FES 2024: ESO Pathways to Net Zero

Pathways to net zero

17 July 2pm

ESO

Agenda

2pm	Welcome	Sian Ramirez Bower
	Key actions	Gary Bateman
	Framework	Gary Bateman
	Emissions Range	Gary Bateman
	Emissions & enablers	Hind Altantawi & Jonathan Morris
	Conclusion	Jonathan Morris
	Q&A	
	Re-cap and close	

Key Message:

Decisive action is needed within the next two years to deliver the fundamental change required for a fair, affordable, sustainable and secure net zero energy system by 2050.

Actions:

1. Accelerate the delivery of whole system infrastructure through a strategic approach to network investment and introduction of planning reforms.
2. Deliver market reform, considering electricity, gas, hydrogen and CO_2, to ensure we have energy markets that provide for and work with a reliable and strategically planned energy system.
3. Prioritise the use of hydrogen for hard-to-electrify applications. Agree business models and kick-start delivery of the hydrogen and CO_2 transport and storage infrastructure needed for system flexibility.
4. Accelerate progress on low carbon heating, including faster rollout of heat pumps irrespective of a decision on hydrogen for heat.
5. Deliver innovation and build consumer trust in affordable smart technology, enabling consumers to save on energy costs while helping with the management of Great Britain's electricity system.
6. Focus on energy efficiency improvements across all sectors to reduce overall energy demand.
7. Expedite the delivery of clean, low-cost and reliable new technologies and long-duration energy storage connected to the system by reforming the connections process.
8. Invest in supply chain and skills to deliver the low carbon technologies and infrastructure needed for net zero and enable the UK to become a world leader.

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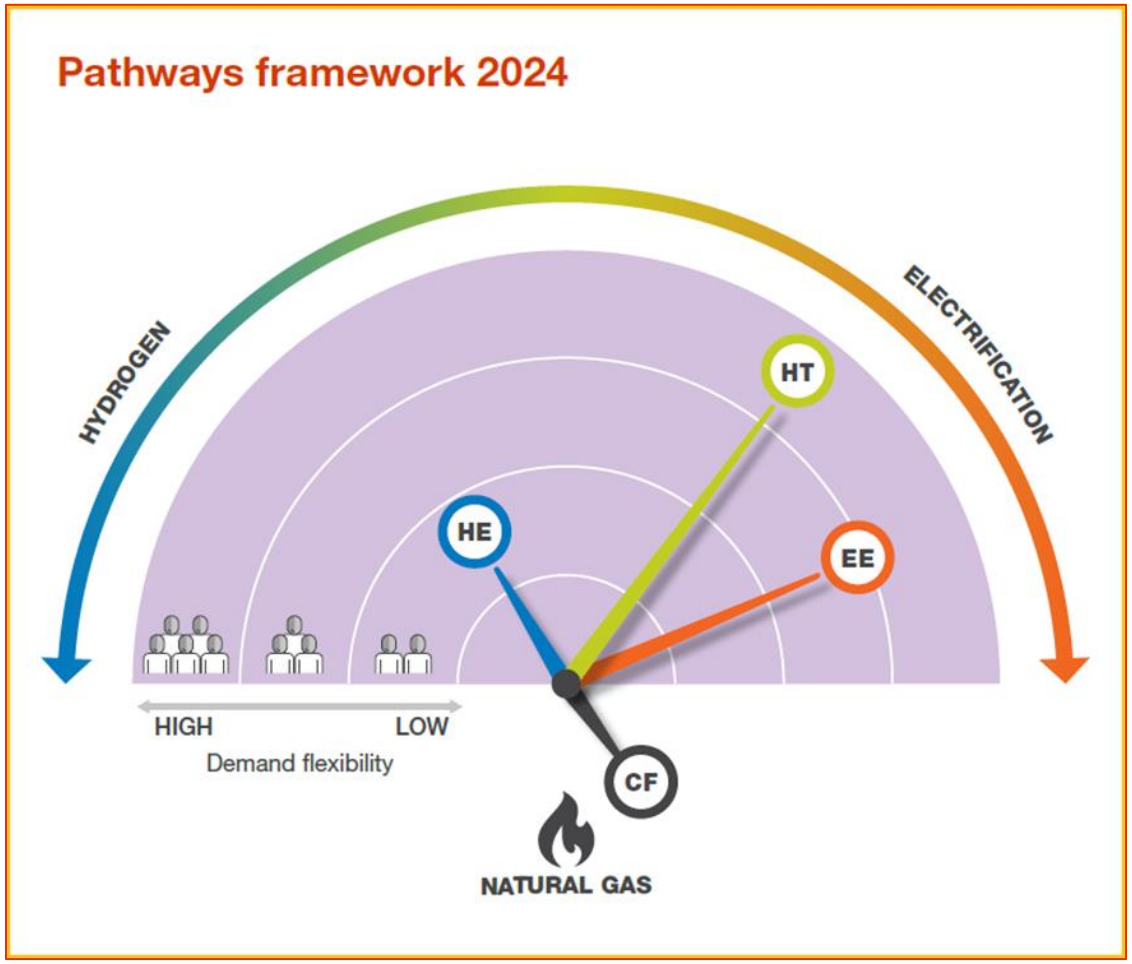
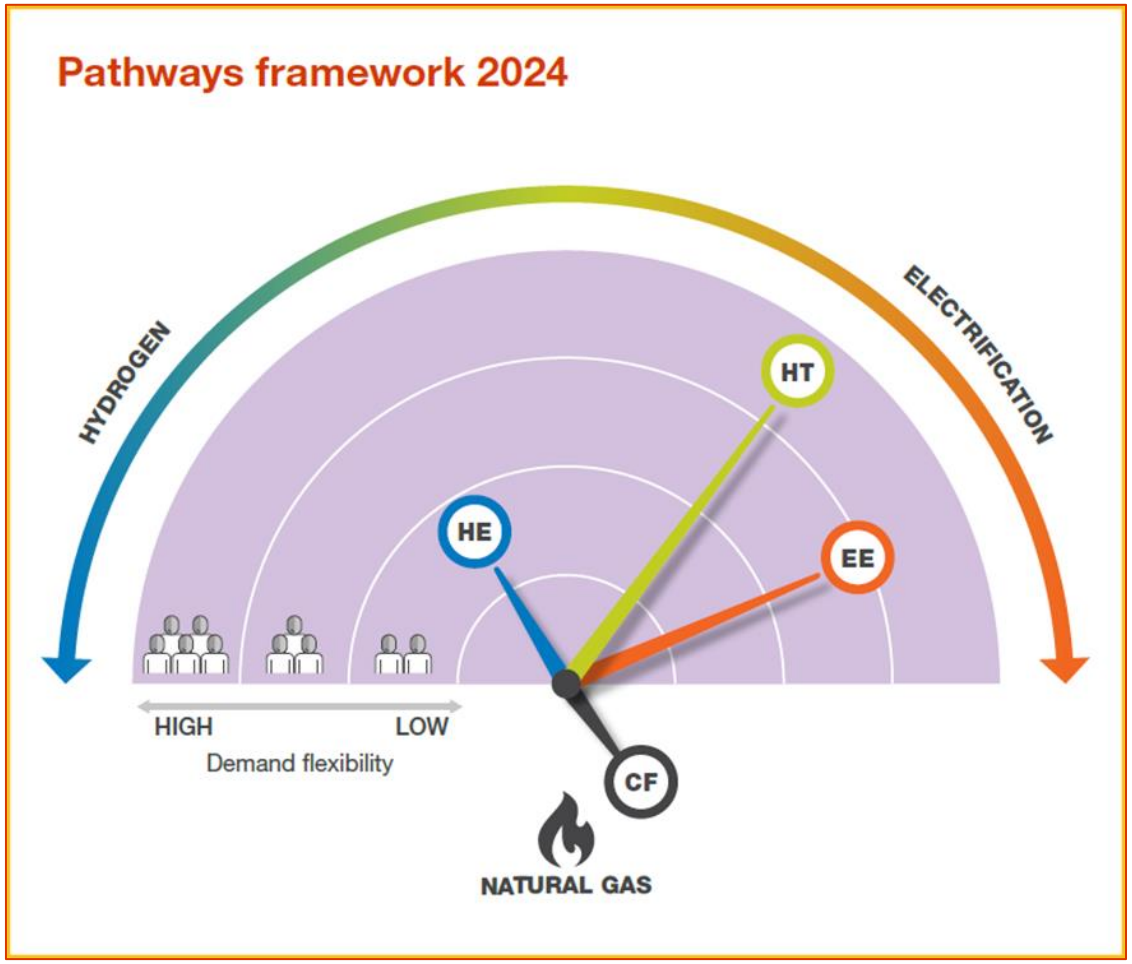


FES 2024: ESO Pathways to net zero

Holistic Transition

- Net zero by 2050
- Mix of electrification and hydrogen
- Very high consumer engagement in the transition



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Electric Engagement

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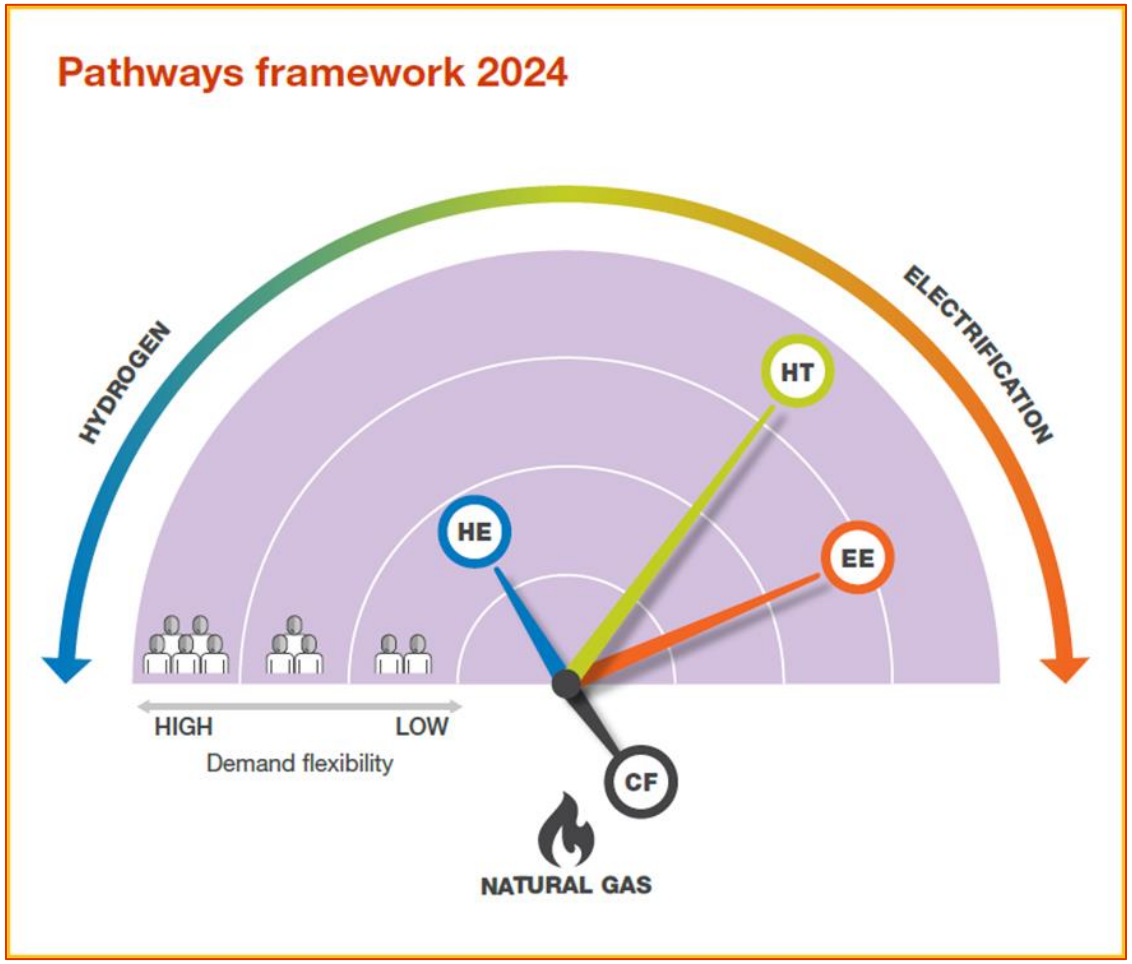
- High levels of electrification
- Strong consumer engagement in the transition



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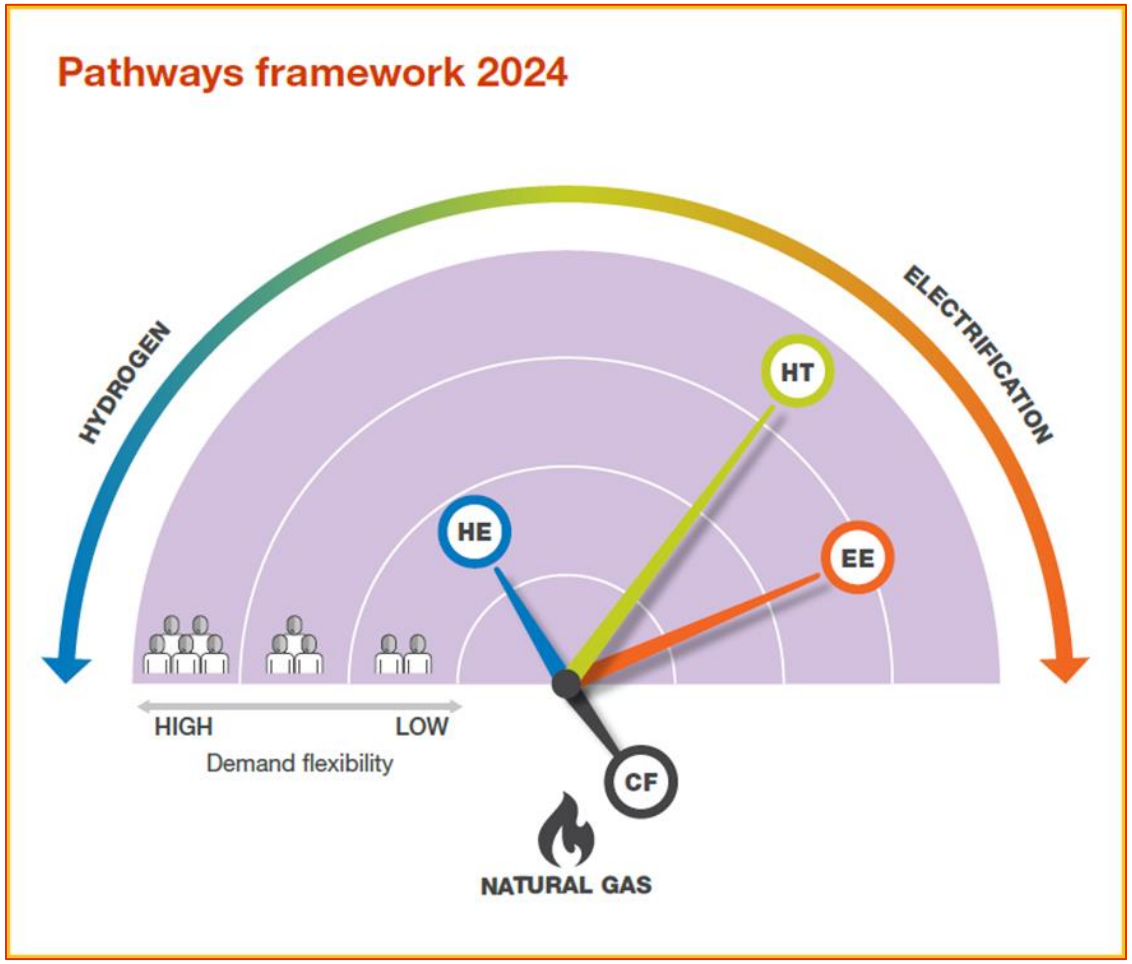

Hydrogen Evolution

- Net zero by 2050
- Fast progress for hydrogen in industry and heat
- Lower levels of consumer engagement

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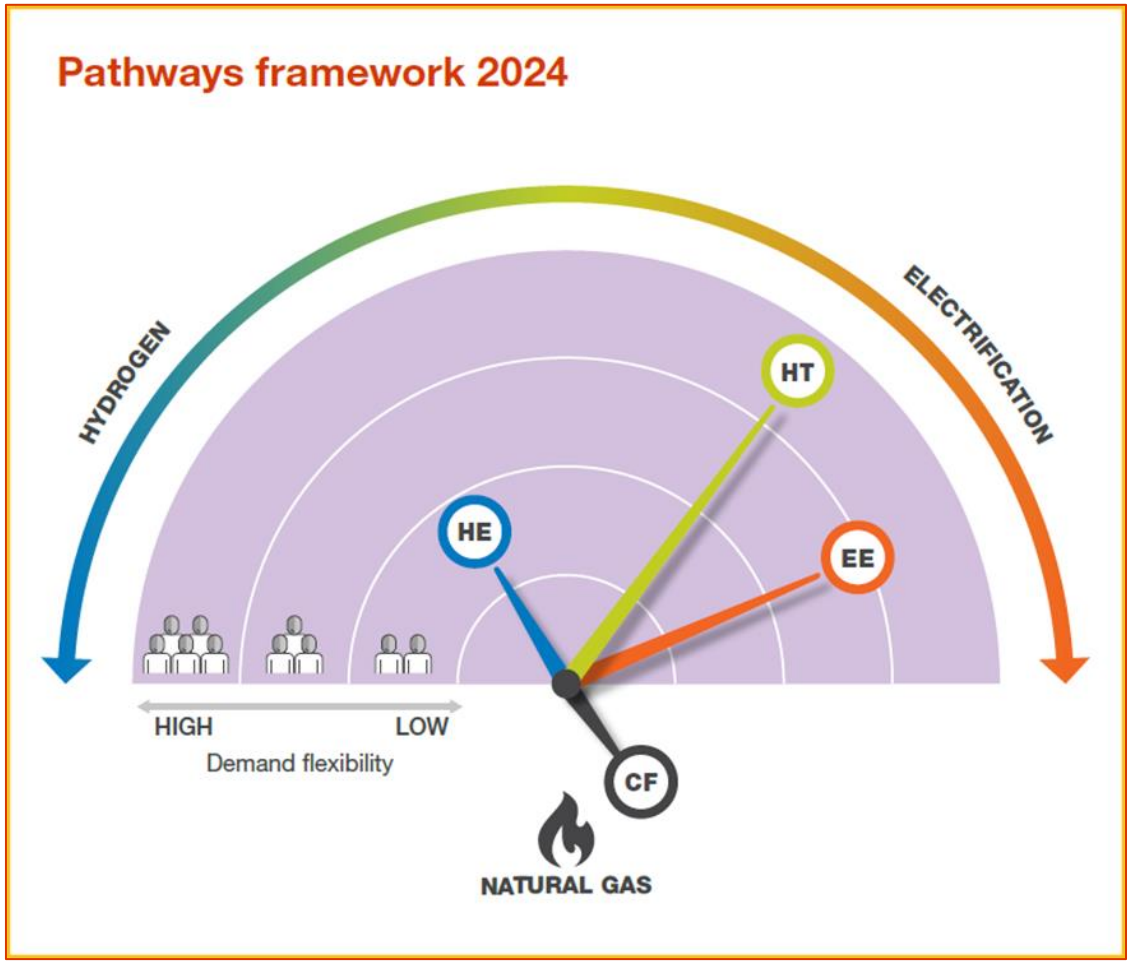

Counterfactual

- Net zero not achieved by 2050
- Some progress is made compared to today
- Heavy reliance on gas across all sectors, particularly power and space heating
- Electric vehicle uptake is slower than the net zero pathways, but still displaces petrol and diesel

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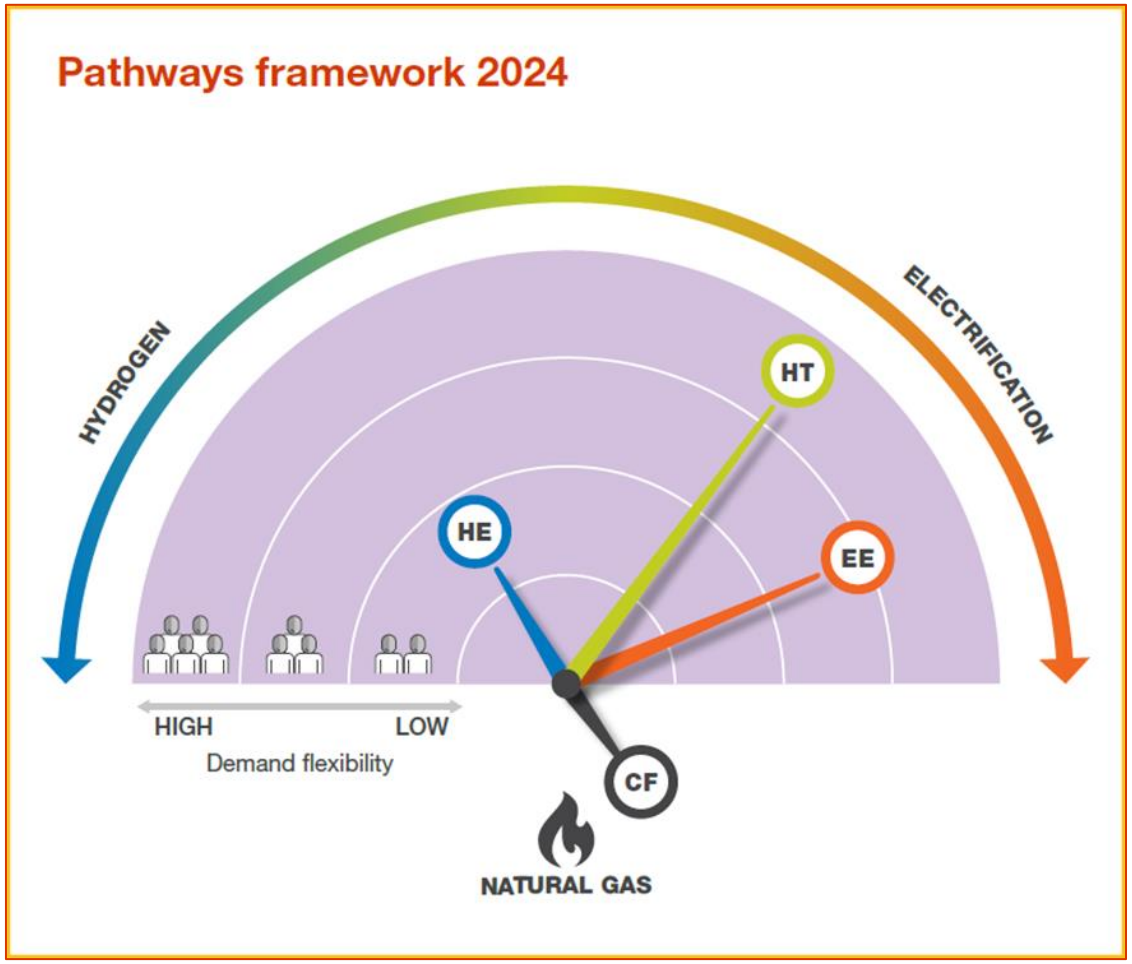

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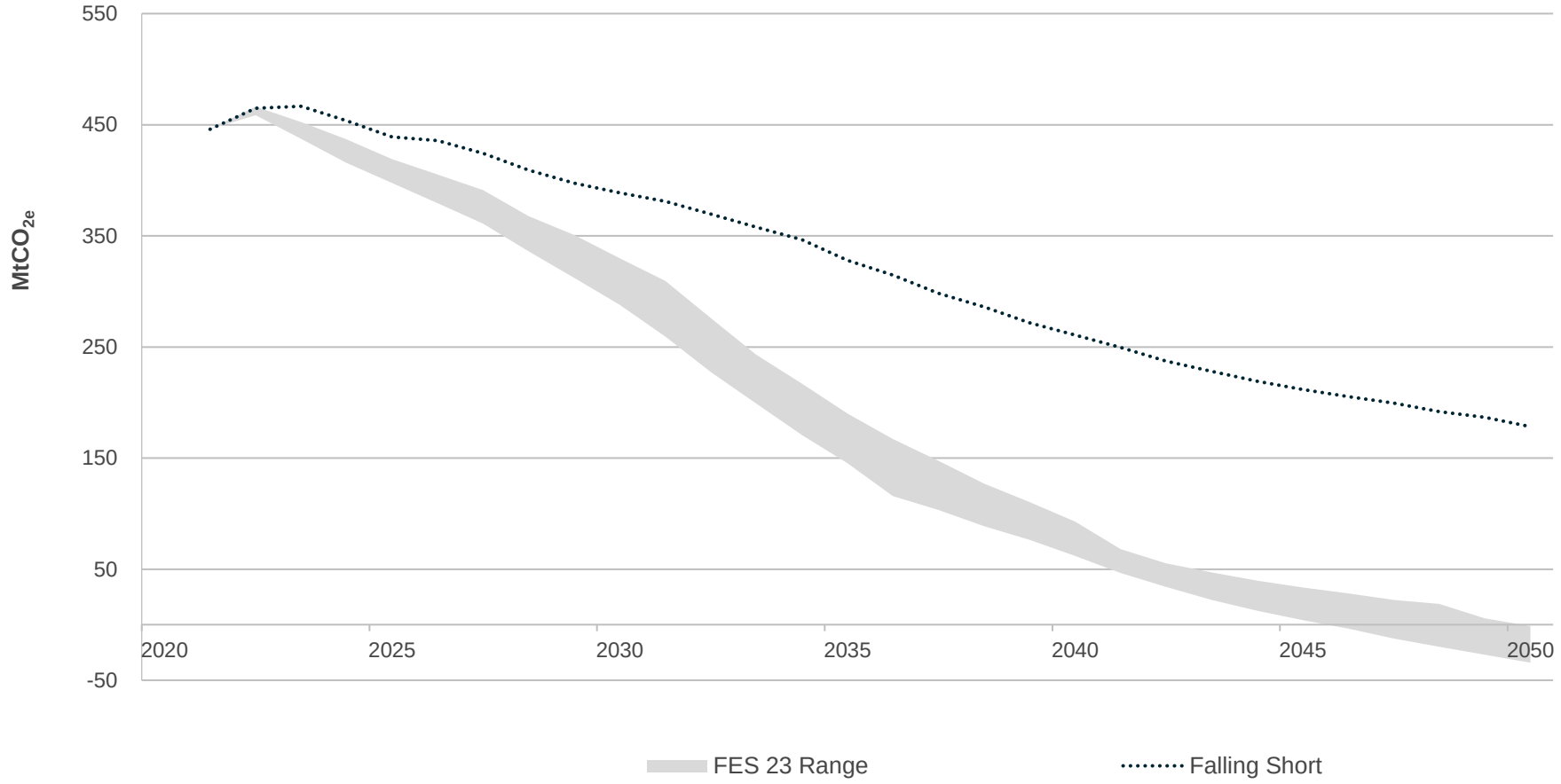
FES 2024 has narrowed the emissions range



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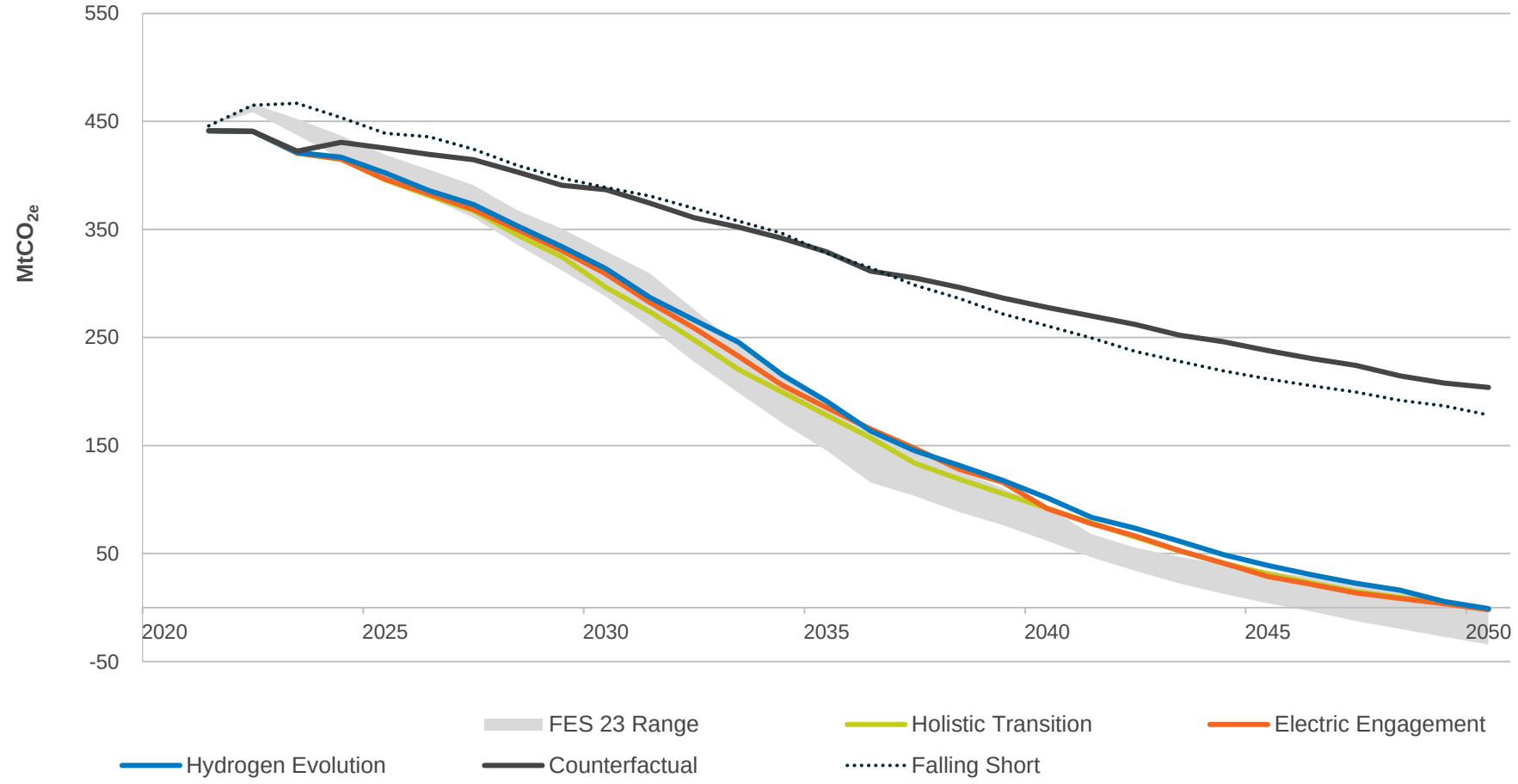

Carbon budgets, emissions and key enablers

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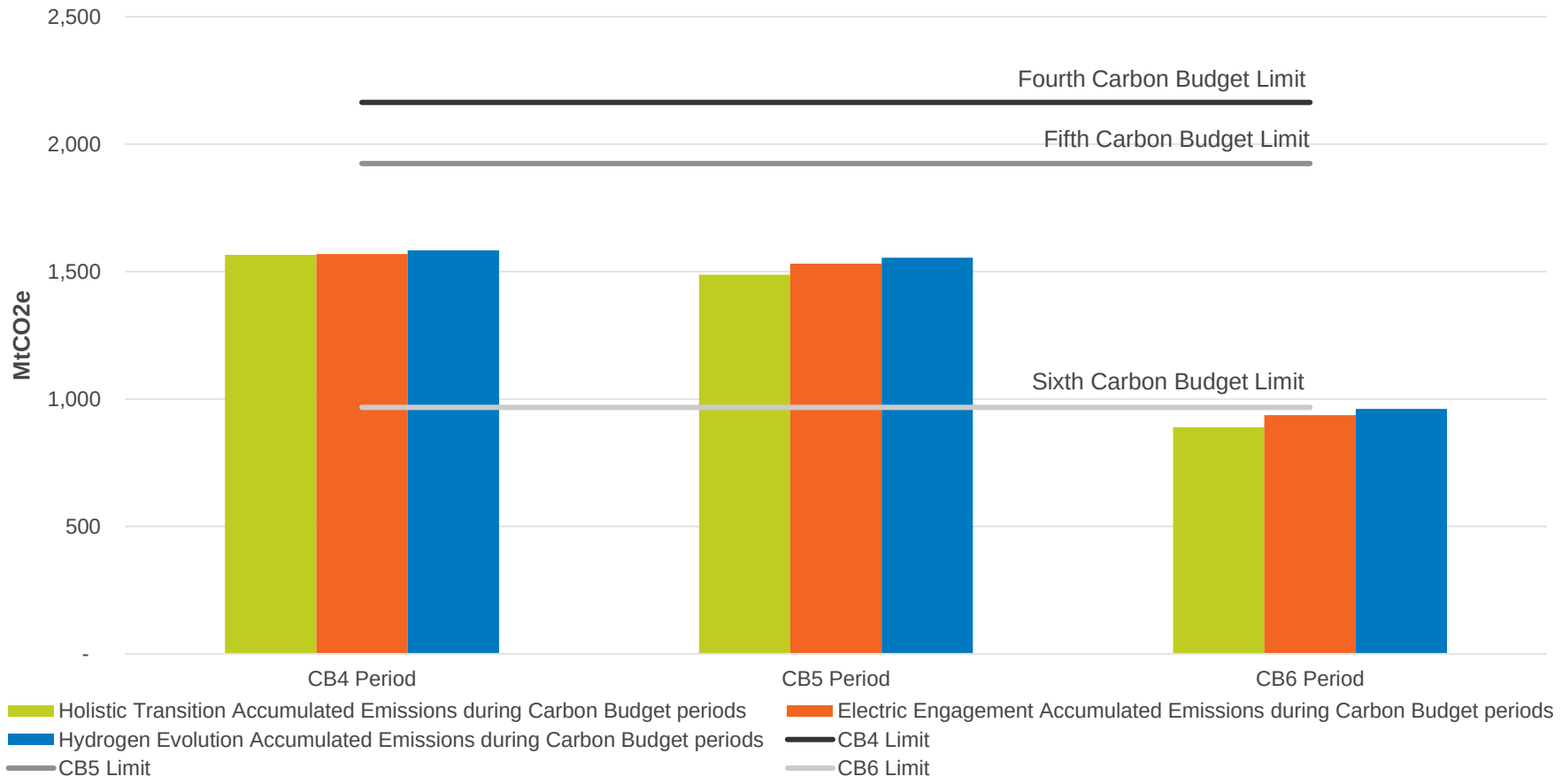
All our pathways meet the challenging Sixth Carbon Budget



Carbon budgets Four to Five represent an approximate **12%** reduction in emissions. Carbon Budget Five to Six represent an approximate **45%** reduction in emissions, making the Sixth Carbon Budget the most challenging to meet.

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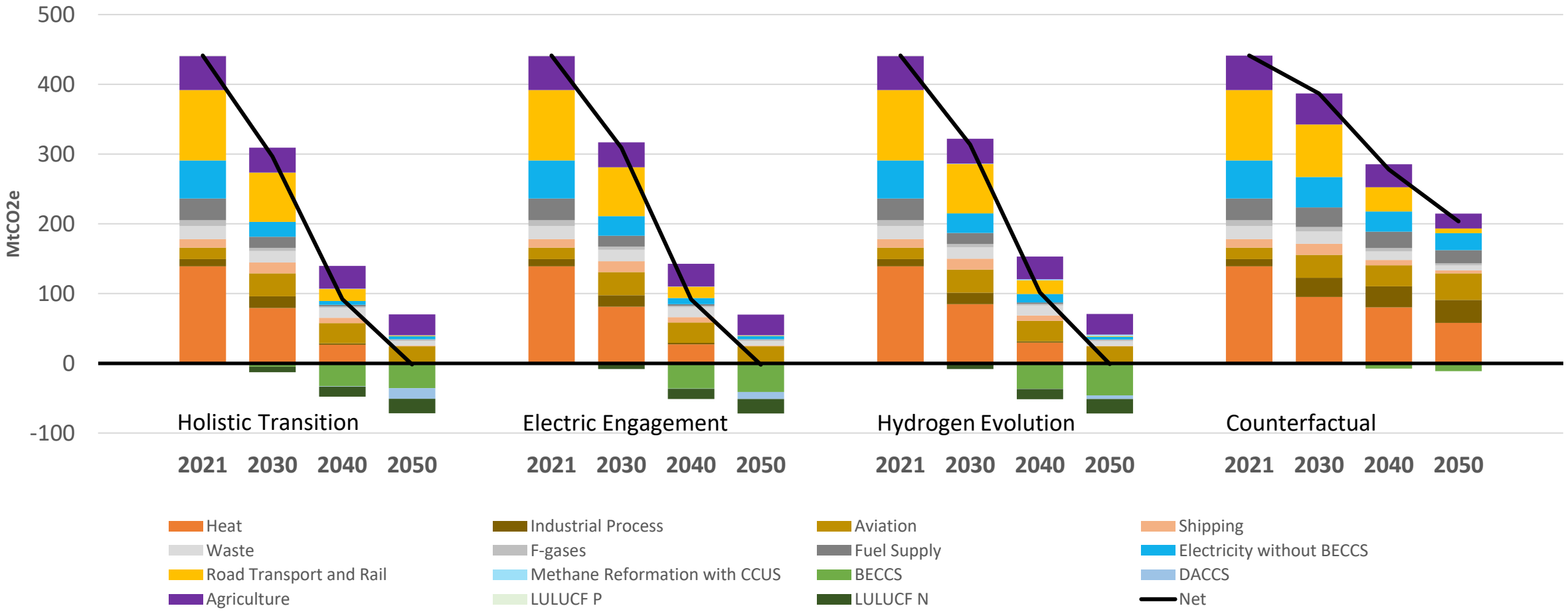
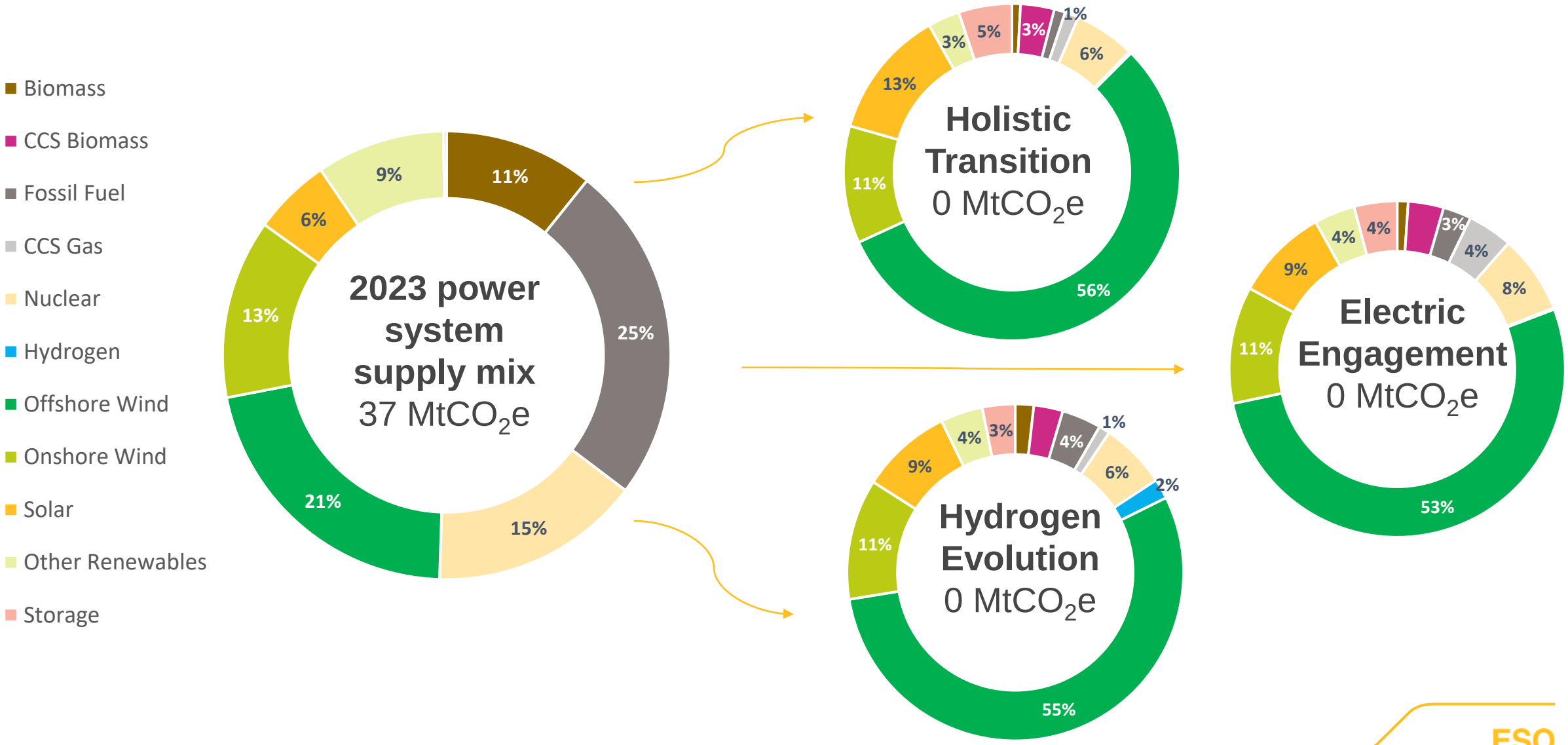
All sectors need to reduce emissions on the route to net zero

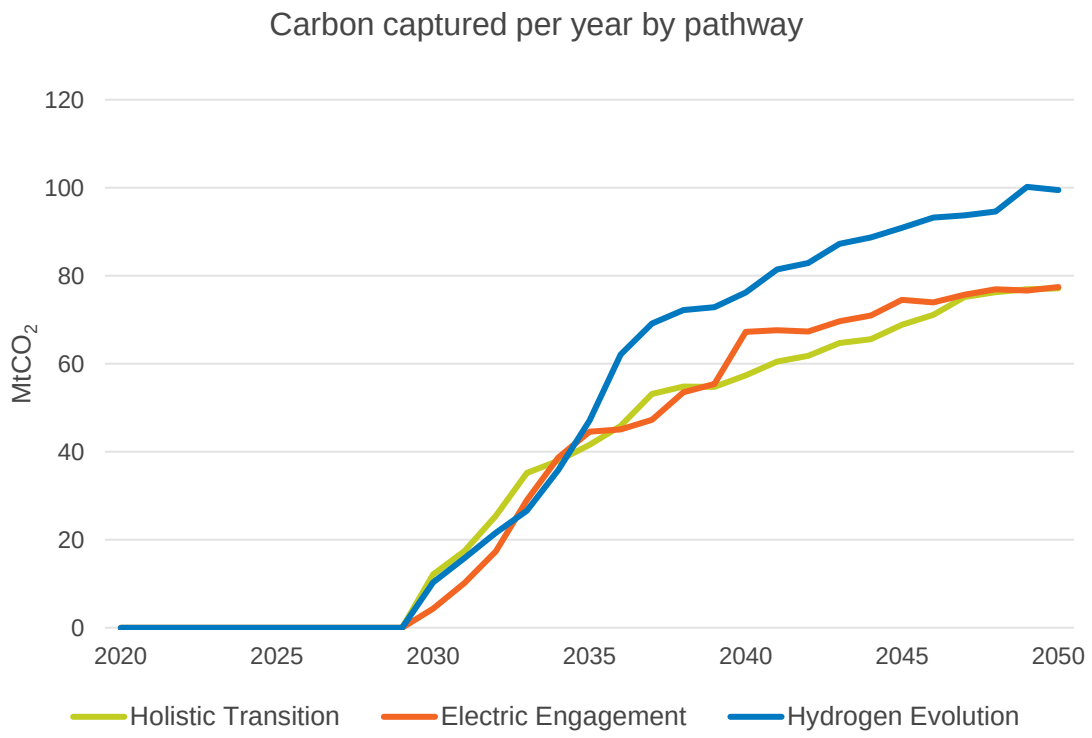


All net zero pathways meet net zero with negative emissions from BECCS and DACCS.

A decarbonised electricity system is key to achieving net zero



Carbon capture and storage is a key enabler of net zero



Quantities of CO_2 captured and stored steadily expand to 2050, across many users.

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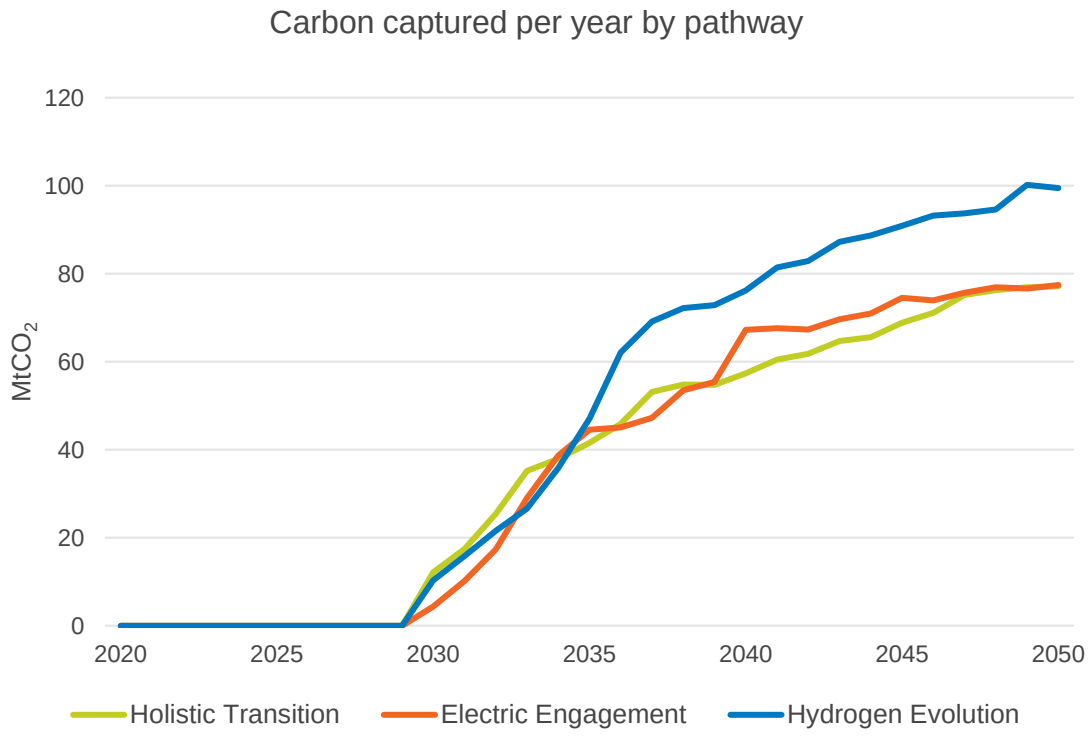

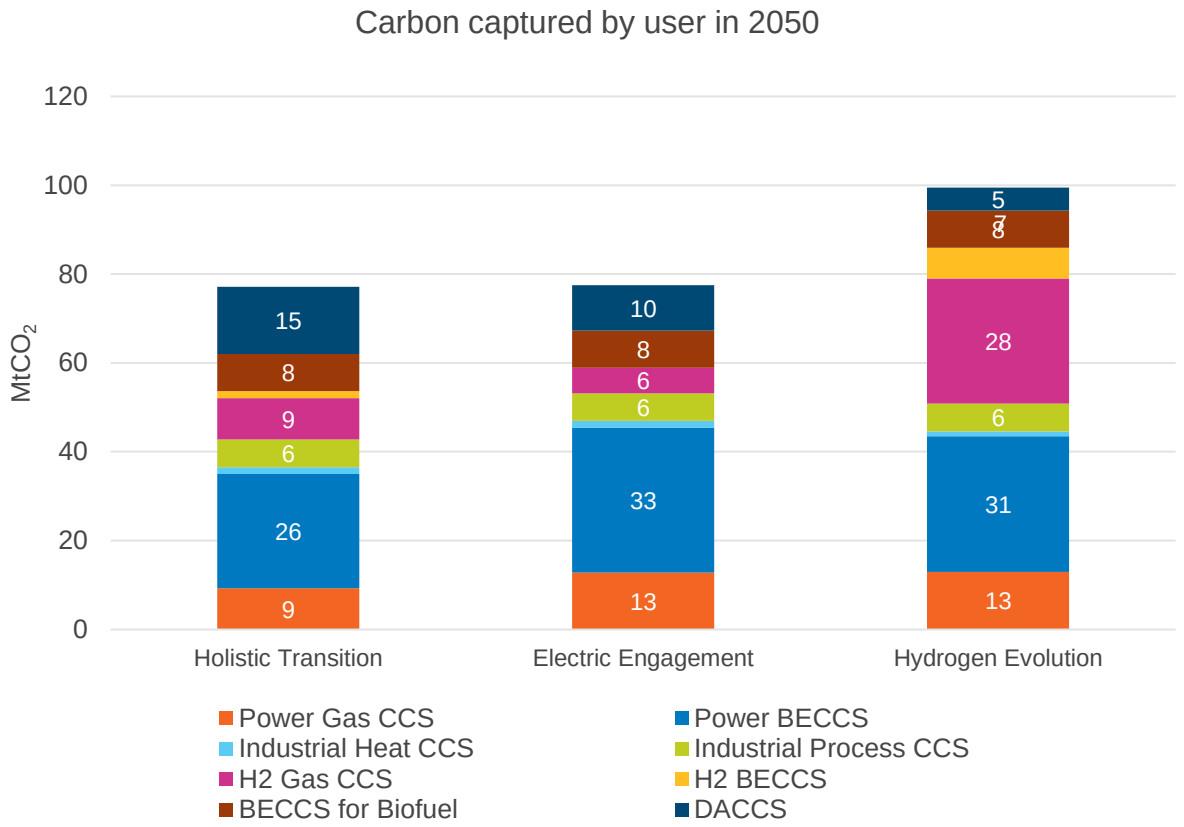

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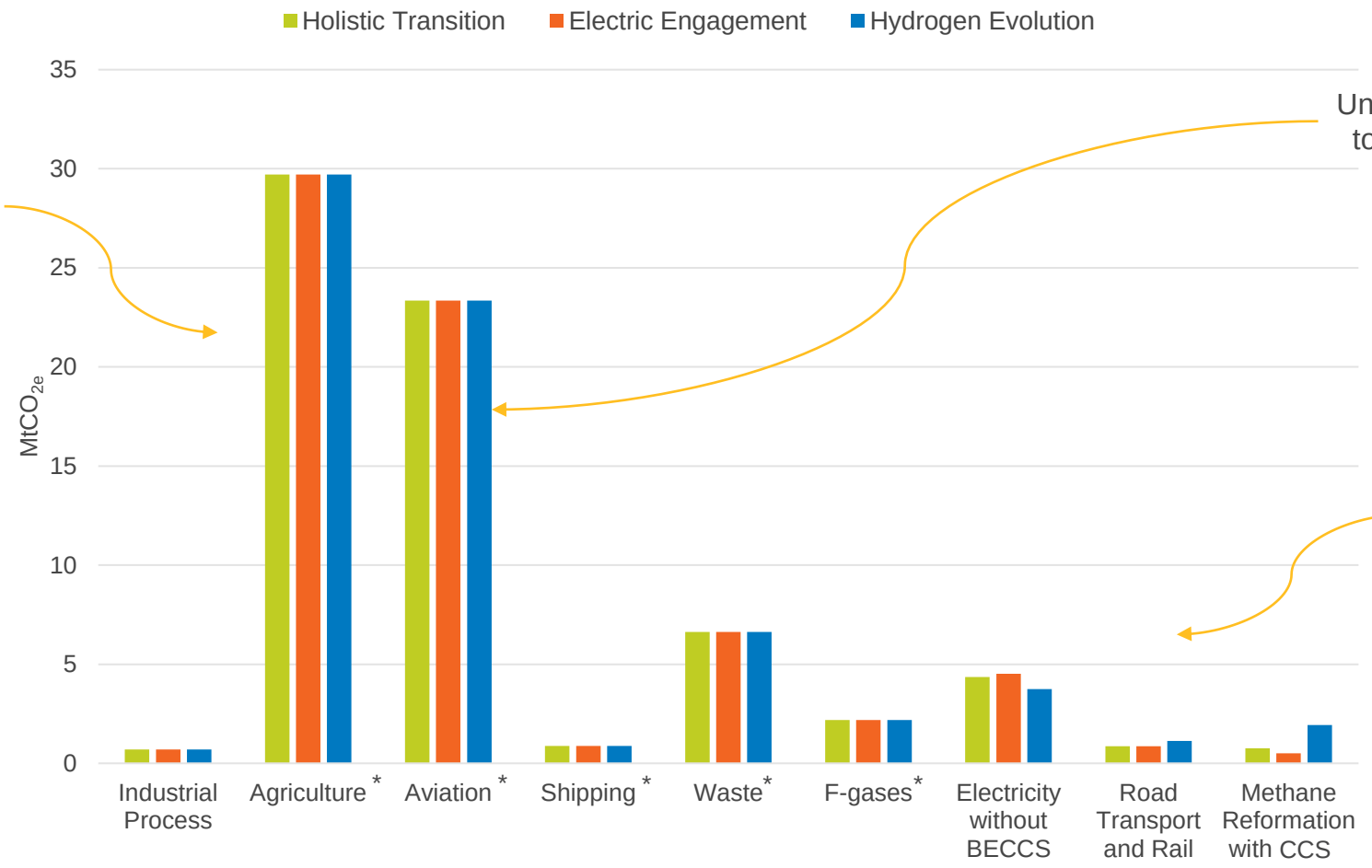
All options are deployed in our pathways to reach net zero

Demand reduction	Low carbon energy production	Low carbon flexibility and storage	Fuel switching	Carbon removals
Key Action 5&6	Key Action 1,2,3&7	Key Action 1,2,3&7	Key Action 3&4	Key Action 2,3&8

Key Action 8

Some sectors will have residual emissions in 2050

Residual emissions from livestock, land use and other agricultural activities



Unclear technological pathway to fully decarbonise by 2050

Continued minor residual emissions across many sectors, despite decarbonisation efforts

** Figure from CCC 6th CB*

These residual emissions continue, despite significant efforts to decarbonise or due to the lack of a credible path to fully decarbonise by 2050.

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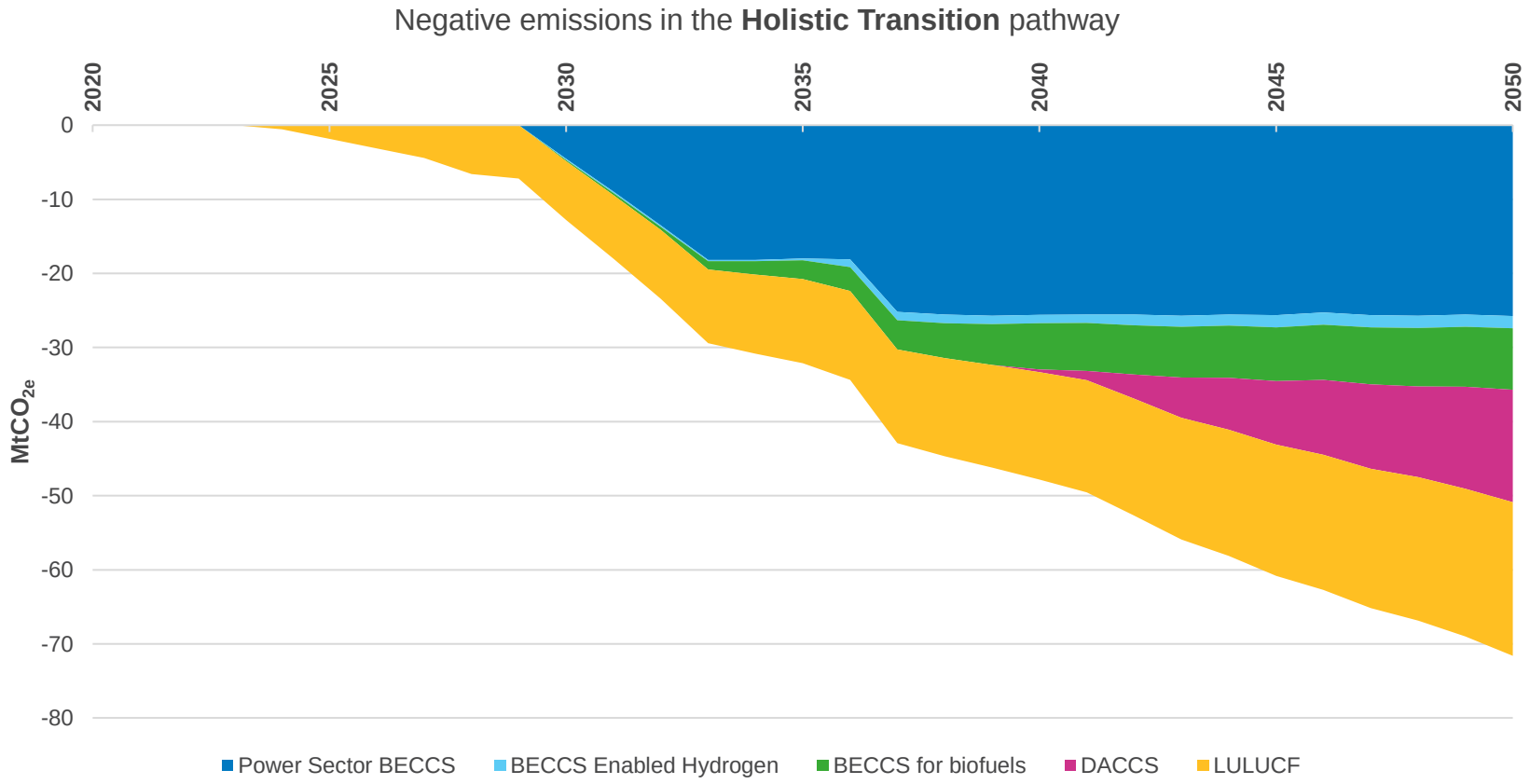
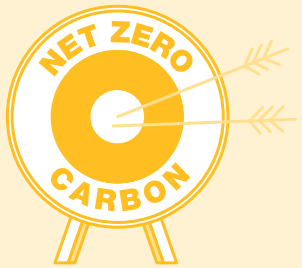
Negative emissions technologies are required for net zero



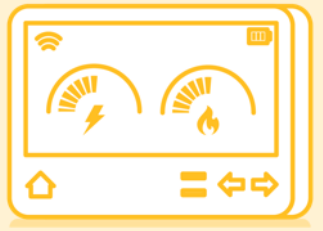
…however, because of costs and resource constraints, they cannot be used to decarbonise sectors which do have routes to net zero.

Conclusion

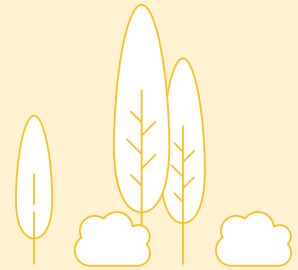


Sixth Carbon Budget and net zero can be achieved, but focused efforts are required

Achieving net zero power is a key step on the route to net zero



Fuel switching, demand reduction and flexibility drive decarbonisation



Negative emissions are essential for net zero

All of the above will require enabling infrastructure, particularly for hydrogen and CCS

Thank you for joining us today

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