

Warm homes and a safe environment:

How government and
the housing sector
can work together to
tackle climate change



Chartered
Institute of
Housing



Homes at
the Heart



orbit
building
communities

Foreword

“Tackling climate change is one of the biggest global challenges we face today. For the UK, decarbonising the housing stock is a crucial element in our national effort and one in which the country’s social landlords have a fundamental role to play, reducing carbon in the houses we own and build and leading the way in tackling the wider housing stock. To do this, we need the support of government and of our tenants, boards and funders.

“This report, jointly authored by the Chartered Institute of Housing and Orbit Group, a leading housing association representing more than 45,000 thousand homes and 100,000 customers, re-establishes the case for urgent action, reviewing what’s been achieved and setting out what still needs to be done.

“This is one aspect of putting **Homes at the Heart**, a national campaign and coalition calling for a once-in-a-generation investment in social housing. Decarbonising our housing is a huge part of this and we are calling on the UK government and the governments in Scotland, Wales and Northern Ireland to join us in taking on this task.

“Like many other social landlords, Orbit is passionate about tackling climate change and is driving fundamental change as a business to address it. We know that this challenge cannot be overcome quickly, but our report clearly identifies the steps we – as a sector working in partnership with government and our communities - need to take.”

Gavin Smart,
Chief Executive,
Chartered Institute
of Housing



Mark Hoyland,
Chief Executive,
Orbit Group



What this briefing does

The housing sector needs to lead the drive to tackle climate change and achieve the targets the government has set to reduce carbon emissions. This briefing sets out the case for change as governments across the UK decide how to boost investment after the Covid-19 crisis.

The briefing is in three parts:

- Why do we need to act now? What do government targets mean for housing? What can the government do to make sure they can be met?
- What does it mean to achieve zero carbon homes?
- How can social landlords contribute?

The briefing is the first part of a two-stage project. CIH and Orbit are working on a further, more detailed guide for social landlords to be published next year.



The targets and what government needs to do to meet them

Why act now?

Along with many other countries, the UK is committed to tackling climate change. The main cause of climate change (or “global heating”) is that we are producing too much carbon dioxide. The Paris Climate Agreement recognised that it’s no longer enough to reduce these emissions, they have to stop completely. We need to “decarbonise” our economy.

The task is urgent. Unless we decarbonise by the middle of this century, along with the other countries who signed the Paris agreement, global heating could become intolerable and severely disrupt life on the planet. So, we need to act quickly but also make sure that our actions are really effective.

Housing is a vital part of this challenge because 14 per cent of emissions come directly from energy used in building our homes and living in them, and more still is affected by our housing decisions, such as energy used in our journeys to work.

Housing is also the sector where progress can be made most quickly. One reason is that the UK is behind other countries. Our housing leaks energy and has inefficient heating systems – we’re near the bottom of the league in Europe for “low carbon” heating. One in ten people face heating bills that are too high for them.

Another reason to act soon is that tackling draughty housing has other benefits. Cold homes cause ill health, so homes that are warmer and less costly to heat are healthier. Poor housing, including cold homes, is **estimated** to cost the NHS £2.5 billion annually in extra treatment, similar to the costs caused by people smoking.

Acting now makes sense because the economy is in recession. A programme to decarbonise housing is a quick and effective way to stimulate it, potentially creating **325,000 UK jobs** over the next 15 years. The government’s Committee on Climate Change has urged it to “use climate investments to support economic recovery and jobs” and many organisations are making a similar call.

What are the government’s targets and what do they mean for housing?

In 2019, the government changed the law to aim for a “net zero carbon” economy by 2050.

In the housing sector, achieving net zero carbon means:

- building new homes that are net zero carbon and if possible that actually generate energy (e.g. for electric vehicles)
- retrofitting existing homes to raise their energy efficiency and make their power and heating sources renewable
- decarbonising the rest of a social landlord’s operations, e.g. moving away from petrol-based vehicle fleets, making offices net zero carbon, reducing consumption of non-renewable materials, reducing water consumption, etc.

Social landlords need to lead this agenda, to benefit tenants, create jobs and make sure they meet government targets. They should be ready to take advantage of any stimulus package and to show that they can have a wider role in driving decarbonisation of the housing stock.

Housing has its **own specific target** as a steppingstone to 2050:

- all fuel poor homes to be upgraded to Energy Performance Certificate (EPC) Band C by 2030
- as many homes as possible to be EPC Band C by 2035 where practical, cost-effective and affordable.

Currently, 19 million UK homes fall below this standard, meaning that 1.2 million homes must be retrofitted each year to achieve it. In 2018, Scotland published a **route map** to meeting the EPC band C target by 2040, now to be advanced to 2030. The Welsh Government has been **recommended** to set a target of achieving EPC band A in social housing within ten years. So far there is no specific target for Northern Ireland.

Clear definitions

In shaping our strategies we need to be able to use the right terms and be clear on exactly what it is that we want to achieve.

Decarbonise

reduce the amount of carbon released by human activity or a specific sector (e.g. electricity generation).

Retrofit

making changes to an existing building to make it more energy-efficient.

Energy Performance Certificates

a rating scheme to summarise the energy efficiency of buildings; EPC bands range from “G” (very poor) to “A” (highly efficient). EPCs have both an “energy efficiency” rating and an “environmental impact” rating. The target usually refers specifically to the energy efficiency rating. Use of EPCs to set the target is often questioned as they may not be an accurate measure of a building’s real energy efficiency. The EPC band C target is controversial, since it falls short of the two higher bands which could lead to net zero carbon and might lead to work being done again to reach a higher standard.

Zero carbon

a zero-carbon building or activity is one that does not cause any carbon emissions to be added to the atmosphere when it is built or in its use.

Net zero carbon

means that any carbon emissions are balanced by absorbing an equivalent amount from the atmosphere (e.g. offsetting through tree planting).

[Click here to read more about it.](#)



Designing in biodiversity Orbit's St. Bede's development

How does the government plan to meet these targets?

The government has so far announced:

- A £2 billion Green Homes Grant for retrofit in England, funding up to two-thirds of the cost in over 600,000 homes, supporting over 100,000 jobs. £500 million is reserved for low-income households and £500 million allocated to **local authorities to support fuel-poor households.**
- A **£50m social housing retrofit programme** for “innovative approaches to retrofitting social housing at scale to make them greener.”
- A further **£26 million** to “reduce build costs and carbon emissions in the construction industry.”

Scotland, Wales and Northern Ireland all have public funding programmes but will need to invest more to meet the targets. Their strategies are under review. Scotland has pioneered the setting of ambitious energy-efficiency standards, not just in social housing but in the private sector.

Will this be enough?

Recent announcements will only be effective if they are the start of a long-term strategy and investment programme. In 2019, the government published its Green Finance Strategy which estimated the cost of achieving the retrofit target to be between £35-65 billion and acknowledged that considerable private sector funds would need to be mobilised. The government’s 2019 election manifesto promised £9.2 billion over five years for energy-efficiency work, beginning in 2020/21. Only part of this funding has so far been announced.

CIH and other bodies are urging the government to make a full commitment in its Autumn Statement. It should show consistency of effort across the whole of the UK, to ensure a fair and equitable approach to meeting a UK-wide target. It should give a clear role to social landlords to take the lead and provide resources that enable them to do so.

But making public money available is not enough in itself. Ways must be found to lever in private finance, stimulate the market and drive action from the banks. A skilled workforce will be needed, new materials and technologies are required, and measures must be put in place to ensure work is carried out to a high standard and to protect the investment that householders make.

Public awareness of the importance of energy efficiency in buildings must be raised dramatically, so that people back the programme and invest in their own homes. A range of carrots and stick will be needed. Monitoring a programme’s effectiveness and being willing to alter it are important at UK level and for the devolved governments who share responsibility for the task.

Recent announcements set the wheels in motion, put government backing in place and show how energy efficiency can be at the heart of economic recovery. But much more is needed, without further delay, if the government’s targets are to be met.

Working together with government

It is vital that the housing sector works closely with government to grasp the scale and urgency of the task of decarbonising the housing stock. The ten key steps needed from both the UK and devolved governments are these:

- 1. Demonstrate commitment** – the government must be fully signed up to the 2050 target for net zero carbon and set steps that show how it will be reached. Make it central to government policy and budgeting – part of its UK National Infrastructure Strategy – and emphasise that this is about a sustained drive, not short-term initiatives.
- 2. Get the public on board** – the impact of decarbonisation will be huge. Not just the government but the public must be signed up to it, too. Make clear that it is “science led” like the approach to the pandemic. It’s a challenge that is bigger than one government’s term in office: we’re talking about a whole generation.
- 3. Show how important housing is in meeting the target** – confirm the interim step of getting the whole stock to a moderate energy efficiency standard (EPC band C) by 2035, but also clarify how this should form a steppingstone to net zero. Make this is a key driver of housing policy. Tell people what’s involved and what the benefits will be.
- 4. Build all new homes to proper net zero carbon standards** – in England, this means ensuring that the new “Future Homes Standard” is based on it. Builders must be clear about what’s expected by 2024 – so that all homes can be built to this standard from 2025.

- 5. Plan for a huge and effective programme to retrofit existing homes** – work out the implications for materials, skills and monitoring the process. Build on recent pilot schemes and those resulting from this year’s kickstart funding. Set a strategy that puts councils in charge at local level. Work out the best ways to lever in private finance.
- 6. Budget for the right amounts of public support** – to get the private sector moving. Recognise that effective responses require adequate lead-in times.
- 7. Go for the low hanging fruit** – while working out how to tackle the millions of homes that are “hard to treat”, have a programme to tackle the remaining homes that lack loft or cavity wall insulation.
- 8. Make sure the programme does what it says on the tin** – set standards, monitor their achievement and be ready to change the programme if it is going off course.
- 9. Decide which technologies to back** – secure investment in them and give a clear message that they are going to be rolled out at scale.
- 10. Let social housing take the lead** – it can help create the market and develop the skills and supply chains that will be essential for this huge task. It can make sure fuel-poor households get earlier priority. But it must be recognised that the sector will also take the risk of using technologies and face the costs if they fail to perform.

This is the moment to launch an ambitious programme that builds on the public awareness created by the pandemic, generates jobs and captures the moment for a generational change in how we build and use our homes.

Making our homes “zero carbon” – what does it mean?

The first task – building new zero carbon homes

To get to net zero carbon new build we need to:

- reduce the amount of energy we use, by making buildings and their components more energy-efficient
- make sure the remaining energy that we use is from renewable sources.

There is no fixed specification for a net zero carbon house although criteria will be required soon for whatever level of carbon reduction is targeted under the planned Future Homes Standard for England and Wales.

A new home will reduce overall demand for energy, use renewable energy and have low water consumption. If it uses any non-renewable energy, e.g. for appliances, then it will have to generate clean energy (e.g. through solar panels) to compensate for what it uses. Water use is kept low to minimise heating needs and reduce water demand in the community. Carbon used in the construction work and embedded in materials is minimised.



The UK Green Building Council sets out a **framework** for achieving net zero carbon status, in which the main steps are:

1. Look at both energy use in construction and use of energy in the completed home.
2. Cut the carbon costs of construction – assess them and offset them.
3. Cut operational energy use – give this priority and monitor the results “in use”. This is likely to require a “fabric first” approach:
 - very high levels of insulation
 - high performance windows with insulated frames
 - airtight building fabric
 - no “thermal bridges” in the building’s construction
 - possible use of mechanical ventilation with highly efficient heat recovery
4. Increase renewable energy use – whether on-site or from off-site sources.
5. Offset any remaining carbon via a recognised framework.

Making a new home genuinely zero carbon at the outset is around five times cheaper than retrofitting it later, and almost always will reduce residents' energy bills too.

There are varying estimates of the extra cost of building to the new standard, which put the extra at between 2-10 per cent on top of normal build costs, assuming net zero is rolled out at scale. In comparison, going back to install extra measures later could cost over £20,000 per unit.

A net zero new home will be more comfortable, cheaper to run and offer residents the knowledge that they are helping tackle climate change. These are easily marketable benefits for homebuyers, which are likely to offset the extra costs. For tenants, homes become more lettable, popular and with more affordable running costs. Low water demand means that more homes can be built in areas of water stress. Many living on low incomes will find the homes easier to heat and cheaper to run: fuel poverty should disappear.

There are many examples of zero carbon new homes like A2Dominion's scheme in Bicester. It is vital that we learn from projects like this and build the experience into mainstream practice.

The second task – decarbonising our existing homes

UK homes are **unfit for the challenges of climate change**.

To make them low carbon, low-energy and resilient to a changing climate they will need:

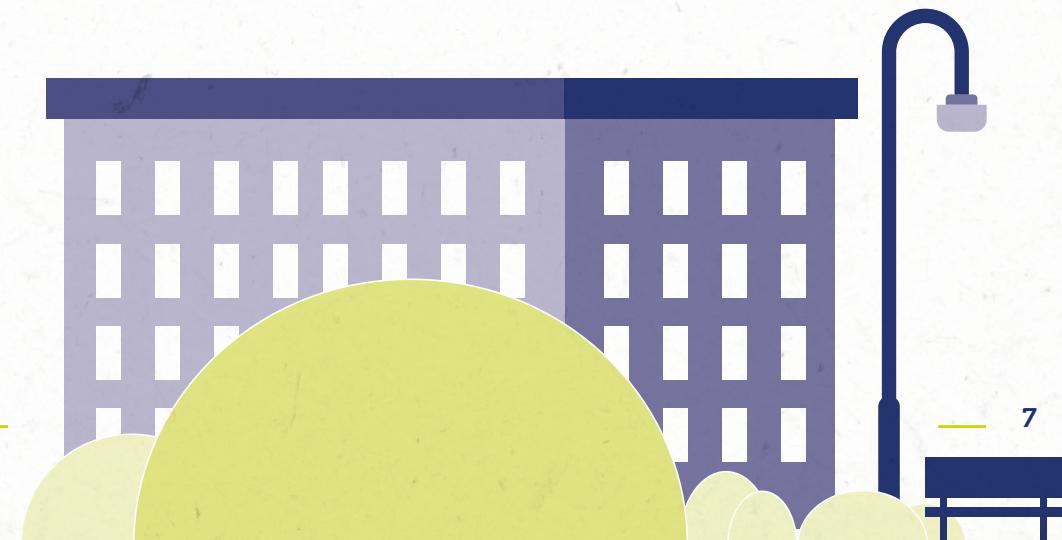
- excellent insulation in lofts, walls and (possibly) floors
- double- or triple-glazed windows
- draught-proofing
- low-carbon heating to replace gas or solid-fuel boilers
- energy-efficient and water-efficient appliances
- protection against flooding if required.

A2Dominion's zero carbon homes in Bicester

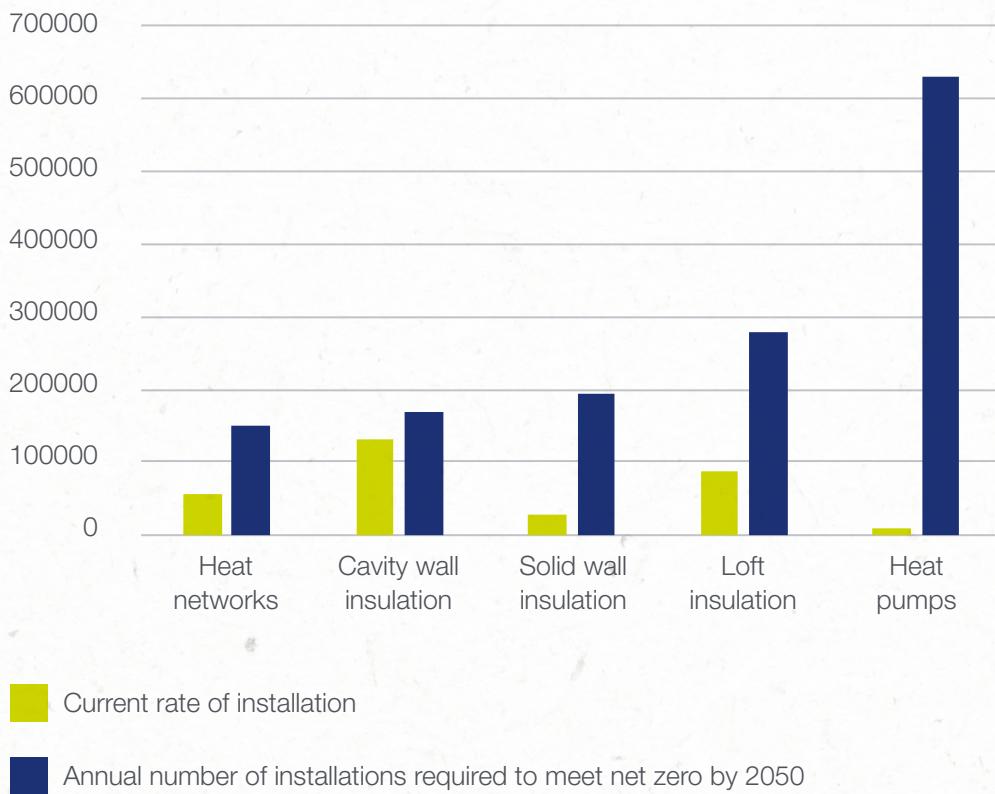
Elmsbrook is a 393-home development, the first phase of North West Bicester eco-town. All homes have super high insulation levels as part of a "fabric first" approach, including triple-glazed windows.



Photos courtesy of A2Dominion. Contact: communications@a2dominion.co.uk



Installation of low carbon technologies across the UK



Source: All Hands to the Pump, IPPR 2020.

How big a job is this? It varies considerably according to the age and type of stock. Some of the measures needed are shown in the chart. The easiest and most cost-effective ones – such as loft and cavity wall insulation – have already been carried out in most homes, although over a third still need this basic work. But the bulk of the measures now needed are more difficult and more expensive.

Heating is also an area where provision is lagging badly behind, with an estimated 19 million homes needing to have low carbon systems installed by 2050 to replace gas and oil-fired boilers. They are more expensive: for example, an air source heat pump costs £6-8,000 compared with a gas boiler costing around £2,000.

A “fabric first” approach is vital. For example, it is simply not appropriate to fit a heat pump without first significantly improving the building fabric, otherwise the heat load would be too high in most cases, with high running costs.



What will retrofit cost?

Because the retrofit task is enormous and the unit cost per property can vary considerably, it is hardly surprising that overall cost estimates also vary:

- The government's **own estimates** for achieving the 2030 target are very wide-ranging – between £2.3 billion and £4.3 billion annually.
- The **Energy Efficiency Infrastructure Group** estimates that annual investment of £5.2 billion is needed - government funding of £1.7 billion aiming to leverage £3.5 billion of private investment from owner-occupiers and landlords.
- IPPR **estimates** that £10.6 billion is needed per year to 2030 across the UK, reducing to £7 billion per year from 2030 to 2050. Within this the social sector would need to spend £36 billion in total. With large-scale deployment, costs could be reduced by 20 per cent by 2030.

In Wales, **Better Homes, Better Wales, Better World** estimates a cost of £0.5-1 billion per year, over ten years, to retrofit social and fuel poor homes to EPC band A.

Clearly work is needed to settle on reliable cost estimates in the context of a proper plan for the investment and how it will be achieved.

What are the benefits?

The main reason for action is to help meet the government's carbon reduction targets and to avoid climate chaos. Fortunately there are many other benefits, including:

- **Cutting energy bills:** Reducing total energy use by 25 per cent by 2035 would result in average energy savings for consumers of roughly £270 per household per year.
- **Fuel poverty:** Affecting 2.5 million households, this could be ended.
- **Jobs:** Some 66,000 to 86,000 new jobs could be sustained annually across all UK regions.
- **Economic Growth:** A "cost-effective" approach would require an estimated £85 billion investment but would deliver benefits (reduced energy use, reduced carbon emissions, improved air quality and comfort) totalling £92 billion.
- **NHS savings:** Reduced NHS costs of roughly £1.4 billion each year in England alone. The health service is estimated to save £0.42 for every £1 spent on retrofitting fuel poor homes.

Many places **outside the biggest cities** would benefit from a retrofit programme, helping to ensure investment goes to poorer areas and to generate jobs.



What can social landlords do?

Can social landlords take the lead?

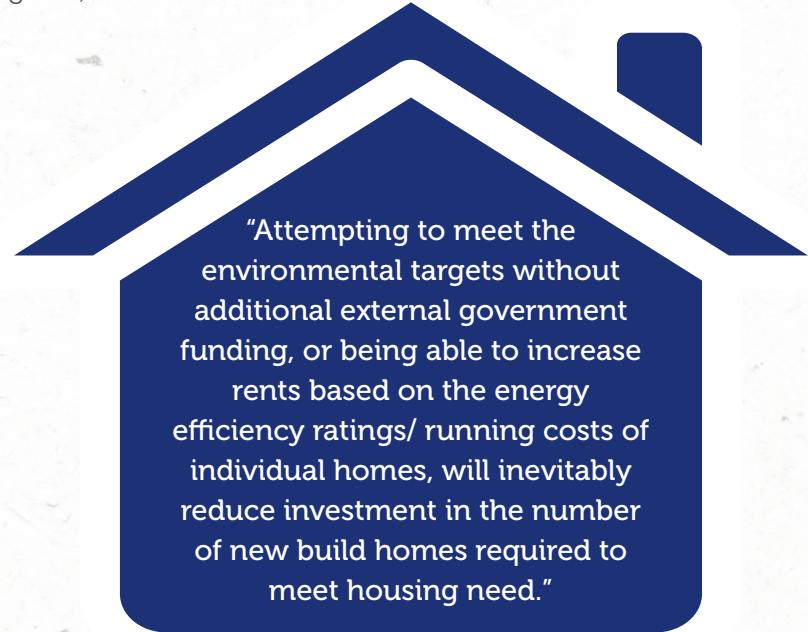
The UK parliament has called for social housing to be the “flag bearer” for energy efficiency. This makes sense, because the sector is already performing better and has the structures to deliver results. But it needs the technological solutions, financing options and policy framework to be in place. The government’s National Infrastructure Assessment recommended a £3.8 billion budget for the sector to 2030 and the Conservative manifesto promised this amount as the “Social Housing Decarbonisation Fund.” But a parliamentary committee warns that while the government wants the sector to lead, it “has failed to set out a trajectory for the sector, let alone a policy framework,” and that it is vital that “government acts with urgency” to agree a strategy and ensure that zero carbon targets are embedded in the sector’s business plans.

Savills estimate the average net cost of retrofitting social housing to band C to be about £17,000 per unit if combined with other refurbishment work. Some 2,200,000 dwellings need to be retrofitted, or 146,000 annually at a net cost of £2.4 billion per year. One housing association, Raven, has costed the work to achieve the full zero carbon target in its stock at £20,000 per unit on top of normal investment – a sum compatible with the Savills estimate.

The government must now quickly start and then gear up the Social Housing Decarbonisation Fund to around £400 million per annum from 2021/22 onwards, aimed at levering in the additional finance from the sector itself. This will soon provide evidence on whether this is sufficient to achieve the 2035 target or whether extra funding is needed.

What social landlords need to tackle their own stock

It is important to recognise that social landlords have to balance investment in their existing stock with meeting government commitments to build new affordable homes. One social landlord, commenting for this guide, said this:



“Attempting to meet the environmental targets without additional external government funding, or being able to increase rents based on the energy efficiency ratings/ running costs of individual homes, will inevitably reduce investment in the number of new build homes required to meet housing need.”

Another commented that if the government said “if you move your homes to a C or above rated, you can charge more rent to recover the capital cost”, this would help social landlords put in the additional long-term investment required, and not wait for government funding to fill the gap.

These comments show the strategic choices involved in what will be a huge commitment by landlords.

Orbit aims for zero carbon

Orbit, with Savills, have assessed the work needed to all properties to achieve zero carbon in a three-stage process:

1 Fabric Improvements

- Upgrading insulation to external walls, roof, windows, doors and floors of all homes.
- Aiming to reduce demand on whatever heating source is installed, reducing bills for customers while preparing the property to be able to sustain alternative heating sources in the future.
- Raising specifications of capital programmes to ensure the building fabrics achieve a “high” EPC band C standard throughout the period of works while poorer performing properties (below EPC band C) are programmed for fabric improvements prior to 2030.

2 Replacement of fossil-fuel powered heating systems

Following fabric improvements, properties will be able to sustain a non-fossil fuel heating system.

Orbit are currently investigating heat pumps and possibly hydrogen-powered boilers, while continuing to use gas systems in the interim.



3 Renewable technologies

Even after fabric improvements and removing fossil-fuel powered heating systems, there will still be a level of residual carbon produced.

The next stage will look at self-generation and storage of electricity through the primary mechanisms of solar or wind generation on either an individual or a scheme-based level. However, industry commitments to decarbonise the electricity grid may result in a zero carbon supply, so to allow time for such developments, the renewable element of Orbit's plan is focussed on works post-2040.



Orbit's Erith Park development

Orbit's approach: Orbit Earth

Established in 2018, Orbit Earth was born from an employee's drive to do more to protect the environment. Starting as an employee engagement campaign at grass roots, it has since become Orbit's group-wide environmental programme and a key pillar of the forthcoming corporate strategy. People have been at the heart of this cultural shift. Orbit Earth empowers employees to improve existing ways of working with the environment in mind.

One of the practical steps Orbit took to realise and quantify the extent of our impact, was to measure our carbon footprint. From this baseline we gained a good broad understanding of the impact we have as an organisation and the importance of our supply chain alongside our stock.

Our baseline year showed that our upstream supply chain accounts for 97 per cent of our footprint (excluding our stock) and highlighted the importance of partnerships in achieving our environmental aims. The process is an eyeopener and helps set the foundations for sound data and reporting, opening the door to strategy, target-setting and investment.

This new data opened up new ways of thinking. It gives us scope to set carbon targets and budgets as well as financial and customer satisfaction objectives. It also challenges previous programmes and highlights challenges with programmes such as energy efficiency retrofit. Whilst shrinking your carbon footprint and tackling fuel poverty can go hand in hand, there are conflicts, especially in the use of gas to heat homes.

By redefining our design standards coupled with a shift in strategy towards the direct build of new homes, we have more control over our supply chain carbon footprint and the environmental performance of our homes. The government target to 2050 will encourage a holistic and long-term lifecycle approach to our stock – the higher performance we can achieve in development, the lower the investment required to retrofit or offset down the line.



Jessica Marshall, Orbit's Environmental Impact Coordinator

Making a cultural and strategic shift

By now, net zero should be on your organisation's radar but there is still likely to be a cultural shift necessary to drive the step change needed. It's no longer enough to treat Corporate Social Responsibility (CSR), Environmental Social and Governance (ESG) or sustainability as an add-on or have people working on it in isolation from the rest of the business. Working towards environmental goals should be core to business decisions in every team. For success, engagement and buy-in is needed from all angles, not only senior leadership but staff at all levels, and crucially your supply chain and customers.

Truly embedding environmental sustainability will need the right skills and resources. This will mean upskilling, educating and building staff resources internally, but also drawing upon expertise through external partnerships as well as learning from, and sharing best practice within, the sector. As many social landlords start to establish new strategies and embark upon the piloting of new technologies, it is the lessons learnt - both successes achieved, and challenges discovered - that will help lessen the enormity of the net zero goal. Be transparent: it's not about getting there first, it's about getting it right and maximising impact by telling people what you are doing.

There's a final crucial factor and stakeholder to remember: our customers. Whilst we must provide our customers with an energy-efficient, low carbon home, it is how they use their home that makes or breaks its true environmental performance. A considerable part of the "energy-performance gap" is down to behaviours: a change in energy consumption habits alone can see a fall of up to 20 per cent in energy use.

This report is our starting point. In it, we re-establish the case for the decarbonisation of our nation's homes and set out the steps we all need to take. We know that we are asking for a lot but the

challenge ahead of us demands nothing less. While government can provide investment and the right policy framework, in partnership we as providers need to implement that change. Our guide for social landlords, published next year, will set out how we do that.



Britain in Bloom winner 2019, Orbit's Malt Mill Lane, Stratford-upon Avon



Creating community gardens with Orbit residents in Stratford



Orbit's employees volunteer to plant trees



Orbit's car sharing scheme



Homes at the Heart

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The Chartered Institute of Housing (CIH) is the independent voice for housing and the home of professional standards. Our goal is simple – to provide housing professionals and their organisations with the advice, support and knowledge they need to be brilliant. CIH is a registered charity and not-for-profit organisation. This means that the money we make is put back into the organisation and funds the activities we carry out to support the housing sector. We have a diverse membership of people who work in both the public and private sectors, in 20 countries on five continents across the world.

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