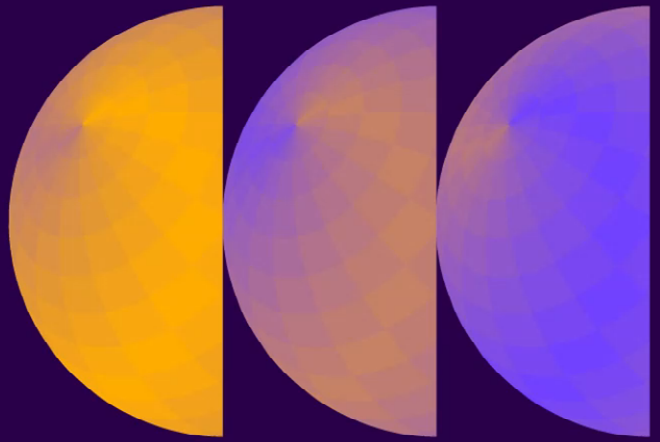


Climate
Change
Committee

UK Net Zero plans

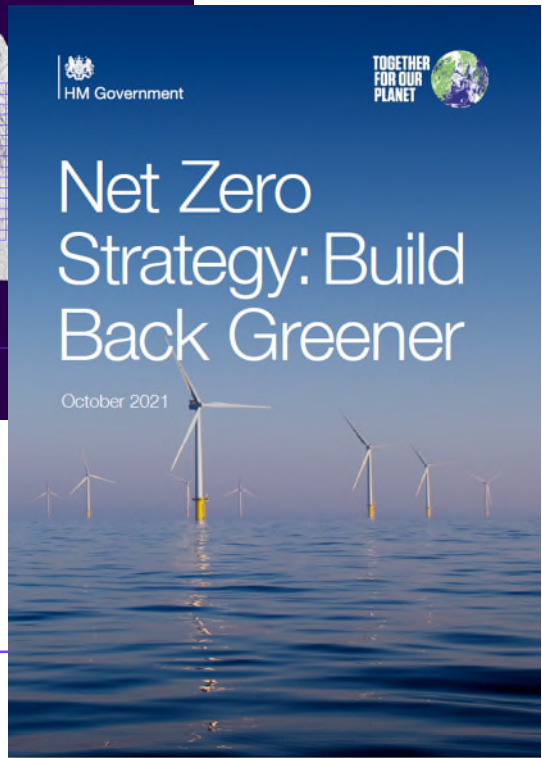
Beyond blah blah blah

Mike Thompson
Chief Economist, Climate Change Committee
March 2022

Climate Change Committee

Agenda

1. What needs to happen on the path to Net Zero?
2. How is the UK planning to achieve it?

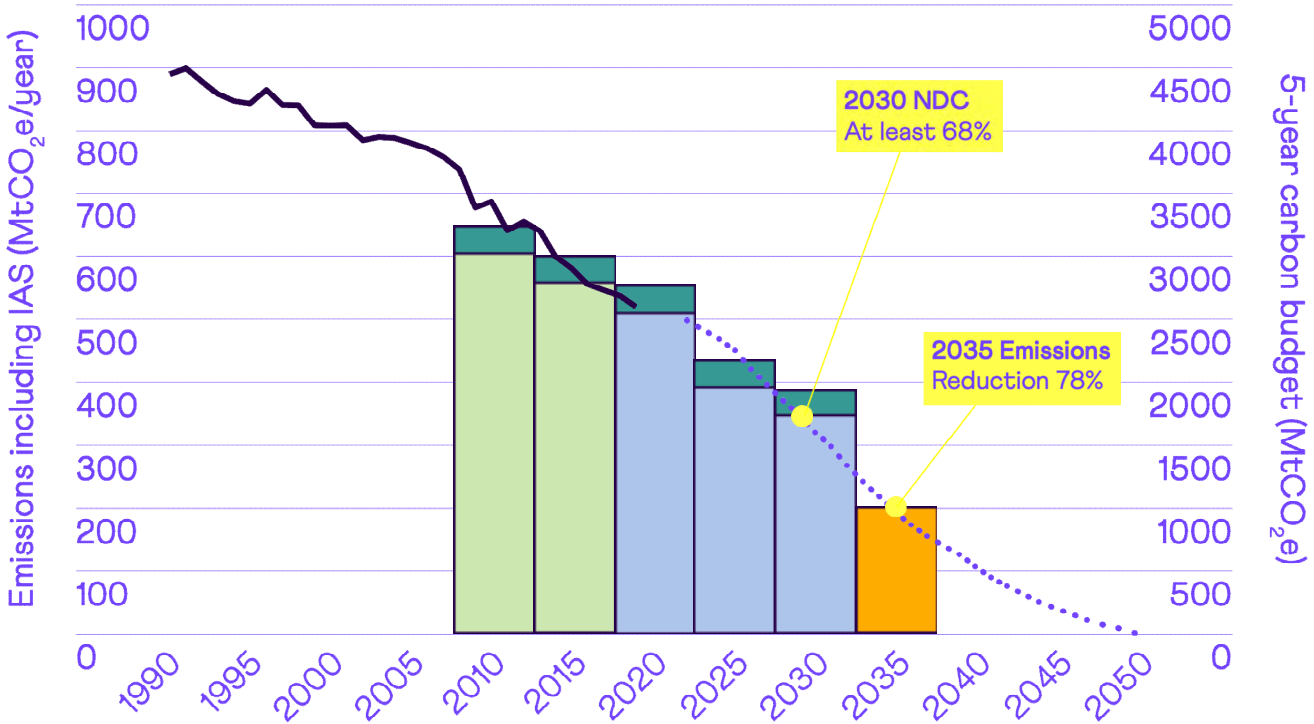


CCC recommended path

"a decisive transition"

Our recommended path

The recommended sixth carbon budget and 2030 NDC

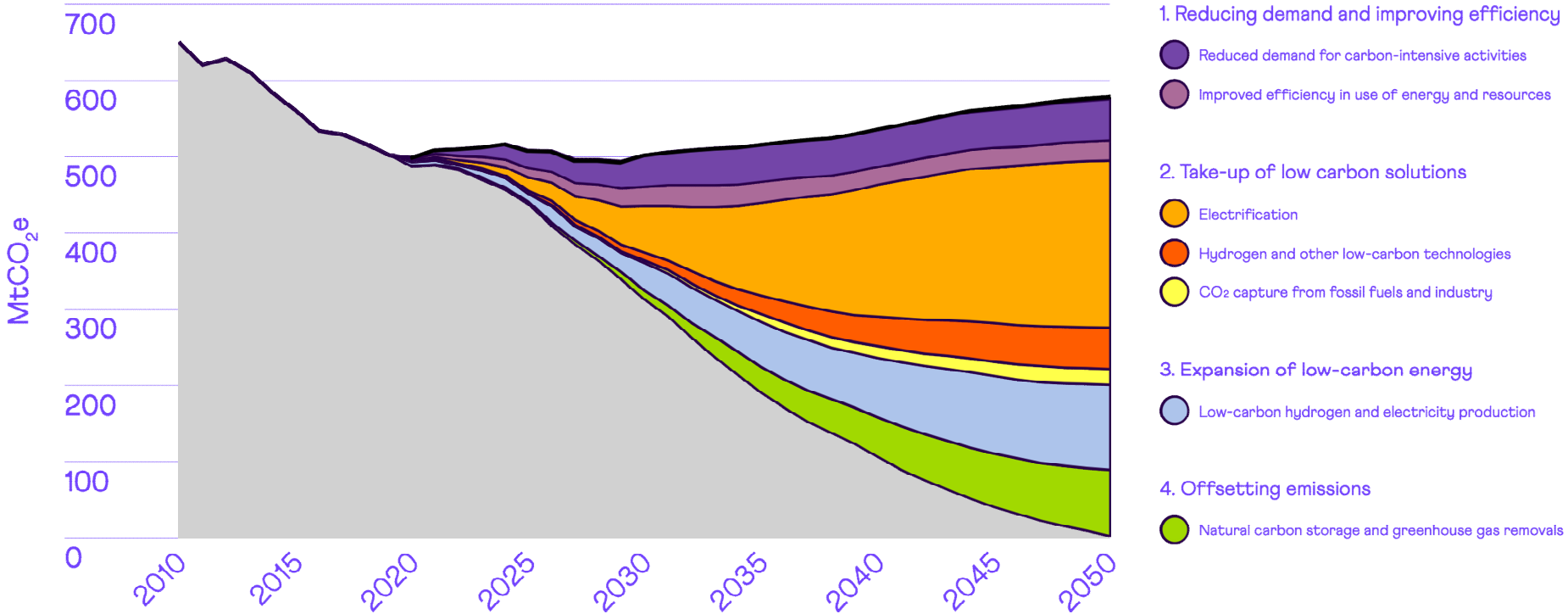


Notes:
Emissions shown including emissions from international aviation and shipping (IAS) and on an AR5 basis, including peatlands. Adjustments for IAS emissions to carbon budgets 1-3 based on historical IAS emissions data; adjustments to carbon budgets 4 and 5 based on IAS emissions under the Balanced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

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

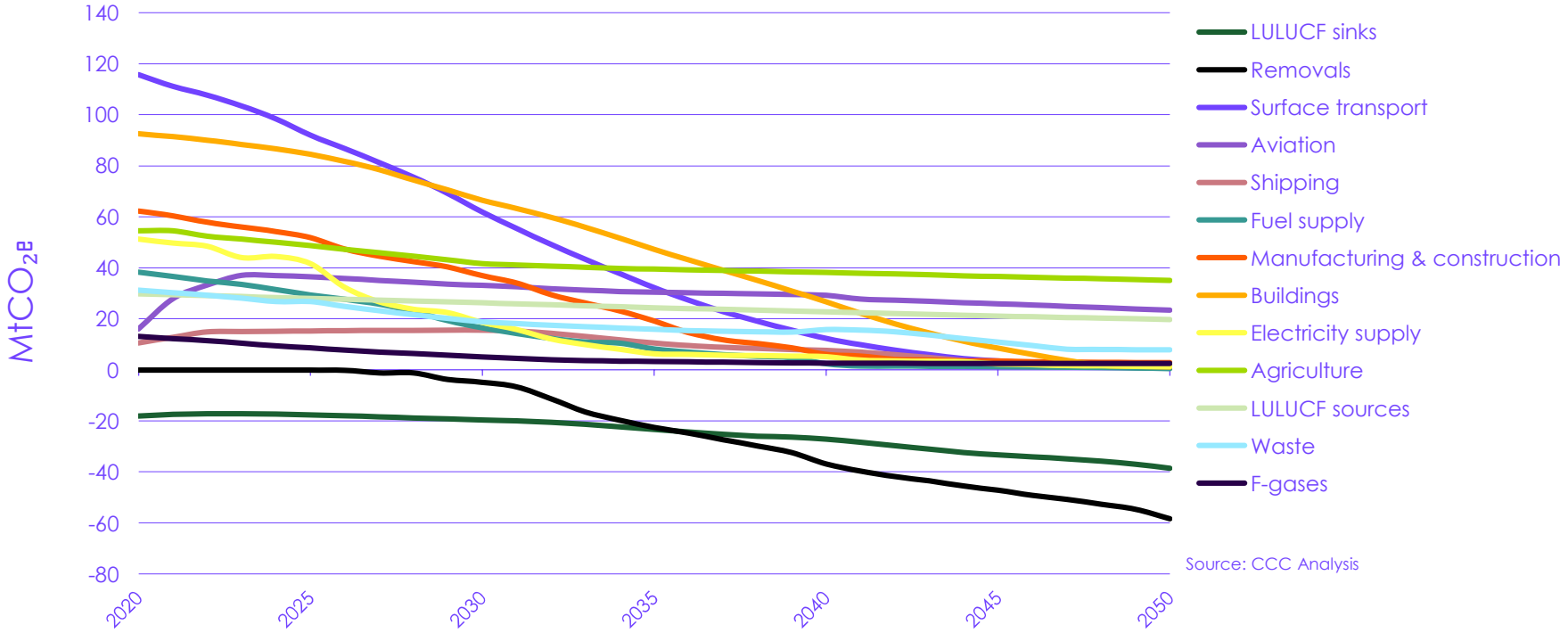
Emissions abatement

Meeting the Sixth Carbon Budget requires actions across four key areas



Emissions reductions on the path to Net Zero

Sectoral contributions



Source: CCC Analysis

The path of least disruption

A real-world constraint: asset lives

Sector	Asset	Lifetime
Transport	Light Vehicle	14 years (average)
	HGV	8 – 13 years
Manufacturing and Construction	Combustion (Boilers, furnaces, mobile machinery, generators, kilns, compressors, dryers, heaters, ovens, Other process assets.	10-35 years
Buildings	Fossil fuel boiler	15 years
	Air Source Heat Pump	15 years
	Ground Source Heat Pump	20 years
	Loft and cavity insulation	42 years
	Solid wall insulation	36 years
	New build home	60 years
Power generation	Gas plant	25 years
	Offshore wind	30 years
	Nuclear plant	60 years
Aviation	Aircraft	30 year technical
Shipping	Ships	30 years technical

Sector	Asset	Lifetime
Fuel Supply	Offshore platforms, flaring, compressors, generators	25-35 years
	Biofuel plants	30 years technical
	BioH2 plants	30 years technical
	Biogas, biomethane plants	20 years technical
	Waste to jet plants	20 years technical
Wastes/Bio	Refuse collection vehicles	8 years technical
	Landfill methane capture and biocovers	20 years technical
	Waste water treatment equipment	25 years technical
	Composting equipment	20 years technical
Removals	DACCS	25 years technical
	Biomethane displacing natural gas	20 years technical
		Set by buildings sector
	Wood in construction	Set by asset lifetimes in each sector
	BECCS	

Managing asset turnover

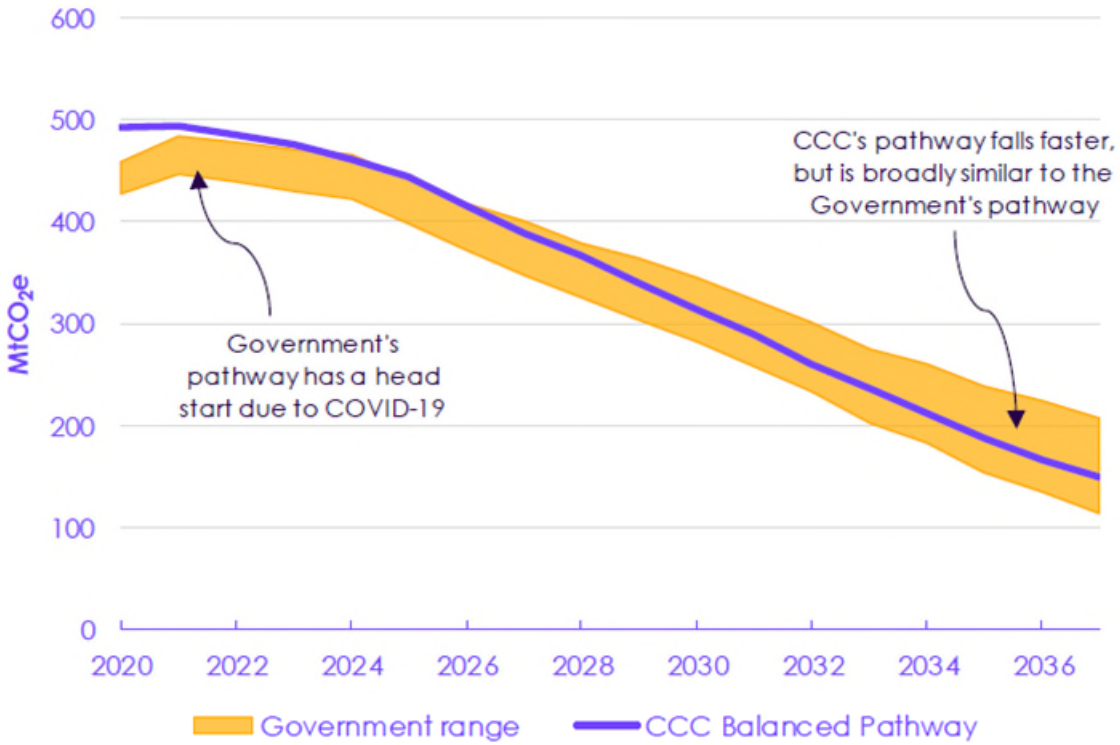
Key UK-wide phase-out dates for high-carbon activities to avoid early scrappage

Phase-out dates of high-carbon activities under the Balanced Pathway		
Technology/behaviour	**Phase out date (sales)**	**Backstop date (operation)**
New fossil-fuelled cars and vans	2032	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 (i.e. trucks)	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.

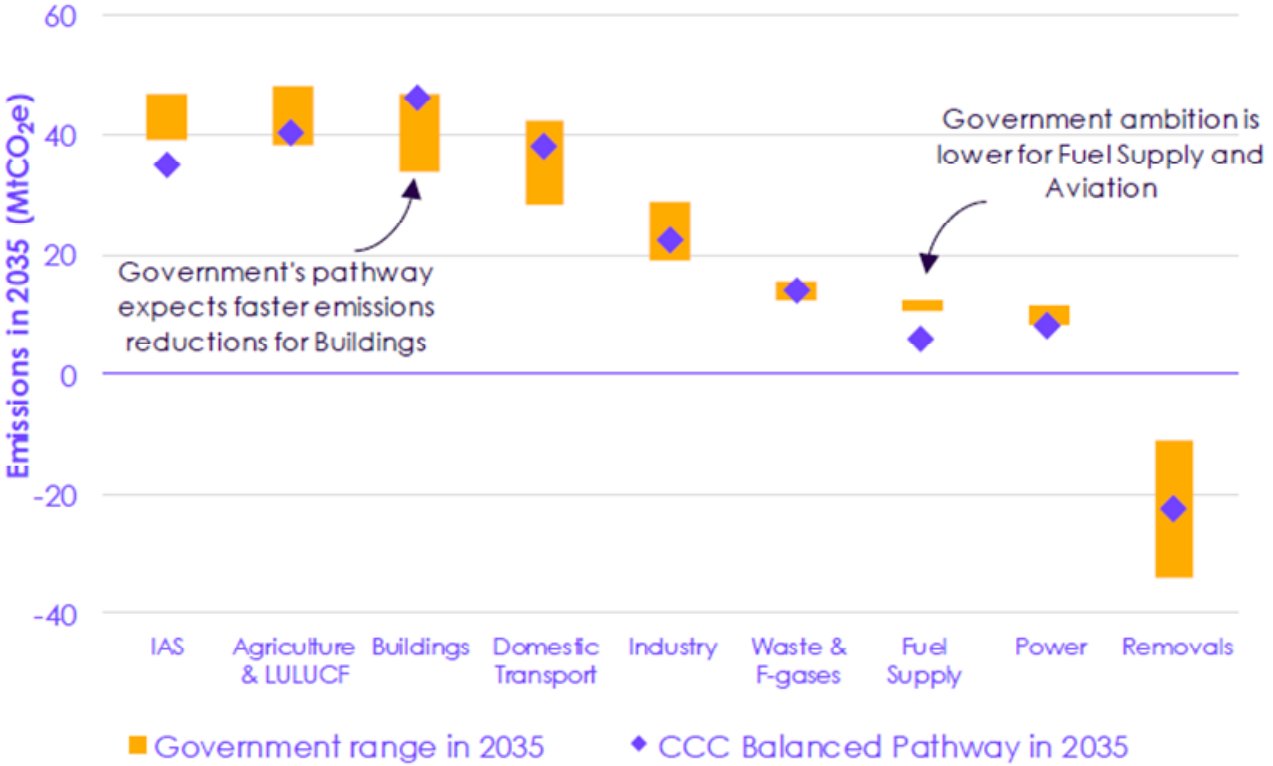
The Net Zero Strategy

Similar pathway to the CCC – as required by carbon budgets



The Net Zero Strategy – sector ambition

Strikingly similar to CCC mix



IAS = international aviation and shipping

Headline actions similar to CCC pathway

Sector	Headline actions	Government ambition [1]	CCC pathway
Power	Fully decarbonised electricity	2035	2035
Fuel supply	Low-carbon hydrogen (2030)	5 GW (~ up to 42 TWh)	30 TWh
Transport	Phase-out of new petrol/diesel cars and vans	2030 (2035 for some hybrids)	2032
Buildings	EPC C across the housing stock	2035	2035
	Heat pump installations in homes (2028)	600k	900k
Industry	Carbon Capture and Storage (2030)	20-30 $MtCO_2$ (incl 5$MtCO_2$ removals)	22 $MtCO_2$ (incl 5$MtCO_2$ removals)
Land	Tree-planting (hectares/year; 2025/2035)	30k 50k	30k 50k

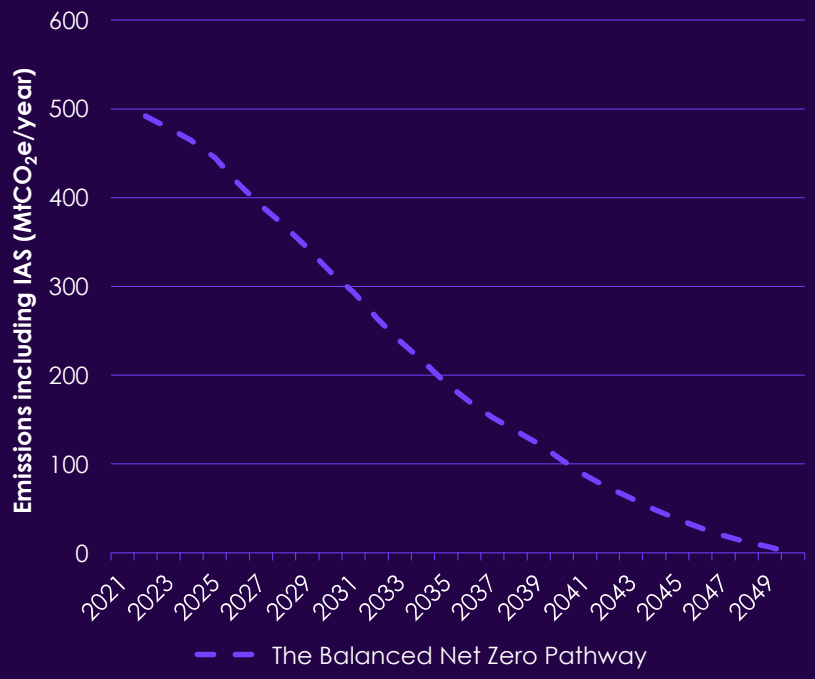
Largest differences are on demand side, with no stated ambition for reducing meat/dairy consumption or to limit growth in flying

Delivering the Net Zero path

Scale up & Roll out

The Policy Challenge

The shape of the Balanced Net Zero Pathway implies a need to scale up low-carbon options in all areas, before mass rollout.



By 2024

Progress being made across all areas, including:
- Business models for hydrogen, CCS, GHG removals and industrial decarbonisation up and running. First plants being built.
- Global goals and policies for aviation and shipping aligned with Paris Agreement
- Environmental Land Management scheme up and running
- Large scale trials for HGVs up and running
- Future Homes Standard legislated in advance of 2023.
- A more circular economy.

Mid-2020s

Scale up

Build out of low-carbon hydrogen to produce 30 TWh/year by 2030
Build out of offshore wind plant towards 40 GW in 2030
Heat pump installations at scale ahead of a natural gas phase-out
CCS projects at industrial clusters, first engineered GHG removals plants
Widespread EV charging infrastructure
No more biodegradable waste sent to landfill
Switch 25 TWh of manufacturing energy use to electricity or hydrogen by 2030

2030

Roll out

By 2030: Recycling rate of 70% achieved
By 2032: 100% of sales of cars and vans are fully electric
By 2033: Sales of gas boilers to all homes and business phased out
By 2035: Phase out of unabated gas for electricity generation
By 2035: Annual tree-planting rates of 50,000 ha/year
By 2035: All ore-based steel-making near-zero emissions
By 2040: Phase out sales of new diesel HGVs
Scale up of low-carbon electricity and hydrogen, GHG removals and CCS infrastructure

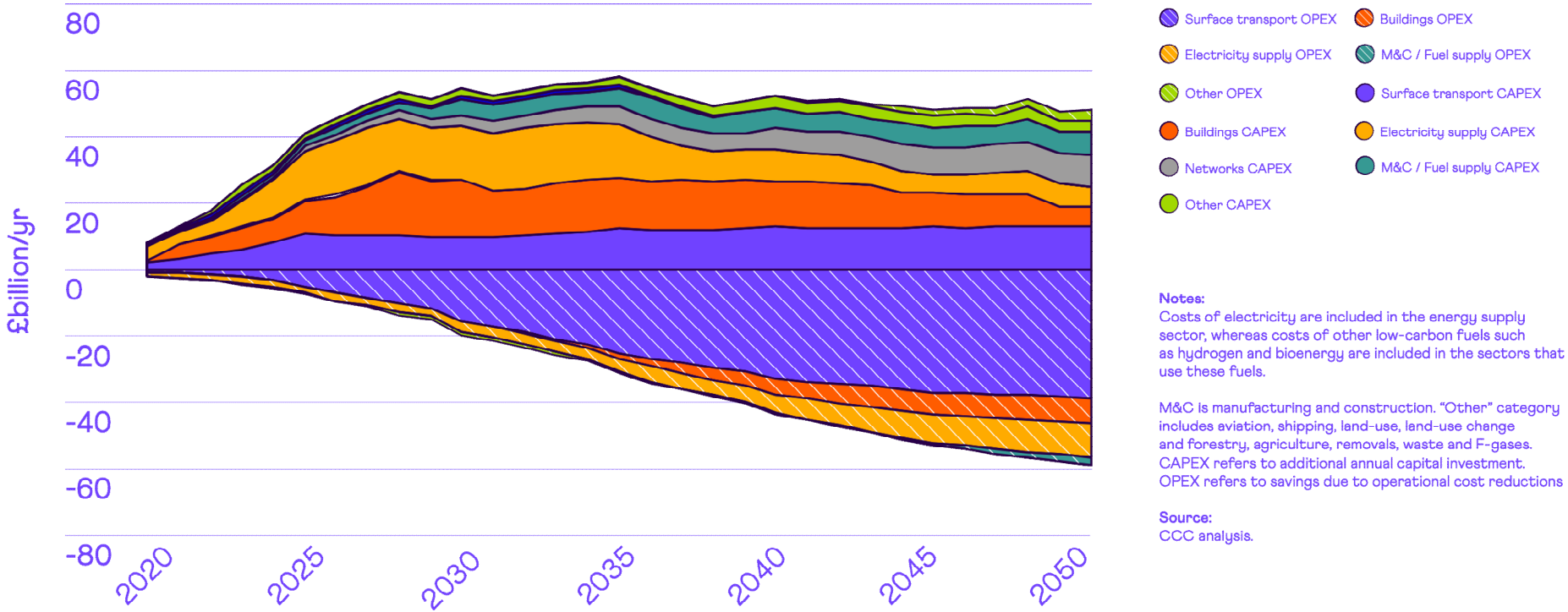
2050

Net Zero

**Including emissions from international aviation and shipping (IAS)*

Investing for Net Zero

Major investment programme, delivering offsetting operating cost savings



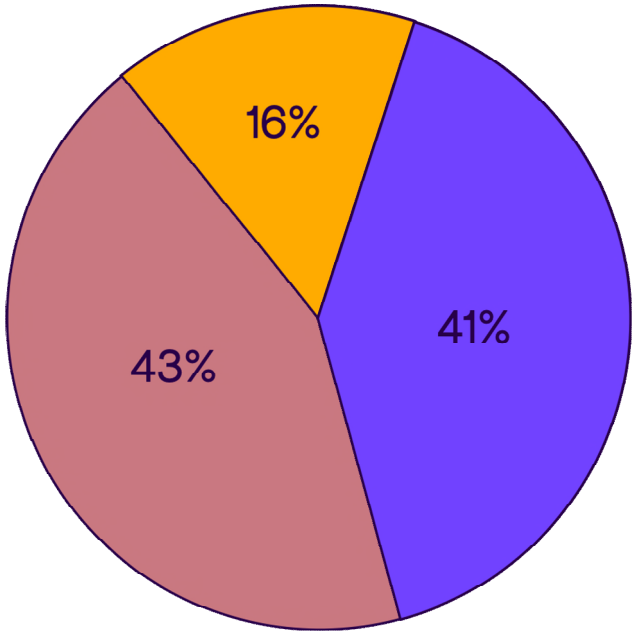
Notes:
Costs of electricity are included in the energy supply sector, whereas costs of other low-carbon fuels such as hydrogen and bioenergy are included in the sectors that use these fuels.

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.

Role of people's choices in meeting the Sixth Carbon Budget

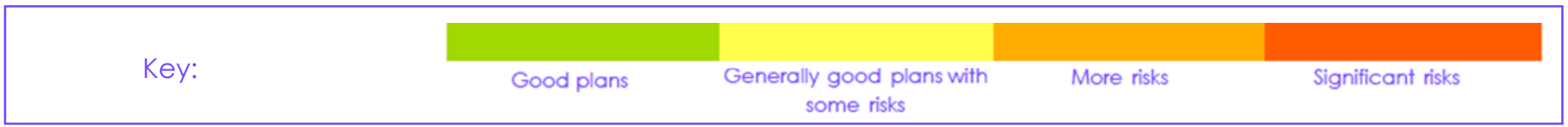


Source: CCC Analysis

The Net Zero Strategy - policies

Good broad plans, but lots of details to be resolved

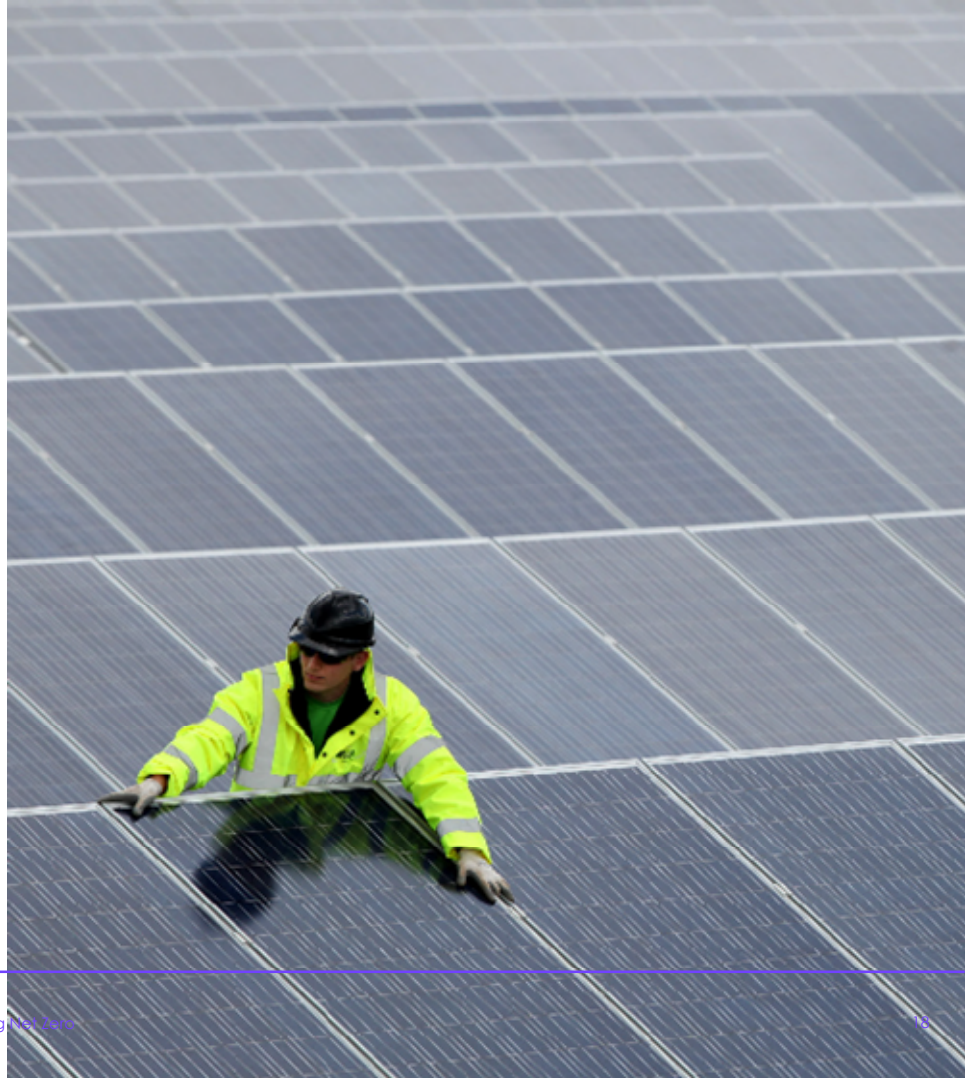
Sector (% of 2019 UK emissions):	Domestic transport (23%)	Buildings (17%)	Industry (15%)	Power (11%)	Agriculture & Land use (12%)
Has a sectoral plan or strategy for reducing emissions been published?					
Does the proposed ambition broadly align to the UK climate targets?					
Have credible delivery policies been proposed or put in place?					
Is it properly funded and/or does it contain sufficient incentives to drive the transition?					
Does the strategy support a balanced mix of solutions to minimise risk on the path to Net Zero?					
Has the government set out timelines for resolving remaining issues?					

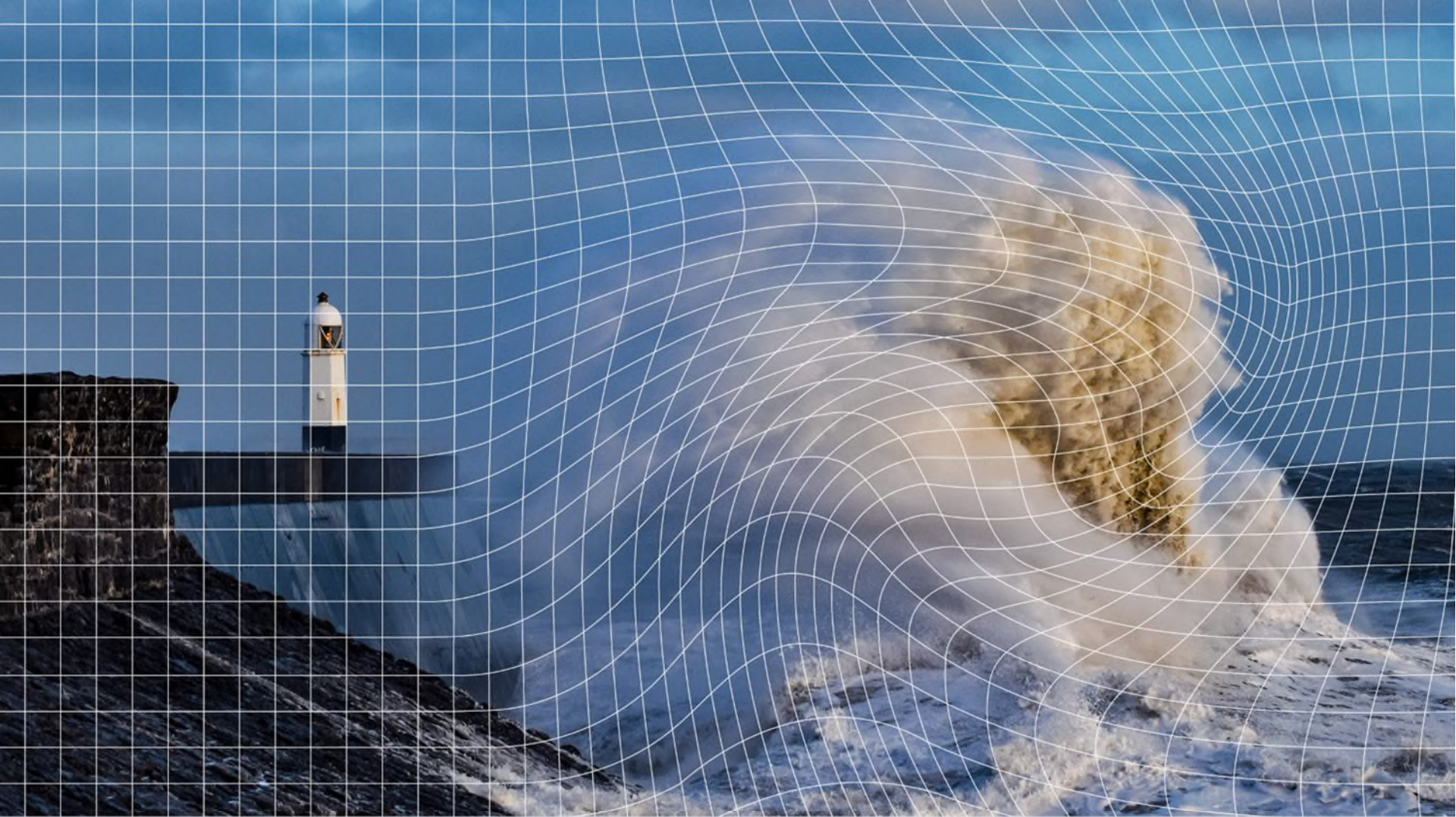


The Net Zero Strategy - policies

…and cross-cutting enablers need attention

- Skills
- Public attitudes & engagement
- Business engagement
- Governance & coordination
- Fair funding
- Integration with adaptation, biodiversity, levelling up





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