

The Sixth Carbon Budget: a briefing for housing associations

6 May 2021

Summary

This briefing explains what the Sixth Carbon Budget is and the key implications for housing associations.

Background to the Sixth Carbon Budget

The Climate Change Committee

The Climate Change Committee (CCC) is an independent, statutory body established under the Climate Change Act 2008. Its purpose is to advise the UK and devolved governments on emissions targets and to report to Parliament on progress made in reducing greenhouse gas emissions and preparing for, and adapting to, the impacts of climate change. The CCC consists of a range of leading academics and experts on climate change and relevant sectors and is chaired by Lord Deben, the UK's longest-serving Secretary of State for the Environment (1993 to 1997).

Under the Climate Change Act 2008 the CCC is required to produce a number of statutory reports for the government. The key reports are:

- Advice on carbon budgets and targets.
- Progress reports on meeting carbon budgets and targets.
- An assessment of UK climate change risks and opportunities.
- An assessment of the compatibility of onshore petroleum with UK carbon budgets.

In addition, ministers can request CCC advice on specific issues and topics. The CCC also produces reports on specific sectors such as land use, coastal change and the decarbonisation of UK housing, and on key technologies such as hydrogen. Conclusions, analysis and underlying data are all available [on the CCC website](#).

Particularly of interest for NHF members will be:

- The [Sixth Carbon Budget](#) and [accompanying policy paper](#).
- [The Buildings Sector Summary for the Sixth Carbon Budget](#).
- [Housing, Fit for the Future? and accompanying paper on adaptations in residential buildings](#).

What is a carbon budget and why are there six of them?

In the 2008 Climate Change Act, the UK set out a long-term climate objective of cutting overall greenhouse gas emissions by at least 80% (relative to 1990) by 2050.

In 2019, this was replaced with a target of achieving net zero emissions by 2050 (100% reduction compared to 1990 levels).

The CCC draws up 'carbon budgets' (which are also part of the 2008 Climate Change Act) to provide a five-year statutory cap on total greenhouse gas emissions which should not be exceeded, in order to meet the UK's emission reduction commitments. Taken together, sequential carbon budgets define a cost-effective path towards Britain's long-term climate objective. Each budget is set 12 years ahead of time to provide sufficient long-term guidance to investors.

The CCC undertakes an annual assessment of whether the UK is on course to meet its carbon budgets, and reports this progress to Parliament. UK emissions have continued to fall since the Climate Change Act was passed in 2008. In 2018, the UK's greenhouse gas emissions were 44% below 1990 levels. This means the UK has met the first two carbon budgets (2008-12 and 2013-17) and is on track to meet the third (2018-22). It is not however currently on track to meet the fourth (2023-2027) or fifth (2028-2032).

It is important to note that a significant proportion of the reductions achieved are the result of international 'outsourcing' of UK emissions. Our production of greenhouse gas emissions within our borders has fallen significantly. However, we retain high levels of demand and consumption for various emitting goods and services (around 50% higher than our territorial emissions) which are now simply produced elsewhere (including EU, USA and China), so our contribution to the reduction of overall global emissions is much less significant.

When recommending a carbon budget, the CCC takes into account a number of factors, including the latest evidence from climate science and relevant international developments (for example, the Paris Agreement), but also the cost effectiveness of the proposed path and its impact on competitiveness, fuel poverty, the fiscal balance and the devolved administrations.

The government considers this advice before making its own recommendations to Parliament, which sets the carbon budgets in law. So far, the government and Parliament have largely followed the advice of the CCC, although the fourth carbon budget was passed subject to a review, which was carried out in 2014.

In the Sixth Carbon Budget the CCC emphasise that, in the context of COP26, 'legislating our recommended budget would send a clear signal that the UK is open for low-carbon investment. This will help to encourage private investment at low cost

at a time when it is needed to support the UK's economic recovery from the COVID-19 health crisis.'

The carbon budgets concern overall emissions from all sectors. They do not make recommendations on the relative contributions expected from different sectors – this is left to policy. After a carbon budget has been set, the government is mandated under the Climate Change Act to define, as soon as is practical, its strategy for meeting that budget.

The Sixth Carbon Budget

The UK's Sixth Carbon Budget will run from 2033-2037 and is 'the most comprehensive advice (the CCC) have ever produced. It is a blueprint for a fully decarbonised UK.'

The CCC's recommended pathway requires a 78% reduction in UK territorial emissions between 1990 and 2035. In effect, it brings forward the UK's previous 80% target by nearly 15 years. They argue that this target should be accompanied by a similarly ambitious pledge to reduce emissions by at least 68% from 1990 by 2030. Recent UK emissions reductions have come from the transition away from coal-fired power, which is almost complete. Future reductions must come from transport, industry, buildings and agriculture, as well as phasing out gas-fired power.

Prior carbon budgets have not included emissions from international aviation and shipping, as UN convention is to report these separately. The Sixth Carbon Budget diverts from that and includes these emissions in the overall target.

On this pathway, progress toward the outlined targets over the next few years would be gradual. The country needs to make up for 'lost ground' and focus on developing supply chains, technologies and societal buy-in. A critical moment will arrive in the early 2030s when sales of most high-carbon goods will be phased out altogether. UK emissions should then fall sharply over the 2030s, before levelling off in the 2040s, as we clear the final hurdles to net zero. However, the CCC is clear, the 2020s must be the decisive decade of progress and action.

What is the challenge for the housing sector?

According to the CCC, buildings are particularly challenging to decarbonise and progress has been slow to date, with emissions remaining flat or rising for the last five years.

The majority of emissions in 2018 – the most recent year for which there is an accurate estimate of emissions for all sectors – were associated with the combustion of fossil fuels in the ‘energy system’ (electricity production, transport, heat in buildings and industrial processes).

In 2018, less than 5% of the energy used for heating homes and buildings was from low-carbon sources.

Direct greenhouse gas emissions from buildings in 2019 were around 17% of the UK total. More than three quarters (77%) of this was from homes.

According to the report, around 74% of the UK’s heating and hot water demand in buildings is met by natural gas, and 10% by petroleum, with smaller amounts of other fuels such as coal and biomass. Buildings are also responsible for 59% of UK electricity consumption and contribute significantly to the country’s ‘indirect emissions’ from the electricity grid. Most electricity use stems from appliances and lighting in homes, and cooling, catering and ICT equipment in non-residential buildings.

The implementation of key measures remains at very low levels, with weak supply chains for key measures such as insulation and heat pumps, and hydrogen use still in a development phase.

Levels of public engagement are low – in particular, there is low awareness of the need to shift to low-carbon heating. This is compounded by the relatively low cost of gas heating and balance of policy costs between electricity and gas, which make low-carbon options uncompetitive.

The UK housing stock is both diverse and relatively energy-inefficient, which means that a range of approaches is necessary. This includes a range of tenures – council, housing association, private-rented, owner occupiers with mortgages, owner occupiers without mortgages – as well as freeholders and leaseholders.

The CCC do believe, on the basis of modelling, that despite the challenges delivering net zero emissions in buildings is feasible.

What needs to happen and when?

The government has accepted the CCC's Sixth Carbon Budget targets. The CCC recommends the following in their 'balanced pathway'. The tables below provide some detail on the timings and policy recommendations the CCC makes for decarbonising housing.

Between 2019-2035, buildings emissions need to fall by just under 50% on the way to reaching near-zero by 2050. By 2033, all of the UK's buildings should be energy efficient and all boiler replacements should use low-carbon technologies such as heat pumps. Alternatively, they should be part of a zone for district heating, or possibly a hydrogen option.

If the CCC's plan is followed, across all buildings, around 34% of reduction up to 2030 will be the result of energy efficiency measures, alongside a growing share from low-carbon heating. The CCC want to see buildings shift to low-carbon heat networks, high efficiency and flexible electrification, along with some hydrogen near industrial clusters from 2030.

For homes, the CCC advise phasing out high-carbon fossil fuel boilers not connected to the gas grid by 2028 and gas boilers by 2033. Most of the energy efficiency programme should be completed by the time fossil fuel boiler installations are phased out from 2033.

They recommend the government produce a robust and ambitious Heat and Buildings Strategy, setting the direction for the next decade, with clear signals on the phase-out of fossil fuel heating, rebalancing of policy costs between electricity and gas, commitments to funding and delivery plans which include regional and local actors. The Department for Business, Energy and Industrial Strategy (BEIS) are already developing this.

According to the report, work is needed by the government to scale up supply chains for heat pumps and heat networks and to develop the option of hydrogen for heat. Proper enforcement of EPC standards, including avoiding overheating risks, and an effective approach to skills are essential.

The CCC suggest the government introduces a favourable VAT regime – including on the sale and installation of low-carbon technology and supporting low-carbon solutions.

More broadly, the CCC say it will be essential for the government to assess how the costs of all forms of heating – electric, hydrogen, hydrogen-hybrid and heat networks – can be made fair, and protect vulnerable and low-income households. This is particularly important with different solutions emerging in different parts of the country.

CCC Housing Climate Policy Deadlines

Efficiency/heating	Balanced net zero pathway date	Scenario implications
All new buildings are zero carbon	2025 at the latest	100% of buildings built with high levels of energy efficiency and low-carbon heating (e.g. heat pumps or low-carbon heat networks).
Rented homes achieve EPC C	2028	Rented homes to achieve EPC C by 2028, such that all practicable lofts and cavities are insulated alongside other low regret measures, with solid wall insulation deployed where this supports low-carbon heat and wider benefits.
Standards for lenders targeting EPC C across the housing portfolio	2025-2033	Homes with mortgages achieve EPC C by 2033, such that all practicable lofts and cavities are insulated alongside other low regret measures, with solid wall insulation deployed where this supports low-carbon heat and wider benefits. This covers just under half of all owner-occupied homes.
All homes for sale EPC C	2028	No dwellings sold unless they meet the minimum standard. At the current housing turnover of once every ten years for mortgagors and once every 24 years for outright owners, regulations at point of sale would be expected to result in a further 15% of owner occupied homes meeting the required standard by 2035 (with further upgrades

		driven by the standards on lenders, totalling at least 60% of owner-occupiers overall).
All commercial efficiency renovations completed	2030	All energy efficiency improvements by 2030 to meet the government's target of reducing business and industrial energy consumption by 20%.
All boilers are hydrogen-ready	2025	By 2025 at the latest, all new gas boilers are hydrogen-ready.
Oil and coal phase-out (outside of any zones designated for low-carbon district heat)	2028 (residential)	100% of heating system sales off the gas grid are low-carbon from 2028, with exemptions for any buildings in zones designated for low-carbon district heat. Earlier dates may be possible in public and commercial buildings.
Natural gas phase out (outside of zones designated for low-carbon district heat or hydrogen conversion)	2033 (residential)	100% of heating system sales are low-carbon from 2033, with exemptions for any buildings in zones designated for low-carbon district heat or hydrogen-conversion. We assume an earlier date of 2030 in public buildings to achieve the Clean Growth Strategy target of 50% emission reduction by 2032.
CHP phase-out for low-carbon district heat	2025	Currently, around 93% of district heat networks use a fossil fuel-based primary fuel source. We assume that all new district heat network connections from 2025 will be low-carbon. All heat networks supplied by legacy CHP schemes convert to low-carbon heat sources by 2040.

Summary of CCC buildings policy recommendations

Summary of policy recommendations in buildings	
Heat and Buildings Strategy	Produce a robust and ambitious heat strategy that sets the direction for the next decade, with clear signals on the phase-out of fossil fuel heating and commitments to funding. This must include a clear set of standards, plans to rebalance policy costs while making low-carbon more financially attractive, plans to introduce green building passports, and a role for area-based energy plans.
Standards for existing buildings	Bring forward the date to reach EPC C in social homes to 2028, in line with the private rented sector proposals, and finalise the delivery mechanism. Implement private rented sector proposals for homes and non-residential buildings in line with new proposals and implement improvements to the EPC framework, and ensure they drive the energy efficiency measures needed. Develop options to cover the regulatory policy gap for owner-occupied homes, looking at trigger points at point of sale and through mortgages. Publish proposals for standards to phase out liquid and solid fossil fuels by 2028, and in-use standards in commercial buildings.
New-build standards	Implement a strong set of standards – with robust enforcement – that ensure buildings are designed for a changing climate and deliver high levels of energy efficiency, alongside low-carbon heat. Publish a robust definition of the Future Homes Standard and legislate in advance of 2023.
Green recovery and supply chain development	Provide a stable long-term policy framework to support sustained growth at sufficient scale (i.e. 600,000 heat pumps per year in existing homes by 2028). Ensure continuing support for non-residential heat pump installations beyond 2022, including low-carbon heat sources for district heating schemes. Create a level playing field for hybrid heat pumps by continuing to support new business models off the gas grid, both financially and by ensuring hybrid heat pumps are an integral part of PAS2035 retrofit coordinator advice .

How much will it cost?

The CCC argue that to meet their pathway, a major nationwide investment programme, led by the government, but largely funded and delivered by private companies and individuals is needed. Given a small overall economic impact, and the expectation for the private sector to finance most of the transition, the overall impact on public finances should be limited. The table below shows how the CCC suggest the £3.8bn social housing decarbonisation fund is invested up to 2030.

Low-carbon investment must scale up to £50bn each year by 2030 to achieve net zero – their central estimate for costs is now below 1% of GDP throughout the next 30 years. The largest increases in investment are for low-carbon power capacity, retrofit of buildings and the added costs of batteries and infrastructure for electric vehicles.

Total investment costs for decarbonising buildings are £360bn to 2050, of which around £250bn is for the programme of upgrading homes. This is an average investment of less than £10,000 per home, over the next 30 years. The report says this can be achieved with practical policy design and some government funding. 63% of homes need spend no more than £1,000 on retrofitting energy efficiency measures.

Total investment in the programme of efficiency in existing homes in is around £45bn to 2035 with a total spend of £55bn by 2050. This compares to the estimate published by BEIS of £35-65bn to achieve the EPC C standard.

The CCC plan can be implemented without large increases in consumers' energy bills, especially as the savings from low-cost renewables begin to be reflected in consumer bills. Indeed, policy can be designed to ensure that vulnerable customers benefit from lower energy bills, given the lower operating costs resulting from improvements in energy efficiency of homes and heating systems.

Investment costs to 2030 in the Balanced Pathway alongside committed public expenditure

Segment	Estimated investment costs	Committed public expenditure to 2030 (estimated)	Comment and RAG rating
Fuel poor owner-occupied homes, energy efficiency	£4.5bn-8.9bn	<p>UK government: £5-6bn across fuel poor homes (ECO, portion of the Home Upgrade Grant, portion of Green Homes Grant).</p> <p>Around £0.5bn at devolved administration level.</p> <p>Further funding possible from Scottish government.</p>	Funding in line with projected costs.
Social housing, energy efficiency	£3.1bn-£4bn	<p>UK government: £3.8bn.</p> <p>Further funding from Scottish government.</p>	Funding in line with projected costs.
Other owner-occupied homes, energy efficiency	£10.6bn	<p>UK government: £1bn-£2bn (a portion of the Green Homes Grant).</p> <p>Further funding from Scottish government.</p>	Current funding in place to 2022 with a focus on private finance for remainder.

Private-rented homes, energy efficiency	£11.1-£13.5bn	UK government: fuel poor funding (see top row) and Green Homes Grant. Possible further funding from Scottish government.	Regulatory approach designed to leverage private financed.
Heat pump scale up to 2025, existing homes.	Estimated £3bn	UK government: Estimated £0.5bn-£2bn (Clean Homes Grant plus a portion of Green Homes Grant and Home Upgrade Grant). Further funding from Scottish government.	Additional funding is required to support the scale up of supply chains ahead of the introduction of standards.
Heat pumps, 2025-2030, existing homes	£17.7bn including £2.8bn in social homes	Negligible.	Current gap in social homes – extent of additional gap will depend on funding model.
Heat networks (all buildings)	£17.5bn in total, of which £5.5bn to leverage private investment	UK government: £0.6bn, aiming to leverage £2bn private finance.	Further funding required, particularly for low-carbon heat sources post-2022.