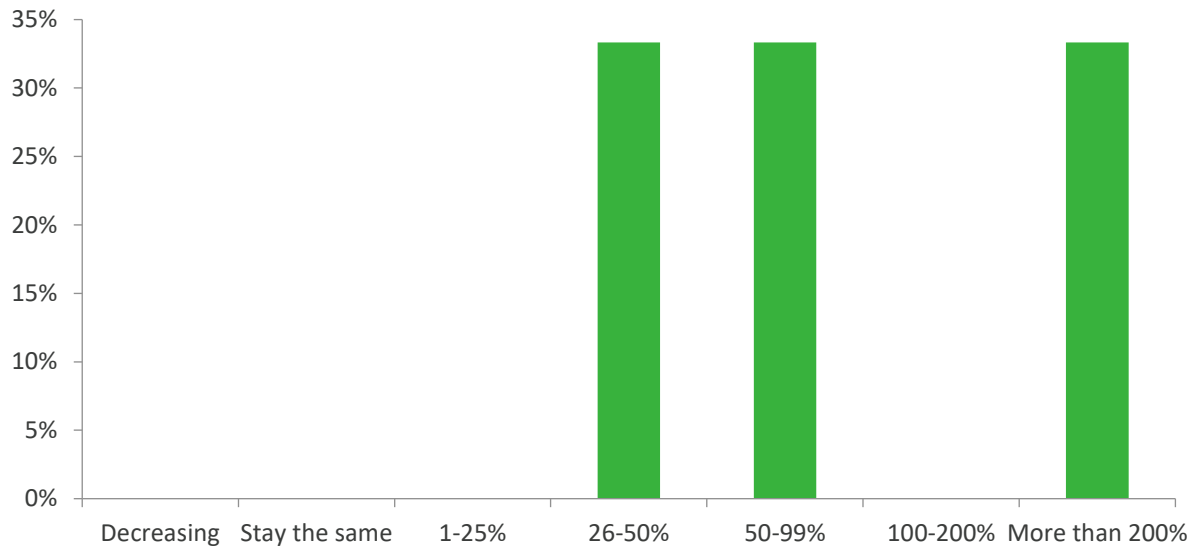


EXPECTED FUTURE DEMAND FROM NORFOLK & SUFFOLK TRAINING PROVIDERS

Despite national policy mechanisms being key to driving an increase in retrofit and low carbon heating systems, local training providers have an instrumental role in creating a pipeline of talent for the region. As part of the stakeholder engagement process, training providers were asked to provide their views on the growth of low carbon heating / retrofit courses. **Figure 135** shows how training providers in Norfolk and Suffolk expect demand for retrofit and low carbon heating related courses to grow[49]. The responses were varied with regards to the specific growth rates, but all the stakeholder views captured indicate that they expect demand for these courses to increase, in line with the need for additional green/retrofit jobs to meet net zero targets.

[49] Note this only received 6 responses based on limited training provider engagement.

Figure 135: How do you see demand for retrofit related courses increasing or decreasing over the next 7 years (Norfolk and Suffolk)



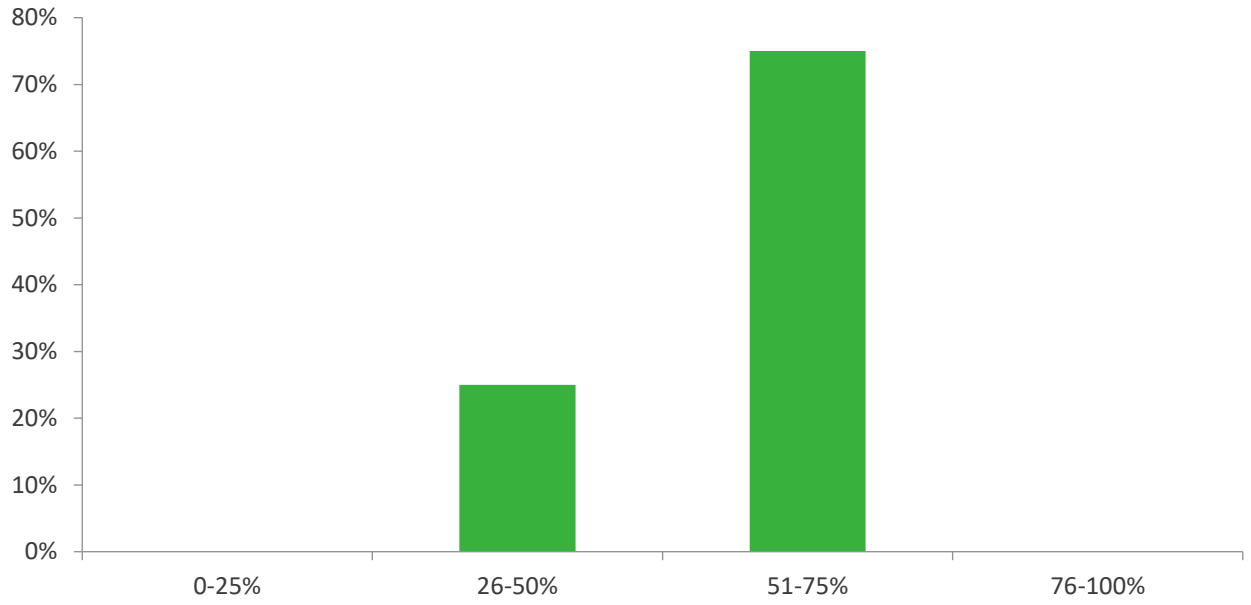
Following on from this survey question, local training providers responded to "how does your organisation plan to adjust to increasing / decreasing demand for green / retrofit related courses over the next 7 years?" in the survey and interviews. As all the respondents indicated that they expect to see demand increase, they are all preparing to adjust for this change through a range of mechanisms. This includes the development of additional green courses, that are shorter and aimed at both 16–18-year-olds and adults. In-person training is also being developed through the refurbishment of training rooms specific to green skills, with equipment to aid in the delivery of courses. Post COVID-19, training providers also recognise the importance of offering online and hybrid courses to attract a wider cohort of students. Additional green skills are also being introduced to all courses within some institutions, allowing for all courses to have a green or sustainability element to further engage students with the importance of these skills and further knowledge. Certain colleges in the region have also enacted green skills focused campaigns. For example, The Green Skills Project[50] enacted by West Suffolk College provides young learners the opportunity to learn more about green technologies, the skills required to install them, hands on knowledge of green skills as well as links into local industries.

Figure 136 highlights the number of students that enrol on courses in the Norfolk/Suffolk region that are local to the area[51]. The results indicate that some students are not from the area initially and move to study within Suffolk or Norfolk, as no training provider indicated that all their students are local.

[50] https://greenskills.wsc.ac.uk/

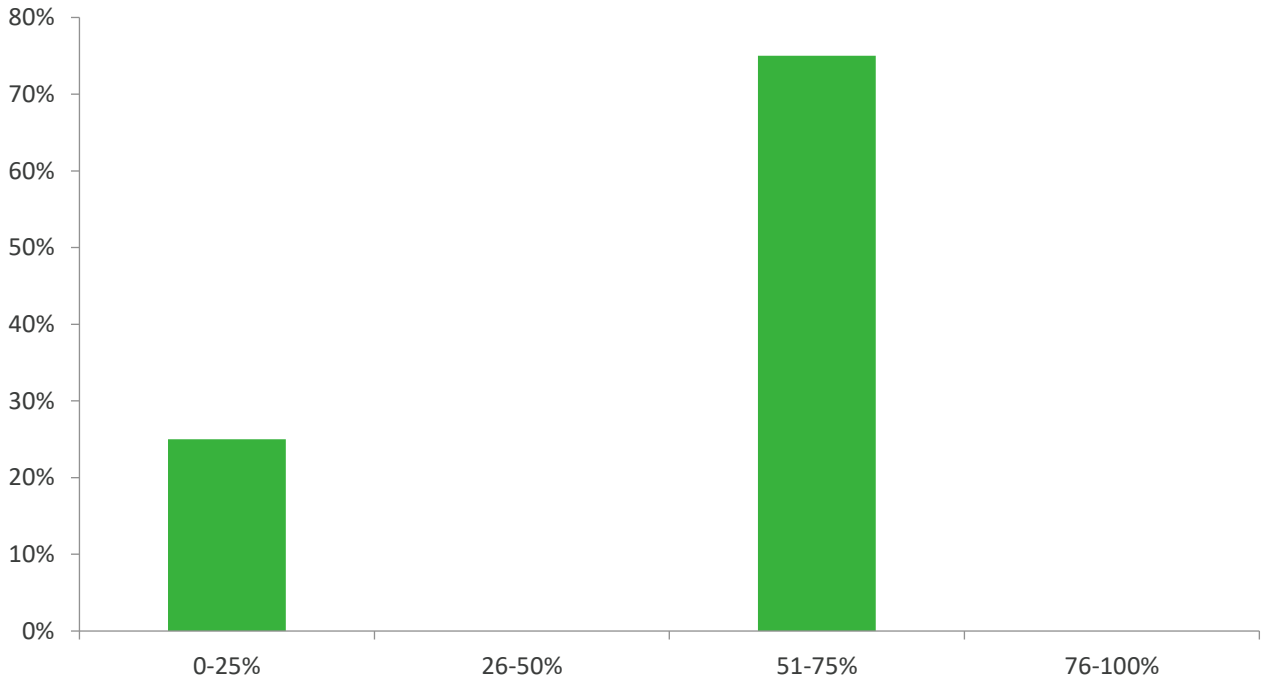
[51] Note this only received 8 responses based on limited training provider engagement.

Figure 136: What proportion of your organisations students are from the Norfolk and Suffolk region when they enrol to study?



Following on from the above graph, Figure 137 below indicates that some local training providers see a large cohort students move away from the area and with some stating the majority are retained locally. Ideally, training providers commented that they would like to see students retained locally in their jobs – attracted by local careers that need to be available for them.

Figure 137: Upon completing their courses, what proportion of your students gain relevant jobs / careers to their subject are in the Norfolk and Suffolk region?



Training for retrofit and green skills does not need to be done solely in colleges or training centres, as some employers have the capability to offer in-house training. Returning to industry representatives that were interviewed and surveyed, and who can develop in-house training (generally larger companies), they provided some insight as to what interventions or training provision would help achieve this, including:

- Increased funding aimed at training provisions for businesses as many industry representatives highlighted that training is funding based and thus extremely important.
- A recognised framework to follow and additional support to develop training and software would enable industry to enhance their in-house training capabilities.
- Education-based campaigns to attract school leavers and those with the potential to upskill – skills need to be advertised as attractive within the industry. Industry representatives highlight the importance of attracting young people the industry as those current gas engineers or electricians, for instance, are nearing retirement age and do not see the need to upskill in the coming years.
- For those who want to upskill, there is a temporal barrier where installers cannot take the time off to go and retrain. Stakeholders highlighted that shorter courses or part-time training would be valuable, alongside funding for this training to make this valuable to the current workforce.

CHALLENGES IN SCALING UP THE WORKFORCE

INSIGHTS FROM LOCAL AUTHORITIES

Local authority representatives offer key insights into some of the challenges and opportunities currently facing the transition to net zero within the region, from a wider development perspective to specific local opportunities. Many of the challenges they identified were politically focussed, highlight the need for long term national political commitments to drive investment locally. Local authority representatives have seen a delay in the implementation of national policy and schemes that would enable widespread adoption of low carbon technologies by consumers, highlighting the need for them to be more viable to more households. This is a barrier for scaling up the workforce, as the industry need to maintain high demand to be attractive to prospective employees.

The local authority representatives who engaged with this study identified some needs within the retrofit industry to enable to workforce to scale up, including:

- Creating long-term incentives for consumers, which in turn will stimulate sustainable, long-term market demand, helping to build capacity and confidence of colleges and training providers to invest in appropriate courses.
- The provision of relevant training courses needs to be incentivised to stimulate the market for the relevant skills. It was felt the Council could provide funding to training centres for an initial period to alleviate the risk of poor course take-up
- Creating relevant training courses specific to the roles where experiencing the biggest shortages, combined with apprenticeships to be delivered at scale.
- Alongside labour and skills shortages, there are teacher/tutor shortages – attracting teachers to courses also needs to be incentivised as working within the industry is currently more attractive on an income basis.
- Coordination and provision of advice: multiple LA representatives highlight the need for a significant body/organisation coordinating and driving forward the local retrofit agenda. This would allow consumers to get advice on local services such as the availability of local contractors and for tradespeople to know what skills are required for certain roles and where they can acquire these.

Following on from the previous point around funding gaps, local authority representatives recognise that installing low carbon heating systems such as heat pumps is very costly for the consumer, limiting demand. A respondent specifically indicated that financial schemes for the able-to-pay sector are particularly limited. Providing financial instruments that could spread the cost of installing low carbon technologies would support demand and attract more individuals to the workforce. Further insights from these representatives also recognise that training can be costly for prospective students and employers, limiting the growth of the workforce. A study from the New Anglia LEP supports this, indicating that businesses are unable to invest in training currently whilst the economy is uncertain[52].

Local authority respondents also recognise a local skills shortage in retrofit and green skills. Adequate training will ensure systems are installed correctly and embed consumer confidence in these technologies. As demand increases for both retrofit and new build projects, labour and skills need to be available to fulfil the needs of the local area in achieving quality installation that meet the requirements of legislation related to the net zero agenda, such as the Heat and Building Strategy.

Specifically at a council level, local authority representatives recognise that coordination between local councils is crucial to scale up the retrofit workforce. This again highlights the need for a central coordinator that can provide advice, education, and training for the workforce, bringing together district partners, providers, decision-makers, and policy-formulators. Skills interventions can then be widely understood in Norfolk and Suffolk and agreed by providers and businesses, centralising resources in one organisation. Working closely with adjacent county councils in this group would ensure wider alignment and consistency in the retrofit agenda to reach net zero targets.

INSIGHTS FROM TRAINING PROVIDERS

Colleges and training providers are finding it very difficult to source qualified training staff. A generic reason is the cost of living is pushing a lot more people into the private sector as they pay more favourably. A more sector specific reason is the best trainers are often those with experience in conducting installations, especially in the heat pump sector. As there are currently few qualified people in the region, and those who are experienced and qualified are often “at the coalface”, attracting them to much-needed teaching positions, against the prospect of higher private-sector wages, is very extremely difficult. A potential solution to this is teaching via artificial intelligence and online learning modules, reducing the pressure on existing staff and enabling a greater cohort of students enrolling on courses year-on-year.

[52] https://newanglia.co.uk/wp-content/uploads/2022/01/FINAL-New-Anglia-Local-skills-Report-Update-Jan-22.pdf

Another challenge is creating suitable courses and finding partnerships. Training providers indicate that there is demand from young people to obtain retrofit qualifications, but there is little support for colleges in building a curriculum. One cited a partnership with the Retrofit Academy though the acquisition of a license that enables the college to use their courses, reducing the time to develop them.

Maintaining demand and interest from students is crucial to scale up the workforce, but some training providers indicate that this needs to increase. Smaller companies are not as concerned about net zero targets and are concentrated on staying afloat, meaning they do not have the resources to invest in training in comparison to larger companies that are more open to training providers. Investment for training in colleges is therefore crucial, through long-term financial aid, allowing all businesses to be able to access relevant and specific training courses.

INSIGHT FROM INSTALLERS AND LOCAL BUSINESSES

Installers and local businesses were asked via interviews and a survey about the main challenges they see the sector facing currently and in the coming years. The cost-of-living crisis was identified as a key challenge in the sector – this is explored in further detail in this section.

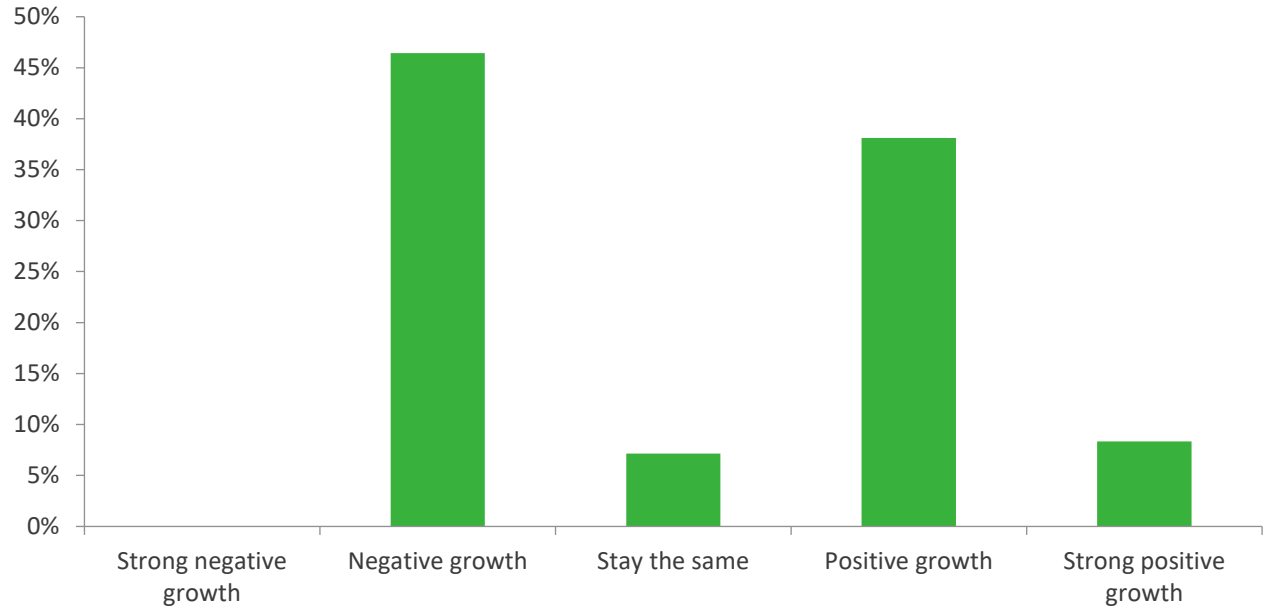
Lack of skills and funding for training was also identified as a key barrier for scaling up the workforce, especially for SMEs with regards to the cost of training. There are not enough installers currently available to deliver what is needed to reach net zero targets, amplified by the lack of funding needed for the workforce to partake in training courses. Those that can train are unable to find available roles, and stakeholders would like to see a formalised route from obtaining their qualifications into employment.

Installers of heat pumps indicated that there are currently supply chain issues, escalated by the war in Ukraine driving European countries to switch to low carbon heating systems, away from the gas grid. This has resulted in observed supply issues of heat pumps in the UK, indicating the need for UK manufacturing for security of supply. The cost of materials for energy efficiency measures has also increased within the last year and become difficult to obtain which has limited business growth to fulfil demand – stakeholders indicate that Brexit and the cost-of-living crisis will have had a major part to play in this.

Consistent demand from consumers is required to provide job stability in the retrofit industry as this will attract more people to work in the sector. This leads onto political instability identified by industry representatives, especially those focused on energy efficiency and low carbon heating. Under funding for this market has prevented further incentivisation for demand, and industry are unable to predict how policies will change in the coming years. This lack of clarity and clear design on funding schemes from government creates a lasting instability in the sector.

When asked specifically about the cost-of-living crisis, installers/industry representatives had mixed views about whether it was impacting growth for their sector, with it producing positive and negative growth depending on the business's perspective as shown in **Figure 138**.

Figure 138: What impact do you believe the cost-of-living crisis is having, or will likely have, on your sector?



For those that indicated the cost-of-living crisis is having a negative impact on the sector, 46% of respondents, one of the key themes was the lack of disposable income from consumers who are no longer able to retrofit their home. With the cost of energy rising and the increased burden that this places upon households, people do not have spare funds to switch to low carbon heating systems that may be cheaper to run. The crisis is also impacting installers who do not want to upskill and are staying in their current roles, while some cannot fund further training, and others who see their current employment as the most secure option.

On the other hand, an equal number of respondents stated they believe the cost-of-living crisis is having a positive or strong positive impact on the retrofit sector. They have seen an increase in demand through distress purchases, with the need to replace old heating systems and through increased fuel costs persuading consumers to invest in renewables. Some consumers can still afford to retrofit their homes to help reduce their future energy bills – a trend that has been observed by energy efficiency measure installers during difficult financial periods. Financial opportunities are also available for those who cannot afford the up-front costs such as loans and mortgaging, but further incentives are needed to enable demand to continue.

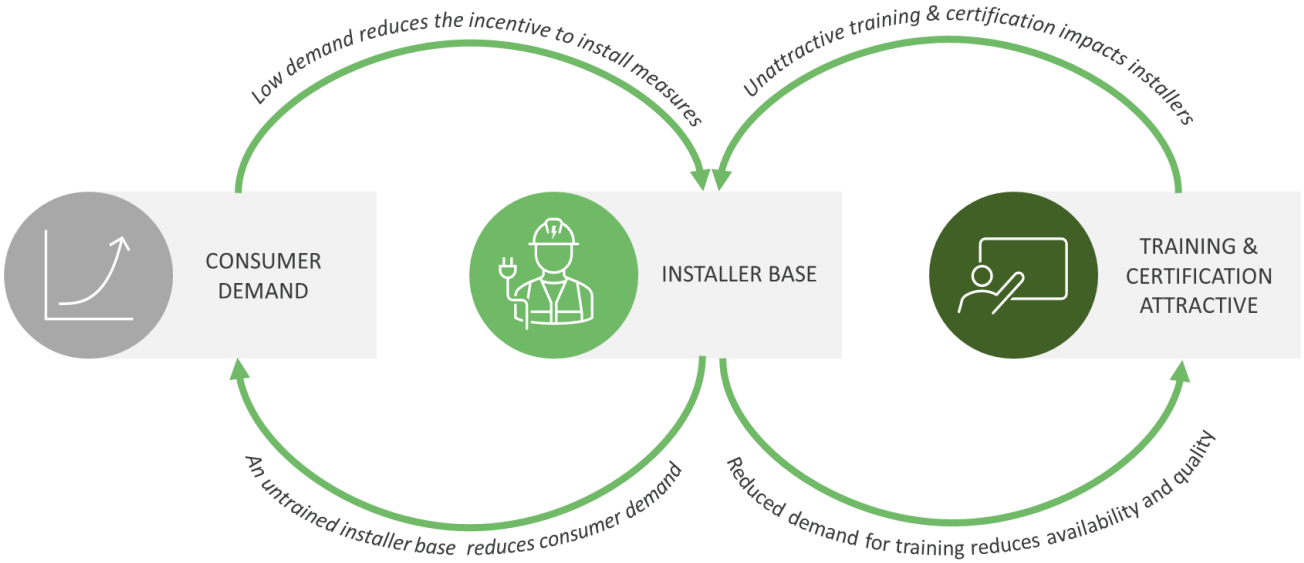
SEIZING THE OPPORTUNITY

Norfolk and Suffolk have some key strengths and favourable local conditions to facilitate the transition of their building stock to meet their net zero ambitions. Heat pump installations are higher than the national average, and both regions also have a higher proportion than the UK average of off-gas grid building stock. This makes it an attractive place for heat pump manufacturers to accelerate UK deployment of heat pumps. Moreover, both Norfolk's and Suffolk's local devolution deals also give them more powers to address the local skills shortages and put in place tailored measures to address hard-to-decarbonise areas of the housing stock. Nevertheless, the scale of the challenge is significant, and a range of policy interventions, co-ordination and private sector engagement is needed to address the deployment scale up and associated skills ramp up. This final part of the report offers both councils a joint set of recommendations. Three broad themes emerged from the research. They can be summarised as follows:

- Accelerating consumer demand
- Building a future installer base
- Making training and certification attractive

These three themes can be viewed as a constant cycle. Consumer demand is needed to give confidence to the installer base to train, but training will only occur if the installer base feels it attractive to do so. This then affects demand as not enough trained people are available promoting heat pumps and providing good quality installations, thereby creating a vicious cycle (**Figure 139**).

Figure 139: Negative interplay between consumer demand, installer base & training availability



Each section focuses on one theme, offering a set of recommendations that attempt to break this cycle and accelerate the deployment of retrofit measures. Due to the similarities in housing stock, comparable local economic conditions, and consistent feedback from the stakeholder engagement process, it was logical to combine the recommendations for Norfolk and Suffolk. However, throughout the narrative, specific Norfolk and Suffolk examples are drawn out to add more local context.

ACCELERATING CONSUMER DEMAND

A lack of consumer awareness, resulting in lower-than-expected demand, is often one of the main reasons new technologies can struggle to be adopted in the early stages of development. To justify the training of low carbon heating and energy efficiency installers, businesses must be confident in the demand for those technologies. A common driver established in the literature and local stakeholder engagement process was the lack of demand from customers for technologies like heat pumps and other energy efficiency measures. Councils can play a key role in generating demand through promoting local awareness around the benefits of retrofit and can create demand via the social housing stock. The following recommendations focus on how Norfolk and Suffolk councils can increase demand locally.

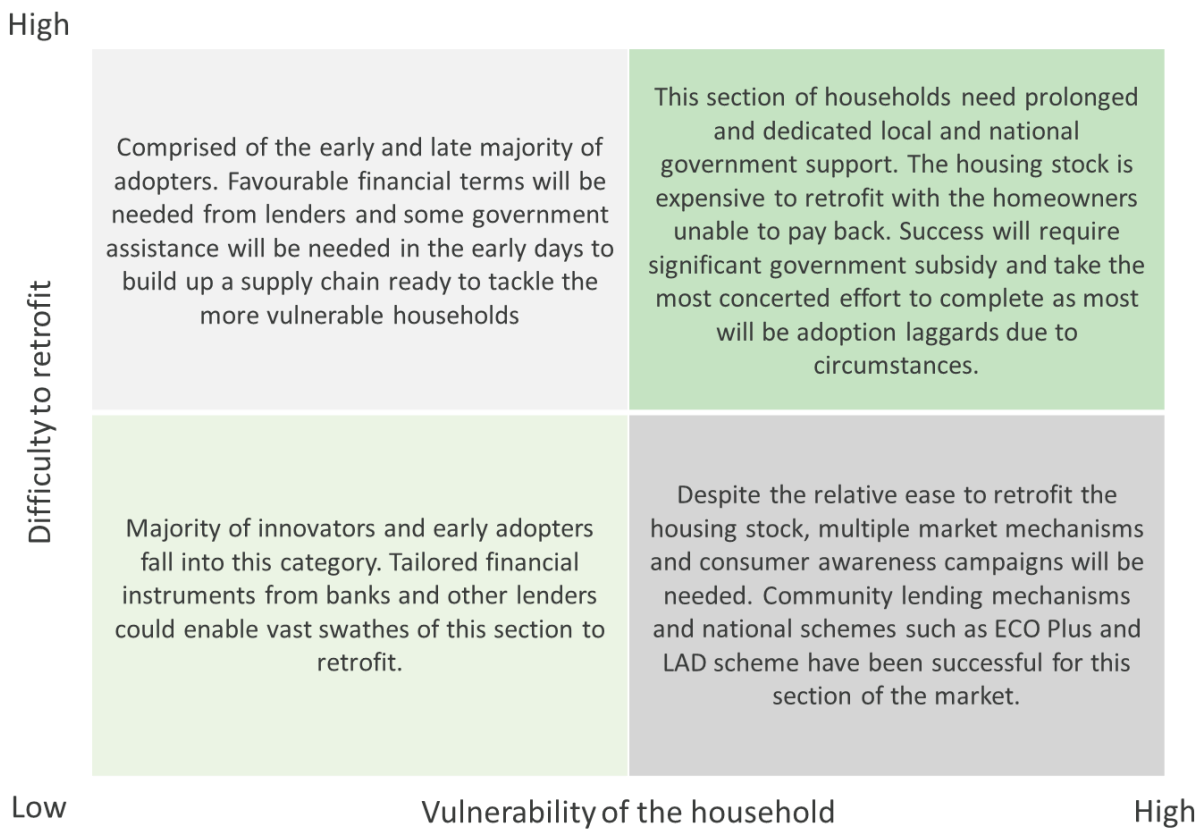
RECOMMENDATION 1	SUB-RECOMMENDATIONS
Creating a prioritisation strategy to concentrate Norfolk's and Suffolk's efforts on the vulnerable and difficult to retrofit properties to provide locally administered support.	Develop an internal tool that links the local housing stock energy efficiency and dwelling characteristics with social factors such as Index of Multiple Deprivation to co-ordinate and prioritise local authority efforts.
	Develop a retrofit programme for public buildings and social housing that takes a street-by-street approach to low carbon heating and energy efficiency measures.

Retrofitting Norfolk and Suffolk's building stock will come with a range of challenges. Gemserv analysis suggests 34% of the domestic housing stock will need to be insulated and 81% will need to be retrofitted with a low carbon heating system. The deployment rates for Suffolk are similar – 34% of the domestic housing stock needs to be insulated with 82% requiring a low carbon heating system. An immediate task for both councils will be to devise a strategy for tackling retrofit activities that prioritises areas of the housing stock where traditional market mechanisms may struggle to work. This would generate initial demand, especially for measures like solid wall insulation where the market hasn't intervened.

To achieve this, understanding the housing stock and local economic factors will be key crucial. One method could be developing an internal tool that maps the local housing stock energy efficiency and other characteristics with other factors included in the Index of Multiple Deprivation. The aim would be to generate a prioritisation matrix of where the housing stock is difficult to retrofit and where households are the most vulnerable. This could help target local council investment into where there's a market failure.

Figure 140 demonstrates the rationale and how a simplified version could look in practice.

Figure 140: Illustrative prioritisation matrix to help Council's assess where interventions will deliver the best value



Difficulty to retrofit will be a function of the different retrofit measure installed, the age of the property and type of property (i.e. flat or detached house). Vulnerability of the household will be a function of income, but also other factors such as underlying health conditions of owners (and other exceptions outlined in the Local Authority Delivery scheme for ECO). This simplified matrix can help Norfolk and Suffolk co-ordinate and manage different intervention policies towards the broad types of household groups and accelerate consumer demand. For example, households and consumers in the bottom left can broadly rely on more tailored financial mechanisms from banks, energy companies and other institutions as the households are able to pay and the installation and the scope of retrofit activity is relatively low (i.e., a heat pump

replacement in an EPC C rated semi-detached house). In comparison, those households in the top right of the matrix will have difficult properties to retrofit and not have the means to pay. Therefore, local authorities and councils need to play a much more hands on role in these houses, offering blended support packages such as bidding into national schemes (see case study), local grants or 0% interest loans via community lenders. The prioritisation should inform a street-by-street approach to retrofit that's led by local authorities and co-ordinated by the local councils. A quick win would be to trial this approach in public buildings and social housing where local government have greater influence in the roll out of measures.

CASE STUDY: NORFOLK AND SUFFOLK TARGETING SOCIAL HOUSING AND PUBLICLY OWNED BUILDINGS

Local authorities across Norfolk and Suffolk County Council have been taking steps to target the housing stock and public sector owned buildings in their area. Last year Norwich, Great Yarmouth, West Suffolk and Broadland and South Norfolk were all awarded funding via the Social Housing Decarbonisation Funding. This forms part of a national pool of funding where local authorities bid into install measures such as solid wall insulation, heat pumps and other measures to improve the efficiency of houses. Norfolk County Council has also appointed Turner and Townsend to co-deliver the retrofit of key public sector buildings. It's vital Norfolk and Suffolk Council spearhead many more activities like this throughout the 2020s acting as a co-ordinator and prioritising action across both Counties.

RECOMMENDATION 2	SUB-RECOMMENDATIONS
Linking private and community finance mechanisms with local installers to accelerate the roll out of energy efficiency and low carbon heating system.	Work with local community lenders to help the most vulnerable in the region access financing options to pay for low carbon heating and energy efficiency measures. Forge partnerships with larger financial institutions to work in partnership with the local installer base to provide financial services to the able to pay market such as landlords.

As energy efficiency and low carbon heating deployment starts to reach critical mass, government subsidies will likely become more targeted at those most unable to afford the measures. Introducing other financial instruments, other than government subsidy, will be crucial in sustaining the deployment of low carbon

heating and energy efficiency measures into the late 2020s. Banks such as Barclays and Lloyds[53] are already offering £500-£1000 awards to homeowners installing low carbon heating and energy efficiency measures if they take out a mortgage with them. While encouraging, these are often time limited incentives, and highlight a need for a much longer-term strategy for private finance in this space. Norfolk and Suffolk Council could explore working with larger financial institutions, offering to locally trial a low carbon heating and energy efficiency monthly repayment scheme in partnership with local installers. The aim would be to target the able-to-pay sector, such as local landlords, enabling installers to provide monthly payment options to reduce large upfront costs associated with the installation. Another option is exploring using local community lenders to partner with installers to provide services for more vulnerable homeowners. Local councils are in a good position to facilitate this given their local knowledge therefore having more influence and buy-in into the scheme. Lendology[54], a not-for-profit community lender, has trialled this in adjacent local authorities with real success (see case study for more detail).

CASE STUDY: LENDOLOGY THE COMMUNITY LENDER WORKING WITH LOCAL AUTHORITIES.

Lendology are a community lender offering tailored low interest loans for energy efficiency measures and low carbon heating. Leveraging council capital, they pro-actively service people who wouldn't normally be considered by existing financial institutions. Lendology's business model enables them to lend to pensioners on limited or no disposable incomes, self-employed people as well as applicants on a variety of different benefits. They are partnered with a variety of local councils and to date have lent £20 million worth of council capital, with over £12 million being rapid enabling the money to be re-lent.

RECOMMENDATION 3	SUB-RECOMMENDATIONS
Local awareness campaigns to promote the benefits and reduce concerns around energy efficiency measures and low carbon heating.	Launch a co-ordinated information campaign across the local authorities on the benefits of retrofit across different property archetypes and heating systems.
	Make households aware of potential national changes in requiring off-gas grid dwellings to install low-carbon heating systems by 2026.
	Increase consumer confidence in the local supplier network by promoting locally certified installers to raise their profile beyond word of mouth.

[53] https://www.lloydsbank.com/mortgages/help-and-guidance/eco-home-hub/eco-home-reward.html
[54] https://www.lendology.org.uk/partners/become-a-partner/

Many respondents from the surveys and interviews observed that rising energy bills has made certain retrofit measures more attractive, leading to rising demand. This can also be observed nationally with a report by the Energy and Climate Intelligence Unit (ECIU) claiming the payback period for insulation and other retrofits measures have reduced due to rising energy prices[55]. Given the public's focus on rising energy bills, awareness campaigns are an effective way to highlight energy saving measures. The UK government has been successful at promoting energy savings tips during the winter of 2022 and 2023, highlighting measures such as adjusting boiler flow temperatures. Given the public's heightened awareness, there's an opportunity for Norfolk and Suffolk Council to use this momentum to drive further awareness on the benefits of retrofit measures. Specifically, a co-ordinated campaign spanning the local authorities could produce targeted messages at certain archetypes of households. This could use elements of the Council's internal tool (see Recommendation 1) to produce an online calculator, providing illustrative pay back periods across different property types and heating systems, using "typical" household types for Norfolk and Suffolk as a baseline. This calculator could also form the basis of public awareness material such as leaflets and social media campaigns.

Once customers have been convinced of the benefits of implementing retrofit measures, another key challenge for the consumers is finding a trusted installer. Norfolk and Suffolk Council could use the online calculator to promote local installers by providing a list of relevant installers across different measures. To ensure Norfolk and Suffolk Council are promoting high quality installations, only MCS, Trustmark or PAS certified installers should be listed on the website. This not only gives consumers an increased level of protection due to the additional auditing requirements of these schemes, but also incentivises installers to get the relevant certification. One challenge to this approach is breaking existing social habits around how people choose their heating installer. Research conducted by BEIS suggested that new work in the heating and cooling industry is primarily driven by personal connections. 93% of trades people said they relied on word of mouth for new business, with 83% relying on repeat business and 42% using other tradespeople recommendations[56]. Therefore, encouraging people to check if their local installer is certified could be one element of a retrofit awareness campaign. This could act as a societal nudge to encourage increased certification, but also to influence their installer choice process by looking online for retrofit services.

[55] https://eciu.net/media/press-releases/2022/poorly-insulated-homes-to-cost-1000-more-to-heat-this-year
[56] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1130626/heating-and-cooling-installer-study-hacis-main-report.pdf

BUILDING A FUTURE INSTALLER BASE

A clear theme emerging from the research body was that Norfolk and Suffolk need to immediately grow the amount of training providers in the area. To provide an agile training landscape for the new and current workforce, both councils should explore multiple training provision options aimed at a cross section of the workforce to ensure adequate provision and choice within the market. Three broad routes of training provision emerged from the research and include existing colleges, specialist centres and emerging, innovative models of provision (the latter discussed in the next theme).

RECOMMENDATION 4	SUB-RECOMMENDATION
Prioritise bringing through a new generation of low carbon and insulation installers by leveraging Norfolk's & Suffolk's network of colleges and universities.	Promote a local "pool" of installer trainers that colleges in the region can access to help stagger training and ensure the optimum number of installers are trained.
	Support training providers by creating an energy efficiency and low carbon heating course implementation guide.
	Targeted campaigns at 14–25-year-olds, promoting the need for low carbon heating and energy efficiency installers demonstrating it's a job for life and aligned with climate action.

A clear message emanating from the desk research, analysis and stakeholder engagement is the need to train a new generation of installers. Regional data shows Norfolk's and Suffolk's population is significantly older than the England average, with over 50% of East Anglia's energy efficiency and heating installers over 50. Attracting younger learners is therefore critical in meeting the accelerated adoption of both heat pumps and energy efficiency measures. Bringing through a younger workforce has multiple benefits for the region:

- They are an integral part of meeting Norfolk and Suffolk's 2030 net zero target as the existing installer base cannot meet the impending demand.
- As the older workforce retires, there's on-going work beyond 2030 in maintenance, reinstallations and new builds, albeit at a reduced intensity. The economic analysis conducted for Norfolk identified that in the urgent ramp up and gradual ramp up scenarios, only around half of the initial demand for heat pump engineers can be met by upskilling current gas and oil heating engineers in the region. This problem becomes more profound later as ~65% of the heat pump engineers required to service the second wave of reinstallations and maintenance will need to be new entries to the heating labour market.

- Certain local authorities in Norfolk and Suffolk contain a high proportion of their population in the lowest 10% nationally for education and skills deprivation. Training a raft of new local installers in energy efficiency and low carbon heating can contribute to reducing educational and skills inequality within the region.

A key route to attracting young people is via the local network of colleges and universities. Gemserv's research indicates that only one college across Norfolk and Suffolk currently provides a specific course in energy efficiency and low carbon heating. A key barrier identified by colleges was attracting suitably qualified trainers to run courses once they had acquired the funding. Private Sector wage competitiveness has been identified as a key factor, exacerbated by the pressure of increasing cost of living.

Other factors include that the small pool of people suitable to be low carbon heating and energy efficiency trainers are often in the private sector. Attracting them into teaching is often difficult, as they're either nearing retirement or the teaching salary isn't attractive enough. A future challenge reflected in a stakeholder interview was how the problem could exacerbate as more colleges start introducing courses and bidding for the small pool of talent. A remedy for this could be for Norfolk and Suffolk Council to promote a local "pool" of trainers all the colleges in the region can access. This would help manage training requirements across the colleges and help stagger training to ensure the optimum number of installers are trained.

Another challenge colleges faced was finding the right information on courses and needing to dedicate time to research, run and validate the efficacy of courses. Striking up partnerships with organisations dedicated to retrofit and low carbon heating training would reduce the search costs involved, with some respondents mentioning organisations like the Retrofit Academy. Norfolk and Suffolk Council could support training providers by creating an energy efficiency and low carbon heating course guide. This would list and describe the relevant courses available, with a guide on how colleges and training providers can enact them based on shared experience in the region. This could include information on course duration, whether it's aimed at new entrants or existing installer base, a course overview alongside capital equipment needs and potential suppliers. Both councils could also facilitate strategic partnerships between colleges and heat manufacturers, creating a mutually beneficial arrangement where the manufacturers assist learners at college and the manufacturers gain exposure for their products.

RECOMMENDATION 5	SUB-RECOMMENDATIONS
Leverage both national and local skills development programmes to upskill the existing network of gas engineers and insulation providers.	Conduct a lesson's learned assessment of the existing New Anglia Green Skills Bootcamp to inform future iterations of targeted solid wall insulation and heat pump boot camps. Apply for additional national skills funding to set up dedicated Heat Pumps and Solid Wall Insulation Skills Bootcamps to increase the installer base in the short term. Ringfence a portion of Norfolk's and Suffolk's Adult Education Budget to retrain existing gas and off-gas installers in ground and air source heat pumps via shorter, specialised courses. Ringfence a portion of Norfolk and Suffolk's Adult Education Budget to rapidly upskill existing insulation businesses to install solid wall insulation, via shorter, specialised courses. Provide targeted support for sole traders who tend not to benefit from apprenticeships and face costs for training.

Economic analysis shows the urgent need to increase uptake in solid wall insulation, air source heat pumps and ground source heat pumps across Norfolk and Suffolk. While the low carbon heating installation rates for both Councils are higher than the national average, the ramp up in associated installers is still significant. For solid wall insulation, the number of full-time equivalent installers rises from a baseline of 84 in 2023 to 3,485 at its peak demand for labour. For heat pumps, the combined number of full-time equivalent engineers and electricians rises from a baseline of 270 in 2023 to around 4,774 during peak demand for labour. Upskilling the local workforce is therefore another pillar of reaching the net zero ambition in buildings.

As Norfolk and Suffolk begin taking control over the Adult Education Budget in April 2025, ringfencing a portion of that to provide low carbon heating and insulation training for existing installers should be made a priority. Introducing shorter and bespoke OFQUAL approved courses tailored to upskilling gas and off-gas providers, was cited as a key enabler by respondents. A range of low carbon heating courses provided by institutions like LCL Awards and EAL Awards are currently offered. These are much shorter than traditional apprenticeship routes and are less of a financial burden and risk for SMEs to enrol their employees on. Any

courses offered should be cognisant of national legislation around technical competency likely to be enforced by this time. For example, it's widely expected that mandatory technical competencies will be enforced at some point in 2024. This will likely require installers to have undertaken an OFQUAL approved course and attained a minimum of Level 3 qualification to install low carbon heating systems and energy efficiency measures. Norfolk and Suffolk should ensure any training provided via the Adult Education Budget adheres to national standards to adequately prepare the local workforce.

As Norfolk and Suffolk potentially take control over the Adult Education budget by 2025, measures enacted as part of that programme form part of the medium-term plan. Therefore, there is an immediate need to act in the next 1-2 years to invigorate efforts in retraining. One route is to use existing national funding mechanisms Norfolk and Suffolk to develop specialised Heat Pump and Solid Wall Insulation Skills Boot Camps. Other colleges are currently running these bootcamps via funding from the National Skills Fund (see case study). Given many households in Norfolk and Suffolk have a high proportion of off-gas properties, targeting the installers who are most active in installing oil or biomass heating systems could drive up demand and get the installer base ready for the expected 2026 national target of a "heat pump first" approach to off-gas homes.

CASE STUDY: HEAT PUMP AND INSULATION SKILLS BOOT CAMPS

As part of the National Skills Fund, some local colleges opted to run targeted heat pump and insulation boot camps. These were 3–4-week short courses aimed at upskilling the existing workforce or those currently unemployed. Eastleigh and running a short course until March 2023 in heat pumps and Coventry College are running a Skills Bootcamp for External Wall Insulation. The bootcamps are fully funded for unemployed individuals, those that are self-employed or those not being co-funded by their employers. 90% funding is available for SMEs and 70% funding is available for other businesses.

Encouragingly, skills bootcamps are already being run by the New Anglia LEP in partnership with Norfolk and Suffolk Council as part of the National Skills Fund. Green skills made up one of the four focus areas of skills development for the bootcamps, with domestic retrofit a sub-section of wider green skills. As a separate action, Norfolk and Suffolk Council should assess the success of the domestic retrofit element of the Skills Bootcamp and feed it into the formation of any Heat Pump and Solid Wall Insulation specific programme. Finally, many heating installers tend to be sole traders who find it difficult to dedicate time to retrain. Supporting these specific businesses via targeted training vouchers or subsidised courses could help aid that transition further.

RECOMMENDATION 6	COUNCIL ACTIONS
Incentivise specialist training providers to expand their course provision through closer ties with industry to increase trainee throughput.	Norfolk and Suffolk Council should facilitate and target national heat pump manufacturers to work in partnership with local training providers to accelerate installer training.
	Create a local Norfolk and Suffolk "pitch deck" to attract heat pump manufacturers to install show room and smaller training / upskilling facilities.
	Engage with local insulation manufacturers about providing training in partnership with local training providers to accelerate the adoption of solid wall insulation.

Colleges and universities are an established part the skills system, but specialist training providers are also an important part of the solution. While only a few training providers were identified during the desk research, there could be an opportunity to increase the reach and scale of their activities via closer industry collaboration. In response to the urgent need to train heat pump installers, national manufacturers are striking partnership with specialist training providers across the country. In nearby Clacton-on Sea, Essex, Daikin, EDF and CB Heating jointly opened a training centre aiming at training 4,000 heat pump installers every year. Norfolk and Suffolk could facilitate this process by providing networking opportunities between the local training providers (including colleges).

Other routes could be encouraging heat pump manufacturers to set up show rooms and smaller adjacent training centres themselves. An example of this is Stiebel Eltron which has installed a joint training and show room facility in the Wirral, capable of providing training to new and existing heat pump installers. Suffolk and Norfolk should leverage the region's large off-gas housing stock and higher than average low carbon heating installations to demonstrate to manufacturers the regions suitability for earlier heat pump adoption.

Another business model found during the desk research were insulation material providers also offering bespoke training for solid wall and other insulation types (see case study right). Local manufacturers of insulation, such as Suffolk based Celotex and Bauder, could expand into providing training for insulation. This would not only increase the local installer base, benefiting the region, but would likely stimulate demand for their insulation products. In fact, Bauder already operate two training centres in Suffolk for their roof insulation products so could pivot into solid wall insulation given the massive need in the region.

CASE STUDY: PROVISIONAL SEALS PROVIDING SOLID WALL INSULATION TRAINING

Provincial Seals are a manufacturer and distributor of insulation materials across the UK. Noticing the need to rapidly train installers of solid wall insulation, they created a range of courses designed at upskilling the local workforce. Provincial Seals now work in partnership with the Northeast Growth Hub to deliver solid wall insulation training.

RECOMMENDATION 7	SUB-RECOMMENDATIONS
Facilitate knowledge sharing between local authorities, the installer base and training providers to share best practice and minimise duplication of effort	Norfolk and Suffolk Council should convene a quarterly "Energy Efficiency and Low Carbon Heating Skills" action group for the region.

A consistent theme from the Norfolk and Suffolk stakeholder engagement activity was the need for closer collaboration between organisations involved in training provision. In the surveys, local authority respondents consistently expressed the need for Norfolk and Suffolk Councils to play a co-ordinating role in energy efficiency and low carbon heating skills development. As mentioned above, one respondent imminently running retrofit and low carbon heating courses raised the need for a mechanism to enable regions to pool knowledge and experience on course development to avoid duplication and speed up training.

To address these concerns, Norfolk and Suffolk Council could convene a quarterly "Energy Efficiency and Low Carbon Heating Skills" action group for the region. The aim would be to bring together installers, manufacturers, training providers and local authorities to share best practices. This enables installers to communicate their evolving training needs, training providers to share best practices amongst colleagues and local government to be responsive to the community's needs. Norfolk and Suffolk Councils could also communicate priorities in terms of training needs, location priorities and course types as well as

communicating national policy changes around technical competencies. This group could also lead in delivering the energy efficiency and low carbon heating course implementation guide outlined in Recommendation 1. A similar approach was taken by Green Suffolk in creating the Net Zero Carbon Toolkit[57] to inform construction and retrofit professionals.

CASE STUDY: GREEN SUFFOLK'S NET ZERO CARBON TOOLKIT

In partnership with local authorities, Green Suffolk launched the net zero carbon toolkit. The toolkit provided a detailed guide for construction and retrofit professionals when approaching new build housing construction and retrofit. The guide is split into three sections, giving detailed advice and guidance on constructing new builds, undertaking retrofit activities and an understanding of the various products available. This acts as a solid starting guide and common blueprint for educating professionals in adjacent sectors who may want to pivot into providing these services.

MAKING TRAINING AND CERTIFICATION ATTRACTIVE

Building the relevant training institutes with the right courses is a necessary first step. However, making the local training and certification attractive to colleges, students and installers was also raised as a separate issue. A major barrier cited across industry nationally is the high cost of training to businesses, both in terms of the opportunity cost of allocating the time and up-front cost of training courses[58]. This was reflected locally across Norfolk and Suffolk, especially in terms of finance options. Other barriers include knowing what training courses were available and suitable, alongside the issues with gaining certification as low carbon and energy efficiency installer. Norfolk and Suffolk Council can act as a facilitator in this respect with some tangible actions for the short and medium term to alleviate these issues.

RECOMMENDATION 8	SUB-RECOMMENDATIONS
Actively promote relevant training courses to local installers to reduce the search cost burden and tackle perceived risks in engaging in training.	Provide targeted support to sole traders and small businesses via training vouchers to support upskilling, focusing first on companies servicing the off-gas areas Facilitate the transfer of apprenticeship levy between large heat pump and insulation manufacturers with local installers to drive up training

[57] https://www.greensuffolk.org/net-zero-carbon-toolkit-housing/
[58] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1130626/heating-and-cooling-installer-study-hacis-main-report.pdf

There is considerable appetite from the existing installer base to be trained in heat pump installations. A national survey of heating and cooling installers conducted by BEIS found that 69% would like to have some form of heat pump training but cited affordability and understanding course suitability as key barriers. The local installer base also reiterated the desire to train in heat pumps in the surveys and interviews. Similar challenges were also highlighted on the availability and affordability of training, with mixed responses on the appetite to learn new skills from their workers.

Another challenge is that many local installers are either micro-businesses or sole traders who aren't aware or have the time to actively search out training courses. Moreover, sole traders are not eligible for the Apprenticeship Levy, and need to cover training costs themselves. Measures such as heat pumps and solid wall insulation typically require twice as many labour hours than existing gas systems. Therefore some businesses (including sole traders) will likely need to expand to maintain their revenue. Supporting sole traders and helping them navigate the transition to low carbon heating systems will be crucial in ensuring buildings are decarbonised in time. Rolling out a localised version of the Heat Pump Installer Training and Support Scheme that targets sole traders who would like to install heat pumps or solid wall insulation is one mechanism to increase the installer base (see case study). Given Norfolk and Suffolk's high proportion of off-gas properties, these could be initially targeted at companies installing oil and LPG heating systems, given the national government's focus on transitioning off-gas properties quickly. National schemes like this are being run by OFTEC, offering significantly discounts on heat pump training for installers[59]. Extending schemes like this to beyond March 2023 would be needed to transition the off-gas installer base quickly. Increasing the awareness of apprenticeships and the Apprenticeship Levy to micro and small businesses should be encouraged, as the scheme can provide 95% of the training cost with the remaining 5% paid for by the company. There's also a role for encouraging large manufacturers of insulation and heat pumps to transfer some of their apprenticeship levy to the Norfolk and Suffolk installer base.

CASE STUDY: HEAT PUMP INSTALLER TRAINING AND SUPPORT SCHEME

To help support installers in related trades into this growth area of Building Services, the Heat Pump Installer Training and Support Scheme (HITSS), funded by the Department for Business, Energy & Industrial Strategy's (BEIS), offers up to 70% off the cost of associated training. Managed by GTEC, the scheme is designed to support installers overcome barriers associated with joining the renewables sector. Courses range from air and ground source heat pump installation to energy efficiency training.

[59] https://www.oftec.org/news-blog/2023/01/10/oftec-launches-discounted-heat-pump-training-following-9-2m-beis-funding

RECOMMENDATION 9	SUB-RECOMMENDATIONS
Encourage local installers to be accredited in order to gain work via local and national funding mechanisms.	Raise awareness of the benefits of being a certified trainer to the local installer base, forging a relationship with relevant accreditation bodies to guide local installers through the process
	Require retrofit work that's funded by Norfolk and Suffolk Council to only carried out by certified installers.

Much of the retrofit work being carried out nationally (and locally in Norfolk and Suffolk) is via national funding schemes such as ECO, the Boiler Upgrade Scheme and the Social Housing Decarbonisation Fund. All work carried out by government funding mechanisms require installers to be properly certified to ensure a high standard. This approach is also being followed in the private sector, with lenders such as Barclays also requiring certification to qualify for discounts for all retrofit measures. Industry respondents in the surveys and interviews underscored the importance of standards and accreditation, especially as the industry is built on trust and word of mouth. Given a high proportion of existing demand is being incentivised through government funding mechanisms, not being accredited locks installers out of potential work, and impedes local businesses forging persistent and on-going relationships with councils and housing associations. Norfolk and Suffolk Council should raise awareness of the importance of accreditation via holding regular retrofit events, highlighting the success of accreditation in creating demand for local installers. Norfolk and Suffolk should also forge closer relationships with accreditation bodies, holding regularly joint surgeries co-hosted by the certification organisation. These would provide a forum for local installers to ask questions and share concerns over the process.

In addition, we recommend Norfolk and Suffolk highlight potential changes in national legislation. For example, it is expected that the Mandatory Technical Competencies will be enforced at some point in 2024. It is anticipated that a minimum of Level 3 qualification will be required to carry out the installation of low carbon heating and retrofit activities. Finally, as Norfolk and Suffolk Council get more autonomy over local spending priorities, they should maintain the national precedent that any work funded by the council can only be carried out by an accredited installer.

RECOMMENDATION 10	SUB-RECOMMENDATIONS
Incentivise innovative models of training either through hybrid online courses, shorter and part time courses or training provision via trade associations.	Encourage the introduction of short courses specifically focused at upskilling the local workforce. Work with colleges and other training providers to accelerate the use of AI and online learning to maximise the use of face-to-face learning Explore more business led models of training provision either through a relevant trade association or local industry body

Despite existing training providers being integral to upskilling the existing workforce and training new installers, innovative models of training will be needed. New ways of teaching not only enable Suffolk and Norfolk to ramp up training but can encourage training options that are more suited to the existing installer base. Through the stakeholder engagement process various suggestions were offered to improve training provision.

A common theme was the need for more short courses. Apprenticeships were viewed positively but were often too long and not the most effective tool for upskilling professionals closer to retirement or those with experience in the heating industry. Over the last year, initiatives like skills bootcamps and shorter OFTEC courses have begun emerging which address this issue. Although some respondents raised concerns around the visibility of these courses to employers, confusion around which course to enrol on and if installers have the time to dedicate 1 day a week for 4-5 weeks.

Another mechanism to encourage training is promoting the use of hybrid online courses. One interviewee from a local college highlighted the importance of e-learning and exploring new AI aided tools to help deliver courses. While this was deemed a longer term development, the college felt it could reduce pressure on them to find suitably trained staff while also assisting in getting more students trained in the relevant courses.

An interesting business model that emerged from reviewing the skills practices of industrial clusters is delivering training via a trade associations and member organisations. These are dedicated forums where industry leaders often meet regularly and discuss issues. Skills and training are often big concerns across industry, with local colleges either unable to justify putting on the courses due to lack of demand or not providing flexible enough training. Trade associations through a combination of member contributions and government funding can deliver apprenticeship or short course training. It also gives learners greater access

to those in industry as members have a vested interest and concrete link to the apprenticeships as they are bespoke to the industry need. An example of this business model is CATCH, a trade association representing businesses in the Humber area. They provide several engineering, process and operational technician apprenticeships and short courses which service their local oil and gas, chemical and renewable energy industries. CATCH also provide a direct line of sight to employers for their apprenticeships raising the likelihood of future employment. Supporting local trade associations in Norfolk and Suffolk could be one route to create a diversity of training routes.

CONCLUDING REMARKS

Gemserv have conducted a thorough analysis of the housing stock within Norfolk and Suffolk and identified a significant deployment effort is needed to reach net zero by 2030. Both Norfolk and Suffolk have low carbon heating installations above the national average which is a solid basis to build from. However, ensuring enough solid wall insulation, air source and ground heat pumps are installed pose the greatest challenge. This is due to the sheer number of installations required for air source heat pumps and the labour intensity inherent in ground source heat pump and solid wall installations.

It's also clear that the steep nature of installations required to meet the 2030 target requires in a level of skills drop off after the late 2020s. This suggests that retrofit businesses in the future will need to provide a diverse range of services from insulation, low carbon heating and other wrap around services to avoid the inevitable drop off in requirement post 2030. This is especially the case for insulation installers where skills requirement drops off rapidly. Low carbon heating installations will still require a network of maintenance, repairs, and reinstallation services but at a considerably lower level than the peak installation years.

Local training provision in this area is relatively nascent, with a few training providers running courses but more provision urgently needed to achieve the installation targets. Moreover, local colleges could introduce more heat pump and energy efficiency specific courses to train specific installers of measures. There's also room for more innovative models of local training provision, leveraging the use of shorter courses and encouraging the private sector to set up dedicated training facilities in the area. However, ensuring these courses are OFQUAL certified and are incentivised correctly to the local installer base is key to overcoming some installer apprehension over training. There is also targeted work local councils can do to promote the benefits of being MCS / PAS certified. This can enable the local installer base to leverage the early demand seeded by national retrofit programmes.

Finally, the recommendations set out in this report can't all be led by the Norfolk and Suffolk Council – it requires forging partnerships with multiple stakeholders. Some recommendations concerning the adult education budget, prioritising the social housing sector and council wide course implementation guides are areas where the council can influence directly. However, in other areas, Norfolk and Suffolk County Council can only take a more influencing and engagement role. These include actions such as encouraging innovative private finance solutions, bidding for national funding mechanisms, and incentivising the private sector to establish training centres.

This report has established the retrofit challenge for Norfolk and Suffolk is considerable. Despite this, the analysis and recommendations also provides concrete evidence on the key barriers and a set of tangible actions to help overcome those barriers.

APPENDIX 1 – RESEARCH METHODOLOGY

ECONOMIC ANALYSIS METHODOLOGY

As part of this study, multiple methods and data points were used to carry out the economic analysis. Some of the data sources drew on publicly available information, while others used a mixture of internal data and models developed by Gemserv specifically for understanding retrofit skills growth. The table below provides a high-level overview of how the major analysis pieces were conducted.

Analysis	Brief description of approach
Local EPC data summary	To account for properties without an EPC record, a stratified sample was formed to account for any selection bias caused by properties without an EPC record having different characteristics to those with an EPC record. For domestic homes, targeted EPC records were duplicated according to access to gas grid[60], floor area[61] and tenure[62]. For non-domestic properties, the sample was stratified based on total properties and access to the gas grid alone.
Off-gas grid data	Calculated using combined approach of analysis of EPC stock and external data[63].
% of solid wall insulation properties	EPC records were assessed for having solid walls using a key word search on the description of the properties walls. Where data was missing, assumptions were made using the age and type of property.
Age of housing stock	Construction age bands were aggregated according to EPC data records.
Housing stock archetype	Utilising a key word search and a range of assumptions around heating systems, the primary heating fuel was determined for each

[60] BEIS (2022) Regional and local authority gas consumption statistics
[61] BEIS (2022) National Energy Efficiency Data-Framework (NEED): consumption data tables 2021
[62] DLUHC (2022) Live tables on dwelling stock (including vacants)
[63] BEIS (2022) Regional and local authority gas consumption statistics

	EPC record. This was used to best match EPC records to archetypes according to Tabula[64], using the properties size, type, heating fuel and construction age band.
Current number of retrofit installations	For heat pumps, data on accredited installs was taken from MCS[65]. Estimates for the ratio of accredited installs to non-accredited installs were calculated by comparing the total number of EPC records with heat pump installations to those given in the MCS data. For cavity wall insulation, loft insulation and solid wall insulation installations, data was taken from regional summaries of retrofit funding schemes[66] and scaled down to each local authority by applying assumptions based on the outputs of the EPC summary analysis. For heating controls, heat networks and double glazing, it was assumed that current labour operated at the same capacity as the average of that of similar labour types. For example, for double glazing, the operating capacity of loft, cavity wall, and solid wall insulation installers was estimated and applied to double glazing installers in the region.
Baseline number of installs: retrofit vs new	Using assumptions around installation types for accredited installs, the share of heat pumps that were installed in retrofit and new properties was assessed by analysing properties with EPC records lodged due to the property being newly constructed that also had a heat pump as the primary heating system.
Baseline number of installer jobs	For the total labour in the region, employment estimates were taken from regional ONS data[67] and scaled down to the analysis area using SIC code mapping based on the labour split of different industries. Reasoned assumptions were used to scale down from the ONS category definitions to the sectors within scope. Employment estimates were then broken down into specific employment types using ONS estimates of splits by industry[68]. For example, retrofit assessors and coordinators were taken using the

[64] Tabula (2014) National building typologies
[65] MCS (2022) The MCS Data Dashboard
[66] BEIS (2022) Household energy efficiency
[67] ONS (2022) Exploring regional estimates of activity in the low carbon and renewable energy economy, UK and regions of England: 2020
[68] ONS (2022) Low carbon and renewable energy economy, UK: 2020

	professional services share of regional employment estimates for the "other energy efficiency products" category. Total employment within each sector was broken down by services offered and local authority using MCS data[69] and key word analysis/geocoding of Trustmark, NIA, and IAA data[70].
Number of measures required for net zero	For domestic properties, wall, loft, heating control and window descriptions were taken from EPC records and combined with assumptions for retrofit requirement as detailed in the main text. For non-domestic properties, a key word search of EPC recommendations data was used to analyse the need for insulation measures and heating controls. The requirements for retrofit low-carbon heating systems was taken by analysing EPC records to see whether homes had fossil fuel heating systems. Additional demand from new build properties in the region was taken from central DFES projections[71]. The potential deployment of heat network connections was also taken from DFES projections with the scenario used depending on the scenario used within our analysis[72]. Remaining demand for low carbon heating, from existing and new properties, was then split between air and ground source heat pumps according to domestic and non-domestic accredited installation splits[73].
Estimated bill savings	Energy reduction estimates were calculated using heat loss transmittance coefficients of different insulation levels off Tabula, for each housing archetype[74]. These were combined with long-term fuel prices to calculate bill savings.
Job projection assumptions (type and number)	Annual installations were split out according to scenario deployment reference curves. For insulation measures, these were then adjusted according to current labour provision (and operating capacity assumptions) and payback times of each property's

[69] MCS (2022) The MCS Data Dashboard
[70] Trustmark (2022) Advanced Search; NIA (2022) Find an installer; IAA (2022) Find your local installer
[71] UK Power Networks (2023) Distribution Future Energy Scenarios
[72] UK Power Networks (2022) Distribution Future Energy Scenarios
[73] MCS (2022) The MCS Data Dashboard

[74] Tabula (2014) National building typologies

	collective retrofit measures. The replacement cycle of low carbon heating systems was estimated using historical deployment data and assumptions around system lifetimes. Employment intensities for retrofit installations, refit installations, new build installations and maintenance were taken from a variety of sources and/or modelling assumptions and used to calculate labour requirements for each year. Productivity increases were estimated using trends in turnover to employment ratios from the ONS[75].
Transferable skills and heating industry forecasts	Using data from the Gas Safe Register[76], Oftec[77], internal survey data[78], and the SMF[79], and combining with population estimates by local authority[80] and heat pump installer employment estimates, the number of fossil fuel heating engineers per local authority was estimated. A combination of internal survey data and historic training data[81] was used to estimate the age profile of the heating industry and was combined with evidenced inputs on retirement age, attrition rate and training rates to form forecasts of the size of the heating industry to 2050. These forecasts informed inputs on the future retirement rate of the heating industry.
Local GVA impacts	Using employment estimates from the scenario projections and ONS estimates for the share of labour by industry, the number of jobs within the parts of the supply chain not included in the projections were estimated. For the manufacture of insulation, estimates were scaled down to each local authority according to an analysis of current businesses, using data from the IMA[82] and each businesses LinkedIn page. GVA intensities, collected from a range of sources, were then applied to the employment estimates as well as productivity increases from the previous stage of the analysis.

[75] ONS (2022) Low carbon and renewable energy economy, UK: 2020

[76] Gas Safe Register (2017) Decade Review
[77] Oftec (2022) Where are all the female heating engineers?
[78] Gemserv (2022) Heating system installers share their views on the opportunities and risks they face in the transition to low carbon
[79] Social Market Foundation (2022) Installation for time?
[80] ONS (2022) Population profiles for local authorities in England
[81] Ofqual (2023) Vocational and other qualifications over time
[82] Insulation Manufacturers Association (2022) Members list

STAKEHOLDER ENGAGEMENT METHODOLOGY

Stakeholder engagement was carried out in December 2022 – February 2023 and three key stakeholder groups were targeted:

- **Installer/ Industry Representatives**: industry will be key to the green transition and are crucial for the delivery of low carbon heating and energy efficiency installations.

- **Skills / Training Providers**: training providers will play a pivotal role in ensuring that existing and emerging skills gaps can be addressed.

- **Local Authority Representatives**: can offer key insight into some of the challenges and opportunities currently facing the transition within the region, from a skills and wider development perspective.

Three sets of questions were developed for the three groups identified above and separated for the local councils (Norfolk and Suffolk). Stakeholders were invited to take part in either a semi-structured interview or to complete an online survey.

Installer/Industry Representatives

Several local installers/industry representatives were interviewed and surveyed within the retrofit market, including energy efficiency and low carbon heating. These ranges from small-to-medium enterprises to large corporations, representing a range of different business capabilities and operations. The questions within the surveys and interviews focused on current and future skills demand, the challenges faced by industry and what support is needed to meet net zero targets.

Interviewees included those active within the manufacturing, energy assessment and installation spaces. A range of companies who specialise in the low carbon retrofit sector were interviewed including across energy efficiency and low carbon heating. For further detail surrounding the type and size of the industry organisations surveyed and interviewed, see the Sample Overview below.

Skills / Training Providers

Skills/training providers from both within and outside of Norfolk and Suffolk were interviewed and surveyed to understand local capabilities and additional perspectives from surrounding areas that will impact Norfolk and Suffolk in the retrofit sector. The engagement focused the existing courses available within the retrofit space, how they expect demand for courses to change, and how they are planning to adjust. The training providers surveyed generally had many students enrolled on their courses (see the Sample Overview below).

Local Authority Representatives

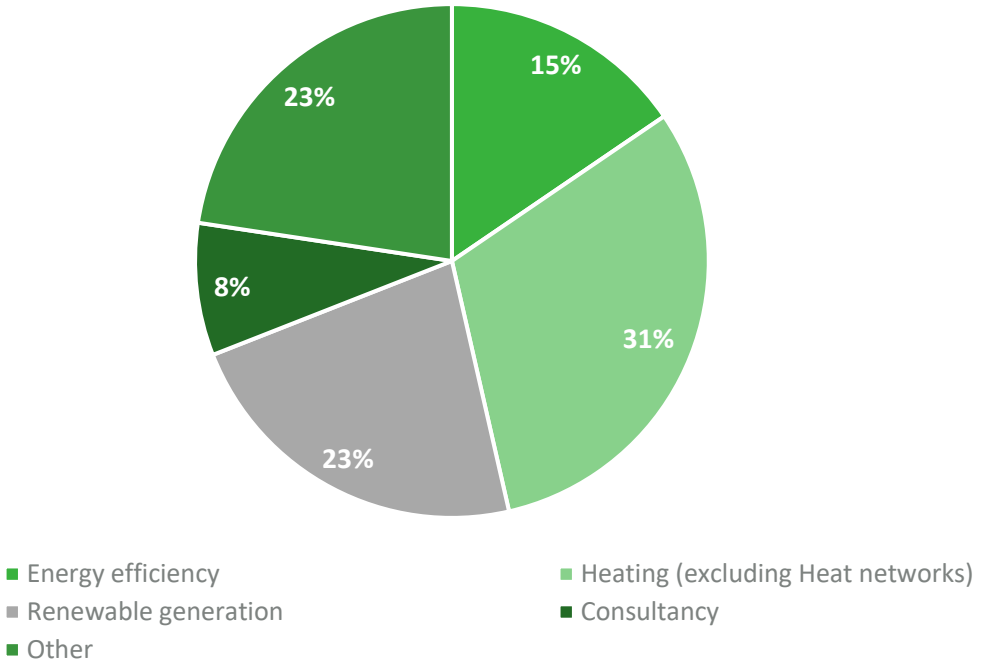
Local Authority representatives were surveyed across Norfolk and Suffolk, representing key individuals involved in the green skills and low carbon space within the regions. Questions within the survey aimed to

understand the challenges perceived by local authorities surrounding retrofit skills and the interventions needed to allow industry to meet consumer demand and local net zero targets.

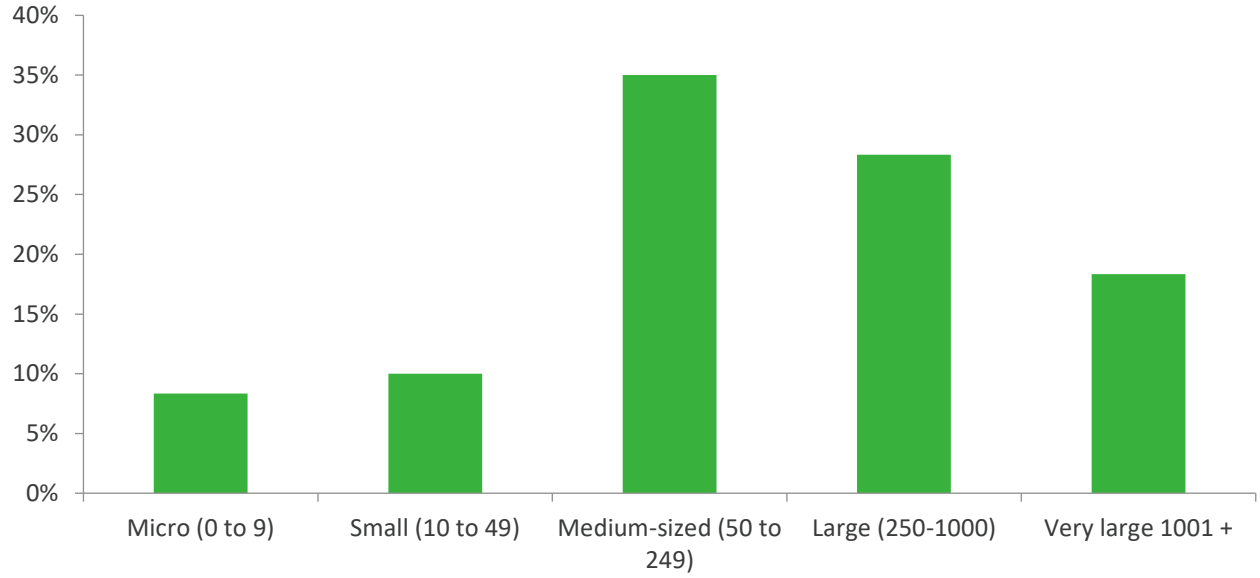
INTERVIEW AND SURVEY SAMPLE OVERVIEW

The following graphs provide information on the industry and training provider stakeholders that were interviewed and surveyed. A broad range of stakeholders were targeted to try and capture as much information as possible about the retrofit sector. In **Figure 141**, those that stated 'other' for company core business, those industries were for construction and a trade association.

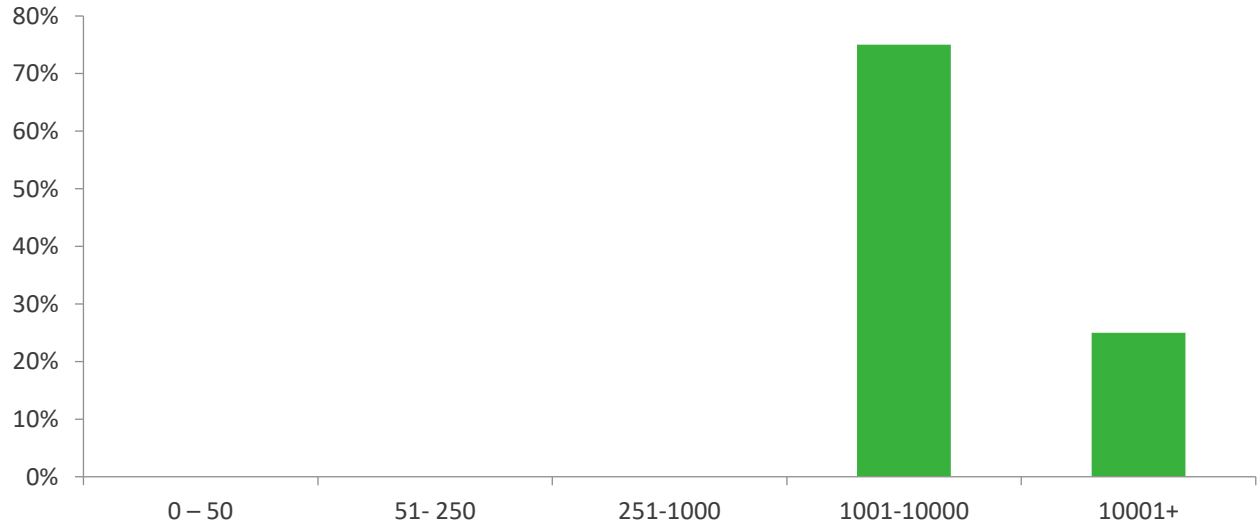
Figure 141: Sector split of companies interviewed and surveyed



SIZE OF COMPANY

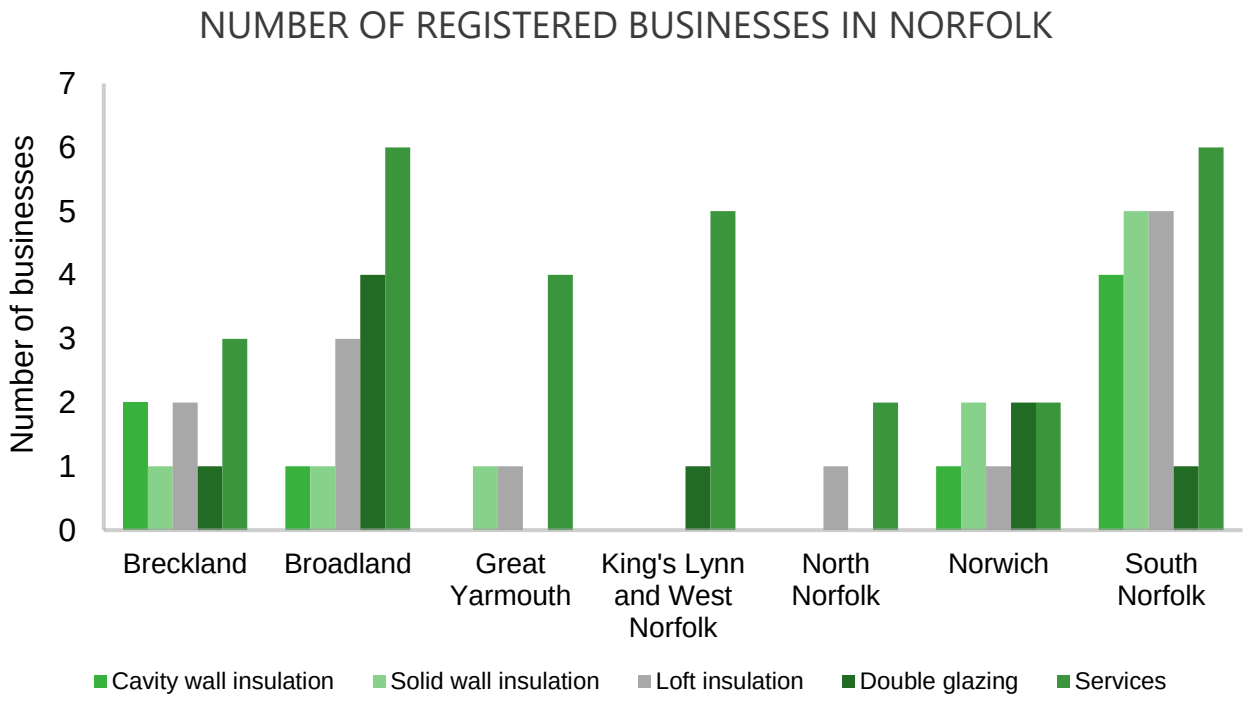


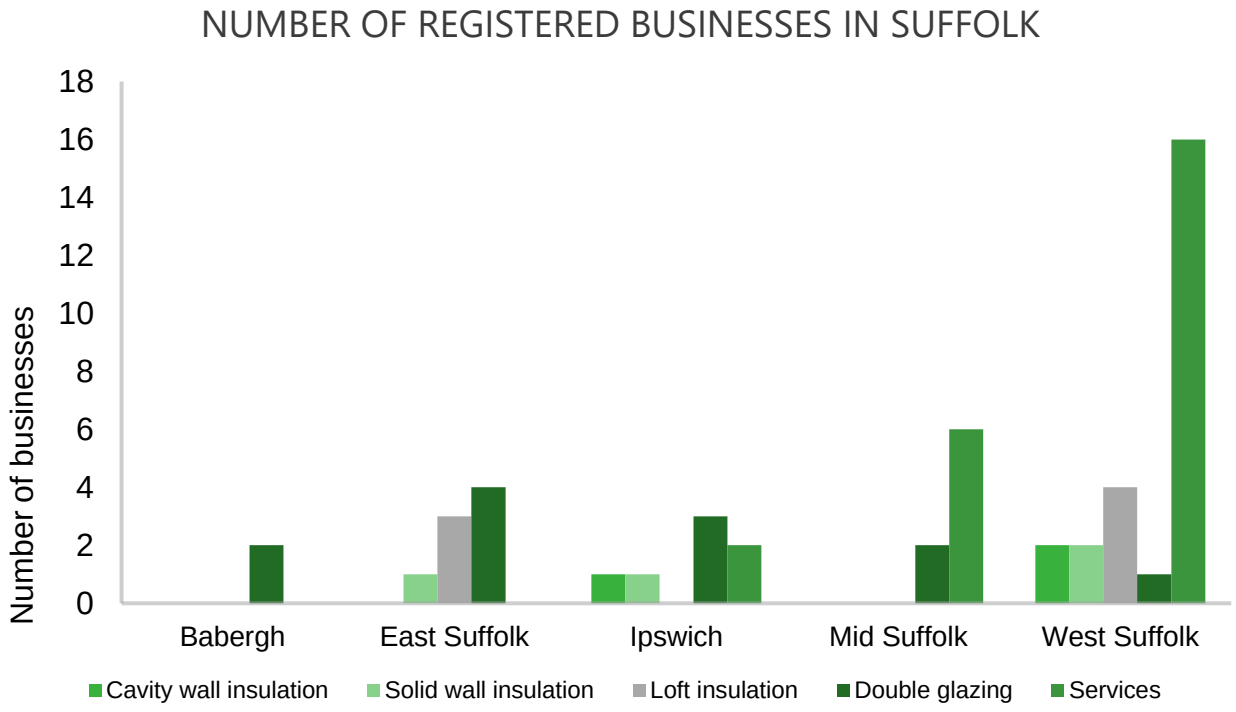
HOW MANY STUDENTS ARE ENROLLED ON COURSE IN YOUR ORGANISATION



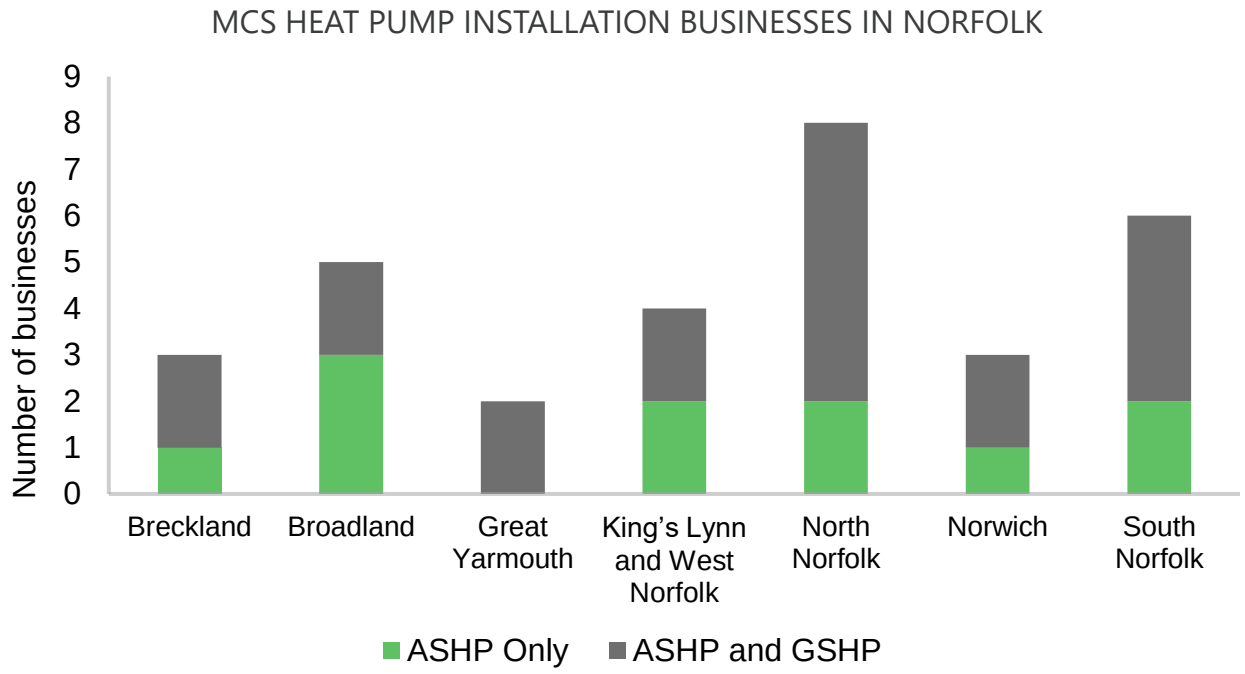
APPENDIX 2 – ADDITIONAL GRAPHS AND DATA

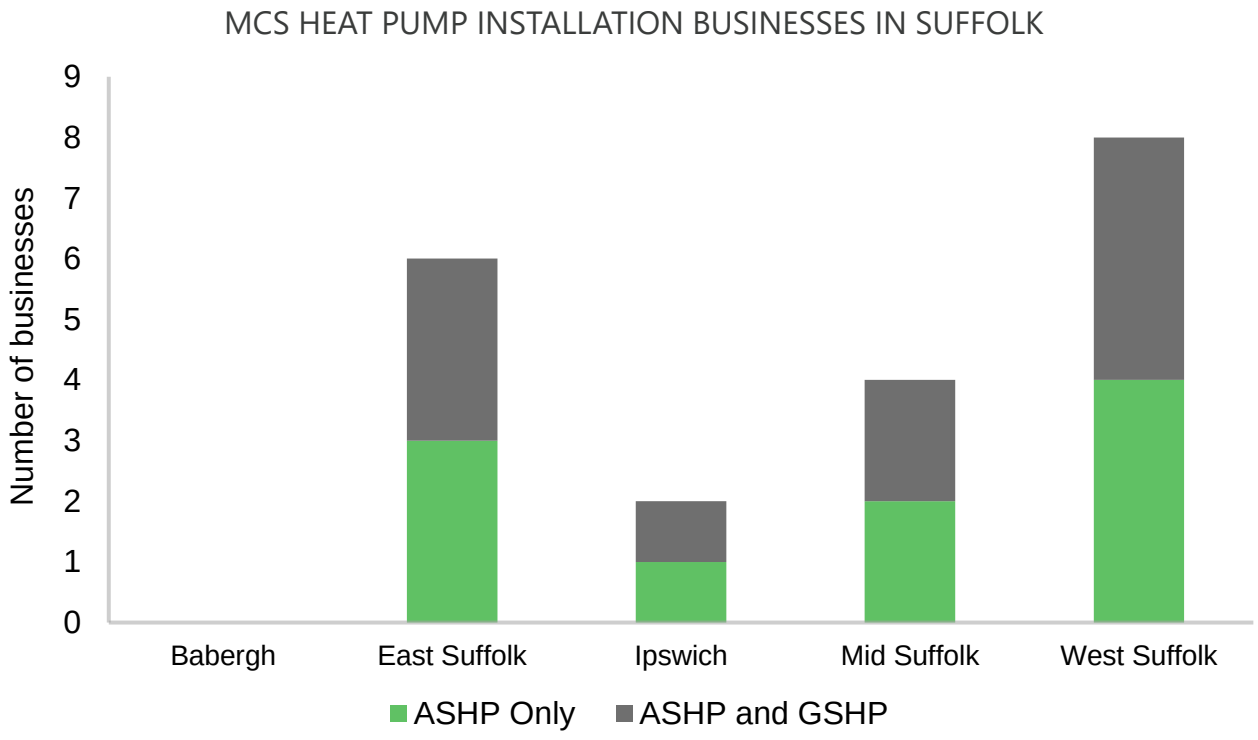
ENERGY EFFICIENCY REGISTERED BUSINESSES



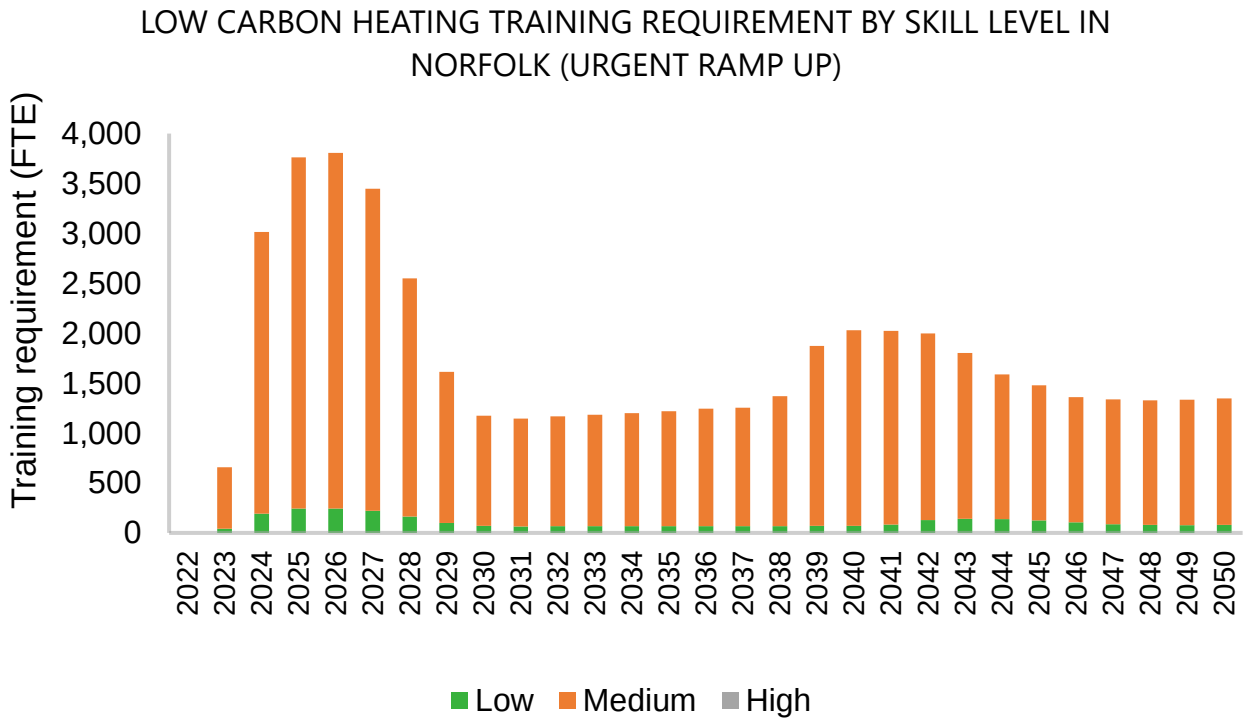


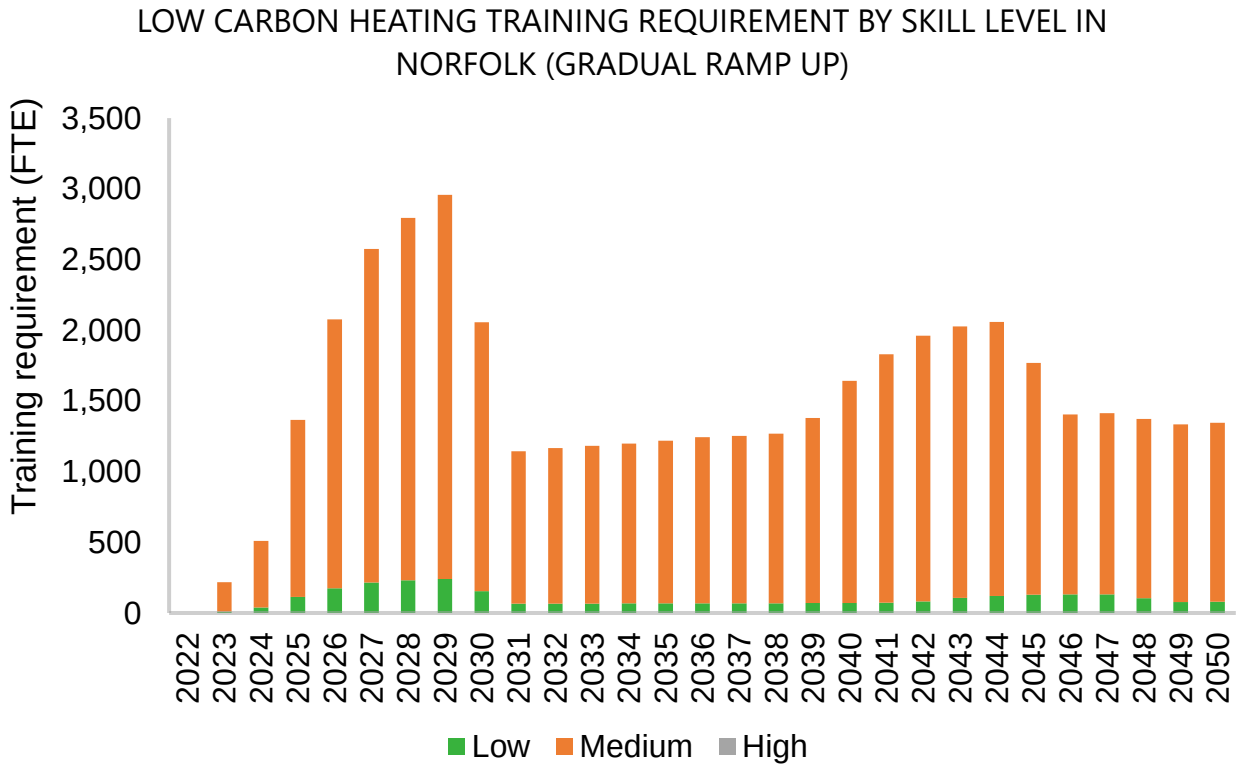
LOW CARBON HEATING REGISTERED BUSINESSES



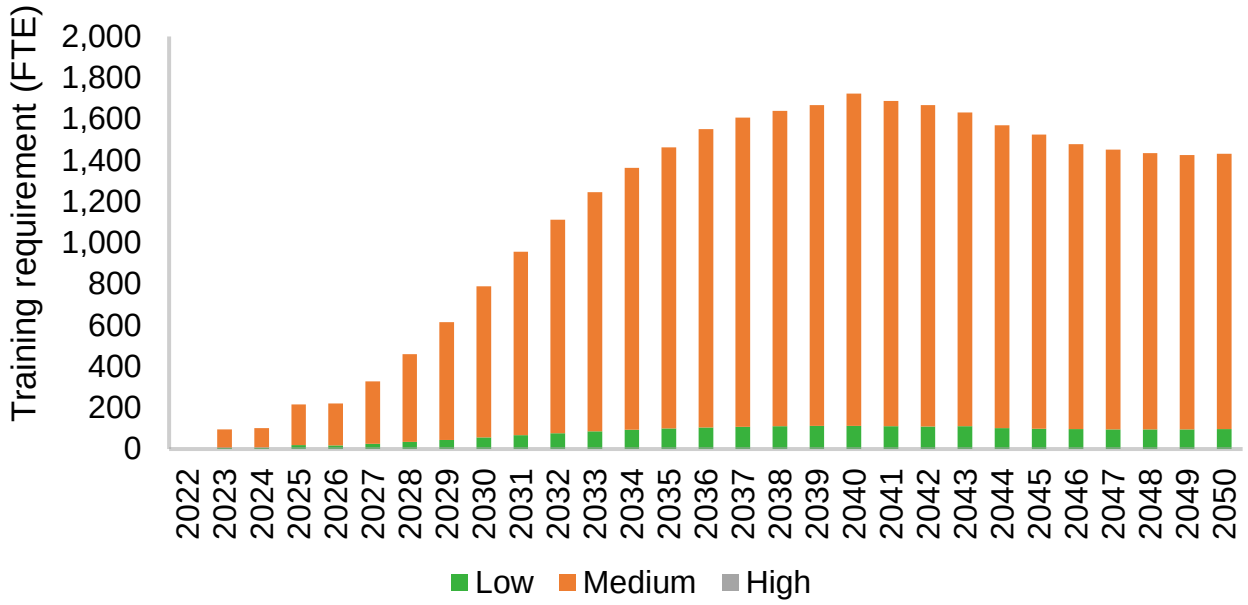


TRAINING REQUIREMENT BY SKILL LEVEL

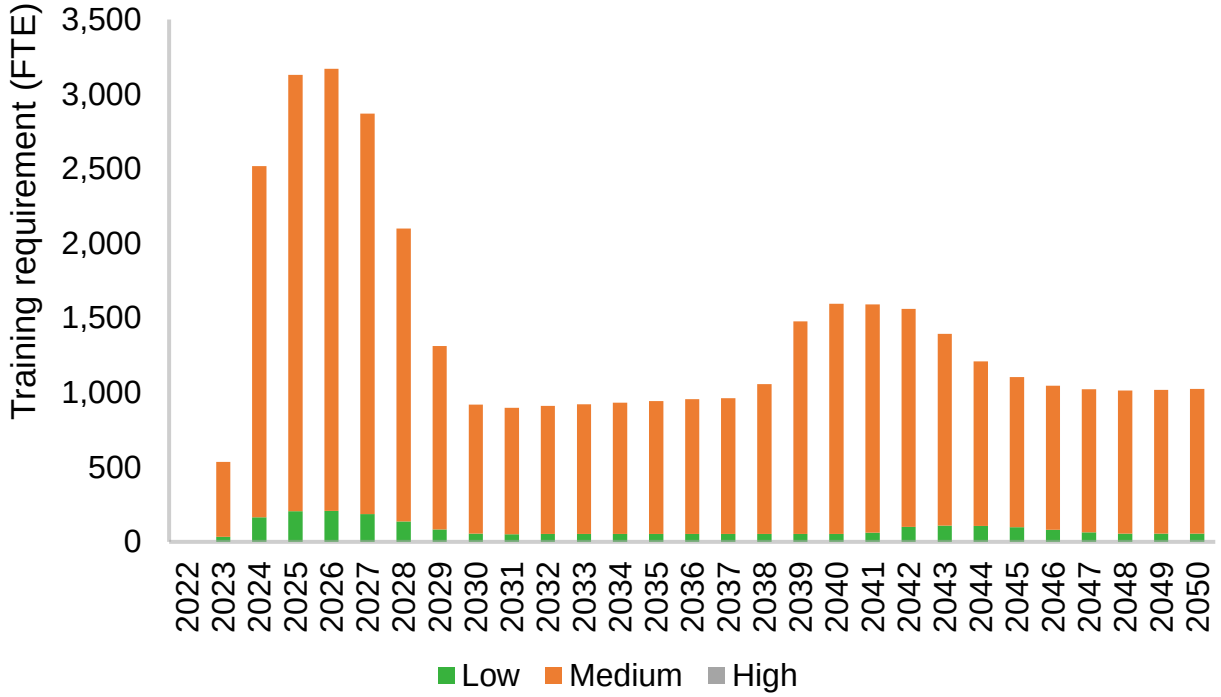




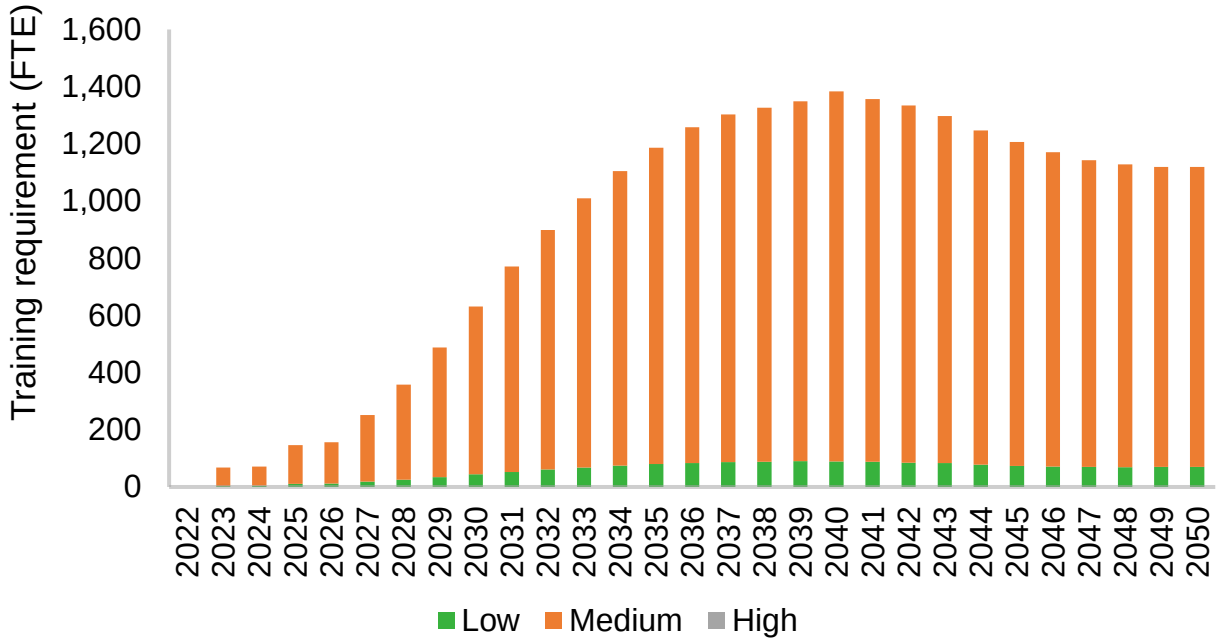
LOW CARBON HEATING TRAINING REQUIREMENT BY SKILL LEVEL IN NORFOLK (NET ZERO 2050)



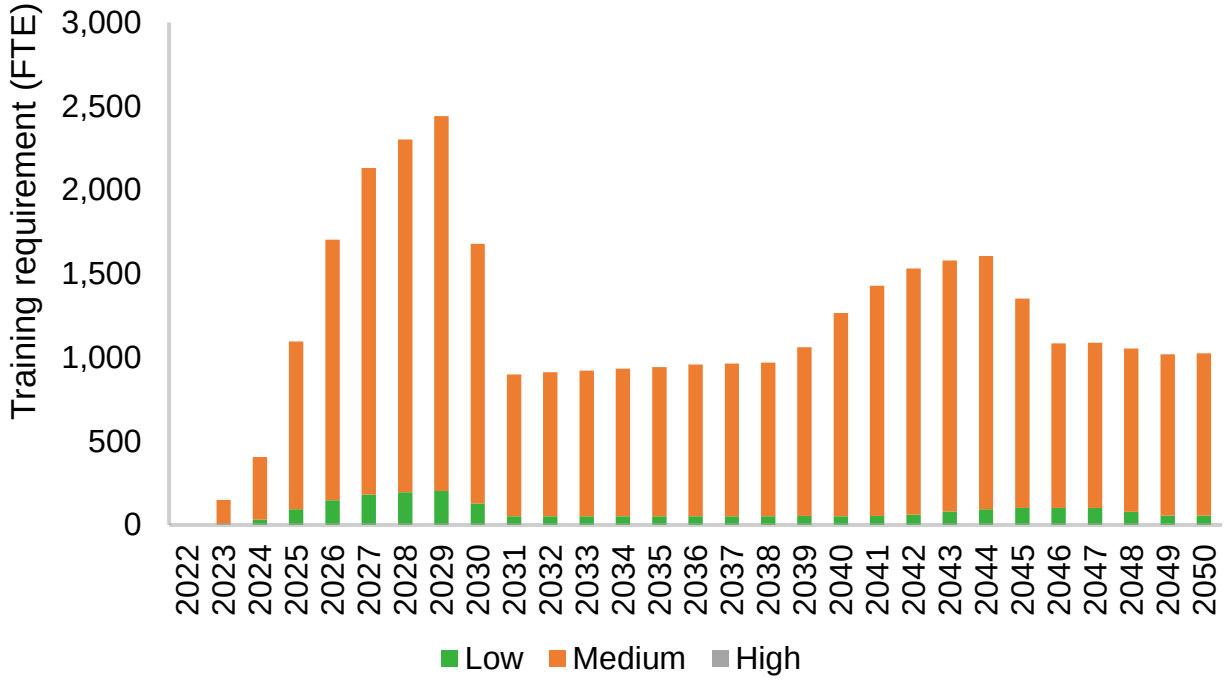
LOW CARBON HEATING TRAINING REQUIREMENT BY SKILL LEVEL IN SUFFOLK (URGENT RAMP UP)

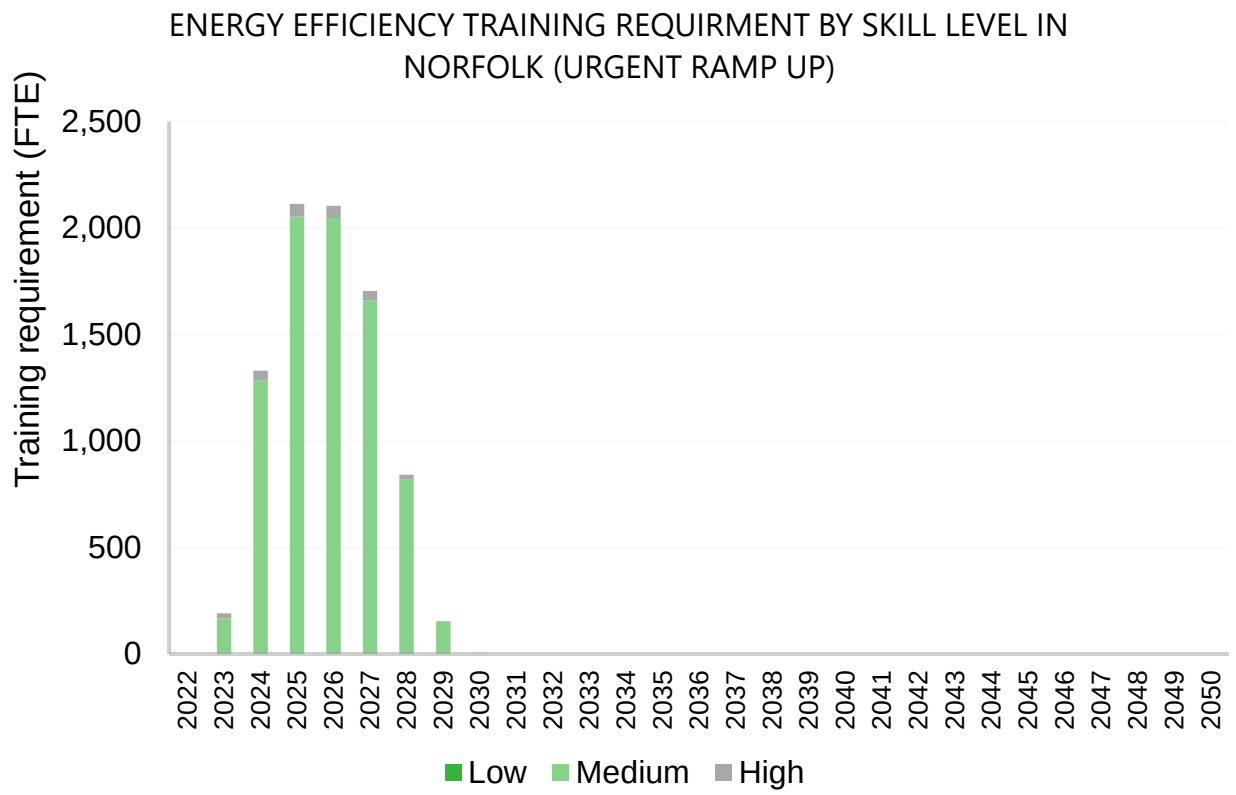


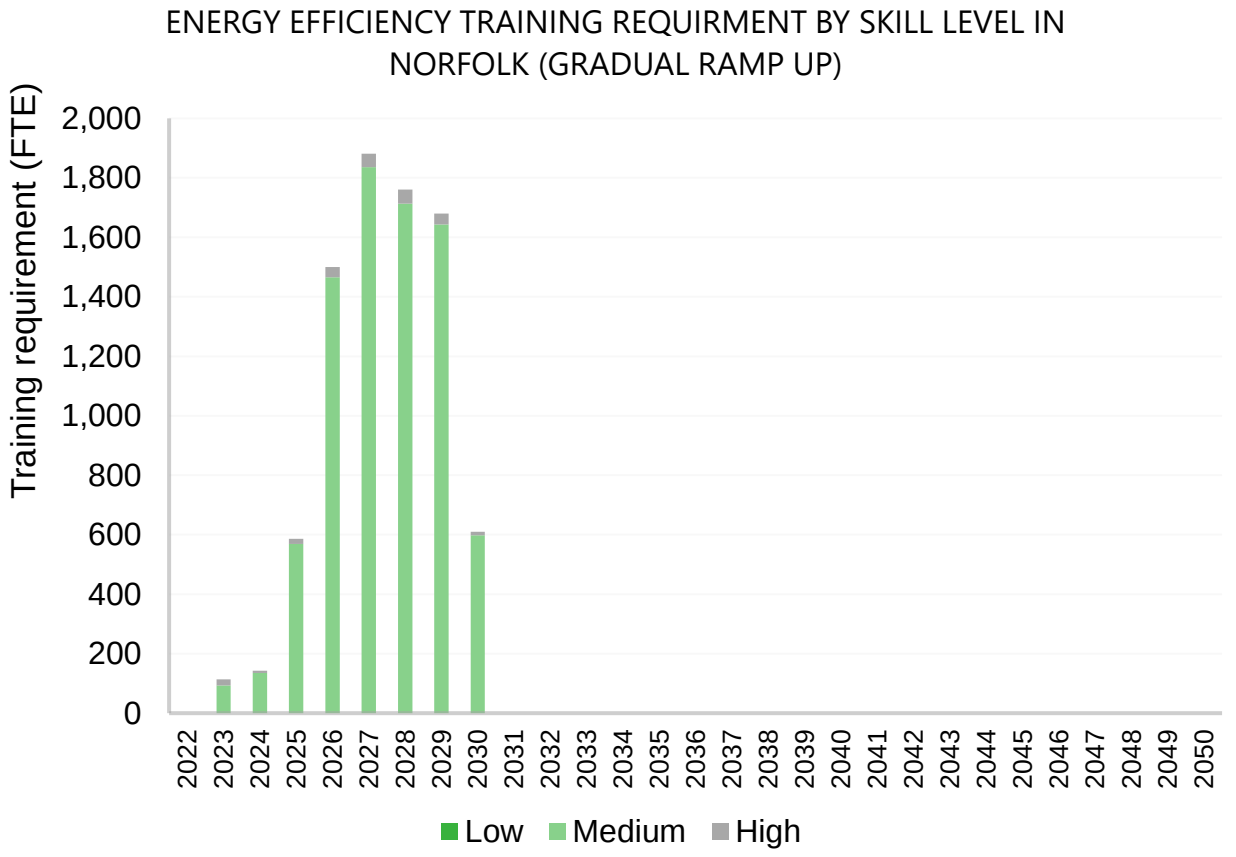
LOW CARBON HEATING TRAINING REQUIREMENT BY SKILL LEVEL IN NORFOLK (NET ZERO 2050)

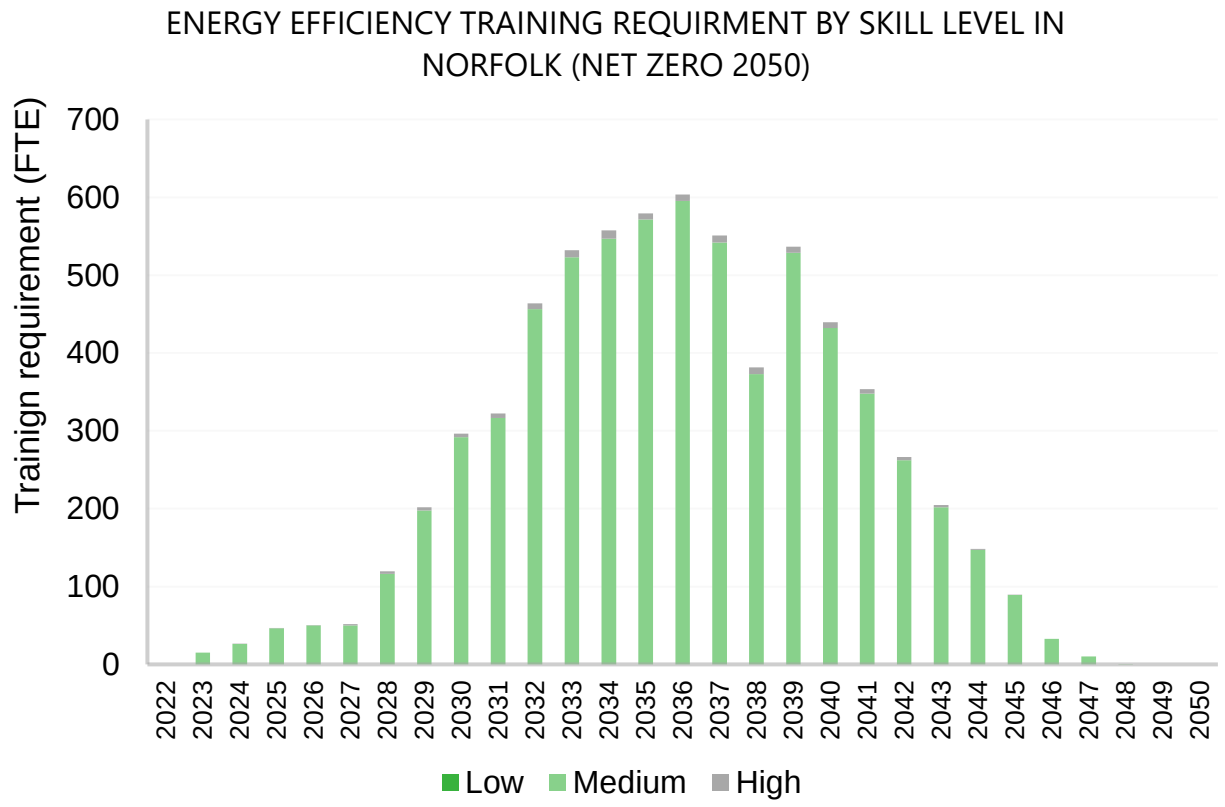


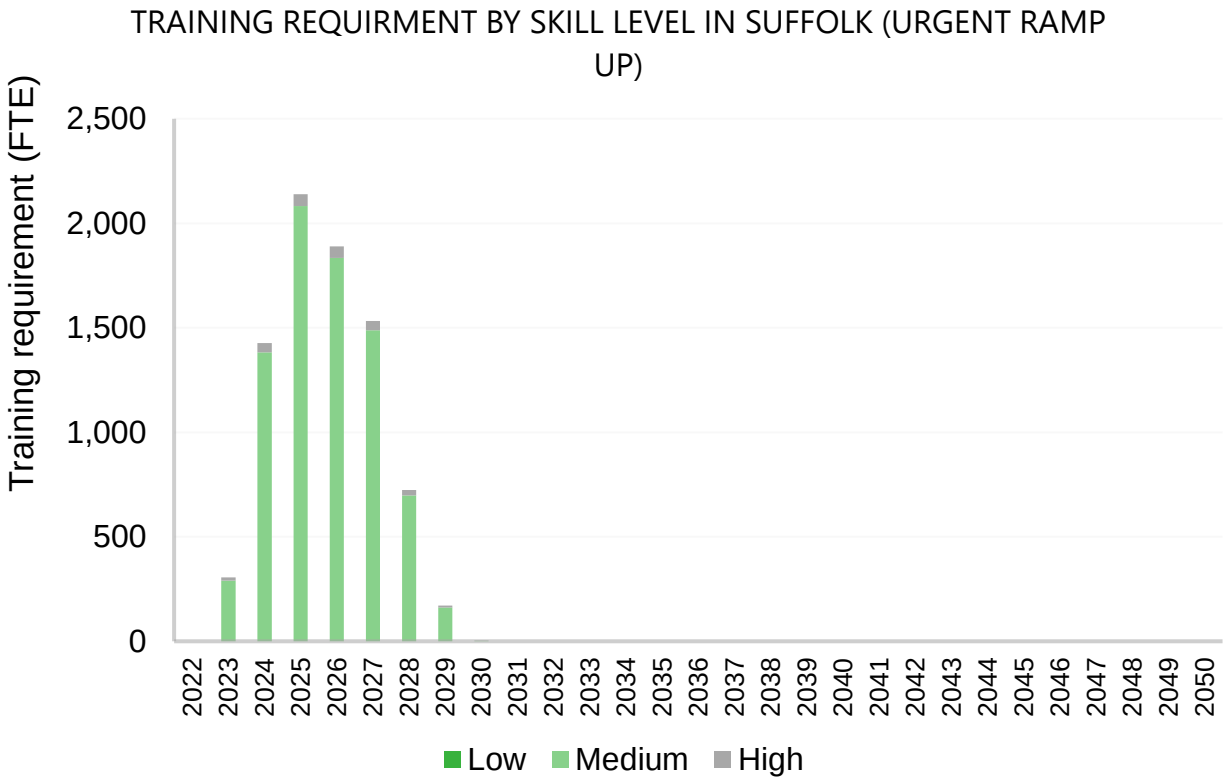
LOW CARBON HEATING TRAINING REQUIREMENT BY SKILL LEVEL IN SUFFOLK (GRADUAL RAMP UP)

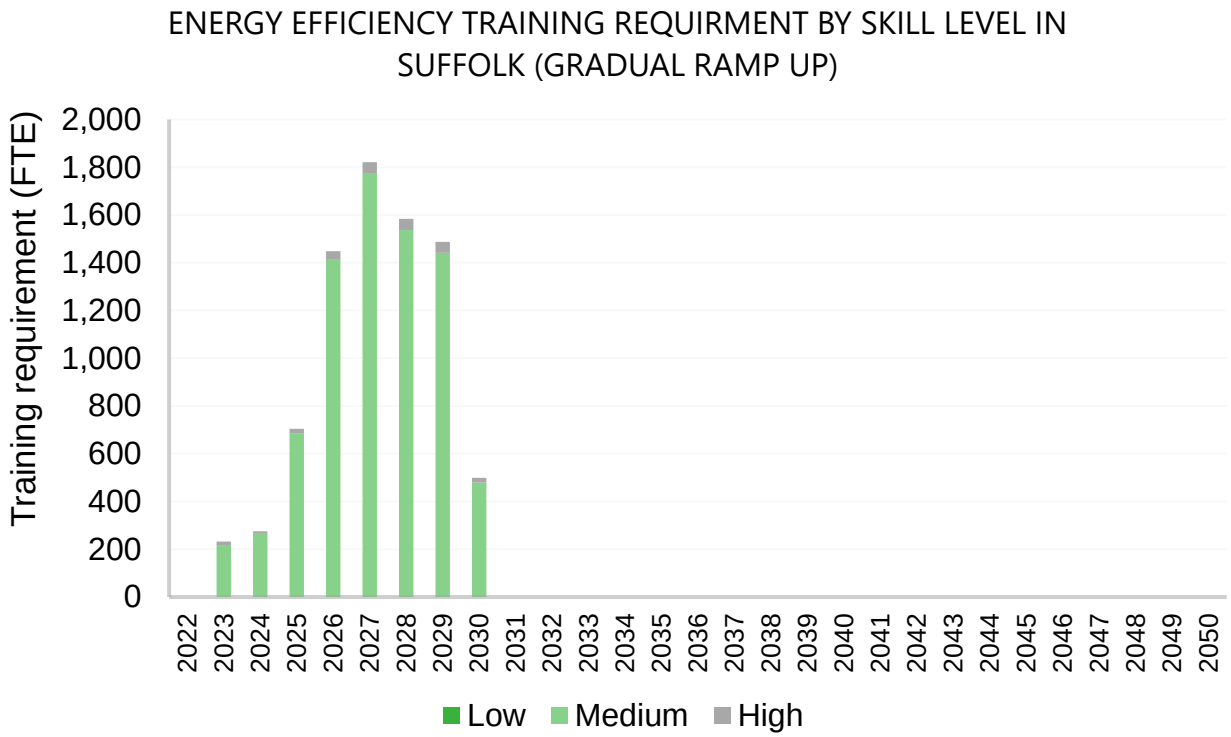


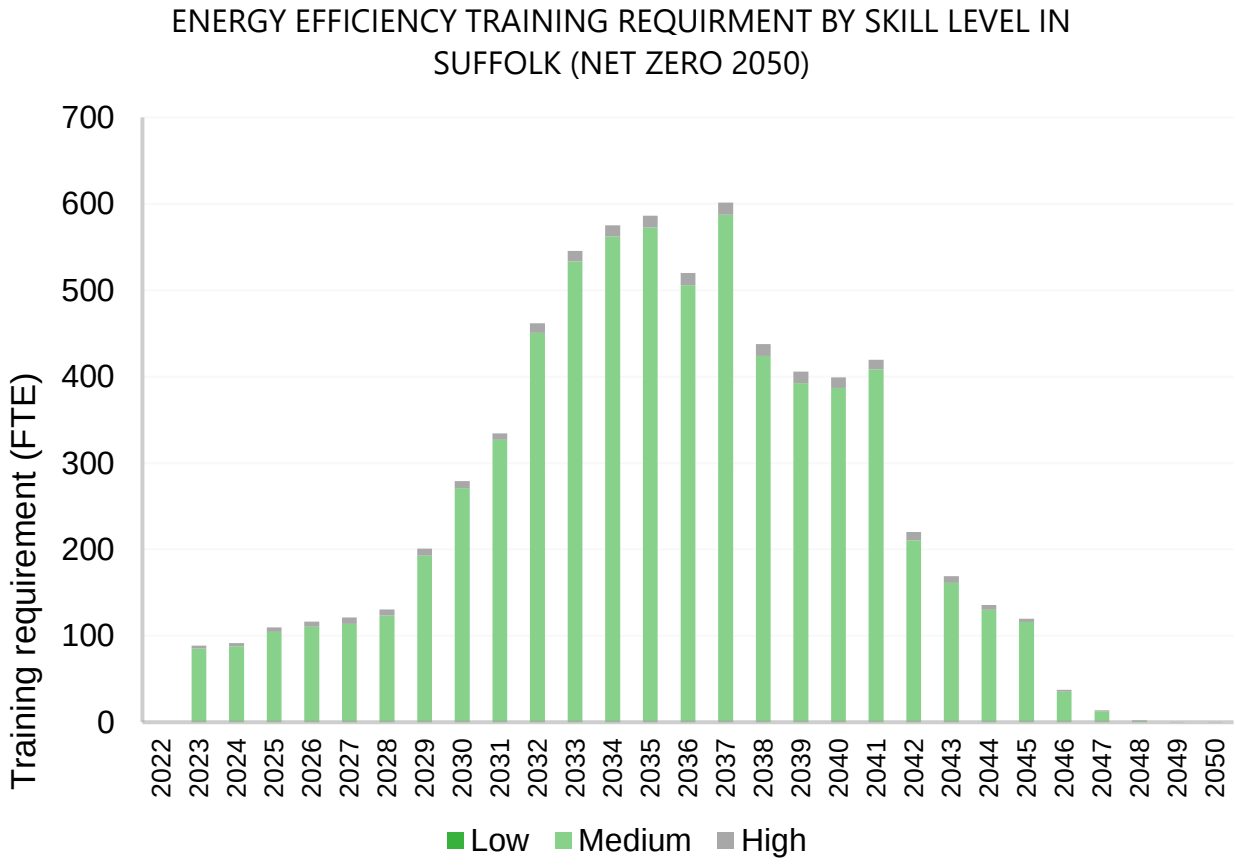

ENERGY EFFICIENCY TRAINING REQUIRMENT BY SKILL LEVEL IN NORFOLK (URGENT RAMP UP)
Training requirement (FTE)
2,500
2,000
1,500
1,000
500
0
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050
Low
Medium
High


ENERGY EFFICIENCY TRAINING REQUIRMENT BY SKILL LEVEL IN NORFOLK (GRADUAL RAMP UP)
Training requirement (FTE)
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050
Low
Medium
High


ENERGY EFFICIENCY TRAINING REQUIRMENT BY SKILL LEVEL IN NORFOLK (NET ZERO 2050)
Trainign requirement (FTE)
700
600
500
400
300
200
100
0
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050
Low
Medium
High


TRAINING REQUIRMENT BY SKILL LEVEL IN SUFFOLK (URGENT RAMP UP)
Training requirement (FTE)
2,500
2,000
1,500
1,000
500
0
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050
Low
Medium
High


ENERGY EFFICIENCY TRAINING REQUIRMENT BY SKILL LEVEL IN SUFFOLK (GRADUAL RAMP UP)
Training requirement (FTE)
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050
Low
Medium
High


ENERGY EFFICIENCY TRAINING REQUIRMENT BY SKILL LEVEL IN SUFFOLK (NET ZERO 2050)
Training requirement (FTE)
700
600
500
400
300
200
100
0
2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050
Low
Medium
High

APPENDIX 3 – RELEVANT POLICIES

LOCAL PROGRESS TOWARDS NET ZERO

Both Norfolk and Suffolk County Councils have responded to the challenges laid out by national Government, reviewing existing policies and implementing new schemes and incentives to promote progress towards Net Zero targets at all levels of the economy.

Similarly, efforts have not been restricted within county lines: Norfolk and Suffolk have joined forces on a number of Policies and initiatives, including the Norfolk and Suffolk Economic Strategy; the Economic Strategy for the East of England (2020); the New Anglia Local Industry Strategy, and New Anglia LEP Energy Recovery and Resilience plan, demonstrating combined commitment to reaching Net Zero targets and face the challenge of economic growth as posed by the UK Government.

Summaries of the Council's varying approaches and combined efforts are laid out below, with more detail on specific schemes and incentives available in the appendices.

Norfolk County Council

Whilst Norfolk County Council (NCC) is yet to declare a Climate Emergency, in October 2020, NCC published the Council's Environment Policy[83]. This policy paper reflects the areas that the Council sees as key to protecting and maintaining the health of Norfolk's distinctive environment and its occupants through effective climate action. As part of this policy NCC seeks to fully support clean air for the population, a clean and plentiful supply of water, a thriving plant and wildlife community, a reduction of risk of harm from environmental hazards such as flooding and drought, the use of natural and sustainable resources, the enhancement of beauty, heritage and engagement with the natural environment, adapting to climate change, minimising waste, managing exposure to chemicals, and enhancing biosecurity.

Furthermore, the Better-together-for-Norfolk[84] document outlines NCC's five key broader strategic aims for a sustainable future including;

1) A vibrant and sustainable economy

[83] Norfolk & Suffolk's Environmental Policy. (October, 2020).
[84] Norfolk County Council Strategy 2021 – 2025: Better-Together-For-Norfolk

2) Better opportunities for children and young people
3) Healthy fulfilling and independent lives
4) Strong and engaged inclusive communities
5) A greener, more resilient future

These aims are to be achieved by:

1) Growing the economy
2) Thriving people
3) Strong communities

NCC's Strategic Infrastructure Delivery Plan 2020 sets out the key infrastructure projects that NCC will deliver with its partners to aid in the transition to net zero including the 'Offshore Transmission Network Review' (OTNR) and additional projects that will address energy supply.[85]

Since 2018/2019, NCC has reduced carbon emissions from heating its buildings by 19%, to 2,642 tonnes of CO2 per year, reduced transport emissions from its lease cars by 65 per cent, to 825 tonnes of CO2 per year, implemented the greenways to greenspaces initiative, to meet the council's active travel and habitat diversity targets, planted more than 51,000 trees, and since 2008 NCC has converted 22,000 streetlights to LED, saving 12,500 tonnes of CO2.

NCC's strategic action plan for energy[86] is underpinned by the **'Norfolk Local Energy Asset Representation' (LEAR)**[87]. The Norfolk LEAR provides a data foundation for developing the most appropriate way to net zero providing the robust evidence base that will guide the Council and partners towards which clean energy opportunities are the most effective.

The Norfolk LEAR provides a review of building stock, energy demands, energy networks, embedded generation, domestic and public electric vehicle charging and social data and has highlighted the following opportunities across the county:

1) Decarbonising dwelling off the gas network in Great Yarmouth.

[85] Norfolk Strategic Delivery Plan: December 2021
[86] Norfolk County Council's Strategic Planning and Infrastructure – Energy: Norfolk County Council's Strategic Planning and Infrastructure
[87] Norfolk Local Energy Asset Representation. (September, 2021).

2) The off-street electric vehicle (EV) potential across Norwich and aligning charging solutions in Great Yarmouth.
3) Concentration of dwellings suitable for solar panels in South Norfolk with an example of 464 dwellings that could generate 1,705KW of energy.

NCC is also working towards carbon neutrality by 2030 by examining the following:

- Offshore wind.
- **The Contracts for Difference Scheme (CfDs).**[88]
- Nationally Significant Infrastructure Projects (NSIPS).

NCC also seeks to meet the collective global challenge by working with neighbouring Councils in the region, specifically Suffolk County Council (SCC) and the Broads Authority to collectively achieve 'net-zero' carbon emissions on its estates by 2030 and within wider areas to achieve 'carbon neutrality' also by 2030. [89]

In summary, NCC has committed investment across the green economy in areas including offshore wind, gas networks, active travel, EVs and solar renewable energy generation. The county has also benefitted from funding programmes to help decarbonise the area, with additional detail about these initiatives summarised in the appendices.

Suffolk County Council

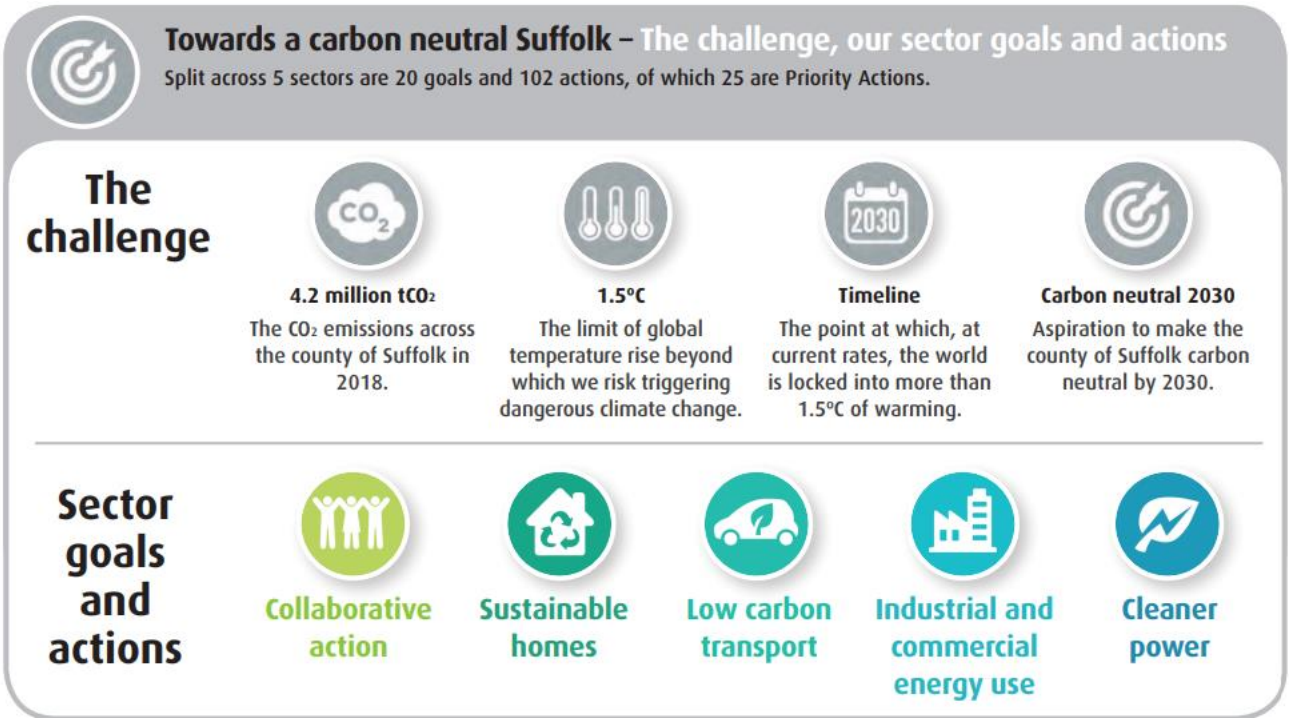
On 21 March 2019 Suffolk County Council (SCC) voted to declare a climate emergency. SCC pledged to work with Local Enterprise Partnerships (LEP), the UK Government and public sector to make the county of Suffolk carbon neutral by 2030.

SCC's Climate Emergency Plan lists the top five priority actions in each sector to help provide focus. These are:

1) Collaborative action.
2) Sustainable homes.
3) Low carbon transport.
4) Industrial and commercial energy use.

[88] Contracts for Difference (CfDs) UK Government: Contracts for Difference (CfDs)
[89] Norfolk County Council's Environmental Policy (2019). Norfolk County Council's Environment Policy

5) Cleaner power.



In addition to the Climate Declaration set out above, John Gummer MP (now Lord Deben) launched SCC's Creating the Greenest County[90] partnership in 2007. The partnership actively seeks to work with local communities and businesses to help them realise the economic benefits of reducing their energy consumption, adapt to climate change and enhance the natural environment.

Suffolk County Council's Energy and Infrastructure Policy[91] sets out how SCC sets out to achieve its net zero ambitions and the significant changes required in order to deliver the pipeline projects that the Government has approved for the region. The policy also stipulates how, in principle, the Council will engage and influence other parties to ensure adverse impacts to communities are understood and addressed by future decisions. The policy also outlines the role of project promoters and priority setting for Suffolk.

In support of the 'Cleaner Power' theme and as part of SCC's delivery role within the Eastern New Energy Project[92], SCC commissioned Energy Systems Catapult (ESC) to conduct a Local Energy Asset Representation (LEAR) to help Suffolk achieve carbon neutrality by 2030. The LEAR conducted pulled information on energy

[90] Suffolk County Council: Creating the Greenest County. Creating the Greenest County
[91] Suffolk Energy and Infrastructure Policy (December, 2021)
[92] Eastern New Energy Project - University of East London & the European Regional Development Fund

demand, generation, storage and distribution assets, social factors like fuel poverty and characteristics like building design types and local geography, using data analysis and aspects of machine learning, in order to aid planners in deciding how best to grow low carbon businesses.[93] By working with the Eastern New Energy Project, and examining the data from the LEAR, SCC gained a further understanding of the barriers that prevent rapid decarbonisation and identified interventions to accelerate the transition to a low carbon economy.

SCC have also made a wide range of grants, loans, and advice and support services available to promote activities aimed at reducing energy use and carbon emissions. The various schemes target businesses, communities, and individual homes to ensure that all aspects of the economy decarbonise. A list of these schemes, with brief descriptions, is available in the appendices.

Combined Efforts

The Councils also seek to meet the collective global challenge by working with each other and other authorities in the region, specifically the Broads Authority, to achieve 'net-zero' carbon emissions on its estates by 2030 and within wider areas to achieve 'carbon neutrality' also by 2030. [94] The following table describes those combined efforts across the region.

BROADER STRATEGIES - NCC	
Norfolk and Suffolk Economic Strategy 2022	The Norfolk and Suffolk Economic Strategy is a response to the Government's Plan for Growth and provides the foundations to secure government funding. This strategy looks to 2036 but focuses on actions needed over the next three to five years to secure long term success.
Environmental Policy - Norfolk County Council	The Norfolk County Council Environmental Policy aims to put an approach that ensures that the development of Norfolk's economy is socially inclusive, while championing innovative and sustainable development at the centre of all efforts. It will support investment in green jobs and

[93] Suffolk County Council - Local Energy Asset Representation (LEAR) report. (January, 2022)
[94] Norfolk County Council's Environmental Policy (2019). Norfolk County Council's Environment Policy

	infrastructure, while ensuring that the environment is both protected and enhanced.
Economic Strategy for the East of England 2020	The Economic Strategy for the East of England was produced by Cambridge Econometrics in 2020 on behalf of IFM Investors. It has been endorsed by LEPs across the region.
Norfolk Rural Economic Development Strategy	This latest report refresh for 2021-2024 focuses on the impacts of the COVID-19 pandemic and how the Strategy can respond to the major changes to rural community life.
New Anglia LEP Energy Recovery and Resilience Plan	Includes outline Clean Growth "Journey to date".
New Anglia Local Industrial Strategy	The Norfolk and Suffolk Local Industrial Strategy (LIS) is the next stage in the evolution and implementation of the regional Economic Strategy.
Norfolk & Suffolk Covid-19 Recovery Plan	The New Anglia COVID-19 Recovery and Restart Plan sets out the LEP's plan to support Norfolk and Suffolk's economy to recover from the impacts of COVID-19.

GREEN SKILLS INVESTMENT

Investment in skills is a key priority for the current Government, having made several commitments towards Education and Skills Development, a brief summary of which is available in the appendices. This investment and the development of skills remains an important item on the national agenda, and underpins the feasibility of reaching Net Zero, by ensuring that relevant skills, trainings and qualifications are available for the highly varied sector, and ultimately ensuring that the workforce is capable, competent and with suitable capacity to meet the requirements of the challenge ahead. As a result, this is also reflected in the plans laid out by councils and authorities as key aspects of their own decarbonisation plans and agendas.

The independent Review of Net Zero[95] notes that we must ensure that the UK has the right pipeline and mix of skills to deliver the transition to Net Zero, and to capitalise on growth opportunities in the UK, although skills challenges were raised by almost all sectors in the report's engagement, and decline in existing numbers of skilled workers is exacerbating the challenge. Despite the importance placed upon the provision of suitable skills, the report suggests that there is insignificant confidence that progress is being made on this front, and recommends that the government should swiftly develop regional green job statistics.

Skills and Training agenda:
Government's March 2020 budget allocated £3 billion towards a National Skills Fund and in October, the Government confirmed integration of the National Retraining Scheme into the National Skills Fund.

As part of the Spending Review, the Chancellor announced that £375 million from the National Skills Fund would be invested in 2021/22 towards a range of programmes including adult technical courses, traineeships, sector-based work academy placements and the National Careers Service.[96]

As part of the Lifetime Skills Guarantee, any adult aged 24 or over who wishes to attain their first full Level 3 Qualification will be able to access approximately 400 fully funded courses across areas including engineering, construction and environmental conservation. A total of £95 million is being made available through the National Skills Fund, which will be directed towards enabling adults to gain qualifications as well as supporting training providers in scaling up their training provision[97].

The Skills Bootcamp Programme will complement this offer and provide adults with free, flexible courses of between 12-16 weeks in length. Skills Bootcamps are available to enable individuals to develop the following digital and technical skills below:[98].

1. **Digital Skills:**
    a. Software Development.
    b. Digital Marketing.
    c. Data Analytics.
2. **Technical Skills:**
    a. Welding.

[95] Independent Report: Review of Net Zero
[96] Institute for Government. (2021). Policy Tracker.
[97] UK Government. (2020). Adults to Gain New Skills on 400 Free Courses.
[98] UK Government. (2020). National Skills Fund.

b. Engineering.

c. Construction.

The Government's Plan for Jobs was published in July 2020 and aims to protect, support and create jobs across the UK. When the then Chancellor announced the Plan for Jobs in 2020, there was indication that overall, the Plan would be worth up to £30 billion. Further detail surrounding some of the key commitments has been provided below.

1. **Kickstart Scheme:** The Kickstart Scheme provides funding for the creation of new job placements for individuals aged between 16-24 who are on Universal Credit and are at risk of unemployment. Under the scheme, funding is available for employers which covers 100% of the National Minimum Wage or National Living Wage for a total of 6 months at a rate of 25 hours per week, alongside National Insurance contributions and automatic enrolment contributions.
2. **Restart Scheme:** The Government's £2.9 billion Restart Scheme will provide additional support to individuals on Universal Credit who have been out of work for at least 12 months.
3. **Apprenticeships and Traineeships:** The Government's Plan for Jobs committed an additional £111 million for the development of traineeships in England. It is thought that the funding will be sufficient to triple participation in trainees. The Government will provide £1000 of funding per trainee, funding employers who provide trainees with work experience. As part of the Plan for Jobs, the Government also introduced a payment for apprenticeships which ran from August 2020 to January 2021.

National Careers Advice: In the Plan for Jobs, the Government committed £32 million funding for the next 2 years for the National Careers Service to provide an additional 269,000 more people in England with a personalised advice service for training and work

While neither Norfolk or Suffolk Councils specifically have Green Skills functionality or training framework established, it is recognised that this report will assist in establishing strategies to address the future skills gap. The sections below lay out summaries of the two council's progress regarding broader skills investments.

Skills Investment - Norfolk County Council

In 2021, the New Anglia Skills Board produced the Norfolk & Suffolk Cross-Cutting Skills report[99], which set out the major skills challenges across Norfolk & Suffolk and the LEP's proposed solutions. Some of the key general and energy specific challenges identified in the report are listed below:

[99] Norfolk & Suffolk Cross-Cutting Skills report. (2021)

1) A net loss of near 12,000 people with a Level 4 qualification or above on an average workday.
2) Over 100,000 jobs to be filled between now and 2024 due to people leaving the workforce.
3) **Energy:** A need for a better supply of local, graduate level mechanical and electrical engineering skills.
4) **Energy:** Employers need to access skills and workers locally from other industries at key times, as much of their requirements are generic.
5) **Energy**: Delivery of apprenticeships not linked to employer needs.
6) **Energy:** Key concerns linked to the future supply of employees in the sector.
7) **Energy:** Imbalances in the workforce linked to age and gender.
8) **Energy:** Removing obstacles to residents securing jobs in the sector.

Many of the 'Cross-Cutting' issues related to each sector were centred around the lack of motivated people who are 'work-ready' as most new roles require technical knowledge. The LEP set out seven key priorities below for addressing the 'Cross-Cutting' issues:

1) **Local Sector Partnerships:** Enable local sector employers and stakeholders to articulate their skills priorities and work collaboratively to connect with national sector deals and maximise private/public skills investment.

2) **Future Industry Proofing:** Support local employers to realise opportunities from industry, ensuring that the availability of skills to work in such environments is an area of competitive advantage for the local economy.

3) **Careers Inspiration:** Support young people and adults to understand the outstanding career opportunities available locally, and the skills pathways to achieve those careers.

4) **Robust Technical Skills Pathways:** Ensure that effective, sustainable, employer-partnered local pathways (School / Apprenticeships / FE / University) are accessible for young people and adults to develop valuable technical skills urgently.

5) **In-Career Development:** Ensure high quality provision for the existing workforce to upskill in relation to the future skills needs of local businesses and the career development of local people.

6) **Teaching/Trainer Pipeline:** Ensure that there are enough qualified, technically experienced / technology-savvy teachers to meet the training and education needs of the future workforce.

7) **Building Local Skills Capacity:** Support local skills providers to be the pivotal suppliers of local skills needs, developing expertise to become nationally recognised in areas of strength.

The Council has also committed to fund a number of programmes to aid training and re-training for adults as well as supporting the Princes Trust programme, which aims to help young people who are not in full-time work and a training for work programme for pre-16 and 16-19 year olds.[100]

The range of skills programmes to drive action at the local level the key schemes have been outlined below:

1. Training for Work - Find training opportunities in Norfolk for 16-19-year-olds on through the Help You Choose website.
2. Fast Lane Training Services - FLTS provides a training and assessment service for highways and construction contractors.
3. Princes Trust Team Programme – The Princes Trust Team Programme aims to help young people get back into education programmes or work. It also provides young people with an opportunity to build confidence and self-esteem, as well as gain new skills and meet new people.
4. Norfolk Community Directory – A directory of organisations in Norfolk offering training courses.
5. Adult Learning – A wide variety of courses including, apprenticeships and online learning support.
6. NCC Apprenticeship Strategy - The Norfolk Apprenticeship Strategy 2020-2023 sets out a strategic vision and operational action plan for apprenticeships in Norfolk across all areas of Norfolk County Council.

Skills Investment - Suffolk County Council

Whilst SCC is yet to create a dedicated Green Skills function, the Norfolk & Suffolk 'Cross-Cutting' Skills report[101] discussed above will aid SCC in shaping its green skills strategy. More broadly, SCC supports several initiatives to augment jobs and skills in the county – some of the key schemes are outlined below:

1. Adult Learning and Careers Advice – Adults can find out about opportunities to improve skills and confidence or learn something new with a range of courses. Courses are available for all ages, from 19 years and above.
2. Work Well Suffolk - Work Well Suffolk is a three-year project (2020-2022) being managed by Suffolk County Council. Its aim is to help more than 2,000 young people into employment by tackling barriers they may face. This includes how young people can get work experience with us or start a career in the public sector through an apprenticeship, internship and graduate placement.

[100] Norfolk Jobs Training and Volunteering: Norfolk Jobs Training and Volunteering
[101] Norfolk & Suffolk 'Cross-Cutting' Skills report. (2021)

3. Yojo Careers and Apprenticeships App - Young people can use the app to find apprenticeships and career advice.

To supplement SCC's work on jobs and skills the SCC has a dedicated Skills Team, which seeks to promote businesses, inspire young people and invest in skills in the county.

As of October 2022, the Skills Team published a bulletin displaying achievements to date[102]:

Adult Learning Service:

Work Well Suffolk

The Work Well Suffolk Team have engaged with over 1,830 participants across the county which is 101% of the target date.

- 92 people have gone into education or training.
- 424 have gone into employment or self-employment.

Apprenticeships Suffolk

- Employers engaged – 257
- Employers supported – 110
- Apprenticeships started – 49
- Established participants – 196

[102] Developing Suffolk Talent (2022). Developing Suffolk Talent

The table below shows the policies that accelerate the net zero agenda within Norfolk County Council (NCC). The policies have been organised in order of the date created in order to provide historical context to the progress of the net zero agenda within NCC.

POLICY	POLICY DETAIL	DATE
Norfolk Rural Development Strategy	The report refresh for 2021-2024 focuses on the impacts of the COVID-19 pandemic and how the Strategy can respond to the major changes to rural community life.	September 2013
New Anglia Local Industrial Strategy	The Norfolk and Suffolk Local Industrial Strategy (LIS) is the next stage in the evolution and implementation of the regional Economic Strategy.	January 2020
Economic strategy for the East of England	The Economic Strategy for the East of England was produced by Cambridge Econometrics in 2020 on behalf of IFM Investors. It has been endorsed by LEPs across the region.	February 2020
Norfolk & Suffolk Covid-19 Recovery Plan	The New Anglia COVID-19 Recovery and Restart Plan sets out the LEP's plan to support Norfolk and Suffolk's economy to recover from the impacts of COVID-19.	June 2020
Norfolk County Council's Environmental Policy	The Norfolk County Council Environmental Policy aims to put an approach that ensures that the development of Norfolk's economy is socially inclusive, while championing innovative and	October 2020

	sustainable development at the centre of all efforts. It will support investment in green jobs and infrastructure, while ensuring that the environment is both protected and enhanced.	
Better-together-for-Norfolk	The document sets out five strategic priorities: (1) A vibrant and sustainable economy; (2) Better opportunities for children and young people; (3) Healthy, fulfilling and independent lives; (4) Strong, engaged and inclusive communities; (5) A greener, more resilient future. This is to be achieved via three themes: (1) Growing Economy; (2) Thriving People (3) Strong Communities	2021
Norfolk and Suffolk Energy Sector Recovery and Resilience Plan	Sets out the opportunities presented in the energy sector and the region's ambition to become the UK's Clean Growth Region.	May 2021
Norfolk Local Energy Asset Representation (LEAR)	The Norfolk LEAR provides a review of building stock, energy demands, energy networks,	September 2021

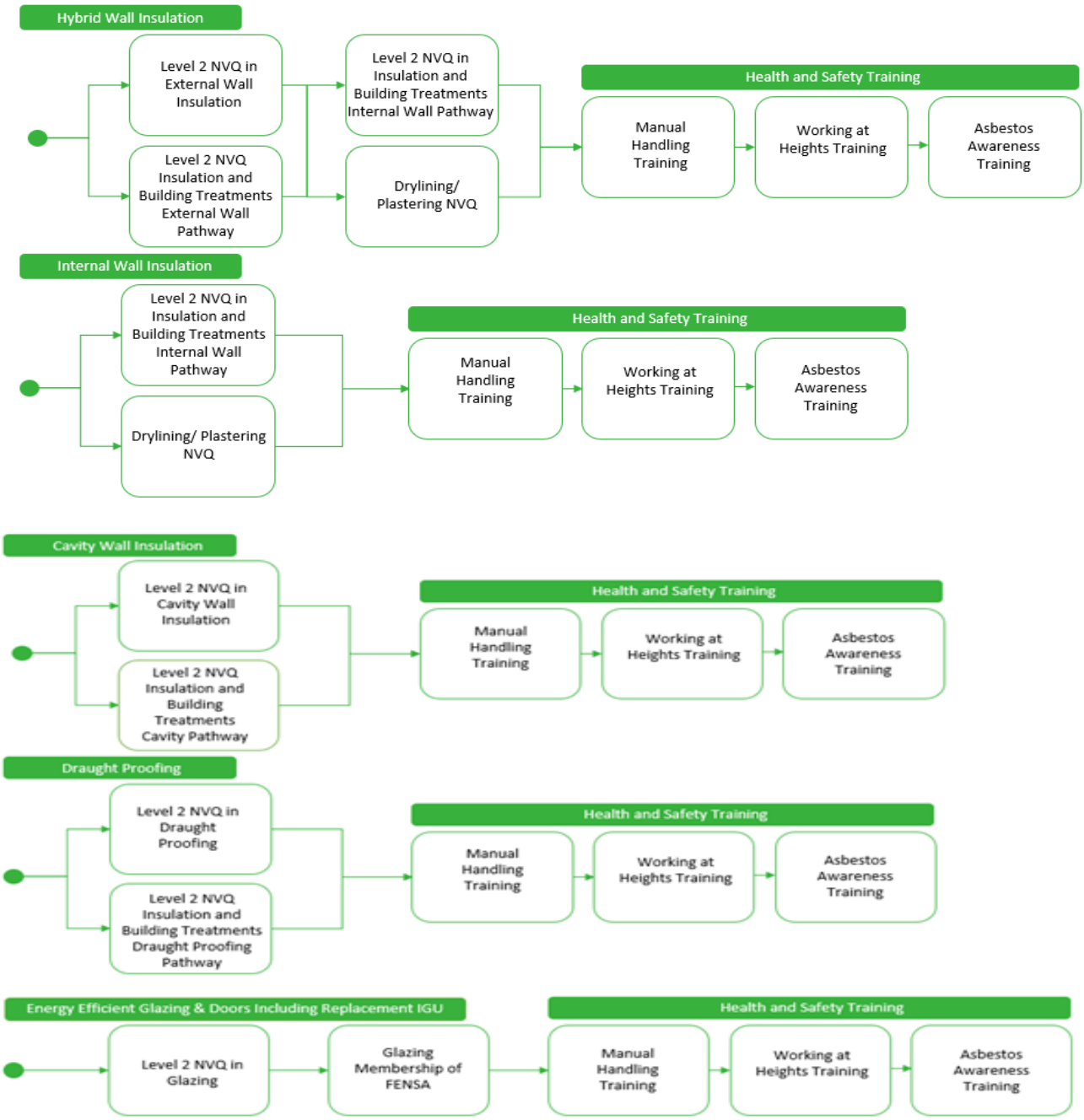
	embedded generation, domestic and public electric vehicle charging and social data and has highlighted the following opportunities across the county: 1) Decarbonising dwelling off the gas network in Great Yarmouth. 2) The off-street electric vehicle (EV) potential across Norwich and aligning charging solutions in Great Yarmouth. 3) Concentration of dwellings suitable for solar panels in South Norfolk with an example of 464 dwellings that could generate 1,705KW of energy.	
Norfolk Strategic Infrastructure Delivery Plan	The Norfolk Strategic Infrastructure Delivery Plan sets out high level strategic infrastructure priorities for the next ten years. It includes projects being delivered by both local authorities and external partners.	December 2021
Norfolk and Suffolk Economic Strategy	The Norfolk and Suffolk Economic Strategy is a response to the Government's Plan for Growth and provides the foundations to secure government funding. This strategy looks to 2036	2022

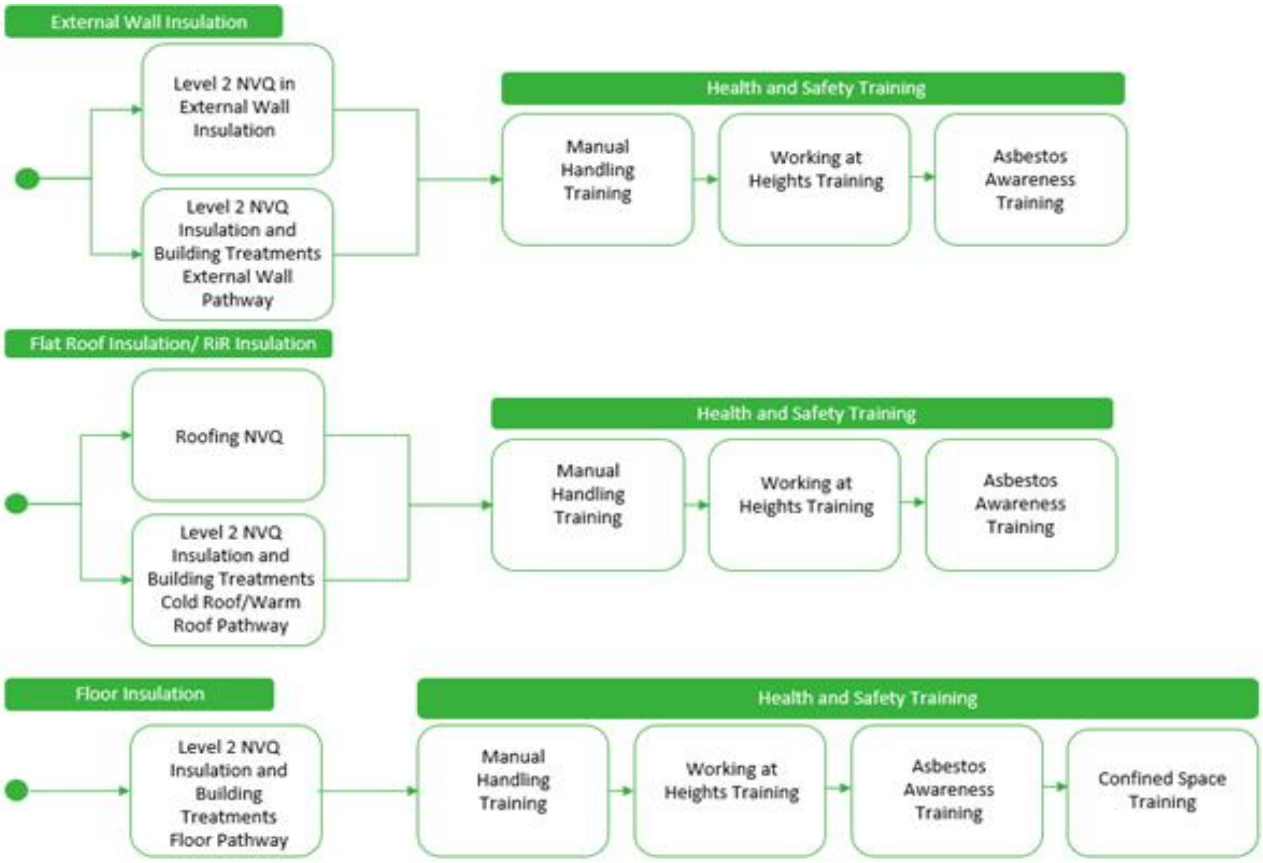
	but focuses on actions needed over the next three to five years to secure long term success.	

APPENDIX 4 – QUALIFICATIONS AND COURSES

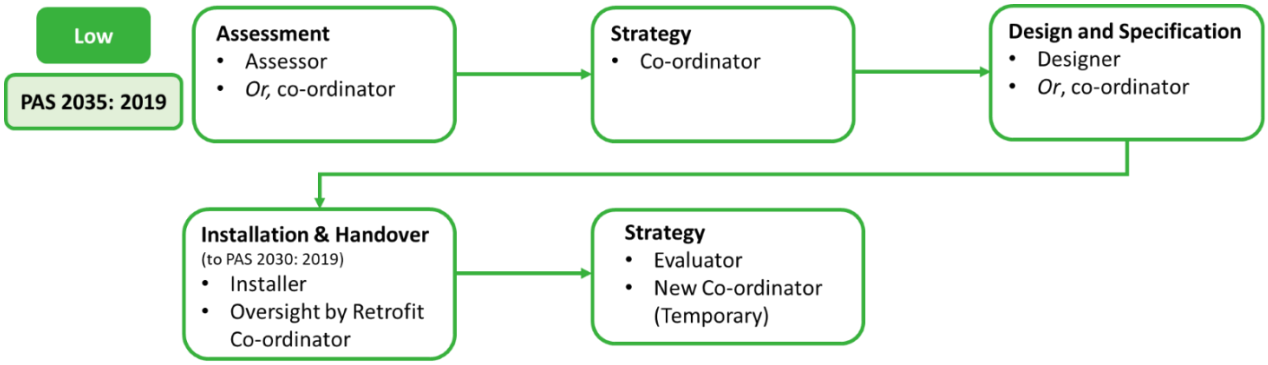
ENERGY EFFICIENCY QUALIFICATION ROUTES AND COURSES

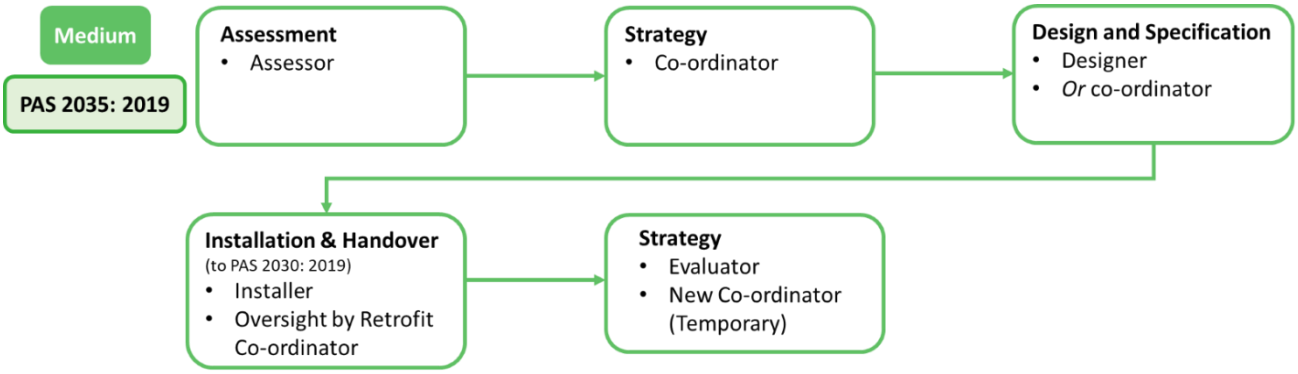
PAS 2030 sets competency requirements to ensure installers are suitably qualified to install under PAS 2030 schemes. The process diagrams below highlight the qualification journey for insulation installers to confirm competence for PAS 2030 installations.

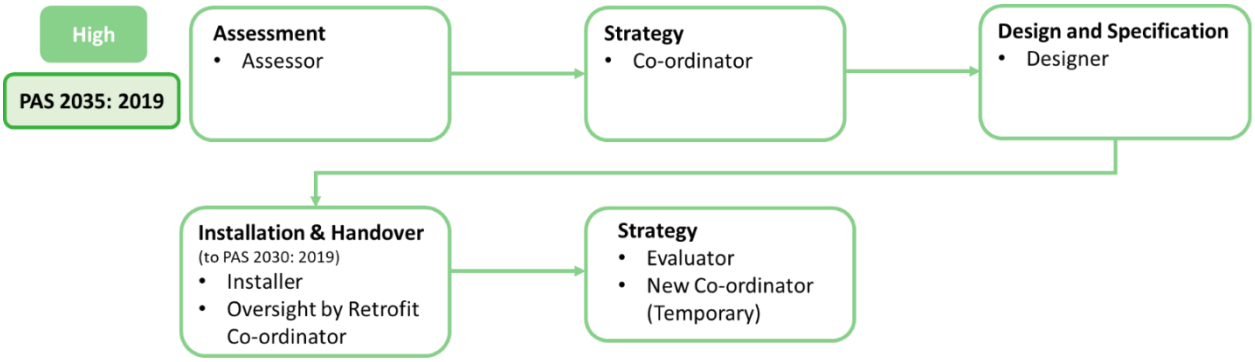




PAS2035 introduces a range of roles and responsibilities required prior to, during and after the installation of fabric efficiency measures. The requirements and roles needed for each retrofit project are dependent on the risk pathway (A, B or C) (see below.




Medium
PAS 2035: 2019
Assessment
• Assessor
Strategy
• Co-ordinator
Design and Specification
• Designer
• *Or* co-ordinator
Installation & Handover
(to PAS 2030: 2019)
• Installer
• Oversight by Retrofit Co-ordinator
Strategy
• Evaluator
• New Co-ordinator (Temporary)


High
PAS 2035: 2019
Assessment
• Assessor
Strategy
• Co-ordinator
Design and Specification
• Designer
Installation & Handover
(to PAS 2030: 2019)
• Installer
• Oversight by Retrofit Co-ordinator
Strategy
• Evaluator
• New Co-ordinator (Temporary)

LOW CARBON HEATING COURSES

Course type	Course title	Training Provider	Still available to learners?
Heat Pumps	Level 3 Award in Ground Source Heat Pump Systems (Non-refrigerant Circuits)	BPEC	Yes
Heat Pumps	Level 3 Award in Air Source Heat Pump Systems (Non-refrigerant Circuits)	BPEC	Yes
Heat Pumps	BPEC Level 3 Award in the Installation and Maintenance of Heat Pump Systems (Non-refrigerant Circuits)	BPEC	Yes
Heat Pumps	Level 3 NVQ Dip in Domestic Plumbing & Heating 600/6863/2 - EN2 (Heat Pumps)	BPEC	Yes
Heat Pumps	Heat pump system (NOS mapped) Heat Pump Technology Air Source / Heat Pump Technology Ground Source	BPEC	Yes
Heat Pumps	Level 3 Diploma in Plumbing and Domestic Heating (9189-04/05/06/07)	City & Guilds	Yes
Heat Pumps	Level 3 Award in the Installation and Maintenance of Heat Pump Systems (Non-refrigerant Circuits)	EAL	Yes

Heat Pumps	Level 3 Award in the Installation and Maintenance of Ground Source Heat Pump Systems (Non-refrigerant Circuits)	LCL	Yes
Heat Pumps	Level 3 Award in the Installation and Maintenance of Heat Pump Systems (Non-refrigerant Circuits)	LCL	Yes
Heat Pumps	Level 3 Award in the Installation and Maintenance of Air Source Heat Pump Systems (Non-refrigerant Circuits)	LCL	Yes
Heat Pumps	Heat Pump qualification	NICEIC	Yes
Heat Pumps	Installation, commissioning and servicing of air source heat pumps (OFT21-504A)	OFTEC	Yes
Heat Pumps	Level 3 Low Carbon Heating Technician apprenticeship	COMING SOON	COMING SOON
Heat Pumps	Design of heat pump systems (OFT21-504D)	OFTEC	Yes
Heat Pumps	Installation, commissioning and servicing of ground source heat pumps (OFT21-504G)	OFTEC	Yes

HEAT NETWORKS RELATED COURSES AND QUALIFICATION ROUTES

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

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

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

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

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

Previous research conducted by BEIS found that there is a need to develop heat network specific training infrastructure at all levels, including in apprenticeships (at Level 4 for construction and construction installation roles and Level 6/7 in engineering and design roles) and in university courses. The role for apprenticeships was confirmed during our interviews and are seen as an important recruitment route for the sector. Heat network providers are looking to expand upon current rates by utilising the Apprenticeship Levy to upskill existing employees to enhance and develop their current skill level to meet the market demands. There is work underway to develop and seek approval for a national apprenticeship scheme which will allow learners to learn skills on the job and in the classroom. In addition, graduate schemes are also used to encourage high-skilled workers into the sector, providing them with a clear training programme and progression route. It is important to note that many undergraduate engineering degrees tend to have at least one module on heat transfer which is applicable to heat networks. Some also offer renewable energy modules, although these tend not to be heat specific[103]. As such graduate schemes, targeted at

[103] BEIS (2020) Heat Networks Skills Review

undergraduates need to address this lack of heat network specific training. The schemes often combine theory with practice and are spread over multiple years. There are more heat network specific options available at post-graduate level.

It is important to note that as training is provided on a case-by-case basis by employers, there is very little standardisation. BEIS found that "heat network specific knowledge is generally developed through on-the-job training and supplemented by the short training course run by the Chartered Institution of Building Services Engineers (CIBSE)." Progression through the ranks is therefore often based on experience of completed projects rather than via a clear training route. Due to a lack of specialised qualifications and heat network training, transfer between sub-sectors at the higher qualification levels is limited. The severity of the skills gap is highest for project delivery, planning, or development manager roles. Despite this, recruitment appears to focus on low / intermediate roles to offer career progression and enhance skill sets at the lower levels. Most junior engineers that have thermodynamic and hydraulic skills are likely to be able to transfer into the heat network sector with relative ease. It is expected that recruitment at the higher qualification levels will remain consistent. The Heat Network Skills Review conducted by BEIS highlights that there is likely to be a natural movement of skilled labour between non-renewable energy sectors to heat networks[104].

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

[104] BEIS (2020) Heat Networks Skills Review

APPENDIX 5 – RETROFIT & LOW CARBON HEATING FUNDING AVAILABLE

NATIONAL FUNDING AVAILABLE

	Scheme Name	Technologies Included	Timings	Budget Allocated	Expected Deployment
Recently Announced	Public Sector Decarbonisation Scheme Phase 3b	Energy efficiency and heat decarbonisation	Applications from Sept 22-April 2025)	£635m	Aim of reducing emissions from public sector buildings by 75% by 2037, compared to a 2017 baseline
	Social Housing Decarbonisation Fund Demonstrator Wave 2.1	Insulation and low carbon heat	Early Oct 22-30th June 2025	£800m	The Social Housing Decarbonisation Fund (SHDF) will upgrade a significant amount of the social housing stock currently below Energy Performance Certificate (EPC) C up to that standard
Existing	Boiler Upgrade Scheme	Low carbon heat	April 2022-March 2025	£450 million across the scheme	90,000 units across the scheme
	Warm Homes Fund	Low Carbon Heat	April 2020 – March 2024	£150 million	21,000 installations already completed with more than 40,000 households expected to benefit from the fund
	Energy Company Obligation 4	Fabric efficiency & Low Carbon Heat	ECO4: 2022-2026	£640 million per year	Retrofit of EEM Low carbon Heating in domestic eligible households
	Home Upgrades Grant	Insulation & low carbon heat	2021-2026	£950 Million	Around 1,300 jobs will be supported
	Heat Networks Investment Project	Low carbon heat	2018-2022	£320 million	Fund over 100 projects, leveraging around £1bn of private & local investment
	Green Heat Networks Fund	Low carbon heat	2022-2025	£270 million	N/A
	Heat the Streets-Bringing Ground Source Heating to Cornwall	Low carbon heat	April 2022-March 2023	£6.2 million	add 3.5 megawatts of renewable heat, reduce greenhouse gasses by 786 tonnes a year
	Green Home Finance Accelerator (GHFA)	domestic energy efficiency and low carbon heating retrofits	Sept 2022-March 2025	£20 million	grant funding to support the design, development and piloting of a range of finance propositions which encourage domestic energy efficiency and low carbon heating retrofits in the owner-occupied and private rented sectors.
Future	Market Based Mechanism	Low carbon heat	Effective from 2024 onwards	No explicit funding from Govt.	Obligation on boiler manufacturers to have a % of total number of sales as heat pumps, with the aim of reaching 600,000 heat pump installations a year by 2028

KEY FUNDING – NORFOLK COUNTY COUNCIL

Homes / support for energy efficiency grants - Norfolk Warm Homes works to improve the energy efficiency of the county's worst performing houses across all local councils, providing information and advice on nationally available schemes targeting fuel poverty. Advice is available to residents, tenants and landlords to improve quality of life and reduce fuel poverty and carbon emissions from the lowest EPC band homes.

Supply Chain Innovation for Offshore Renewable Energy (SCORE) - 40% of eligible costs, or £50,000 with a minimum grant of £2,500 Grants are available for SMEs across England to develop new products, processes and ideas in offshore renewable energy.
12 hours of subsidised business support to help grow and develop businesses within the offshore renewables sector are also available.

Internationalisation Fund Match-funded - Grants of £1,000 - £9,000 Currently open (started Dec 2020) Grants are available for English SMEs with up to 250 employees to use for future business activities, aimed at helping these businesses grow into new international markets.
Funds can be used to support areas including (but not limited to) market research, IP advice, translation services, or international social media. Small Grant Fund £1,000 - £25,000 (20% of the total cost of the proposed project). Currently open Designed to provide funding for UK based growing SMEs. Grants can help towards the purchase of significant capital items, IP costs, development of new products or services, consultancy support, and trade fairs.

Go Digital Funding Programme - £500 and free expert advice Currently open. Free digital business support available for small and medium sized businesses in Norfolk to learn how to better use digital tools to identify business opportunities and help grow businesses. A grant of up to £500 can be applied for to help implement a digital action plan.

Business Growth Grant - £500-£10,000 15th Oct 2021 – 31st Jan 2022. Grants are available to Norwich-based SMEs (with fewer than 250 employees) for projects which support business growth. The grants will provide funding of up to 50% of the cost of improvement projects such as premises refurbishment or improving IT like card payment facilities or WiFi.

Start-up Grants - £1,000 Currently open. Grants to support the start-up and development of new businesses that are less than six months old. The business must be based in the South Norfolk or Broadland District Council area and operate for a minimum of 16 hours per week.

Delivering Rural Investment for Vital Employment (DRIVE) - A grant between £5,000 and £30,000 (up to 40% of total project costs). DRIVE provides local businesses with access to a capital grant to invest in new business development that leads to job creation.

KEY FUNDING – SUFFOLK COUNTY COUNCIL

Businesses

West Suffolk Greener Businesses Grant - The Green Business Grant is funded by West Suffolk Council to help local businesses and organisations reduce their energy use and save money. Eligible businesses based in West Suffolk can apply for up to £1000 to fund capital works designed to improve environmental performance.

West Suffolk Solar – The council plans, finances, installs and manages the solar installation. The installation is a relatively simple and quick process. Once installed, the council monitors and maintains the performance. The installation is completely financed by the council.

Suffolk Carbon Reduction Loan Scheme - The loans are available to any business with fewer than 250 employees, so long as the financial criteria is met. The only restriction on the loan is that funding must go on work within Suffolk that delivers demonstrable carbon savings. Loans will be paid directly to the installer/ supplier and then repaid by the applicant.

Plug In Suffolk Scheme – The Plug In Suffolk Scheme offers fully funded installation of EV chargers, fully operated and maintained for businesses who want to offer EV charging to their clients/general public. Businesses pay from just £1.99/charger/day and can keep 90% of charging revenue. With this option the business doesn't pay for installation but has a fixed fee to pay each day. Different operating models are available and there is also the option of 100% green energy.

Carbon Charter - Free Net Zero Business Advice – Free Net Zero Business Advice for Suffolk-based businesses. Support includes:

- An energy audit of a business
- Undertaking a carbon footprint
- Guidance and support to access funding
- Developing a Sustainability policy, or Pathway to Net Zero
- Evaluating specific proposals for your business (e.g. developing a business case for renewables)
- Enhancing your business sustainability communication or staff engagement

An Introduction to Climate Change Awareness Course – A free online course has been launched to support individuals and businesses to learn about the impacts of climate change in Suffolk.

Communities

Suffolk Climate Action Community Match Fund - The Fund is to assist charities, community interest companies, parish councils, voluntary groups and other not for profit organisations who wish to deliver community-based carbon reduction projects.

Suffolk and Essex Areas of Outstanding Natural Beauty (AONB) annual grants scheme - An annual grants scheme that sees over £110,000 given to community projects across Essex and Suffolk has opened for applications. The AONB grants wish to support projects that show innovation, social inclusion, sustainability, public benefit and partnership working. Individuals as well as organisations such as schools, businesses and community groups are welcome to apply.

An Introduction to Climate Change Awareness Course – A free online course has been launched to support individuals and businesses to learn about the impacts of climate change in Suffolk.

Green Suffolk - Communities Advice Service – Communities across Suffolk are eligible to access Green Suffolk's Community Building Advice Service which supports communities to reduce their carbon footprint and save money on their energy bills.

Suffolk Climate Action Community Match Funder – The Fund is to assist charities, community interest companies, parish councils, voluntary groups and other not for profit organisations who wish to deliver community-based carbon reduction projects that contribute to Suffolk's Climate Emergency Plan.

Homes

Suffolk Greener Homes 0% Loan Scheme - The Greener Homes Loan Scheme offers loans of up to £5,000 at 0% APR to help homes cut their energy use. Loans are available for energy saving measures such as insulation, boiler upgrades and renewable energy systems. Loans are only available for the installation of approved materials and technologies by accredited installers.

There are two types of loan available. Short term loans (2 to 12 months) of up to £1,000 for smaller improvements such as insulation, and long term loans (1 to 3 years) of up to £5,000 for more expensive measures such as renewable projects.

Suffolk Carbon Reduction Loan Scheme - A 0% Loan of up to £5,000 for measures that deliver clear carbon reductions in businesses and community groups.

Warm Homes Suffolk - Warm Homes Suffolk wants to help the people of Suffolk live in homes that cost less to heat, so they can reduce their energy usage and enjoy lower bills. Home owners, renters and landlords can apply.

East Suffolk Council - Energy Efficiency Help and Advice – Energy Efficiency advice for communities, homeowner and vulnerable residents in the Suffolk area.

Solar Together Suffolk - Local councils have teamed up with iChoosr to organise Solar Together for homeowners as well as small and medium-sized enterprises, to help deliver carbon savings across the country. All residents living in one of the participating council areas and who own their own house (or have permission from the landlord to install a solar PV system) can register for the Solar Together group-buying scheme. Small and medium-sized enterprises (non-domestic) and Commonhold Associations meeting this requirement can participate as well.

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