Committee on Climate Change

24 September 2019

Lifting the lid on Net Zero

Chris Stark

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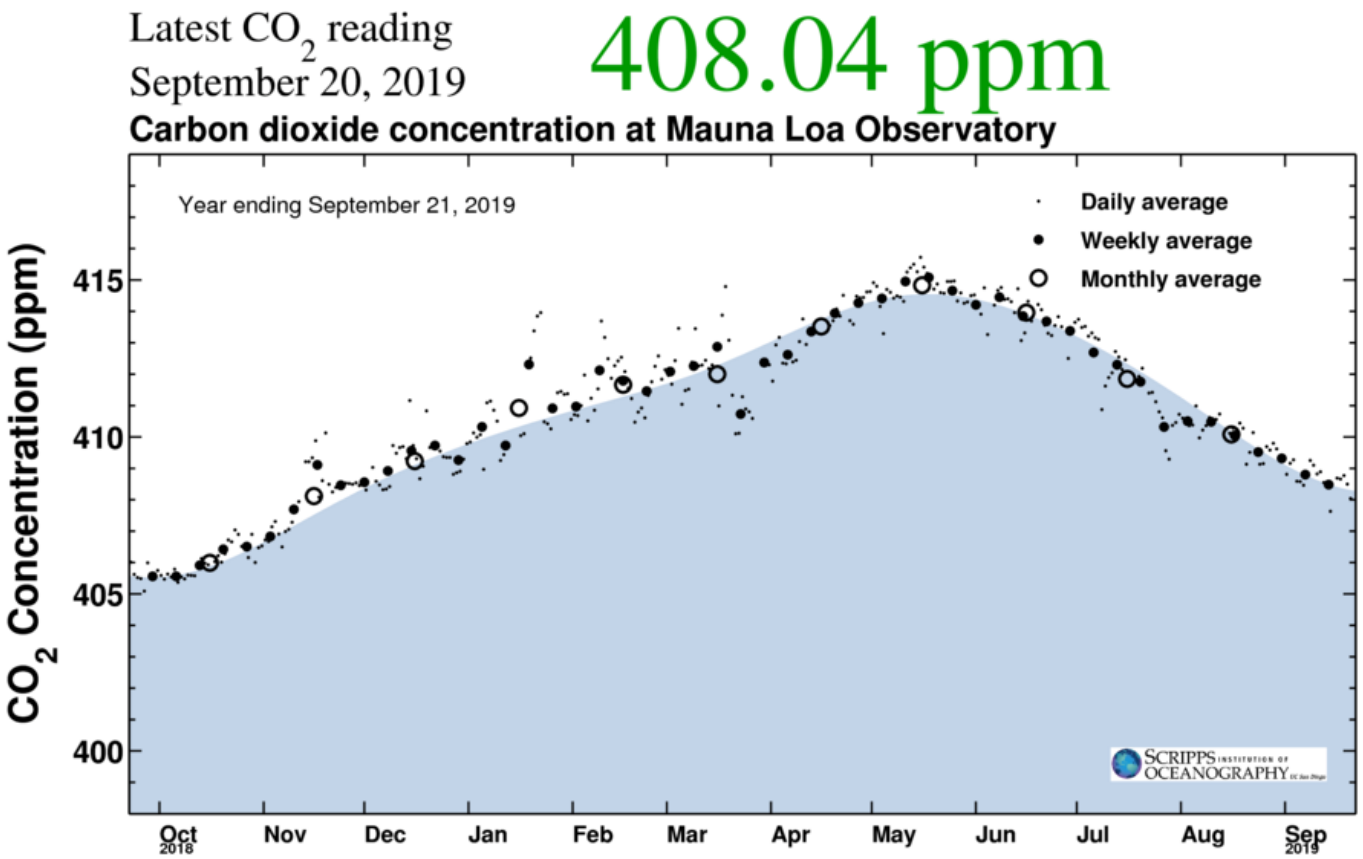
Where do we stand?

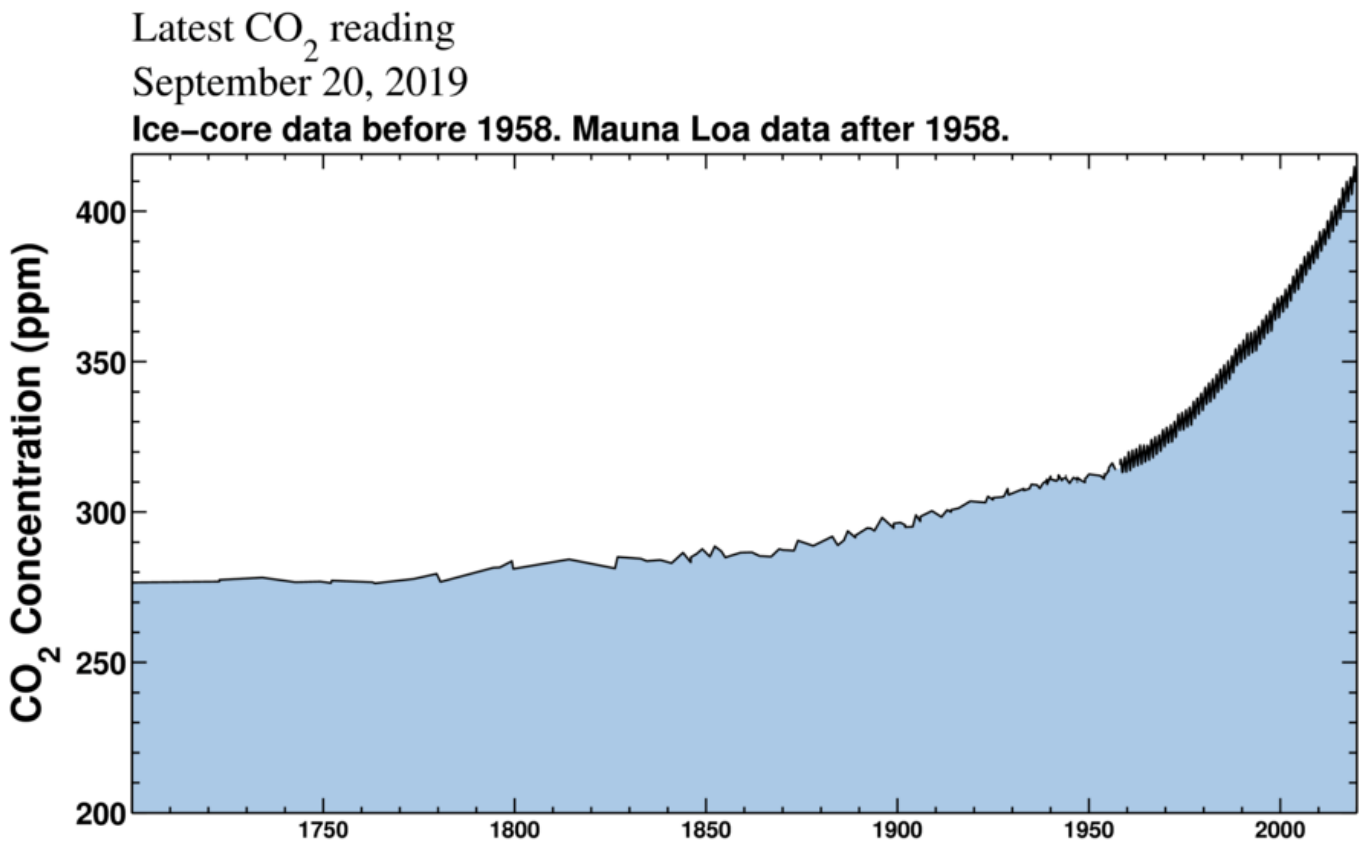
Global warming

CO_2 Concentration – 12 months



Source: Scripps Institution of Oceonography

CO_2 Concentration – 1700 to Present



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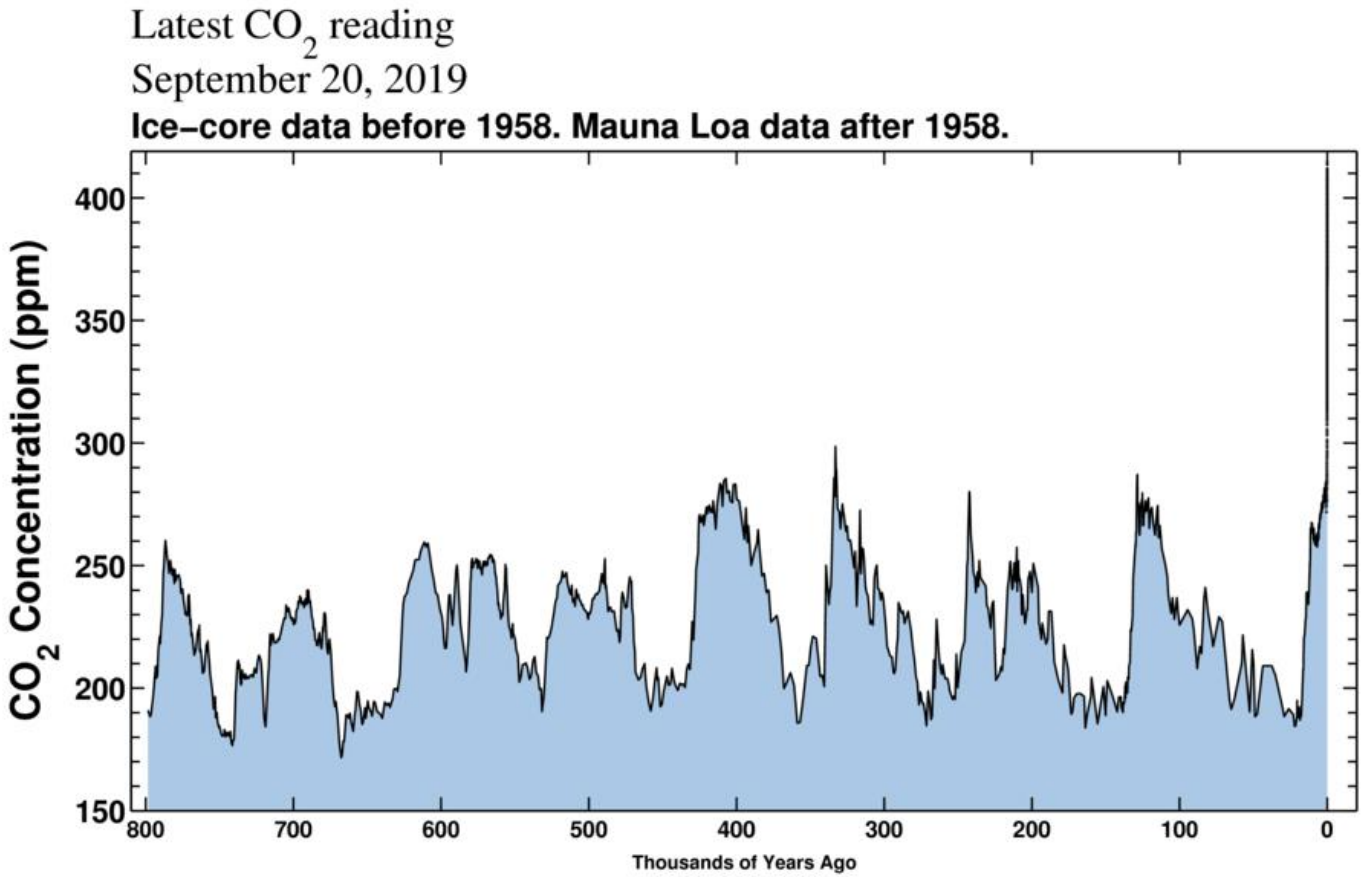
Global warming

CO_2 Concentration – 800,000 years



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Global warming

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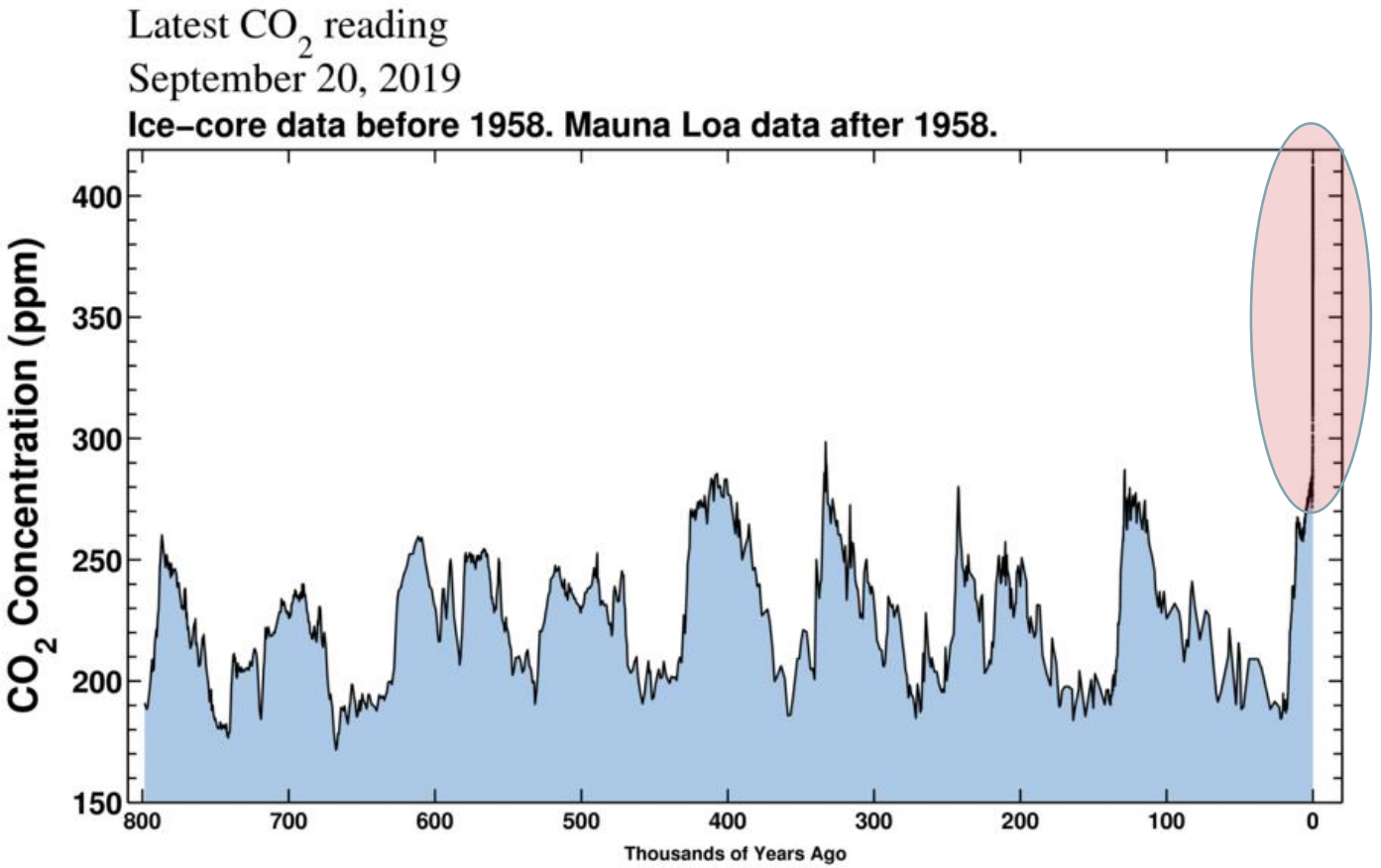

Source: Scripps Institution of Oceonography

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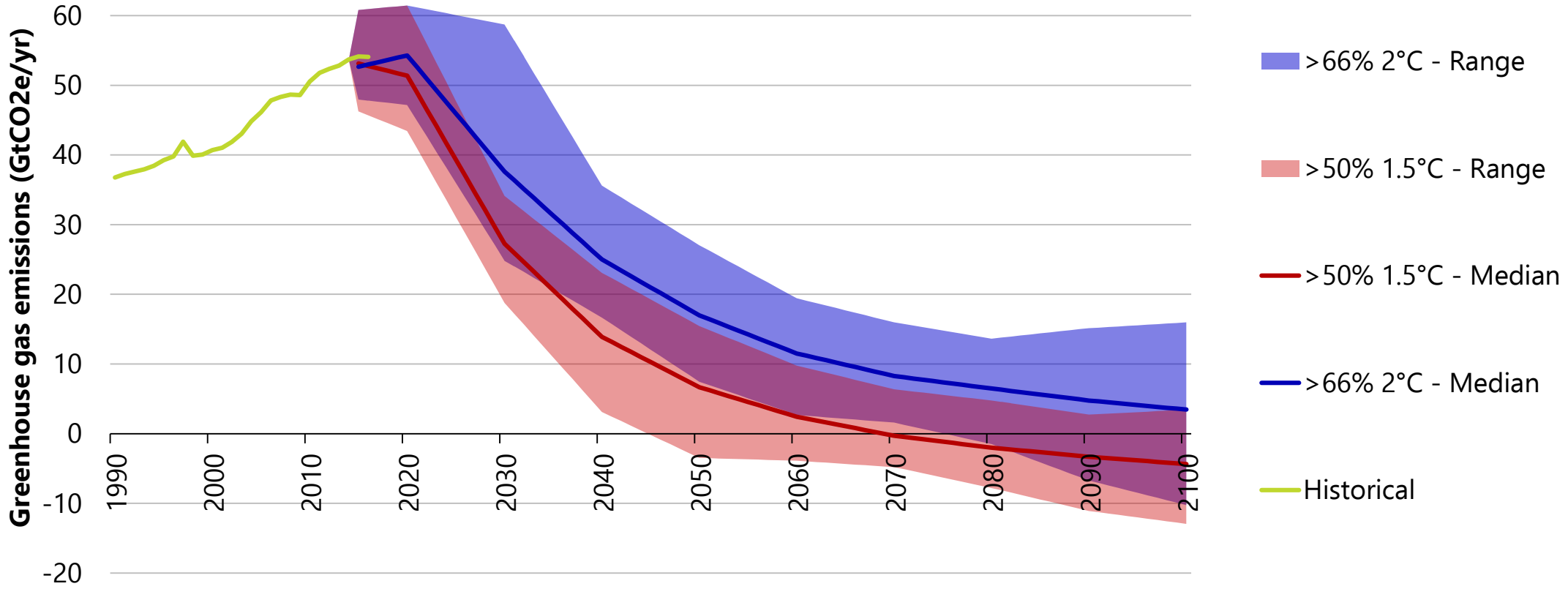
What do we do about this?

Cutting emissions - 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.

Cutting emissions - Science and international context

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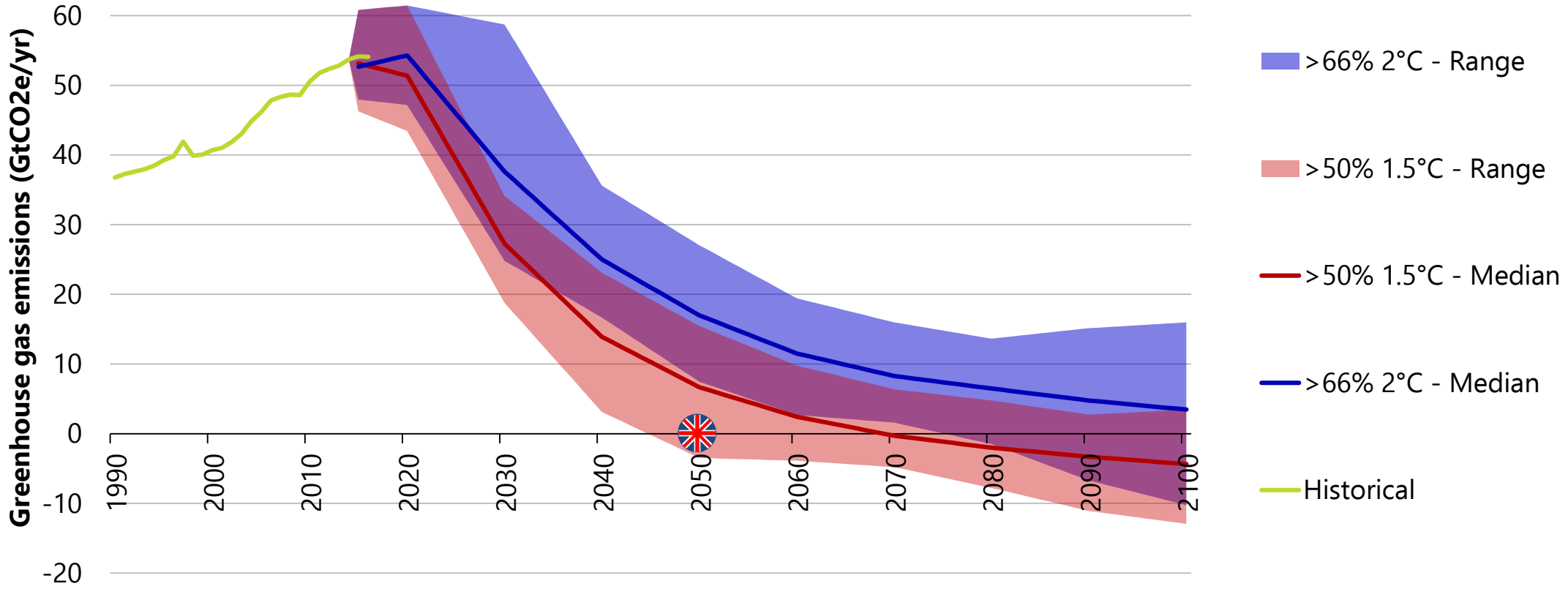

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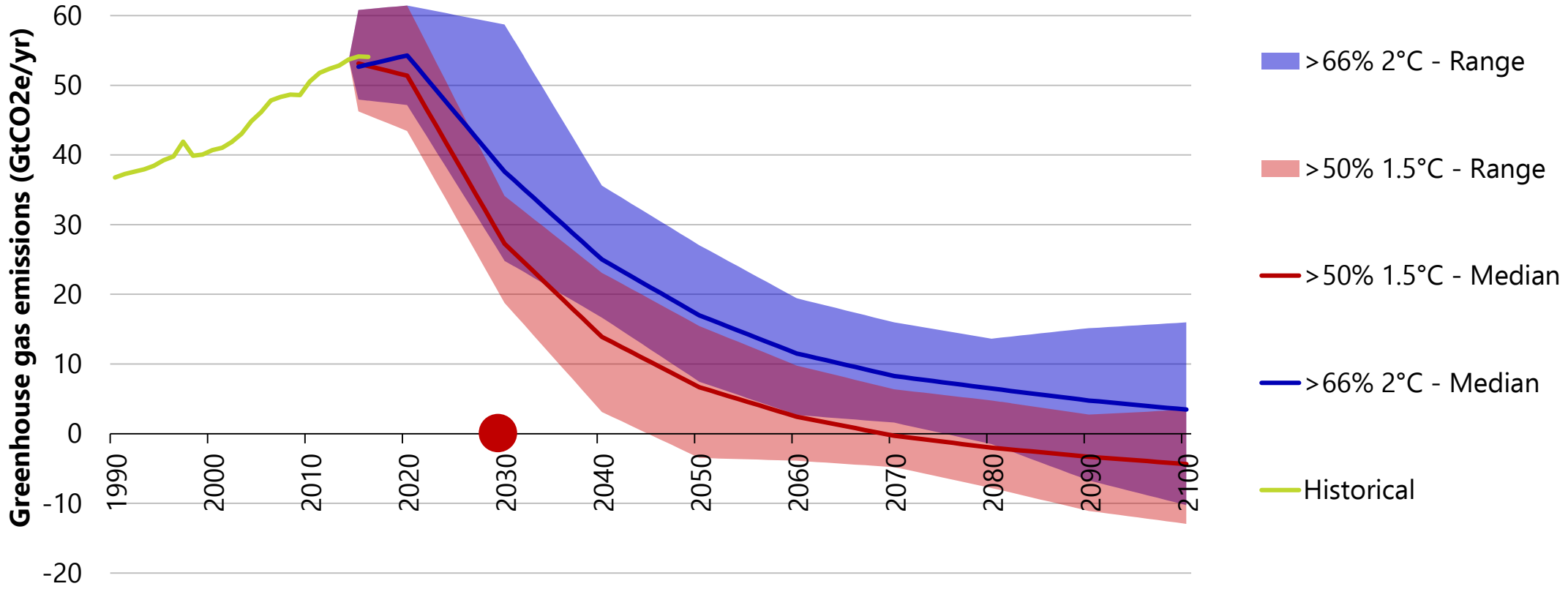

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Cutting emissions - Science and international context

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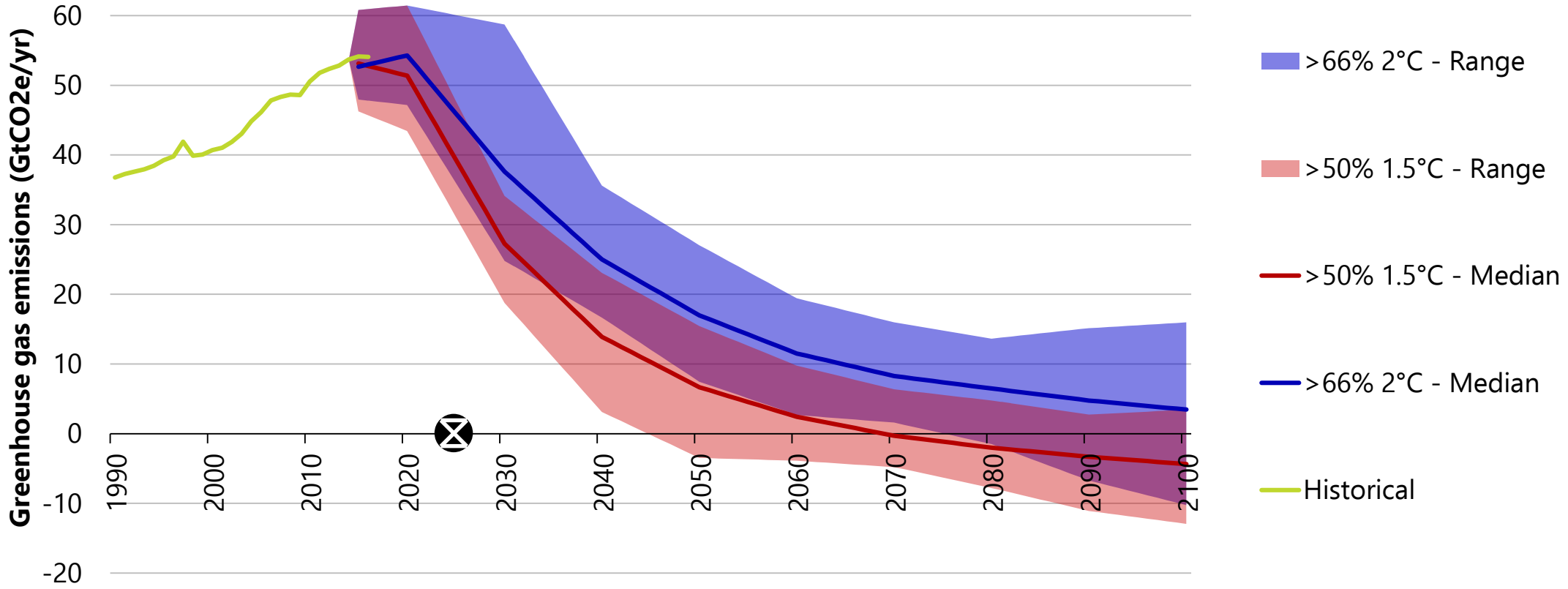

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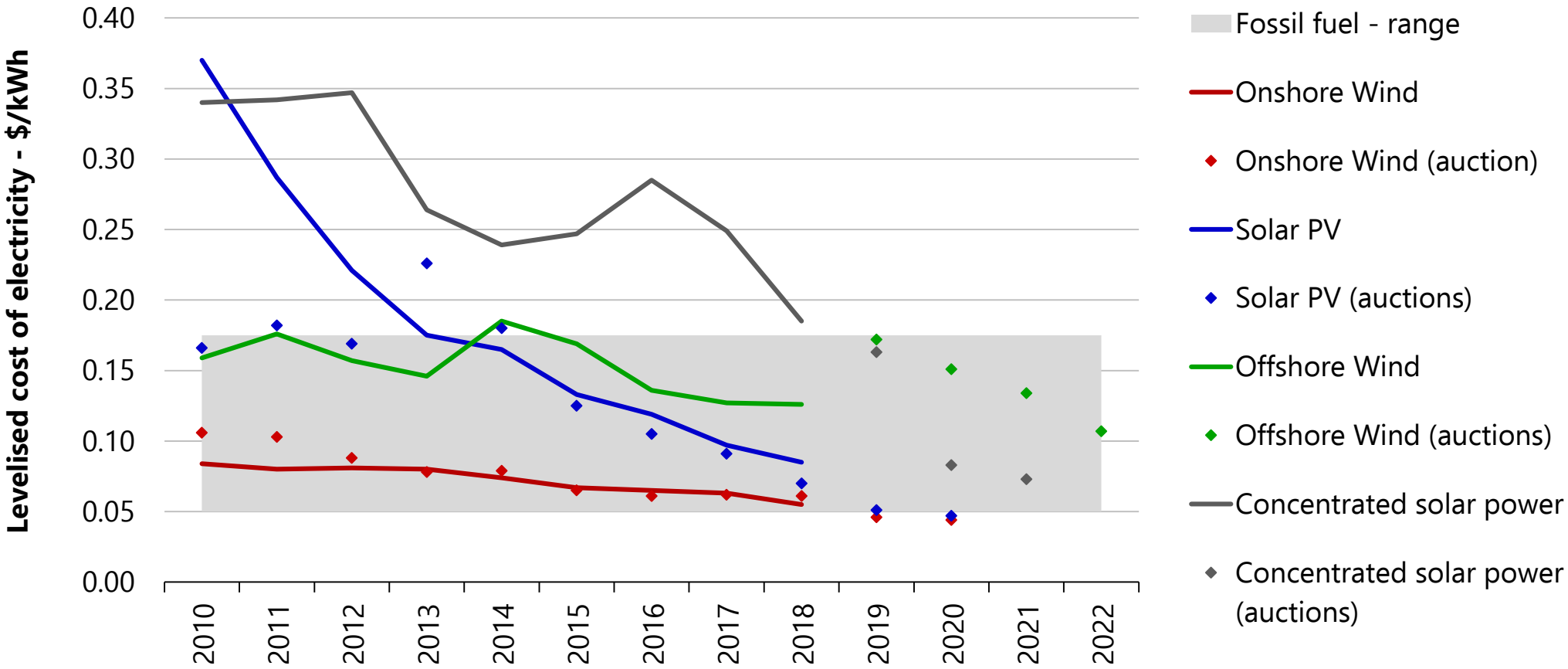
Cutting emissions - Science and international context

Alternatives to fossil fuels – Renewable Power Generation Costs



Source: International Renewable Energy Agency (2019) Renewable Power Generation Costs in 2018

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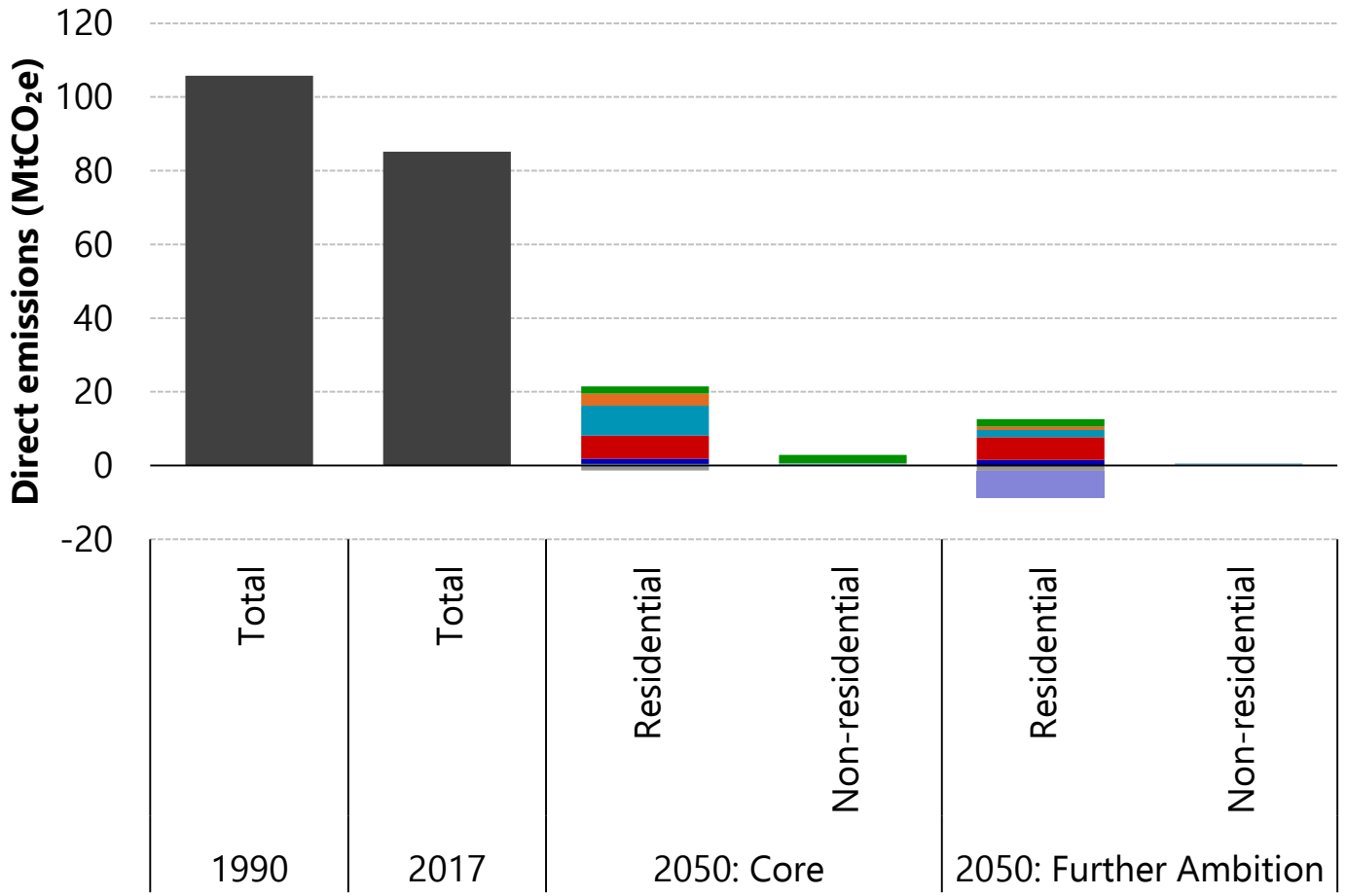
Reducing emissions in the UK

How UK net-zero scenarios can be delivered

Buildings: Emissions in 2050

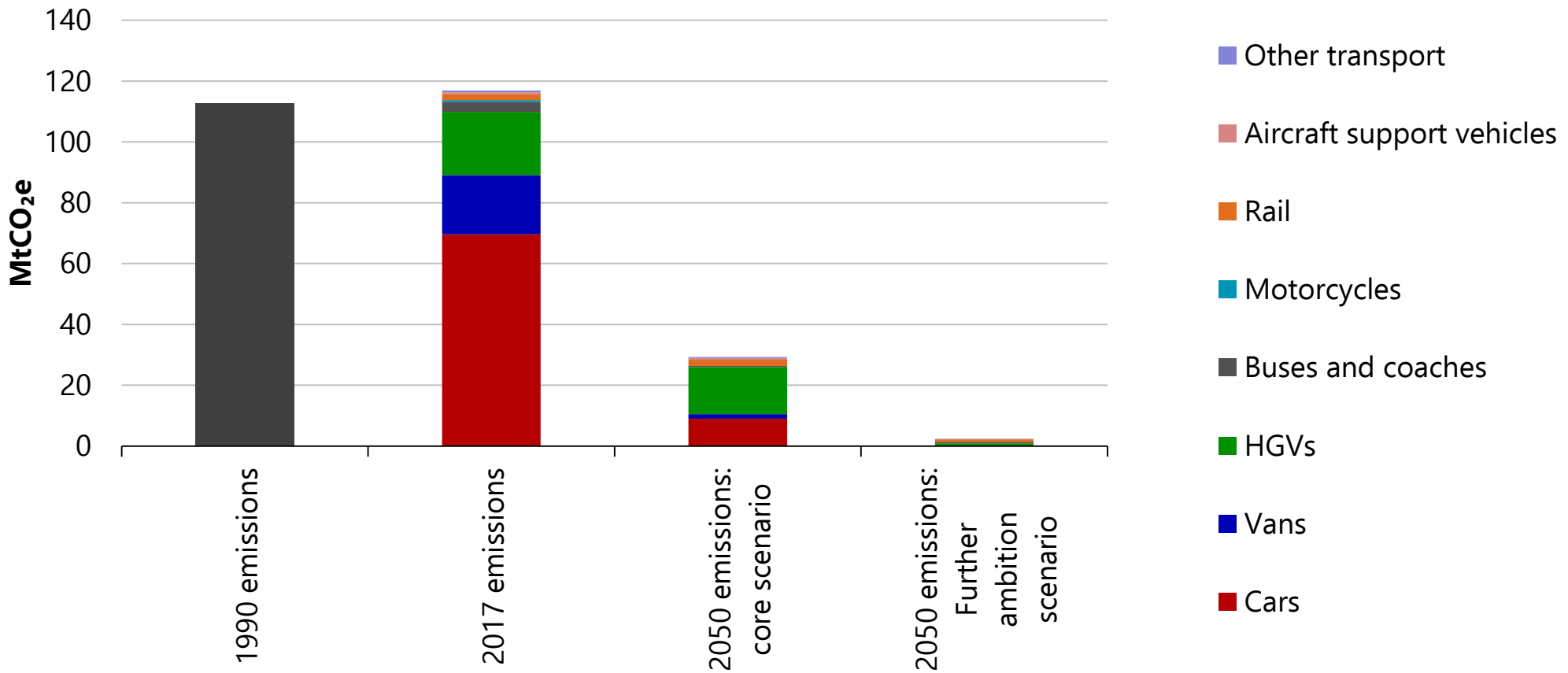


- Historical emissions
- Buildings in heat dense areas
- Heritage homes
- Space constrained homes
- On-gas homes, no constraints
- Off-gas homes
- Gas peak demand to hydrogen
- Off-gas peak demand to biofuels
- Cooking and other

Source: CCC analysis

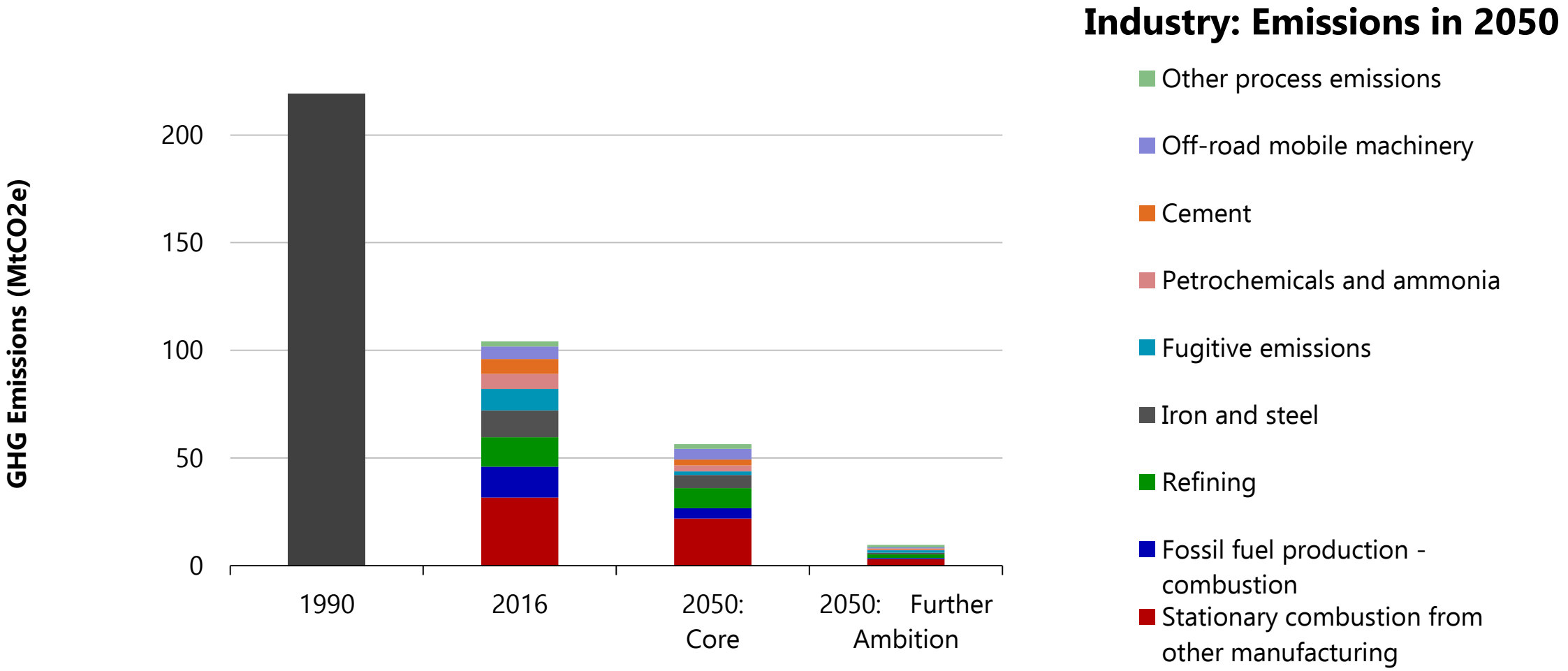
How UK net-zero scenarios can be delivered

Surface Transport: Emissions in 2050



Source: CCC analysis

How UK net-zero scenarios can be delivered



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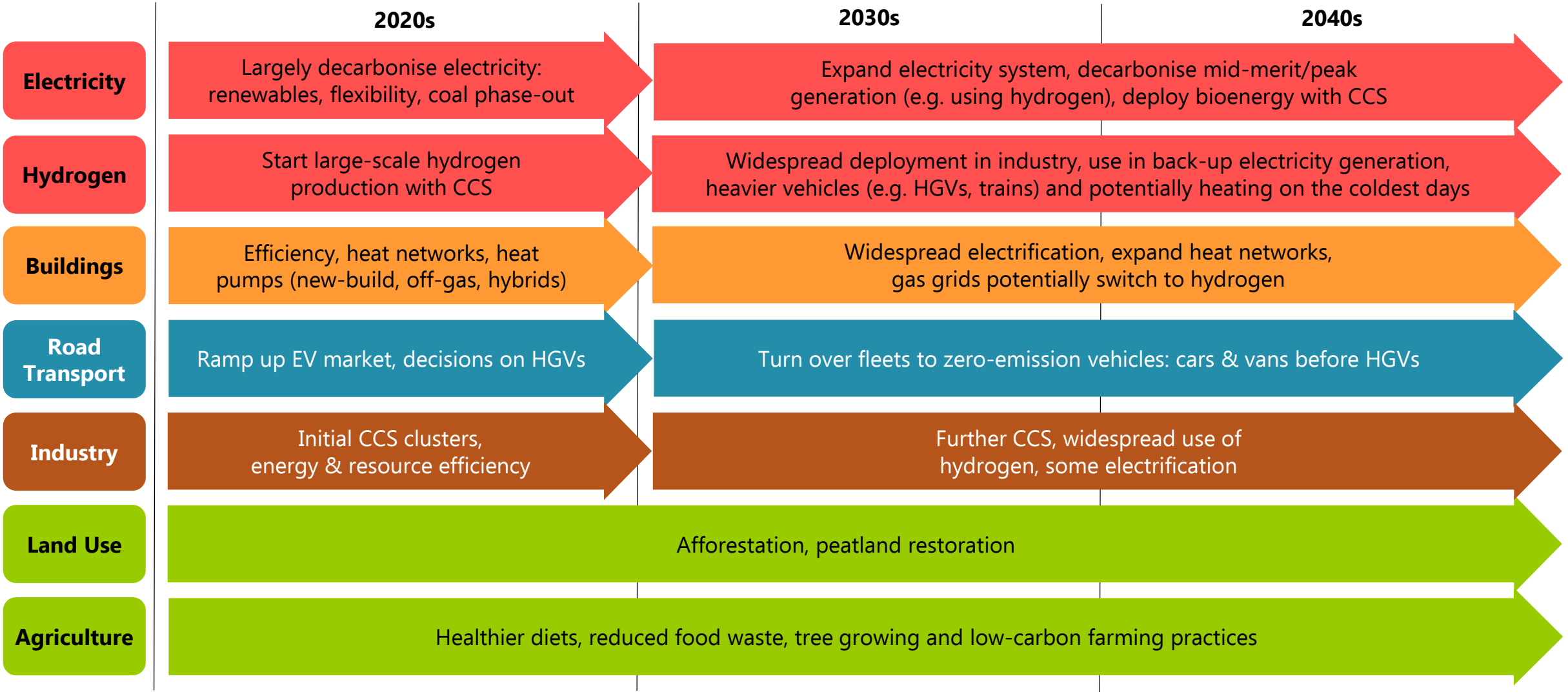
How UK net-zero scenarios can be delivered



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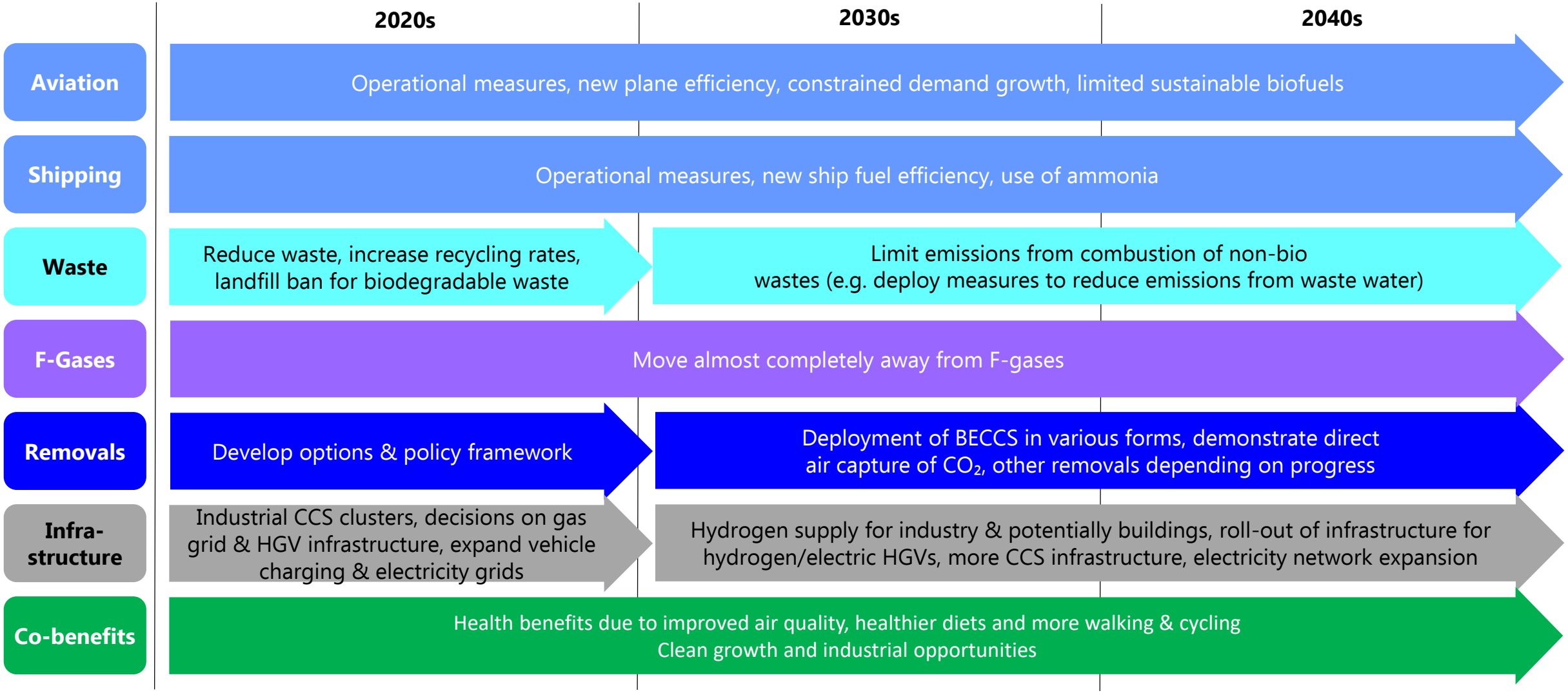
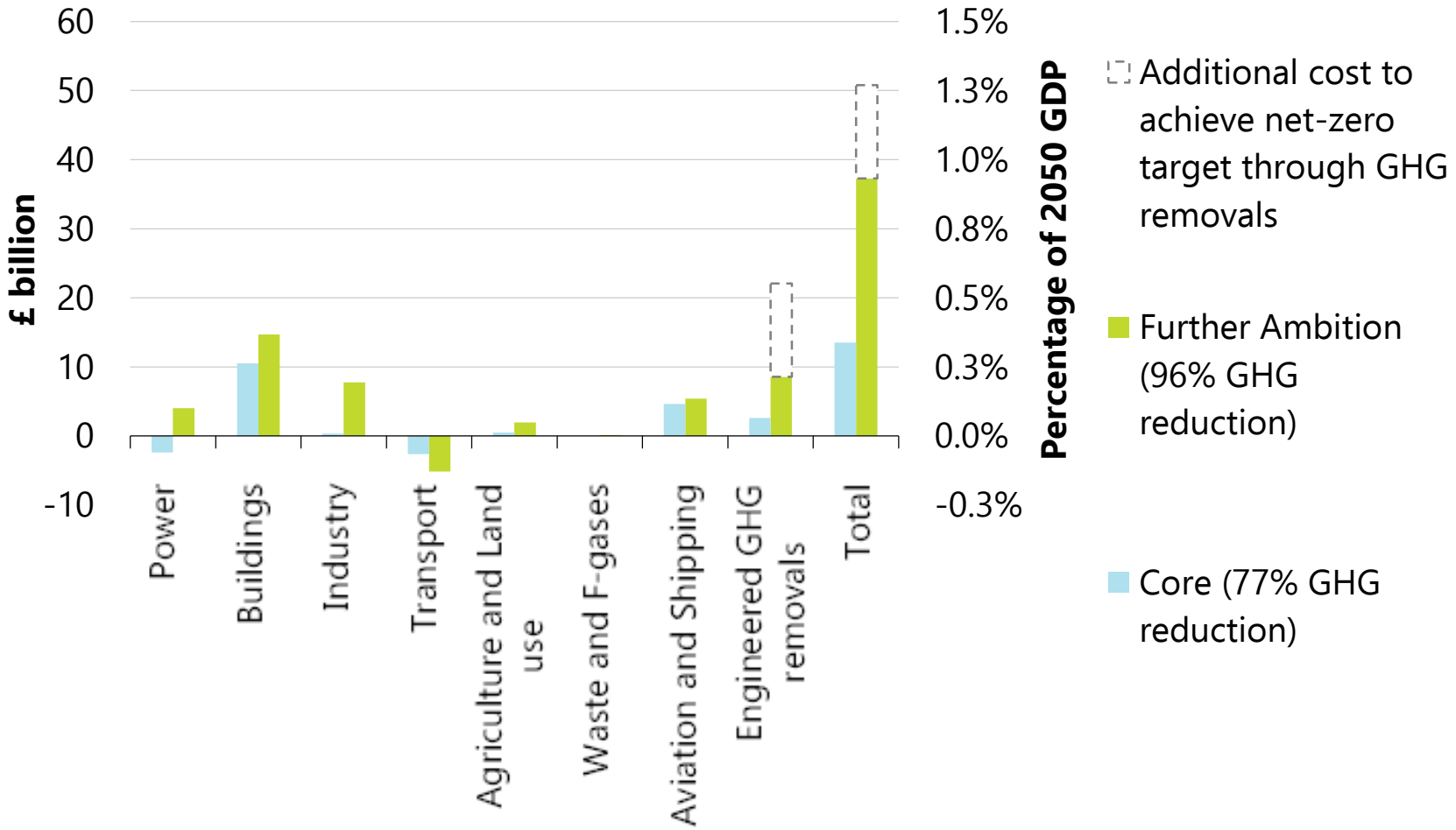
How UK net-zero scenarios can be delivered



Costs of meeting the UK net-zero target

Central estimates for annual resource cost of meeting a net-zero GHG target (2050)



Source: CCC analysis

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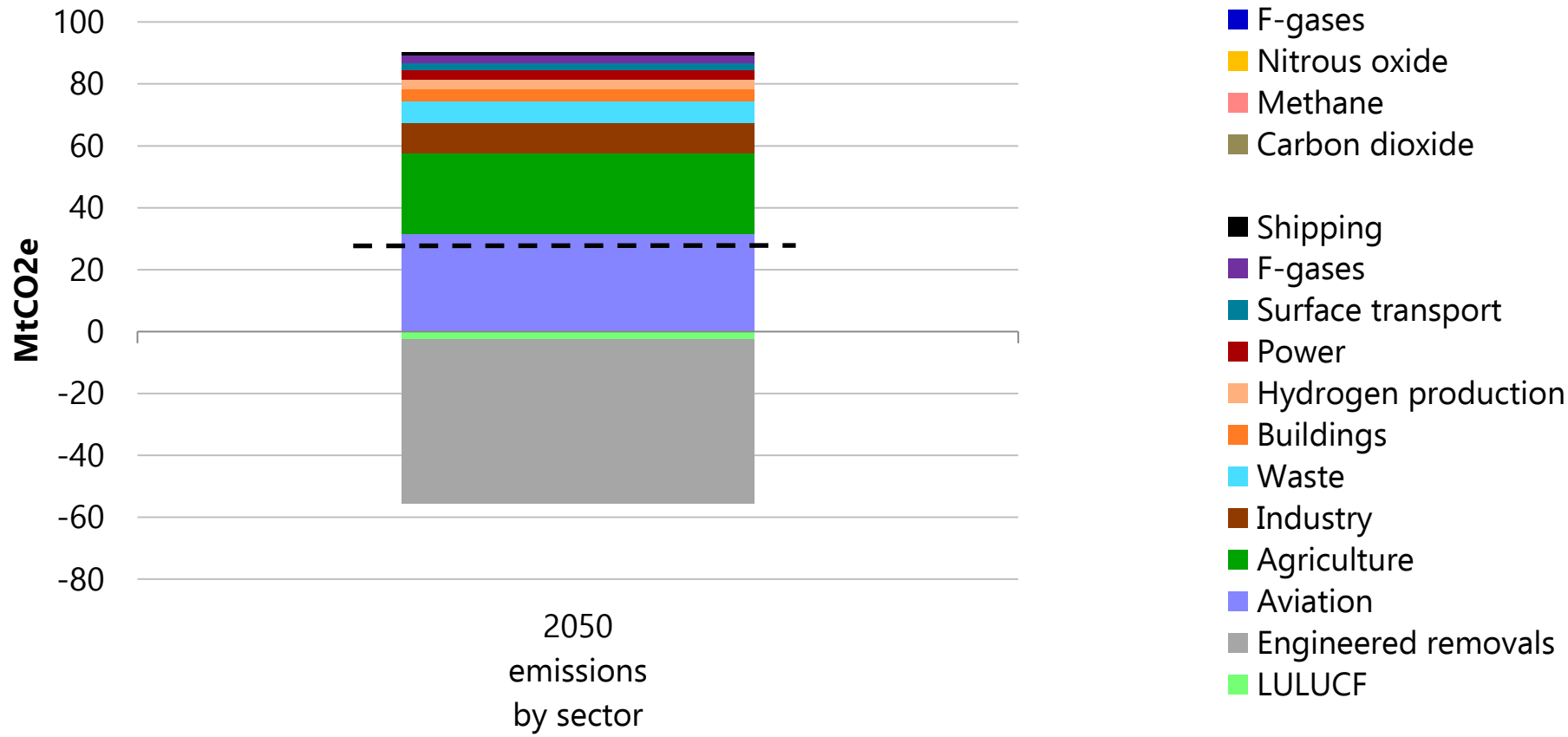
Five months on – some observations

Observation one: We don't have all the answers

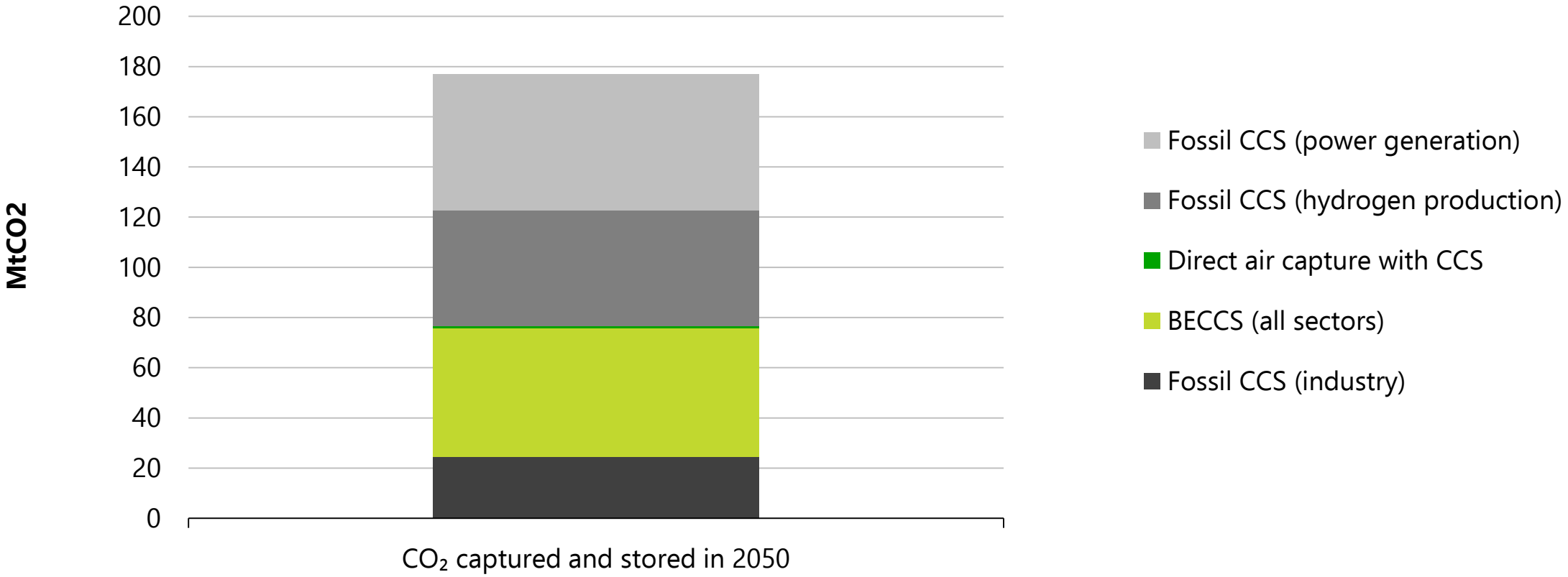
Remaining emissions in the Further Ambition scenario



Source: CCC analysis

Observation two: Fossil fuel use continues

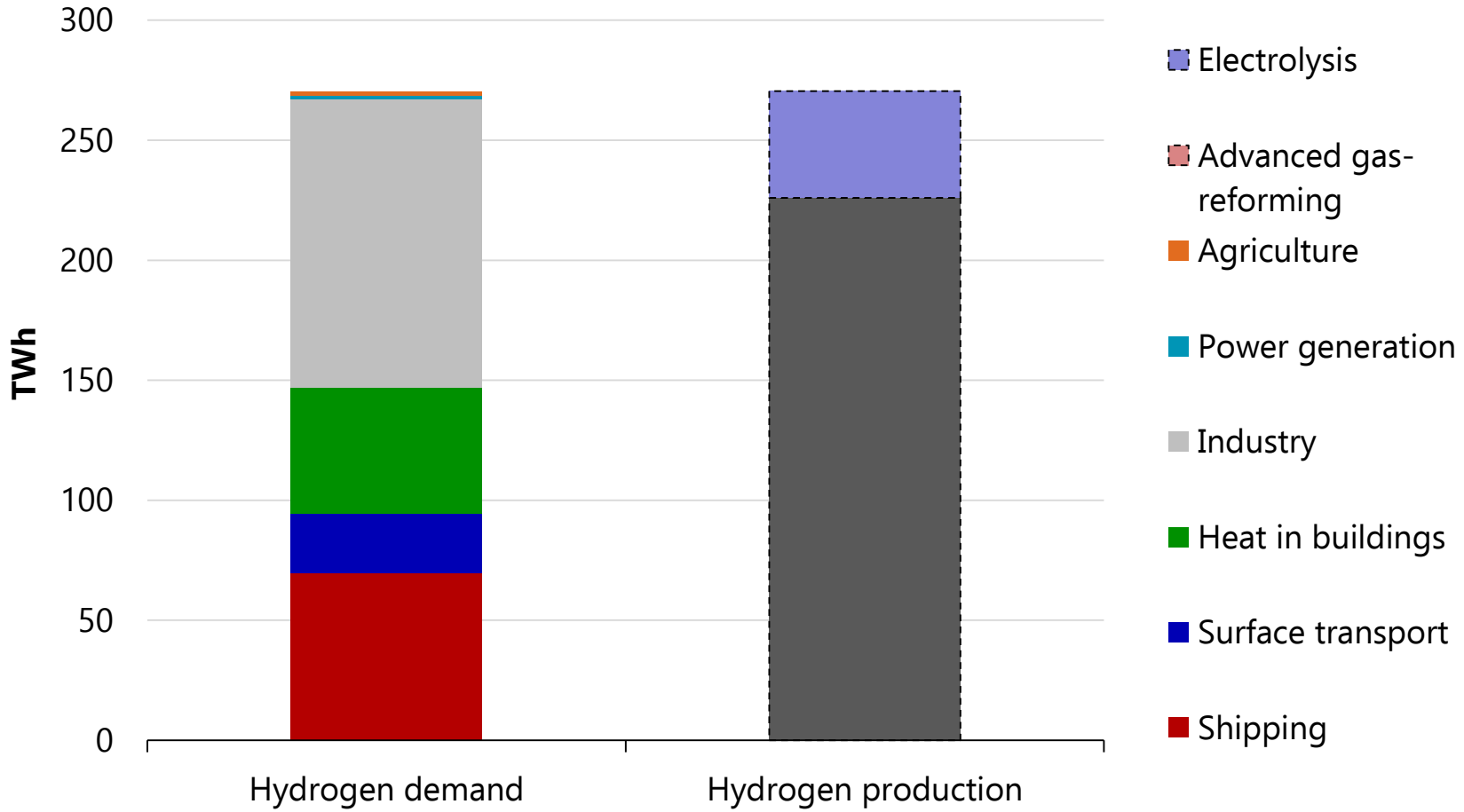
Total CO_2 captured and stored due to Further Ambition options in 2050



Source: CCC analysis

Observation two: Fossil fuel use continues

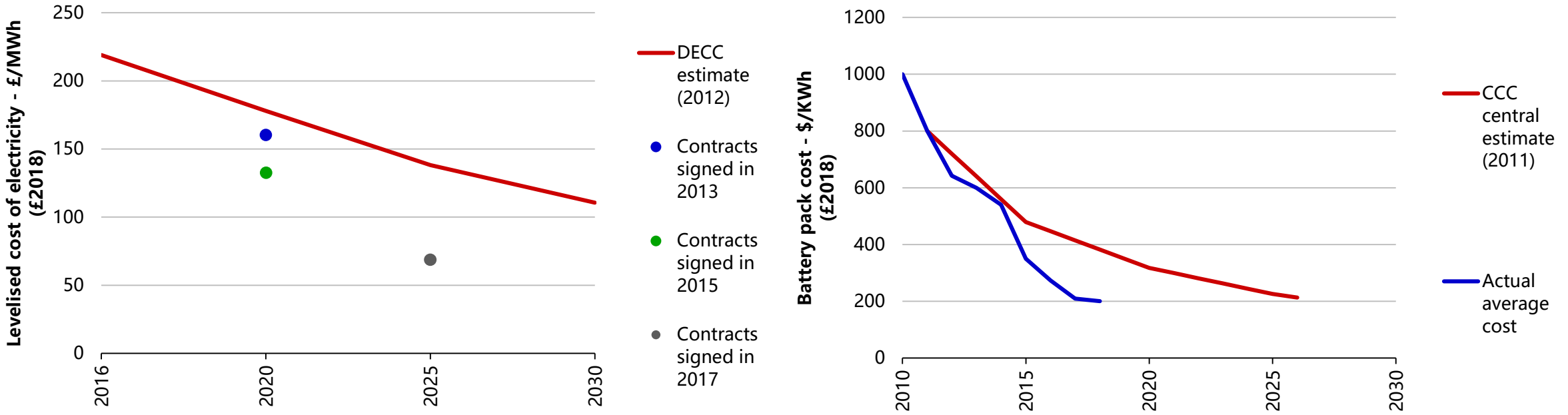
Use and production of Hydrogen in 2050



Source: CCC analysis

Observation three: Innovation has moved the dial

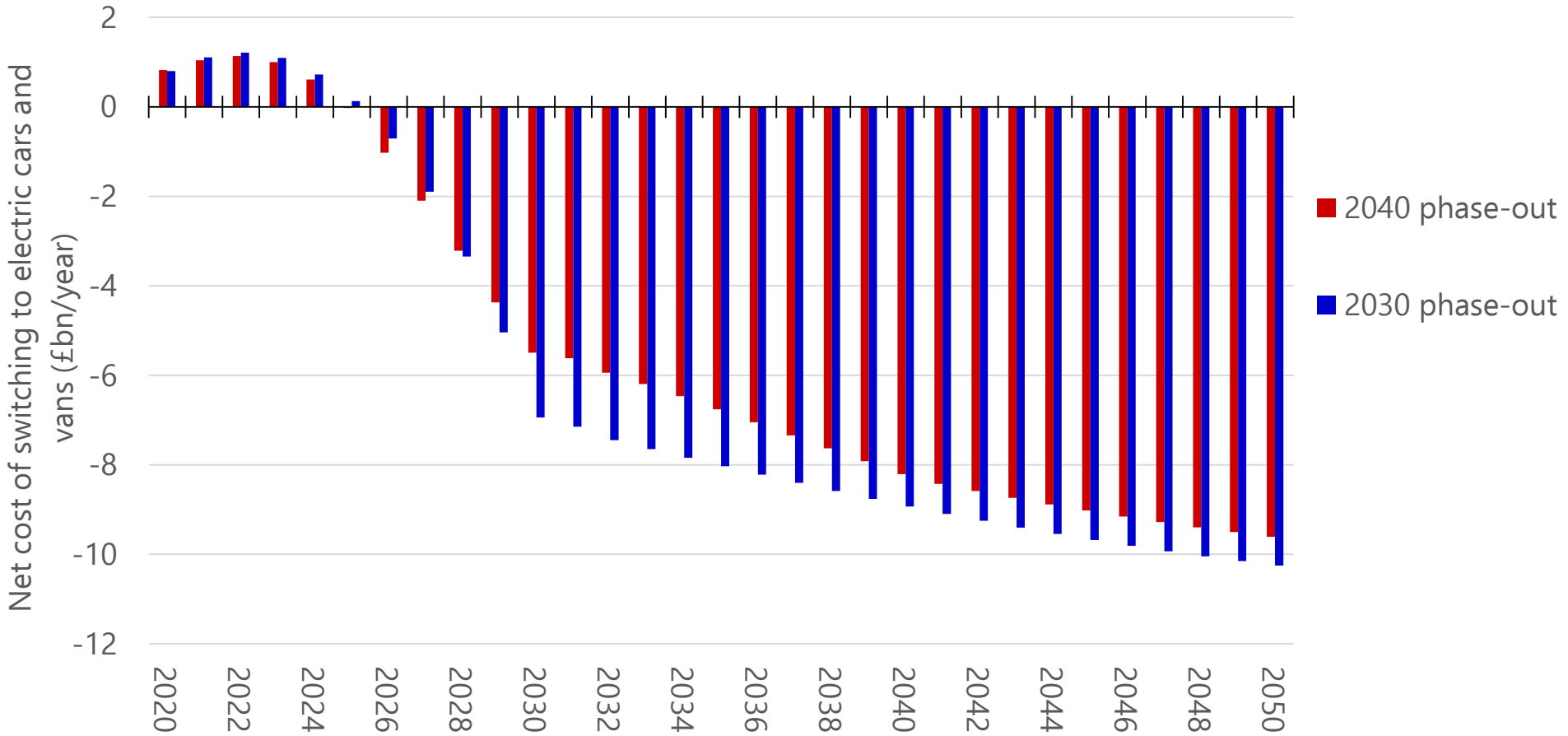
Costs of example low-carbon technologies compared to past projections
Offshore wind (left) Battery packs (right)



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

Observation three: Innovation has moved the dial

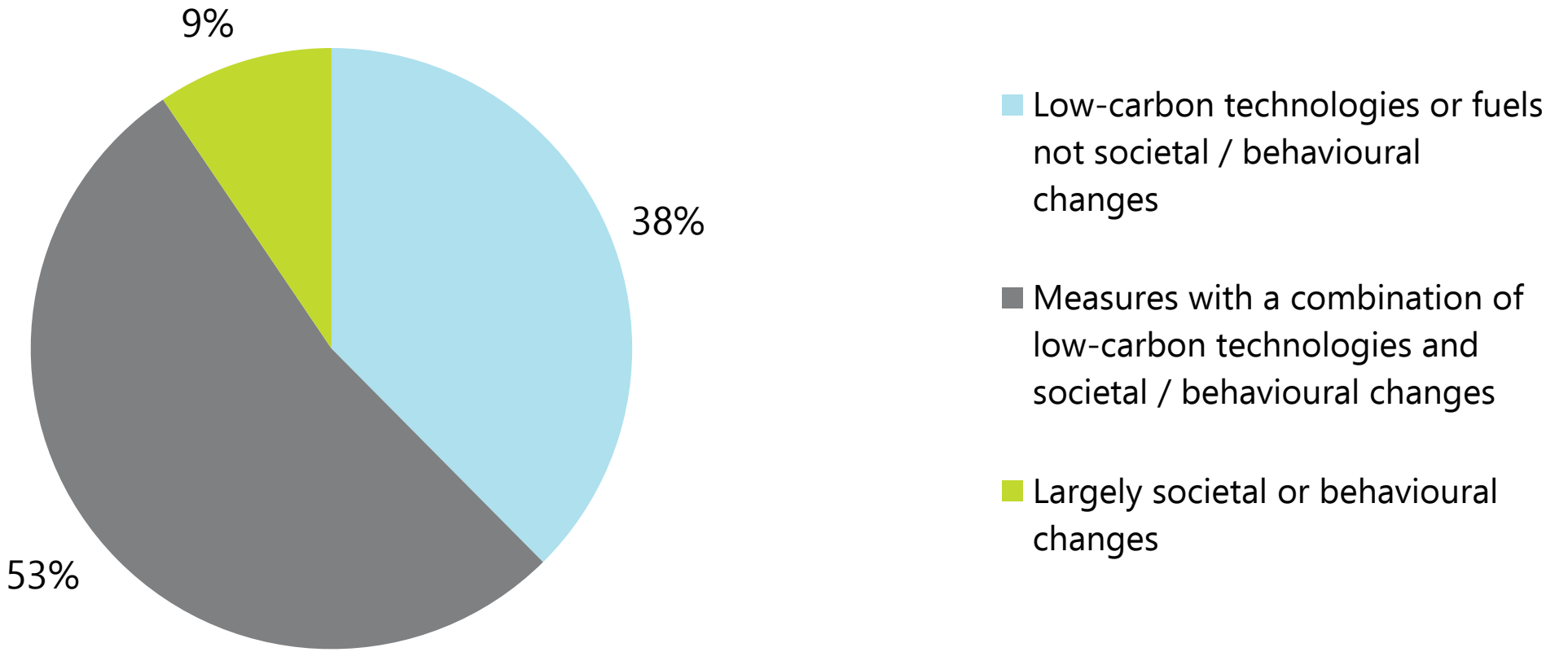
Economy cost of Electric Vehicle switchover



Source: CCC analysis

Observation four: Behaviour policy moves centre stage

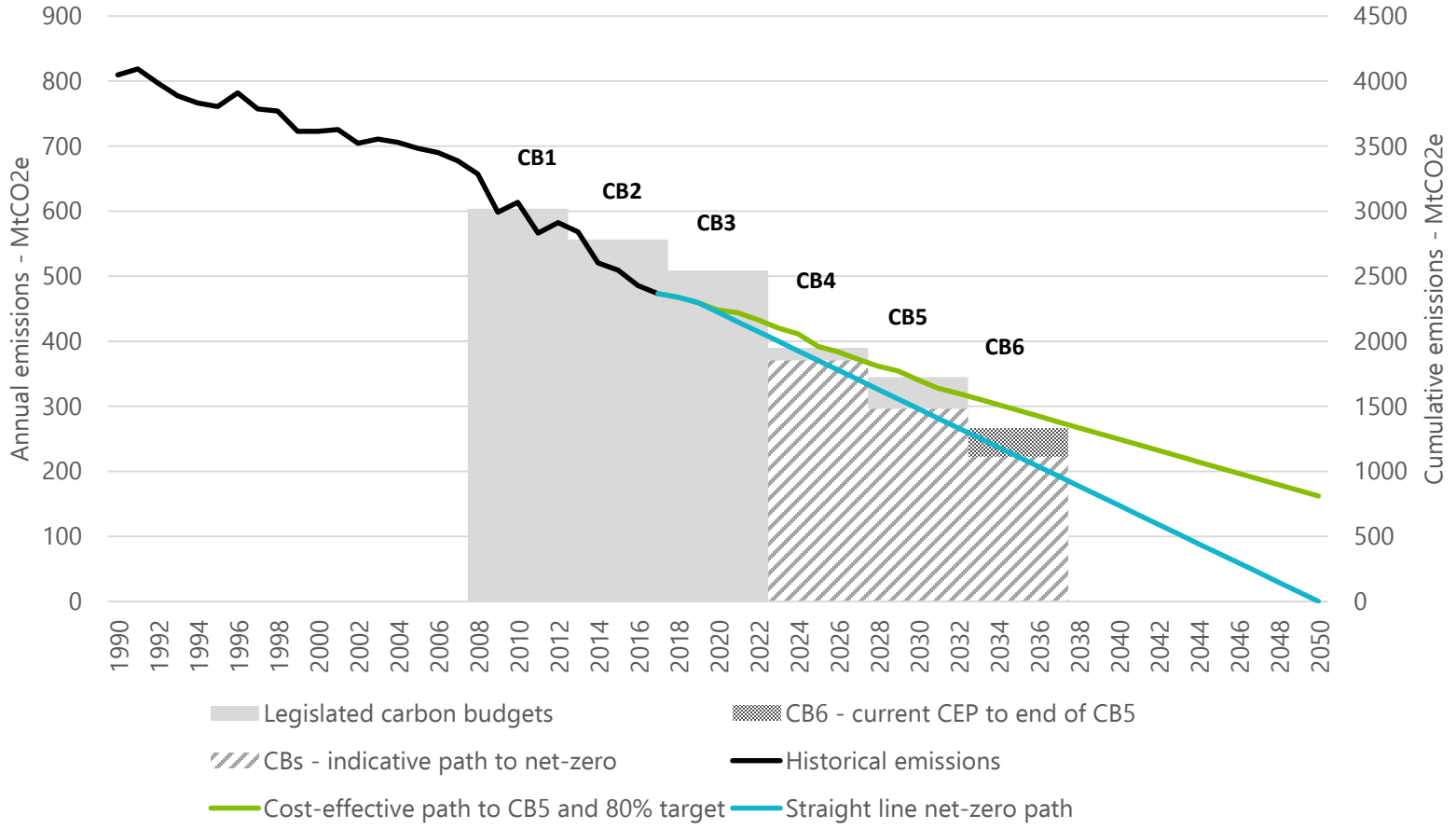
Role of societal and behavioural changes in the Further Ambition scenario



Source: CCC analysis

Observation five: Other approaches are available

Indicative emissions trajectory



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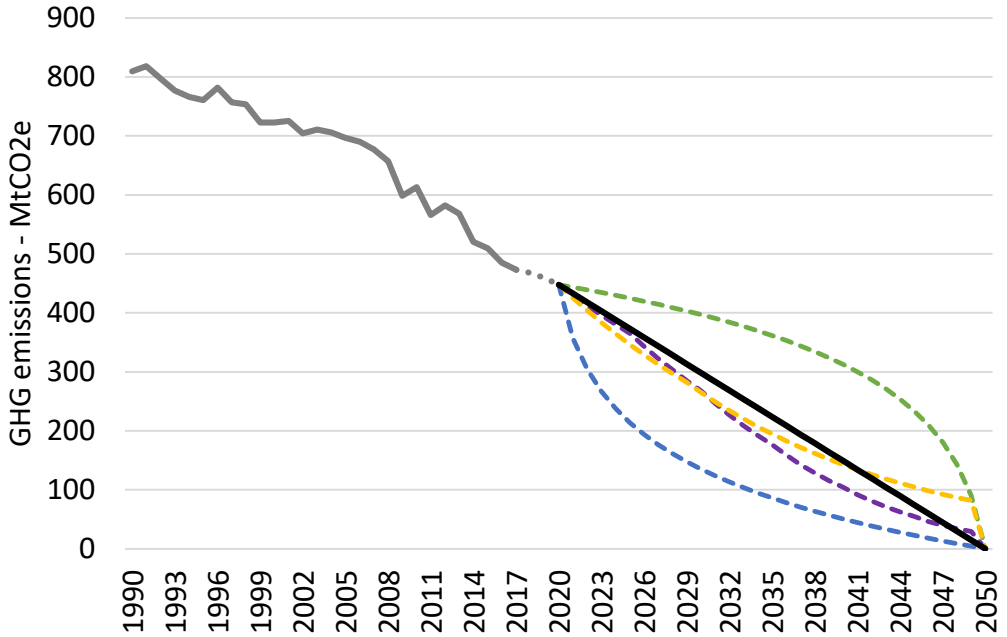

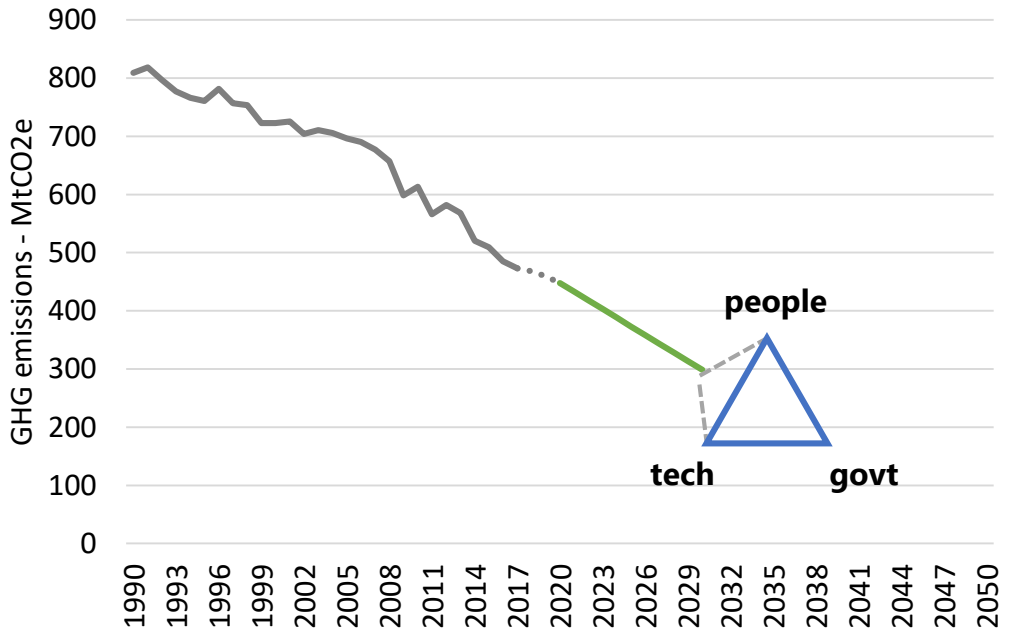

Source: CCC analysis

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Thank you