13th September 2021

What next for buildings policy as part of a Net Zero resilient society?

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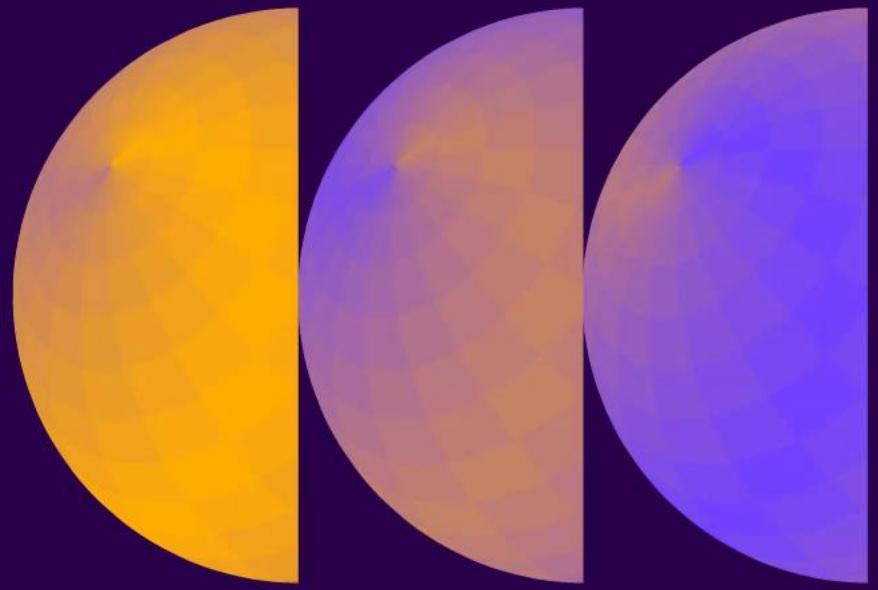

Climate
Change
Committee

In this presentation

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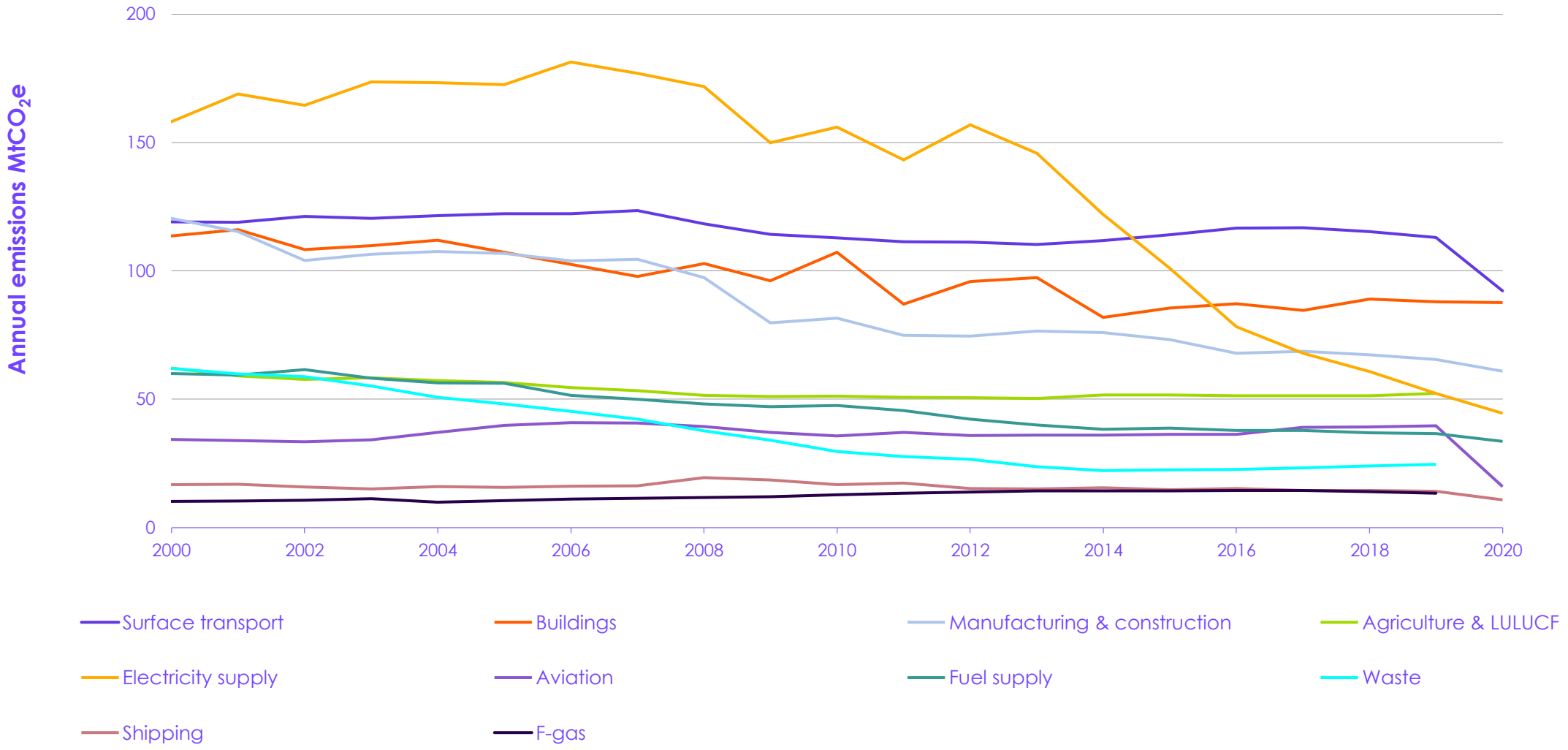
3. Who pays: a question of fairness
4. Next steps

Heat policy today

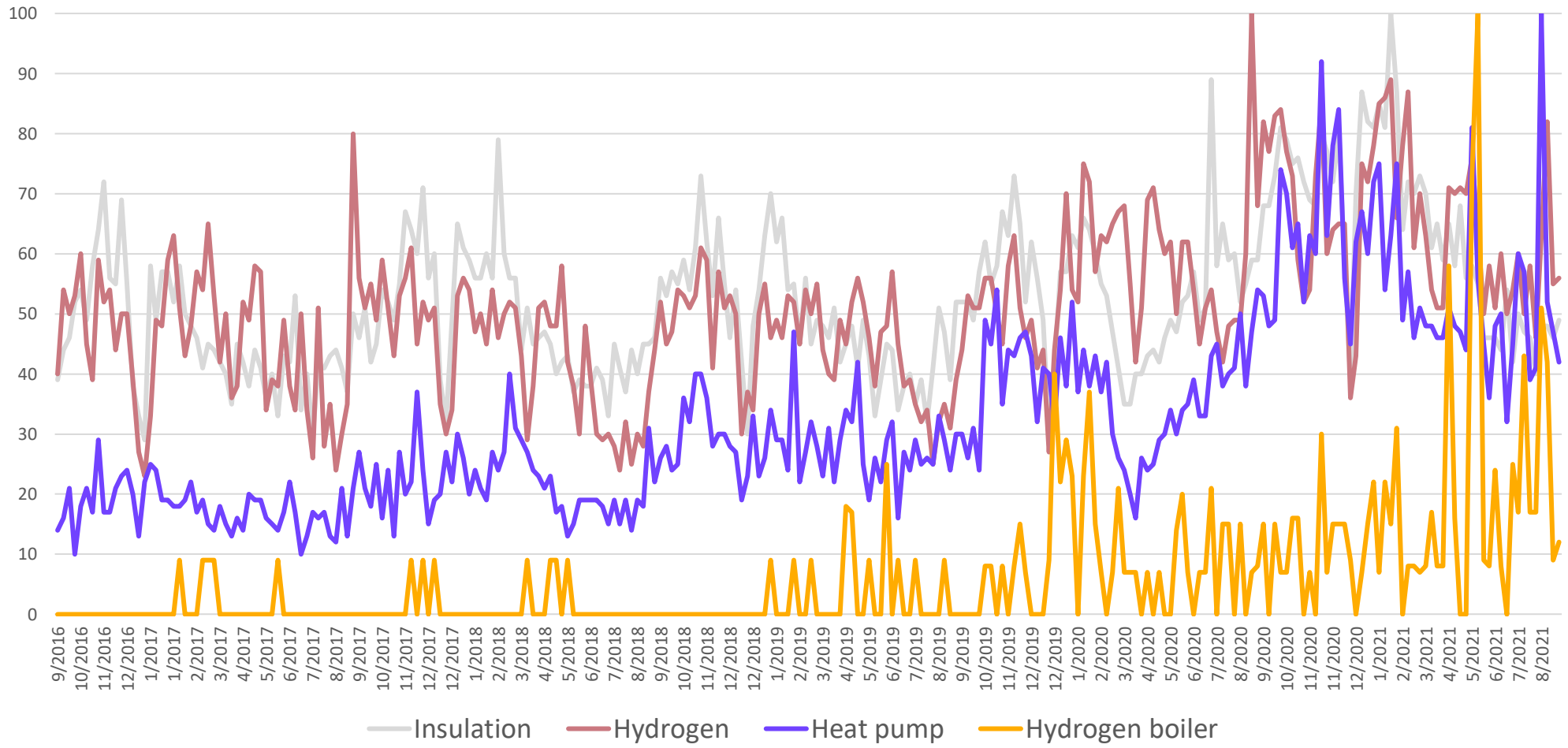
Heat policy today

Limited progress in reducing buildings emissions



Heat policy today

Public awareness of low-carbon heat



Buildings heat - 6th carbon budget policy package

1. A clear direction	• Clear trajectory of standards towards phase-out. • Clear signals on the future of the gas grid - electrification remains the primary route, hydrogen providing flexibility.
2. Making low-carbon financially attractive	• Shift relative prices in favour of electricity over gas, value flexible electric loads • Further financial incentives • Unlock green finance at scale
3. Enabling measures	• Quality household information with real-world performance measurement • Stronger compliance and enforcement • Skills and retraining packages
4. Getting on with it	• Strong early action in new build homes, off-grid, social rented sector • Area-based planning and green building passports across the housing stock • Energy planning informing RIIO investment cycles

Sixth Carbon Budget: pathway anchored in policy levers

Sixth Carbon Budget: pathway anchored in policy levers

Phaseout dates for fossil fuel technologies provide a signal to the market

Technology/behaviour	Phase out date (sales)	Backstop date (operation)
New fossil-fuelled cars and vans	2032 (including plug-in hybrids)	2050
Gas boilers	2033 (in residential homes) 2030-33 (in commercial properties)	2050
Oil boilers	2028 (in residential homes) 2025-26 (in commercial properties)	2050
Gas power generation (unabated)	2030 (no new build of unabated gas plants)	2035
HGVs	2040	Beyond 2050
Biodegradable waste sent to landfill	N/A	2025 ban on all municipal & non-municipal biodegradable waste going to landfill
Unabated energy-from-waste plants	From today, new plants and extensions should be built with CCS or CCS ready	2050

Source: CCC Analysis

Sixth Carbon Budget: pathway anchored in policy levers

Residential buildings standards modelled in Balanced Pathway

New home standards	Minimum standards on rented buildings	Standards for lenders	Requirements on owner-occupied homes at point of sale	Phase-out dates for new oil and gas boilers

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

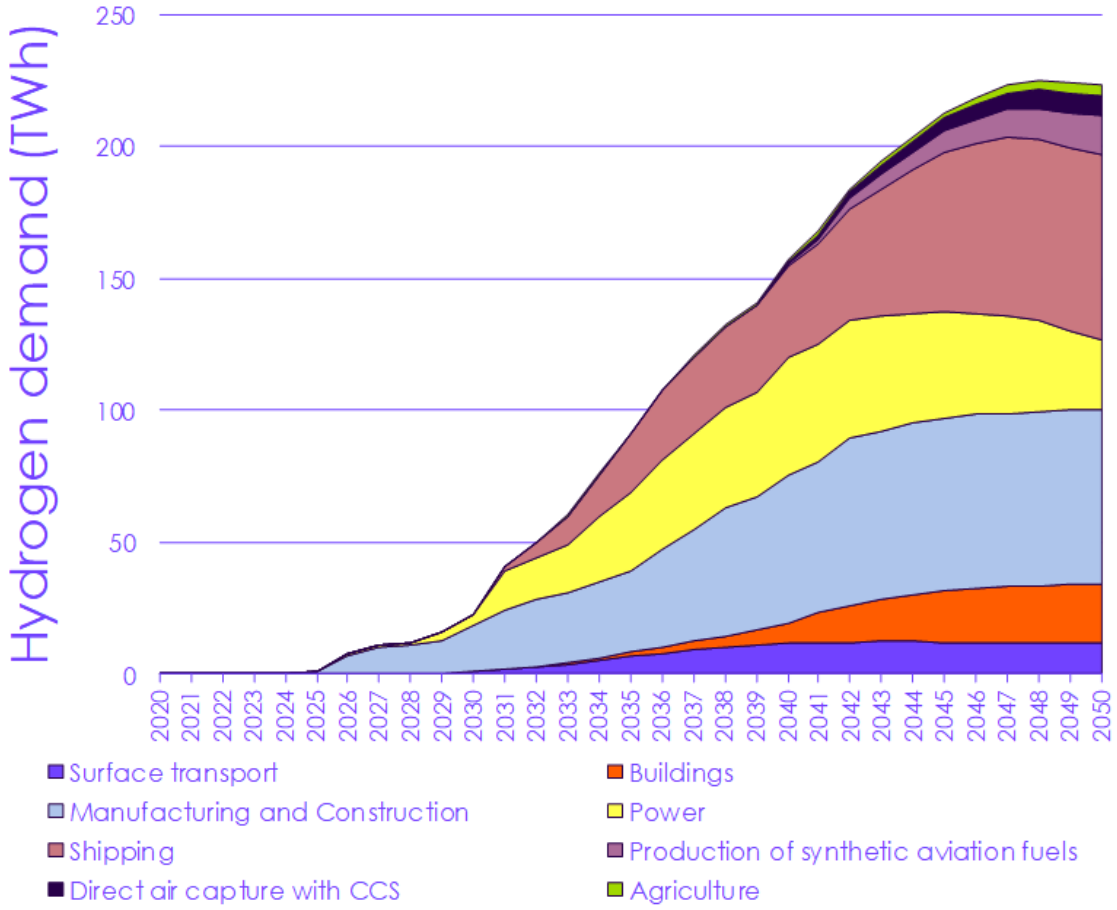
Sixth Carbon Budget – international comparison

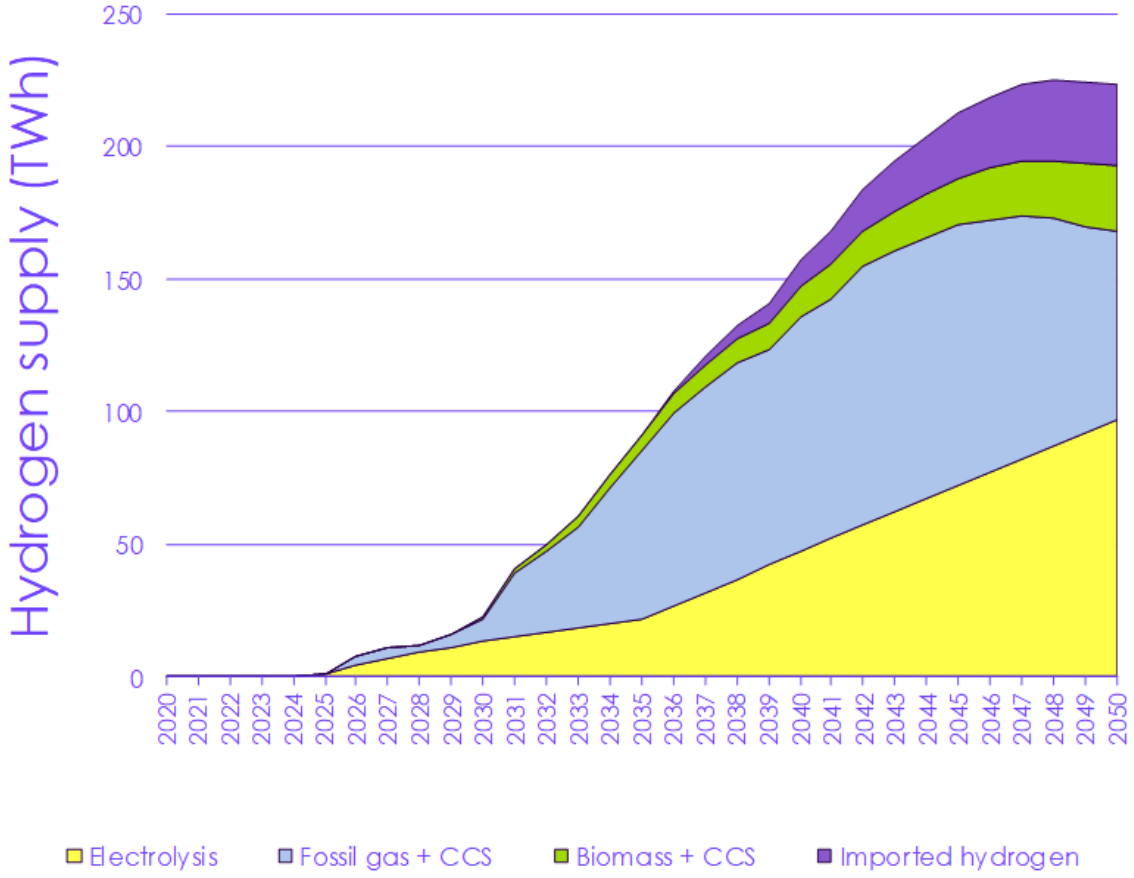
The pathway to Net Zero is narrow – developed countries must take action now across all sectors

	CCC 6CB pathway c.f. IEA NZE2050 selected examples		
Sector	Example	UK pathway	IEA NZE2050
Power	Net Zero electricity	2035	2040 (2035 OECD)
Transport	ICE cars sales end	2032 (2030 UK 10 Point Plan)	2035
	HGV fleet zero-Carbon	2050	2050
Buildings	Oil/coal boiler sales end	2028	2025
	Zero-carbon newbuild	2025	2030
	Heat pump installed	Homes: 6 million / 20% stock (2030)	60 million / 20% heating energy (2030)
	% buildings zero-carbon	100% by 2050	>85% by 2050
Industry	-	CCS clusters established, ore-based steel low-C (2030)	New facilities low-C from 2030
Behaviour	Direct behaviour-change	16% total 2050 reductions	8% total (diet excluded)
	Technology adoption by consumers	41% total 2050 reductions	55% total reductions

Hydrogen supply and demand

By 2050 the hydrogen economy is comparable in scale to existing electricity use



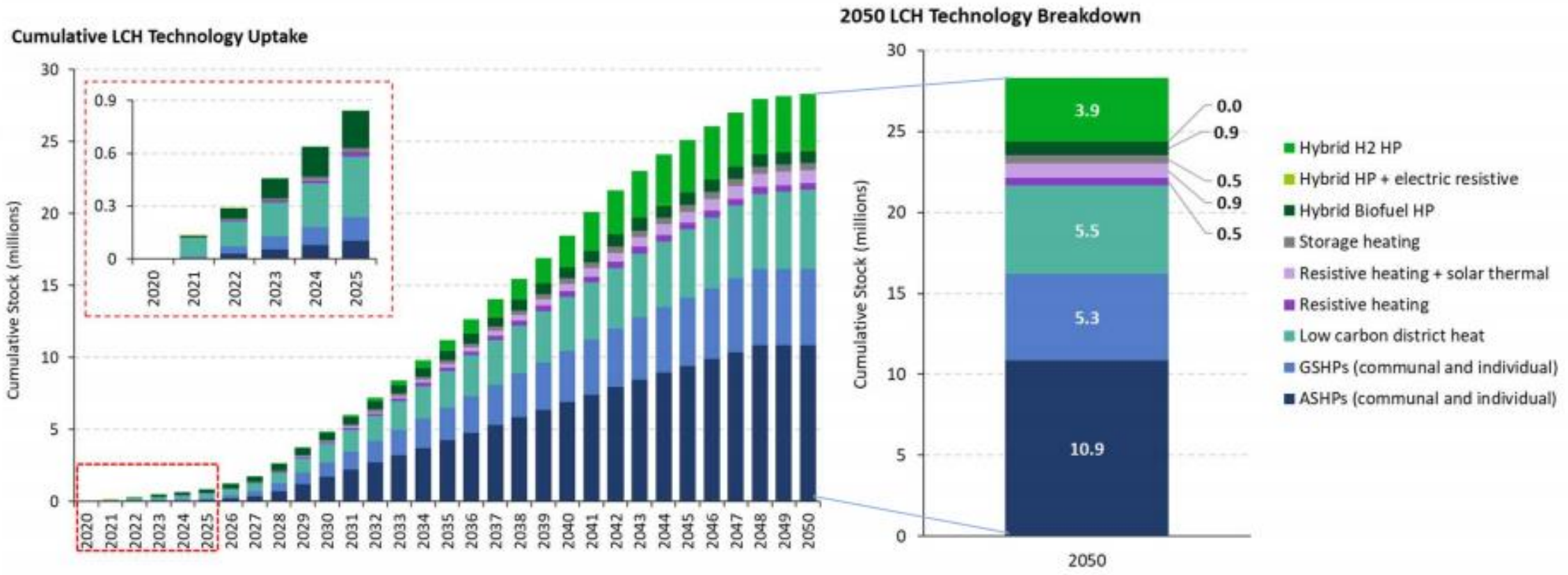


Source: CCC analysis.

Heat: the delivery challenge

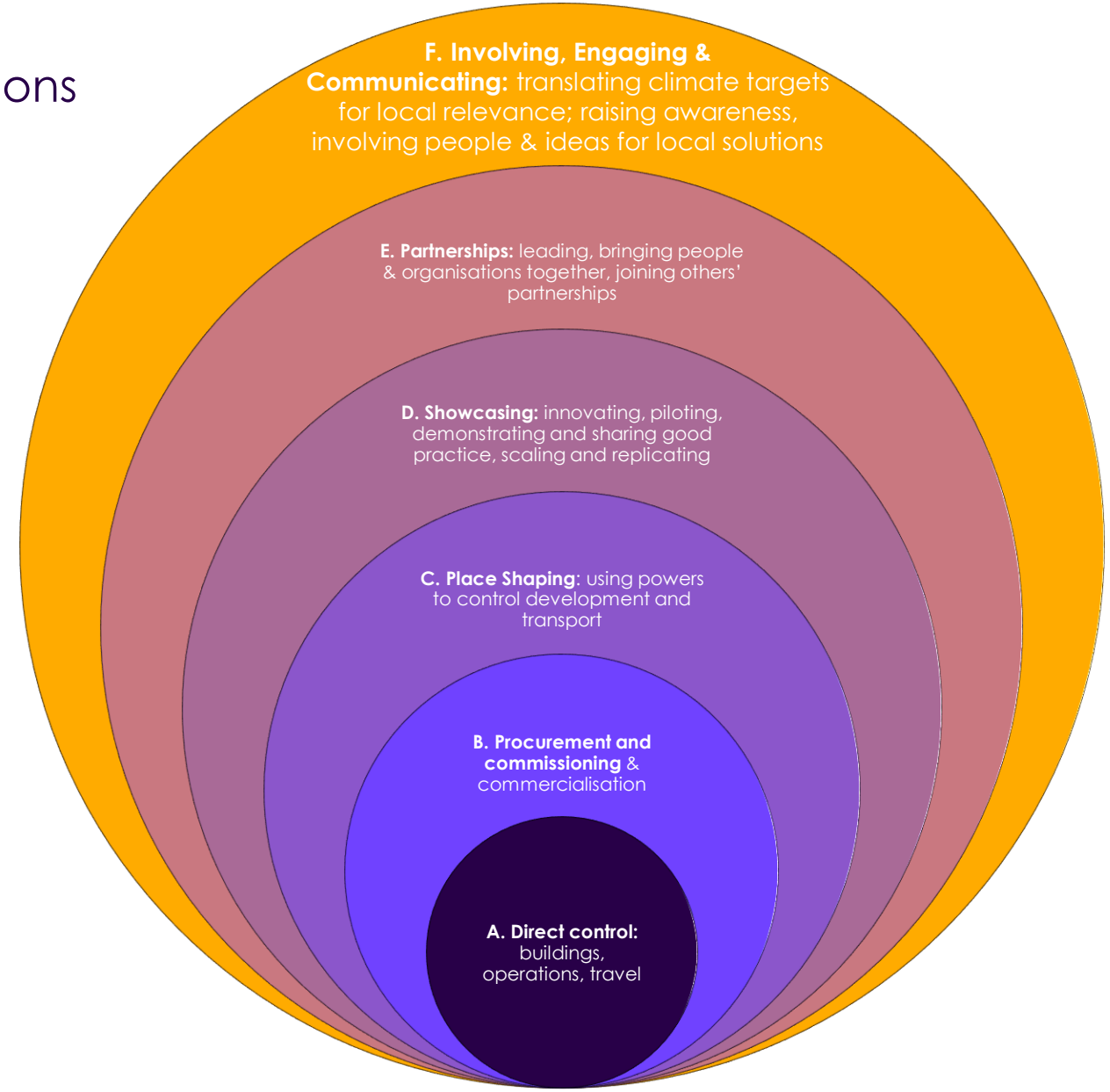
Sixth Carbon Budget

Uptake of heating technologies in residential buildings



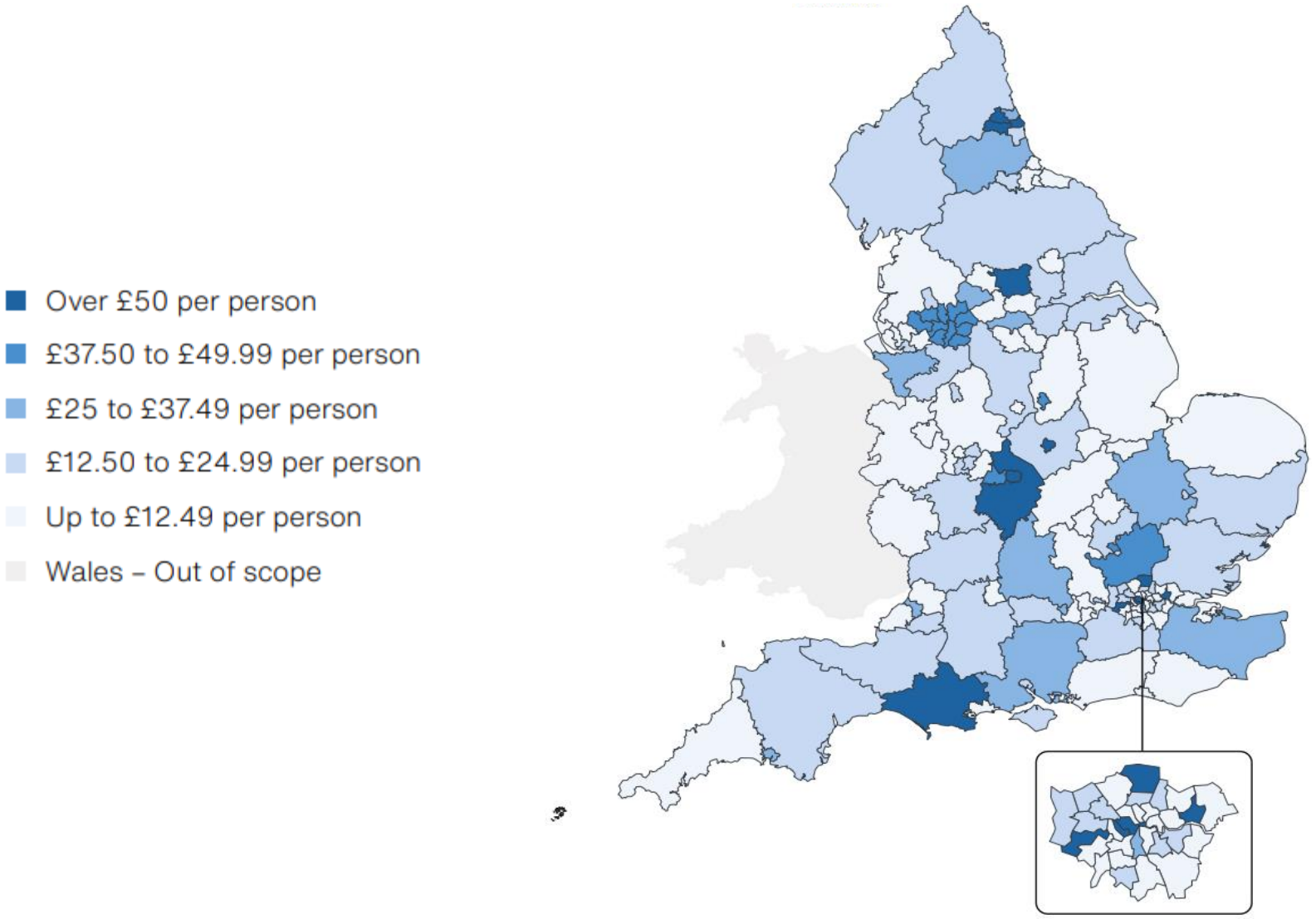
Why is local important for Net Zero delivery?
Influence extends much beyond direct emissions

- **Momentum and commitment.** Three-quarters of local authorities have declared a climate emergency, and many have developed action plans.
- **Trusted local expertise.** Trust in local authority trading standards twice that in energy suppliers
- **Local place-shaping.** Net Zero requires a whole-system transition, requiring buy-in and action across all communities.
- **Influence on communities.** Almost 60% of CB6 abatement will require some degree of societal/behavioural change.
- **What's needed?** Our CB6 local authorities report identified a need for:
  - An agreed framework of actions and responsibilities
  - Appropriate long-term financing
  - Flexibility to work in the best way for local communities
  - Coherent policy and powers for facilitation of delivery

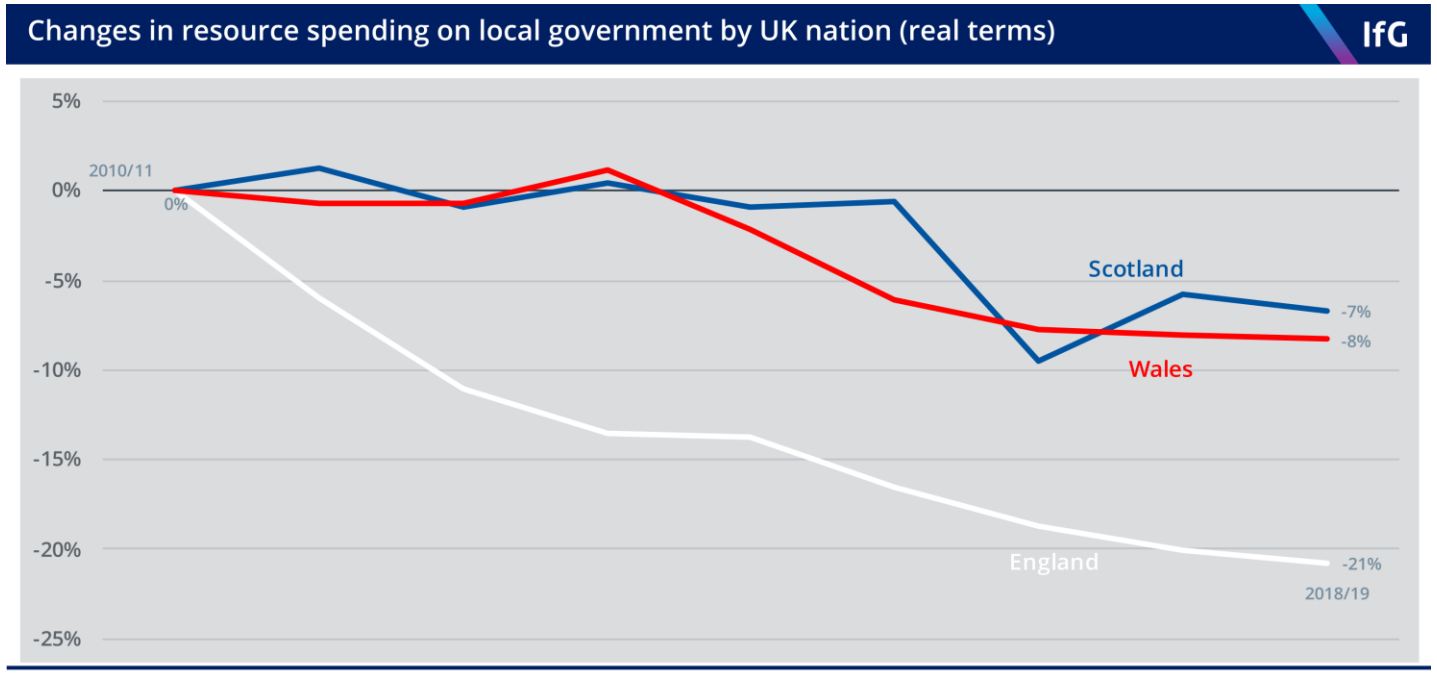


Net zero funding for local authorities is fragmented and unequal

Net zero grant funding per person for local authority areas 2020-21



The picture in the devolved administrations
Better funding and simpler structures



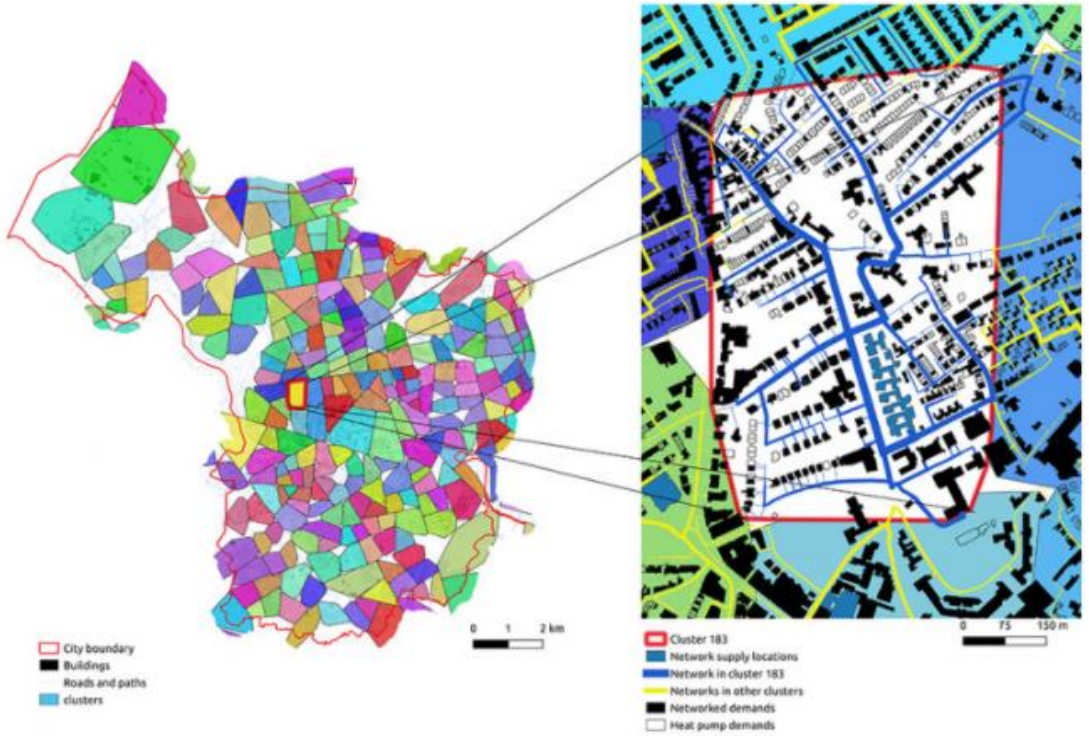
Source: Institute for Government analysis of HM Treasury, Public Expenditure Statistical Analyses, 2015 to 2019; and Office for National Statistics, Country and regional public sector finances expenditure tables, 2019. The analysis covers identifiable resource spending only. It excludes any spending on health, education, and public order and safety. Funding received from DWP for Housing Benefit is also excluded. The functions of local government in Northern Ireland are significantly more limited than in Great Britain and Northern Ireland is therefore not shown.

	England	Scotland	Wales	Northern Ireland
Size	343 local authorities, split between two-tier, unitary authorities and combined authorities	32 unitary authorities	22 unitary authorities	11 unitary authorities
Funding source	50% UK Govt 31% council tax 8% business rates	58% Scot Govt 22% council tax 20% business rates	67% Welsh Govt 20% council tax 16% business rates	8% NI Executive 70% council tax 22% fees for services like waste

Heat: the delivery challenge

Local Area Energy Planning framework

- Demonstrators and hydrogen trials
- Zoning for heat networks
- Grant funding, Growth funding, Levelling up and Infrastructure Bank
- Methodology honed by Energy Systems Catapult, Centre for Sustainable Energy and Ofgem which pinpoints critica data requirement on substation capacity



Recommendation: BEIS and Ofgem undertake a major study to identify prime candidate areas for hydrogen or full electrification with input from networks on current capacity.

Heat: the delivery challenge

Location-specific solutions require a range of business models supported by a coherent governance and regulatory framework

Areas suitable for heat networks	On-gas, not suitable for heat networks	Off the gas network
Create level playing field with gas on pricing		Accelerated programmes of network reinforcement alongside efficiency
Zoned approach Shift from grant funding to managing demand risk Market framework - level playing field in regulatory terms	Process for identifying and designating areas as suitable for conversion to hydrogen alongside areas not suitable for conversion	

Who pays – a question of fairness

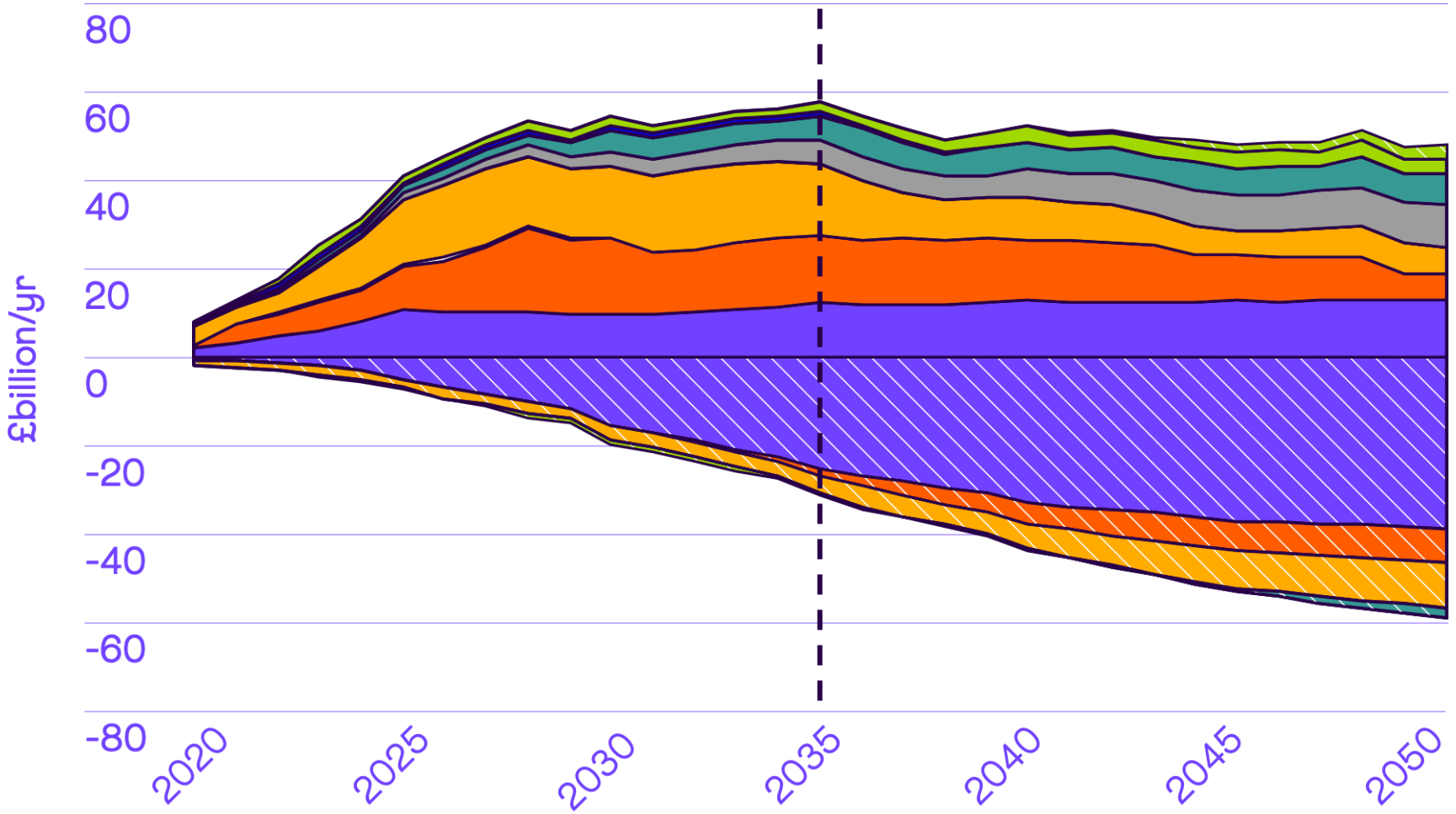
Delivering Net Zero in the UK is affordable

Our cost estimates for reaching Net Zero have been revised down

Changes in cost estimates for long-term emissions goals		
GHG emissions reduction target (relative to 1990)	Report (Year)	Cost Range Estimated for 2050
60% reduction in CO_2 (~55% reduction in GHG)	HMG Energy White Paper (2003)	0.5 - 2.0% of GDP
80% reduction in GHG	CCC 2008 Advice (2008)	1 - 2% of GDP
100% reduction in GHG	CCC Net Zero Advice (2019)	1 - 2% of GDP
100% reduction in GHG	CCC 6th Carbon Budget Advice (2020)	<1% of GDP

Paying for Net Zero

Net Zero requires a major investment programme, but many of the costs can be offset in operation



- Surface transport OPEX
- Buildings OPEX
- Electricity supply OPEX
- M&C / Fuel supply OPEX
- Other OPEX
- Surface transport CAPEX
- Buildings CAPEX
- Electricity supply CAPEX
- Networks CAPEX
- M&C / Fuel supply CAPEX
- Other CAPEX

Notes:
Costs of electricity are included in the energy supply sector, whereas costs of other low-carbon fuels such as hydrogen and bioenergy are included in the sectors that use these fuels.

M&C is manufacturing and construction. "Other" category includes aviation, shipping, land-use, land-use change and forestry, agriculture, removals, waste and F-gases. CAPEX refers to additional annual capital investment. OPEX refers to savings due to operational cost reductions

Source:
CCC analysis.

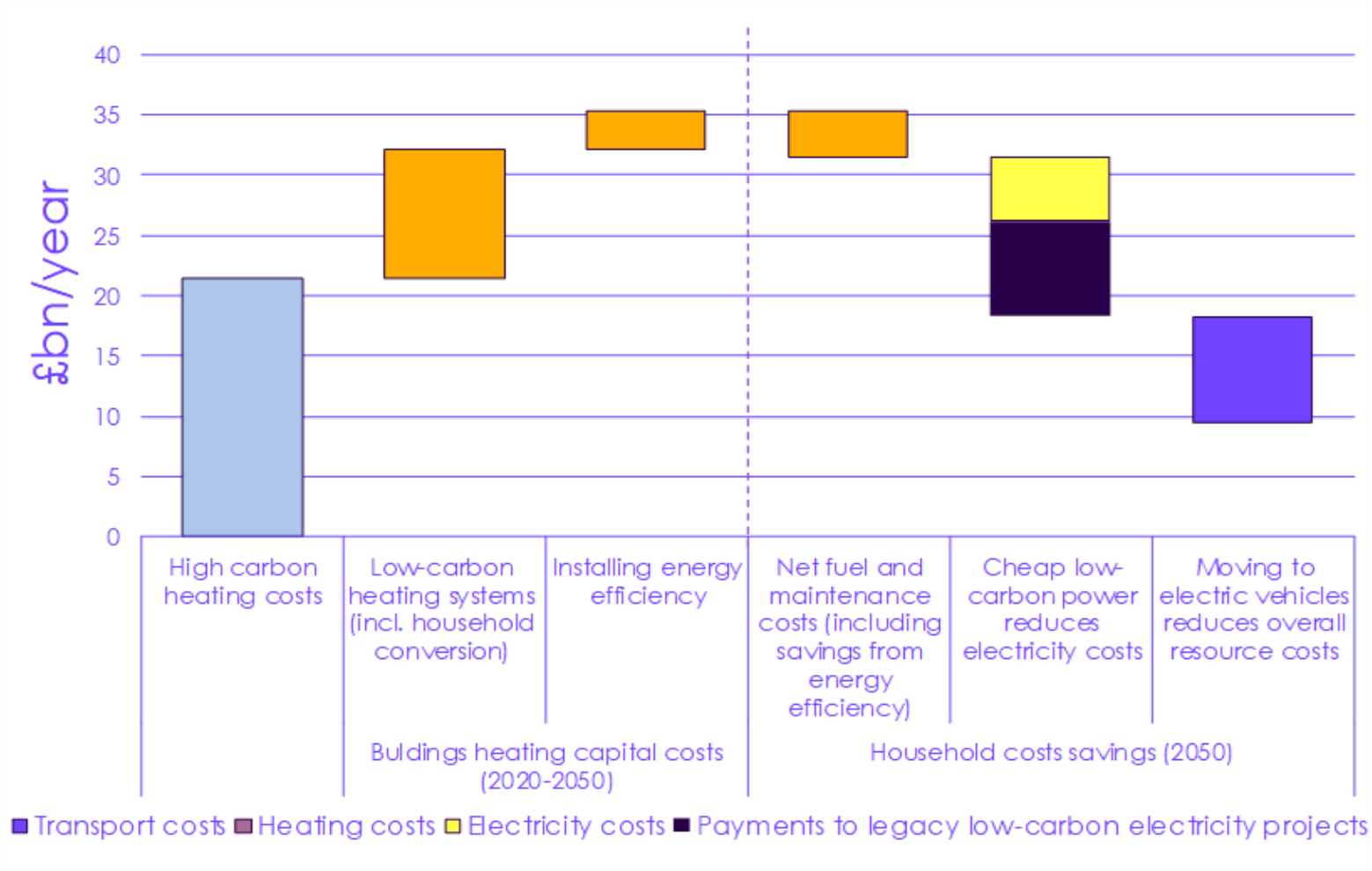
Source: CCC analysis.

Paying for Net Zero
Rebalancing policy costs

Source: CCC analysis

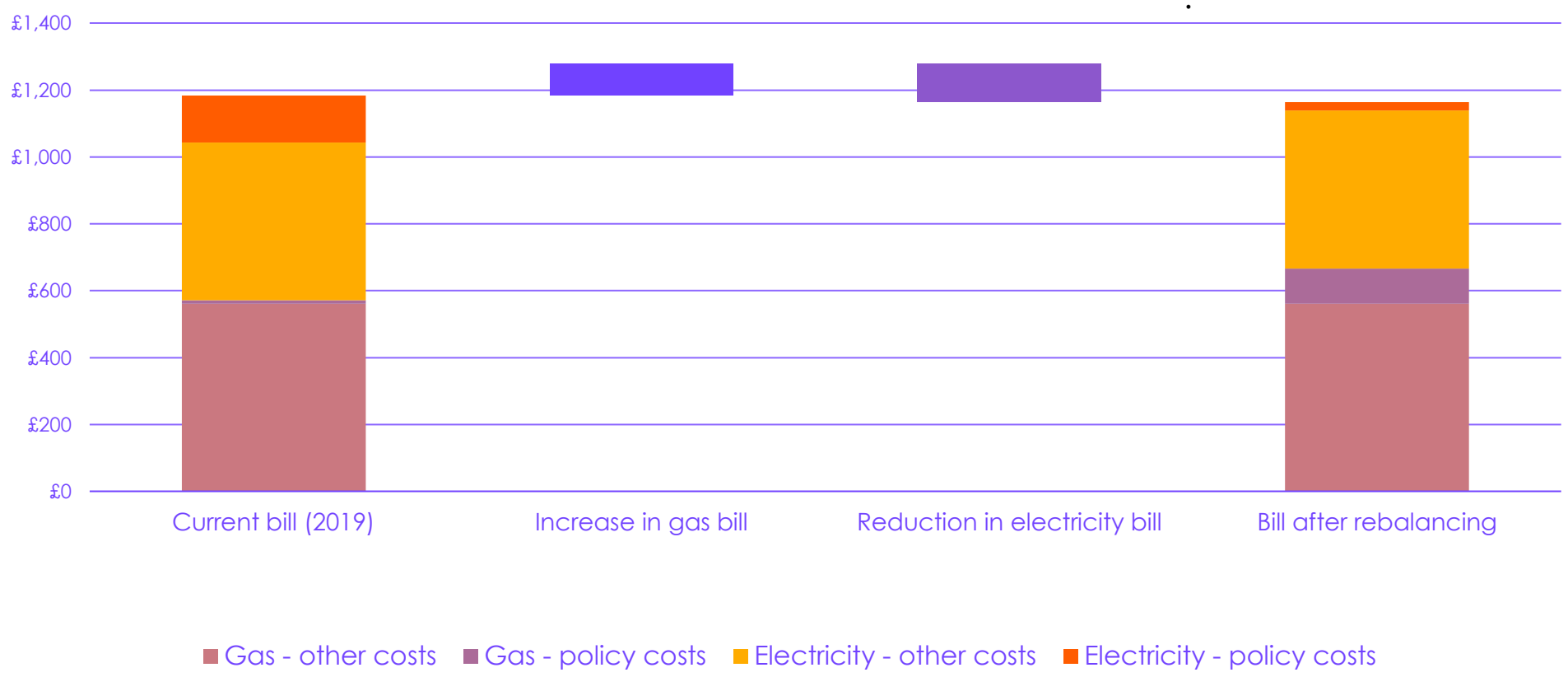
Ensuring a fair transition
Household costs and savings

- A key challenge is how to fund decarbonisation of household heating
- Extending existing funding (~£4bn/year) and adding up to £3 billion of annual funding by 2030, alongside private rented standards, would cover increased costs to households
- Savings will be made elsewhere on electricity use and transport



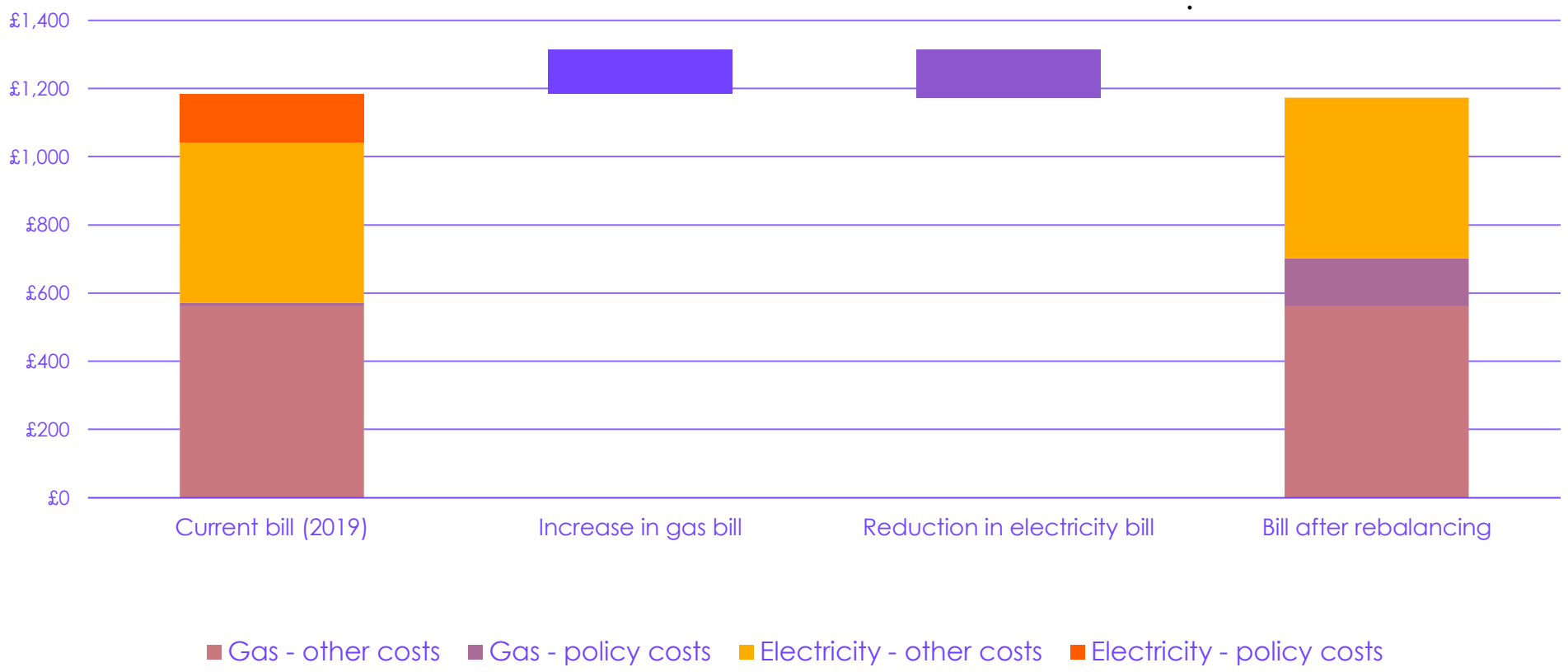
Rebalancing policy costs

Shifting 75% of policy costs from electricity to gas on average dual fuel gas bill

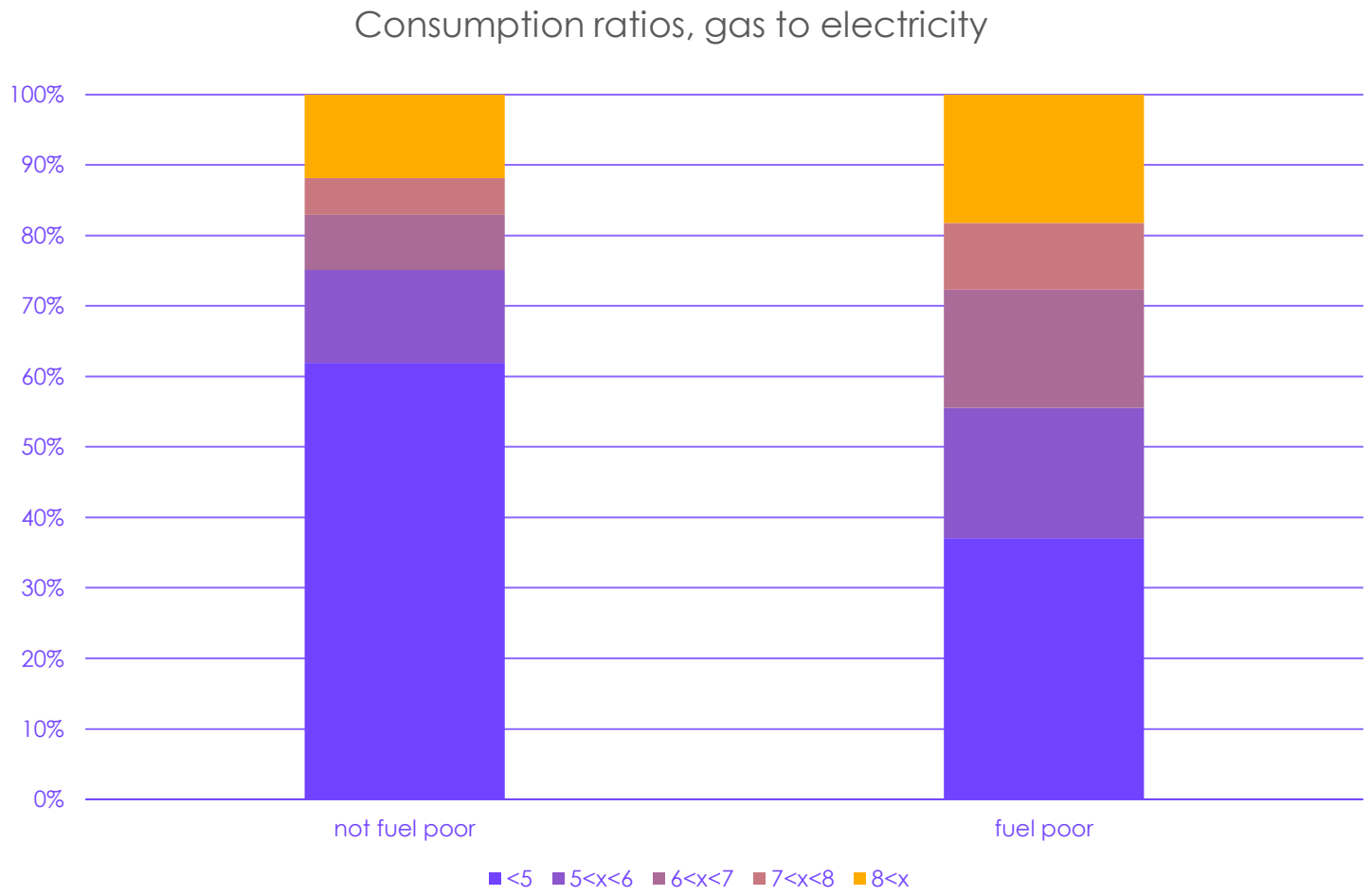


Rebalancing policy costs

Shifting 100% of policy costs from electricity to gas on average dual fuel gas bill



Rebalancing policy costs
Managing impacts on fuel poor



Fuel poor homes are more exposed to shifts on to gas than the rest of households.

Of the 3m fuel poor homes, only 800k would benefit from a shift based on the average dual fuel customer.

Around 720k of these are electrically-heated fuel poor homes.

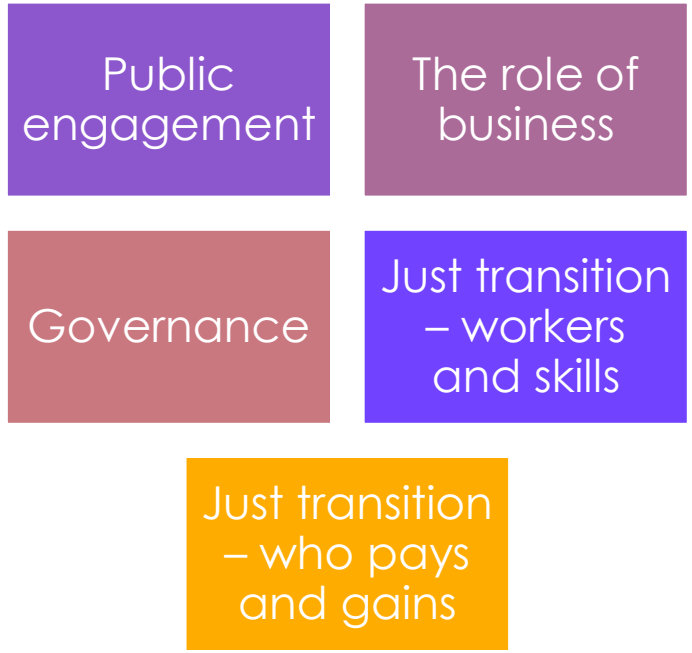
Source: National Household Model, 2015 outputs

Next steps

Next steps for buildings policy

- Crystallise the roles of different actors – public, business, local authorities, FSO and networks
- Create a level-playing field for electrification and heat networks, whilst managing impacts on the fuel poor
- Set out options for a fair and equitable transition

CCC thematic work programme



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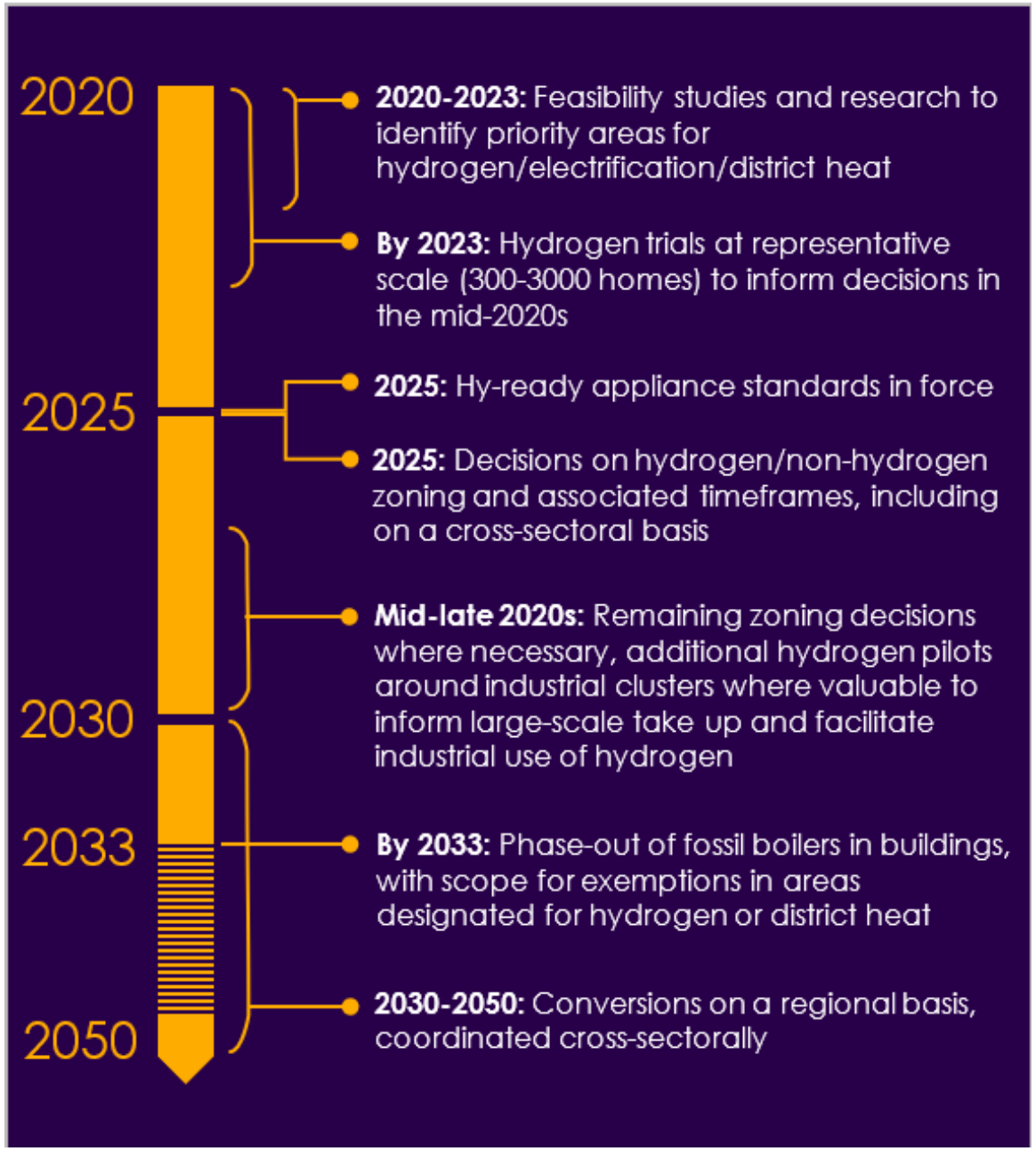
Annex

Indicative hydrogen development pathway

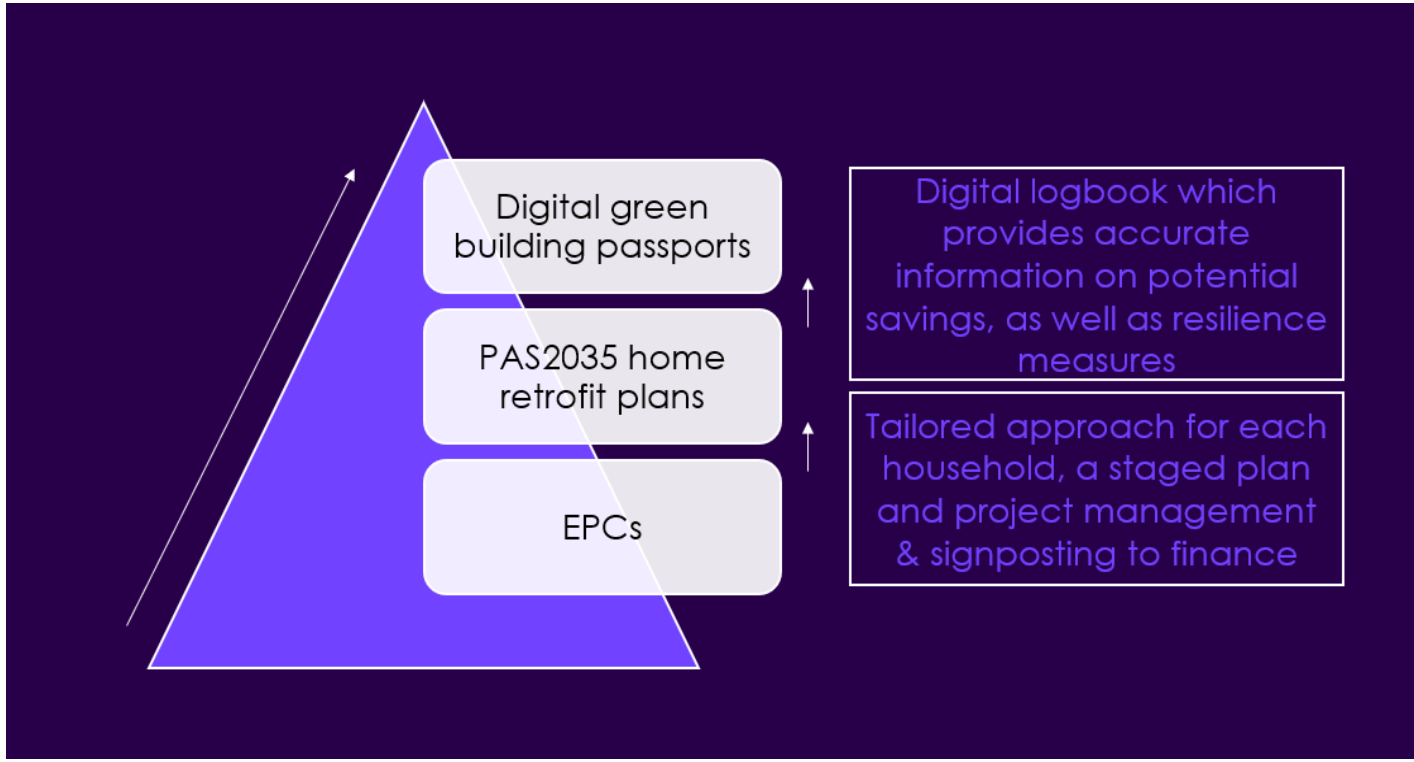
Keeping hydrogen in play

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



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.



Skills, compliance and enforcement

Projected increase in employment