



*Championing
better homes and
communities*

Decarbonising Social Housing

Lessons from the ALMO sector



November 2022

⚠ PARENTS ARE ADVISED TO WARN THEIR CHILDREN NOT TO CLIMB ON SCAFFOLDS

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Phrases and abbreviations

AHP	Affordable Homes Programme
ALMO	Arms-length management organisations, council-owned companies that manage a local authority's housing stock on its behalf and often take on its responsibilities for delivery of other housing related services such as homelessness.
ASHP	Air source heat pump
BEIS	Department of Business, Energy and Industrial Strategy
DLO	Direct Labour Organisation – repairs and maintenance service run internally by the ALMO
EPC	Energy performance certificate
EWI	External wall insulation
GSHP	Ground source heat pump
HRA	Housing Revenue Account
IWI	Internal wall insulation
Net Zero 2050	The target set by the UK government to bring all greenhouse gas emissions to net zero by 2050; that is, we add no more CO ₂ to the atmosphere than we remove.
PAS2035	This is a best practice specification for retrofit of homes to cut carbon emissions setting out how projects should be staffed, planned, delivered and monitored. PAS2035 is a necessary requirement for publicly funded retrofit projects such as the Social Housing Decarbonisation Fund.
Retrofit	Changing buildings to make them more energy efficient and lower carbon consumption and emission. Approaches include 'fabric-first' – for instance, insulating and improving ventilation – and installation of low carbon heating such as air source and ground source heat pumps.
SAP	Standard Assessment Procedure; the government methodology to assess and compare the energy and environmental performance of homes. RdSAP is a simplified version of the SAP (reduced data SAP) using assumptions about a building based on construction standards and conventions at the time it was built.
SHDF	The government-funded Social Housing Decarbonisation Fund
SHIFT	Sustainable Homes Index for Tomorrow; an independent accreditation and assessment scheme for the housing sector
SHRA	Social Housing Retrofit Accelerator
Solar PV	Solar photovoltaics panels and systems
Whole-house retrofit	Sometimes called deep retrofit, this is a comprehensive refurbishment which, in one go, makes every possible change to achieve maximum energy efficiency.

Introduction

The case for decarbonising homes has already been made. The issue is not whether to decarbonise, but how to do it.

ALMOs are council-owned housing management organisations that look after around 300,000 homes – nearly a fifth of all local authority housing across England. They both maintain stock and make sure it is fit for purpose for the future. This includes preparing homes for a zero-carbon world through retrofit programmes.¹

ALMOs and the wider social housing sector are moving to more comprehensive decarbonisation programmes driven by government commitments to net zero and the urgent need to tackle fuel poverty and the effects of climate change on communities.

The welcome injection of government funding through the Social Housing Decarbonisation Fund (SHDF) has made it possible to test and learn from a range of approaches. New impetus from the cost of living crisis and spiralling energy costs makes it imperative that this fund delivers reductions in fuel poverty for the biggest possible number of tenants. The next SHDF funding round will close mid-November 2022.

Decarbonisation of housing stock sits in the wider context of increasing pressure on local authority Housing Revenue Accounts. Escalating inflation is driving increases in the cost of staff, contractors and materials; a proposed lower cap on social housing rents will reduce spending power further. Councils and their ALMOs are committed to exploring as many ways as possible to fund decarbonisation within the HRA and through external funding, but there is a risk that this work slows or stops without continuing commitment from government.

The first section of this brief examines the decarbonisation landscape alongside some of the issues which are facing ALMOs and local authorities. Its conclusion offers a dozen asks for government and policymakers that will move the sector's decarbonisation plans forward.

The second section highlights seven case studies from NFA members that address the various approaches ALMOs are taking to decarbonise their stock. It offers learning from the Social Housing Decarbonisation Fund and from a variety of strategies and solutions such as regional partnerships designed to develop a wider retrofit market, long-term incremental approaches, specialised programmes such as Homes as Energy Systems and Energiesprong, and housing archetype-specific projects.

Why focus on decarbonising social housing?

The residential sector is responsible for over one-fifth of all UK CO₂ emissions², the majority from heating. We cannot reach the UK government target of net zero by 2050 without decarbonising the residential sector.

Decarbonising housing stock is mainly about retrofitting existing homes – four out of five homes that will exist in 2050 have already been built, and 16 per cent of them were built before 1930.³

Of the 29 million existing homes across the UK, at least 19 million must be made low carbon, low energy and resilient to climate change⁴.

1 For commonly used terms and phrases, please see the abbreviations list at the beginning of this brief.

2 Residential journey to net zero. Savills, 2021.

3 Net zero and the housing challenge. Building Back Britain Commission, May 2022.

4 Environmental Audit Committee, Energy Efficiency of Existing Homes, 2021

Climate change is the headline issue but energy costs are increasingly pressing, especially for those living in social housing. Half of the households in the social rented sector fall within the lowest income quartile and their precarious finances leave them most exposed to the accelerating price of electricity and gas.

Social housing tenants are, on average, older than people in other tenures – around a quarter are 65 or older. More live with a disability or long-term illness (55 per cent of households, compared with less than 30 per cent in other tenures).⁵ Research shows that these households are also disproportionately affected by the cost of living crisis⁶; they are more likely to spend more time in the home and are more vulnerable to the effects of living in housing where a comfortable living temperature is hard to maintain. Decarbonising and improving the energy efficiency of their homes is an urgent necessity.

5 English Housing Survey, Office for National Statistics, 2022

6 See for example, the Citizens Advice Bureau cost of living [dashboard](#)

The policy environment

The government has set out its approach to reaching net zero in a number of strategies.

These include the [Clean Growth Strategy](#) (2017); [Heat and Buildings Strategy](#) (2021); [Fuel Poverty Strategy](#) , (2021); and [Net Zero Strategy: Build Back Greener](#) (2021). These strategies:

- “Prioritise action to: improve buildings with low energy performance and high-carbon emissions, futureproof new-builds to avoid the need for later retrofitting, adopt a fabric-first approach to improve building thermal efficiency, increase the performance of products and appliances, ensuring climate change resilience by mitigating risks of overheating and poor air quality, build the market by developing our technical expertise, growing the workforce, and expanding the UK’s manufacturing capacity and capability.” (Heat and Buildings Strategy)
- Aim to have as many homes as possible upgraded to EPC Band C by 2035, where practical, cost-effective and affordable; and as many fuel-poor homes in England to reach a minimum energy efficiency rating of band C by the end of 2030.
- Ensure households have access to sustainable, low carbon warmth as the country transitions to Net Zero.
- Signal the intention to phase out the installation of new natural gas boilers from 2035, ensure all heating systems used in 2050 are compatible with Net Zero; ensure that all new buildings in England are ready for Net Zero from 2025.

In terms of social housing, the government funding for decarbonisation of stock is mainly being channelled through the Business, Energy and Industrial Strategy (BEIS) department’s Social Housing Decarbonisation Fund (SHDF). The 2019 Conservative manifesto included a proposal for £3.8bn SHDF funding over a 10-year period:

- In the Spending Review (2020), £61m of SHDF funding was allocated to the demonstrator programme to deliver innovative retrofit projects for social housing.
- In August 2021 applications for wave one of the SHDF opened. The initial level of funding (£160m) was increased to £179m, with projects delivering in 2022-2023. This wave is focused on moderate volume and complexity, looking at fabric-first, insulation and energy efficiency.
- The 2021 Spending Review committed a further £800m for a three-year period.

Overall, the SHDF is aiming to:

- Reduce CO₂ emissions and work towards Net Zero 2050
- Improve the comfort and wellbeing of social housing tenants
- Support the Clean Growth Strategy ambition to improve as many homes as possible to EPC C where practical, cost-effective and affordable by 2035.
- Support the retrofit supply chain capability and capacity
- Develop the green economy and associated jobs
- Support the Fuel Poverty target to ensure that as many fuel-poor homes as reasonably practical achieve a minimum energy efficiency rating of band C by 2030.

Wave 2.1 of SHDF

[Wave 2.1 of the SHDF](#) opened at the end of September 2022 with a deadline of 18 November 2022 for bids. Successful projects will be notified in February/March 2023. Grant funding must be spent by 31 March 2025 and the projects delivered by 30 September 2025 at the latest.

This wave is focused on existing social housing below EPC C (a minimum 90 per cent of homes in a bid must be below EPC C) and projects that deliver upgrading of at least 100 social homes. As in previous waves, bids must specify contractors and procurement strategy, and compliance with PAS2035:2019 is mandatory. At least 50 per cent of eligible costs must be funded by the applicant. SHDF funding can also be merged with other government funding schemes. Improved homes must achieve at least EPC C rating post-retrofit, and projects should aim to achieve a space heating demand of 90kwh/m²/year.⁷

Since the SHDF programme was announced there has been considerable political and economic change. However, Wave 2.1 is a good opportunity for social housing providers to tackle as many properties as possible to reduce fuel poverty and energy costs.

Learnings from the SHDF demonstrator projects

A BEIS report on [the SHDF and views from social housing providers](#) in October 2021⁸ found:

- Familiarity with stock energy performance is a challenge for some providers;
- Energy performance is typically a secondary consideration in planned maintenance, due in part to lack of long-term funding and attempts to keep disruption to a minimum;
- Only a quarter of the providers surveyed had set clear targets for achieving a particular energy rating by a specific date;
- Providers did not have a strong grasp of their tenants' attitudes towards energy performance;
- Providers perceived financial support as key to achievement and expansion of their energy performance plans, and this underpinned their enthusiasm for the SHDF.

The SHDF's strong underlying focus on learning is having a positive impact on how funding is designed and allocated as successful bidders feed information directly back to BEIS about the practical pros and cons of their projects. The Social Housing Retrofit Accelerator (SHRA) has been designed specifically to help social housing providers shape their bid and a large and growing archive of resources is now available through the [SHRA knowledge hub](#); we highly recommend this to readers.⁹

HouseMark decarbonisation research project

HouseMark published [decarbonisation research](#) in June 2022 which draws on data from 41 social landlords managing 600,000 homes.¹⁰ They found that:

- on average 68 per cent of social homes are EPC C or above, with 27 per cent of homes EPC D and 6 per cent EPC E or worse;

7 <https://www.gov.uk/government/publications/social-housing-decarbonisation-fund-wave-2>

8 <https://www.gov.uk/government/publications/social-housing-decarbonisation-study-views-from-social-housing-providers>

9 <https://socialhousingretrofit.org.uk/>

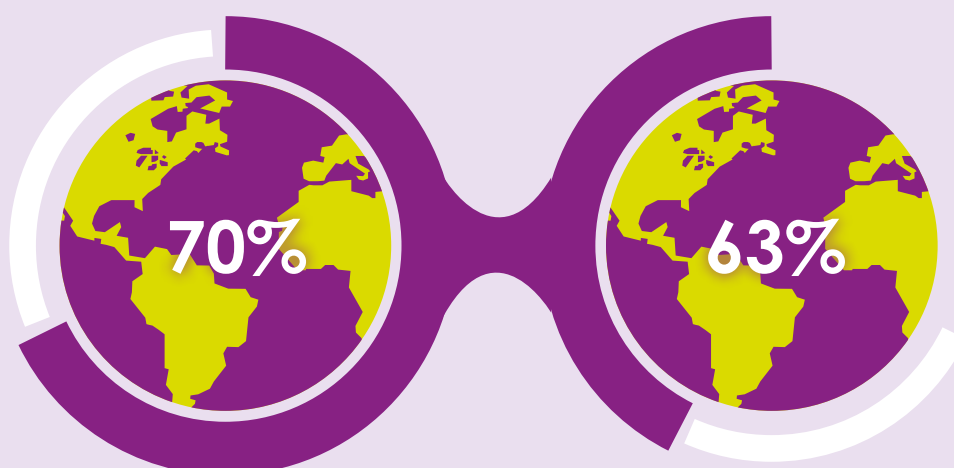
10 <https://bloom-digital.s3.eu-west-2.amazonaws.com/housemark/wp-content/uploads/2022/06/15092819/Housemark-decarb-research-report-EXEC-SUMMARY-final.pdf>

- just 35 percent of landlords have a delivery target for net zero earlier than 2050; 40 per cent of landlords expected to complete their 'fabric-first' approach in the 2020s, allowing time for technology to catch up;
- landlords have budgeted an average of £14,600 per property for net zero work to 2050.

The study found that a lack of funding sources is a significant barrier to social housing landlords reaching net zero. Just over 40 per cent of landlords were still installing gas boilers because they are 'cost-effective, comparatively efficient and in are in some cases, hydrogen-ready'. Most reported that they were tackling decarbonisation work as they would other major capital projects using an 'investment model' approach.

The study identified skills gaps including those needed to cover post-retrofit maintenance, the technical monitoring of building performance and carbon literacy for non-specialist staff.

The ALMO Sector



When surveyed in December 2021, 70 per cent of ALMOs had already reviewed their asset management strategy's response to climate change and most of the rest were planning to review it soon. Of those who had completed reviews, 63 per cent had an investment programme to meet either the 2030/35 or 2050 target or were developing one.

Those who did not have an investment programme were planning to update stock condition surveys and EPCs over the next few years and to set up pilot schemes for the various building archetypes in their stock to gather data for long-term planning and investment programmes.

Just over a third (35 per cent) of ALMOs had a plan for phasing out new gas boilers by 2035. For example:

- Stockport Homes Group board has approved a ban on new gas boiler installation from 2023 and a move to renewable alternatives; exceptions will only be made where no suitable renewable option is as yet available.
- Derby Homes has fitted around 100 ASHPs and is monitoring running costs before fitting more.

- Northampton Homes is considering all types of heat pumps, heat networks and hydrogen technology; air source heat pumps are part of their SHDF pilot.
- Eastbourne Homes is fitting both ASHPs and hydrogen-ready boilers and considering all technologies for a future major works programme.

Some members still in the planning stage are focusing on fabric-first and insulation to reduce heat demand before moving to more expensive solutions. Some are considering whether to wait for the newer technologies which may emerge in the next few years or wait for reduced costs as current technologies are scaled up and become cheaper. Some noted that the cost of new technologies is rising – members have reported that ASHPs have almost doubled in price in the last two years due to a range of factors, including demand, component shortages and significant price increases in materials and labour in the building trade – and even organisations with installation plans in place may have to re-examine budgets.

Supporting councils to achieve climate objectives

NFA members are supporting their parent councils to achieve their climate objectives by, for example, leading or contributing to climate change working groups, assisting the development of local transport plans, moving fleets to electric and rolling out electric car charging points, developing sustainability strategies, incorporating biodiversity and flood resilience into property improvement projects, and supporting carbon literacy programmes. While we expect this work to continue, we have to recognise that local authorities are facing massive cost and spending pressures which are likely to get worse in the current economic climate and which will impact on what is possible to achieve.

St Leger Homes of Doncaster (SLHD): the SHIFT standard

SLHD is part of its council's Environmental and Sustainability Networking group which focuses on delivery of climate change pledges in the borough. It also belongs to SHIFT (Sustainable Homes Index for Tomorrow), the sustainability standard for the housing sector. This independent assessment and accreditation scheme helps organisations track their delivery of challenging environmental targets against 21 environmental criteria. These include CO₂ emissions, water use, landfill waste and response to climate change risks. SHIFT accreditation progresses through commended, bronze, silver, gold or platinum levels and come with a bespoke set of recommendations on how to improve. Benchmarking covers all areas of the business including existing homes, new build homes, offices, strategy, management and supply chain.

In 2019, SLHD achieved silver accreditation. In the following three years they achieved gold with an improved score in 2022.

Homes in Sedgemoor: A sustainability strategy

HiS have developed a three-year sustainability strategy that sets out the steps the organisation will take between now and 2025 to develop a costed, evidence-based route to net-zero emissions by 2050. The strategy is supported by a sustainability map and action plan.

The vision for the organisation is to 'enable sustainable living' for residents. The key aims of the strategy include:

- Determining and measuring HiS's carbon footprint, including emissions directly from its own operations, from the combustion of fossil fuels in its assets, and from contractors and others in the supply chain delivering services to residents.
- Up to 2025, trialling various sustainability approaches. For example, a number of ways of achieving net zero and improving the environmental performance of existing homes will be evaluated. New technologies and ways of working to reduce carbon footprint and monitor stock condition will be tested.
- Creating a positive perception of sustainable living, building awareness of climate and environmental emergencies and explaining how customers can make a real difference.
- Aligning key groups to the strategy, including local schools and colleges.

A copy of the strategy is available on request.

The decarbonisation landscape: Challenges and recommendations

Local authorities and their housing management organisations are committed to decarbonising their housing stock and meeting net zero targets. Tackling fuel poverty is clearly an equally important driver in NFA members' plans.

Some well-recognised challenges need to be overcome:

- The single biggest issue reported by members was the short-term and reactive nature of funding which makes such schemes difficult to factor into long-term stock investment programmes. The SHDF has been really welcome, but the sector needs certainty to deliver their retrofit programmes.
- Immature supply chains and markets make retrofit technologies expensive and difficult to scale up.
- A lack of green skills, including PAS2035 roles such as retrofit coordinators and assessors¹¹, is compounded by more recent shortages of construction workers such as renderers and fitters of ASHPs and external wall installation. Costs have also increased as materials have become scarce.
- The capacity of the grid to manage increasing demand is a concern, as is the capacity of electricity companies to help map the impact of low carbon heating upgrades in their areas.

The NFA is joining wider calls for government to continue efforts to establish long-term stability for providers and suppliers; to commit to longer-term funding cycles; and to invest in the new generation of 'green skills' needed for retrofit at scale.

We are also asking government to work with energy providers to make sure the grid is ready for a transition to low carbon energy. The SHDF is a good start, particularly with its focus on learning and development of the contractor market, and more of this work is needed.

There are a range of other challenges facing local authorities and ALMOs, which we summarise below.

Housing Revenue Account sustainability

Since 2017 and the Grenfell Tower Fire, a substantial chunk of HRA funding has necessarily been directed towards building safety. Inflation is also eating into repair, maintenance and staffing budgets, and other pressures on the HRA include new-build programmes and maintaining Decent Homes standards. This all leaves less money for decarbonisation programmes.

NFA members' boards and councils are having to consider what net-zero carbon looks like for their housing stock. This is not only about what is affordable within their budgets, and when this will be achieved. It includes deciding what to do with properties where decarbonisation will never return good value, and how to balance thermal comfort with affordability. The energy crisis will also have an impact on stock investment decisions and retrofit plans.

¹¹ See The Learning & Work Institute report for more in-depth analysis on this issue: Skills for a net-zero economy, Insights from employers and young people, Learning and Work Institute, June 2022

Balancing asset management programmes and external funding

Asset management programmes are long term; external funding pots are short term and erratic. During interviews for this research, one asset manager said that trying to reconcile this is like trying to simultaneously ride two horses going at different speeds. External funding is welcome, but it is additional to capital programmes within HRAs.

The supply chain and good contractor relations depend on a planning arc of at least three to five years ahead, as does developing a good practice approach which ties together all the capital works needed on a block or street/estate to minimise disruption for residents and deliver value for money. This also allows landlords to give tenants timely warning of works that may alter their personal plans to redecorate or refurbish.

However, to combat this, some of our members report that they now build the requirements of government funding into their procurement models – for instance, making them PAS2035 compliant – so that they are able to put together a bid quickly if some grant funding comes on line unexpectedly. Some are also training internal staff to be 'retrofit ready' so they are not so dependent on contractors.

Many would like to see a government retrofit programme that works in a similar way to the Affordable Homes Programme so that organisations can bid into it when they have a project ready to go. This would help them bridge the challenges between short-term funding and longer-term capital programmes.

Understanding stock

The importance of underpinning retrofit plans with good stock data has been recognised by NFA members. They reported that they are doing comprehensive stock condition surveys, updating EPCs and procuring software systems that can model the stock.

Knowing your stock is a necessary precursor to tying asset management programmes and decarbonisation programmes together, particularly as organisations cannot do everything at once and will need to prioritise.

There are, however, known limitations to using EPCs to determine actual energy efficiency and therefore whether a property is eligible for funding,¹² and members also report concern about the quality of EPCs when they have to use less experienced assessors.

Where members have properties currently rated EPC D and they carry out small interventions to raise the rating to C, there is a risk that the current EPC assessment methodology will move post-works properties to an even lower rating. ASHPs are a particular problem; EPC ratings are less favourable for heating from an electric source than a carbon-based one, although this should be addressed in the next version of the SAP

The government consulted on EPCs in 2018 and is currently working through a list of 35 actions to refine the system. However, when the Environmental Audit Committee reported on the energy efficiency of existing homes in 2021, it concluded these changes would not achieve the EPC assessment reform needed to support the decarbonisation of homes.¹³ Considering how central EPC ratings are to decarbonisation work, reform here is an urgent priority.

¹² See the Environmental Audit Committee's report on the [Energy Efficiency of Existing Homes](#) for a summary of issues (pp 46-47)

¹³ Ibid, p50

Understanding stock

Stockport Homes uses the cloud-based software *DREam* to assess the energy performance of their entire housing portfolio. All EPC ratings on this software are up-to-date and based on the latest version of reduced data SAP (RdSAP). This information helps determine the best way to retrofit and calculates post-retrofit carbon reduction, fuel savings and EPC ratings.

Sutton Housing Partnership surveyed its stock condition in 2021, including internal surveys of 77 per cent of the stock and updated EPC assessments. This revealed considerably more properties below EPC C than calculated by a previous system of sample surveys using the older EPC methodology.

Whole neighbourhood decarbonisation

One of the big challenges reported by NFA members is the tenure mix among their housing stock due to Right to Buy. Where once whole streets and even estates were council-owned, private ownership, leasehold and private rental sector properties are now part of the landscape. Retrofit work obviously becomes more complex where, for example, permission is needed to work on neighbouring property; but more broadly, retrofitting by tenure is a deeply inefficient way of tackling decarbonisation where property archetypes are likely to be similar.

The solution lies in local authority-led, neighbourhood-level and multi-tenure retrofit plans that can be delivered by councils or through their ALMOs, with much greater integration of the various funding pots to allow street-level retrofit programmes. Incentives for private landlords also need to be part of the mix; they would not normally benefit from the higher energy efficiency of their property and so have little reason to be involved.

Decarbonising leasehold

One of the more intractable problems that social landlords are facing is how to decarbonise their leasehold stock, particularly in areas of high density. The average percentage of leasehold properties for our members outside London is around 6%. Inside London, it ranges from 18% to 46%.

Decarbonising leasehold properties is a well-known problem, but it is so complex that it risks being put into the 'too difficult' pile. It cannot be solved by landlords alone, and requires a comprehensive and funded plan from government if the sector is to meet zero carbon targets.

Right to Buy

If councils, through their ALMOs, invest heavily in property retrofits using a model that aims to recoup costs – and repay loans – through rental income, this clearly poses a grave financial risk if that property can then be sold at a substantial discount through Right to Buy before the investment is repaid.

- For a fabric-first retrofit, councils need to have the current cost floor mechanism extended from 15 years to 30 years; this is the normal loan term for their borrowing to cover this type of works.
- If deep retrofit or any substantial energy efficiency work in social housing is to be financially feasible, social landlords must be able to generate an income that repays any borrowing. New homes provide a new rental stream; work to tackle energy efficiency does not and so far has largely been paid for through government grant schemes.

Social housing landlords obliged to deliver Right to Buy need a mechanism that protects their finances from discount rules that would leave them unable to service loans taken out to fund stock decarbonisation, or to recoup the cost of continued maintenance of retrofit installations.

Leaving aside the RtB difficulty for the moment, retrofitters such as Energiesprong working in partnership with social landlords have looked at ways to adjust an incentive model that is currently split between landlords (investment in assets) and tenants (reduced bills from higher energy efficiency). Energiesprong's solution is the 'comfort plan', a fixed monthly fee that post-retrofit tenants pay to their social housing provider which can service borrowing and be invested in further performance-assured retrofit to Energiesprong standards. The plan aims to make sure a tenant's total cost of living after retrofit is slightly less than previous combined rent and utility bills, while making sure a proportion of the energy cost savings returns to the landlord to help pay for the investment. The comfort plan package is akin to a mobile phone bundle, promising rooms heated to 21/18°C (living area/bedrooms), 140lt hot water a day at 45°C (adjusted for larger households), and a 2,300kWh annual allowance for lighting, cooking and appliances (to cover all basic needs) for a fixed monthly payment.

Difficult-to-decarbonise properties

Once 'low hanging fruit' properties have been retrofitted, social landlords have to consider how to deal with harder-to-decarbonise buildings. The SHDF has naturally encouraged a focus on 'oven-ready' packages that fit bid windows and can be delivered in set timeframes.

However, some property types need much longer lead-in times to allow for exploration of solutions with several partners, to test possibilities without necessarily succeeding, and to allow for good retrofit programmes even where it is challenging, if not impossible, to get economies of scale such as in conservation areas, off-grid homes and non-traditional builds. Funding is needed that accommodates 'thinking' time and development of solutions and designs, and not just the actual physical retrofit.

The difficulties around planning and reconciling policy intentions to decarbonise with the practicalities of planning permission were also raised during interviews for this research. In conservation areas, for instance, retrofitters must negotiate a different set of rules about what type of measures are acceptable and in many cases must have planning permission.

One NFA member spoke about the challenges of developing a retrofit plan for around 120 listed properties, all thermally inefficient and all in a conservation area. Historic England will not approve external wall insulation, and it isn't clear whether internal wall insulation will reduce space inside the property too much. To trial various approaches, the landlord will need to work on empty properties or move tenants for the duration of the work; and this means that only small numbers of homes can be worked on at any one time because tenants will have to be rehoused.

Difficult to Decarbonise Properties

The [Building Back Better Commission's 2022 report](#) identified five 'key retrofit risk factors' that make it difficult to retrofit a home: a very low EPC rating, (homes in bands E,F,G); old housing stock; conservation requirements; low market value; and EPC C unattainable by current retrofit technology. There is a need for 'neighbourhood-specific strategies to secure area-wide housing improvements across all tenures... for many areas, a combination of retrofit, stock replacement and new build will be required, with planning on a neighbourhood-by-neighbourhood basis'.¹⁴

A 2022 sector report, *Hard-to-decarbonise social homes*,¹⁵ identifies the changes needed to the policy, regulatory and technological landscape to make hard-to-treat social homes easier to decarbonise: external funding, adjustments to regulation, supply chain and technological innovation, clarity in planning policy and resolution of delays and inconsistency in local planning approaches.

14 Building Back Better Commission, 2022

15 <https://www.housing.org.uk/globalassets/files/climate-and-sustainability/hard-to-decarbonise-homes-2022.pdf>

Building new homes

Although decarbonisation of the social housing sector focusses on retrofit, it is important that new homes don't add to the challenge.

The government consulted on the [Future Homes Standard 2025](#) in 2019. From 2025, Part L (conservation of fuel and power) and Part F (ventilation) of the building regulations for new dwellings will change to make new homes zero-carbon ready and future-proofed with low carbon heating and high levels of energy efficiency. The aim is that no new home will need now further energy efficiency retrofit work as the electricity grid continues to decarbonise.¹⁶ An interim target demands that from 2022 new homes produce 31 per cent less carbon emissions compared with current standards. A technical consultation is due in 2023; legislation is due to be introduced by 2024 and implemented by 2025.

Last year council-owned ALMOs built 740 new homes. Close to 70 per cent of these organisations were already building to a higher specification than required by building regulations. They were using standards such as those set out in the Code for Sustainable Homes, EPC A-C ratings, the Future Homes Standard 2025, fabric-first, and net zero carbon or Passivhaus.

Where the remainder use current building regulations, they are clearly preparing for the new Future Homes Standard 2025 by developing and costing new programmes, and piloting smaller sites for the learning to scale up.

Government support is needed to harness the sector's willingness to build at Future Homes Standard now to save money on retrofit later, by:

- Increasing AHP grant rates;
- Increasing the proportion of RTB receipts councils and their ALMOs can spend on the total cost of new build properties.

Solihull Community Housing: New build

SCH completed seven new highly energy efficient low carbon bungalows for social rent in 2021, all of which have an EPC A rating. These bungalows use a range of low carbon features including:

- A highly insulated build system (Eco 200 system)
- Air source heat pumps
- Solar PV panels (with one property benefiting from a shared system because its roof orientation made direct fitting impossible)
- Domestic battery storage
- Mechanical ventilation and heat recovery systems
- Energy monitoring systems – monitoring the amount of power and energy used, the amount of carbon emitted, temperature levels in the property, how much energy the solar panels produce, and how much energy the ASHP uses and costs.

The extra cost of these measures, on top of conventional build costs, was £27,500 funded through the HRA.

¹⁶ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/956094/Government_response_to_Future_Homes_Standard_consultation.pdf

Tenant engagement

Effective engagement and communication with tenants and leaseholders is vital to help them cope with the disruption of retrofit programmes, and post-retrofit, make sure they are able to make use of all the technology. As the Northern Housing Consortium's Tenants' Climate Jury states: 'Decarbonisation is as much a tenant engagement issue as an asset management issue.'¹⁷

Recognising this, as part of the Wave 2.1 funding bids, BEIS requires landlords to outline how tenants will be given suitable support and information during both the retrofit and occupancy. The BEIS Social Housing Retrofit Accelerator knowledge hub has a useful [Resident Engagement toolkit](#).¹⁸

Tenants' juries and other input

The [Social Housing Tenants' Climate Jury](#) was convened by the Northern Housing Consortium in partnership with six housing associations. It met largely online over 2021, hearing evidence from the sector and independent experts – an online resource library has been created from these videos. The jury made 19 recommendations covering: retrofit technology; costs; disruption to tenants; helping tenants properly understand decarbonisation works; and tackling climate change at neighbourhood level.

The following lessons from first-hand experience were shared during interviews for this research.

- In many cases, contractors include tenant liaison in the retrofit contract and such contracts should be clear and monitored closely. ALMOs' knowledge and experience of tenant engagement can help shape accessibility of information and messaging, and tailor work with tenants who need a more individual approach, particularly those with poor health or disabilities.
- Make sure that all teams within the organisation are talking to each other and fully involved in the retrofit work from the start – housing management, repairs and maintenance, tenant engagement officers and press & communications teams. Once the retrofit is completed, all these staff will be closely involved in helping tenants use new equipment and maintaining it.
- Develop accessible messaging and non-technical communications. Focus on the concrete impact of retrofit such as warm homes and stopping damp & mould. But in times of rising energy costs, be wary of promising reduced bills.

Trust is important. Tenants' experiences of retrofit are spread by word of mouth.

- Where work goes well, it is likely that other tenants will ask when they can have the same work done, so be clear about the wider plans for homes in the area.
- Pilots and research produce uneven results, so be honest with tenants and don't raise expectations. Build in a period of evaluation and keep tenants well-informed about findings.
- Involve tenants in developing retrofit models and plans. The tenant perspective is invaluable, both in properly understanding stock and building tenants' support for the work being done on their homes.

¹⁷ <https://www.northern-consortium.org.uk/the-social-housing-tenants-climate-jury/>

¹⁸ <https://socialhousingretrofit.org.uk/knowledge-hub/toolkits/resident-engagement>

Asks for government and policy makers

The NFA has a number of asks of the government and policy makers to support the sector to decarbonise homes and meet the government's net zero targets.

- Confirm the commitment of the new administration to the net zero targets and Social Housing Decarbonisation Fund.
- Make it easier for councils to integrate decarbonisation funding for all housing tenures into one long-term funding stream so that local authorities can produce neighbourhood-level, multi-tenure retrofit plans.
- Review the sustainability of HRAs and explore new ways of funding energy efficiency work (for example carbon bonds) and/or sharing savings on energy bills with tenants.
- Move away from short-term funding announcements to longer term strategies: programmes funded over at least five years (but preferably longer); and structured in the same way as the Affordable Homes Programme¹⁹ so organisations can bid when they have a project ready to go.
- Address the retrofit industry skills gap.
- Urgently update the EPC scheme to make it fit for purpose.
- Consider how to help social landlords with gas-using homes that are already EPC C. Current funding criteria and weighting make funding bids to move these properties away from gas unlikely to succeed.
- Extend the Right to Buy cost-floor mechanism to help recuperate costs from sales of retrofitted properties; explore 'comfort plan' approaches that give landlords an income stream to help fund deep retrofit borrowing.
- Review planning policy and guidance to remove planning barriers to retrofit.
- Provide guidance and/ or mechanisms for recouping costs from leaseholder properties, especially costly measures such as external wall insulation.
- Review PAS2035 to make sure that it maintains quality but does not create unnecessary barriers to decarbonisation projects.
- Increase Affordable Homes Programme rates to allow all social landlords to build to Future Homes Standard now.
- Upgrade energy networks so that heat pumps and solar PV can be installed at scale.

¹⁹ <https://www.gov.uk/government/collections/affordable-homes-programme-2021-to-2026>

Case studies

Derby Homes: The long-term view

Derby Homes (DH) manages 12,500 homes on behalf of Derby City Council. Its decarbonisation journey started just over 30 years ago when the newly launched National Home Energy Rating Scheme (NHER) made it possible to measure the energy consumption of its homes. Overall the stock had an average rating equivalent to SAP 40 – approximately EPC E, very poor.

DH's initial focus was on measures with the biggest impact such as loft and cavity wall insulation and more efficient condensing back-boilers. Integrating energy efficiency measures with other work programmes has been key to the progress made. For example, if kitchens and bathrooms were replaced in solid walled homes, walls were insulated during the work.

Derby Homes has now reached the point where almost all its stock has had thermal improvements made to its fabric. A few homes of non-traditional construction that need bespoke improvements will be completed over the next few years, bringing all stock up to at least EPC C.

Every few years, DH does a sample stock condition survey and also holds very strong data on all homes which feeds into auto-evaluator energy software which keeps an accurate record of all energy ratings (SAP and EPC).

More than 1,200 homes have solar PV systems and many of these installations were supported through the feed-in tariff. Now, when homes are reroofed, DH routinely incorporates integrated solar PV panels which also reduce the number of roofing tiles required.

The true cost of 120 air source heat pumps installed in homes that are well insulated and have no gas supply is currently being assessed by DH before any plans are made to install them in traditionally built homes. The difference between gas and electricity bills will be among the determining factors here.

All DH's new build homes meet net zero standards: super insulated, low carbon heating, solar PV systems to offset the energy needed to heat them, car charging points, and minimised impact on biodiversity.

DH stock now has an average SAP rating of 77 compared to a sector average of 68.4 (EHS, 2019); its new homes have SAP ratings of over 100. Overall its tenants save around £12m per year on energy bills. The next goal is a strategy to bring all DH homes to net zero by 2050.

Homes First & Eastbourne Homes: Developing the regional market

Homes First manages the council housing stock for Lewes District Council and Eastbourne Borough Council (in partnership with Eastbourne Homes Ltd). Lewes Council is part of the Greater Brighton Economic Board (GBEB), a partnership between seven local authorities, and in 2021 GBEB established a cross-sector Housing Retrofit Taskforce to work out how it can make homes zero carbon by 2030. Homes First is leading on this work and heads up a team of external specialists including academia, whole carbon experts, retrofit experts and specialists in energy and the supply chain.

The Taskforce's three objectives are to:

- determine how public sector homes and buildings can take be improved at scale across the region while boosting new skills, quality 'green-collar' jobs, and investment in low carbon industries;
- identify and promote long-term changes to energy usage while also increasing private sector engagement with the whole-lifecycle decarbonisation agenda;
- future-proof the region's homes

Core considerations that underpin the taskforce's decarbonisation decisions include the central role lower energy bills play in tackling poverty and how housing procurement tools can be used at scale to disrupt the current system.

Plans need to be scalable and replicable and work with existing supply chains and budgets. Collectively, to 2030 the GBEB region's councils will spend around £1 billion on repairs and maintenance of council homes. While the region will look for external funding, net zero will largely need to be achieved within a limited budget, not least because procurement needs to be coordinated and long-term to allow the development of a supply chain and local market.

A deep assessment of 10 main types of housing has helped to shape what the future zero carbon pathways could be with the need to balance the cost to the landlord against the benefit to the tenant and whole-life carbon reductions.

The findings will be used to support the best possible decarbonisation strategy and possibly set new standards across the region, provide certainty for the supply chain and private sector, and establish the scale of work needed so that providers can gear up and train local staff. It is also hoped that working at scale will increase purchasing power and reduce unit costs.

Homes First in partnership with Eastbourne Homes have employed a Community Development and Sustainability Adviser as part of its zero-carbon work. Sustainability messaging is being promoted under the brand 'Not Costing the Earth' to raise awareness with accessible, down-to-earth, non-technical information. Non-technical guides on low carbon hardware such as solar PV panels explain how they work and benefit tenants who have them. The adviser has also worked in tandem with the taskforce, both supporting tenants involved in pilots and evaluating the best ways to engage and communicate with those whose homes are being retrofitted.

Northampton Partnership Homes: Learning from the Social Housing Decarbonisation Fund – Demonstrator/Wave One

Northampton Partnership Homes manages around 12,000 council homes for West Northamptonshire Council. They received SHDF Demonstrator funding to retrofit 150 homes; and Wave 1 funding to retrofit 429 homes. The focus has been on solid wall homes where EWI can be used, largely because these homes are easy to identify and geographically close together. The goal is EPC B/C or better and for all homes retrofitted to reduce energy use and carbon emission by 70 per cent.

The work includes: EWI, top up to loft insulation, new windows and doors, improved ventilation and heat recovery, solar PV in 49 properties, and air source heat pumps (ASHP) in 15 properties. A huge rise in ASHP costs has reduced the number installed.

The relationship with the first partnering contractor was key. The ALMO had already worked with this supplier who was able to bring expertise and experience of whole-house retrofit to the project. They became a 'critical friend', able to source support from specialists in domestic retrofit, mechanical & electrical systems expertise, and already had an understanding of PAS2035.

When the first contractor's capacity was stretched, a second partner was brought in. This provided unexpected learnings from the differing approaches of each contractor. The architect for the second contract was employed directly by NPH which gave an extra level of control over design and oversight. The programme has now moved from opt-in to opt-out for residents and it is managed in the same way as other large investment programmes.

Learnings include:

- The speed of response demanded by the SHDF bidding process has shifted thinking from a focus on individual measures to a holistic overview of what the organisation wants to achieve with fully net

zero homes. There has been real benefit from just starting, and then building trust and expertise and learning as the project progresses.

- When discussing retrofit with tenants, how the benefits are framed is key - better homes, more comfortable to live in, warmer in winter and cooler in summer. Talking about carbon savings or climate change doesn't create buy-in. Promising cost savings is risky given current rising energy costs – though reduced energy use may help keep bills lower than they might otherwise have been.
- Also key are the fundamentals of good social housing management – tenant satisfaction, listening to the tenant voice, and partnership and place – and these values should also be central to the relationship with the contractor and their interactions with tenants.
- Good project management – NPH have hired an additional project coordinator – is vital and should sit alongside strong governance and monitoring.

Nottingham City Homes: Destination Zero with Energiesprong UK

Destination Zero is led by Nottingham City Homes, Nottingham City Council and Energiesprong UK, and is funded by the Department of BEIS. It is aiming to develop an approach to deep retrofit which can be delivered incrementally by social housing providers through their asset management programmes, making the most of current budgets and retrofit technology.

Project progress can be followed on the programme's dedicated [blog](#).²⁰

This work was showcased at the United Nations Climate Change conference in Glasgow in 2021 showing how the hardest-to-heat council houses could be transformed into super warm and energy efficient homes that meet 2050 standards now.

A core objective of the programme has been to develop a model that others in the sector can adapt and use.²¹ Emily Braham, UK Director of Energiesprong, has distilled key lessons from this work to help other retrofitters.

- There is no one answer to the questions that kick off every project: what are we trying to achieve, and what needs to be done? Each organisation has to consider its own internal and external pulls and pushes and adapt.
- If the project is not set on sure foundations from the start, unintended consequences may ripple out and stress project goals long-term.
- Get comfortable with prioritisation. Thousands of homes in any given place will need retrofitting, so every project is an exercise in prioritisation. Create a strong methodology at the start to give structure and make it clear why certain homes have been chosen before others - for example, homes with particularly low EPC rates.
- Know your archetypes. Each UK housing type needs a different approach to retrofit. It's important to understand housing archetypes before setting out on a tender exercise. This is early spadework that pays off in the long term. If done well, it helps create a plan for each type of home that will be a sound basis for future project planning and costing, for live testing and adjustment, and for creating a comprehensive list of every retrofit measure each house needs to reach the 2050 zero carbon target.

The project is also feeding new skills and 'green' jobs into the local labour market; the contractor delivering Energiesprong retrofits is linked up with Nottingham City Homes' own Women in Construction and green jobs programmes. Construction taster sessions run by NCH include information about these new roles and support recruitment to the contractor.

²⁰ <https://medium.com/@DestinationZero>

²¹ First published in an NFA viewpoint by Emily Braham, Energiesprong UK Director, 2021.

Six Town Housing (Bury): Approach to decarbonisation

Six Town Housing (STH) manages around 8,000 council homes for Bury Council. STH is retrofitting 100 homes in Wave 1 of the SHDF as part of a combined £10.5 million bid between the Greater Manchester Combined Authority and the [Greater Manchester Housing Providers \(GMHP\)](#) network. Bid partners include a range of housing associations and ALMO Stockport Homes.

The GMHP have created a low carbon strategy template that helps landlords define pathways to net zero that suit the needs of their stock and tenants. It is particularly useful for smaller landlords who may not have the resources or experience to develop a strategy from scratch. A copy is available on request.

To make sense of SAP data, STH are using cloud-based software that maps properties and identifies appropriate measures for them. It assesses their likely impact on energy efficiency and models cost. This data feeds into STH's reporting to its board and council so that strategic decisions have a robust evidence base.

The approach is to develop processes that make it possible to retrofit many properties in one programme, rather than individual whole-house pilots. The main source of funding will be the HRA augmented by any available external funding. Decent Homes funding ensured that few STH homes are below EPC C, so SHDF funding may be difficult to win if the scheme continues to target only stock with lower ratings.

Infrastructure, particularly the energy grid, poses difficulties. Long-term planning for low carbon demands either guaranteed sufficient grid capacity or adjustments to the plan. Energy companies also need the capacity to be part of this planning.

STH is working with one main contractor to deliver all the element of retrofit in-house rather than a team of sub-contractors, to make oversight and guaranteed good service simpler. Planning also includes skilling-up STH's own DLO to be retrofit-ready so that prices can be to some extent protected.

Some lessons shared from Six Town Housing include:

- Work out what you mean by net zero carbon, and once you've decided that, when you are going to achieve it by.
- Be bid ready, as timescales for government funding are tight, but don't rely on grant funding alone
- Know your energy data, including refreshing EPC data
- Make sure you do early engagement with the energy grids
- Do longer term project planning up to 2050, don't do everything at once
- Consider how to upskill internal teams
- Consider how tenants will use the technology once it has been installed

Stockport Homes Group, Procure Plus and Manchester City Council: Homes as Energy Systems (HAES) project

The Homes as Energy Systems project is one of the largest collaborative low carbon projects in north-west England. It is led by Procure Plus with strategic partners Stockport Homes Group (SHG) and Manchester City Council (MCC) and a range of delivery partners, and evaluated by Salford University. Funding comes from SHG, MCC and the England 2014 to 2020 European Structural and Investment Funds.

HAES is developing a model to demonstrate that energy efficient homes with small scale electricity generation and storage can actively contribute to a more dynamic system, either storing energy or sending it to the grid. The project is also investigating how much income this approach might generate to find out whether retrofit of properties could be funded partly or fully this way rather than by external funding or from the Housing Revenue Account.

The project's goal is 1,000 installations of a range of measures, from air source heat pumps to deep retrofits, reducing emissions by a total 2,750 CO₂e tonnes a year.²²

The delivery phase is due to end in 2022/3 and installations and retrofits will be monitored for 12 months. Findings are likely to start coming through in 2024.

Learning to date includes:

- Customer engagement is vital, and customers need strong support to change behaviours in a way that brings them most benefit from their new low carbon solutions. On this project, Energy Solutions Advisors work alongside Customer Liaison Officers to offer this kind of help.
- Housing providers must do more than rely on contractors' liaison work. Review all literature and information sources early to make sure they are accessible and follow best practice of wider tenant engagement work. For instance, frequently asked questions documents and handover checklists have been developed to help residents understand their new energy systems.
- All teams within a housing provider's organisation and its partners should be working together from the start. Training for maintenance teams with the new technology should begin at the design stage. On the HAES project, for instance, heat pump suppliers have trained staff and teams directly.
- Planning rules may need to be changed to remove barriers to installing new low carbon technology, and local authorities should make sure policy and planning are 'joined up'. For example, planning permission for air source heat pumps in flats adds around 30 per cent to the cost of each installation because of the need to get planning consultant opinions, acoustic testing and other reports; yet the same pumps are part of permitted development for stand-alone homes.
- The cost of technology and installation has risen sharply in the last couple of years for our member Stockport Housing Group. Two years ago, an ASHP would have cost £6.5k to install, with planning permission and associated costs this has now risen to around £12.5k. This reflects cost increases across construction puts pressure on budgets, particularly when gas boilers can still be installed for significantly less. It can be a challenge to balance the business case between a cheaper solution and meeting long-term low carbon targets.
- Electricity North-West has been a key partner, and experience has confirmed that a good relationship with the energy provider helps keep the project on track.

Sutton Housing Partnership: High-rise decarbonisation

Sutton Housing Partnership (SHP) is currently working on a programme to decarbonise 138 homes: 75 through SHDF Wave One, focused on a fabric-first approach; and 63 whole-house retrofits through Energiesprong, 40 of these through European funding and 23 with funding from BEIS and the Greater London Authority.

The majority of the properties are two storey dwellings, a mixture of semi-detached, mid and end terraces, dating from the 1930s-1960s. Forty of the homes receiving the Energiesprong whole house performance approach are in a low rise block (four storeys) and they are a mixture of social rented and leasehold properties. Around 20 per cent of properties managed by SHP are leasehold. SHP carried out a stock condition survey of 77 per cent of its properties in 2021 to get accurate data and update EPC ratings. Around 2,400 homes were found to be below EPC C.

The whole house approach to retrofit in Sutton is aiming to reduce energy demand first through fabric improvements (windows, walls, roof and floors) before upgrading to low carbon heating systems, for example heat pumps. Some fabric measures, e.g. external wall insulation, can be completed from the

²² CO₂e is the unit for measuring carbon footprint. It measures carbon dioxide and then adds in the CO₂ equivalent of any other greenhouse gas being emitted. The result is a single number for all greenhouse gases. For comparison, the average house emits around 2.6 tonnes of CO₂e a year.

outside of the building reducing the impact to residents, this enables inclusion of leaseholders with less impact, recouping the costs appropriately from the leaseholder. Other improvements do require access and this reduces ability to push improvements forward if leaseholders are able to decline works.

For the retrofit programmes, SHP has developed selection criteria to target suitable properties, this focuses on the needs of the funder as their criteria often drives the inclusion of property types. This can include EPC rating, wall type, current state of the property and resident characteristics.

Learning includes:

- A reliable partnering contractor is key to success of the project. There is a good supply of contractors in London that can deliver fabric-first measures, but availability and price inflation are issues. There are very few contractors able and willing to do whole-house retrofits, partly because the work is more complex than fabric-first approaches.
- Resident liaison is vital, particularly for disruptive whole-house retrofits and for working with leaseholders. SHP employs two full time resident liaison officers who sort out consent for works, keep residents informed, manage on-site liaison and issues, with contractors and gather post-project data. Further to this, it would help enormously if there was a Borough wide engagement programme to enable residents to understand the transition to net zero. This includes how to optimise use of solar PV, transitioning away from gas cookers and the importance of controlled ventilation.
- Due to the nature of the property stock, and because of the extent of works undertaken during a whole house retrofit, it is important to get as much information as possible on the property to provide assurance when carrying out the retrofit. Additional surveys can include: asbestos R&D, digital measured surveys, architectural design, structural and acoustic surveys. This clearly increases the cost but the complexity of these improvements and the disruption incurred by the residents during the works means they are vital to get the best outcomes.



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