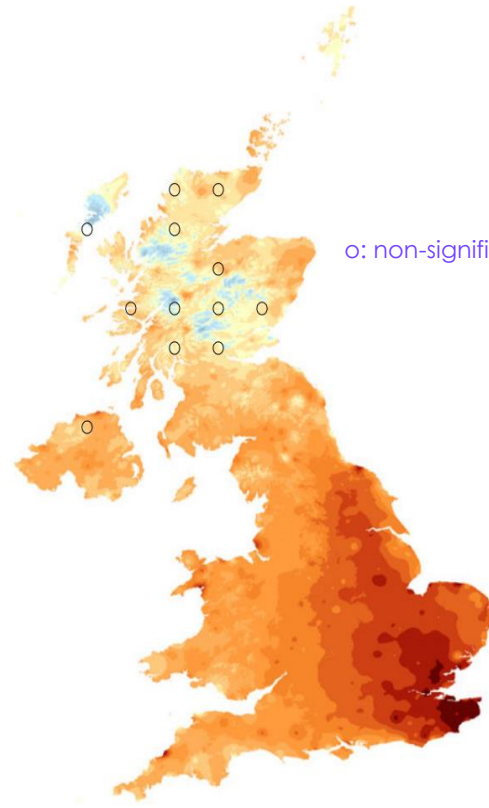


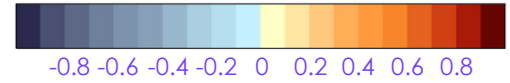
Climate  
Change  
Committee

## Climate breakdown

### Warmest daytime temperatures in the UK (1960 to 2019)



Trend ( $^{\circ}\text{C decade}^{-1}$ )

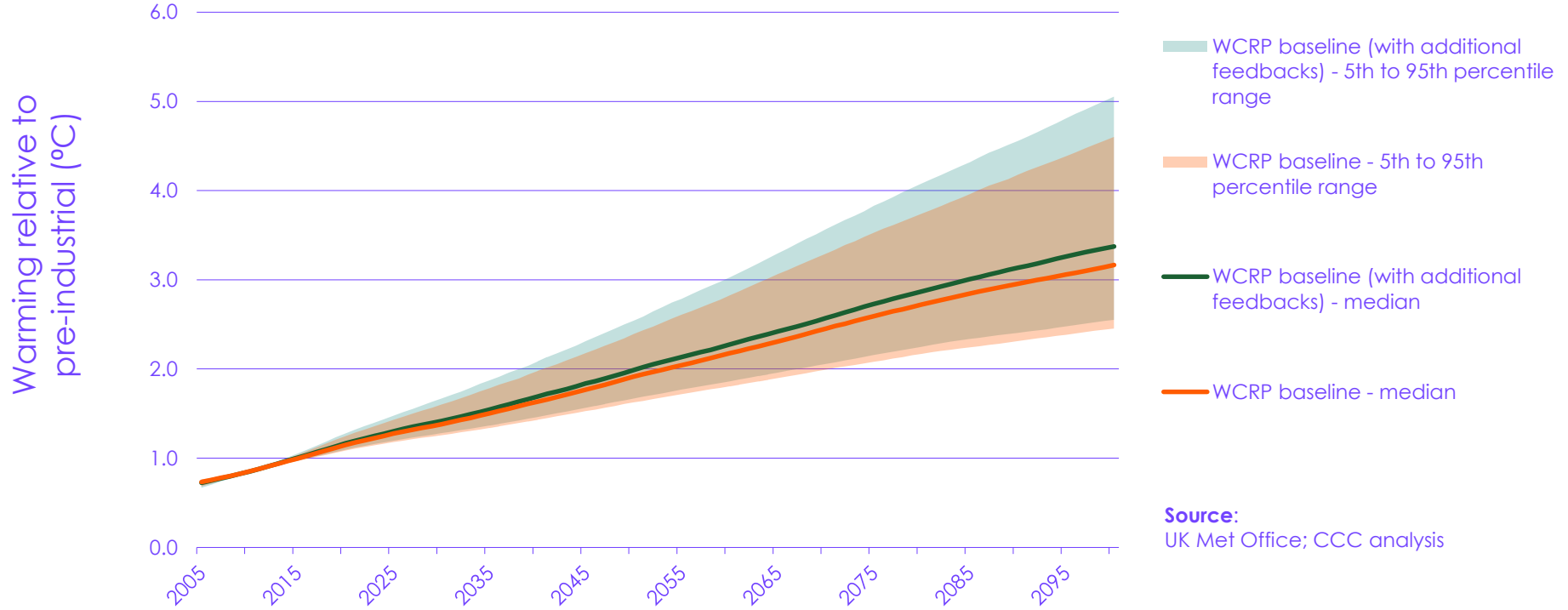


**Source:**

Christidis et al, Nature Communications  
(2020)

# Climate breakdown

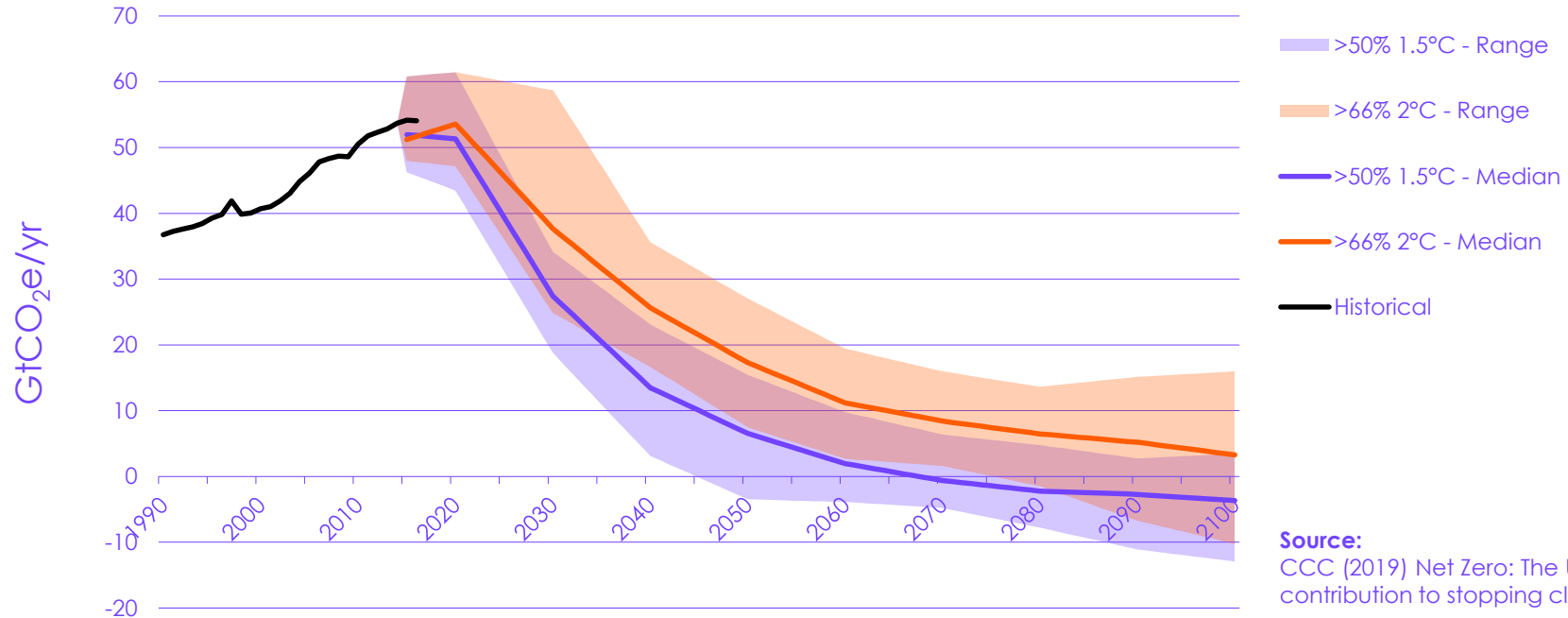
## Global temperature projections for current global ambition for 2030 emissions reductions



# What can we do about this?

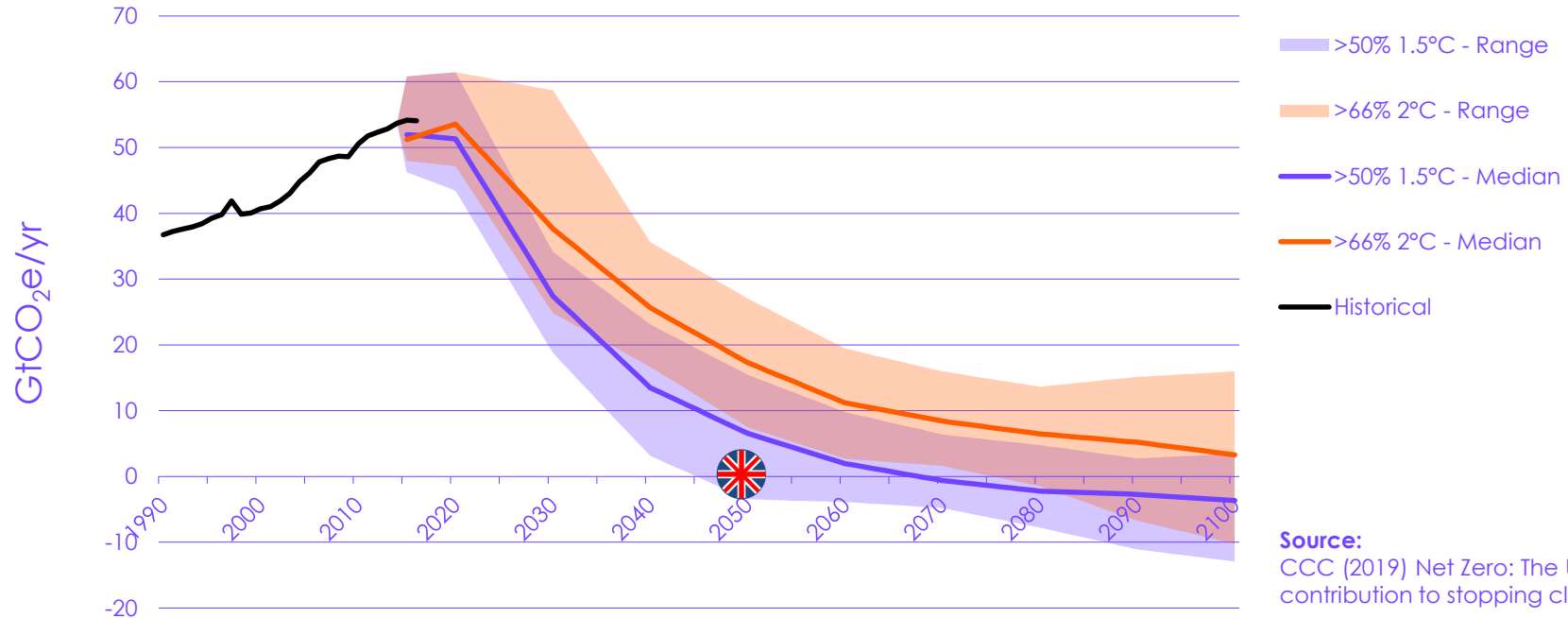
## What do we do about this?

Global emissions (all GHGs) pathways consistent with the Paris Agreement



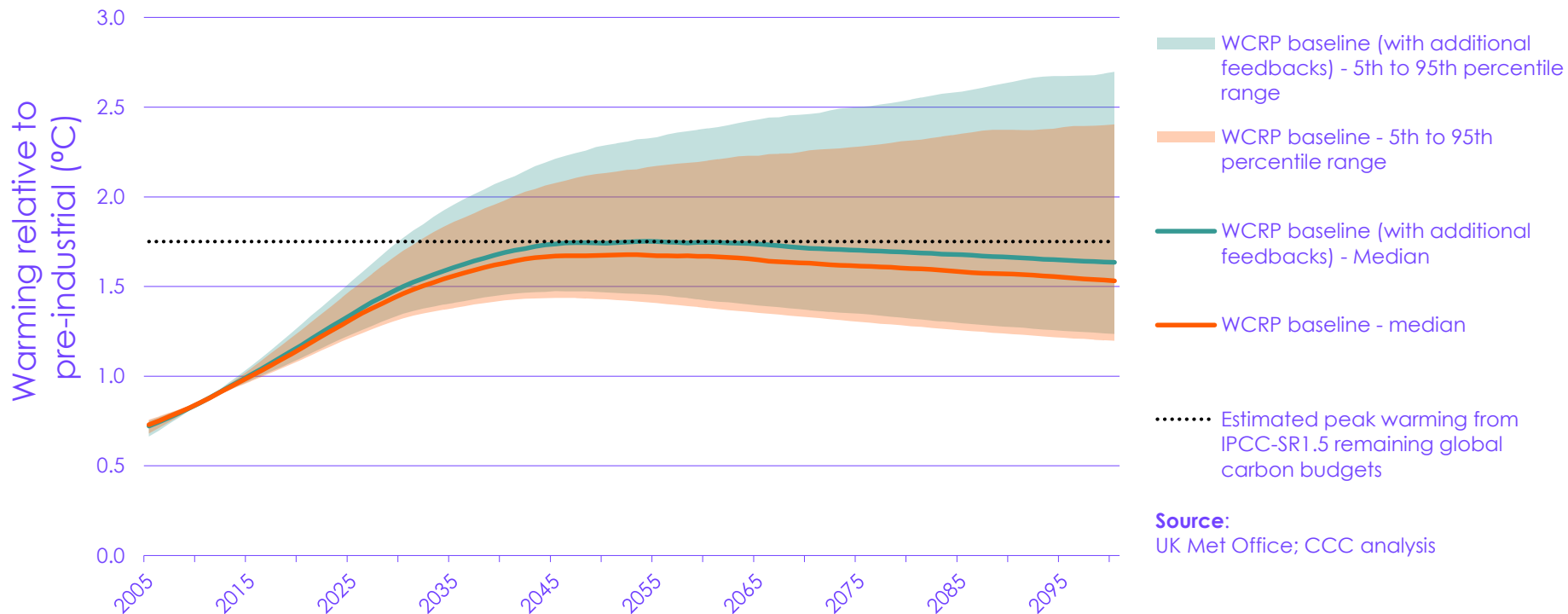
## What do we do about this?

Global emissions (all GHGs) pathways consistent with the Paris Agreement



## Rapid global decarbonisation scenarios

### Global temperature projections, including additional Earth system feedbacks



# The recommended path for the UK



## Our approach

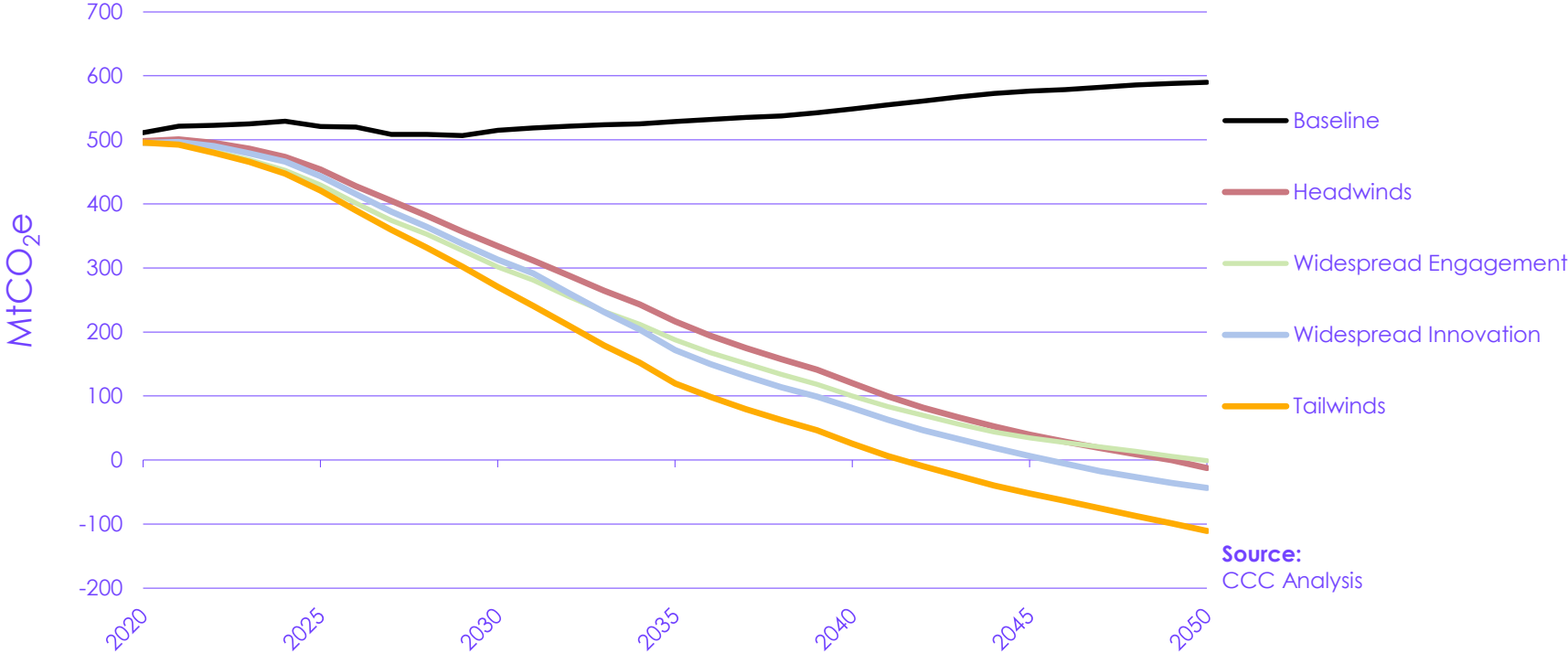
### A real-world constraint: asset lives

Sector	Asset	Lifetime
Transport	Light Vehicle HGV	14 years (average) 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 Air Source Heat Pump Ground Source Heat Pump Loft and cavity insulation Solid wall insulation	15 years 15 years 20 years 42 years 36 years
Power generation	Gas plant Offshore wind Nuclear plant	25 years 30 years 60 years
Aviation	Aircraft	30 year technical
Shipping	Ships	30 years technical

Source: CCC analysis.

# Our approach

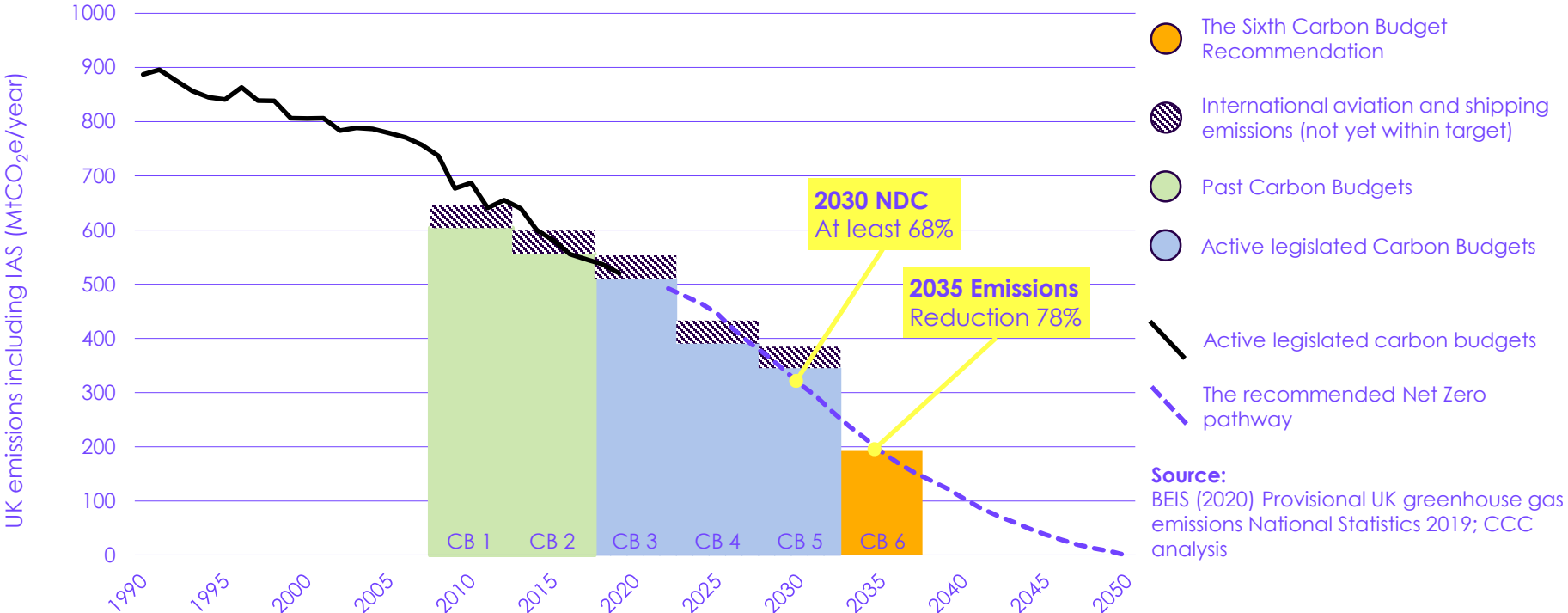
## Illustrative scenarios for UK Net Zero



Source:  
CCC Analysis

# Our recommended path

## The recommended UK Sixth Carbon Budget and 2030 NDC



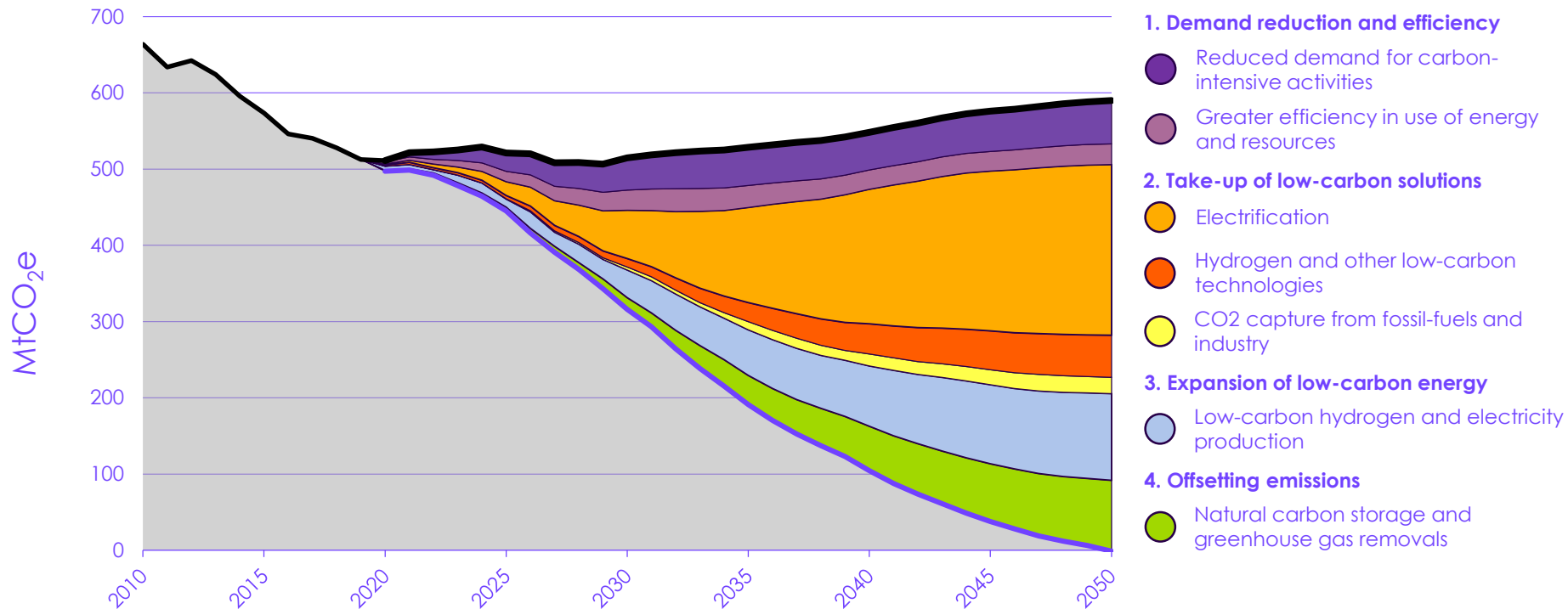
- The Sixth Carbon Budget Recommendation
- International aviation and shipping emissions (not yet within target)
- Past Carbon Budgets
- Active legislated Carbon Budgets
- Active legislated carbon budgets
- - - The recommended Net Zero pathway

**Source:**  
BEIS (2020) Provisional UK greenhouse gas emissions National Statistics 2019; CCC analysis

# Delivering Net Zero UK

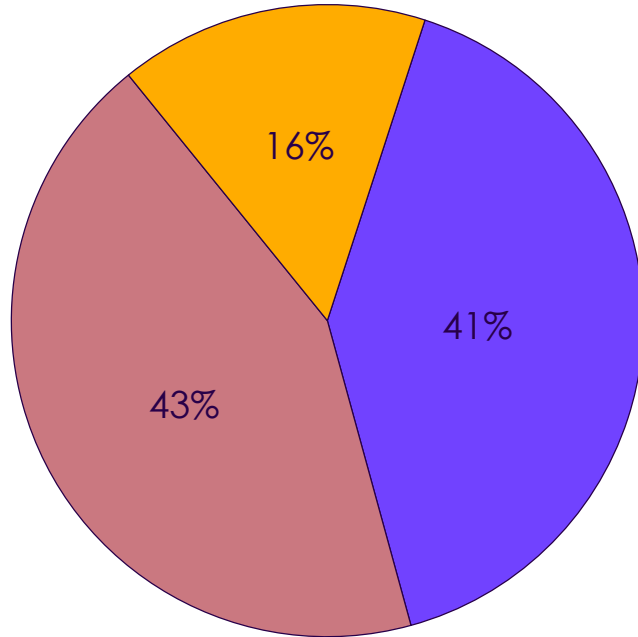
# Emissions abatement on the balanced path

Meeting Net Zero requires actions across four key areas



## Emissions abatement on the balanced path

Role of behavioural and societal change in meeting the Sixth Carbon Budget (by 2035)



- Low-carbon technologies or fuels, not societal/behavioural changes
- Measures with a combination of low-carbon technologies and societal/behaviour changes
- Largely societal or behaviour changes

**Source:**  
CCC Analysis

# The policy challenge

## Scaling up in the 2020s; Rolling out in the 2030s

Before COP26



- **Legislate the Sixth Carbon Budget (2033-37)** at 965 MtCO<sub>2</sub>e\*
- **Updated Nationally Determined Contribution (NDC)** for at least a 68% reduction on 1990 levels
- **Comprehensive Net Zero strategy** setting out the Government's vision for how to achieve Net Zero
- **Finalisation of multiple strategies and decisions, including:**
  - Energy White Paper
  - Heat and buildings Strategy
  - New carbon pricing regime following EU EFS
  - Transport decarbonisation plan
  - Final HMT Net Zero review
  - Tree and peat strategies
  - Industrial decarbonisation strategy
  - Rail decarbonisation strategy
  - Next Contract-for-Difference allocation round
  - National food strategy and white paper
  - Hydrogen strategy

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

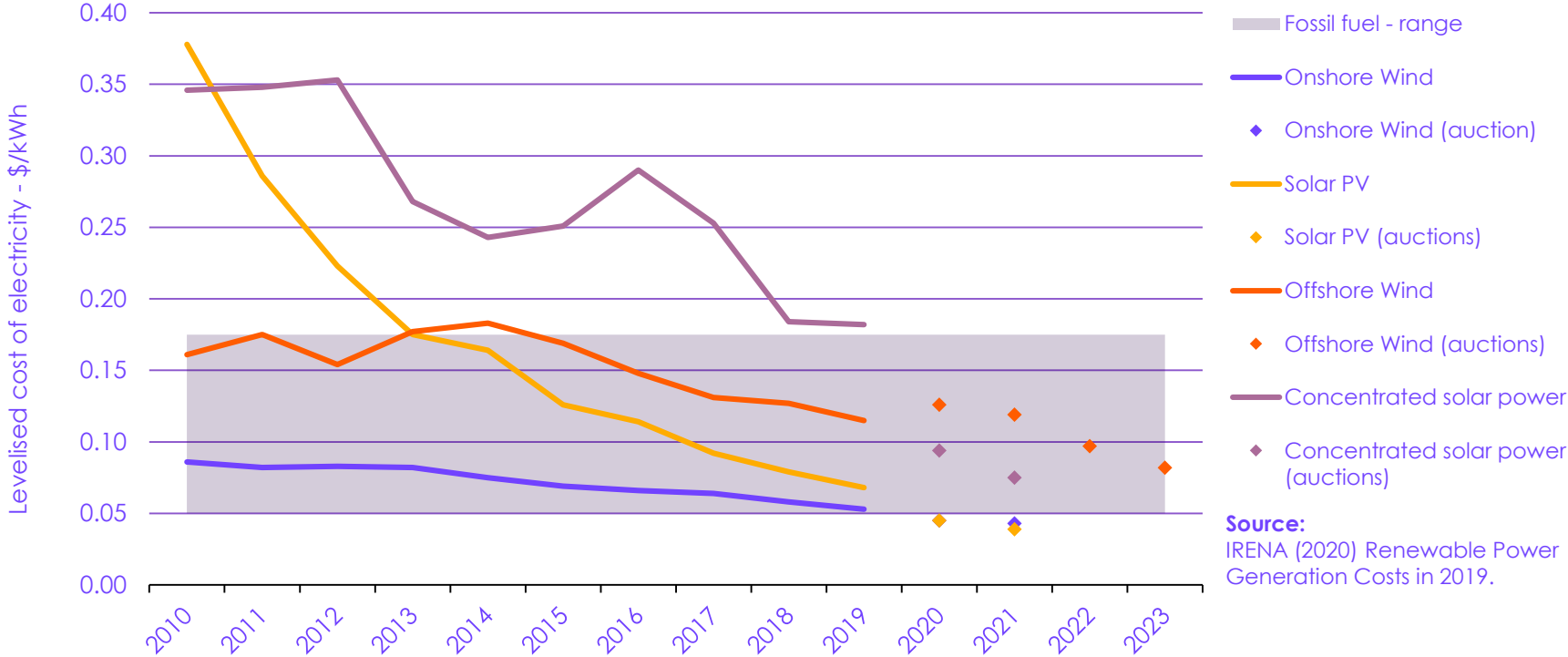
### Net Zero

# Costs and benefits of Net Zero



# The impact of innovation

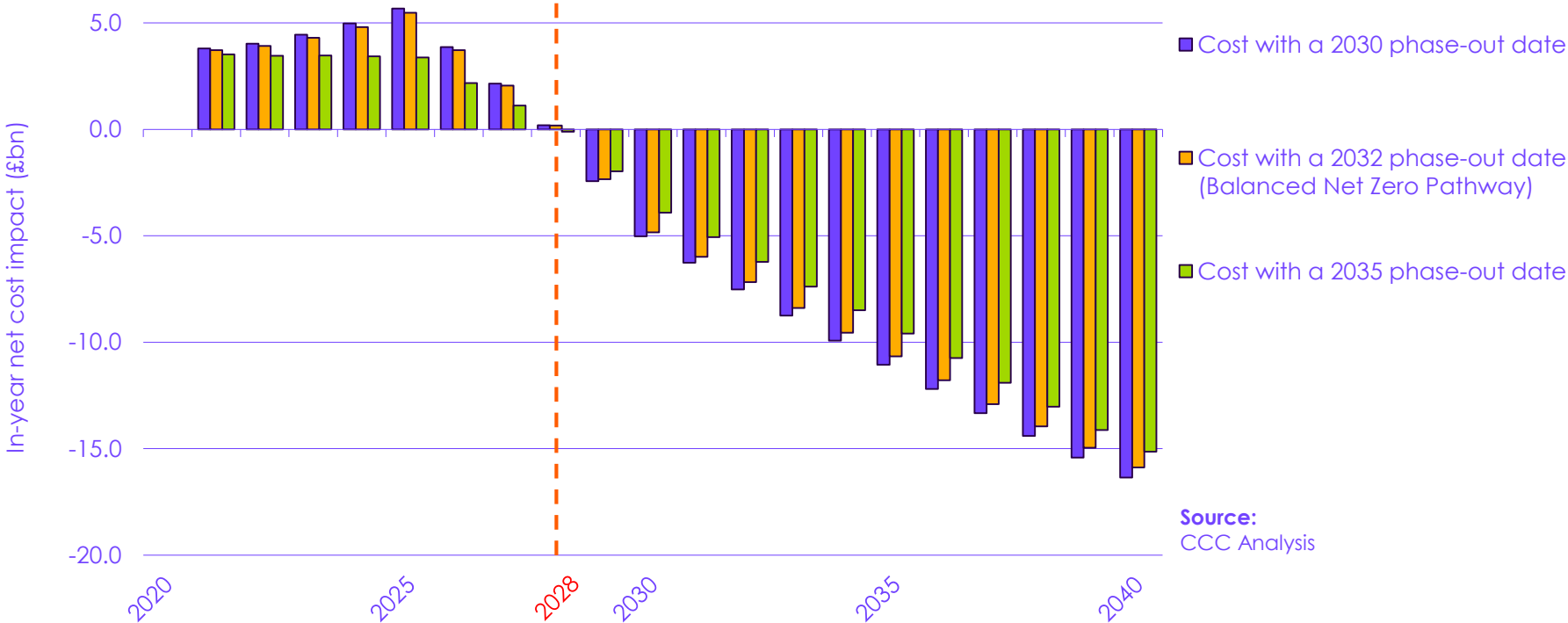
## Global average levelised cost of electricity (\$2019)



**Source:**  
IRENA (2020) Renewable Power Generation Costs in 2019.

# The impact of innovation

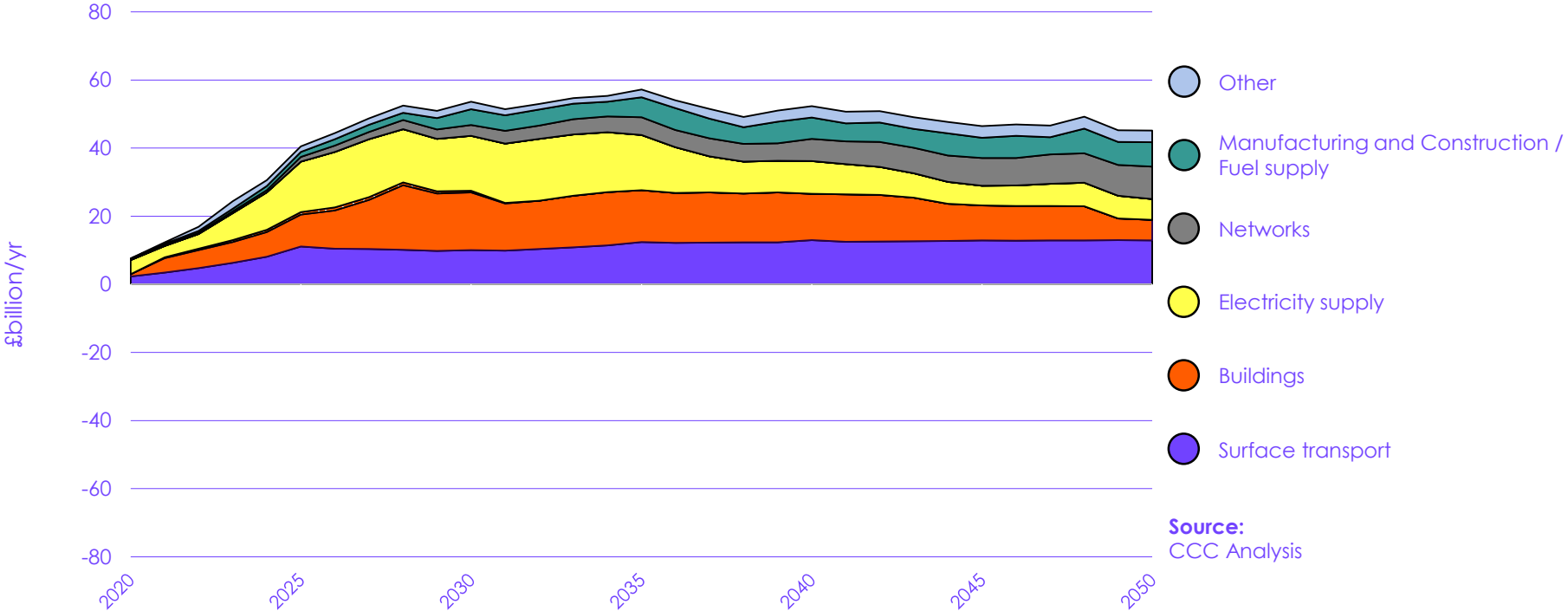
## Net cost to the UK economy of the phase-out of fossil-fuelled cars and vans - 2030, 2032, 2035



Source:  
CCC Analysis

# Investing for Net Zero

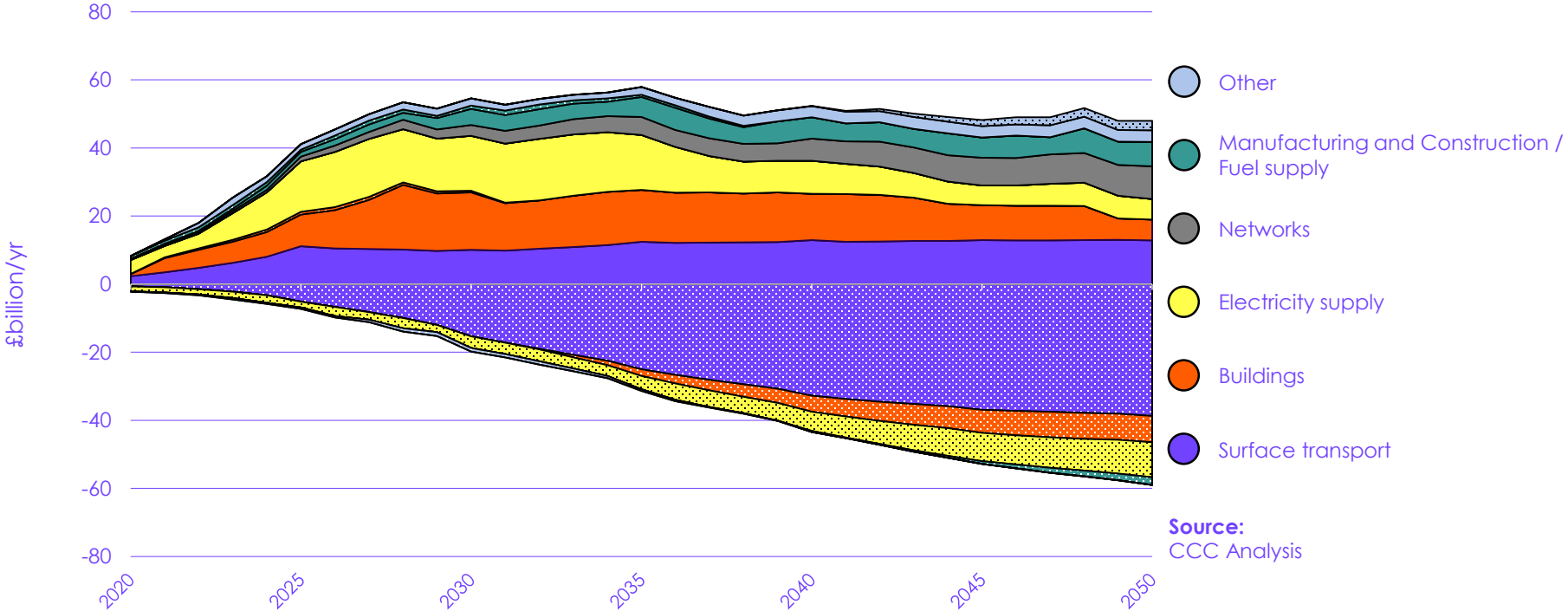
## Major investment programme



Source:  
CCC Analysis

# Investing for Net Zero

Major investment programme, delivering offsetting operating cost savings

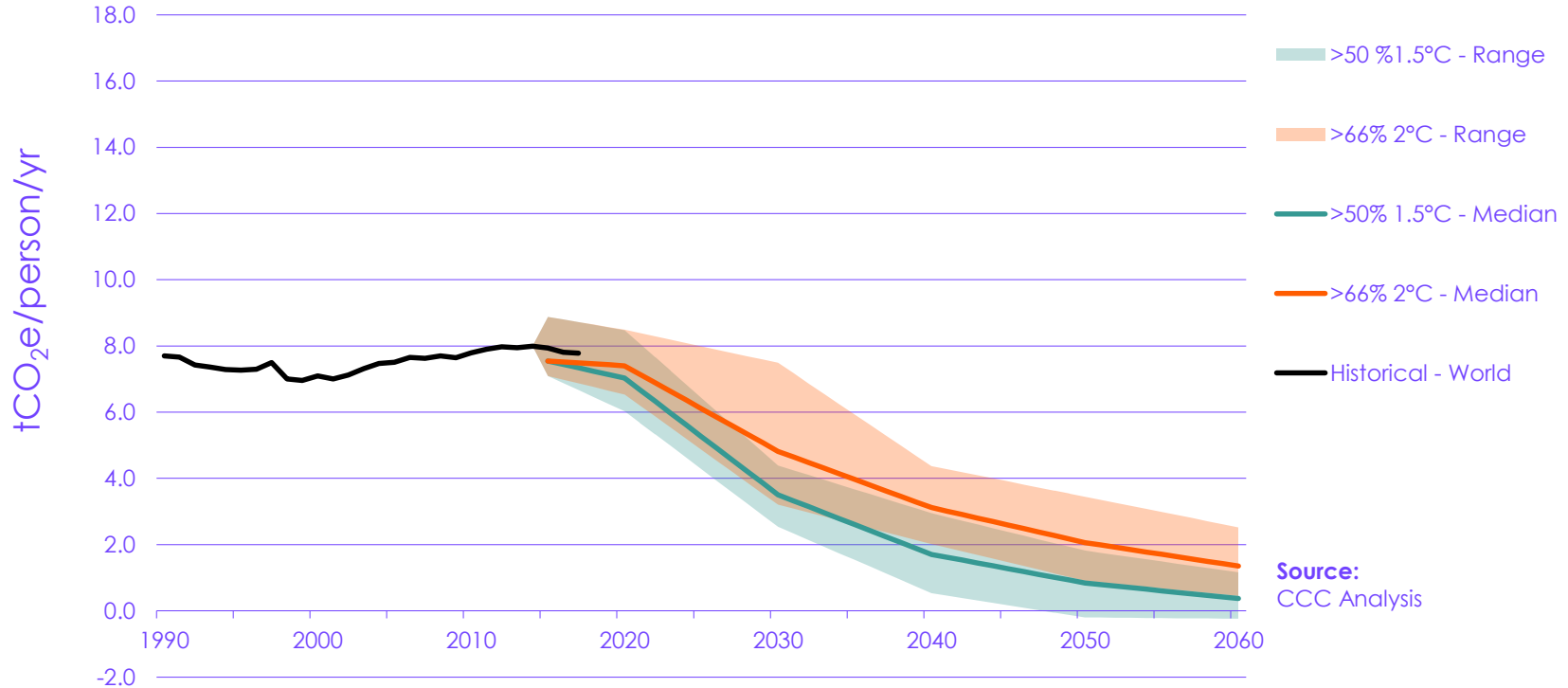


Source:  
CCC Analysis

# The UK 'offer' for COP26

# UK's offer at COP26 Glasgow 2021

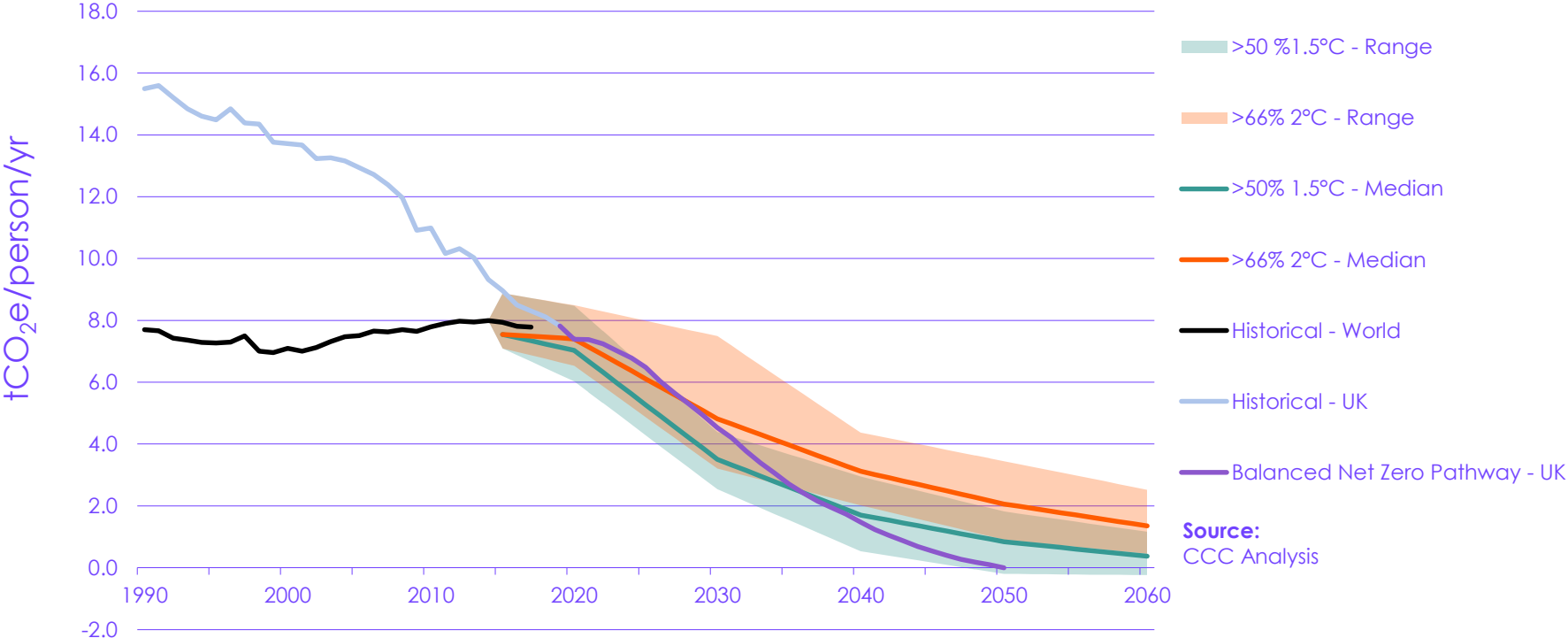
## Per person emissions – global requirements of Paris



Source:  
CCC Analysis

# UK's offer at COP26 Glasgow 2021

## UK per person emissions on the balanced path



Source:  
CCC Analysis

[www.theccc.org.uk](http://www.theccc.org.uk)

@ChiefExecCCC