Climate
Change
Committee

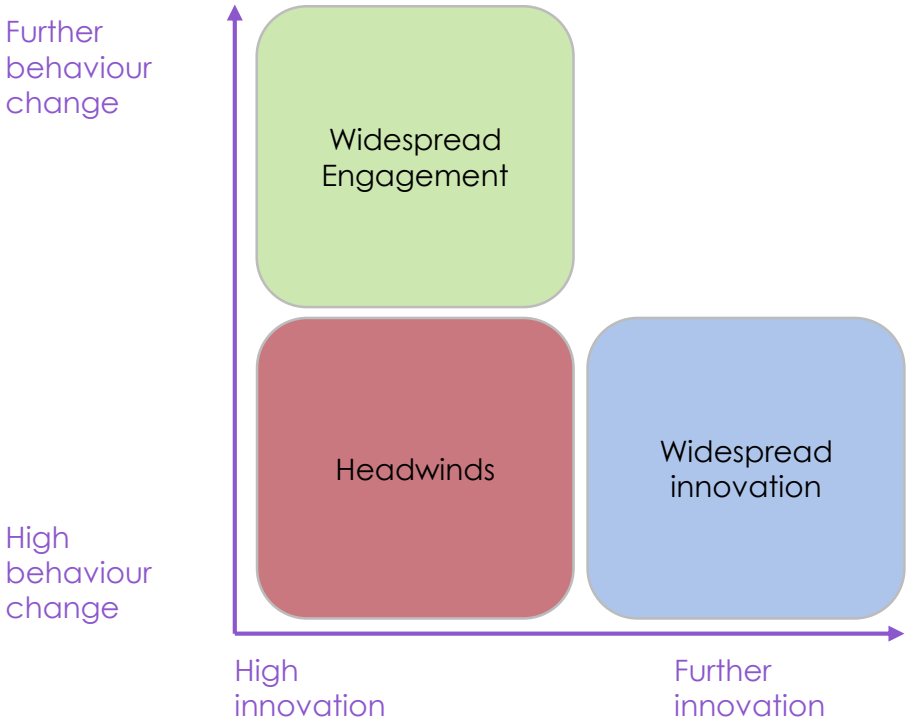
The Path to Net Zero

Advice on the UK's Sixth Carbon Budget 2033-37 – implications for Northern Ireland

Our approach

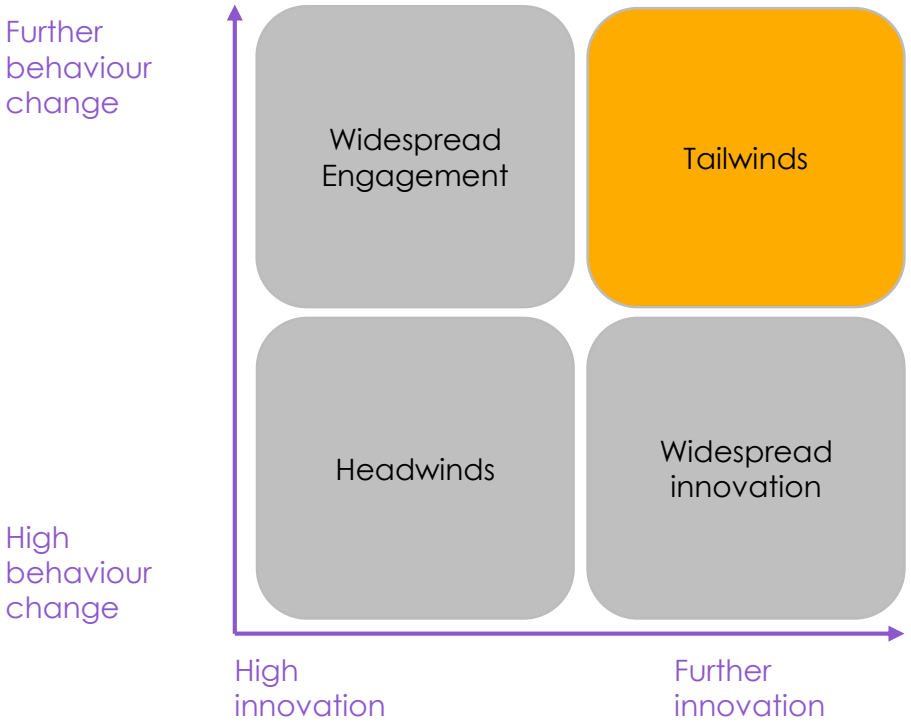
Our approach

Three exploratory scenarios to reach Net Zero by 2050



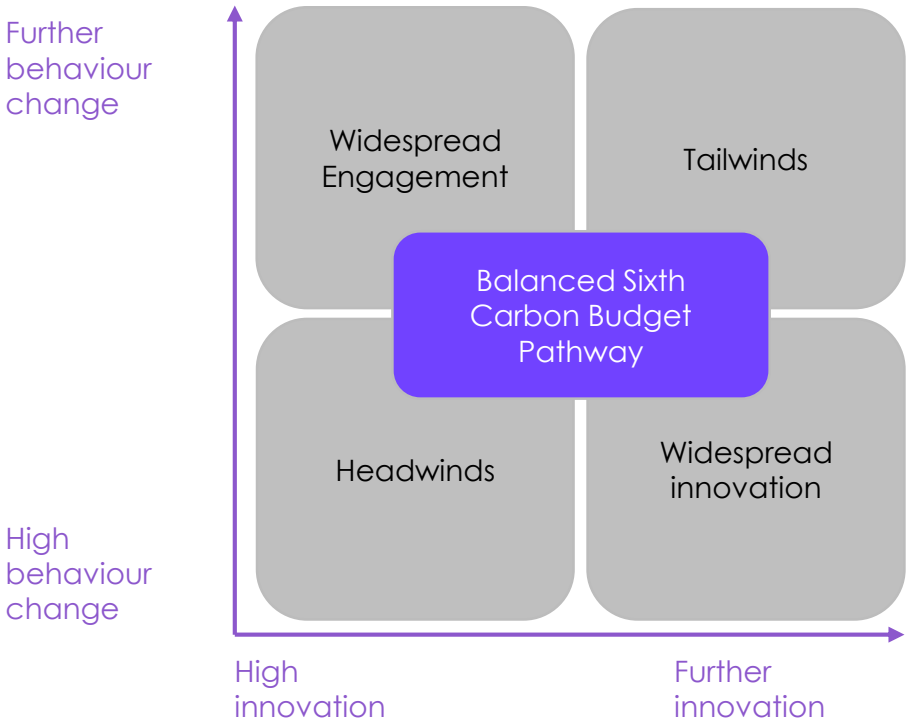
Our approach

One highly optimistic scenario with success on infrastructure, innovation, societal and behavioural change



Our approach

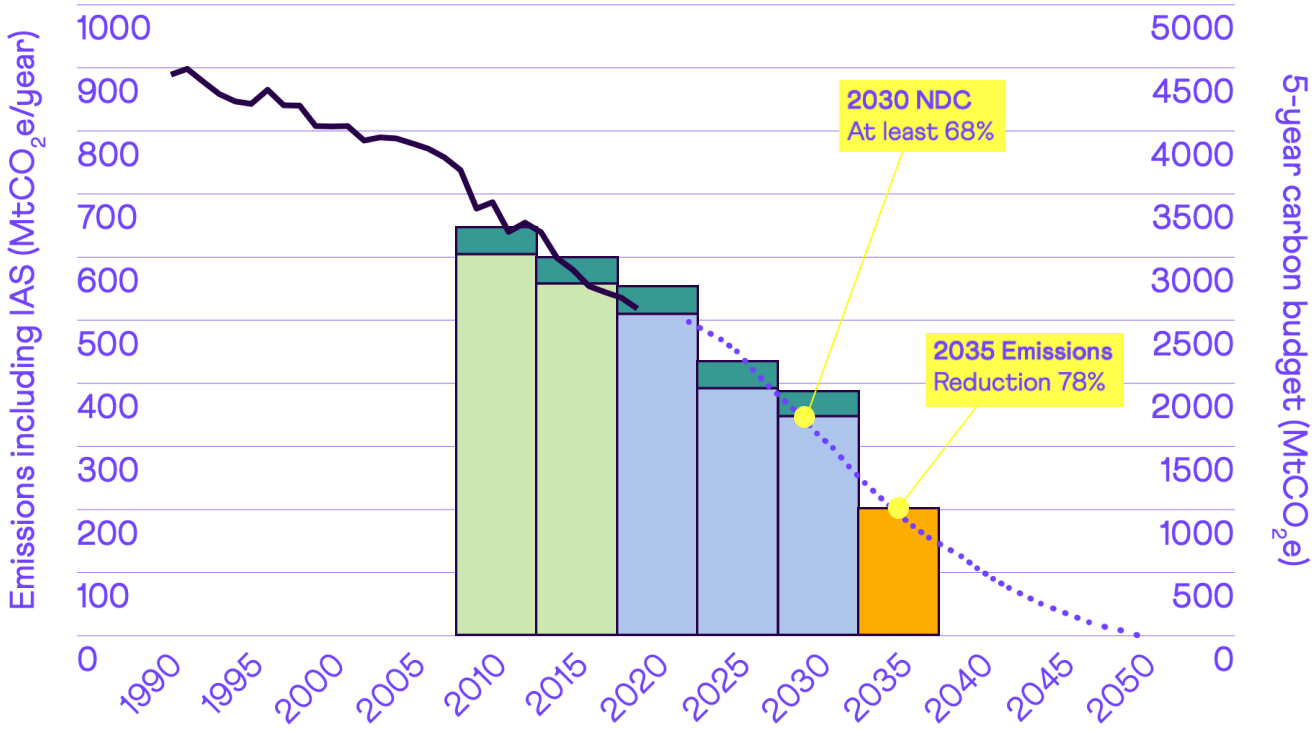
A balanced pathway to keep options open



Our recommended path

Our recommended path

The recommended sixth carbon budget and 2030 NDC

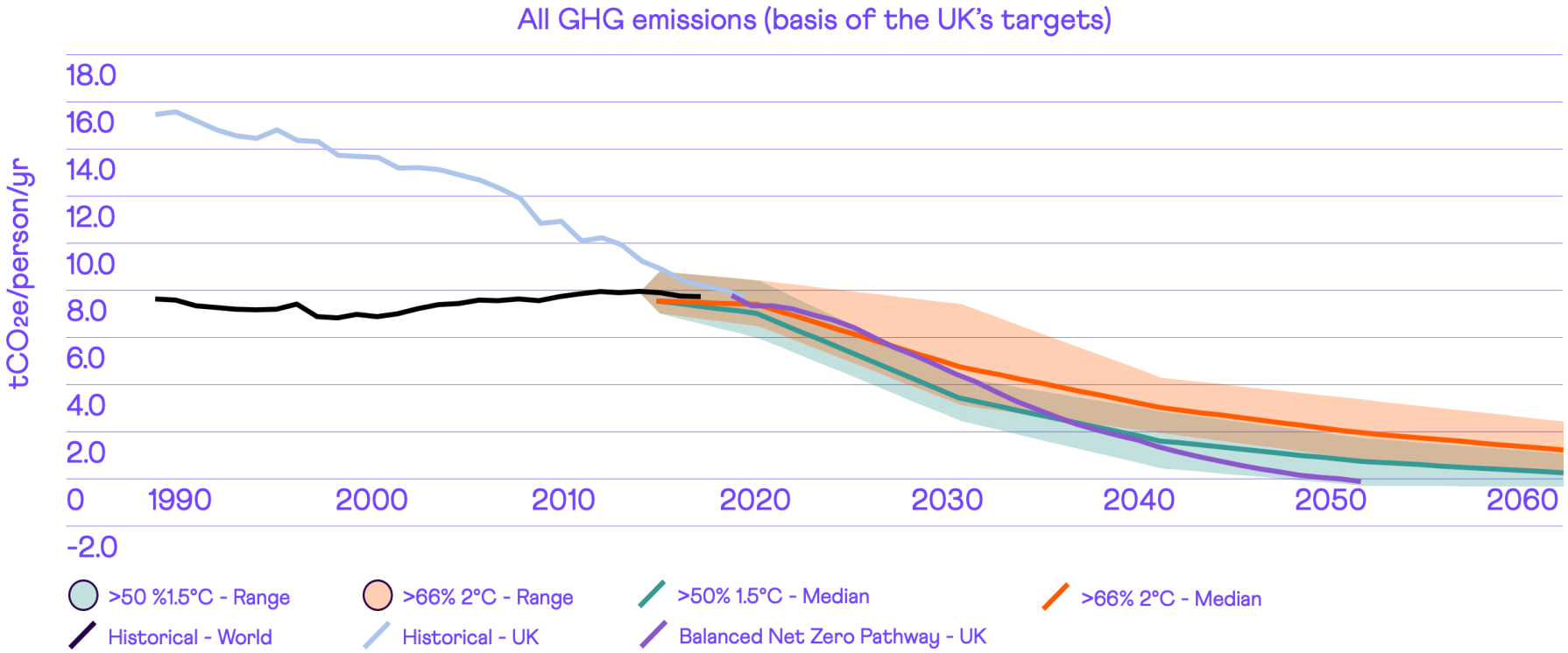


Notes:
Emissions shown including emissions from international aviation and shipping (IAS) and on an AR5 basis, including peatlands. Adjustments for IAS emissions to carbon budgets 1-3 based on historical IAS emissions data; adjustments to carbon budgets 4 and 5 based on IAS emissions under the Balanced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

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

UK's offer to COP26

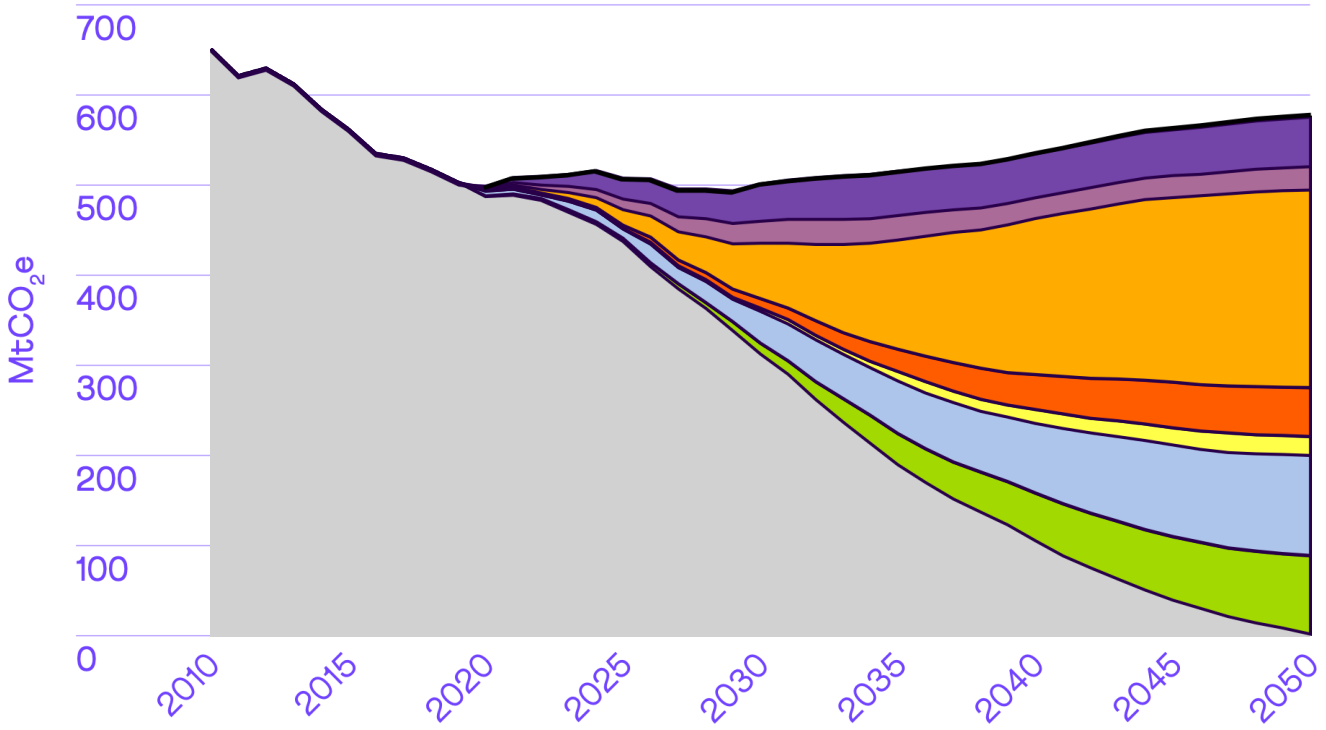
Per person emissions vs global requirements of Paris



Delivering Net Zero

Emissions abatement

Meeting the Sixth Carbon Budget requires actions across four key areas



1. Reducing demand and improving efficiency

- Reduced demand for carbon-intensive activities
- Improved efficiency in use of energy and resources

2. Take-up of low carbon solutions

- Electrification
- Hydrogen and other low-carbon technologies
- CO_2 capture from fossil fuels and industry

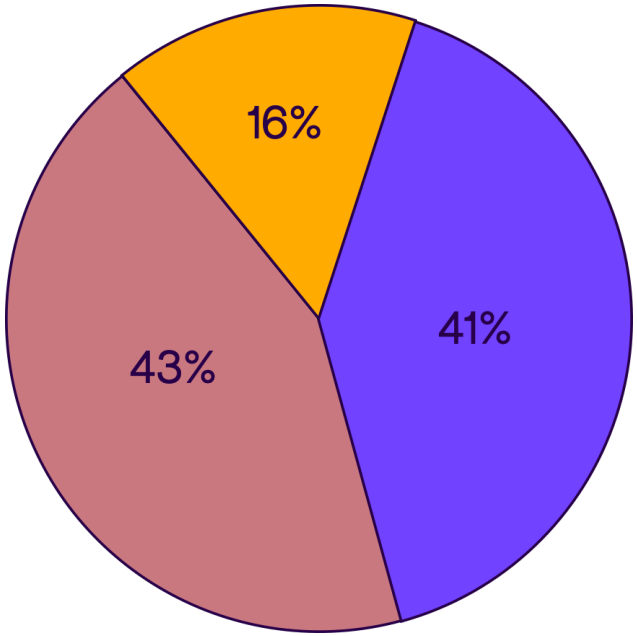
3. Expansion of low-carbon energy

- Low-carbon hydrogen and electricity production

4. Offsetting emissions

- Natural carbon storage and greenhouse gas removals

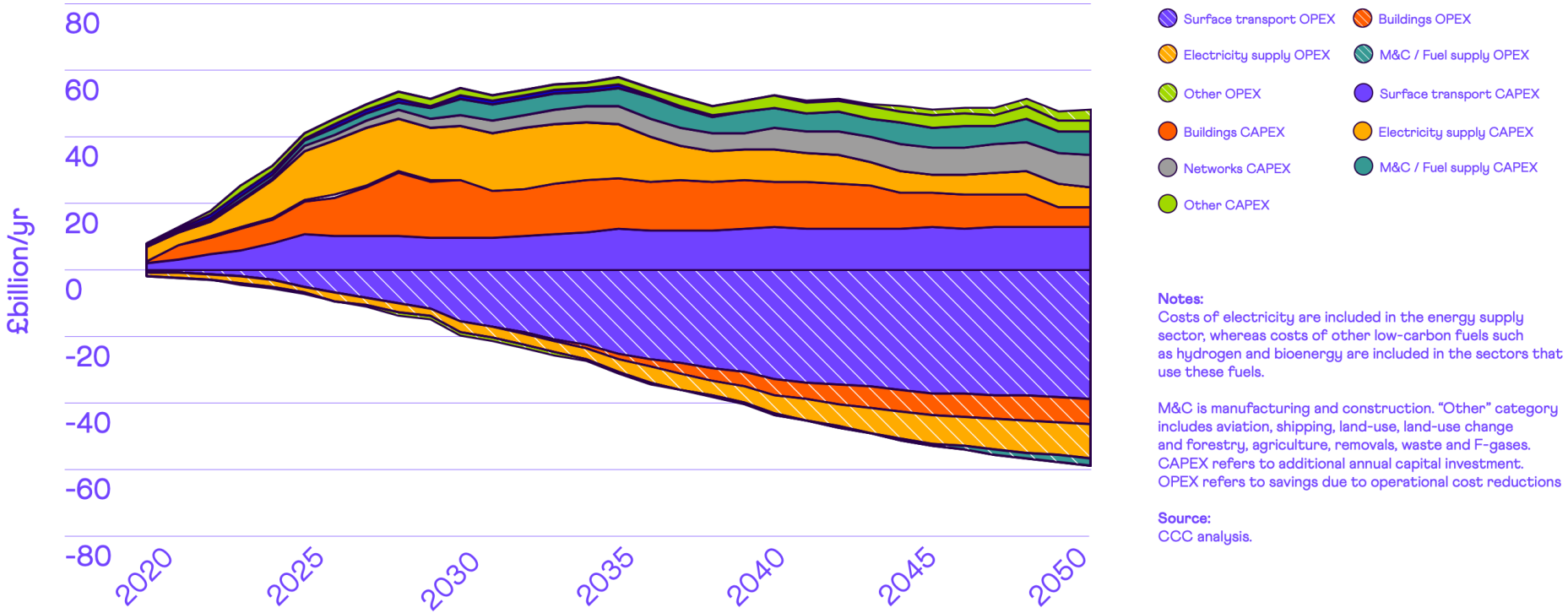
Role of behavioural and societal change in meeting the Sixth Carbon Budget



Source: CCC Analysis

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.

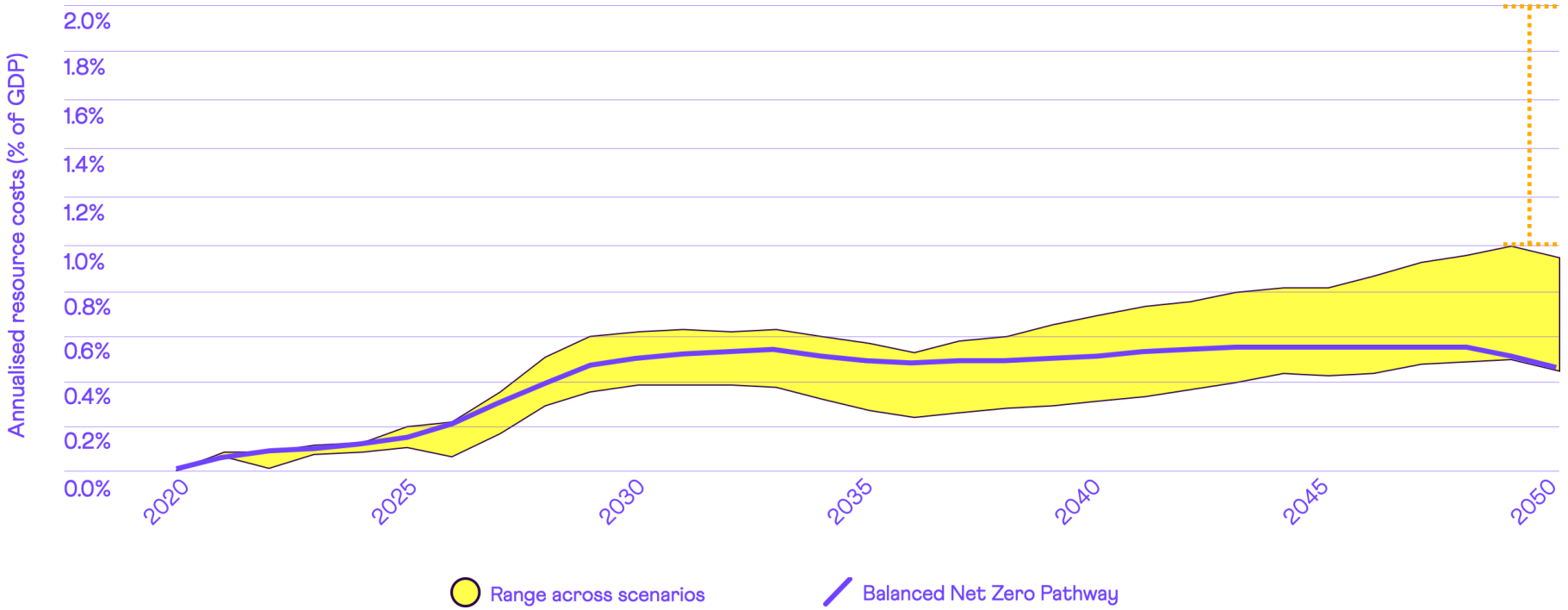
M&C is manufacturing and construction. "Other" category includes aviation, shipping, land-use, land-use change and forestry, agriculture, removals, waste and F-gases.
CAPEX refers to additional annual capital investment.
OPEX refers to savings due to operational cost reductions

Source:
CCC analysis.

Source: CCC analysis.

Resource costs

Change in resource costs over time as a percentage of GDP

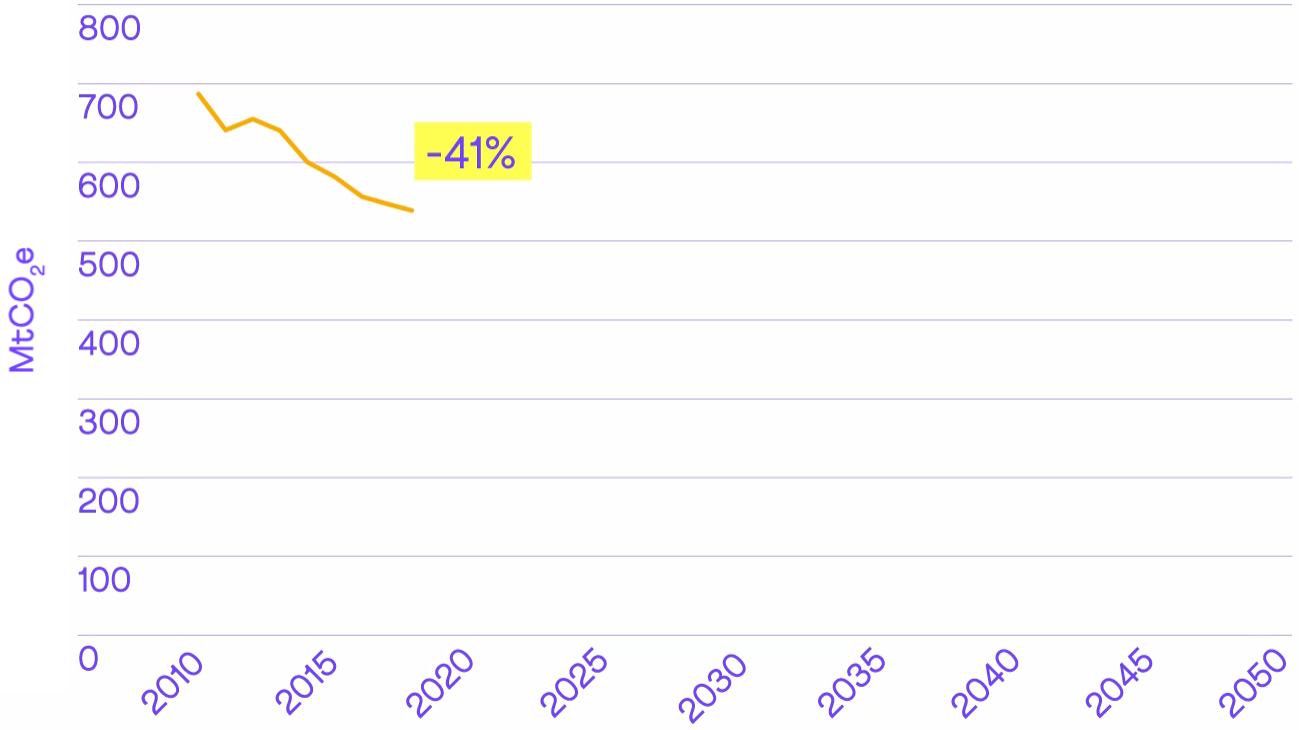


Source: CCC analysis.

What changes will we see on the balanced pathway?

What changes will we see on the Balanced Pathway

2019



Key developments

Reduced Demand

Meat consumption p/ person (% reduction)	0%
Insulation fitted (millions)	0

Low-carbon Choices

EV share of new sales (%)	13%
Low-carbon share of boiler replacements	11%

Low-carbon energy

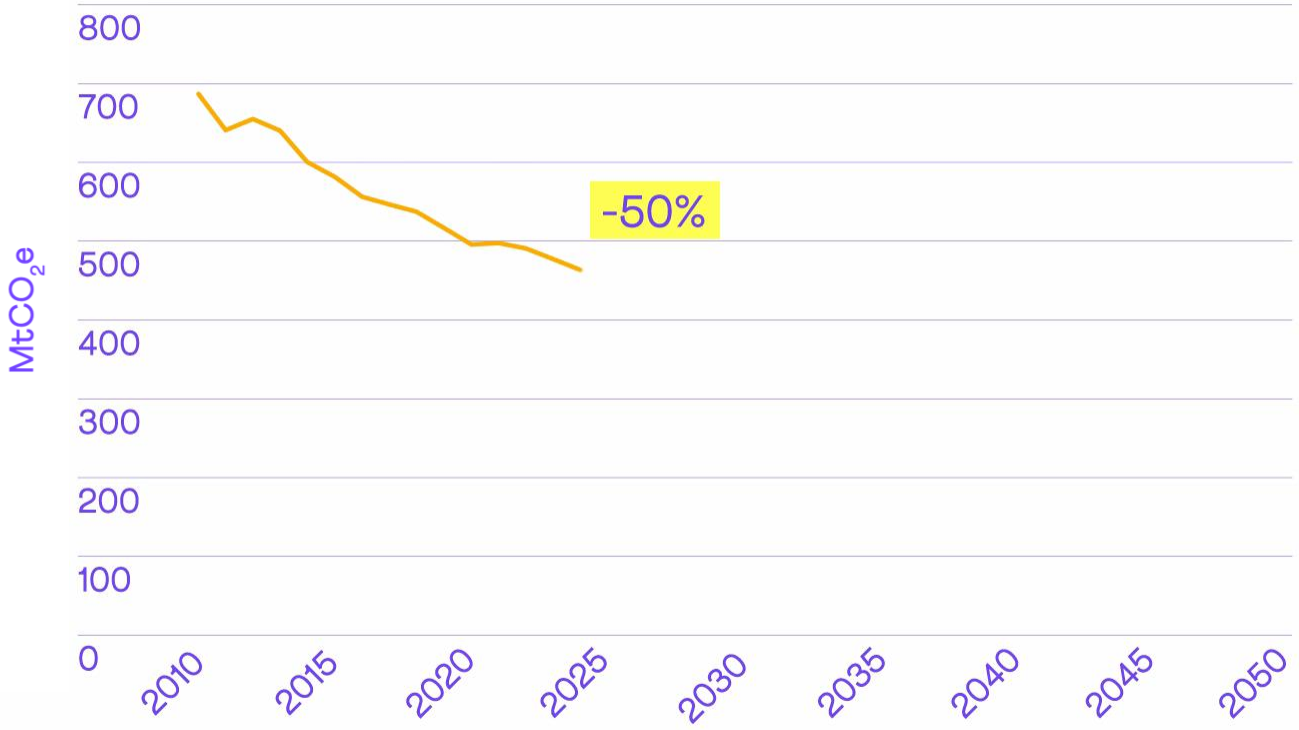
CCS ($MtCO_2e$)	0
Electricity (TWh)	205
Hydrogen (TWh)	0

Land use

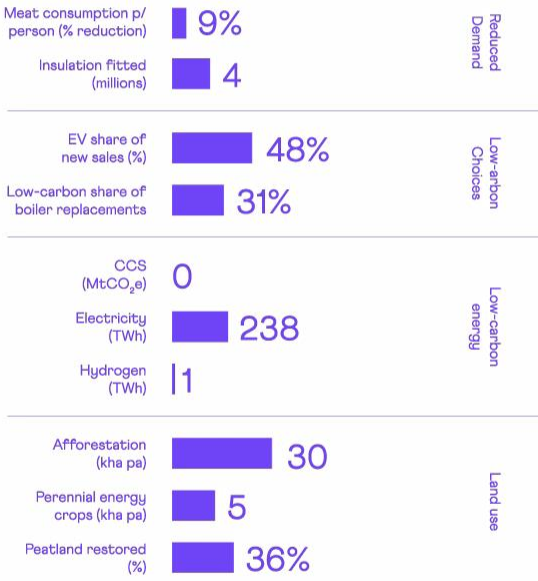
Afforestation (kha pa)	19
Perennial energy crops (kha pa)	0
Peatland restored (%)	25%

What changes will we see on the Balanced Pathway

2025

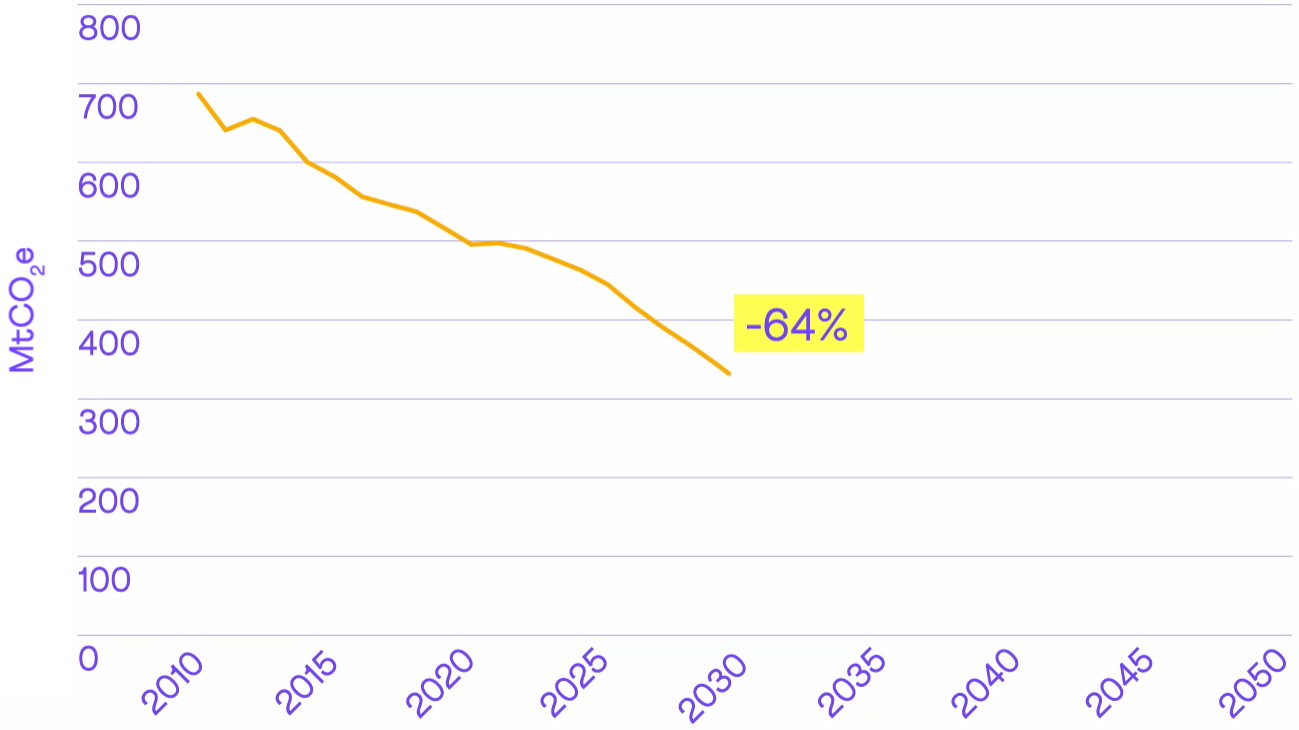


Key developments

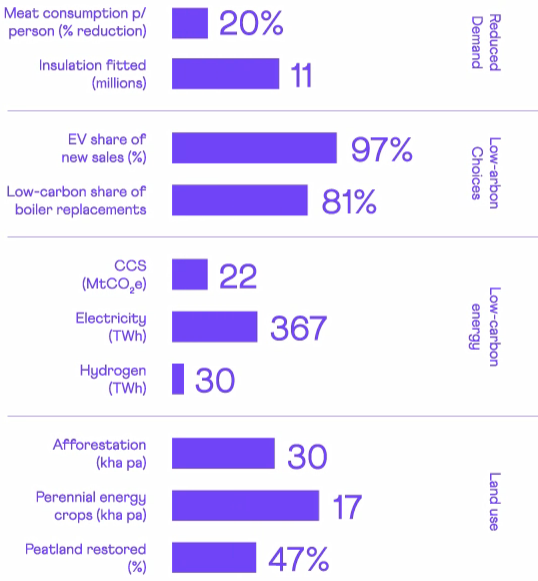


What changes will we see on the Balanced Pathway

2030

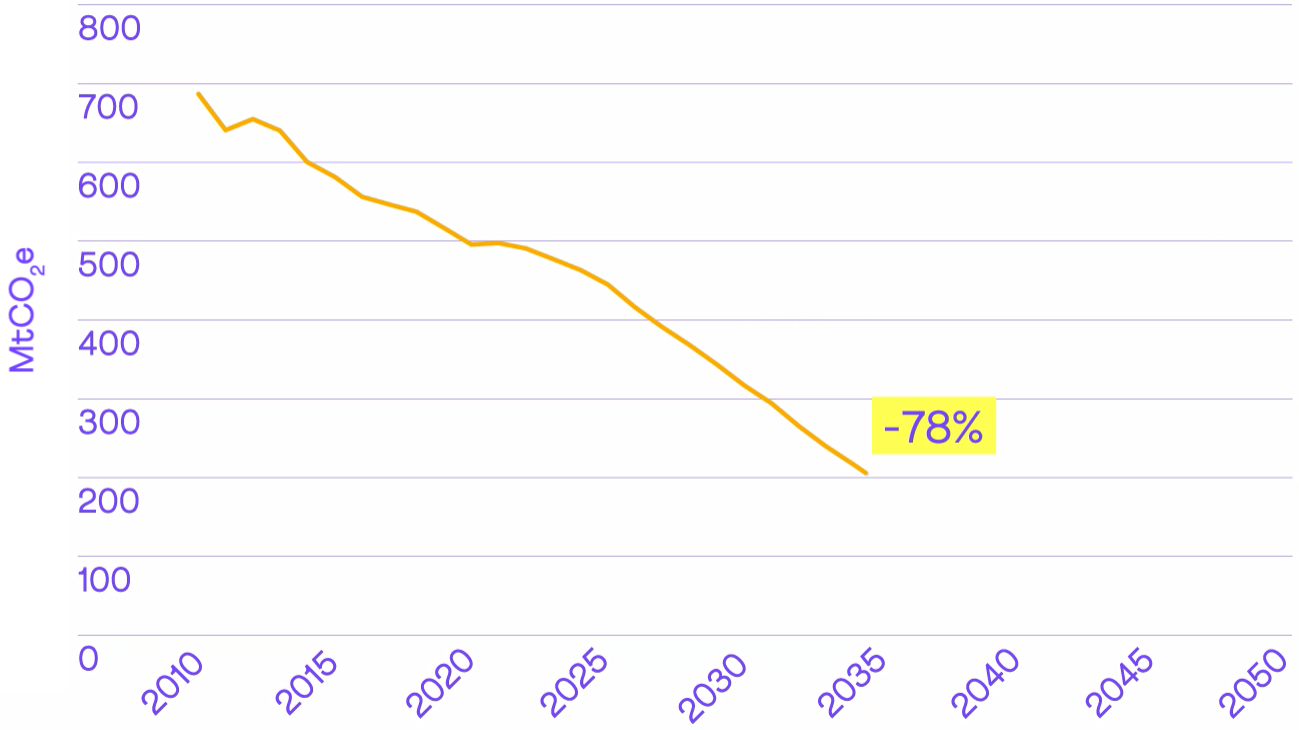


Key developments



What changes will we see on the Balanced Pathway

2035



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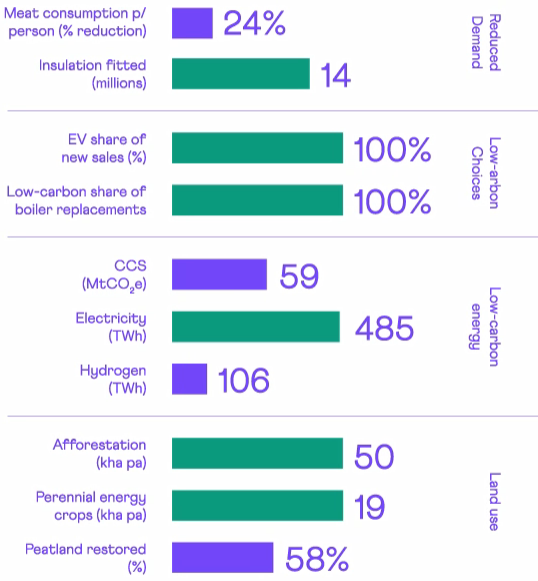
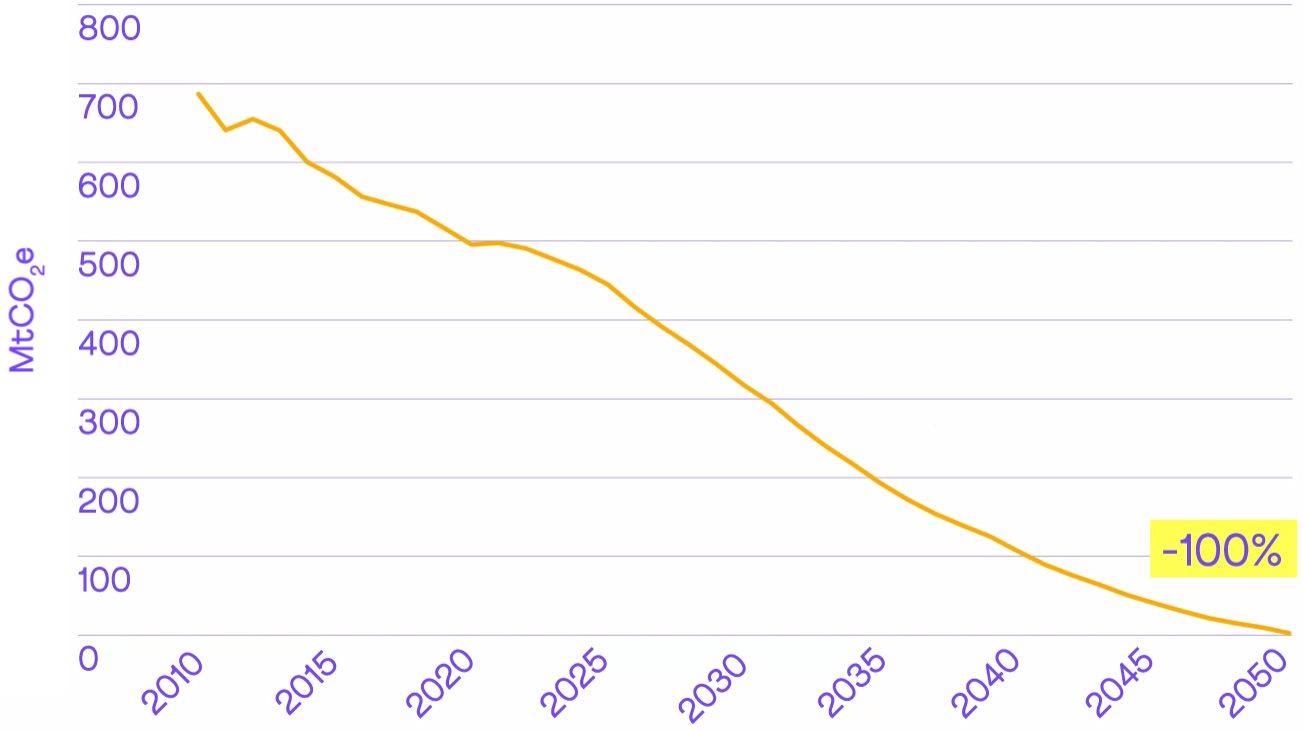
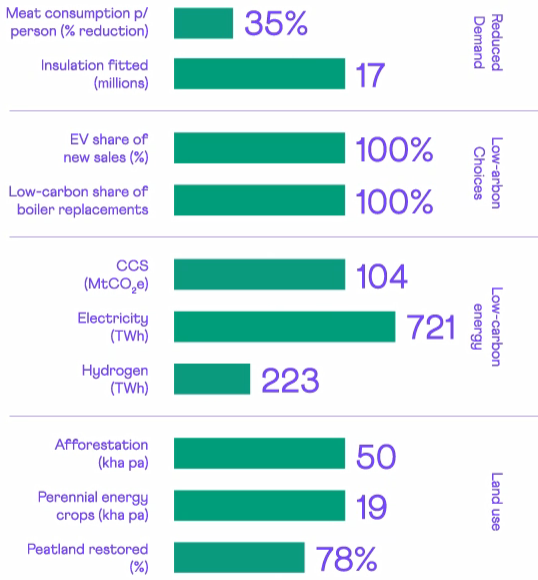


What changes will we see on the Balanced Pathway
2050



Key developments



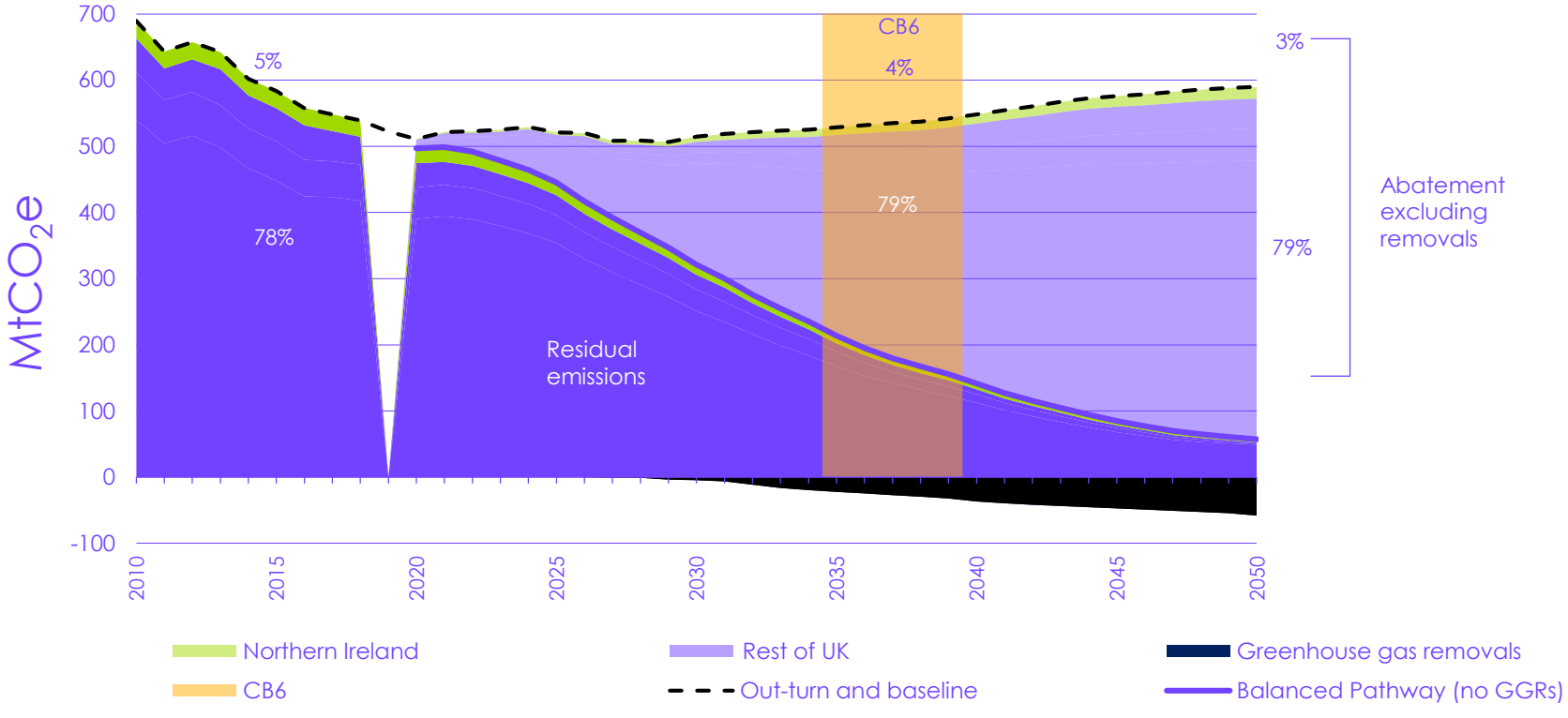
Policy timeline
2021 will be busy

Date	Outcomes and Milestones	
Before COP 26 **(November 2021)**	• Legislate the Sixth Carbon Budget at 965 $MtCO_2e$, including emissions from International Aviation and Shipping (IAS) • Net Zero strategy • Energy White Paper • Heat and Buildings Strategy • New carbon pricing regime following EU ETS • Transport decarbonisation plan • Final HMT Net Zero review • England Tree Strategy • Peatland strategy, including an immediate end to rotational burning of peat • Hydrogen strategy, and consultation on hydrogen business models • Rail decarbonisation strategy • Industrial decarbonisation strategy • Net Zero carbon hospital standard, and further commitments towards delivering a Net Zero NHS • Publication of Greening Government Commitments • Ofgem's final business model approvals for the RIIO-ED2 period should accommodate network upgrades for EVs and heat pumps • Aviation decarbonisation strategy • Next Contract-for Difference allocation round, targeting large volumes of renewables, towards 40 GW offshore wind by 2030	• Updated Nationally Determined Contribution (NDC) for at least a 68% reduction on 1990 levels (excl. IAS) • Build on the UK's NDC to increase global climate ambition in the run up to COP26 • Strengthened UK Adaptation Plans • Updated Green Book guidance on climate change • Decision on funding model for CCS infrastructure • MOD review of climate change and defence • Call for evidence on policy for GHG Removals (GGRs) • Consultation on mandatory food waste reporting • Consultation on including maritime in Road Transport Fuel Obligation (RTFO) • Scottish Government to publish updated Climate Change plan • Conclusion of Green Jobs Taskforce • Environmental Land Management pilots • Implementation of minimum device standards for EV chargers • National food strategy and white paper • Welsh Government to publish an 'All Wales Plan' for the second carbon budget

Pathway for Northern Ireland

Pathway for Northern Ireland

Share of Balanced Net Zero Pathway in Northern Ireland



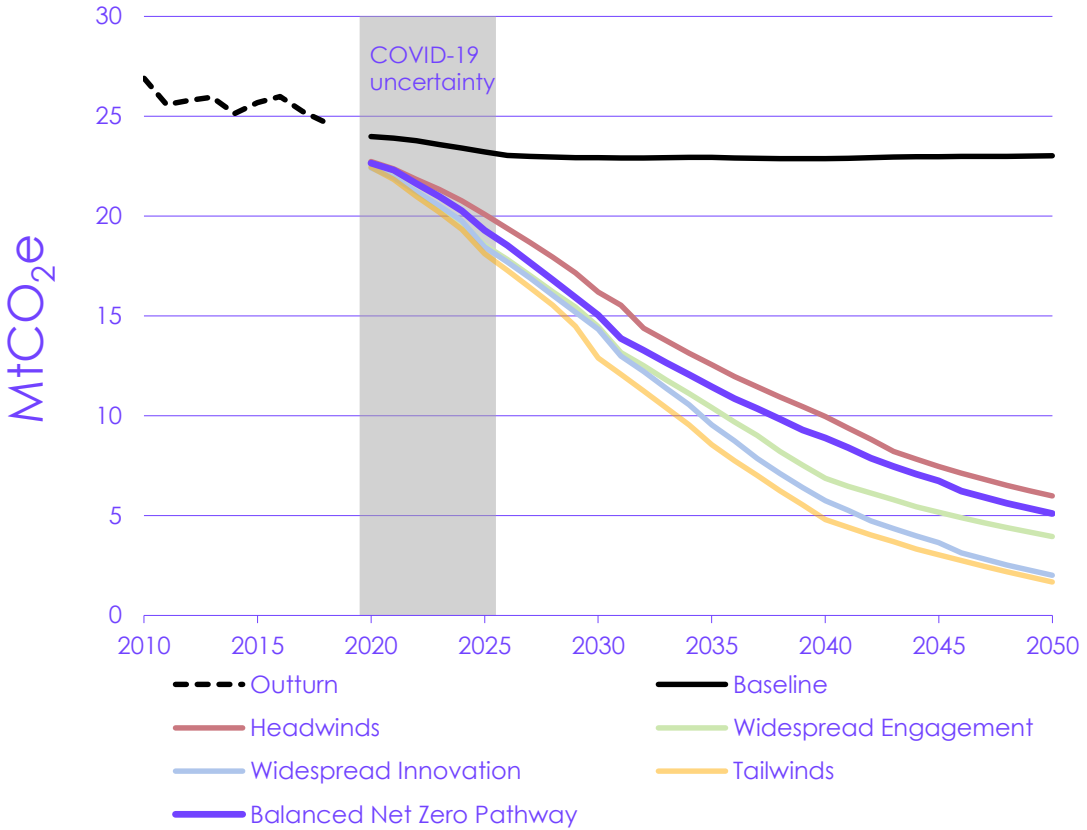
Pathway for Northern Ireland

A decisive transition for Northern Ireland

Emissions fall by 54% compared to current levels in 2035

Very deep emissions reductions in all scenarios

Scenarios do not reach Net Zero in 2050 at the same time as the UK – even though the actions are equally as stretching

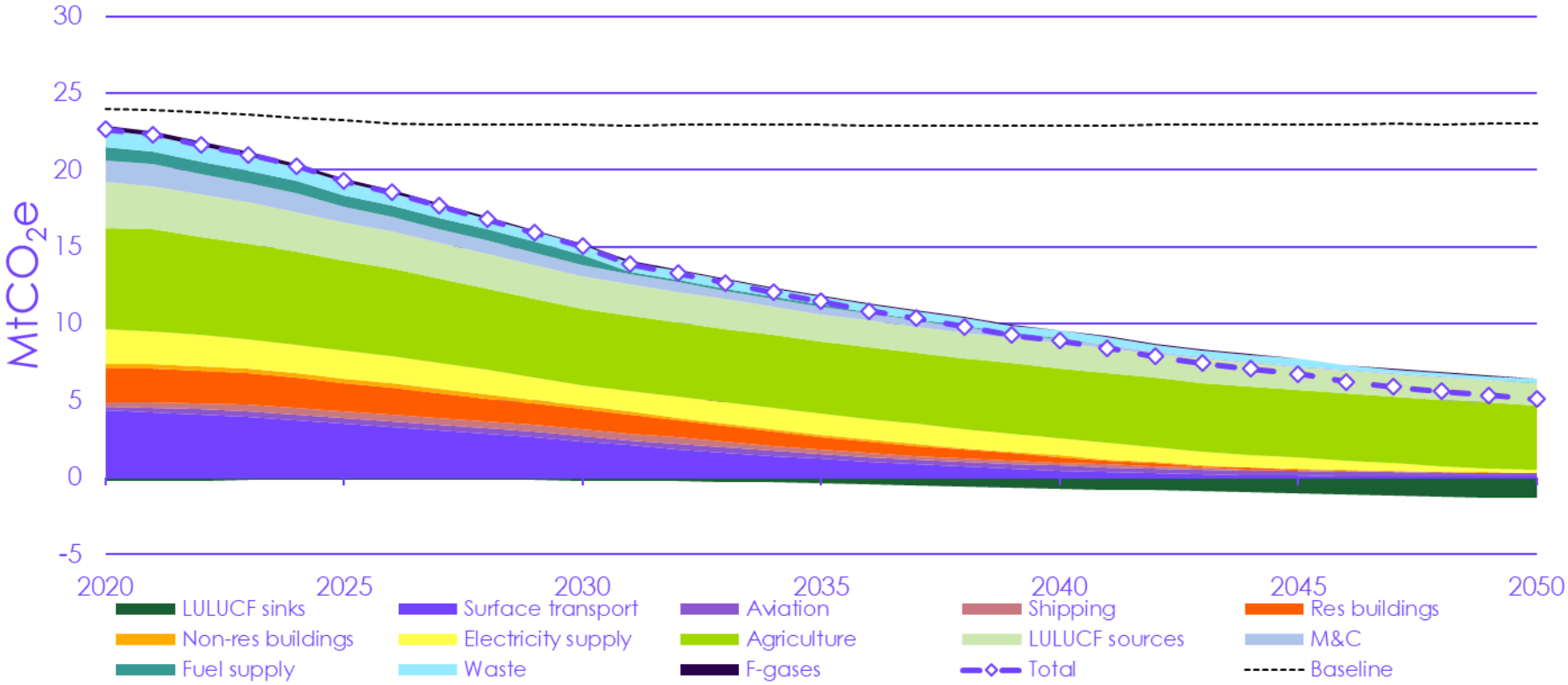


Source:
NAEI (2020) Greenhouse Gas Inventories for England, Scotland, Wales & Northern Ireland: 1990-2018; CCC analysis.

Notes: Does not show any use of engineered removals in Northern Ireland

The Balanced Net Zero Pathway in Northern Ireland

Agricultural methane dominates emissions by 2050



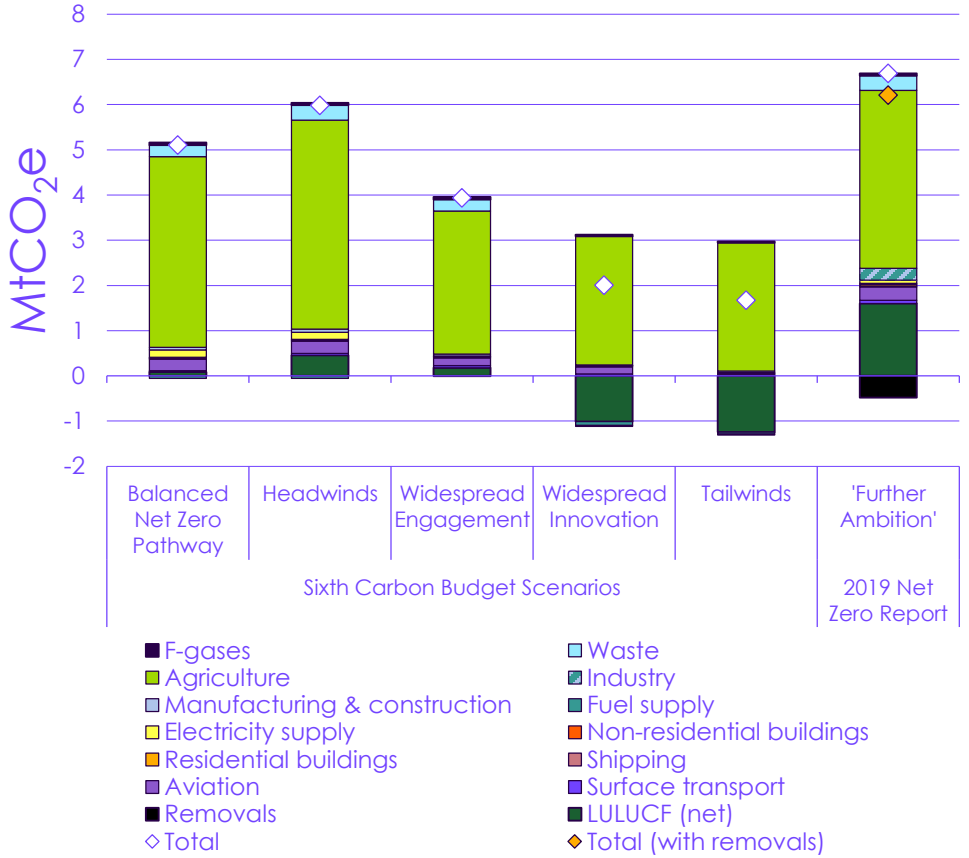
(No greenhouse gas removals)

2050 snapshot for Northern Ireland
Changes since 2019 advice

Bigger range of possible actions on Northern Ireland's land – tree planting, energy crops, peatland restoration

Very deep emissions reductions in all scenarios

Some further action is possible in other sectors – including waste, aviation and industry



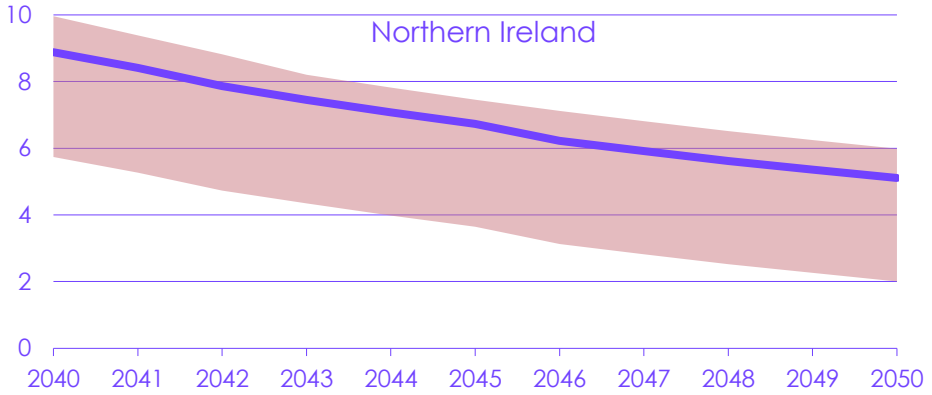
Source:
NAEI (2020) Greenhouse Gas Inventories for England, Scotland, Wales & Northern Ireland: 1990-2018; CCC analysis.

Notes: Does not show any use of engineered removals in Northern Ireland

Pathways for Northern Ireland
Allocation of greenhouse gas removals

Our scenarios show there is **limited potential for Northern Ireland to reach Net Zero through the use of greenhouse gas removals** – around 5 $MtCO_2e$ would be required in the Balanced Pathway (nearly 10% of the UK total).

We identify around 0.1 – 0.4 $MtCO_2e$ of potential for removals in manufacturing and in construction.



Range of greenhouse gas removals required to meet net-zero in a given year

	Balanced Pathway	Range	Potential in manufacturing and construction	Allocated in 2019 Net Zero Report
2050	5 $MtCO_2$	2-6 $MtCO_2$	0.1-0.4 MtCO2	< 1 $MtCO_2$

Source: CCC analysis.

Notes: Range is defined by the Headwinds, Widespread Engagement, and Widespread Innovation scenarios.

Targets in a Northern Ireland Climate Change Act
All greenhouse gases

All greenhouse gases contribute to warming temperatures.

All GHGs must be reduced in Northern Ireland as part of the fair contribution to UK Net Zero.

A Climate Act for Northern Ireland should include a target to reduce all GHGs by **at least 82% by 2050 in line with the UK Net Zero goal.**

Possible targets in a Northern Ireland Climate Change Act (% reduction compared to 1990)	
	All greenhouse gases
2030	48% reduction
6CB period (2033-2037)	60% reduction
2040	69% reduction
2050	82% reduction

Targets in a Northern Ireland Climate Change Act
CO2 only

All greenhouse gases contribute to warming temperatures, but peak temperature change is determined by when emissions of long-lived GHGs reach net-zero (assuming that short-lived GHG emissions are not rising).

Of the long-lived GHGs, **CO_2 contributes most** to warming and therefore the date of net-zero CO_2 is closely linked with when the contribution to rising temperatures ends.

All GHGs must be reduced in Northern Ireland as part of the fair contribution to UK Net Zero. Methane cannot get a 'free-pass' by only setting a target for CO_2.

Possible targets in a Northern Ireland Climate Change Act		
	All greenhouse gases	**CO_2 only**
2030	**48% reduction**	56% reduction
6CB period (2033-2037)	**60% reduction**	70% reduction
2040	**69% reduction**	83% reduction
2050	**82% reduction**	**Net Zero**

Targets in a Northern Ireland Climate Change Act
Excluding agricultural land and waste

All greenhouse gases contribute to warming temperatures.

All GHGs must be reduced in Northern Ireland as part of the fair contribution to UK Net Zero.

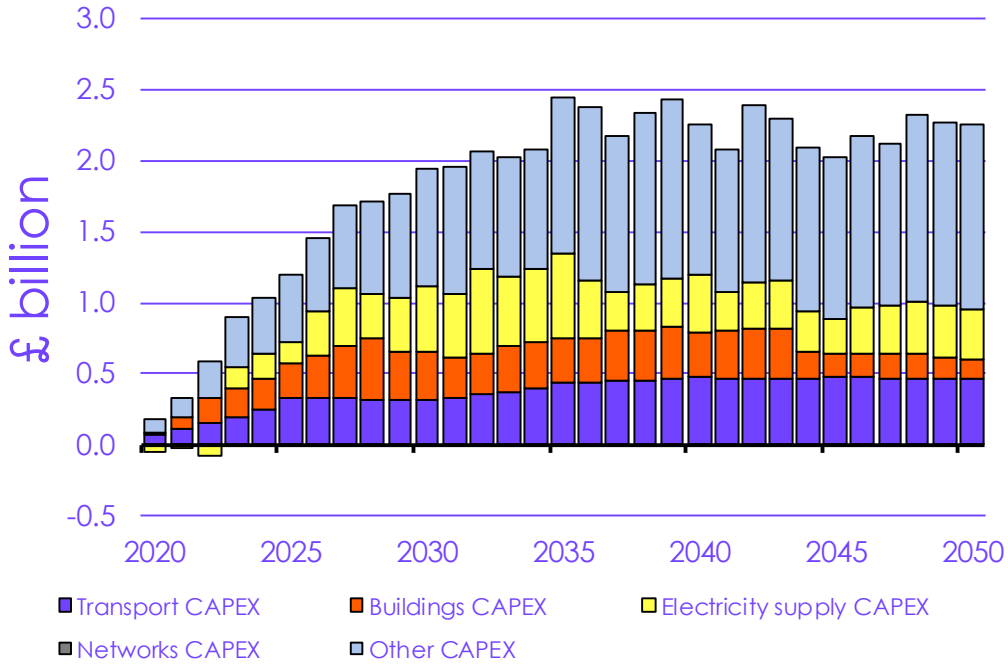
The Republic of Ireland is considering a target for **all greenhouse gases excluding biogenic methane.** Similar targets exist elsewhere in the world.

Methane must not get a 'free-pass' by only setting a target that excludes biogenic methane.

Possible targets in a Northern Ireland Climate Change Act			
	All greenhouse gases	CO_2 only	Excluding agricultural, land and waste methane (only excluding agriculture)
2030	**48% reduction**	56% reduction	52% reduction (53% reduction)
6CB period (2033-2037)	**60% reduction**	70% reduction	67% reduction (67% reduction)
2040	**69% reduction**	83% reduction	79% reduction (78% reduction)
2050	**82% reduction**	**Net Zero**	**96% reduction** (93% reduction)

A large increase in low-carbon investment is required

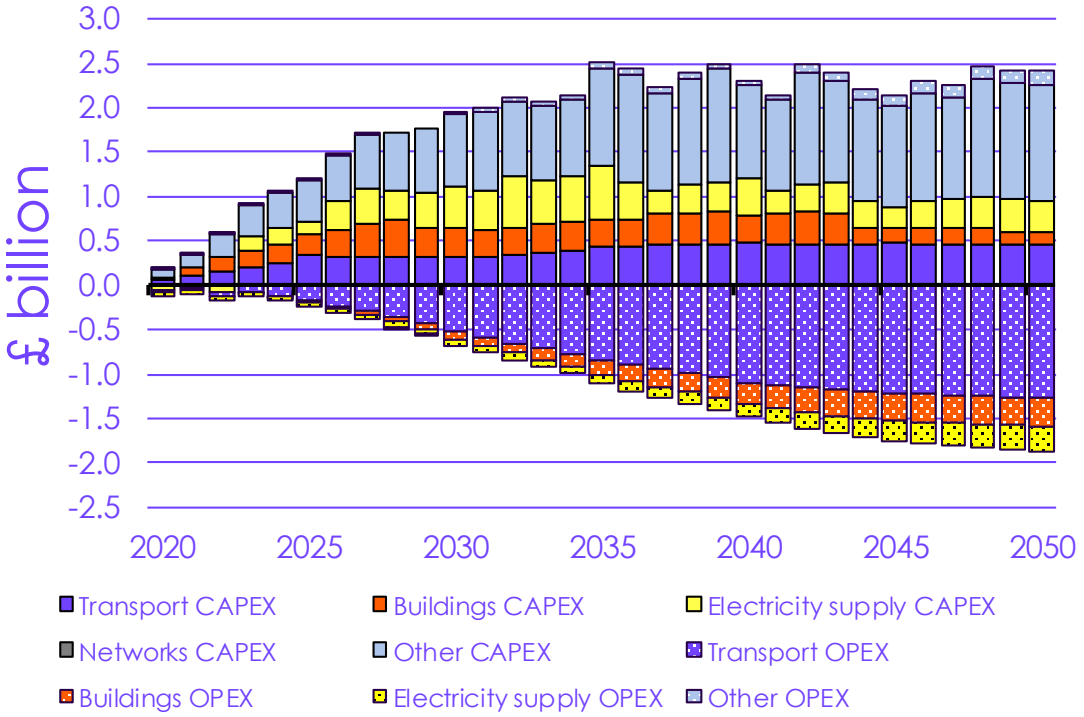
Additional capital investment in the transition (Northern Ireland)



- **Low-carbon capital investment will need to scale up to nearly £2-2.5 billion/year by 2030 in Northern Ireland** (around £50-60 billion for the UK)

A large increase in low-carbon investment is required

Additional capital investment in the transition (Northern Ireland)



- **Low-carbon capital investment will need to scale up to nearly £2-2.5 billion/year by 2030 in Northern Ireland** (around £50-60 billion for the UK)
- That investment buys Net Zero and buys savings in operational costs due to improved efficiency

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