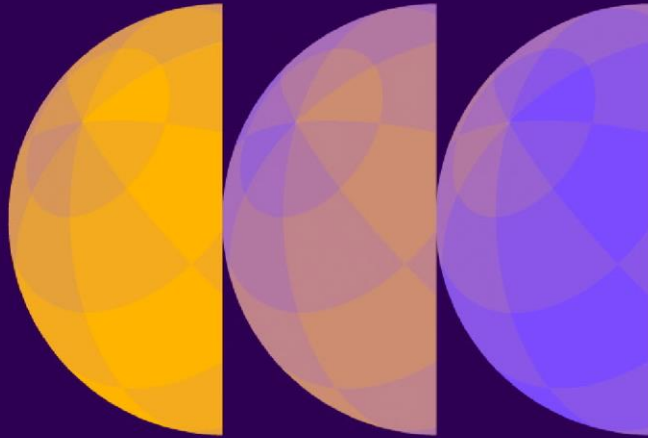


14th December 2020

Unpacking the Sixth Carbon Budget – The transition for buildings



Climate
Change
Committee

1. Context

2. Pathways

3. Costs

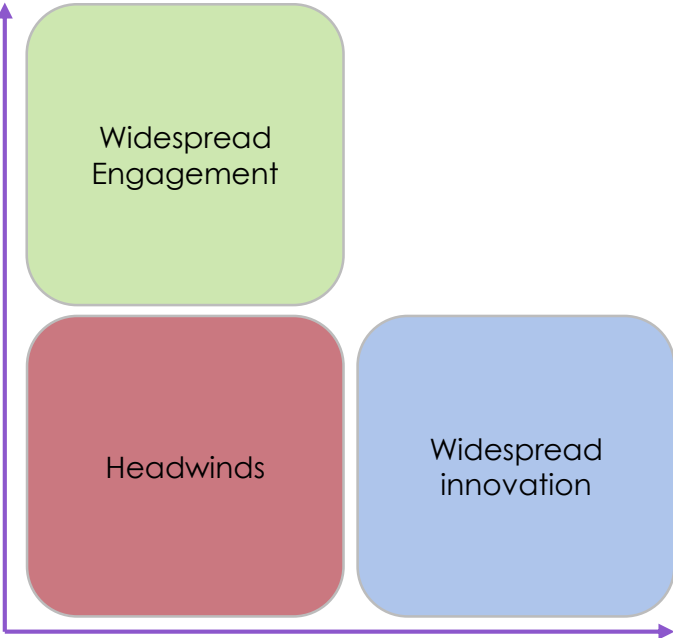
4. Outline Policy Framework

Context

Our approach

Consistent with the Paris Agreement

Further
behaviour
change

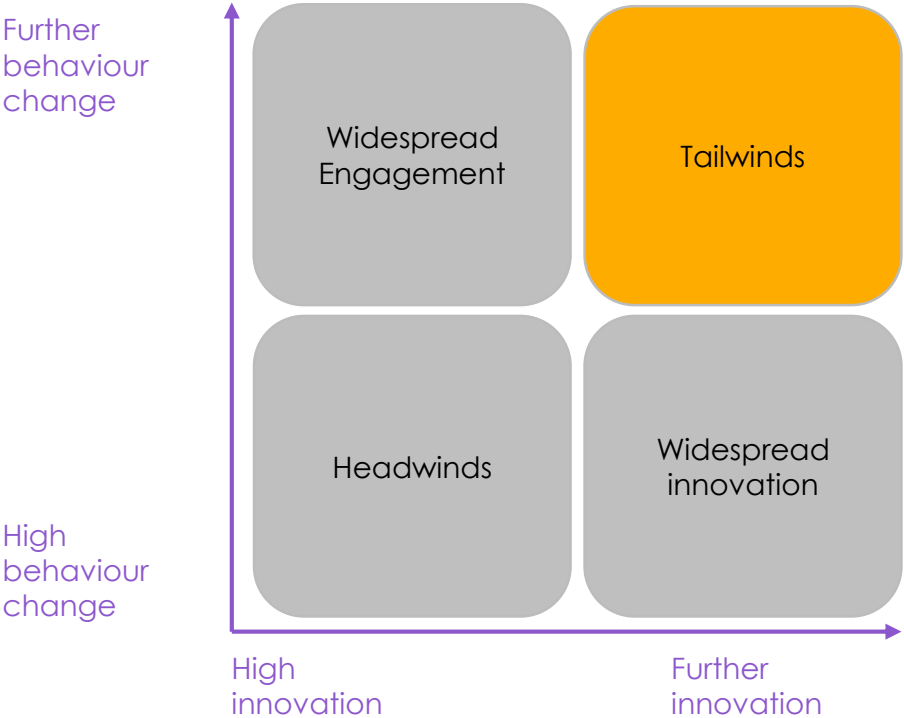


High
innovation

Further
innovation

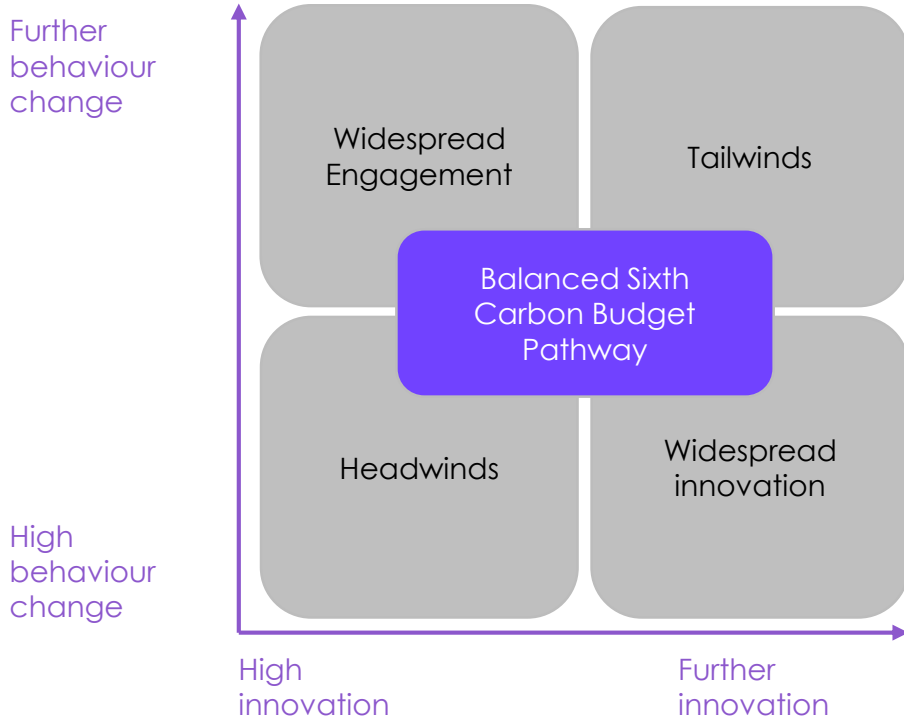
Our approach

Consistent with the Paris Agreement



Our approach

Consistent with the Paris Agreement

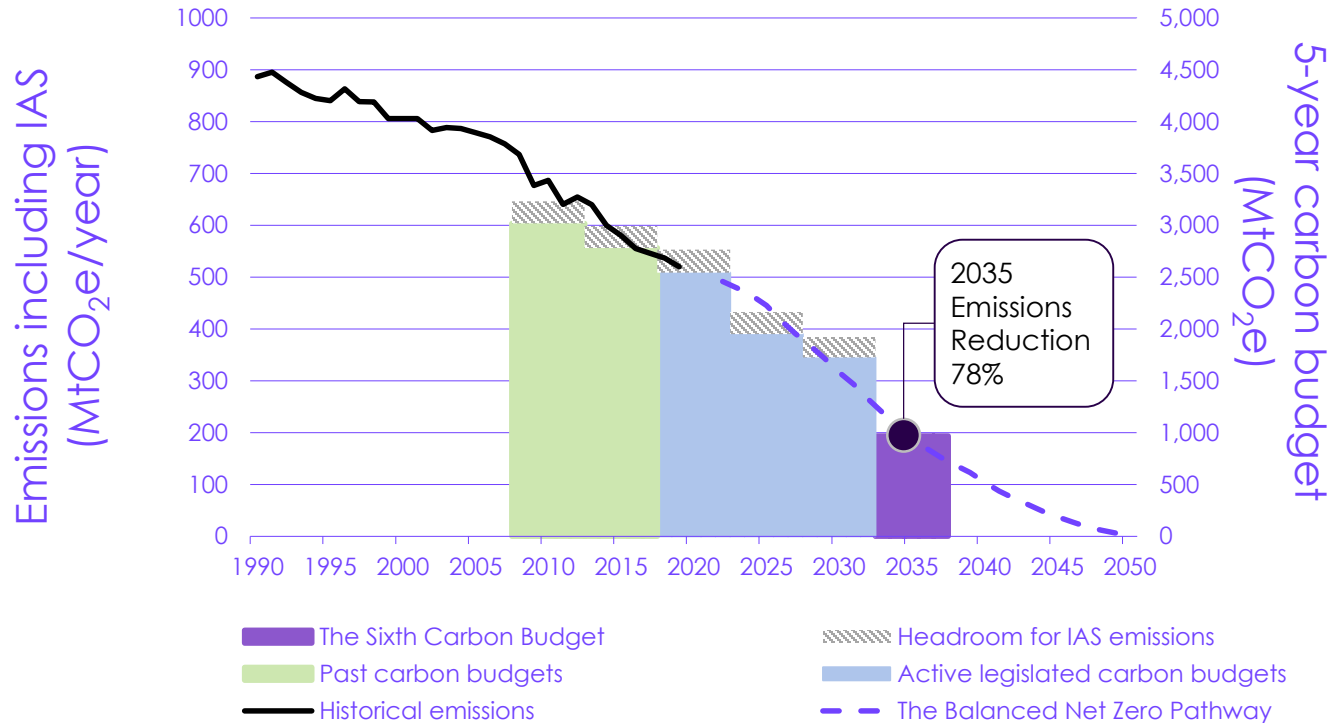


Climate science and international circumstances

- Need deep reductions globally to 2030 to keep 1.5°C in play
- Paris demands 'highest possible ambition'
- UK leadership matters as President of COP26
- Equity arguments reinforce need for strong UK action

Our recommended path

The recommended sixth carbon budget and 2030 NDC



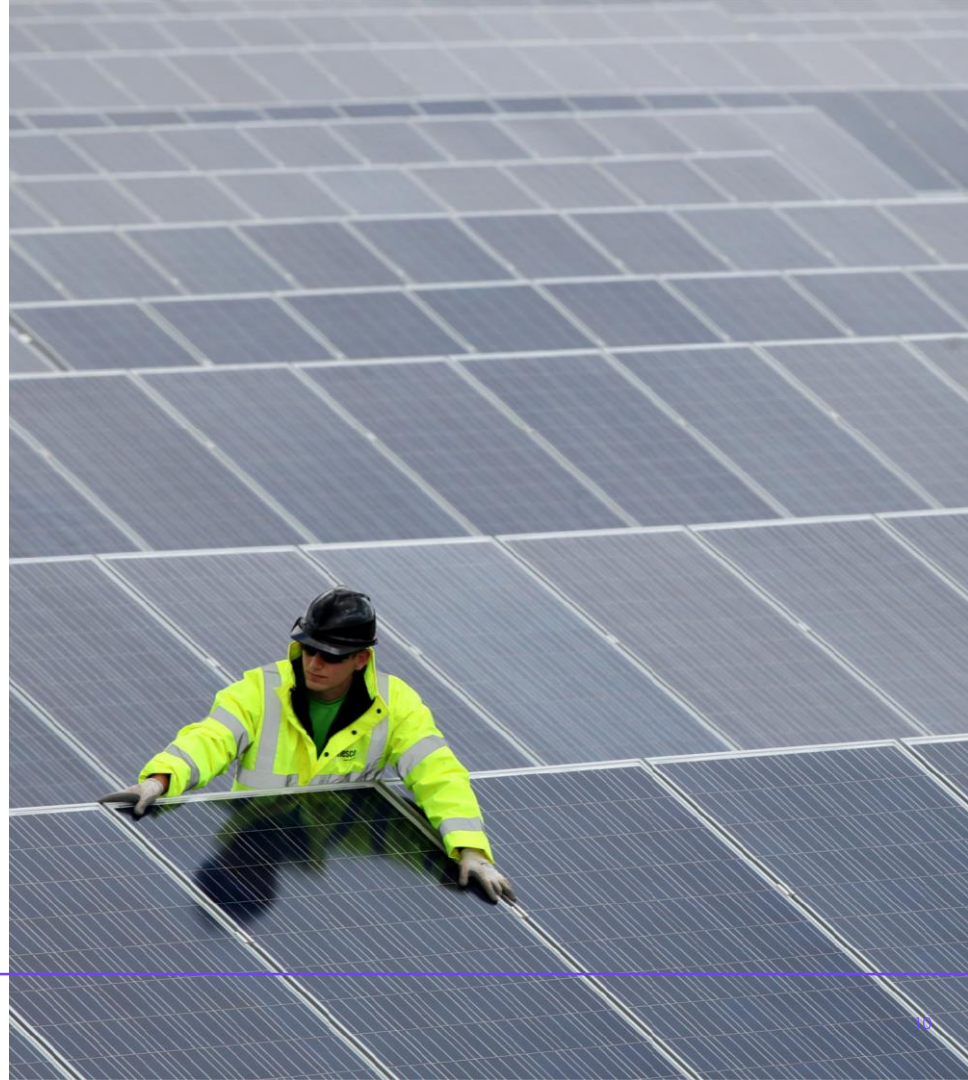
Notes:
Emissions shown including emissions from international aviation and shipping (IAS) and on an AR5 basis, including peatlands. Adjustments for IAS emissions to carbon budgets 1-3 based on historical IAS emissions data; adjustments to carbon budgets 4 and 5 based on IAS emissions under the Balanced Net Zero Pathway.

Source:
BEIS (2020) Provisional UK greenhouse gas emissions national statistics 2019; CCC analysis.

Pathways

High level principles to guide the buildings transition

- Energy efficiency is a fundamental first step, or the scale of the problem gets too big.
- System costs are not a major differentiator between electrical and hydrogen heat, so public support is likely determine the shape of our decarbonised future.
- Full hydrogen conversion is unwieldy (100-150GW of gas reforming + CCS; or 300 GW offshore wind capacity if just using electrolyzers), so sensible to plan for a range of solutions.
- Electrification likely to remain the primary route to decarbonise, with hydrogen providing flexibility.
- With coordination, solutions can vary by region, depending on local resources, infrastructure and consent.

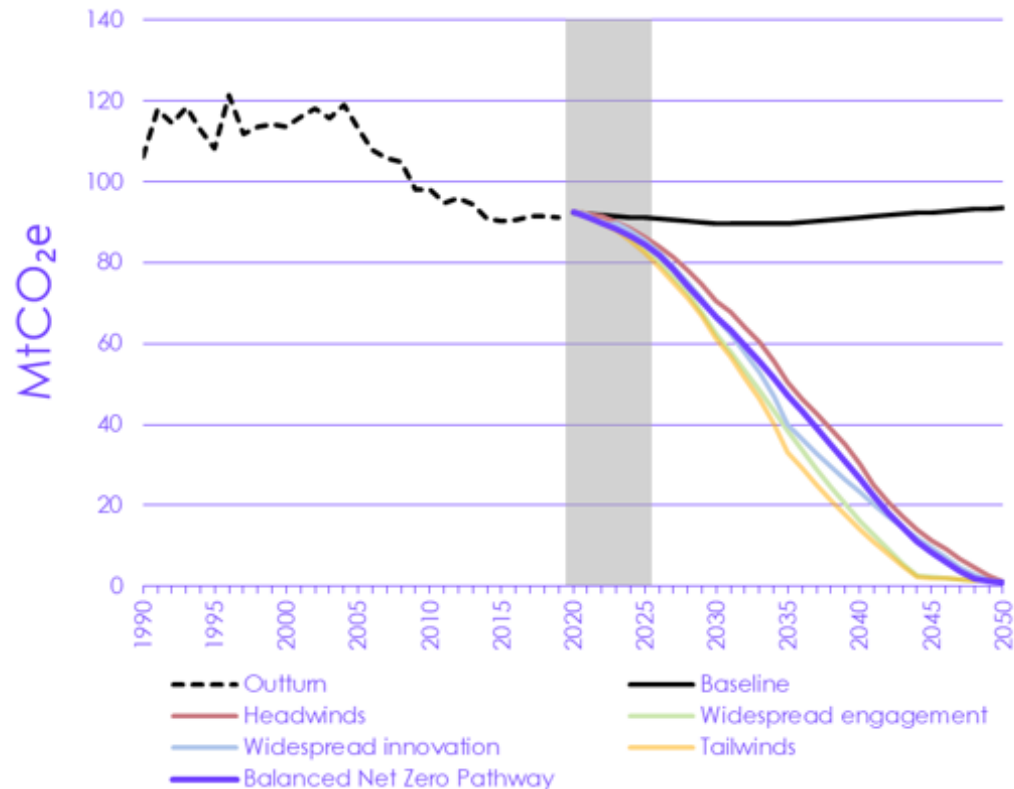


Emissions pathways for buildings

All buildings scenarios achieve close to zero emissions by 2050.

The Tailwinds and Widespread Engagement pathways are four years faster than the Balanced Pathway, reducing to close to zero by 2044.

By 2035, the pathways achieve reductions of 45% - 65%, relative to current emissions.

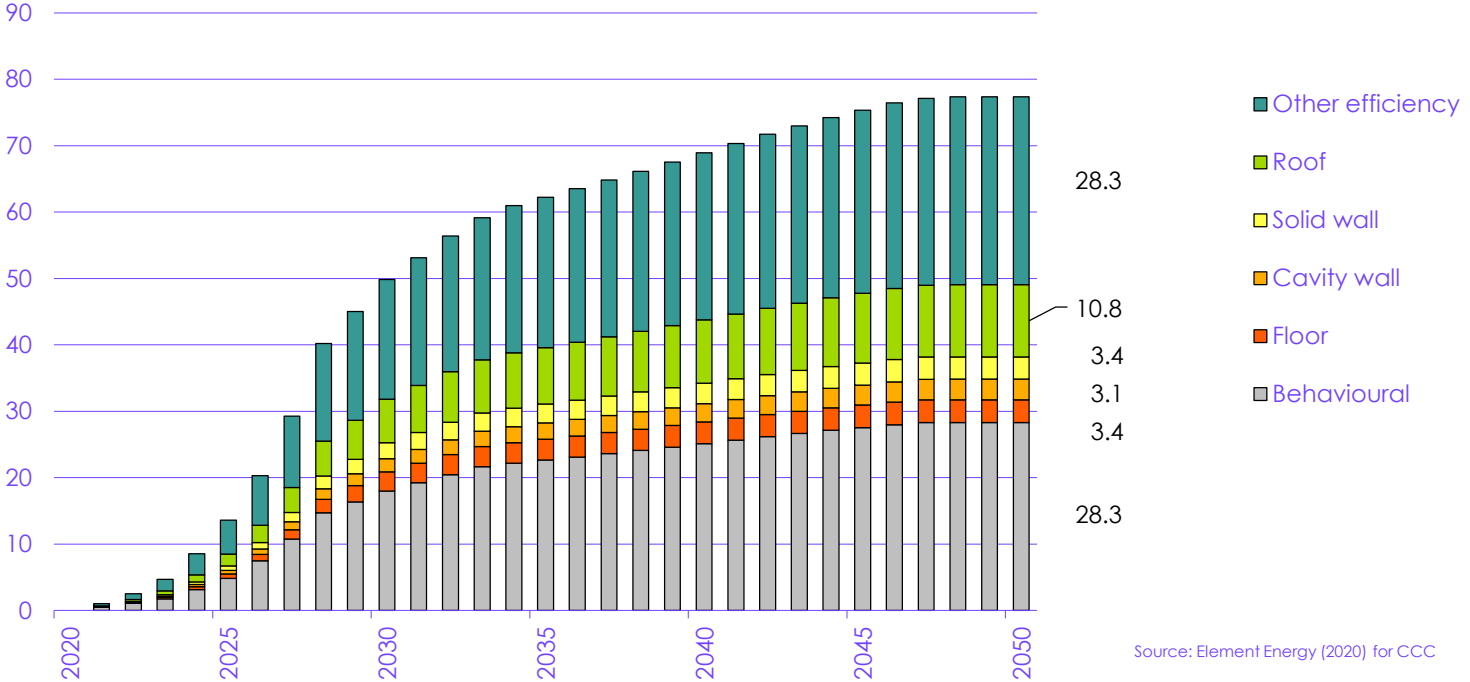


Sources: Element Energy for the CCC (2020) *Development of trajectories for residential heat decarbonisation to inform the sixth carbon budget*; CCC analysis

Sixth Carbon Budget modelling: Energy Efficiency

Cumulative energy efficiency measures

Cumulative uptake (millions)

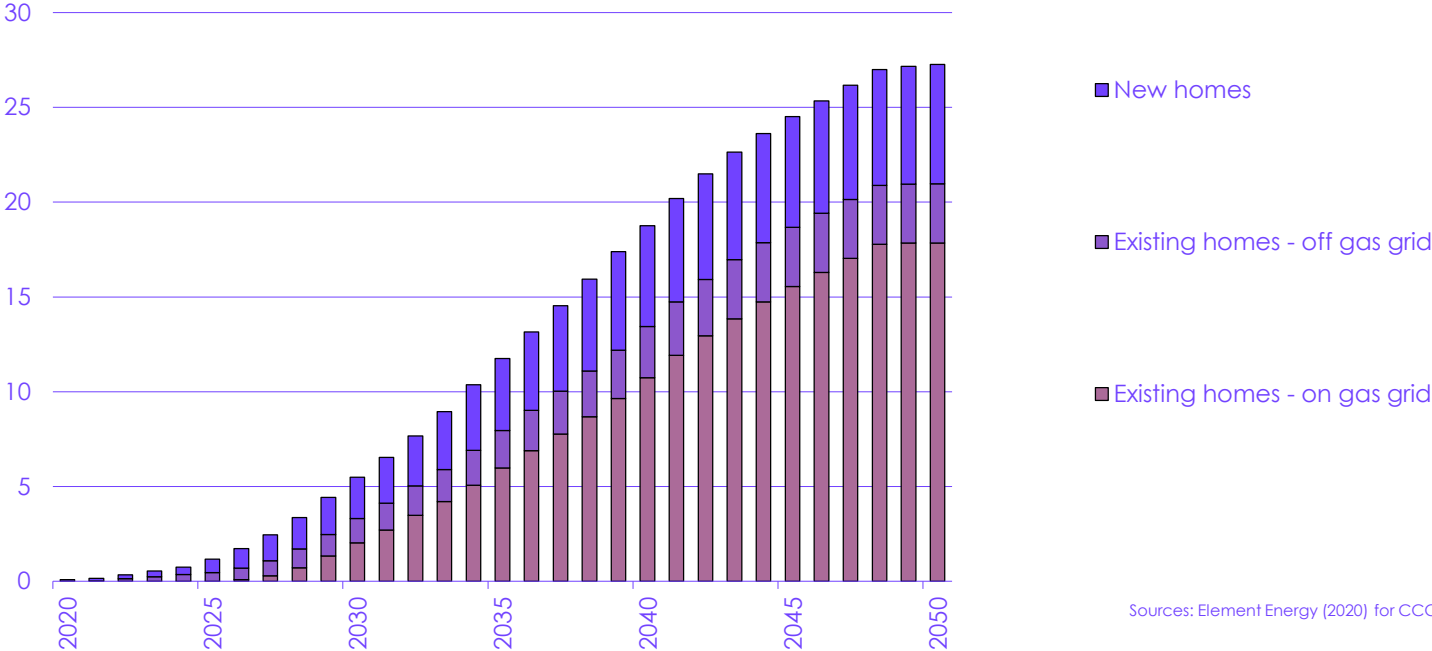


Source: Element Energy (2020) for CCC

Sixth Carbon Budget modelling: Heat pumps

Uptake of heat pumps in residential buildings

Cumulative uptake (millions)



Sources: Element Energy (2020) for CCC; CCC analysis

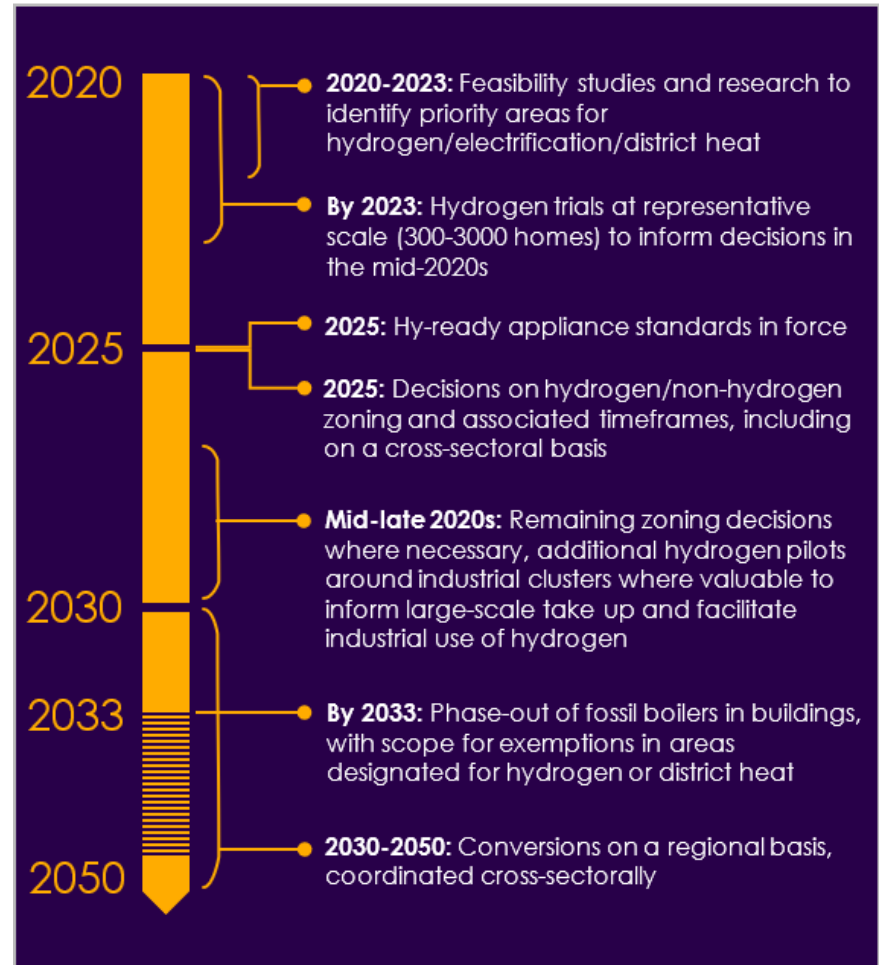
Indicative hydrogen development pathway

Keeping hydrogen in play

Keeping hydrogen in play means progressive steps building through the 2020s – looking across CCS, industry and transport.

- Our Balanced Pathway includes 11% of homes on hydrogen heating (in a hybrid heat pump).
- In Headwinds scenario, this goes up to 71% of homes (along with 13 million heat pumps).

Important to keep in play this option with trials in 2020s and hydrogen-ready boilers from 2025.

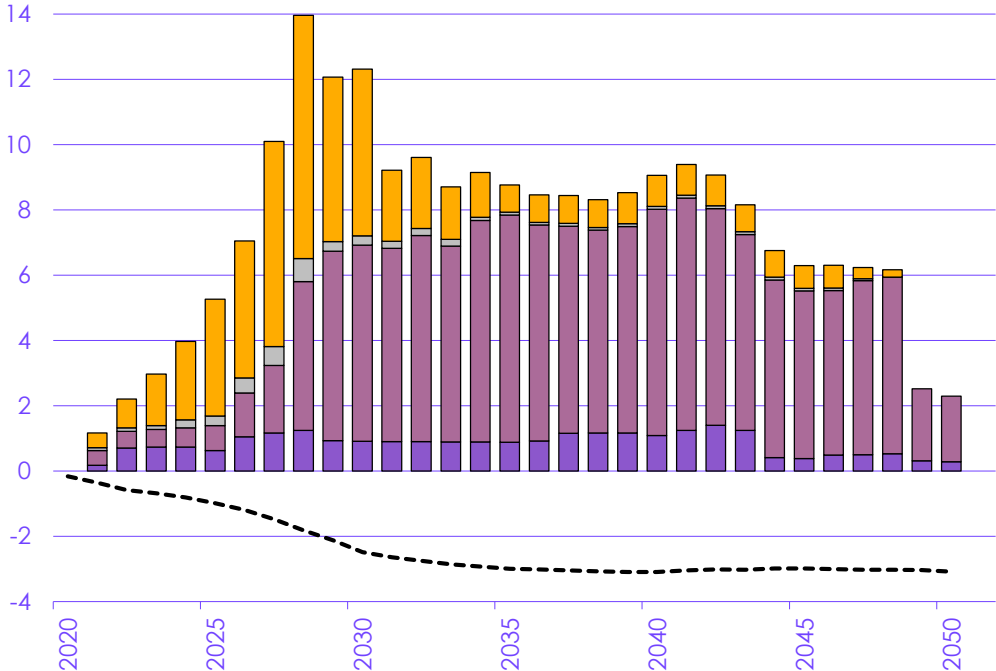


Costs

Sixth Carbon Budget modelling: Existing homes

Household investment and operating costs, Balanced Pathway

Annual costs (£ billion)



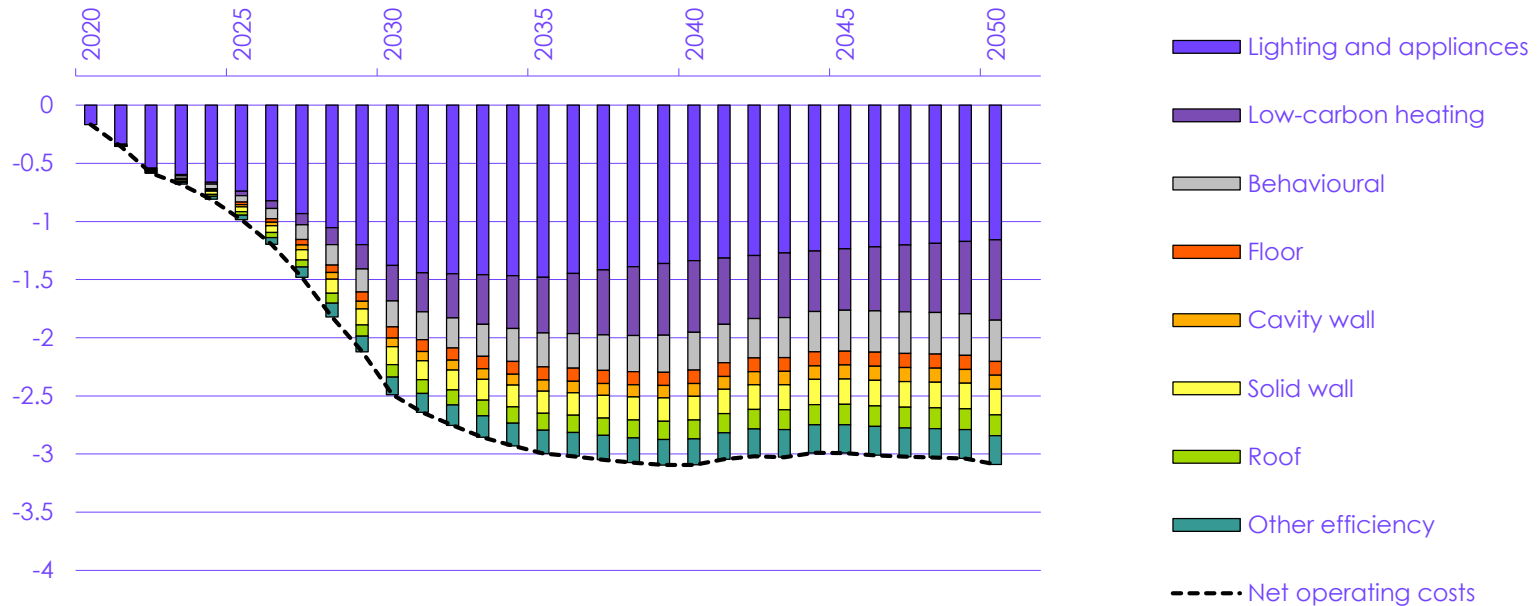
- Energy Efficiency
- Behavioural
- Low-carbon heat (on gas grid)
- Low-carbon heat (off gas grid)
- Net operating costs

Sources: Element Energy (2020) for CCC; CCC analysis

Sixth Carbon Budget modelling: Existing homes

Operating costs for existing homes, Balanced Pathway

Annual costs (£ billion)

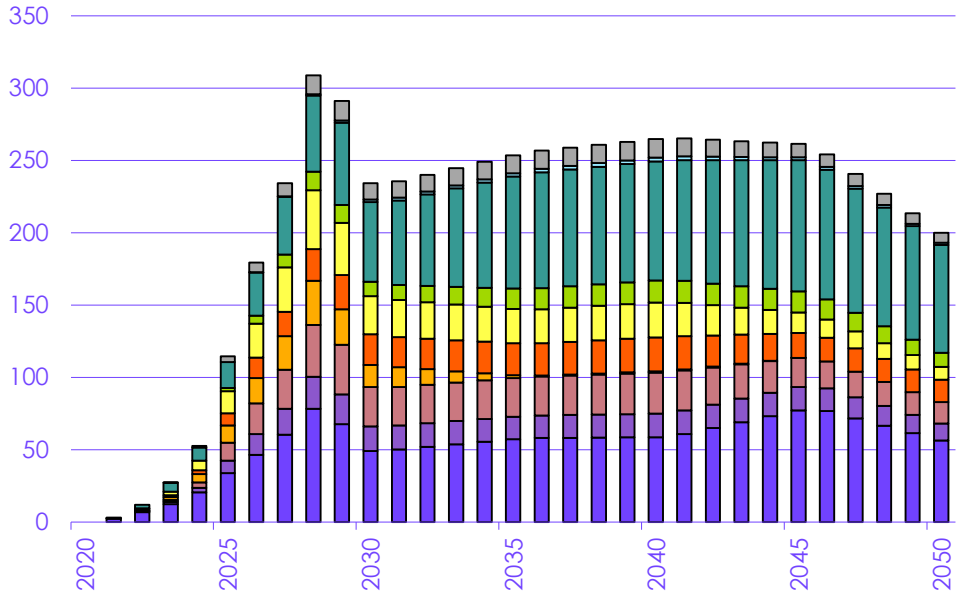


Sources: Element Energy (2020) for CCC; CCC analysis

Sixth Carbon Budget: benefits

Over 200,000 jobs created

FTE above 2019 (thousands)



- Project Managers and Retrofit Coordinators
- Construction Trades Supervisors
- Construction Trades
- Building Envelope Specialists
- Scaffolding and Plant Operatives
- Labourers and Civils Operatives
- Electrical Trades
- Plumbing and HVAC Trades
- Logistics and Non-Construction
- Construction Professionals

“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.”

Outline policy framework

Outline policy framework

Clear signals



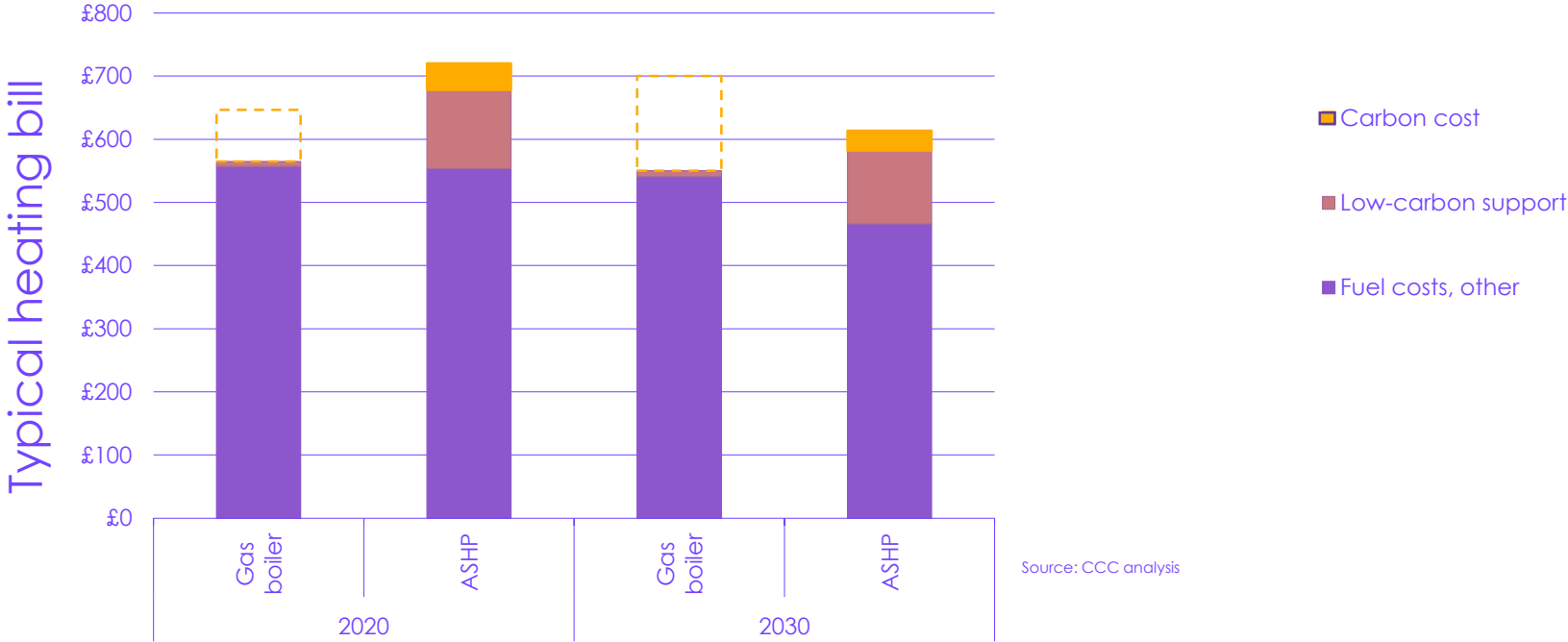
Indicative timetable

Future Homes Standard – all new homes	2025 (at the latest)
Private-rented and social homes achieve EPC C	2028
Standards for lenders	2025-2033
All homes for sale EPC C	2028
Oil phase out	2028
Gas phase out	2033

Making low-carbon financially attractive

Rebalancing policy costs

- Three steps to keep costs down:
1. Minimise costs
 2. Rebalance policy costs
 3. Targeted use of subsidies

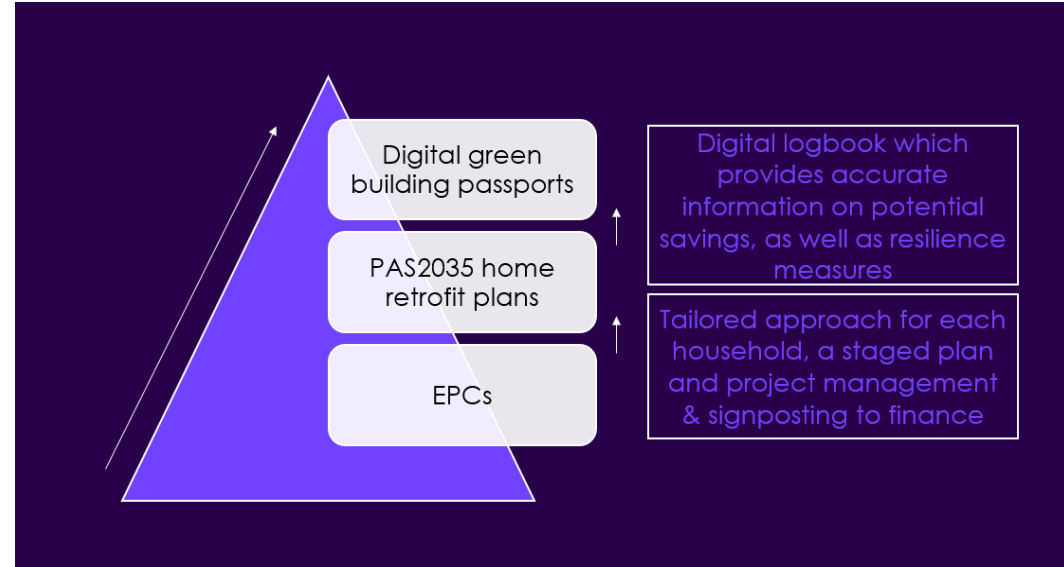


Source: CCC analysis

Outline policy framework

Improving availability of quality information as an enabling measure

- Poor household-level information has been a key barrier to progress.
- Digital green building passports are a natural progression from EPCs and home retrofit plans.
- Green passports can unlock green finance at scale and help make standards enforceable.



Outline policy framework

Local Area Energy Planning

Options:

- Zoning for heat networks
- Pathfinder Cities / areas
- BEIS and Ofgem undertake a major study to identify prime candidate areas for hydrogen or full electrification with input from networks on current capacity.
- Next set of Local Area Energy Plan pilots, with full rollout after 2025
- Heat Delivery Body (CBI proposal)



Contact us

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