1. Net Zero

12 July 2023, 10am

Net Zero

Sli.do #netzero

ESO

Agenda

10am	Welcome:	Lauren Stuchfield
	Key Messages:	Sian Ramirez-Bower
	Key insights & analysis:	Kris Dadhley
	Guest speaker:	Abbie Badcock-Broe, ESO S&R
	Guest speaker:	Kate Mulvany, Cornwall insights
	Break	
	Q&A with Sli.do	
	Close	
	Virtual networking follows	

1 Key Message
Policy and delivery

Measures to reduce uncertainty are needed to ensure the UK delivers a net zero energy system that is affordable and secure.

Net zero policy

Focus on heat

Negative emissions

2 Key Message
Consumer and digitalisation

Consumer behaviour and digitalisation are pivotal to achieving net zero but easy access to information and the right incentives are critical.

Empowering change

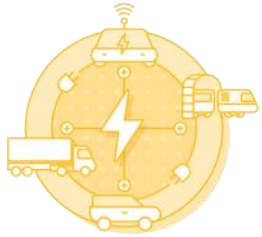
Digitalisation and innovation

Energy efficiency

3 Key Message
Markets and flexibility

Improved market signals and new distributed flexibility solutions are key to managing a secure, net zero energy system at lowest costs to consumer.

Distributed flexibility



Transport flexibility

Locational signals

4 Key Message
Infrastructure and whole energy system

Benefits to the whole energy system must be considered to optimise the cost of delivering net zero technology and infrastructure.

Strategic network investment

Connections reform

Location of large electricity demands

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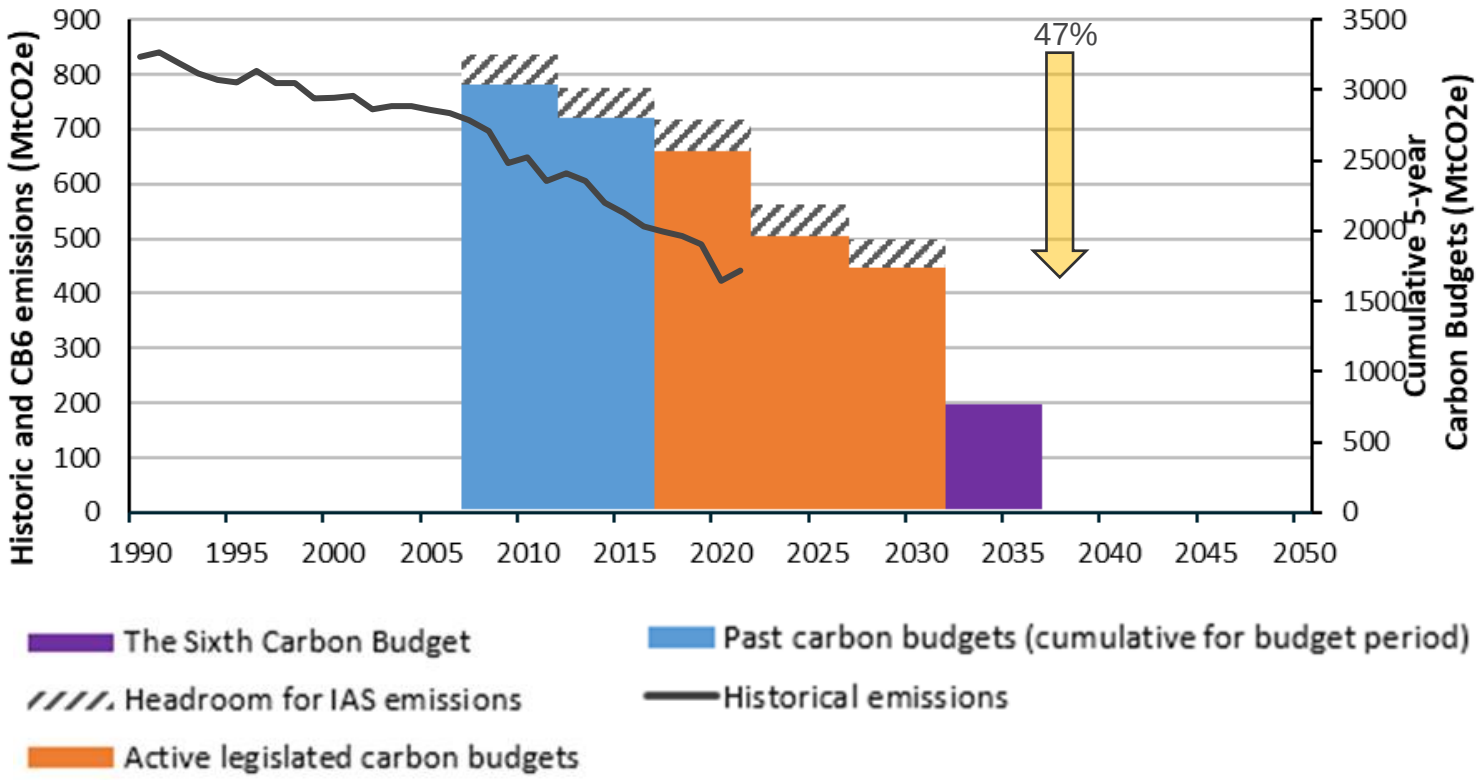
Executive summary

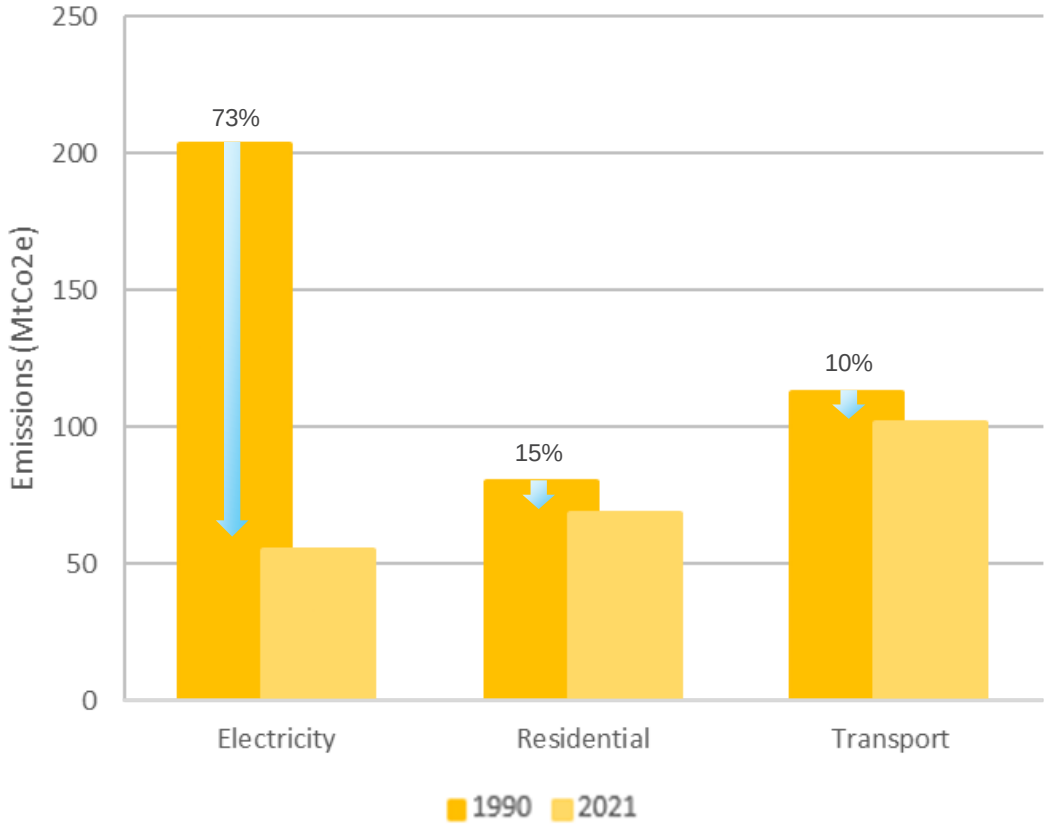
What we've found	Biggest challenges to a fair transition to net zero are reaching zero carbon electricity, CCS, negative emission technologies and regionalisation
Greatest uncertainty	To what degree will each decarbonisation effort play a role in net zero?
No regret actions	Delivery of carbon capture and storage, investment in negative emissions, further decarbonisation of the electricity system
Bottom line	Despite these challenges the range of pathways gives us confidence we can achieve net zero by 2050

Net zero is critical in order to limit the affects of climate change



- **Emissions** in 1990 and 2021 were 837 and 446 $MtCO_2e$ respectively
- In 1990 **electricity production** was the biggest source of emissions
- In 2021 **transport** was the biggest source of emissions
- **Carbon budgets** are set by the CCC

Decarbonisation to date has varied across the economy, a similar pattern will be seen as further decarbonisation happens



- Electricity supply will need to decarbonise further
- The majority of these emissions come from gas boilers and petrol/diesel cars
- Low carbon alternatives will need to be adopted to reduce emissions

The transition to net zero is challenging but achievable, requiring large scale deployment of technologies and whole system thinking

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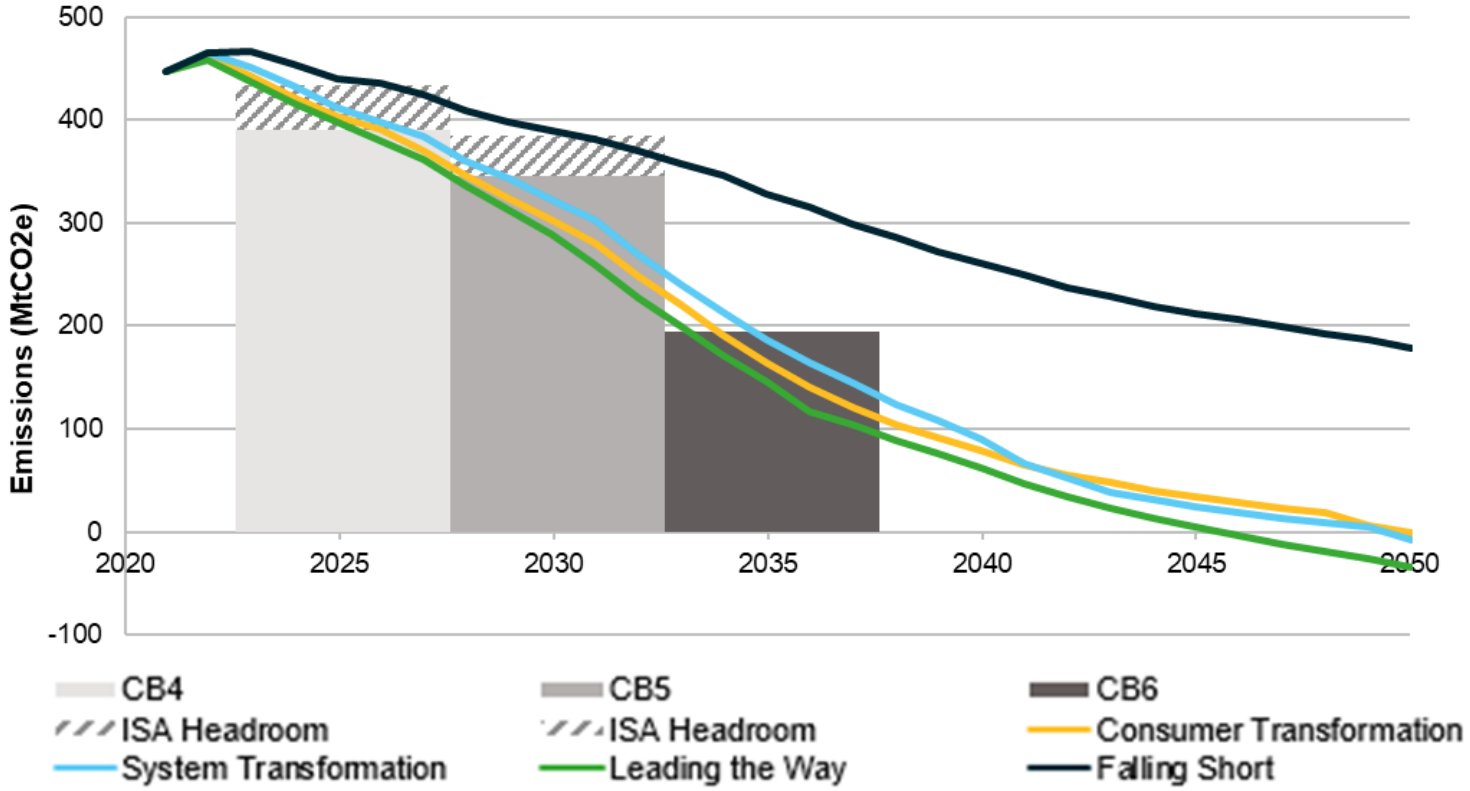
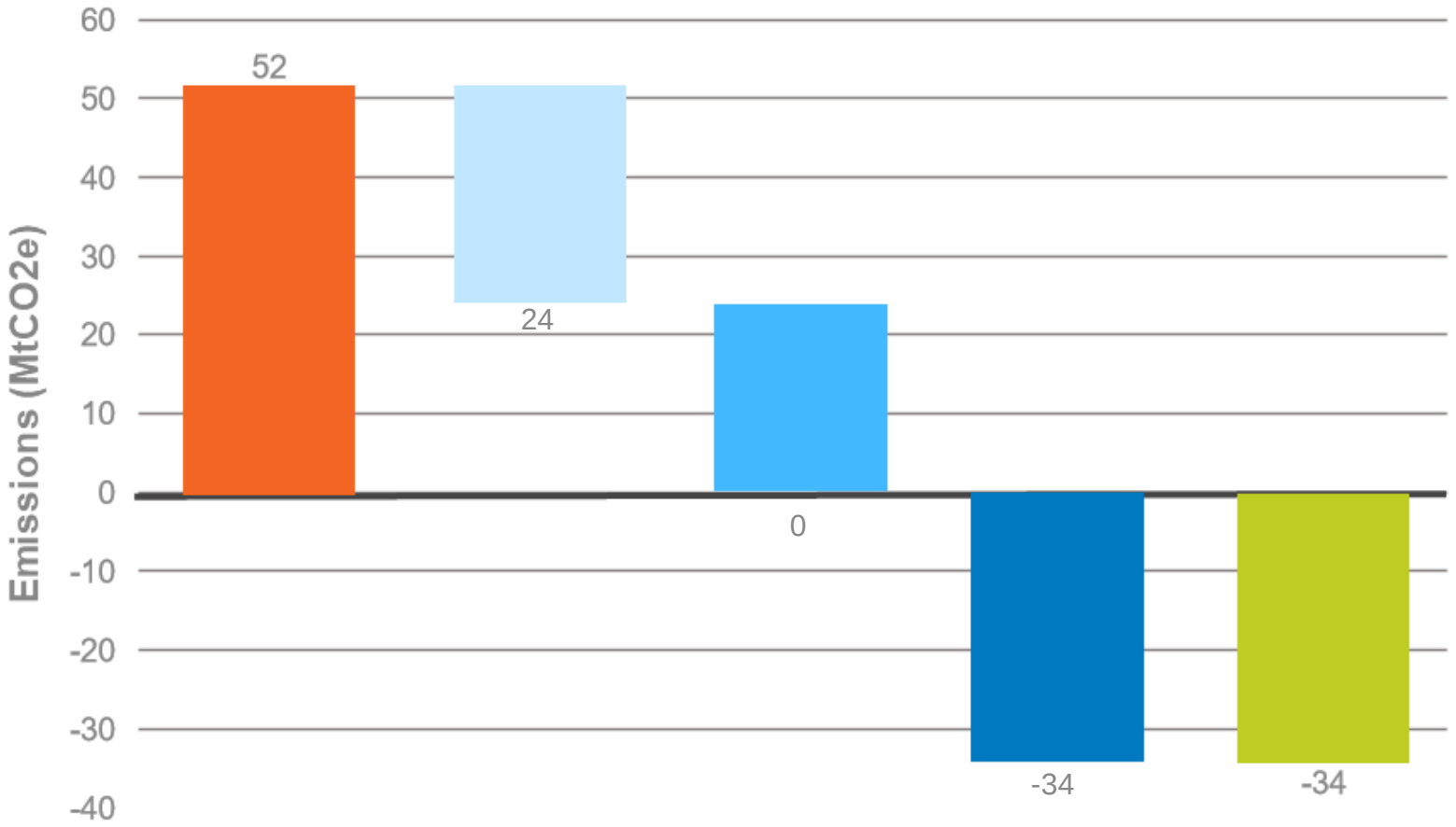


- Negative emissions technologies are needed
- A whole system approach is required for CB6

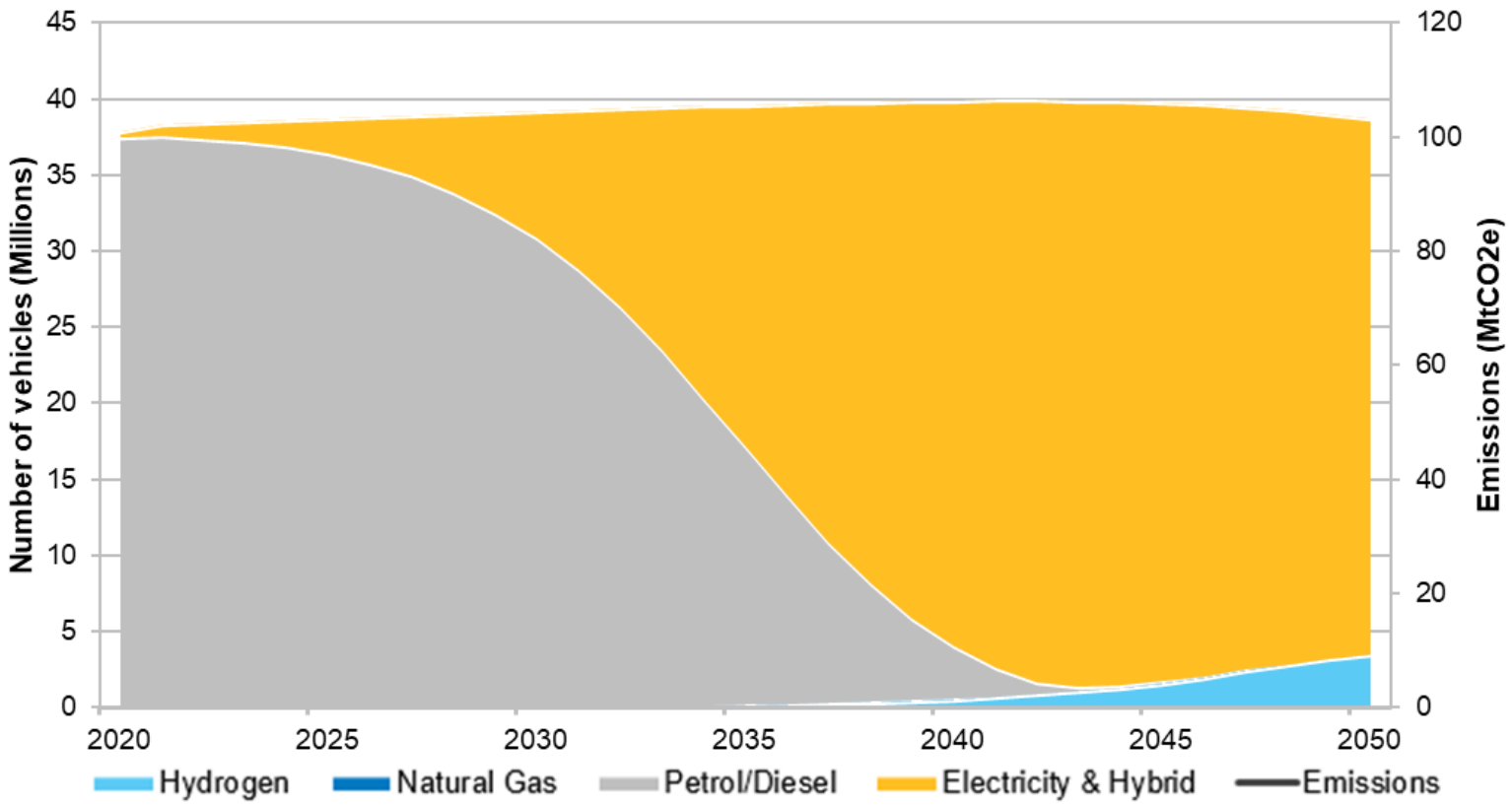
Not all sectors will be fully decarbonised by 2050 so negative emission technologies are vital



- Negative emissions technologies are essential
- BECCS and DACCS are the main engineered solutions

To meet net zero cross-sector decarbonisation is required

Number of road vehicles by fuel type: System Transformation



- Phasing out of petrol/diesel vehicles can help transport decarbonise
- The number of electric and hydrogen vehicles set to grow

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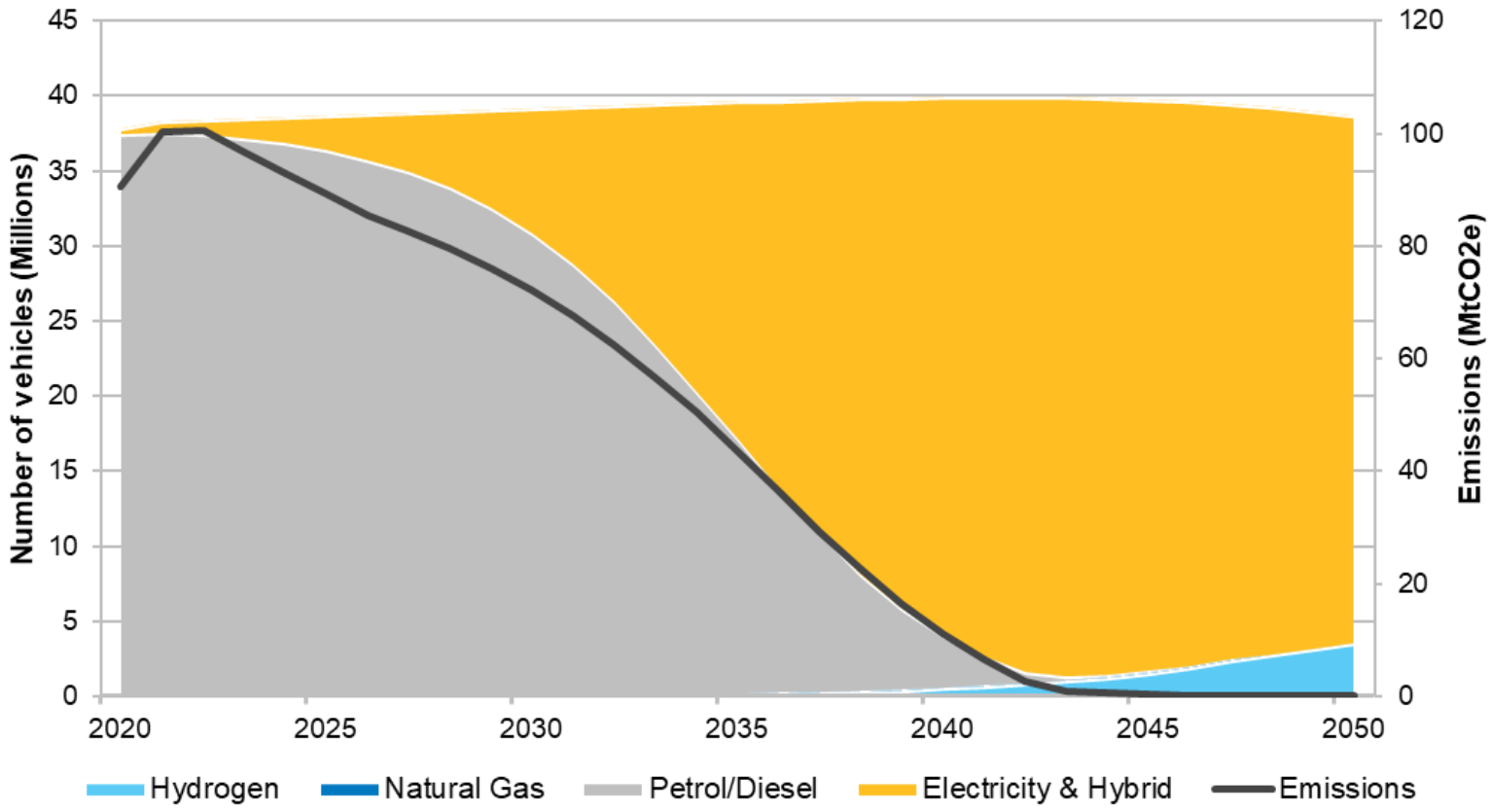
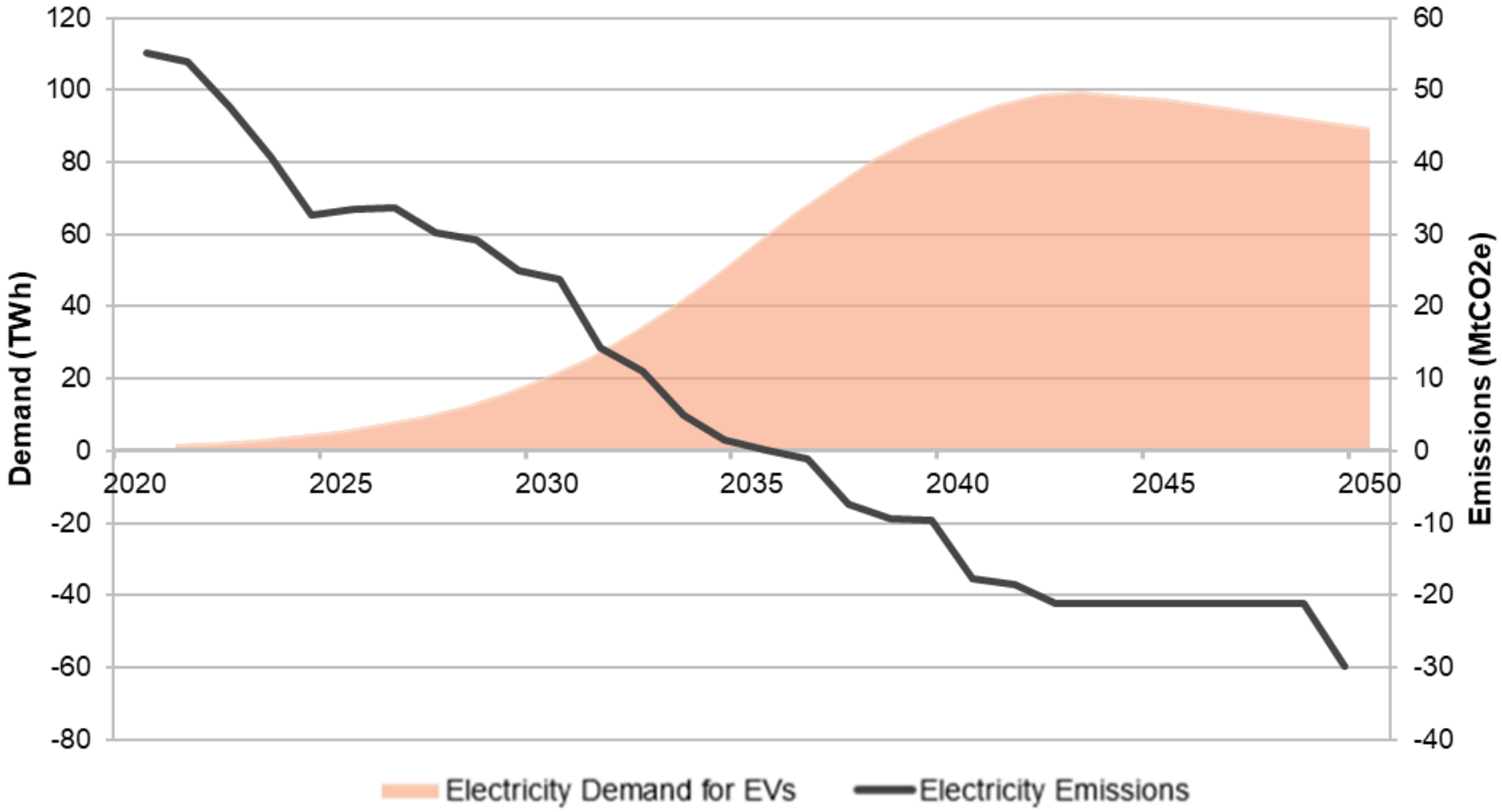


- Phasing out of petrol/diesel vehicles can help transport decarbonise
- The number of electric and hydrogen vehicles set to grow
- Road transport can fully decarbonise by 2050
- Road transport in System Transformation decarbonises before 2050

To meet net zero cross-sector decarbonisation is required

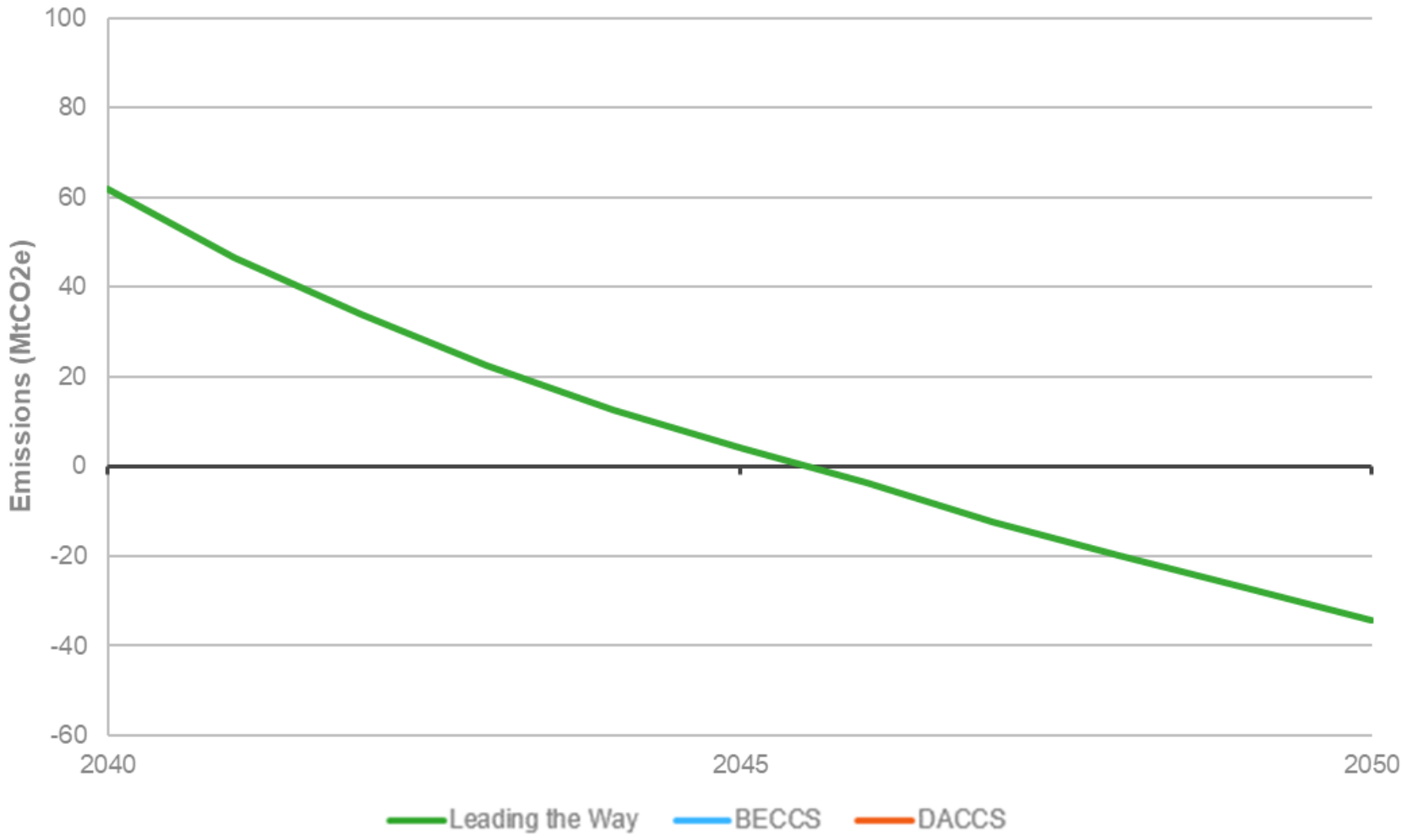


- Electricity and hydrogen demand for transport is set to grow
- This should be met from renewable sources
- Whole system thinking is needed

CCUS can be used across multiple sectors and can play a vital role in net zero

Sector	FES Scenario
Power	CT ST LW FS
Industrial Processes	CT ST LW FS
Hydrogen Production	CT ST LW FS
Biofuels	CT ST LW
DACCS	LW

Without large scale deployment of CCS we do not meet net zero



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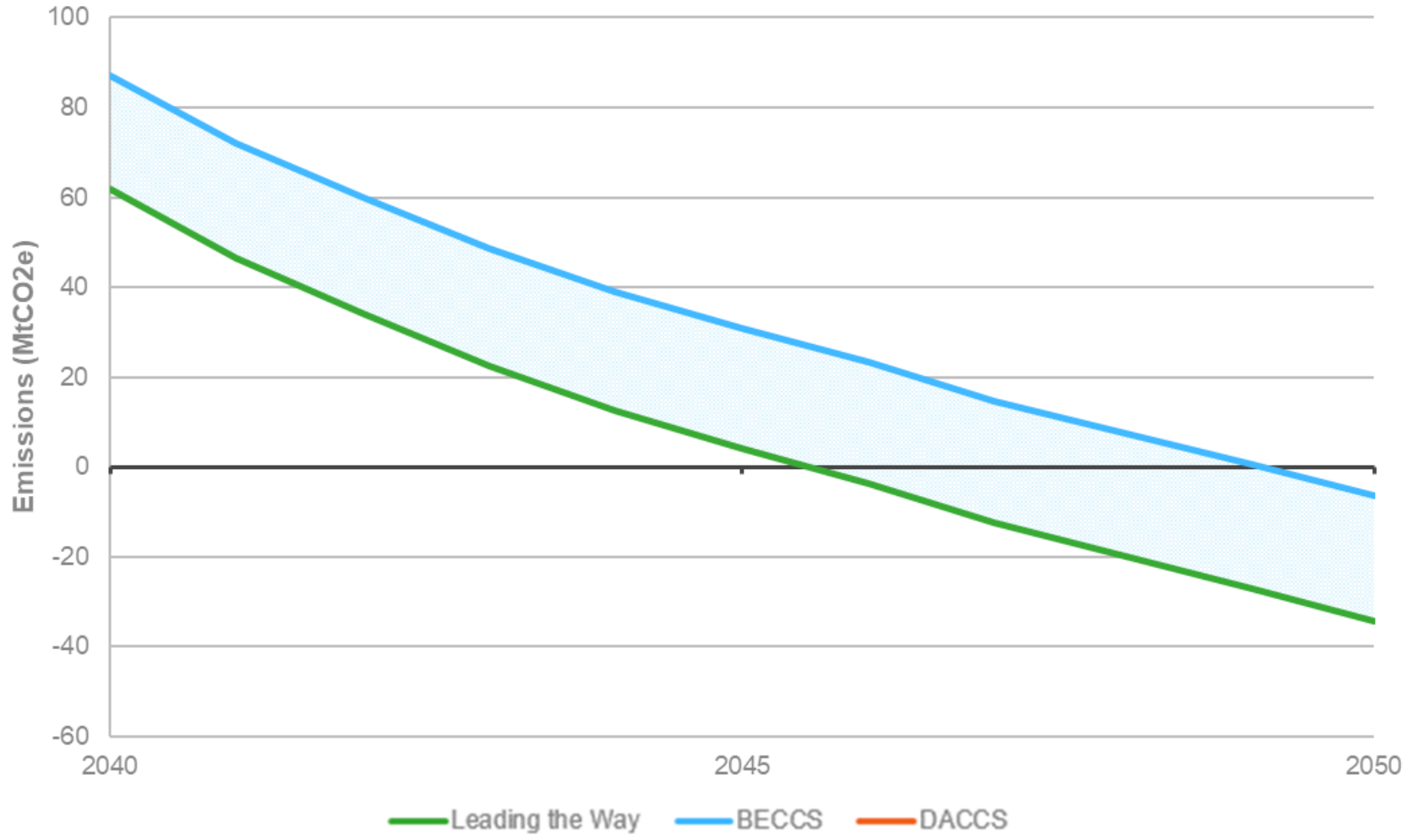

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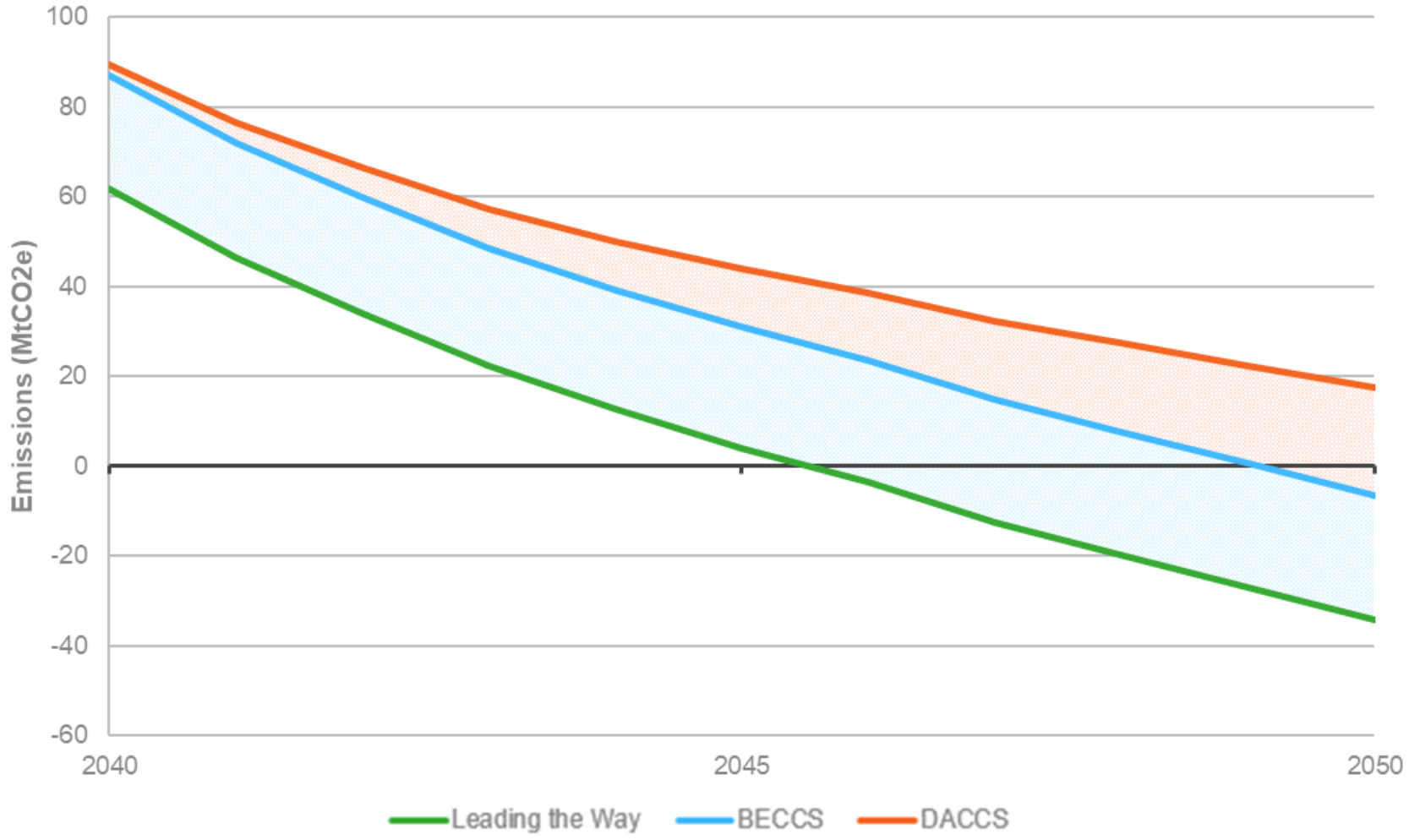
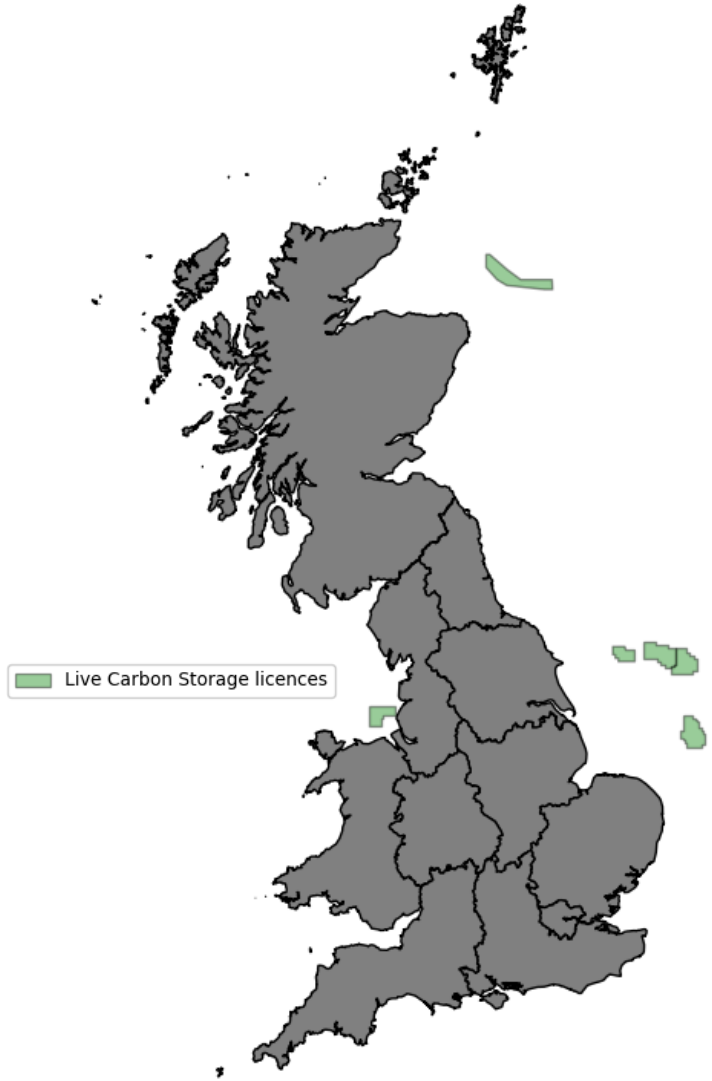


GB is well positioned to store CO_2, however competing demands means co-optimisation of the seabed is needed



- The British Geological Survey estimates over 70 billion tonnes of carbon storage capacity around GB
- Currently 6 live carbon storage licenses
- Storage injection starts towards the end of this decade

Carbon storage location from NSTA (North Sea Transition Authority (NSTA): Carbon Storage - NSTA Open Data - Data centre (nstauthority.co.uk)) and offshore wind Crown Estate (Wind Site Agreements (England, Wales & NI), The Crown Estate (arcgis.com))

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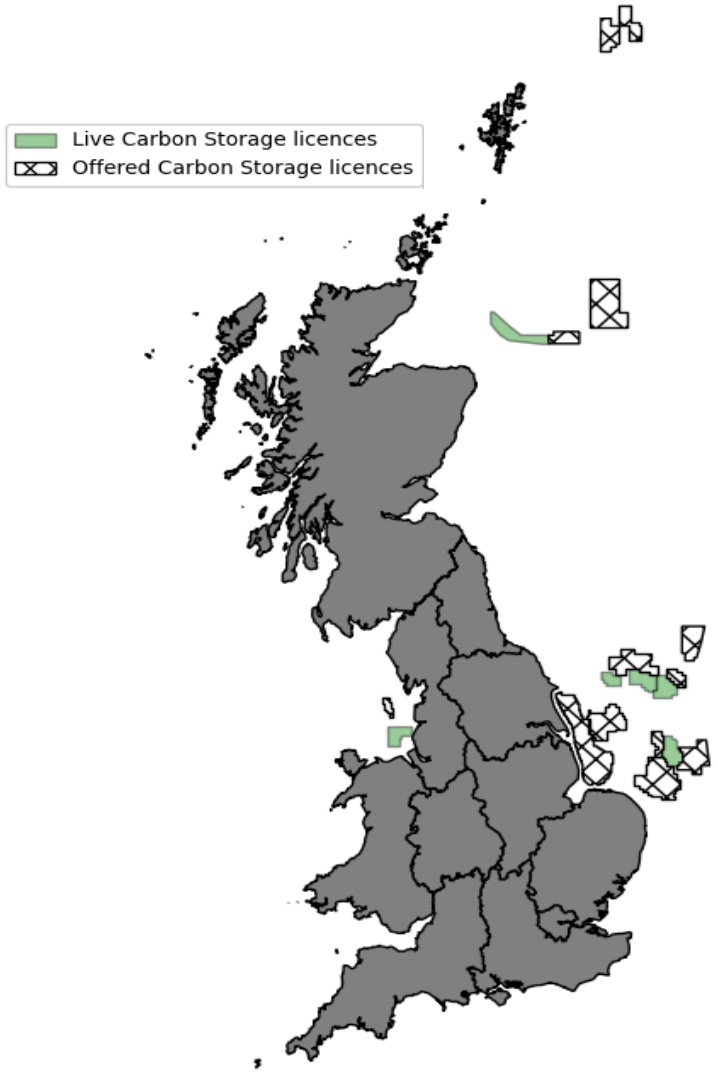

- 20 additional licenses have been offered
- Once operational injection could start within 6 years
- Further carbon storage licensing rounds will happen

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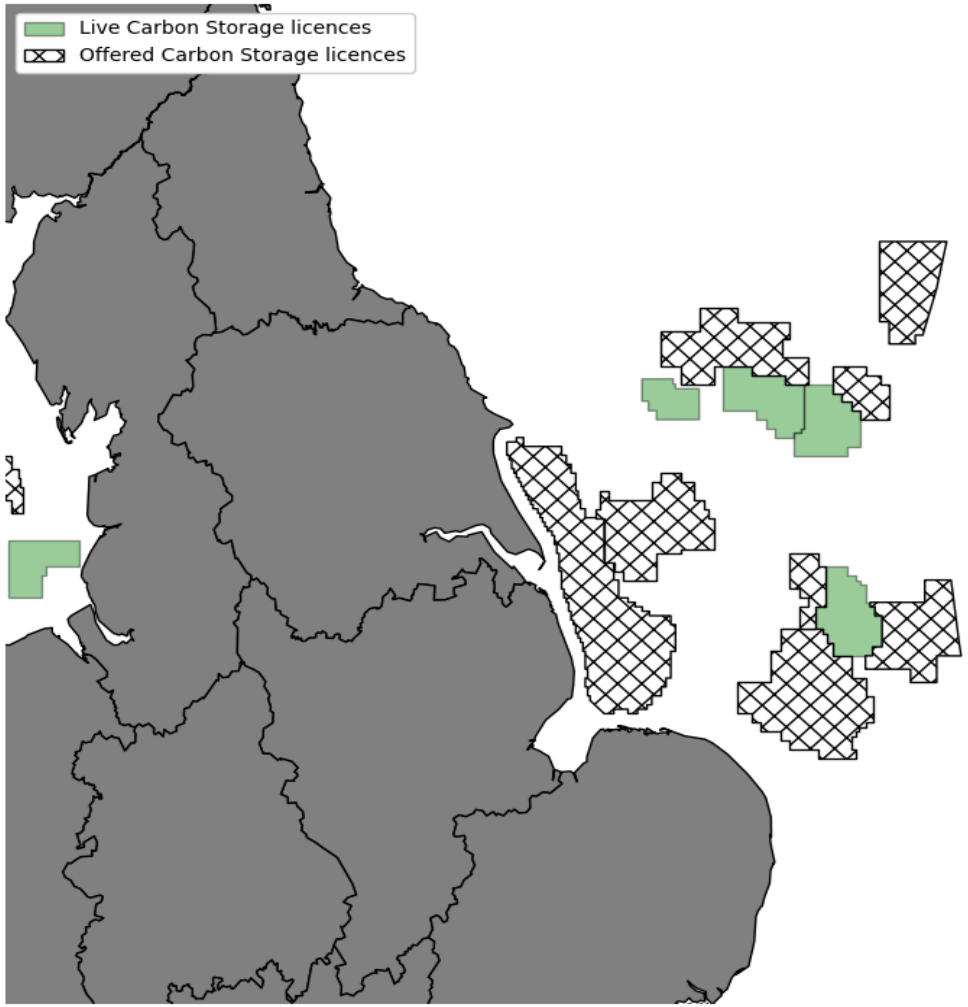

- Government target of 20-30 million tonnes of carbon storage by 2030

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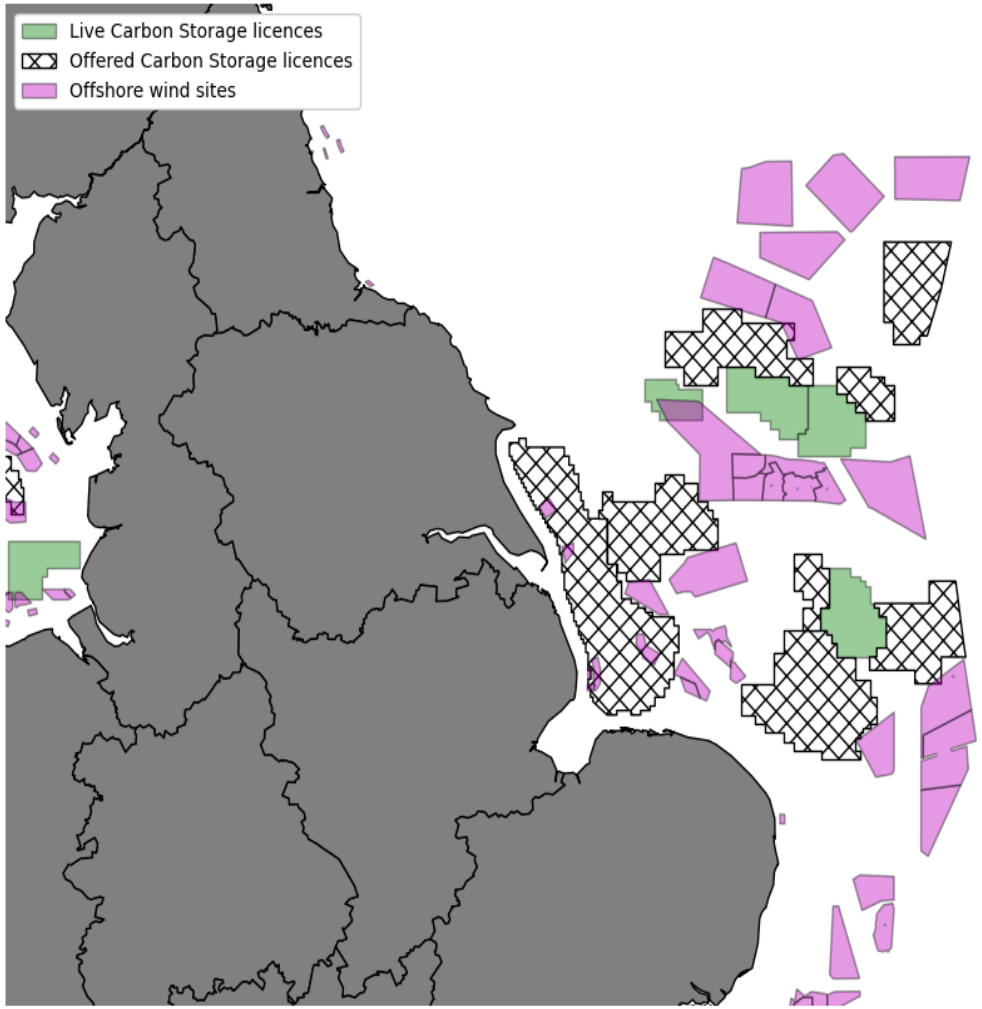

- Government target of 20-30 million tonnes of carbon storage by 2030
- 50GW offshore wind by 2030
- Whole system approach needed

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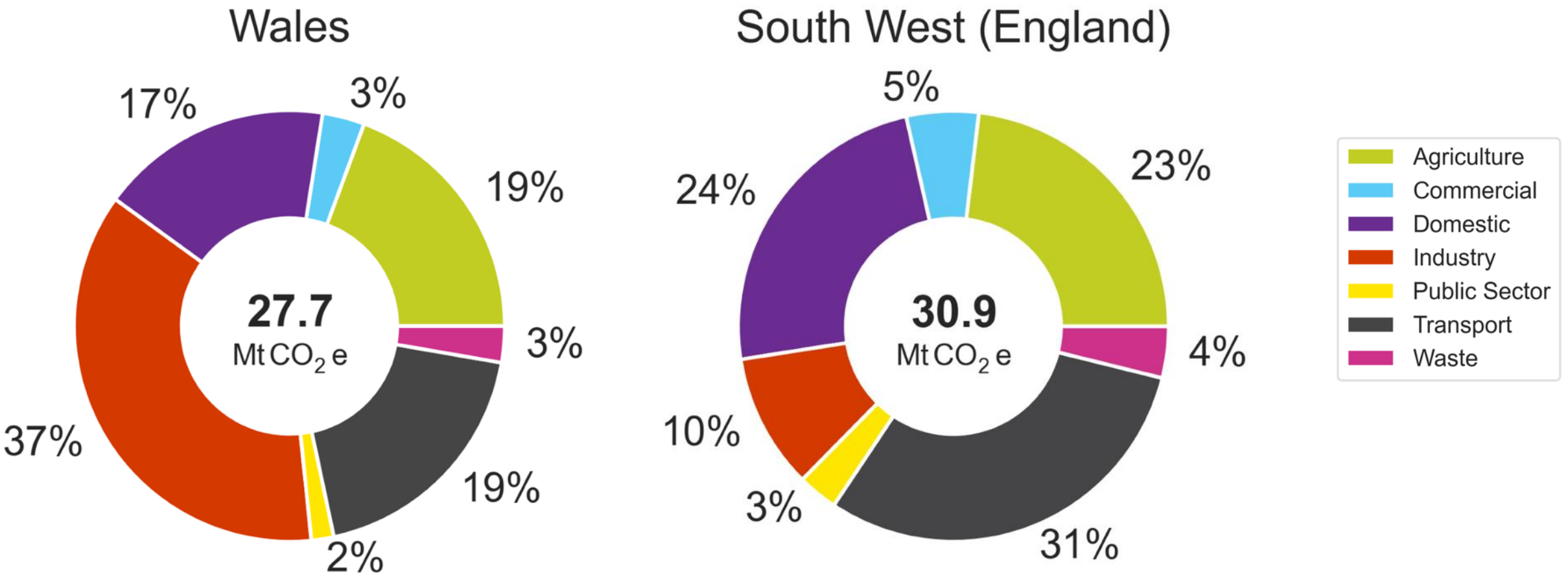
Emissions sources vary across GB, policy and planning will need to work at a local and national level



Main Takeaways

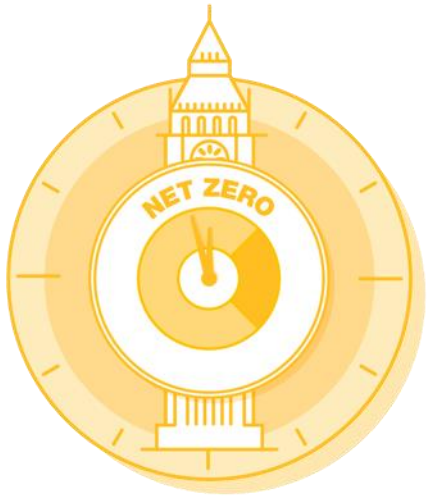
NETs are needed to meet net zero

Whole system thinking

CCS plays a critical role

Emission sources vary across GB

What is needed over the next year?



Net zero policy

Continuing delivery on the role out of CCS

Net zero policy

Addressing cost of living in the transition to net zero

Negative emissions

Continual support for the development of NETs

Strategic network investment

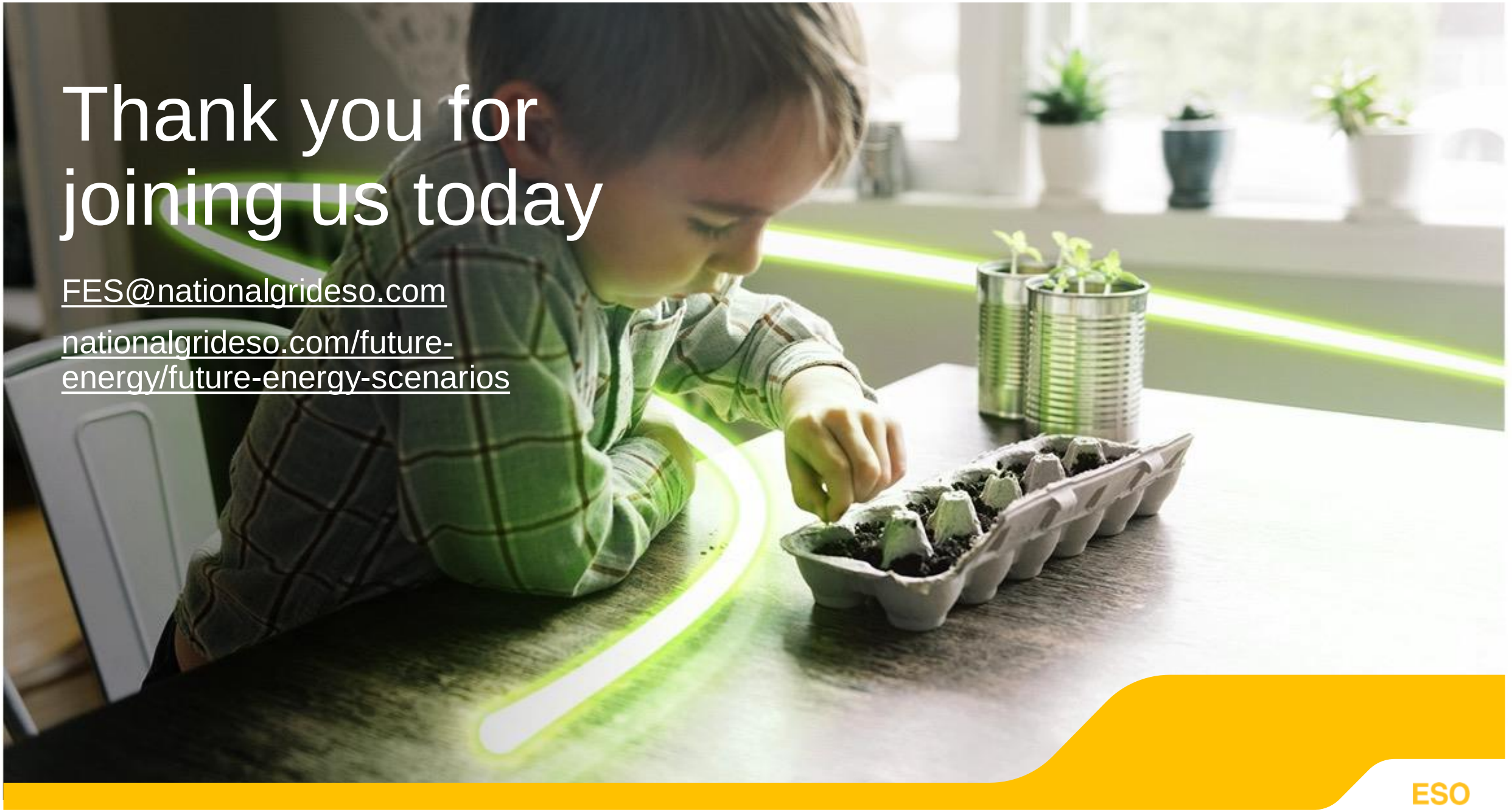
Making sure the electricity system is resilient through change while ensuring zero carbon generation

Abbie Badcock-Broe

Strategy, National Grid ESO

Kate Mulvany

Cornwall Insights



Thank you for joining us today

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