#netzero

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The role of energy in meeting the UK's net zero greenhouse gas targets

Monday 9 September | 14:00 – 16:30

Conference Auditorium 2, University of Leeds

Committee on Climate Change

10 September 2019

Net Zero

Chris Stark
Committee on Climate Change

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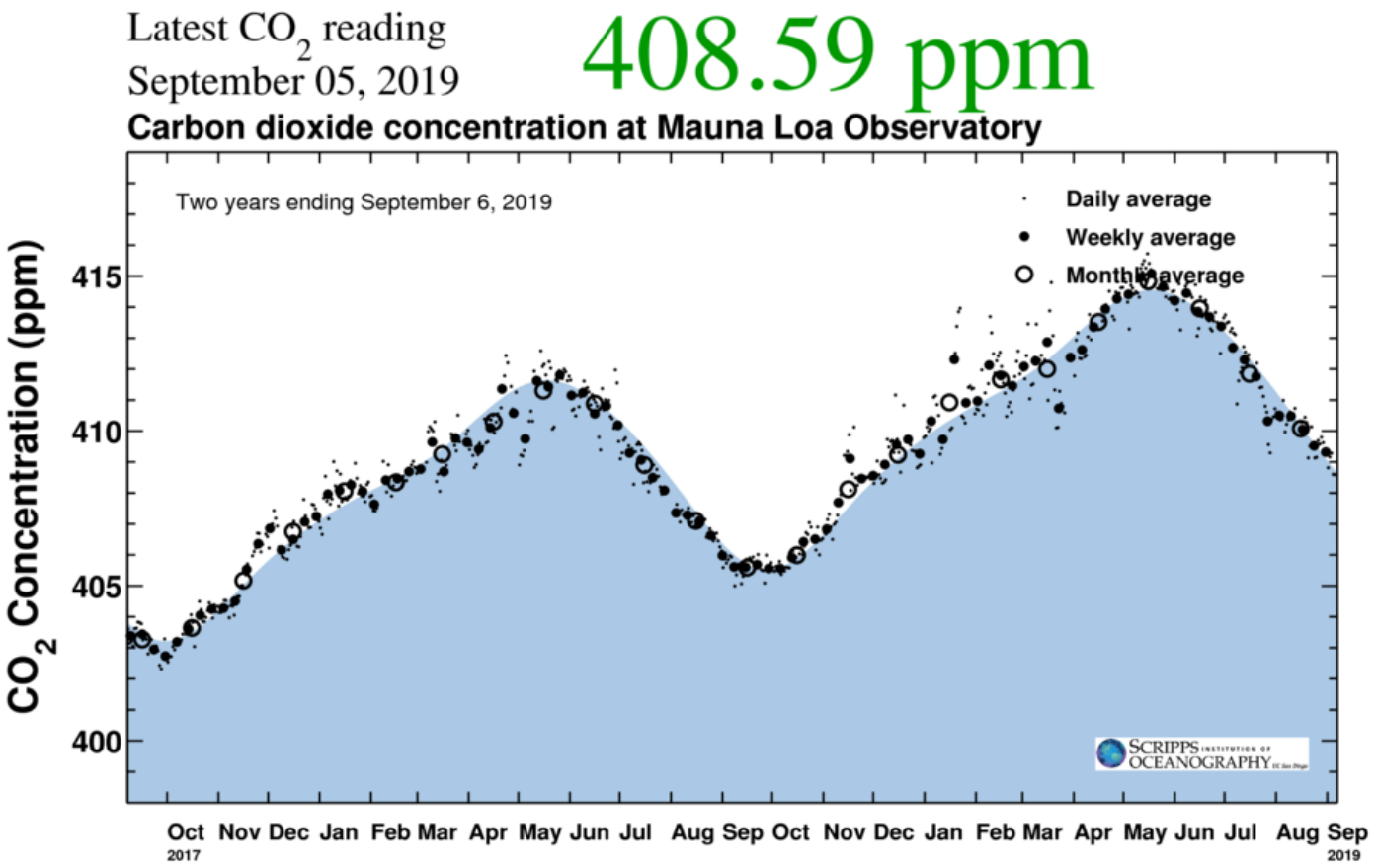
Where do we stand?

Global warming

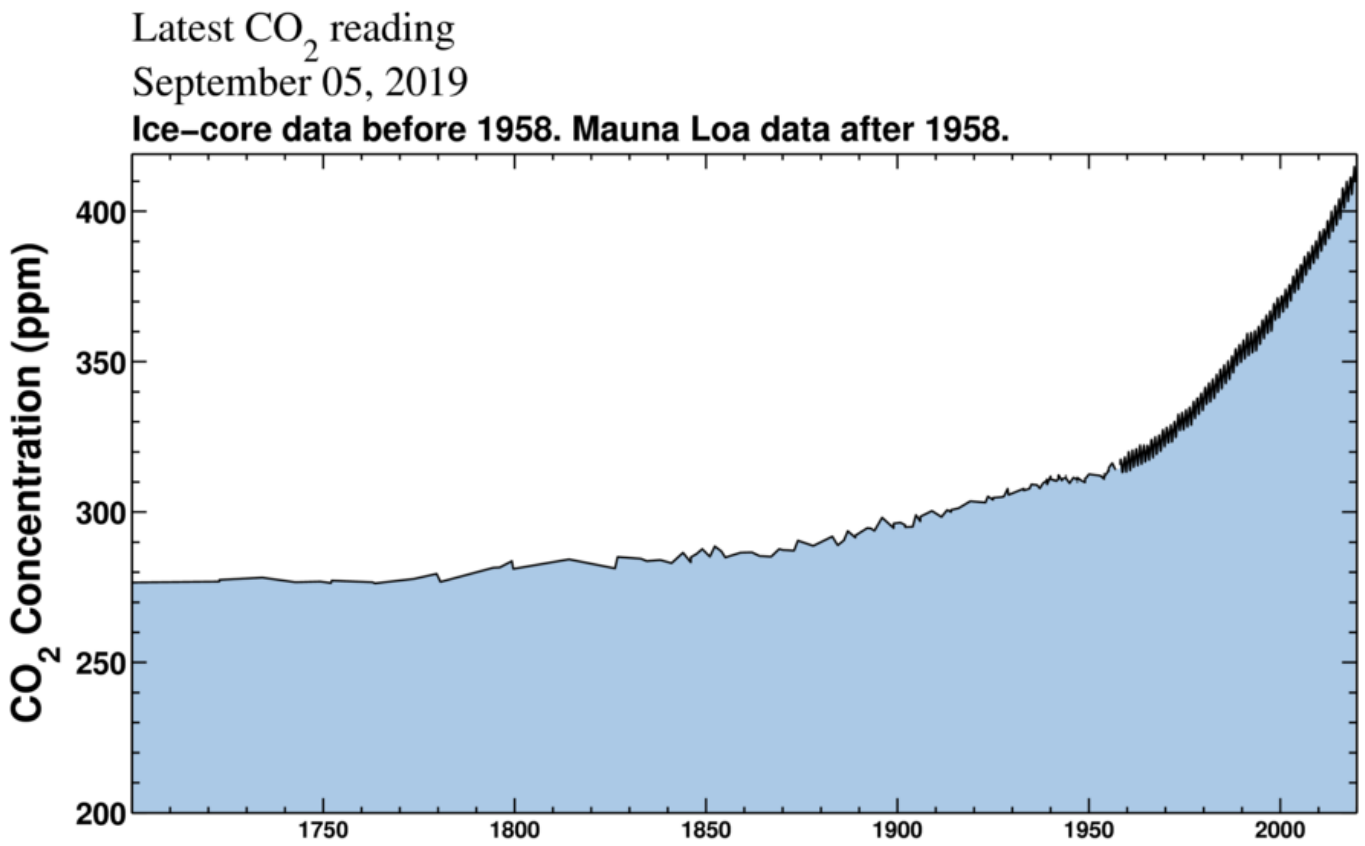
CO_2 Concentration – 2017 to 2019



Source: Scripps Institution of Oceonography

Global warming

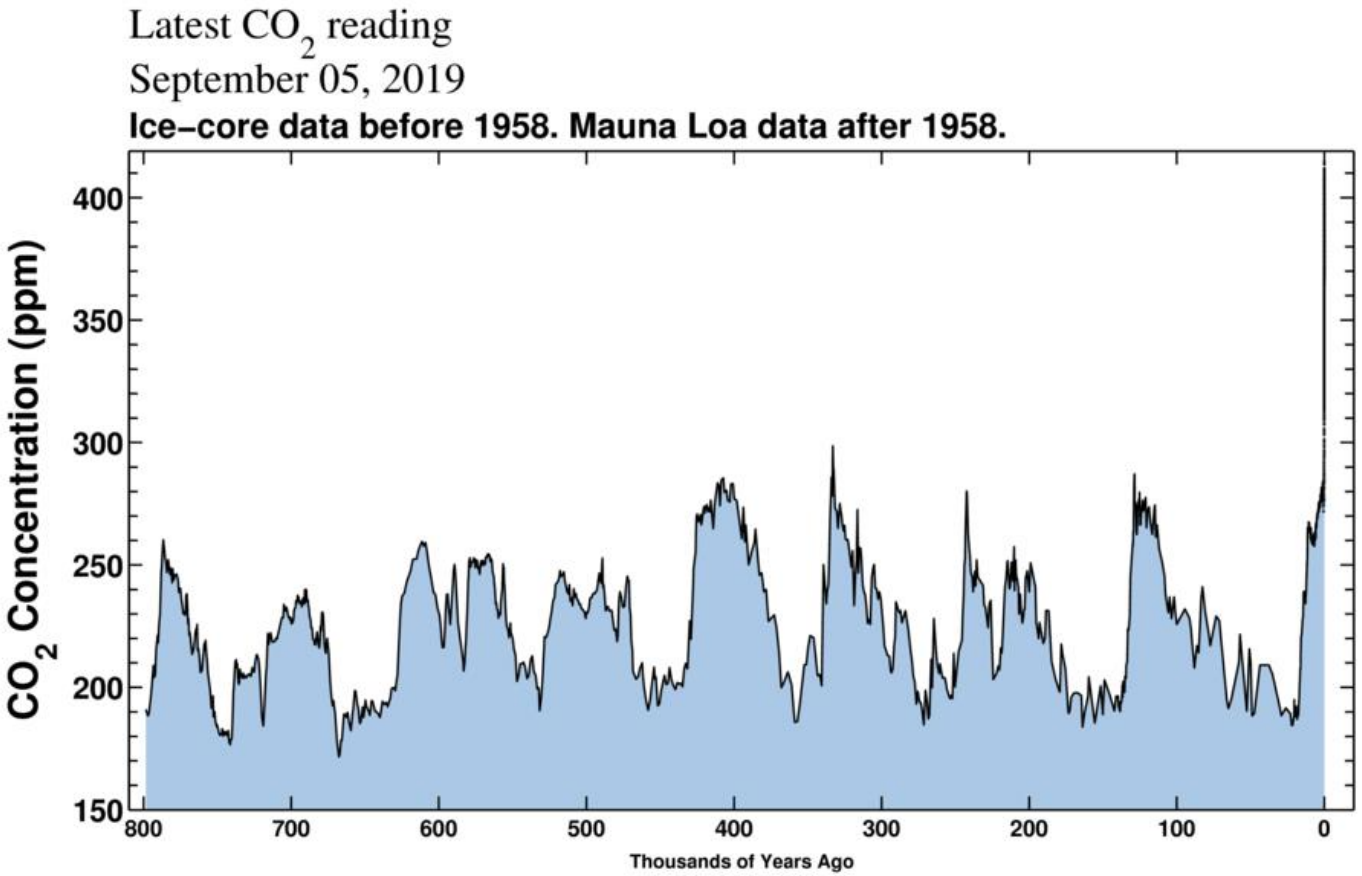
CO_2 Concentration – 1700 to Present



Source: Scripps Institution of Oceonography

Global warming

CO_2 Concentration – 800,000 years



Source: Scripps Institution of Oceonography

Global warming

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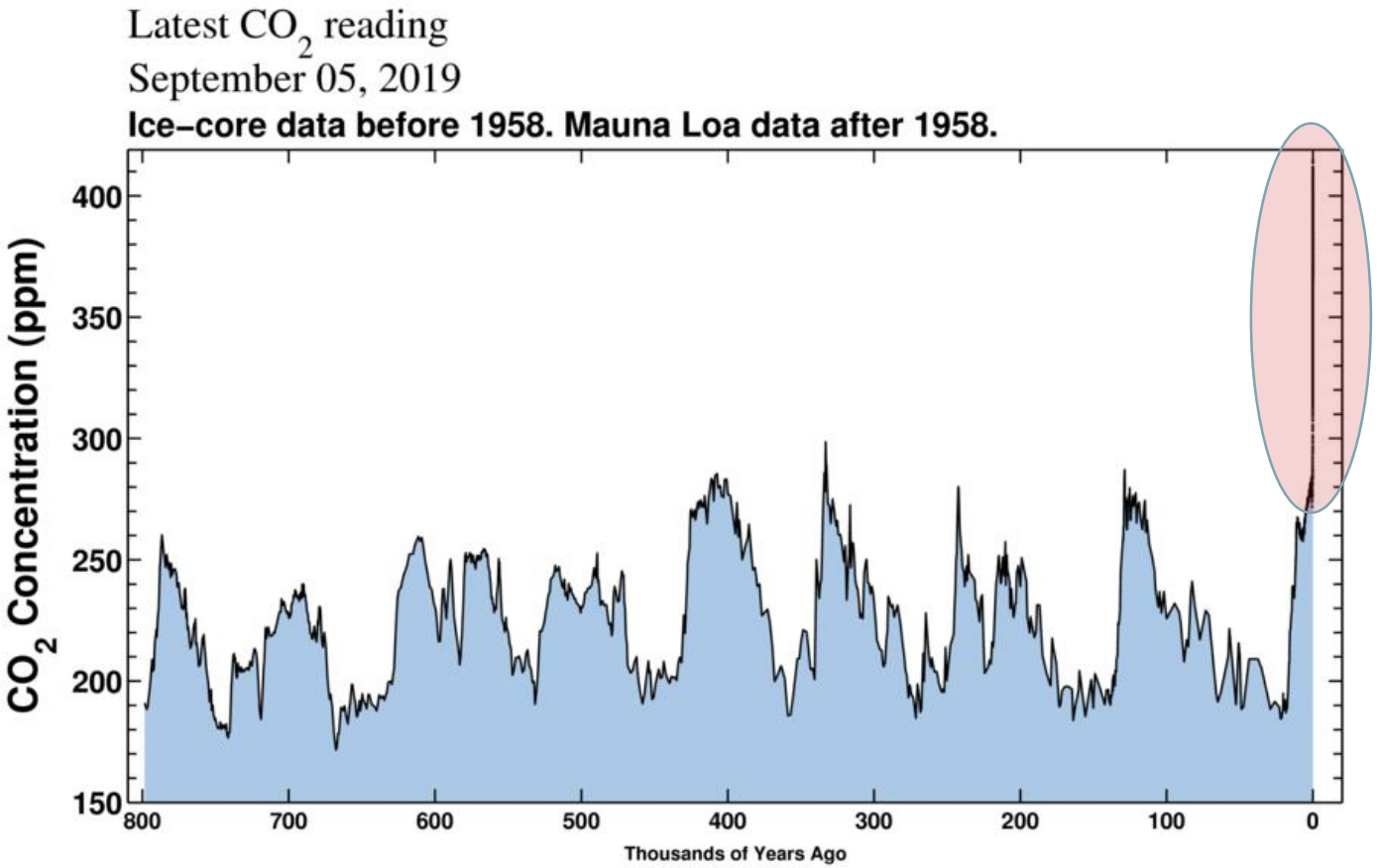
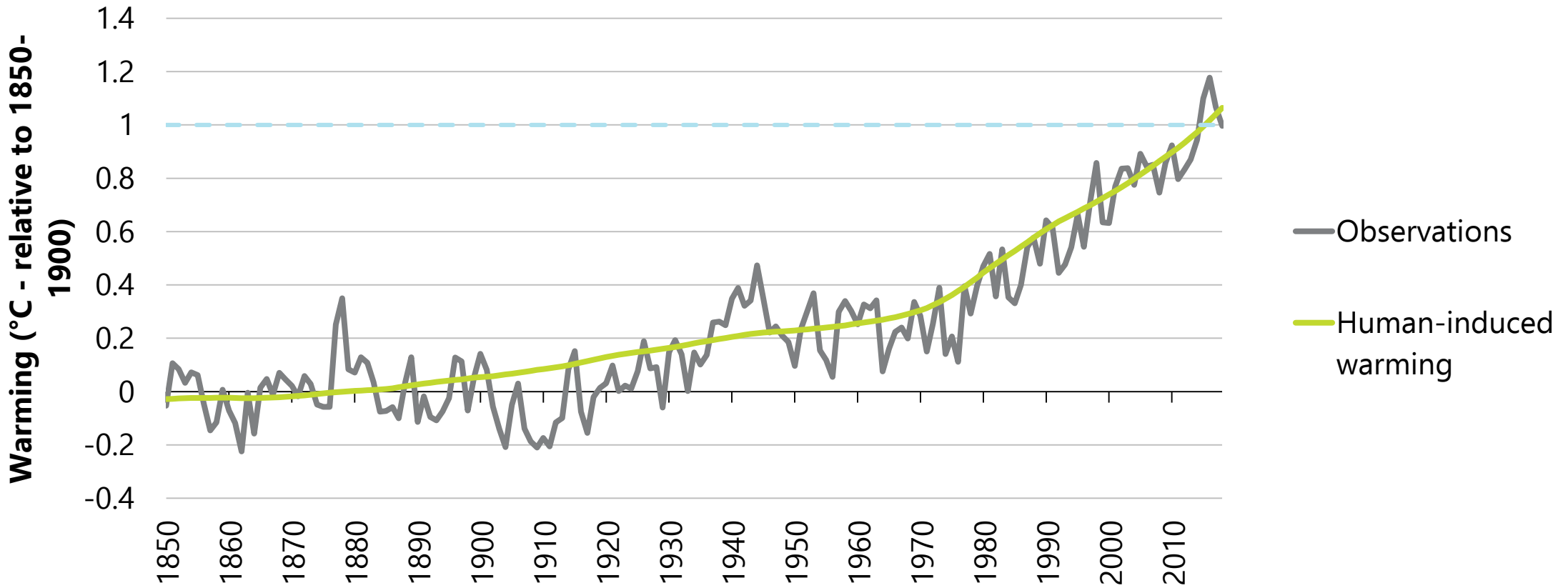


Source: Scripps Institution of Oceonography

Global warming

Observed and human-induced warming



Source: HadCRUT4, NOAA, NASA and Cowtan & Way datasets; IPCC (2018) Chapter 1 - Framing and Context.

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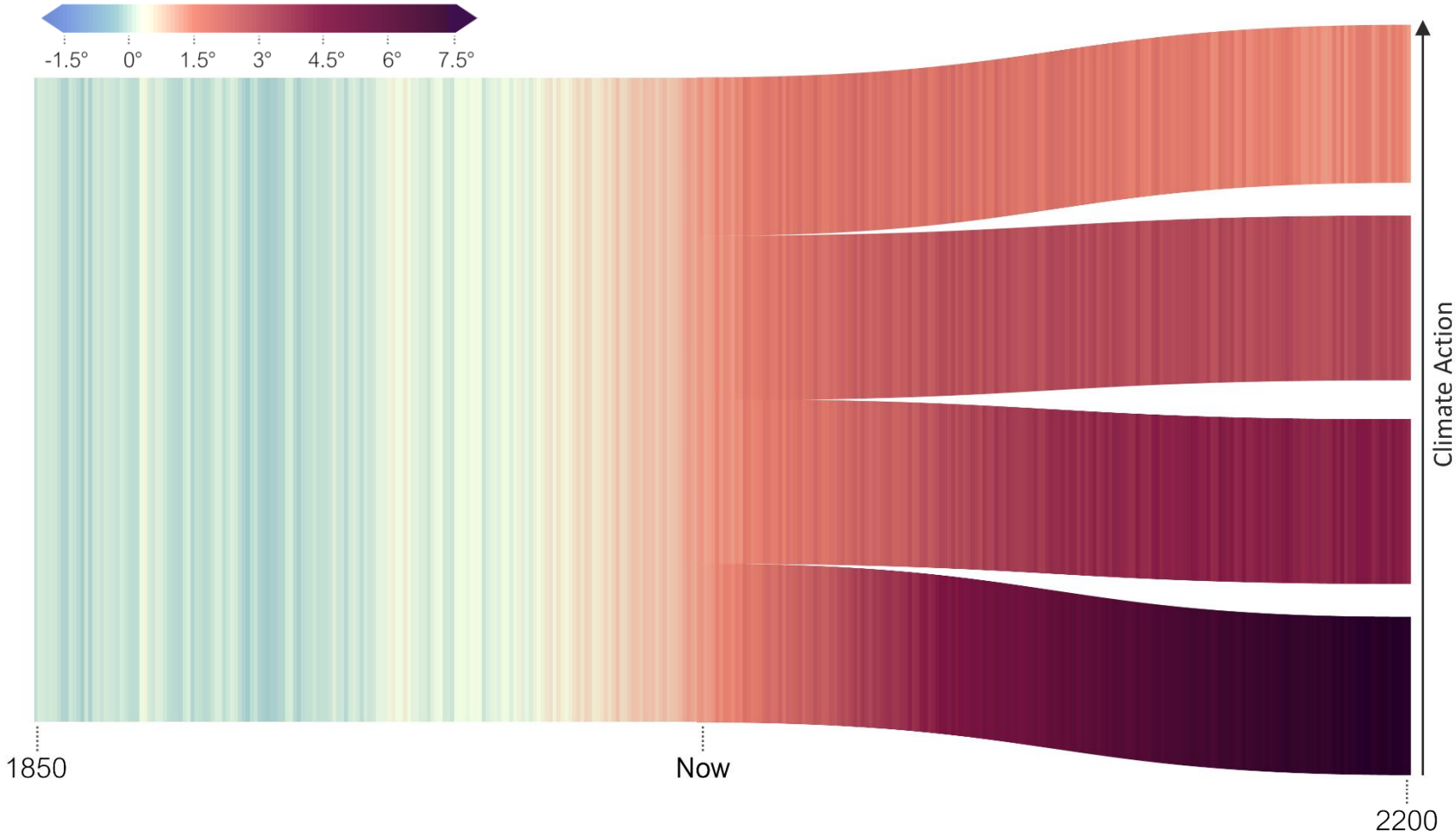
The climate choice



+1.9ºC in 2100/+1.4ºC by 2200
Emissions peak by 2029; Negative emissions by 2080

+2.7ºC in 2100/+2.8ºC by 2200
Emissions peak by 2049

+3.1ºC in 2100/+3.7ºC by 2200
Emissions peak by 2089

+4.8ºC in 2100/+7.8ºC by 2200
Emissions peak between 2100 - 2150

Source: Projections based on CMIP5 RCP scenarios, from warningstripes.com

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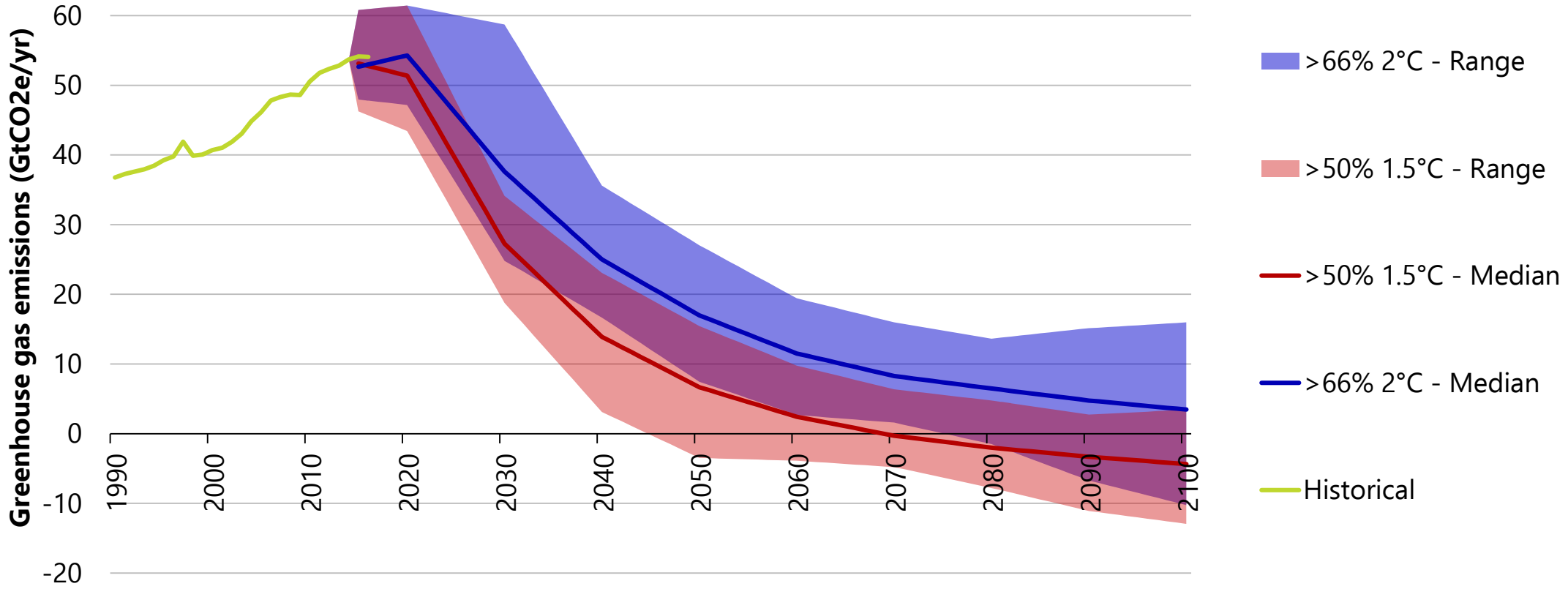
What do we do about this?

Science and international context

Global emissions pathways – the need for net zero



Source: Huppmann, D. et al. (2018) A new scenario resource for integrated 1.5°C research.

Science and international context

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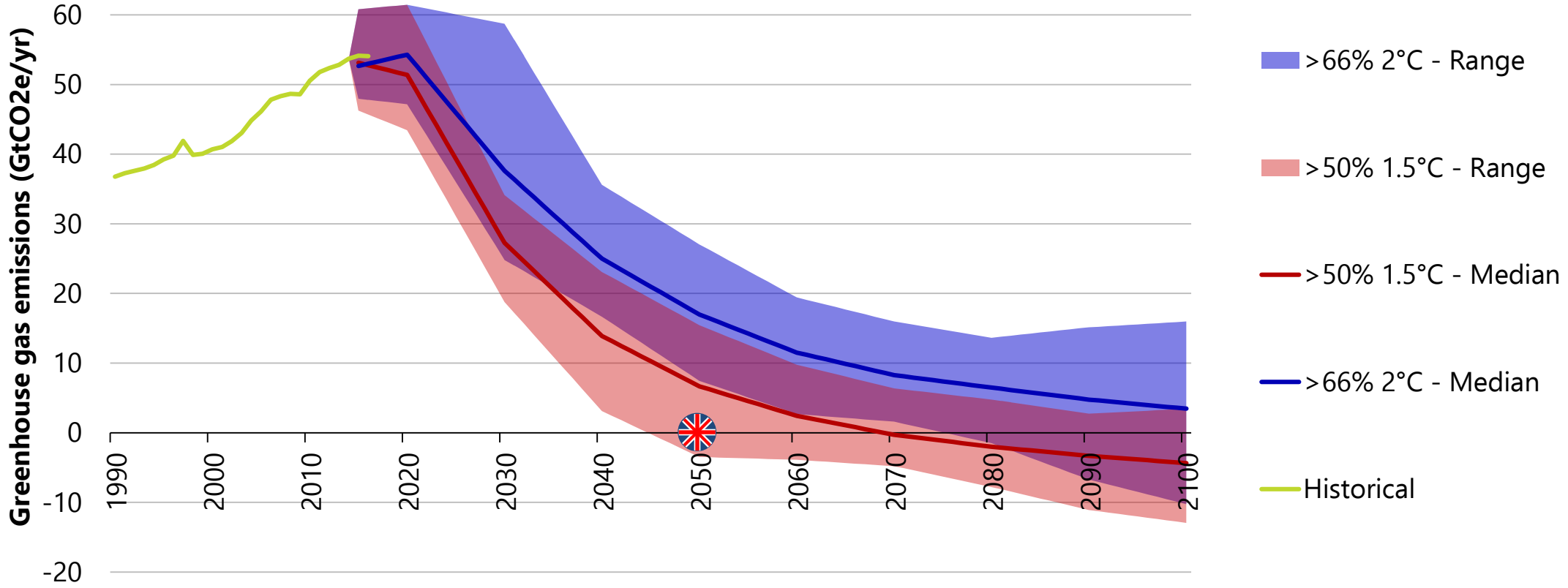

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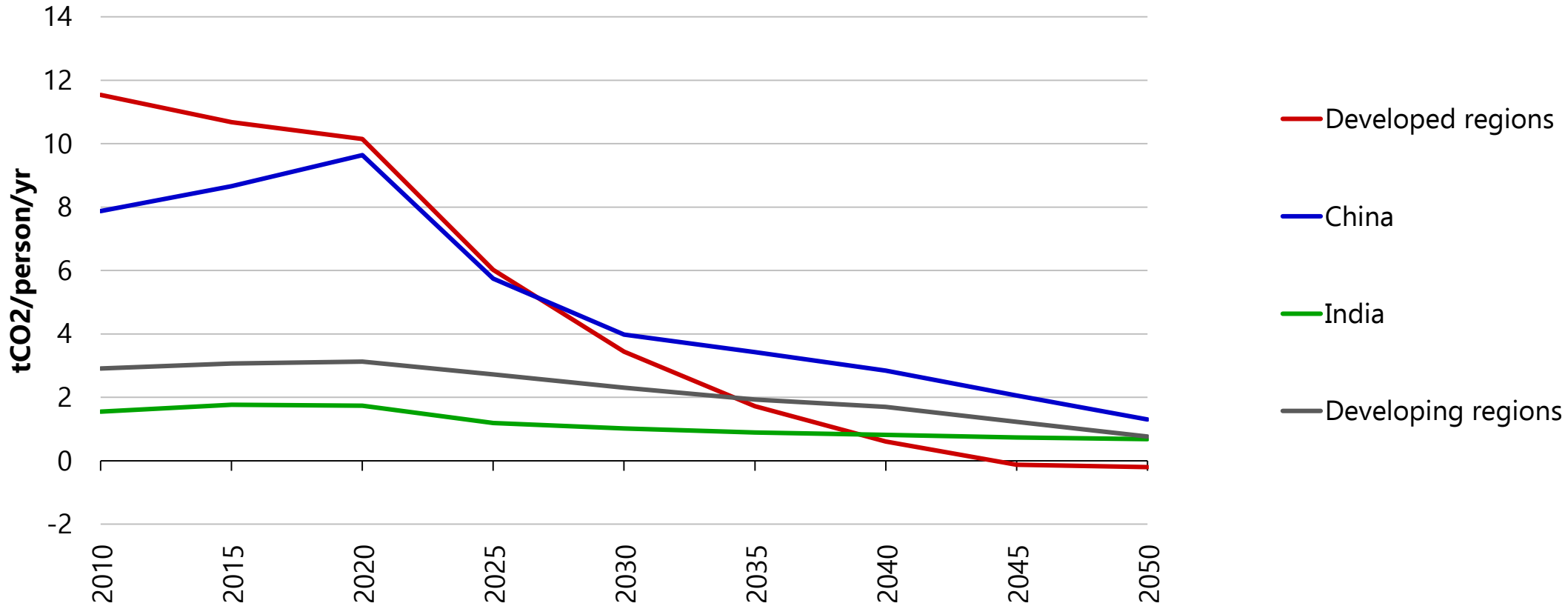
Science and international context

Global emissions pathways – role of each regions



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Science and international context

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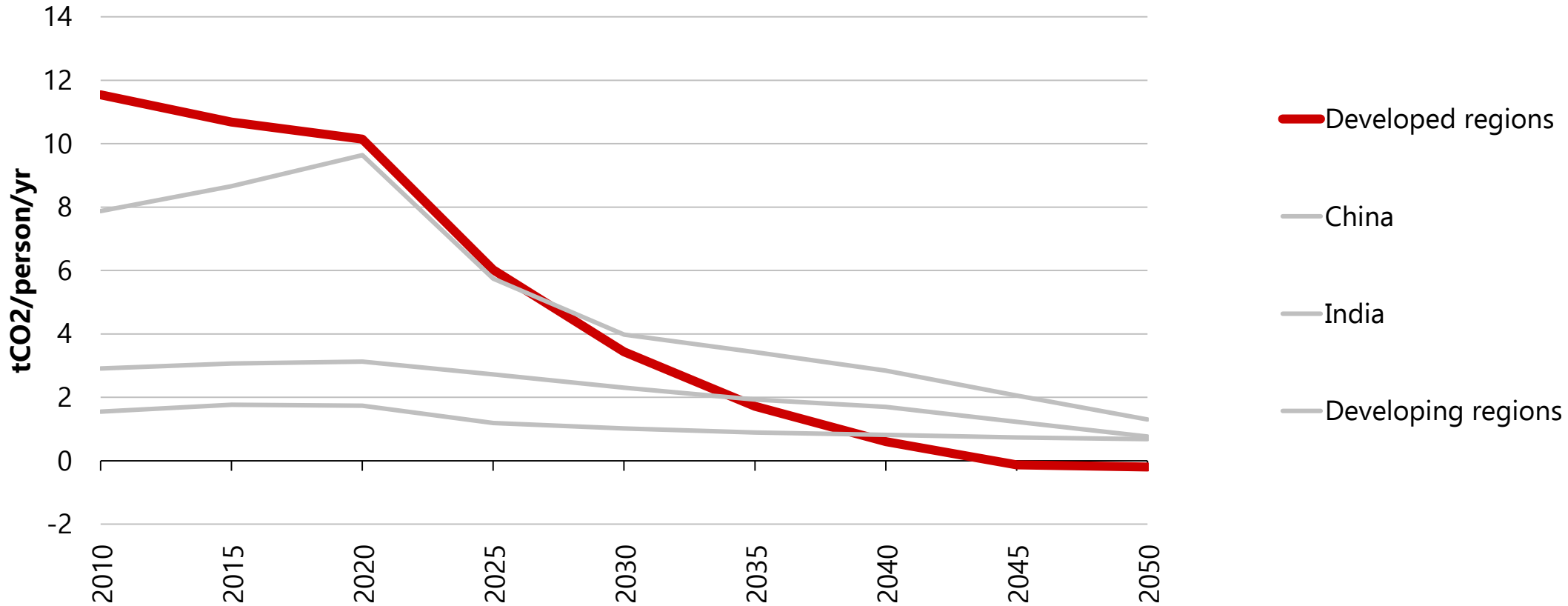
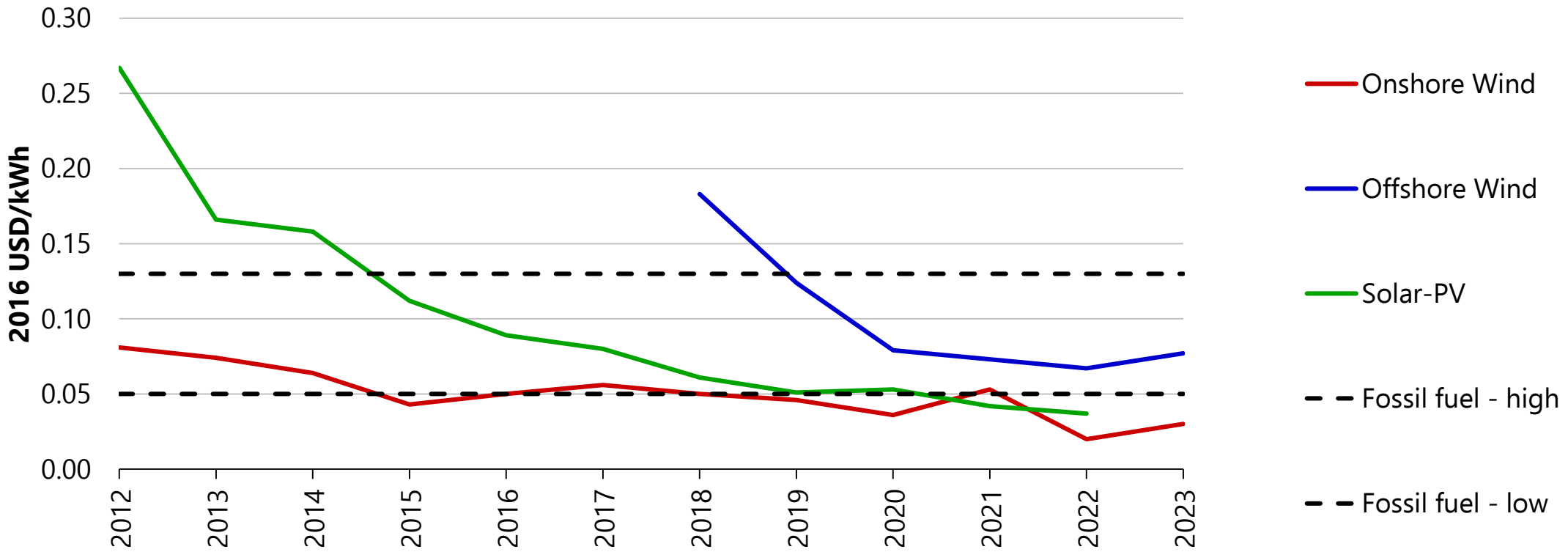


Source: Huppmann, D. et al. (2018) A new scenario resource for integrated 1.5°C research.

Alternatives to fossil fuels – Global average auction prices by commissioning date



Source: IEA (2019) Renewable Energy 2018

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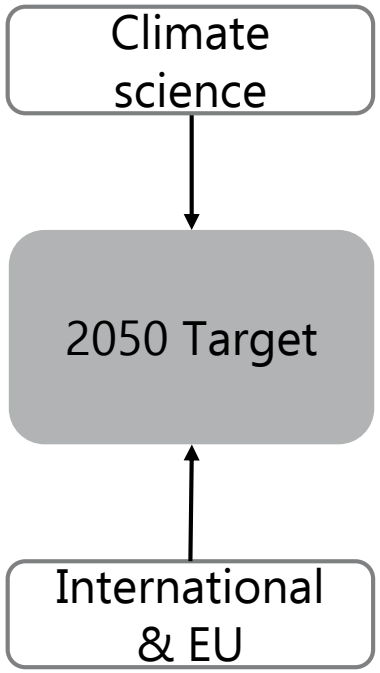
Reducing emissions in the UK

Our approach to forecasting



Our approach to forecasting

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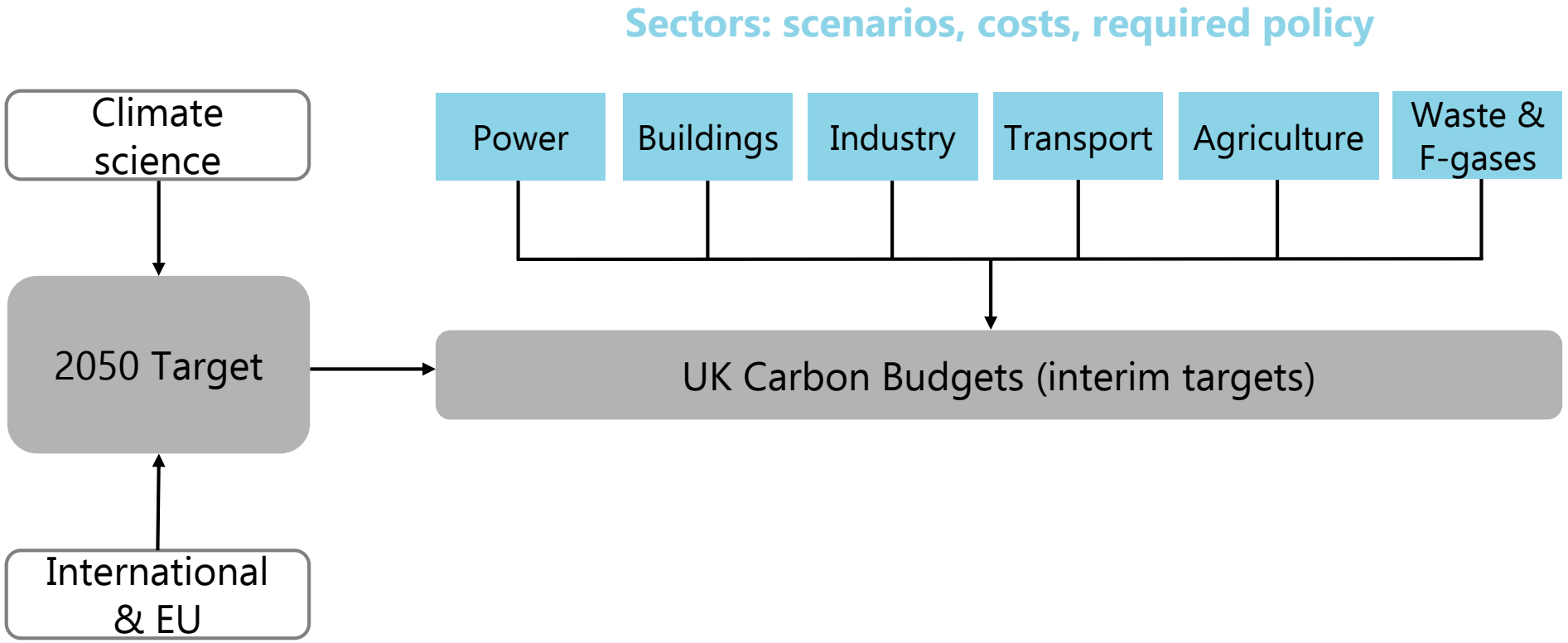
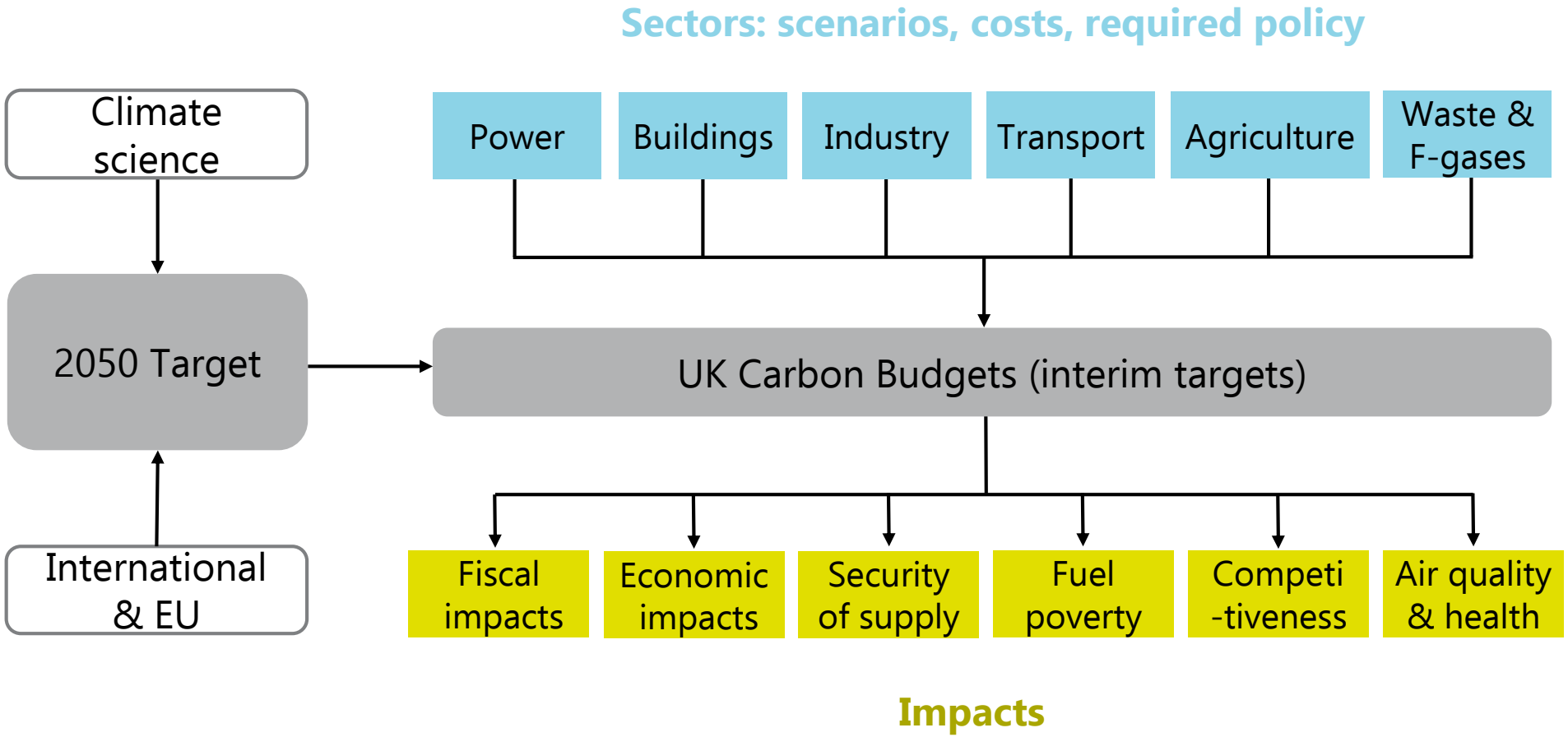


Our approach to forecasting



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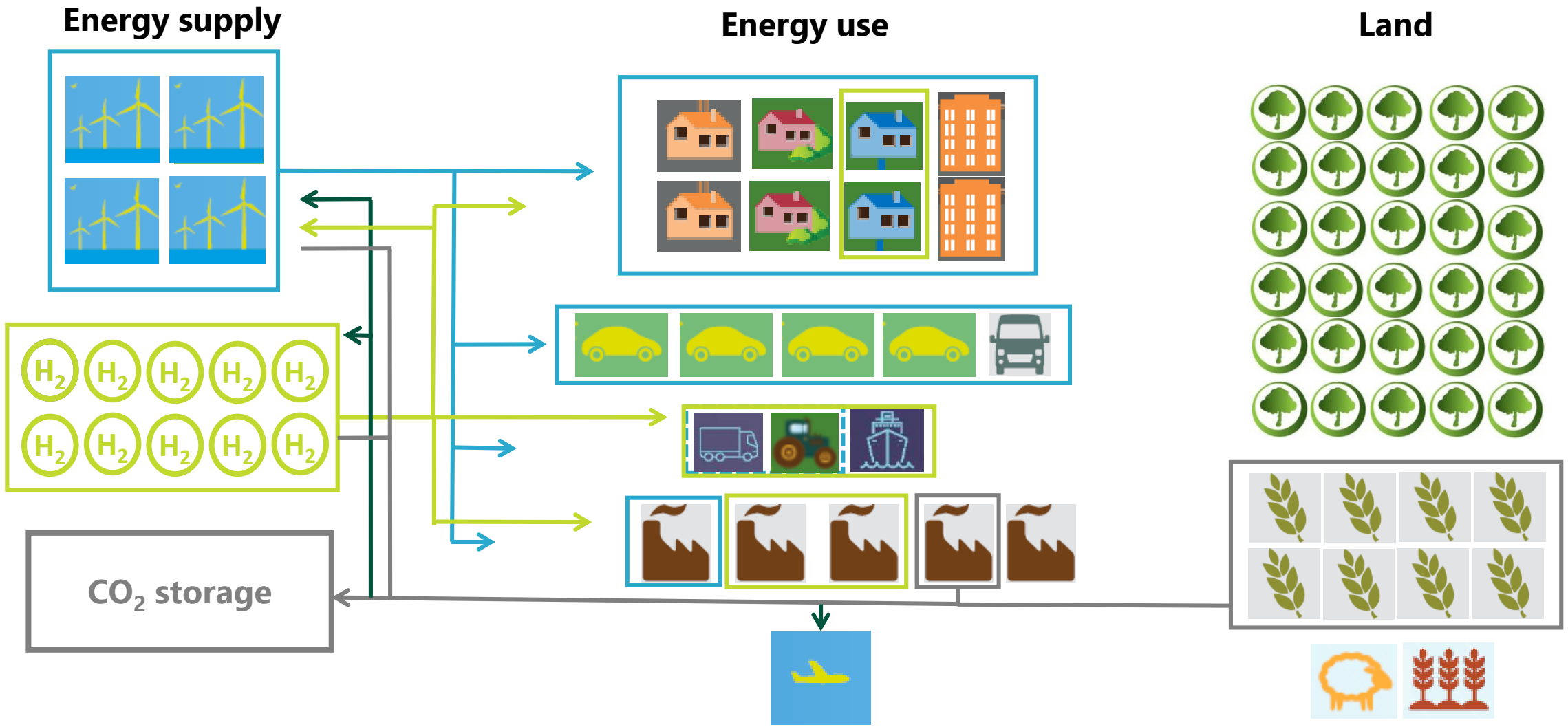
How UK net-zero scenarios can be delivered



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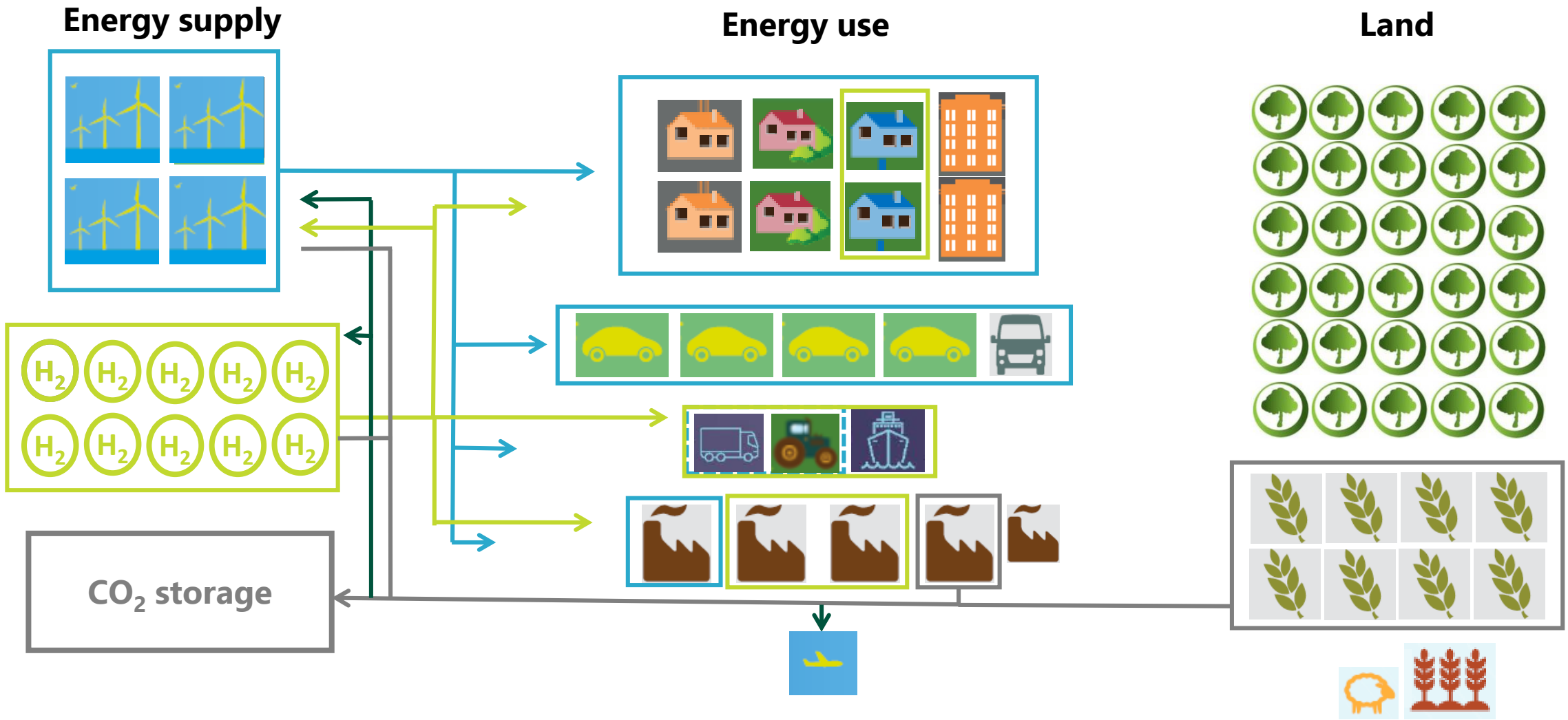

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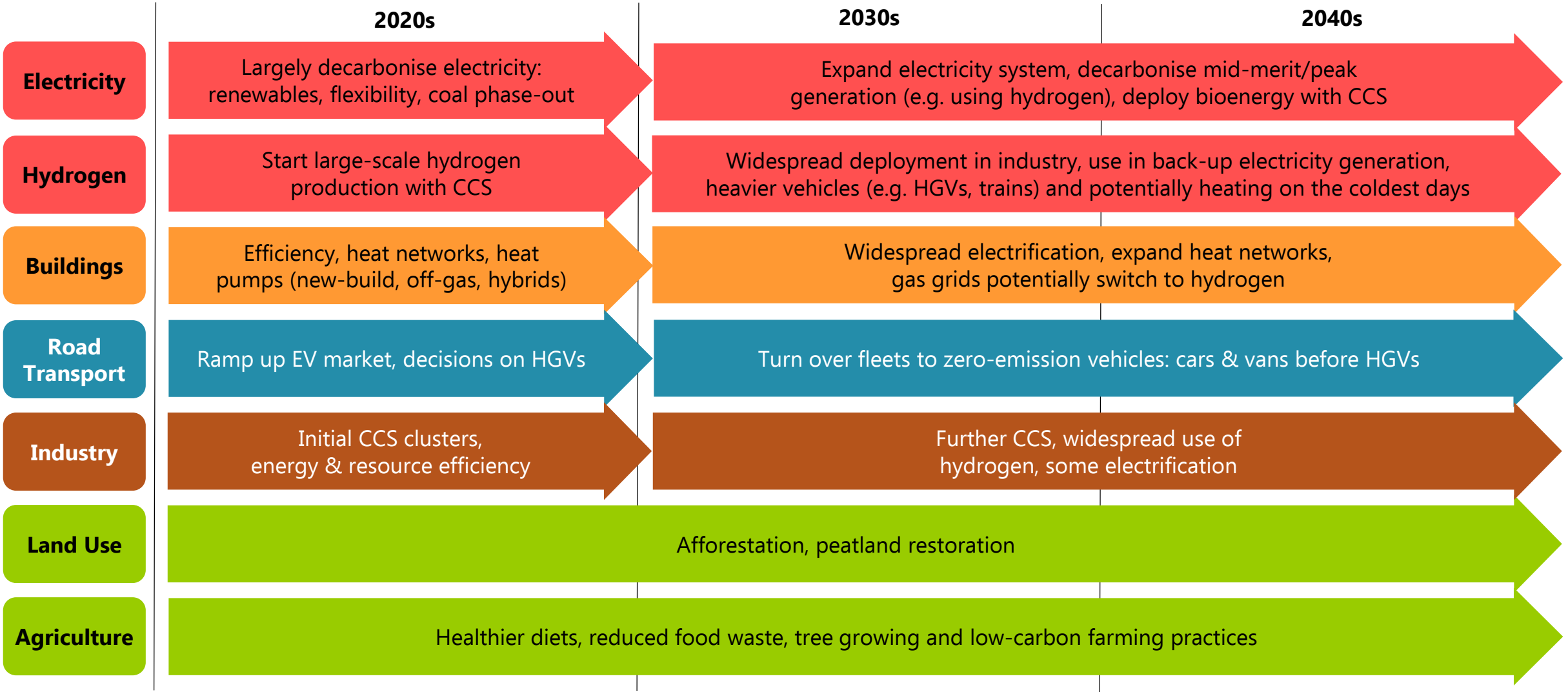

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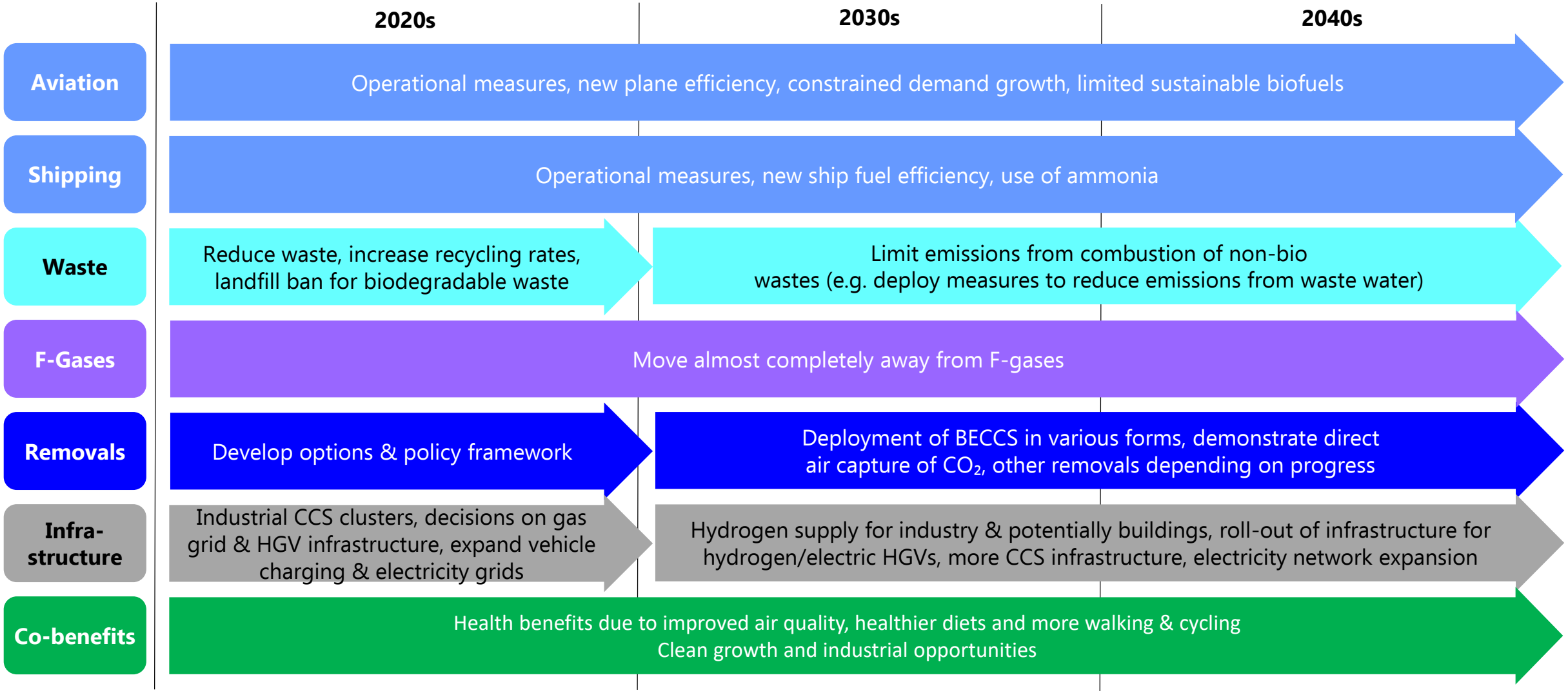
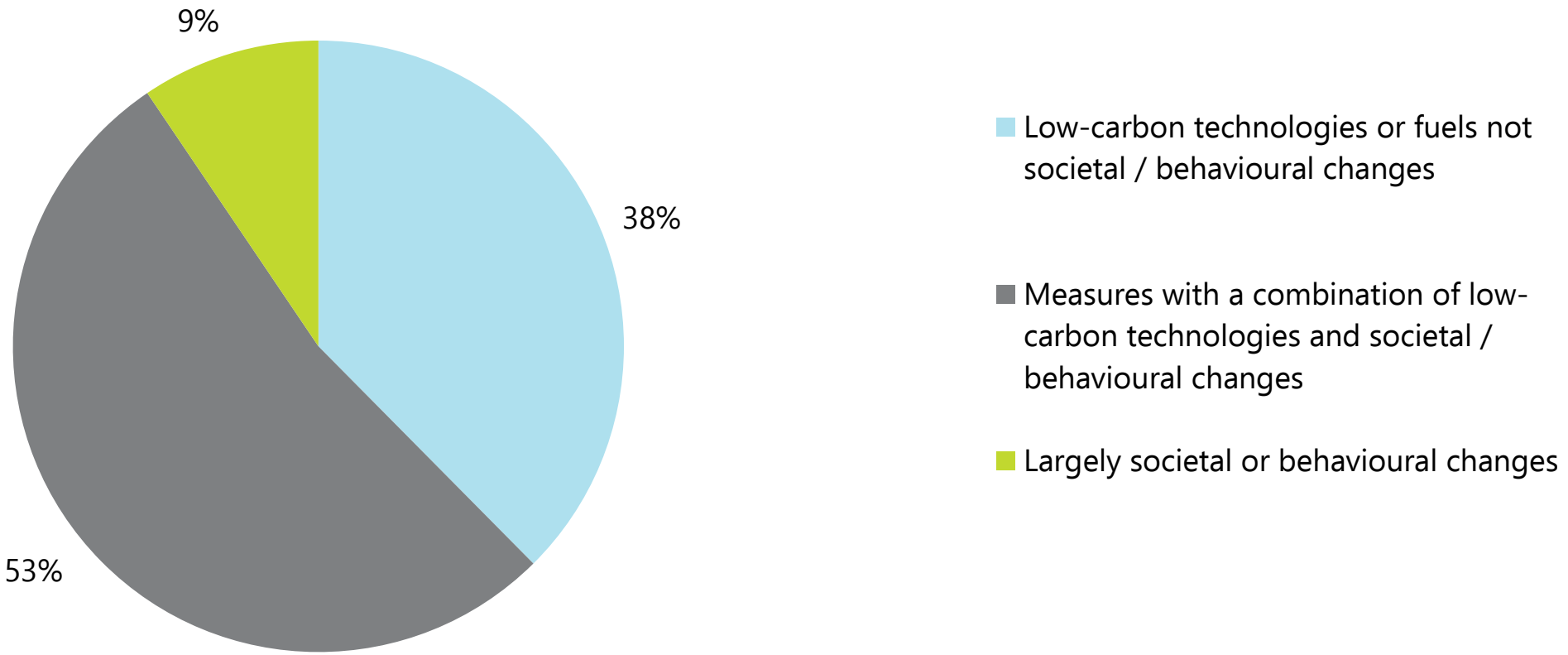


How UK net-zero scenarios can be delivered

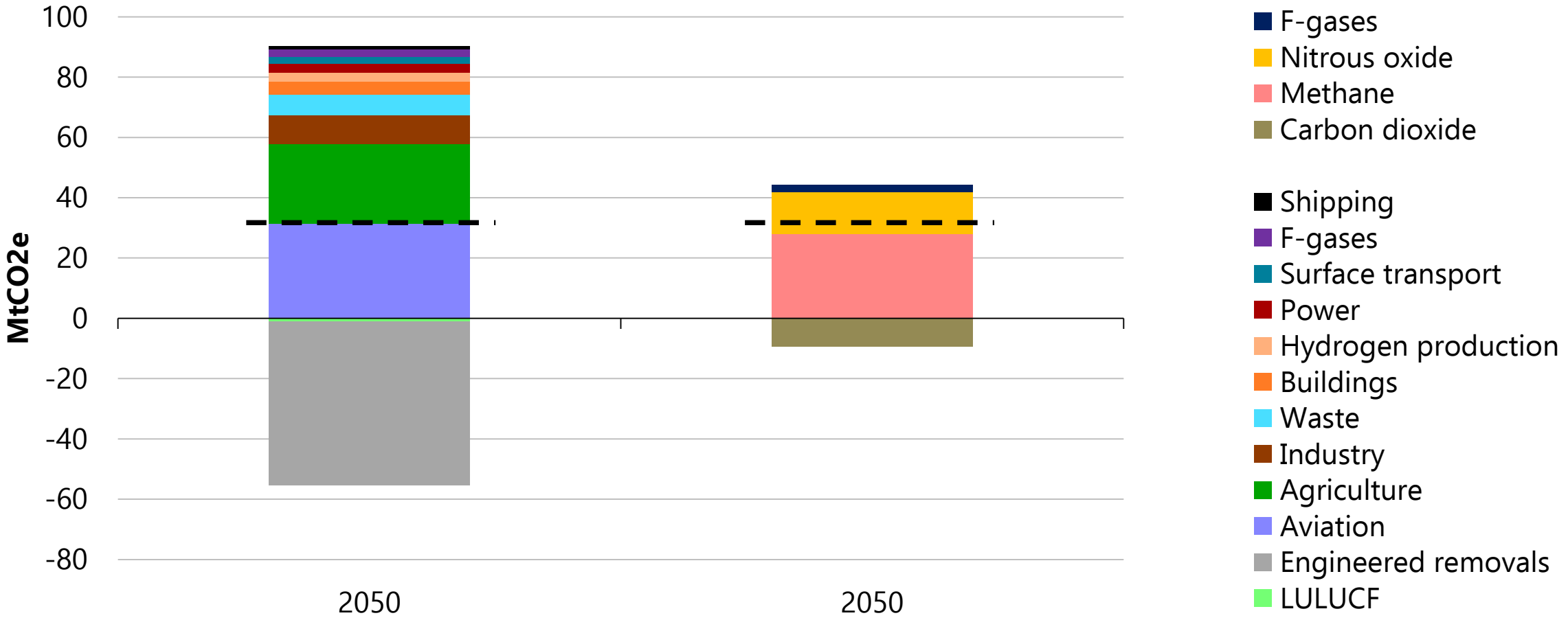
Role of societal and behavioural changes in the Further Ambition scenario



Source: CCC analysis

How UK net-zero scenarios can be delivered

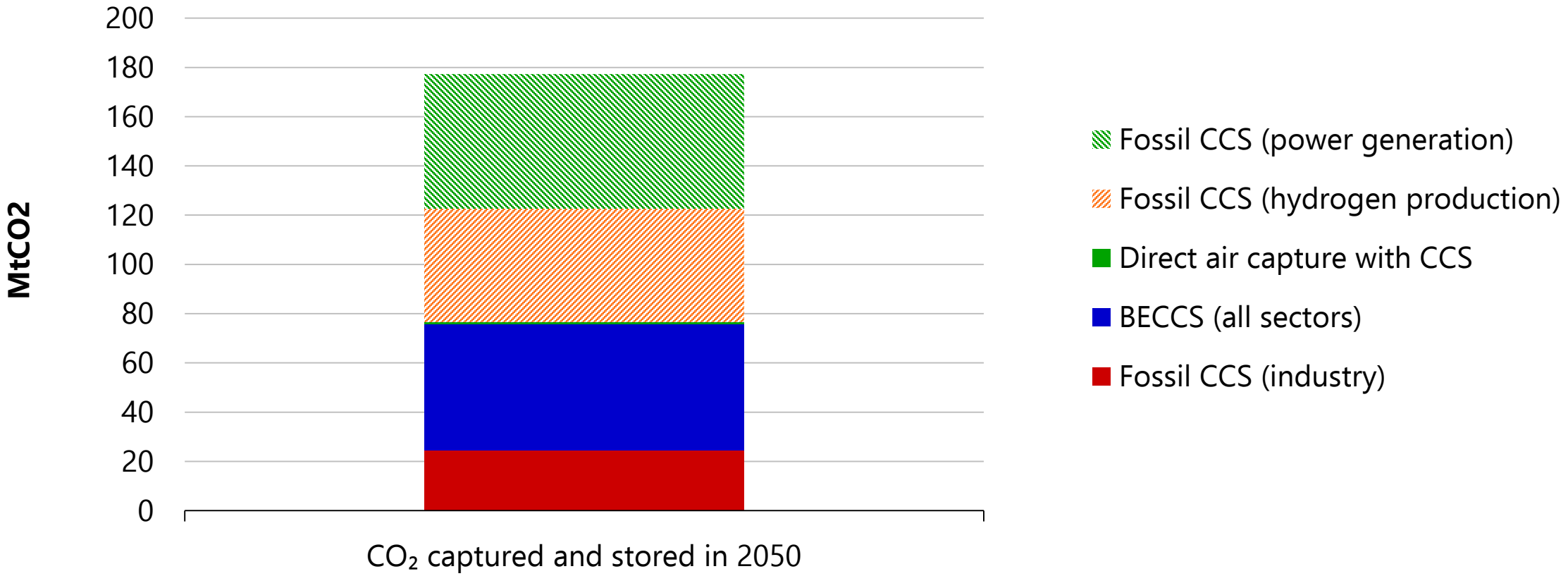
Remaining emissions in the Further Ambition scenario by sector (left) and gas (right)



Source: CCC analysis

How UK net-zero scenarios can be delivered

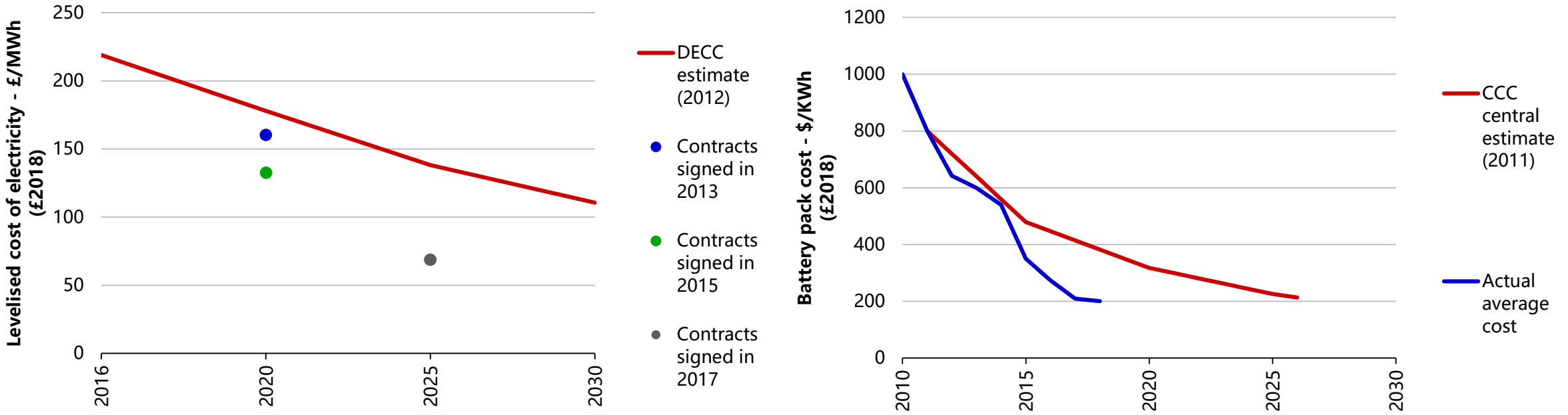
Total CO_2 captured and stored due to Further Ambition options in 2050



Source: CCC analysis

Importance of innovation

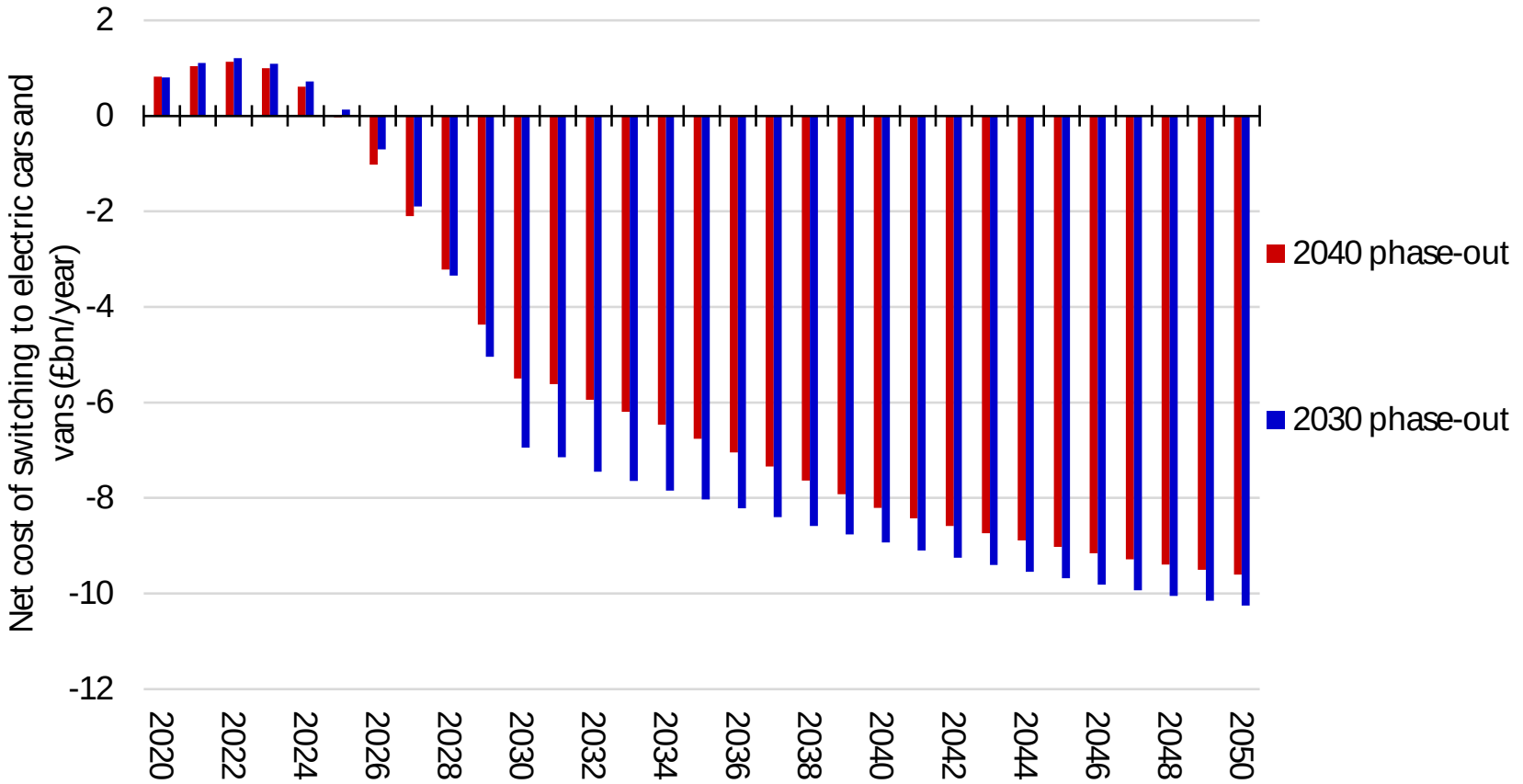
Costs of example low-carbon technologies compared to past projections
Offshore wind (left) Battery packs (right)



Source: Offshore wind costs, CCC analysis based on DECC (2012) Electricity generation costs and LCCC (2019) CfD register. Battery forecasts, CCC (2015) Sectoral scenarios for the 5th Carbon Budget, outturn costs from BNEF (2018) Electric cars to reach price parity by 2022

Importance of innovation

A 2030 switchover to electric vehicles would save more money than a 2040 switchover



Source: CCC analysis

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Costs to the economy of meeting a UK net-zero target

The impact of innovation on the costs of achieving carbon targets

- Overall, innovation and falling technology costs mean that we now estimate that the UK's 80% emissions target could be met at a lower cost than we estimated in 2008 – under 1% of GDP in 2050, rather than 1-2% of GDP.

Changes in cost estimates for long-term emissions goals		
GHG emissions reduction target (relative to 1990)	**Year and report**	**Cost range estimated for 2050**
60% reduction in CO_2 (~55% reduction in GHG)	2003 - *Energy White Paper*	0.5-2.0% of GDP
80% reduction in GHG	2008 - *Building a low-carbon economy – the UK's contribution to tackling climate change*	1-2% of GDP
100% reduction in GHG	2019 - this report	1-2% of GDP

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Thank you

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Panel discussion

Chris Stark	CEO, UK Committee on Climate Change
Lindsay McQuade	CEO, ScottishPower Renewables
David Powell	Head of Environment & Green Transition, New Economics Foundation
Julia Steinberger	Professor of Social Ecology & Ecological Economics, University of Leeds
Piers Forster	Professor of Climate Physics, University of Leeds and member of the UK Committee on Climate Change
Chair: Peter Taylor	Chair in Sustainable Energy Systems, University of Leeds

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