Decarbonisation:
a guide for housing associations

housing.org.uk/decarbonisation

NATIONAL HOUSING FEDERATION

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Foreword

At the National Housing Federation we share with you – our housing association members – a vision of safe, green, high quality, affordable homes and a housing market that delivers for all.

Housing associations are uniquely placed to deliver this vision – secure, strongly regulated, not for profit organisations with a deep commitment to the long term sustainability of your homes and communities.

In England, housing associations own and manage 2.7 million homes for six million people. Now, as we recover from the pandemic, is the right time to review our aspirations for our homes over the years ahead.

- Following the tragedy at Grenfell Tower, we know that your first priority is to **make sure all homes are safe**. Housing associations and the government have committed to achieving this as quickly as possible.

- We agreed with the proposal in the Social Housing Green Paper for a new Decent Homes programme to further **improve the quality of social homes** over the next decade, building on the enormous investment in homes that housing associations have already made.

- And we are acutely aware of the scale of **need for more truly affordable homes.** Independent research shows that we need to build 145,000 affordable homes – including 90,000 for social rent – each year for at least the next 10 years. Housing associations will contribute as much as possible to this.

But perhaps most significantly, the government's commitment to delivering a zero carbon economy by 2050 will have far-reaching implications for housing associations. We will need to **virtually eliminate the carbon emissions of all homes**, including social homes, over the next 30 years, bringing enormous benefits for residents, communities, the economy and the environment.

Addressing the need to reduce emissions while investing in building safety, quality of home and service and continuing to build new homes at scale is a daunting task, especially given the current challenges around skills, supply chains and costs. But I also know that it's a task that housing associations will relish because it is wholly in keeping with the social purpose that underpins everything you do.

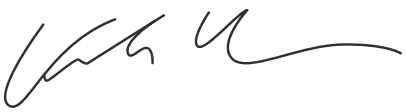
Given the scale of the challenge, **it's a task we can only accomplish by working together with the government, residents, industry and wider society.**

This guide starts to plot a route towards 2050 for existing social homes, but it's a route that housing associations cannot deliver alone. Given the huge challenges and costs involved, decarbonising housing association homes will be impossible without support from the government. A companion report published by Savills explores the scale of these costs and the types of solutions needed.

There is much uncertainty but the situation is urgent. We cannot wait for all the answers to fall into place before taking action and I know that housing associations are already forging ahead. As well as outlining an overall trajectory, this guide provides suggestions for how housing associations might embark on their journey to zero emissions. To help with this, we have launched an online hub which we will keep up to date with practical tools, guides and videos.

This guide to decarbonising homes is the start of our work on decarbonisation and sustainability in the housing association sector. I look forward to working closely with you, with the government and with other partners over the coming months and years to deliver on our shared vision for our homes.

Kate Henderson
Chief Executive



Introduction

If the UK is to meet its climate goals, we must radically reduce our carbon footprint. That means rethinking the way we heat and insulate our homes.

The climate challenge

The government has set a legally binding target for the UK to reduce carbon emissions to net zero by 2050. This is to ensure that as a nation, we meet our international obligations of 'highest possible ambition' set out in the Paris Agreement which would limit global warming to 1.5°C with a backstop of keeping it well below 2°C.

In all possible scenarios projected by the Intergovernmental Panel on Climate Change (IPCC) we are now guaranteed to breach global warming of 1.5°C but if we act fast, this will be temporary and reversible. Every fraction of further warming can and must be prevented.

To play our part in avoiding catastrophic climate breakdown, we need to decarbonise all homes in England by 2050 at the latest, including the 2.7 million homes owned by housing associations. We will almost certainly need to move more quickly, so that other parts of the economy that are harder to decarbonise are bought as much time as possible.

Housing associations are already acting. Housing association homes are on average more energy efficient than any other homes, and housing associations have invested in energy efficiency and new heating technology for many years. **But the scale of the challenge is so significant that it will require an unprecedented programme of work at an unprecedented scale.**

Our climate challenge in numbers

- Domestic use of fossil fuels contributes 21% of England's carbon emissions, with social housing contributing 10% of this.
- Around 74% of the UK's heating and hot water in buildings is met by natural gas, 10% from petroleum and smaller amounts from coal and biomass.
- In England, our homes produce more carbon emissions every year than all our cars. Eliminating emissions in all housing associations homes would be the equivalent of taking 1.8 million cars (the equivalent of all the cars in Manchester and Birmingham) off the road indefinitely.
- Emissions from housing increased by 7% during the coronavirus pandemic.
- 18.4% of residents in social housing live in fuel poverty.
- 22% of the carbon reductions from home energy efficiency measures are predicted to come through changing resident behaviour.

Our social mission

In some ways, this is familiar territory for the National Housing Federation and our members. Housing associations have always taken on societies' greatest challenges and delivered support beyond housing to their residents.

Housing associations are not for profit organisations and are defined by their social purpose. But now more than ever, **that social purpose encompasses environmental goals.**

We suggest that delivering decarbonisation in a socially just manner means adhering to two guiding principles:

1. **The climate transition must be a just transition.** 18.4% of housing association residents still live in fuel poverty. With the right policy interventions and approach, decarbonisation can be a once in a generation opportunity to eliminate fuel poverty for good, delivering lower bills alongside more comfortable homes. And with 1.6 million households in desperate need of social housing, we must aim wherever possible to deliver more social housing.

2. **Housing association residents must be at the heart of this work.** While they will benefit from warmer, more affordable, healthier and smarter homes, residents will also face the disruption of retrofit and installation of new heating technologies. As a result, residents' willingness to learn about, adopt and champion new low carbon technology will be crucial to our collective success.

We support and recommend the work of Placeshapers and TPAS, and the Northern Housing Consortium, on resident engagement in decarbonisation.

What is the Climate Change Committee?

The Climate Change Committee is an independent body who advises the UK and devolved governments on how to prevent and respond to the climate emergency. It also reports to Parliament on progress. It is made up of experts from a range of fields who are guided by the latest climate science. It is responsible for research, policy recommendations and monitoring progress across all sectors of the UK economy and government.

The Climate Change Committee's Net Zero Reports (2019) and Sixth Carbon Budget (2020) are currently the most holistic, informed roadmaps for our collective journey to net zero. They propose that for the UK to reach net zero carbon emissions by 2050, all direct, regulated emissions from buildings must be eliminated by 2048. To achieve this, they propose that by 2033 all UK buildings are made energy efficient, and all future fossil fuel heating systems are replaced with low carbon alternatives such as heat pumps.

Other key milestones they propose include:

- All new buildings are zero carbon-ready from 2025.
- All new boilers installed are 'hydrogen-ready' from 2025.
- All new district heat network connections are low-carbon from 2025.
- All social and private rented homes and homes for sale are certified EPC C or better by 2028. See page 18 for an explanation of EPCs.
- No new oil and coal heating systems are installed from 2028.
- No natural gas boilers replaced after 2033.
- All heat networks convert to low carbon heat sources from 2040.

Fuel poverty among social housing residents almost halved from 40.3% in 2010 to 18.4% in 2019.

Our successes so far

- Housing association homes are already more efficient than all others. 64.3% are certified EPC C or above, compared with 38.3% of privately rented homes and 35.6% of owner-occupied homes.
- The vast majority of housing association homes below EPC C are EPC D (31.2%). Just 4.5% of housing association homes are EPC E-G.
- In 2019 alone, we brought more than 100,000 social homes up to EPC C, decreasing the number of homes below EPC C by 4.4%.
- Fuel poverty among social housing residents almost halved from 40.3% in 2010 to 18.4% in 2019.
- In the years to 2050, housing associations already plan to invest £70bn in the fabric, heating systems and components of their existing homes. We estimate that decarbonising all homes will require a minimum additional £36bn of investment on top of that already planned – a 50% increase.

Delivered in partnership

Housing associations cannot meet this challenge alone.

This guide sets out measures to decarbonise our homes by 2050. But housing associations can only fund and deliver this in partnership with residents, the government, industry and society.

Housing associations are eager to lead the way on decarbonisation and in turn, support the wider housing and built environment sector in this challenge. However, pioneers are exposed to risks and so we want to work in a strong partnership with the government to mitigate those risks and pursue the best possible pathway to decarbonisation.

Here, we start to set out how – collectively – we can retrofit existing social homes so they are more comfortable, cheaper to live in and emit no carbon. But this guide also sets out the support we'd need from the government to deliver this, and it highlights the uncertainties we face.

Our task is to do what we can now to invest in our homes, while working with the government, residents and partners to swiftly put in place the policies, funding and public support needed to deliver complete decarbonisation of our homes.

Delivering in partnership with the government

Just like the rest of society, housing associations cannot meet the net zero challenge alone. We will need to work closely with the government on all aspects of delivery, but in particular we know we will need:

- Clarity over the fabric standards necessary to support clean heat – with these standards required across all homes (not just social homes).
- Reform of the SAP / EPC methodology to accurately measure and incentivise decarbonisation. See page 18 for an explanation of SAP / EPC.
- Reform of electricity pricing to ensure electric heating systems such as heat pumps don't lead to higher bills.
- Funding and financing – building on the Social Housing Decarbonisation Fund to find ways of complementing the £70bn of investment that housing associations are already planning.
- Support for skills and supply chains to ensure that the technology is available at the scale and price needed, and that we rapidly train up a workforce to deliver retrofit and clean heat installation and maintenance.
- A major public information campaign to prepare residents of all homes for the changes that will need to be introduced in the following decades.

The approach

This guide focuses on decarbonising existing homes. We know that implementation will be complex and challenging, but the overarching approach is straightforward.

Housing associations should concentrate primarily on tackling the emissions they can control and support other sectors to play their part where possible. This means the 'direct, regulated' emissions caused by burning fossil fuels to heat homes and water. In other words, the gas, oil, coal and Liquid Petroleum Gas heating systems present in housing association homes.

What carbon emissions are we talking about?

To understand the challenge ahead of us we have outlined six types of carbon emissions in the housing association sector to help us understand the sector's carbon footprint. We then identify which ones are our sector's strategic priorities in terms of reductions. This approach looks both at where emissions are produced and who controls them.

1. Direct emissions in housing stock
Direct emissions are the carbon emissions produced directly from the burning of carbon-emitting fuels in homes to heat space and water, e.g. gas boilers in our homes.

2. Indirect emissions in housing stock
Indirect emissions are the emissions produced in our energy system when generating electricity or other fuels, which in turn power heating technologies in homes – for example the emissions from a gas-fired power station, producing electricity which powers a domestic heat pump.

3. Regulated emissions in housing stock
Regulated emissions are produced, either directly or indirectly, by a household's use of structural/fitted energy consuming items over which a landlord has control. Examples include space and water heating mechanisms and mains lighting.

4. Unregulated emissions in housing stock
Unregulated emissions are produced directly or indirectly by a household through use of personal energy consuming items. These might include kitchen appliances, televisions, hairdryers etc.

5. Embodied or supply chain emissions in housing stock
Embodied or supply chain emissions are those produced through the building of new – or works on current – housing association homes. These include the emissions resulting from the production, transportation and deployment of building materials.

6. Peripheral organisational emissions
Peripheral organisational emissions are the carbon emissions a housing association may produce or contribute to through wider organisational activities outside of their housing stock. These could include, the carbon emitted through staff commuting, organisational vehicle usage and office building emissions.

The primary role that housing associations must play in the national 2050 net zero target is to eliminate our sector's share of the direct, regulated emissions (1 and 3 above) that are produced from the burning of fossil fuels to heat space and water in residential buildings.

Other sectors are similarly responsible for the emissions they can control, and the government has overall strategic responsibility for bringing everyone together in a concerted and comprehensive effort to reduce carbon emissions. There will always be more we can do as a sector, as organisations and as individuals to tackle other emissions but these are not our immediate strategic priorities.

We need to eliminate virtually all emissions from homes by 2050 at the latest, as part of the UK's net zero target.

All scenarios projected by the Climate Change Committee are modelled on a 100% reduction in emissions for housing. **There is no role for offsetting emissions.**

Offsetting emissions

Offsets will play a part in our national route to net zero, but not in decarbonising our homes.

To reach net zero as a nation, the amount of carbon we emit must be balanced by the amount of carbon we draw down from the atmosphere. There are two primary mechanisms for drawing down carbon from the atmosphere. One is carbon capture and storage technology (still in its infancy). The other is through supporting nature to draw down carbon, for example, by planting additional trees.

There are a limited number of sustainable, equitable and effective offsets that can be deployed around the world. These will need to be reserved for offsetting the residual emissions from sectors that are extremely hard to fully decarbonise – for example some heavy industry or aviation.

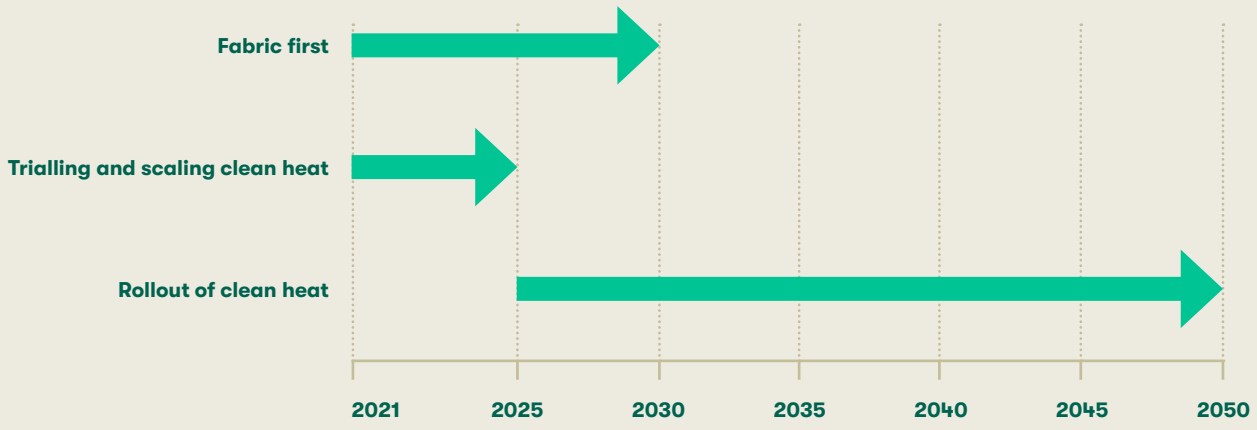
As a result, there will be no role for offsetting residual carbon emissions from housing.

Install clean heat by 2050

In principle it would be possible to decarbonise simply by replacing carbon-emitting heat systems like gas and oil with alternatives that are powered by a decarbonised energy system like electric heat pumps and decarbonised heat networks. Doing this by 2050 would deliver decarbonisation of all our homes.

But if this is all we do in many cases at present it could lead to higher energy costs and cold homes for residents and create strain on the nation's energy systems because many homes are currently too poorly insulated to be heated efficiently by low carbon technologies.

Trajectory to net zero



Dependant on:
- Rebalancing gas/electricity prices.
- Reform of SAP methodology.
- Investment in supply chains and skills including in heat pump technology.

Fabric improvements by 2030

Therefore, fabric first energy efficiency measures are a vital precursor to clean heat installation. They also lower bills and emissions immediately, helping residents and the planet.

It's not yet clear what fabric energy efficiency measures are needed to ensure clean heat technologies are both efficient and affordable. What we do know is that it is going to depend on the affordability of energy, particularly electricity, and improvements in low carbon heating technologies.

What is fabric first and why does it matter?

Taking a 'fabric first retrofit' approach simply means improving the energy efficiency of a home by investing in its insulation before investing in clean heat. Fabric first retrofit is essential because it reduces demand for space heating in the home, ensuring that:

- **We can tackle fuel poverty** by bringing down energy bills for residents immediately and mitigating any potential future rise in running costs when clean heat technologies are installed.
- **We reduce carbon emissions immediately** helping to meet national intermediary carbon reduction targets.
- **We ensure that future clean heat technologies work at their best.** Technologies like heat pumps operate at lower temperatures than gas boilers and they are at their most efficient in a well insulated home.
- **We lessen the strain on our current and future energy infrastructure,** making us more resilient to energy shocks and making it more viable to meet energy demand entirely through renewables.
- **More of our current homes are successfully decarbonised,** reducing the need for regeneration and building new homes (which releases high impact embodied carbon emissions).

After fabric retrofit measures and clean heat have been installed, housing associations can look to the role of other interventions like solar panels to help bring down running costs further and reduce Scope 2 and Scope 3 emissions.

> It's not yet clear what fabric energy efficiency measures are needed to ensure clean heat technologies are both efficient and affordable.

In the absence of a better measure, both the government and the Climate Change Committee are currently using EPCs as a proxy for energy efficiency. For example, both the Clean Growth Strategy and Social Housing Decarbonisation Fund (SHDF) are seeking to ensure all social homes reach EPC C by 2030. Recognising the deficiencies in EPCs and SAP methodology, the SHDF requires **a 'fabric first' approach and properties should aim to reach at least a space heating demand of 90 Kwh/m2/year. For now, we believe this is the most appropriate minimum baseline for housing associations to work to.**

We share the concerns of our members and the Climate Change Committee regarding EPCs and SAP and understand that the government have committed to reform in this area to better support decarbonisation. We aim to work closely with them on this agenda.

Bringing down the costs of electricity

In our decarbonised future, electricity will heat the majority of our homes via heat pumps. At the moment, electricity is much more expensive than gas so heat pumps can cost more to run than gas boilers – even though heat pumps are more efficient.

Bringing down the cost of electricity will be vital to ensure that heat pumps can be installed without fuel bills going up.

Currently, 25% of the total cost of an electricity bill is made up of levies, compared to just 2% of a gas bill. The majority of these levies are used to support green and fuel poverty initiatives such as the Energy Company Obligation and the Warm Homes Discount scheme, but perversely they disincentivise the switch to clean heat. Removing these levies would be one important way to bring down bills – either by switching them to gas, or by incorporating them into progressive taxation.

Going further

The trajectory outlined above is the minimum we would need to deliver. In practice we know that many housing associations will be aiming to move faster, for example through whole-house retrofit upfront, or by working to shorter term targets.

There is significant scope to go beyond minimum standards to further tackle the intertwined climate and fuel poverty challenges, for example by installing solar panels, wind turbines, smart meters or low energy lighting. All of these reduce our Scope 2 emissions and can help to lower bills for residents.

Reforming Energy Performance Certificates

Energy Performance Certificates (EPCs) and the Standard Assessment Procedure (SAP) which underpins them are the most widely recognised measure of the energy performance of buildings. They inform policymakers, property-owners and tenants about the current energy performance of a home and provide advice on how to improve it.

EPCs are primarily an assessment of how affordable a property's energy running costs are, rather than an assessment of its carbon footprint. As a result, the interventions they incentivise are often not aligned with decarbonisation.

We support the government's intention to overhaul the SAP/EPC methodology to support decarbonisation and will work closely with them to do this as soon as possible.

Hard to decarbonise homes

To play our part in a net zero economy by 2050, all homes need to be transitioned off fossil fuel heating, facilitated by improvements to the fabric energy efficiency of the building. Currently, these works may not be technically possible or financially viable for all homes. These homes are often referred to as 'hard to decarbonise' or 'hard to treat' homes.

There is significant uncertainty ahead which makes decisions about these homes difficult. We don't yet know:

- The true scale and distribution of hard to decarbonise homes across the country.
- How the policy environment will evolve – for example around planning, funding and the regulatory environment – to take account of hard to decarbonise homes.
- How fabric retrofit and clean heat technology will improve to make decarbonisation interventions more technically feasible.
- How the costs of insulation and clean heat technology will change, potentially making intervention more viable.

Many of these barriers apply across all homes, not just social homes.

Wherever possible housing associations will want to:

- Decarbonise as many homes as possible.
- Ensure these homes are made or kept affordable to heat.
- Minimise the need for any loss of social homes as a result of pursuing climate goals.

To do this we will need to work closely with the government in the coming months and years to agree a policy trajectory that allows us to deliver on these goals. Our aim is to create a policy landscape that ensures as many hard to decarbonise homes as possible are made viable.

We know many housing associations are weighing up these challenges but are not taking decisions until there is greater clarity on the policy environment and available funding.

While we must move at pace, a lot can change in three decades, especially in the world of climate policy. Technology and best practice for both retrofit and clean heat will improve and with the right policy support this will likely happen at an exponential rate. As we have seen in other green sectors such as solar panels, we expect they will become cheaper, more readily available and more suited to the diversity of our homes. The government and societal support to decarbonise these homes will continue to grow, making it more economical and more tenable.

A role for hydrogen?

When burnt to produce heat, hydrogen does not produce carbon emissions. However most hydrogen is currently derived from high carbon fossil fuels like coal and gas. In the future, these emissions could in theory be captured using carbon capture and storage technology – this is known as 'blue' hydrogen. So-called 'green' hydrogen is produced from water using renewable electricity.

Low carbon hydrogen is likely to play a role in our society's net zero future in sectors where electrification and other decarbonisation options are limited. However, in the housing sector we have readily available technologies such as heat pumps and networks and as a result hydrogen is only likely to play a marginal role. Hydrogen solutions could be employed in homes where both:

- Heat pumps or networks are not viable.
- The homes are co-located near hydrogen production facilities or heavy industry which can distribute surplus hydrogen.

The government's Hydrogen Strategy explains that by 2030, only around 70,000 homes will be heated by hydrogen. Many experts believe that the deployment of hydrogen in buildings should be actively discouraged from anything more than a marginal role.

Regeneration will play an important role in some areas where existing homes are of very poor quality, or no longer meet local demand. But retrofit is much more climate-friendly due to the significant environmental impact of embodied carbon when replacing existing homes with new homes, so decisions about when to regenerate will need to consider this.

A role for heat networks?

After electric heat pumps, low carbon heat networks are likely to be the dominant technology for heating our homes in a decarbonised society. The Climate Change Committee estimate that 5.5 million homes (18%) could be heated by low carbon heat networks in 2050.

Heat networks (also called communal or district heating) harness or generate heat at a central source and distribute it to homes in an area. Communal heat networks heat a single building, whilst district heating heats multiple buildings across an area. They are best suited to densely populated urban environments.

Currently, there are roughly 14,000 heat networks (12,000 communal and 2,000 district) in the UK, supplying about 440,000 homes. More housing association homes (6.1%) are currently connected to heat networks than any other tenure. Heat networks are more prevalent in many countries around the world including Denmark where almost two thirds of homes are connected to one, mostly fuelled by biomass.

The vast majority of heat networks in the UK are currently powered by fossil fuels but by 2050, these will be transitioned to new energy sources alongside the establishment of new low carbon heat networks. Heat networks can be powered by a range of low carbon sources including large-scale electric heat pumps which draw heat from water and sewage facilities, geothermal and solar powered heat networks and networks powered by waste heat from industry, nuclear facilities and even underground metros.

Alongside scaling up the infrastructure, there are consumer challenges that need to be addressed to make heat networks more viable and attractive to residents and more easily managed by landlords.

Policy and funding context

The policy framework for decarbonising our homes is emerging rapidly, along with details of the funding available to support it.

However there is much further to go and we expect considerable progress on both fronts over the next few months and years, as the government puts in place formal plans to deliver on its legislative target to reach net zero by 2050. The NHF is working closely with the government on this policy agenda.

The decarbonisation hub on the National Housing Federation website includes an overview of the key pieces of policy currently guiding the sector's approach, which will be kept up to date as the environment evolves.

Visit the decarbonisation hub

The timeline below sets out what we might expect to see over the next few years.

	Policy	Funding
2021	2021 — Heat and Building Strategy to be published, setting out high level approach to decarbonisation of buildings (awaiting).	2021 — Social Housing Decarbonisation Fund Wave 1 (£160m).
	2021 — Spending Review may commit to Social Housing Decarbonisation Fund (awaiting).	2021-2022 — Green Homes Grant (Local Authority Delivery Scheme) LAD Phase 3 - £200m. This funding is being delivered by the Sustainable Warmth Competition alongside Home Upgrade Plan Phase 1.
	Net Zero Strategy (promised before COP26) will bring together strategy from across government into a holistic document outlining our society's road to net zero (awaiting).	2022-2026 — Energy Company Obligation Phase 4 (ECO4) funding (awaiting details following consultation). Social homes likely to be eligible if they are EPC E or below (or EPC D for 'innovation' measures) and residents meet certain criteria.
2022	2022 — Part L and F uplift to the building regulations as a stepping stone to the Future Buildings Standard.	2022-2024 — Clean Heat Grant (awaiting details following consultation). The government began to consult on a successor scheme to the Renewable Heat Incentive that would support the rollout of heat pumps and other clean heat technologies in housing. We are awaiting further details of the scheme.
2025	2025 — SAP11 introduced.	2022-2025 — Home Upgrade Grant — £2.5bn. The Home Upgrade Grant scheme is a £2.5bn government manifesto commitment to provide energy efficiency upgrades and low carbon heating to low income households living off-gas grid in England to tackle fuel poverty and meet net zero.
	2025 — Future Homes Standard introduced.	2022-2030 — £3.8bn Social Housing Decarbonisation Fund further waves (if Conservative manifesto commitment is upheld in spending review).
2028	2028 — 600,000 heat pumps installed per year, according to the government's ten point plan (Climate Change Committee striving for 900,000).	
2030	2030 — current target for all fuel poor and social homes to be EPC C or above where practical, cost effective and affordable.	

Getting started

We have outlined a strategic, national approach to decarbonising housing association homes. In practice, the approach of each organisation may differ and is dependent on many factors including stock condition, distribution and scale as well as organisational size and capabilities.

With the support of SHIFT Environment, we have put together a suggested timeline of activity to support you on your journey to decarbonisation and inform your more detailed plans. As the uncertainties we have highlighted in this document play out, our approaches may change. We have also worked with SHIFT to produce a separate guide for smaller and rural housing associations which will be published later in 2021.

Getting started
Phase one

Phase	Timeframe	Suggested actions for housing associations
Planning and scoping	**0-2 years**	Understand the energy efficiency of and heating technologies in your current stock through a thorough assessment.
		Ensure your organisation is equipped with the practical and strategic expertise to deliver decarbonisation programmes by undertaking an internal skills and resource audit, upskilling and recruiting new staff where necessary. Key areas may include energy efficiency surveyors, procurement specialists, resident engagement experts and those able to support government grant applications.
		Begin to engage residents in developing your strategy and plans to improve the energy efficiency of their homes and discuss the potential for new clean heating systems.
		In line with the government's Clean Growth Strategy, create your own bespoke plans that aim to make all your housing stock rate at SAP 69 / EPC C or better by 2030, focusing on using fabric first insulation measures.
		Build on this by devising plans to transition appropriately insulated homes to low carbon heating systems. Explore potential to deploy on site renewables and other energy-saving measures such as smart meters.
		Consider halting any current plans to remove hot water cylinders from existing homes – future electrical heating is more efficient with hot water storage.
		Establish annual monitoring procedures to measure progress against decarbonisation targets. Third party environmental consultancies may provide an element of independent verification for these reports.
		Start to work towards including retrofit costs in 30-year financial plans and explore the role of government grants and other funding mechanisms.
		Consider partnerships and consortia with other local landlords to pool resources, access funding and maximise procurement potential. In the early stages this will be for planning retrofit programmes and project management.

Getting started
Phase two

Phase	Timeframe	Suggested actions for housing associations
Trialling and testing	**1-3 years**	Start retrofit projects focused on 'no regrets' options, e.g. fabric insulation improvements. Review and learn from works especially with newer technologies. Focus on fabric measures to ensure future clean heat technologies are going to be operating at their most efficient and affordable to the resident.
		Carry out 'stepping stone' trials on heat pump systems in homes where the highest possible energy improvement measures have been made. Identify properties that are suitable for heat pumps using current electricity and gas prices. These are likely to be off-gas properties fuelled with Liquid Petroleum Gas or other systems which have good fabric insulation. This is because the running costs on these archetypes are most likely cheaper with heat pumps than the current heating system. Highly energy efficient new builds may also be viable. Work closely with residents to support them with getting the most out of their new technology, ensure they are accessing all relevant funding support and support them to identify the best tariffs, energy suppliers and deploy supportive technology such as smart meters and on site renewables. You can also trial low carbon heat networks where available.
		Initiate study to establish the cost savings to your organisation of more environmental properties. These should include reduced maintenance costs, reduced voids and rent arrears, as well as potential added asset values. Use this data to support business cases for future retrofit programmes.
		Establish procedures and methodologies to confirm that retrofitted homes actually achieve the energy efficiency to which they are designed. This could include post-occupancy evaluations and smart thermostats.

Getting started
Phase three

2024-2028 (or 2030 at the latest)

Phase	Timeframe	Suggested actions for housing associations
Implement full energy efficiency work	**4-6 years**	Establish plans for annual deep retrofits to meet targets and increase levels of retrofit work across remaining stock.
		Consider plans to integrate energy efficiency improvements with regular component replacement work. For example, if a roof needs replacing, incorporate a solar panel, top up loft insulation and extend the eaves, if it is known that the home will need external insulation sometime in the future.
		Consider establishing Energy Service Company (ESCo) to benefit from solar panels, battery storage and new generation technologies. This will increase value for money and give landlords more control over the price of the electricity they supply. Review battery storage technologies and the opportunities they present to residents and the organisation.

We are the voice of housing associations in England.

With almost 800 housing association members, providing homes for around six million people, we are at the forefront of tackling the nation's housing crisis.

Our vision is for a country where everyone can live in a good quality home they can afford.

We work with our members to make this vision a reality – delivering ambitious programmes that lead to lasting, positive change.

With thanks to:
SHIFT Environment and all the members of our Task and Finish group which supported this work.

housing.org.uk/decarbonisation

NATIONAL HOUSING FEDERATION