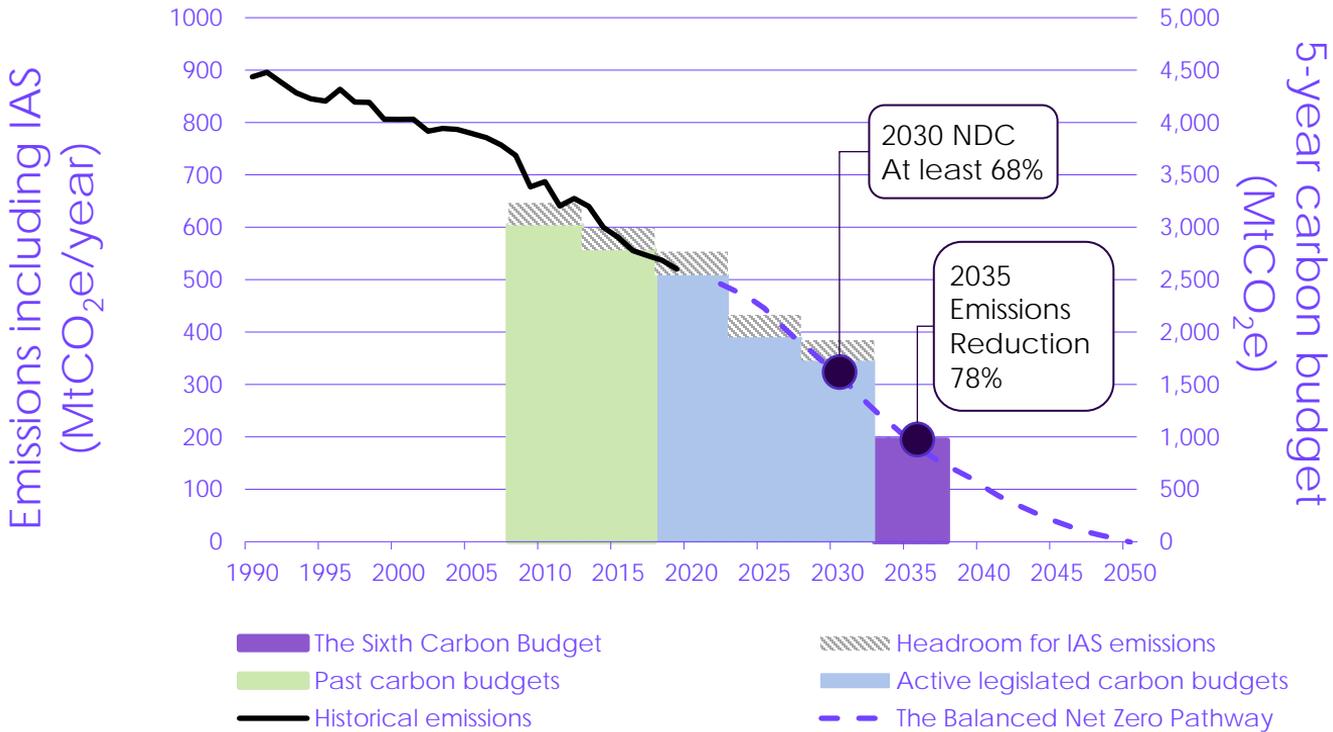


The UK's legislated path

The sixth carbon budget and 2030 NDC on the way to Net Zero by 2050

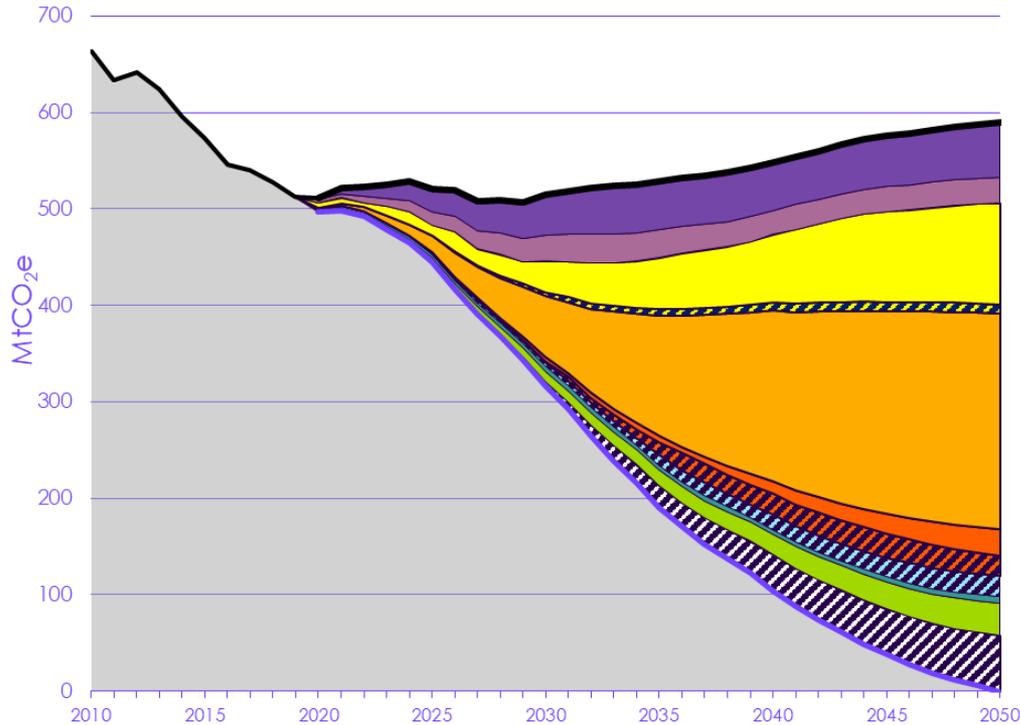


Notes:
Emissions shown including emissions from international aviation and shipping (IAS) and on an AR5 basis, including peatlands. Adjustments for IAS emissions to carbon budgets 1-3 based on historical IAS emissions data; adjustments to carbon budgets 4 and 5 based on IAS emissions under the Balanced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

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

Emissions abatement

Meeting the Sixth Carbon Budget requires actions across four key areas:
demand; decarbonize supply; electrify and use hydrogen; greenhouse gas removals

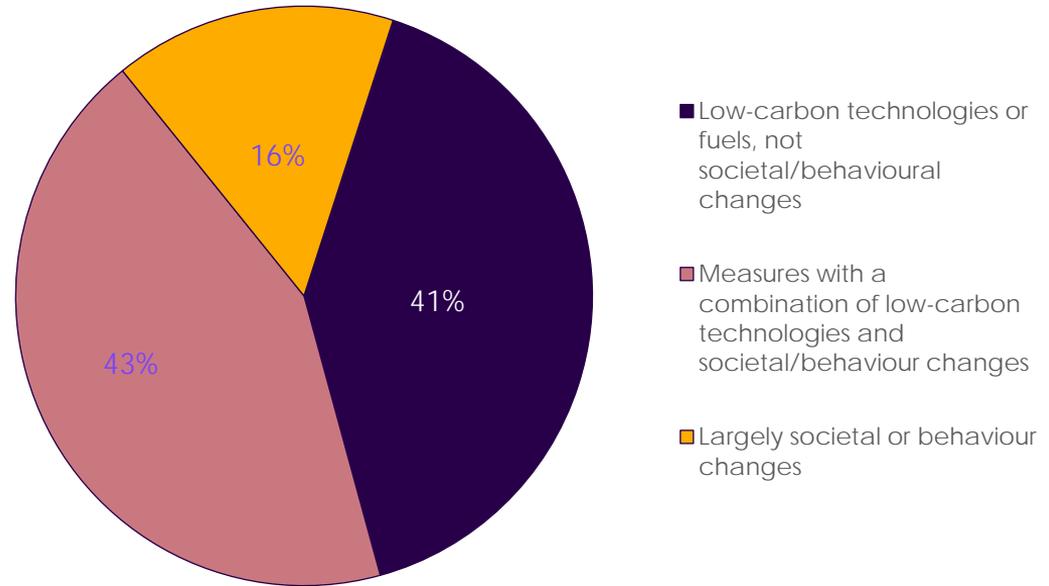


1. Reducing demand and improving efficiency
 - Reduced demand for carbon-intensive activities
 - Improved efficiency in use of energy and resources
2. Expansion of low-carbon energy
 - Low-carbon hydrogen and electricity production
3. Take-up of low carbon solutions
 - Electrification
 - Hydrogen and other low-carbon technologies
 - CO₂ capture from fossil fuels and industry
4. Offsetting emissions
 - Natural carbon storage and greenhouse gas removals

Delivering Net Zero

Role of behavioural and societal change in meeting the Sixth Carbon Budget

- Over 40% of the abatement to 2035 is through low-carbon technologies or fuels, with very limited behavioural change
- Over 40% involves at least some degree of change from consumers (e.g. driving an electric car, or installing a heat pump instead of a gas boiler).
- Over 15% of the abatement measures in our scenarios require consumer choices – both to reduce demand and improve efficiency. Shifting quickly towards healthier diets, reducing growth in aviation demand and choosing products that last longer and therefore improve resource efficiency are all key. In the Widespread Engagement scenario this is even higher, at 19%.



Source: CCC Analysis

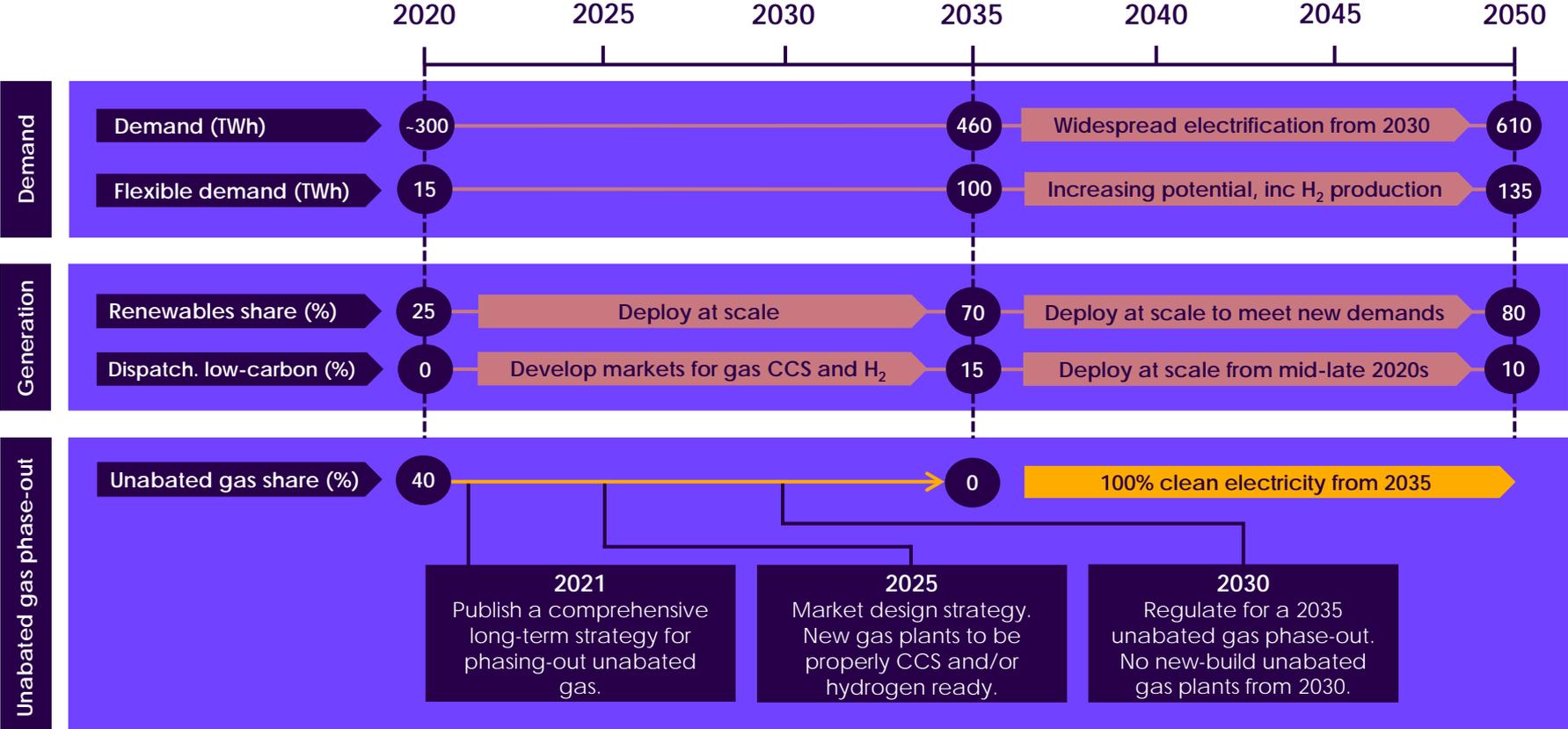
Progress required by 2035

Breaking the back of the Net Zero challenge

- **Emissions reduction:** Our recommended path achieves nearly 2/3 of the emissions reduction required for Net Zero by 2035, halfway to 2050
- **Investment:** every new car/van and heating appliance to be Net-Zero compatible by the early 2030s – further emissions reductions will follow as these roll through the stock
- **Energy supply:** 100% low-/zero-carbon electricity by 2035, with supply doubling by 2050 as sectors electrify
- **Infrastructure:** Development of hydrogen and CCS infrastructure by 2030, to enable decarbonisation where renewables / electrification can't do everything
- **Greenhouse gas removals:** First deployment by 2030, and mechanism established for 'hard to decarbonise' sectors (e.g. aviation) to pay for them

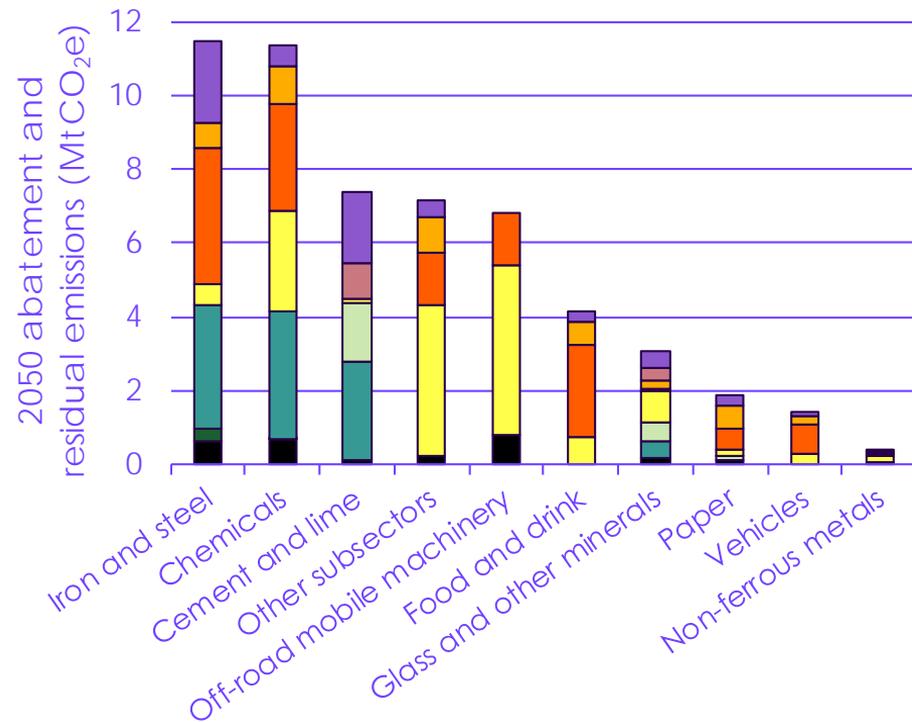
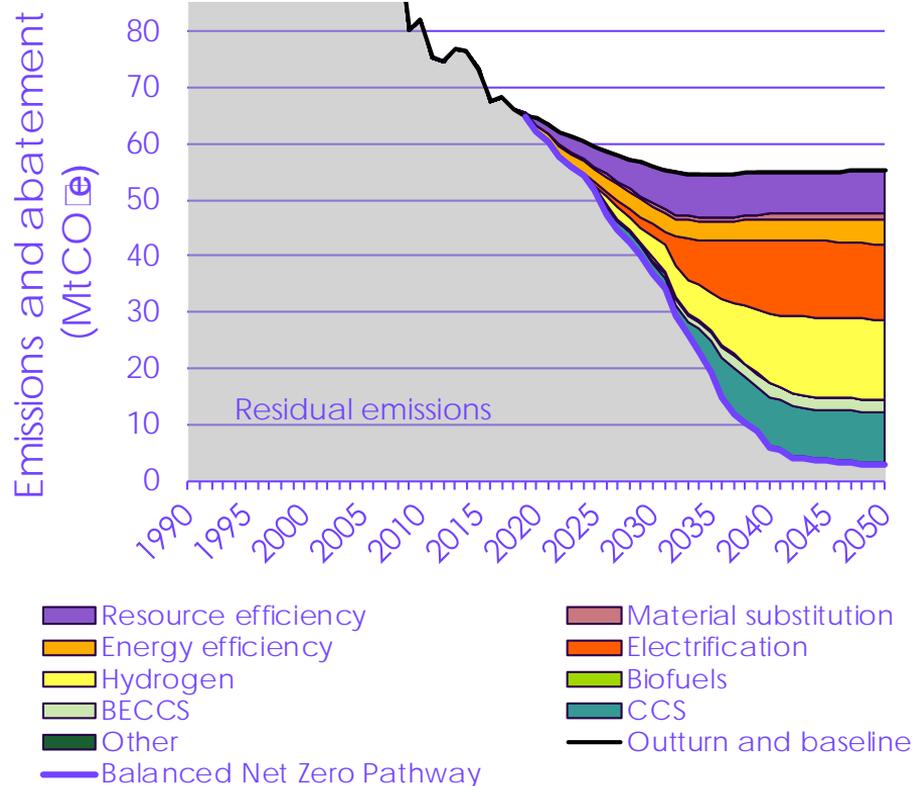
Phase-out dates of high-carbon activities under the Balanced Pathway		
Technology/behaviour	Phase out date (sales)	Backstop date (operation)
New fossil-fuelled cars & vans	2032	2050
Gas boilers	2033 (homes) 2030-33 (commercial)	2050
Oil boilers	2028 (homes) 2025-26 (commercial)	2050
Gas power generation (unabated)	2030 (no 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

Summary of advice on electricity generation



The Balanced Pathway for manufacturing and construction

Resource/energy efficiency, electrification, hydrogen and CCS are all important



Note: Cement includes correction vs published report

The best solution for HGVs is currently uncertain

But now is the time to act, with trials + planning

Early 2020s – large-scale trials:

- Commercial demonstrations
- 50-150 vehicles per trial, lasting up to 5 years
- Collect and communicate data on costs, system performance/reliability, and commercial suitability

Early 2020s – planning:

- Consult on phase-out date for diesel
- Comprehensive plan for how phase-out can be delivered

2035 – our modelling assumes sufficient incentives to ensure total cost of ownership parity versus diesel

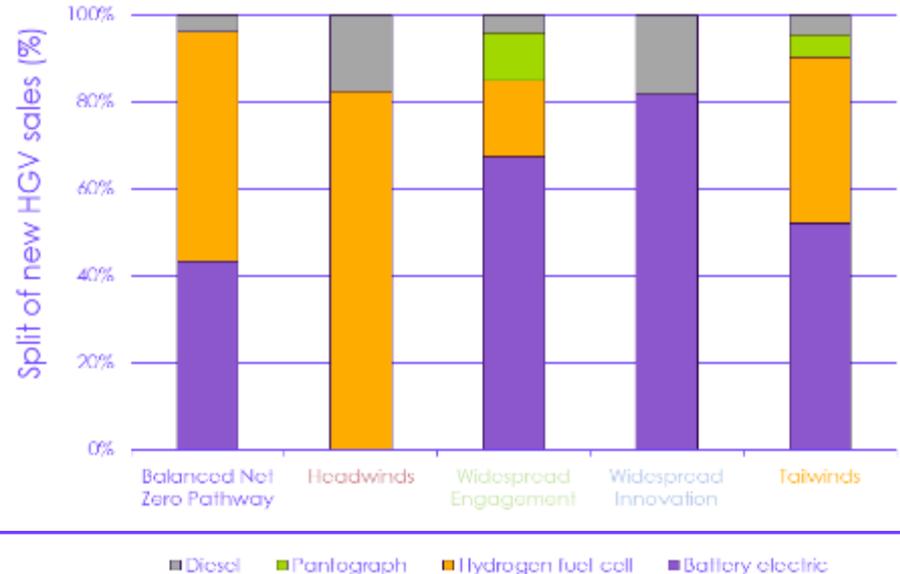
2040 (or earlier) – end of sales of new diesel HGVs

Simultaneously:

- Support schemes to reduce HGV/van use
- Set ambitious CO₂ emissions standards for HGVs

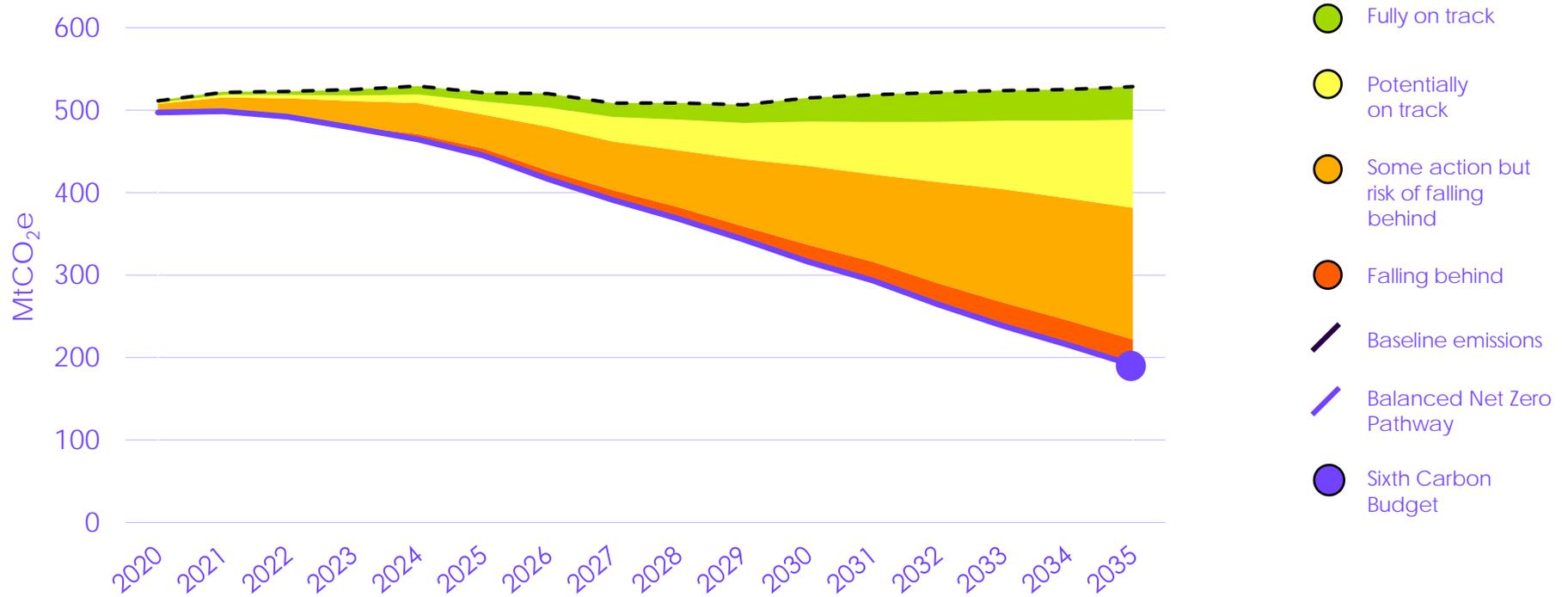


New HGV sales in 2035



Government ambition

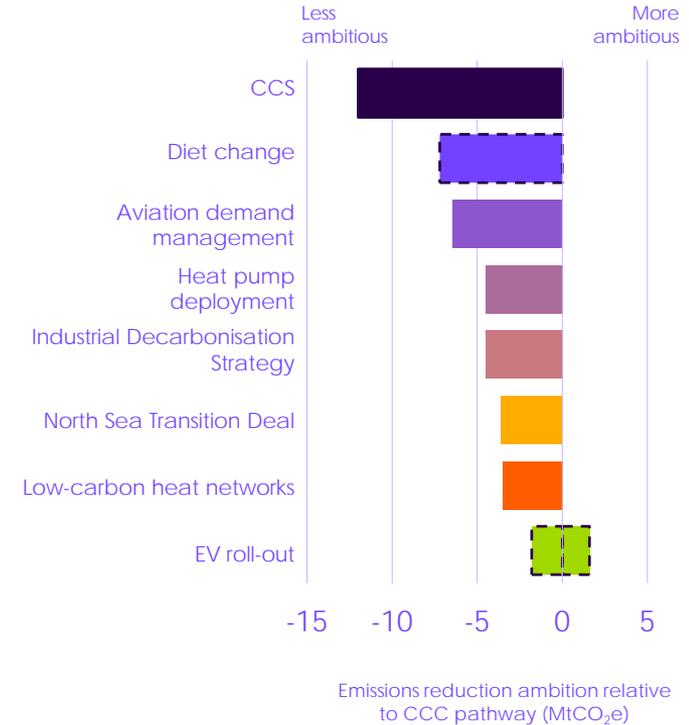
Do Government commitments put us on track to meet the Sixth Carbon Budget?



Government ambition

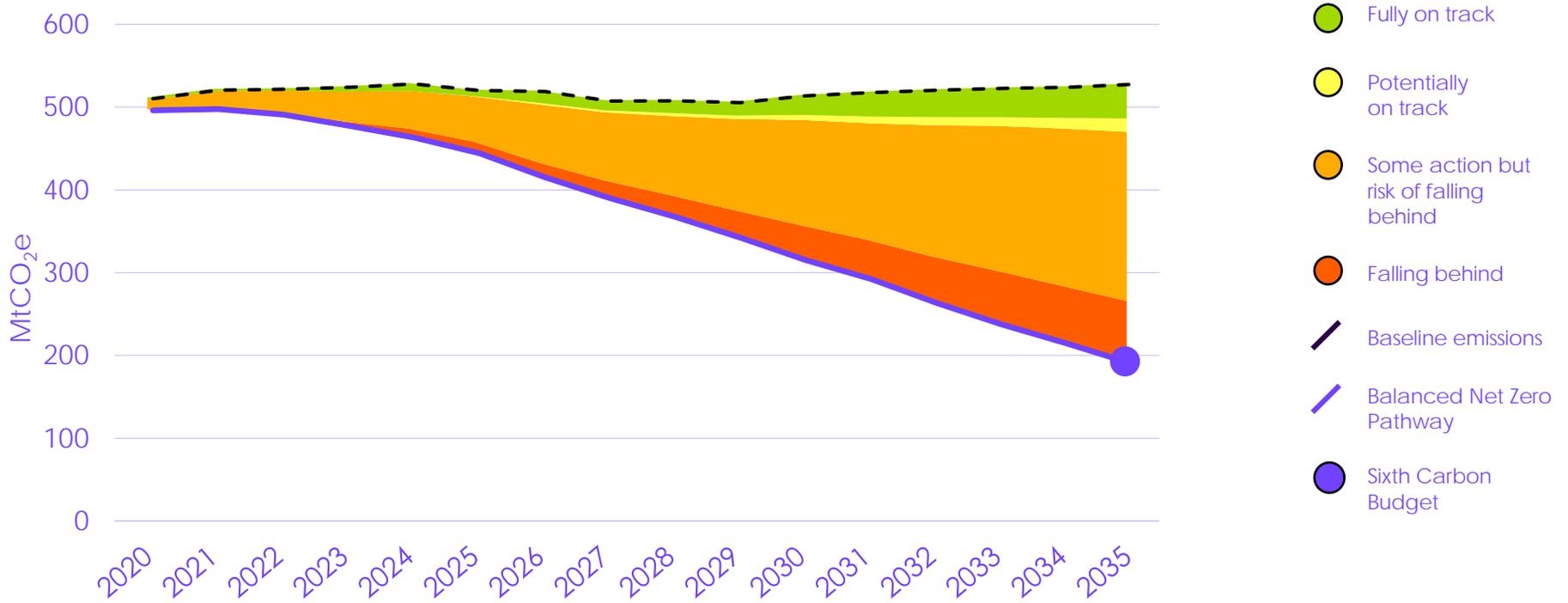
Where Government announcements do not match the CCC pathway, they are generally less ambitious

Headline actions	Government commitment	CCC pathway
Offshore wind	40 GW by 2030	40 GW by 2030
Electric vehicles	Phase-out new fossil fuel vehicle sales by 2030, except some hybrids to 2035	Phase-out new fossil fuel vehicle sales by 2032
Heat pumps in homes	600,000 installations / year by 2028	900,000 installations / year by 2028, 1.1 million by 2030
Low-carbon heat networks (all buildings)	2 TWh by 2030	25 TWh by 2030
Low-carbon hydrogen	5 GW (up to 42 TWh) by 2030	30 TWh by 2030
Carbon Capture and Storage	10 MtCO ₂ /year by 2030, at four industrial clusters, and at least one power project	22 MtCO ₂ /year by 2030, at least five industrial clusters and multiple power projects
Manufacturing and refining emissions	Fall by two-thirds from 2018 to 2035	Fall by 73% from 2018 to 2035
Tree-planting	30,000 hectares / year by 2025	30,000 hectares / year by 2025 50,000 hectares / year by 2035
Peatland restoration	32,700 hectares / year by 2025	67,000 hectares / year by 2025
Greenhouse gas removals	Innovation support, but no firm commitment on deployment yet	5 MtCO ₂ /year by 2030
Nuclear power	Final Investment Decision on at least one new nuclear power plant by the end of this Parliament	One new nuclear plant operational by 2030, and a further plant by 2035



Policy

Is ambition reflected in policy yet?



The Net Zero Strategy

Getting the policy framework right before COP26

Cross-cutting priorities
Comprehensive Net Zero Strategy
A plan for a just transition
Public engagement
A framework for local delivery
Integration with climate adaptation

Essential elements of the transition
Electric vehicles
Buildings decarbonisation
Low-carbon farming, tree-planting and peatland restoration
Decarbonising manufacturing
Auctions for low-carbon power
Hydrogen Strategy
Allow greenhouse gas removals to contribute to carbon budgets

Major gaps
Phase out unabated gas-fired electricity by 2035
Demand-side action: aviation, diet, walking and cycling
Limiting Energy from Waste emissions and increasing reuse and recycling
Net Zero Aviation Strategy

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