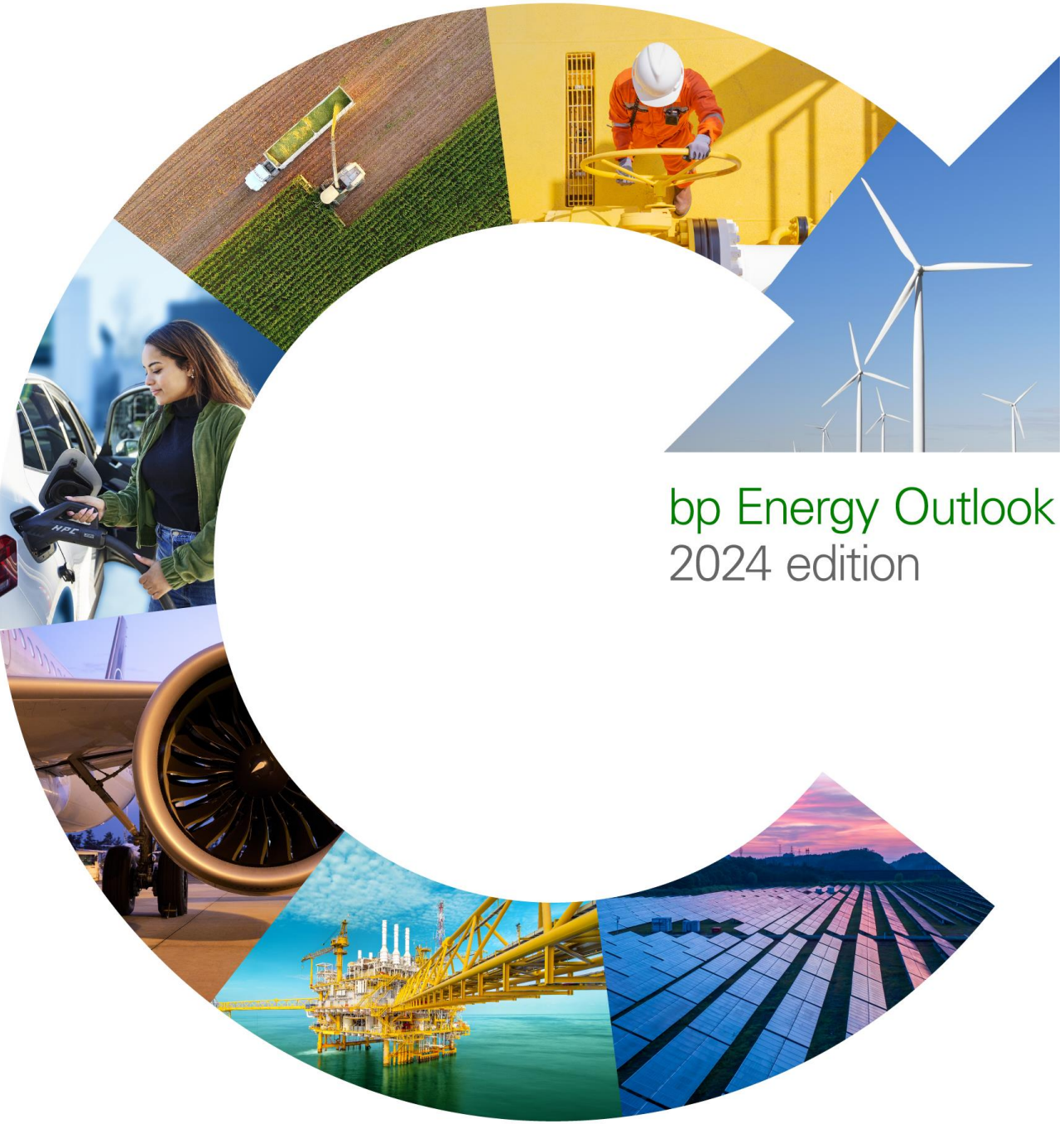


bp Energy Outlook
2024 edition

Dallas and Kansas City 9th Joint Energy Conference

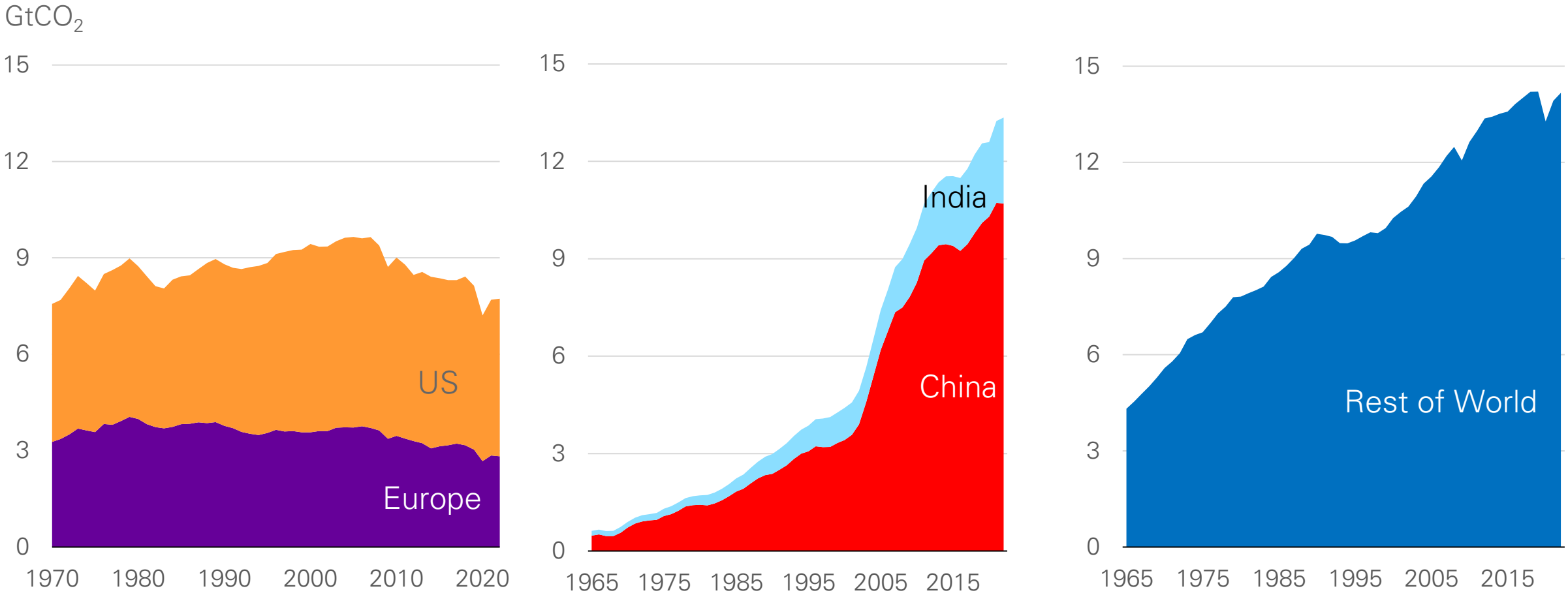
Energy and the Economy:
Meeting Rising Energy Demand

Michael Cohen
Chief US Economist and Head of Oil & Refining
Strategy, Sustainability and Ventures
Economic and Energy Insights

Global Trends

Emissions are at all time highs but trajectories diverge

~40 gigatons of carbon dioxide emissions emitted per year

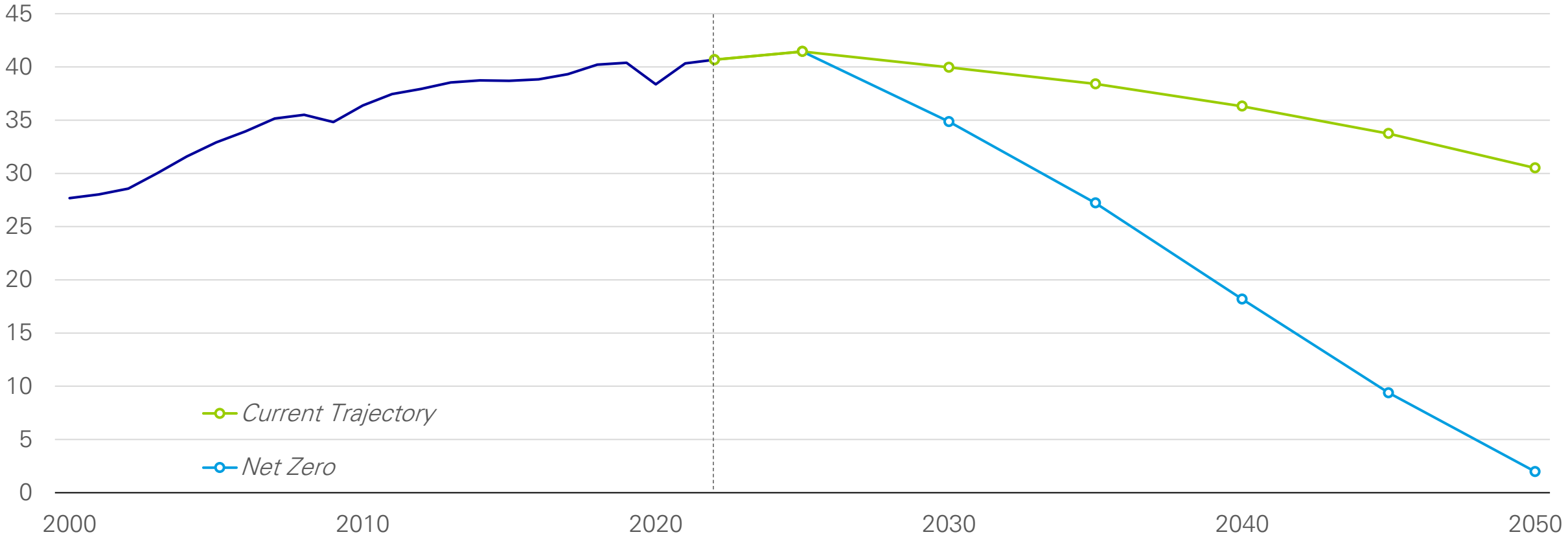


bp Energy Outlook

Two scenarios to explore the *Energy Outlook*

Global carbon emissions

Gt of CO_2e



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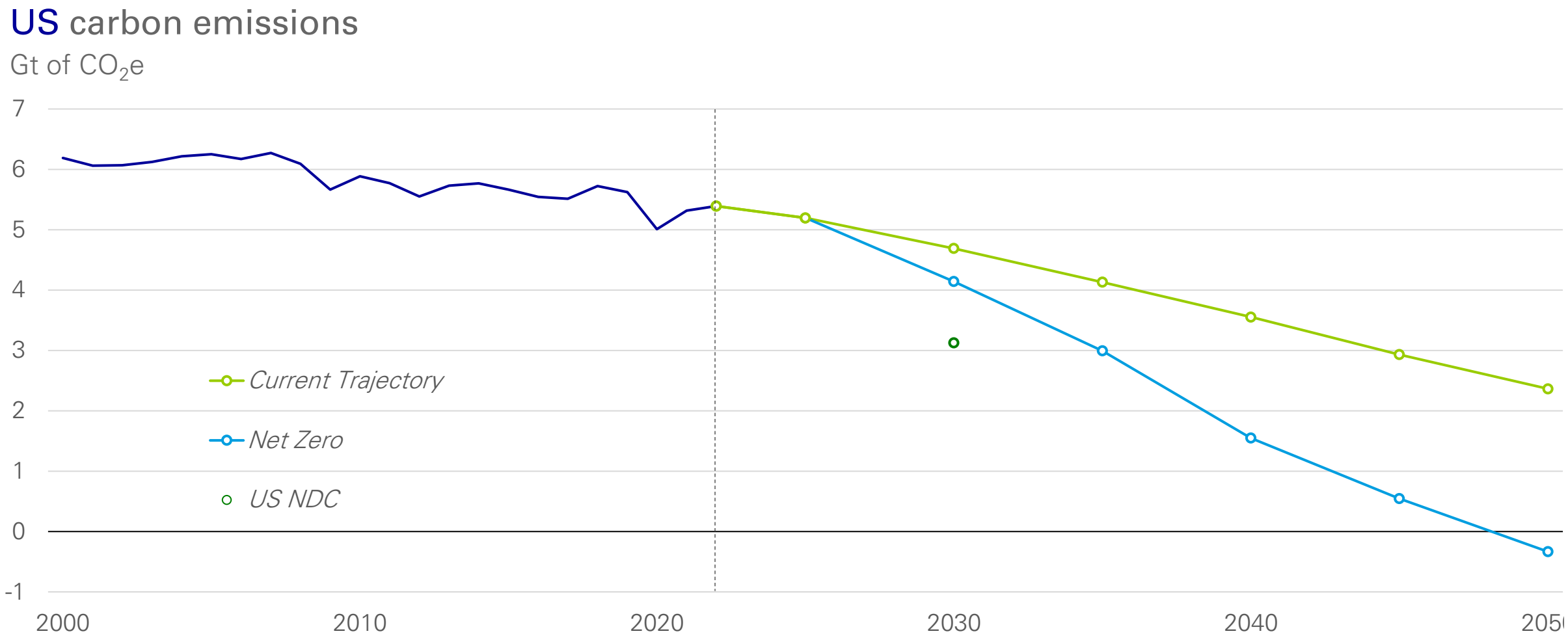
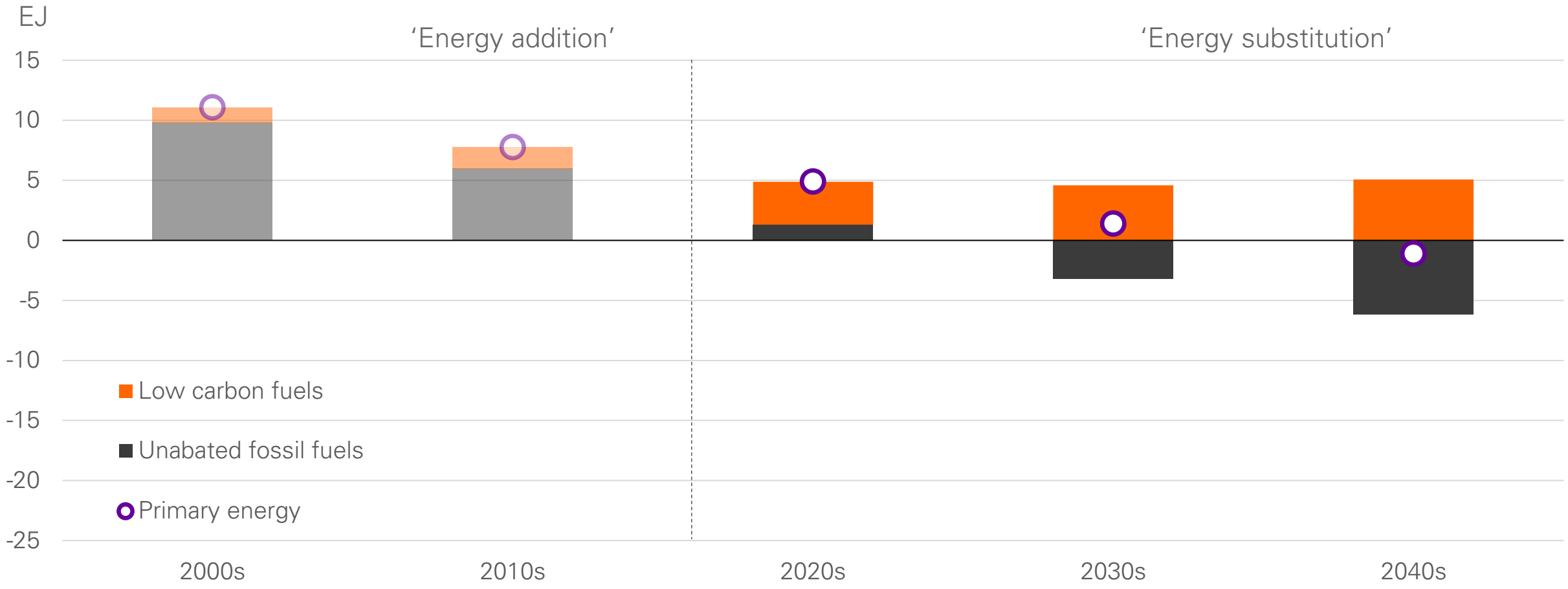


From ‘energy addition’ to ‘energy substitution’

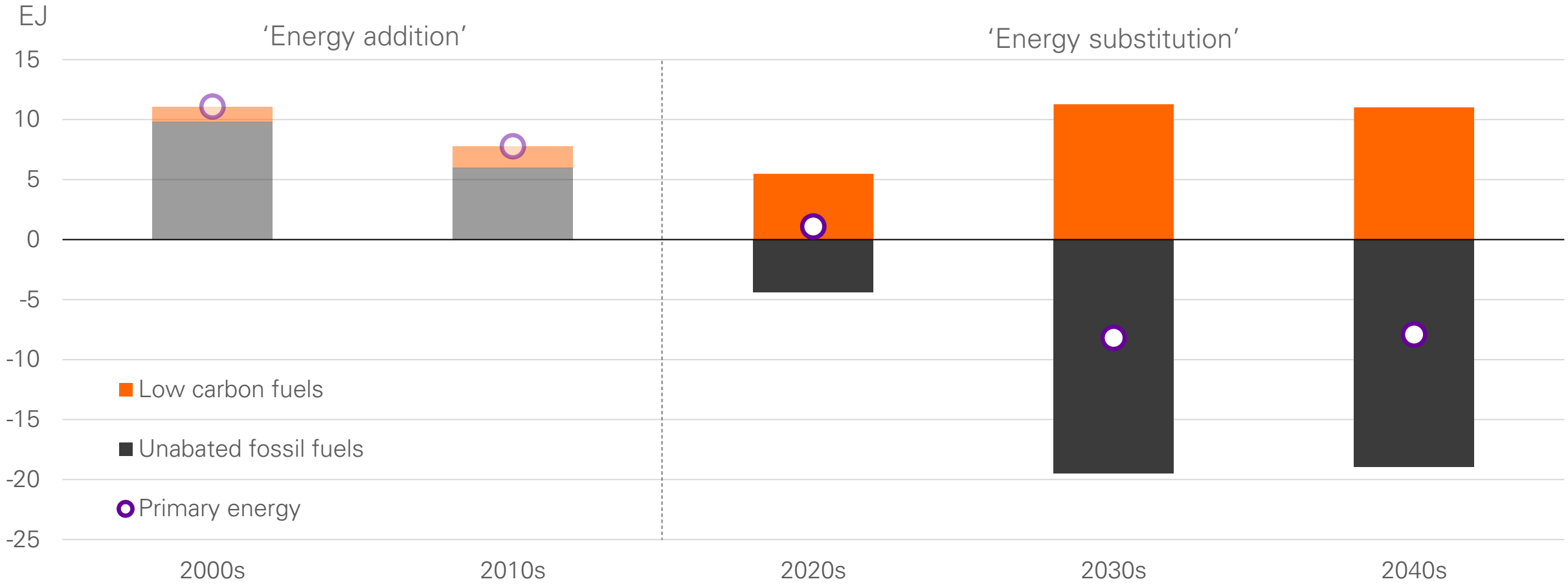
Global average annual change in primary energy in *Current Trajectory*



Calculation does not include 2020 due to impact of Covid-19

From ‘energy addition’ to ‘energy substitution’

Global average annual change in primary energy in *Net Zero*



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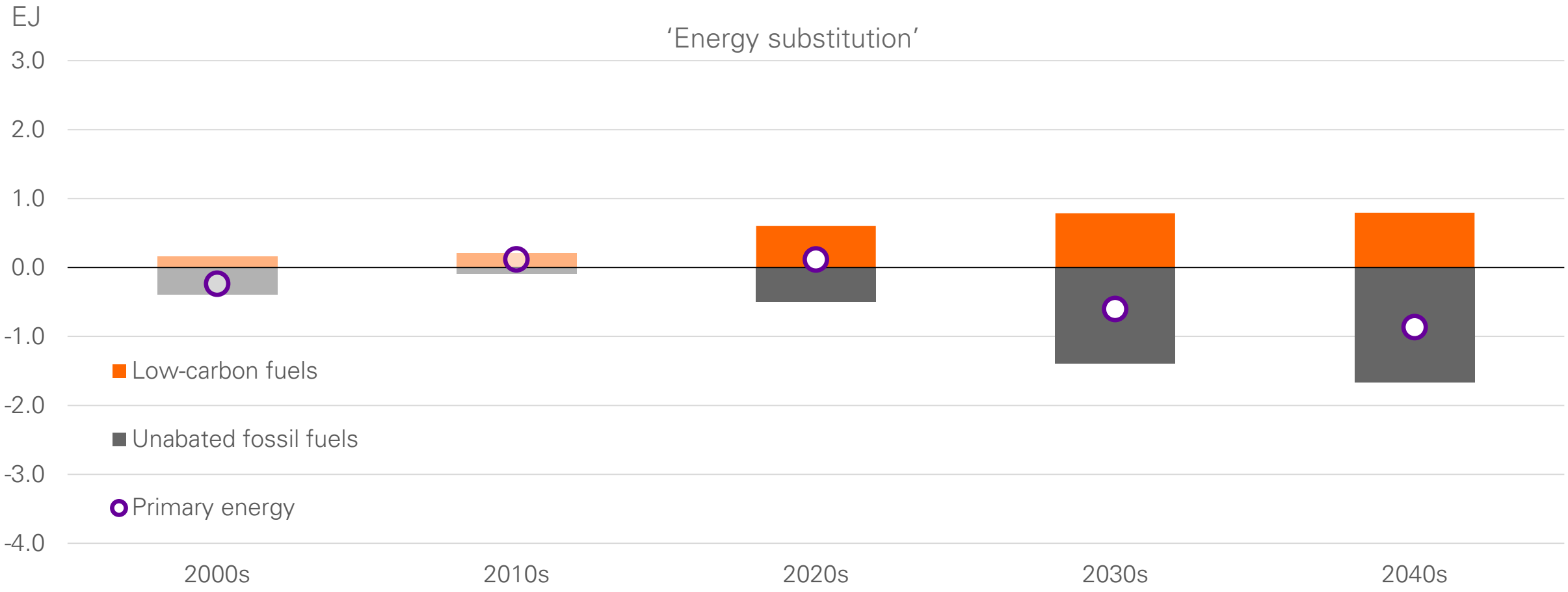

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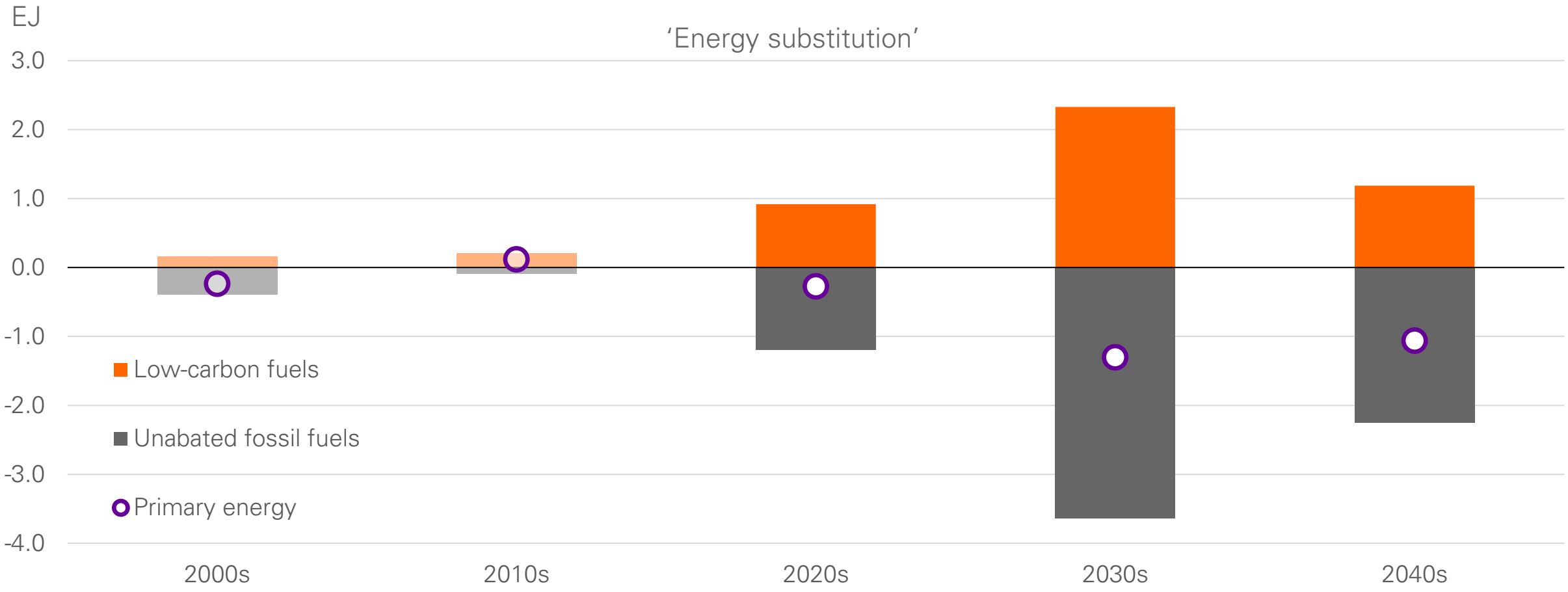

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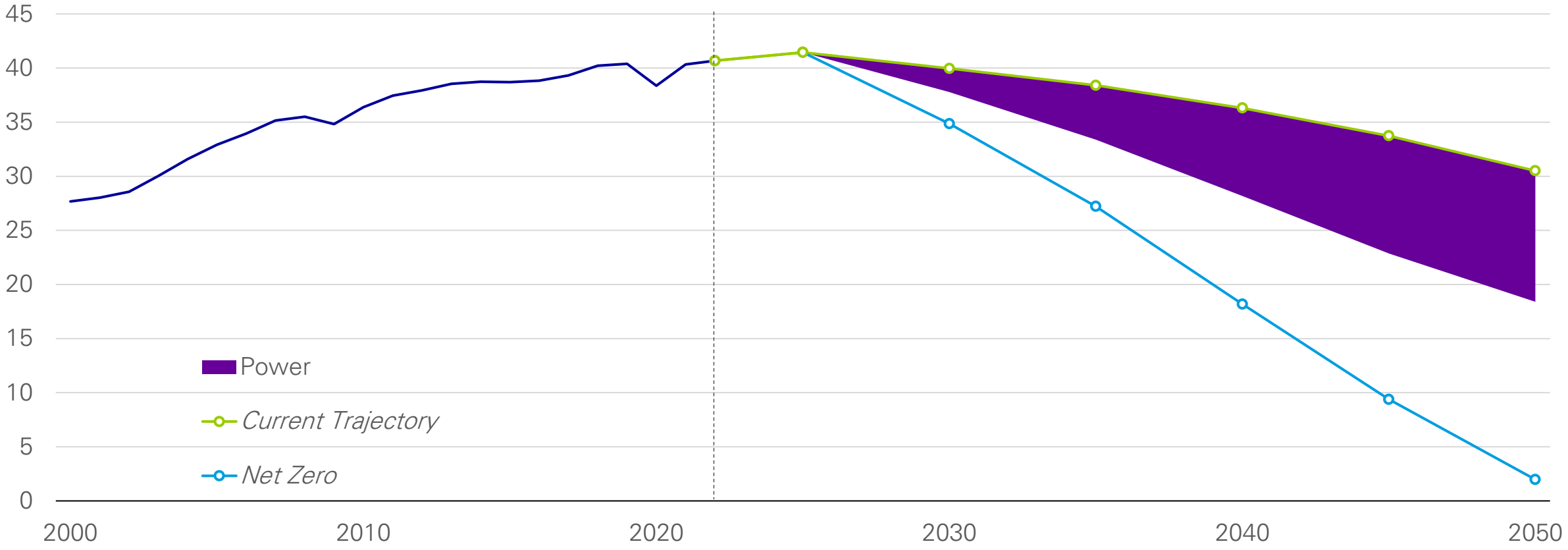
Accelerating the energy transition

Global carbon emissions

Gt of CO_2e



Accelerating the energy transition

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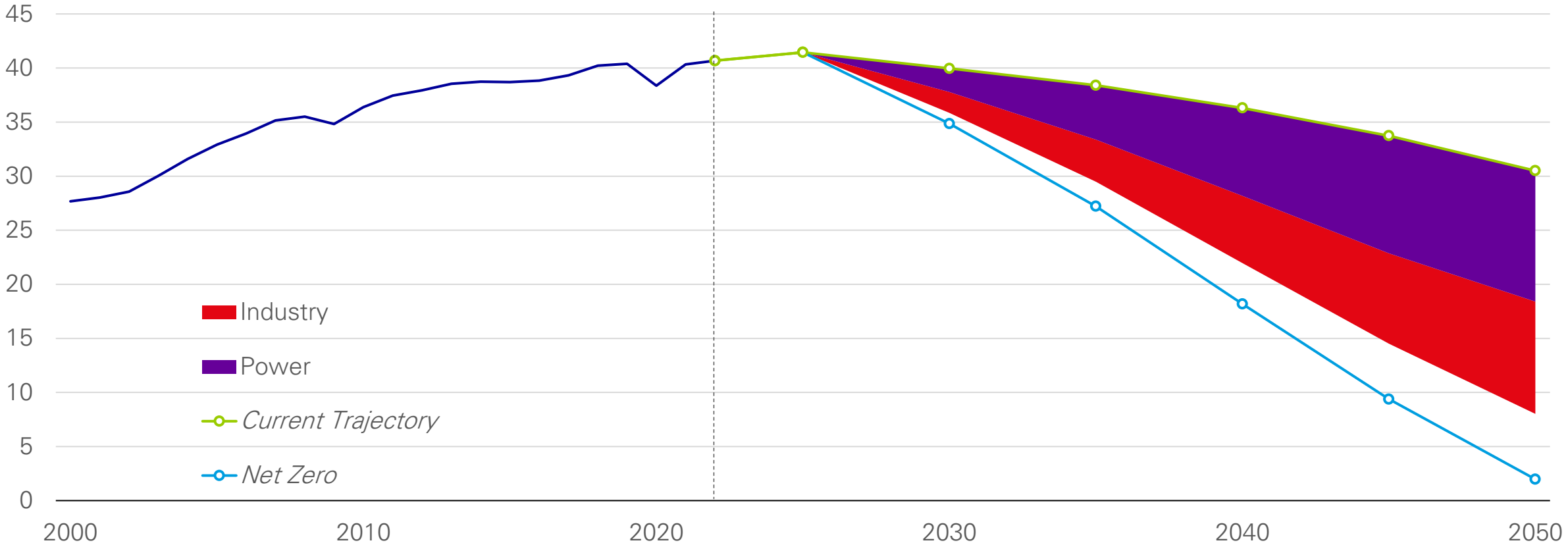

Accelerating the energy transition

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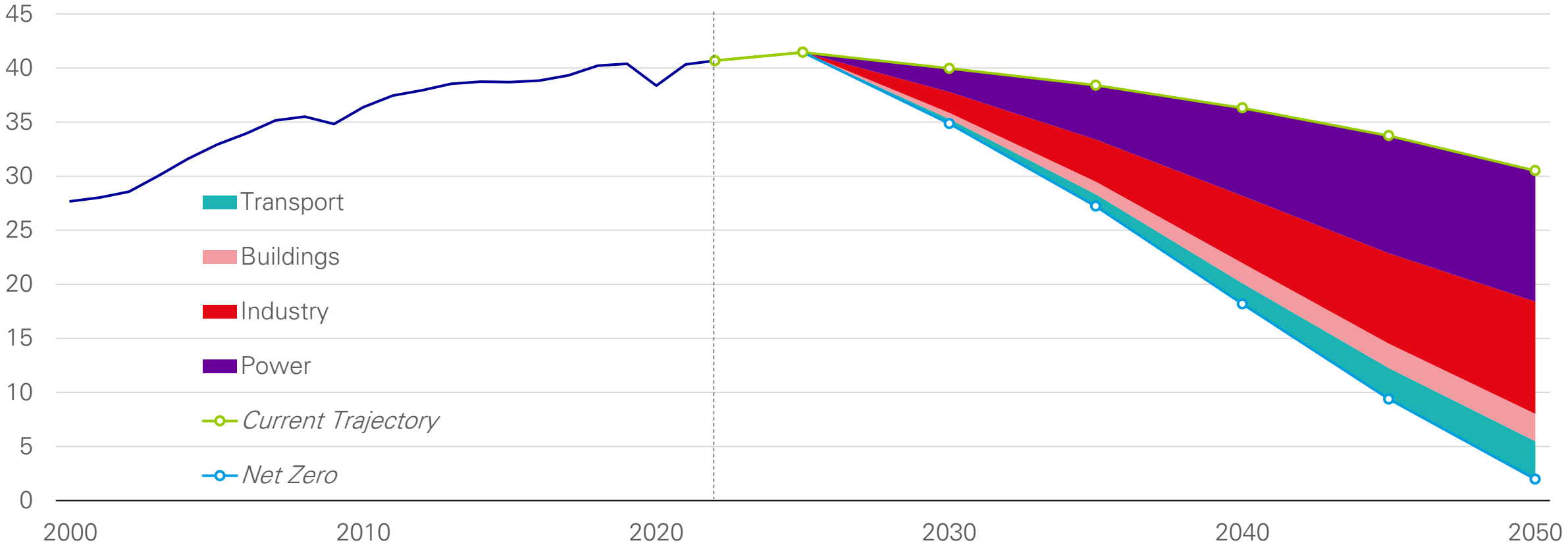
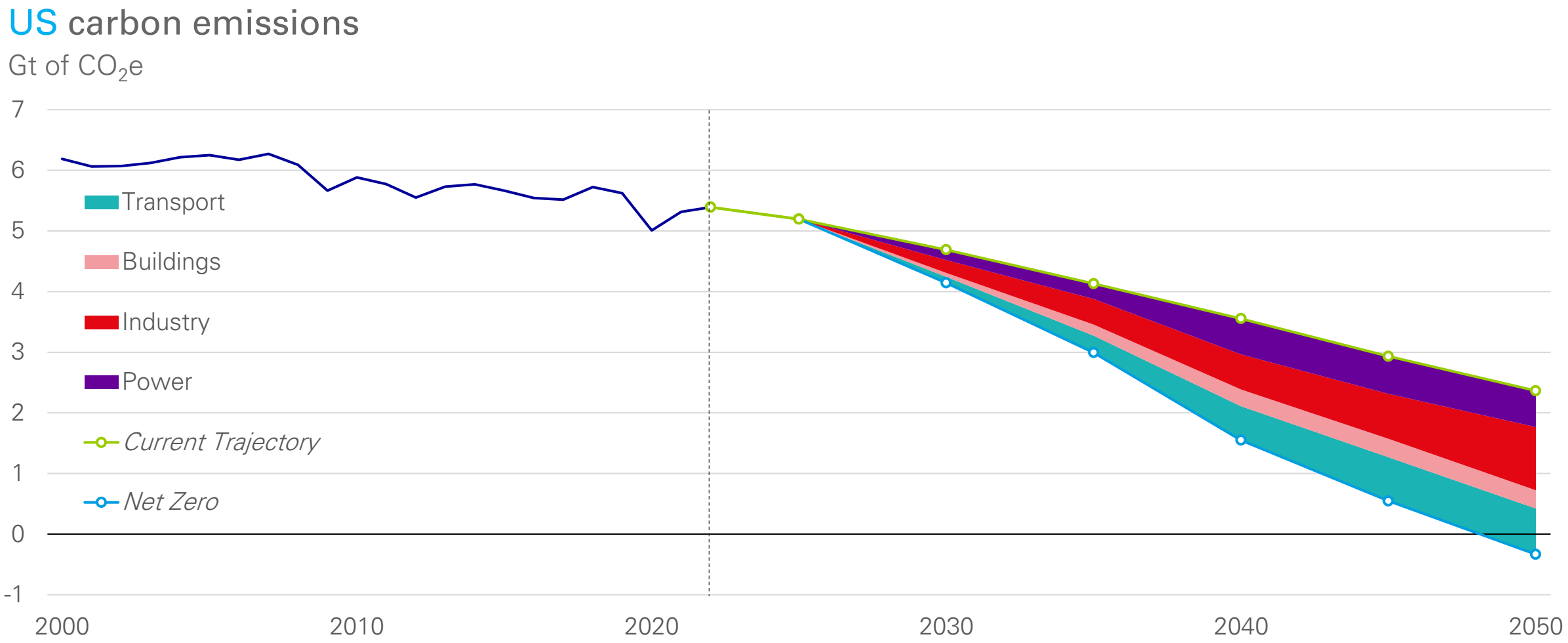
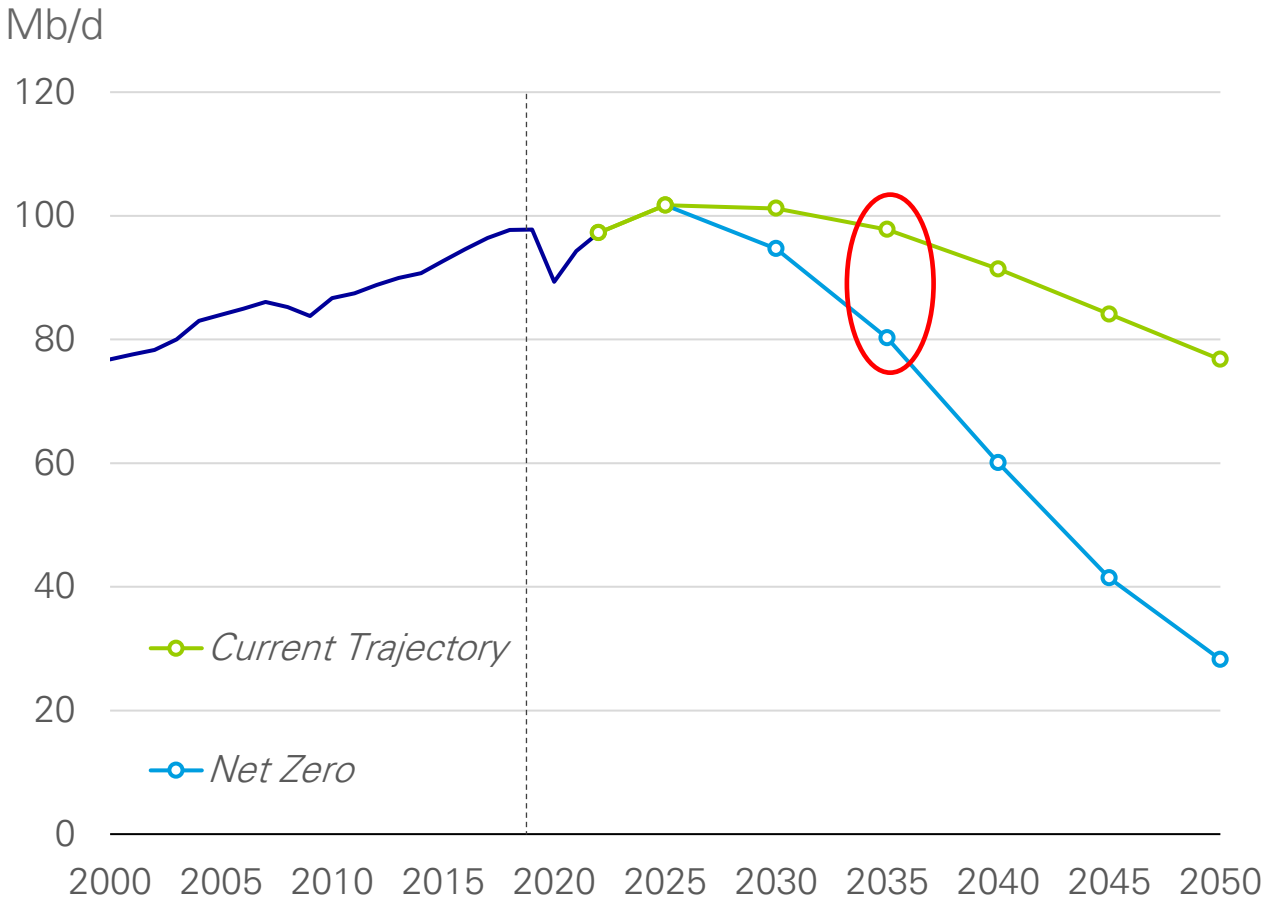


Accelerating the energy transition in the US

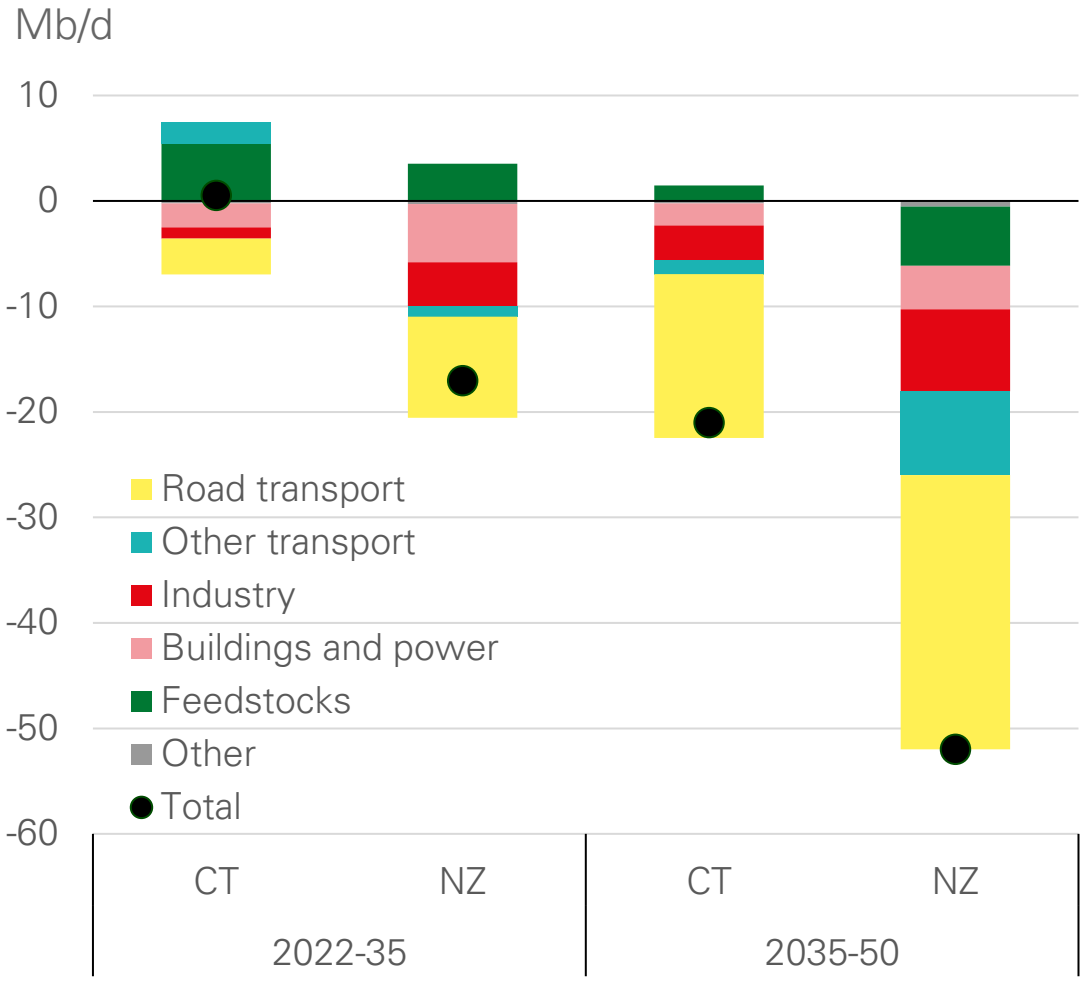


Feedstocks demand grows while road transport demand falls

Oil demand

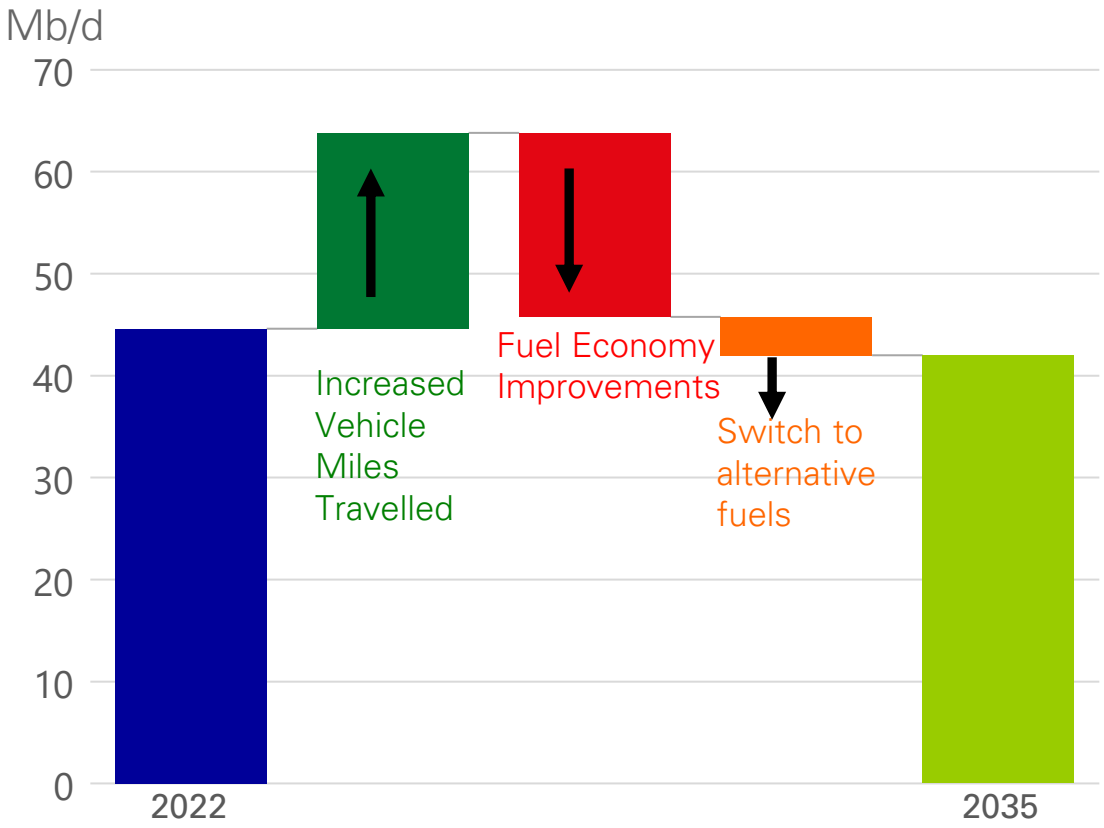


Change in oil demand by sector

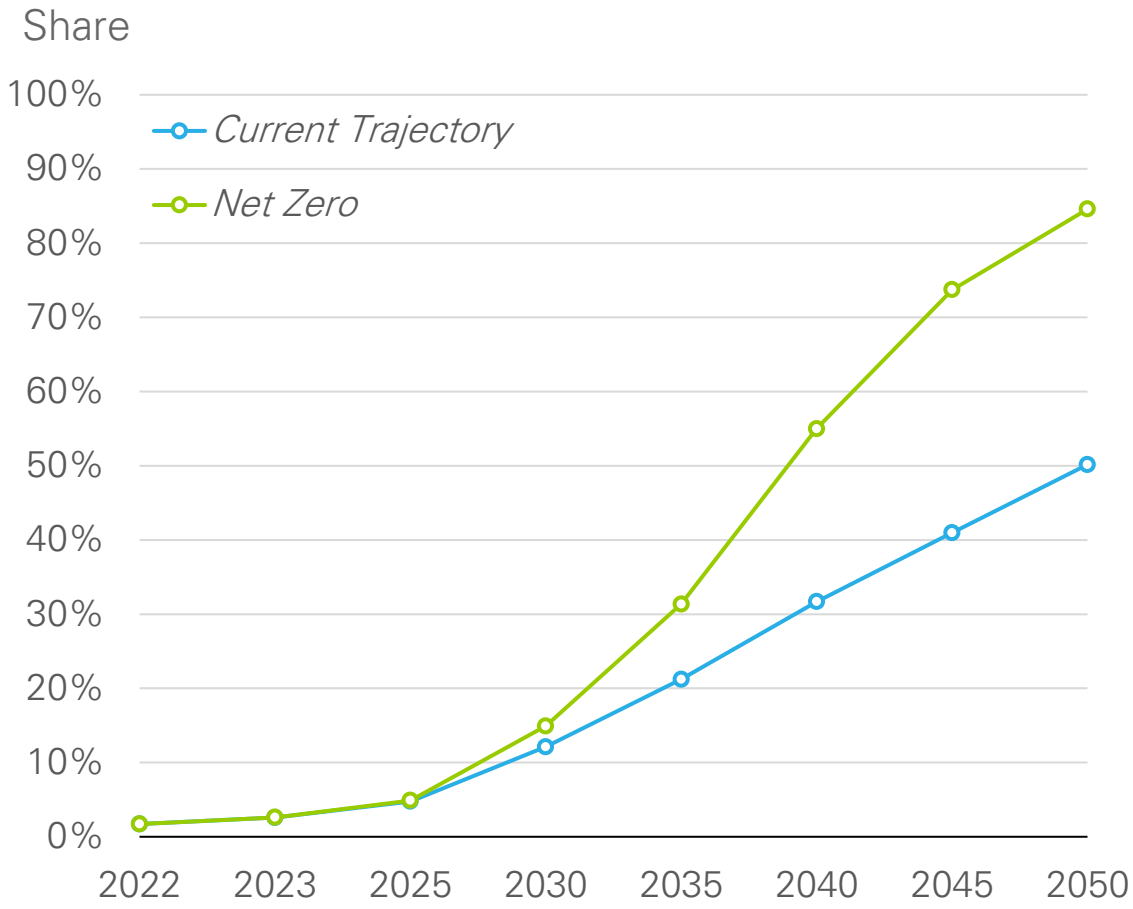


Factors affecting oil demand in road transport

Factors driving change of oil use in road transport in *Current Trajectory*

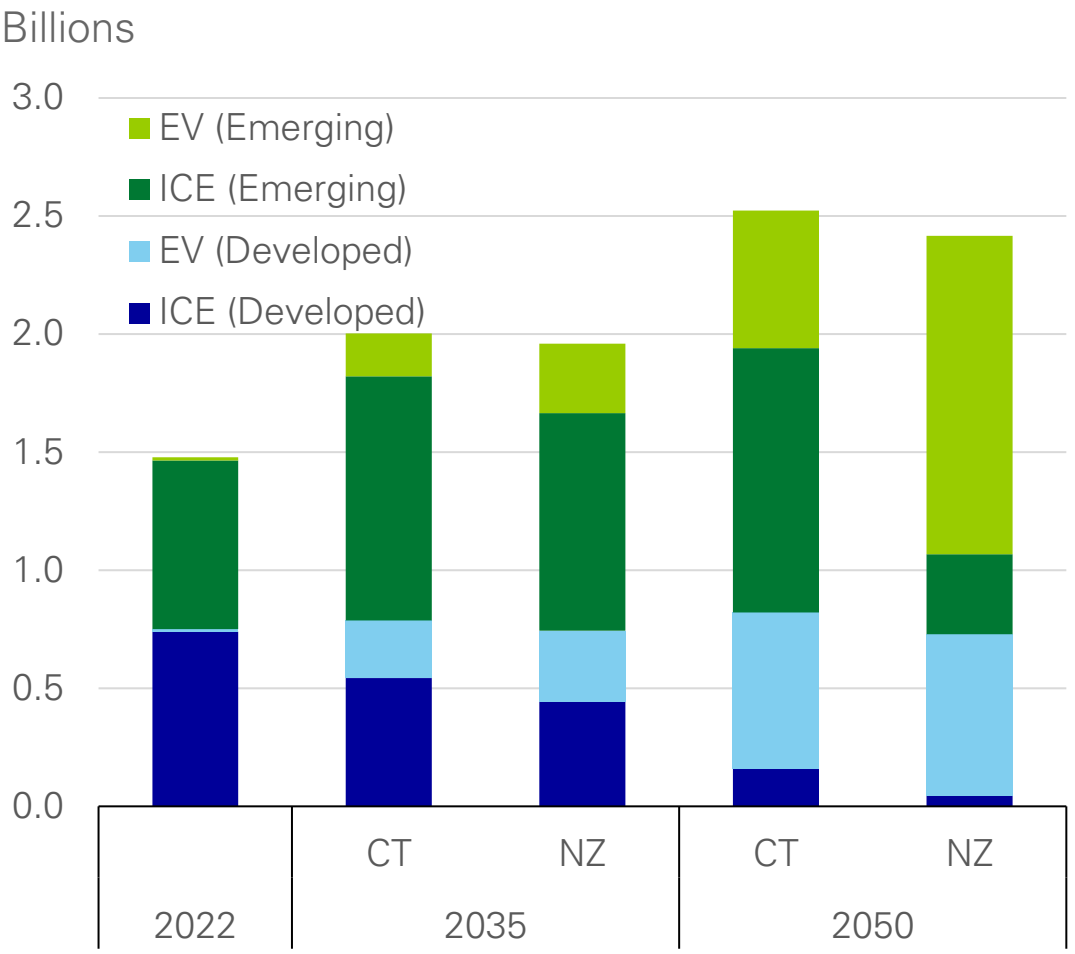


Share of electrified LDVs in new sales

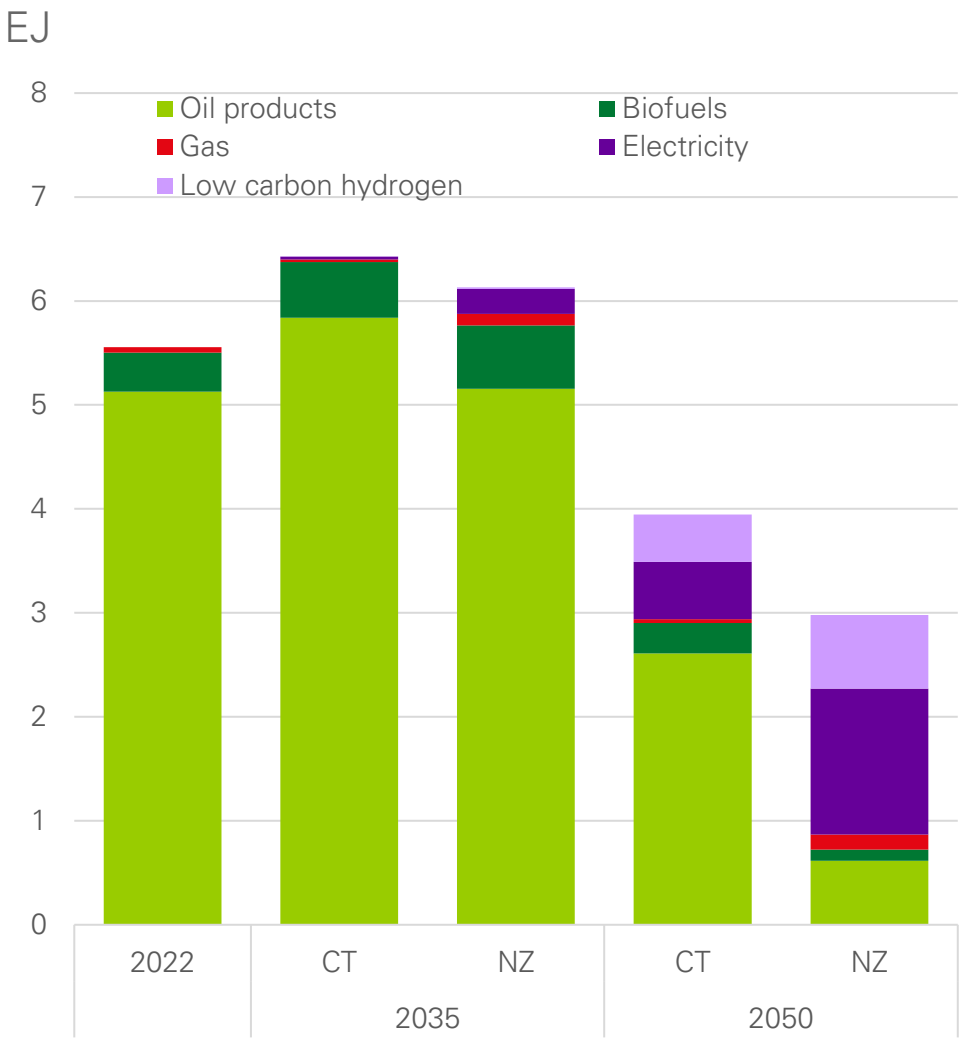


Road transport electrification drives oil demand reduction

Light duty vehicles by technology and region

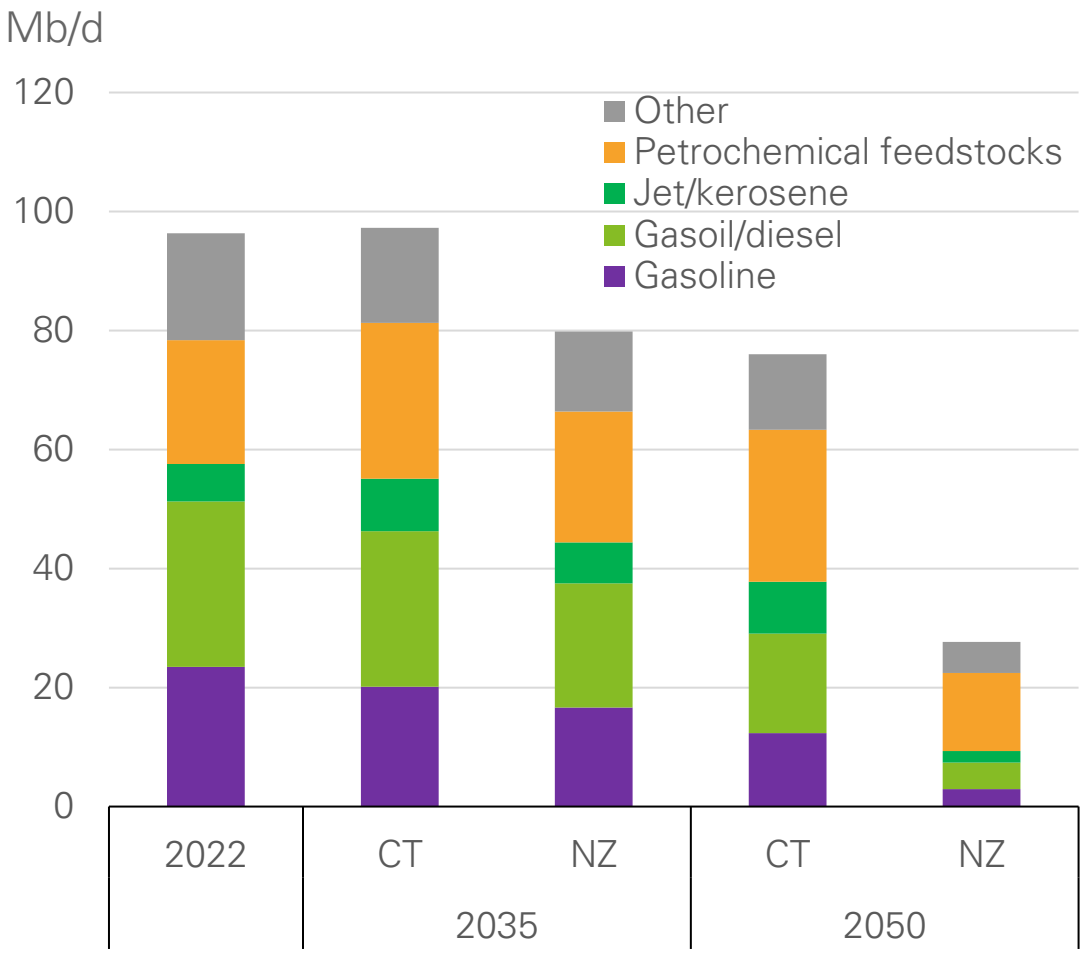


Medium and heavy duty vehicles: **US** transport energy mix by fuel

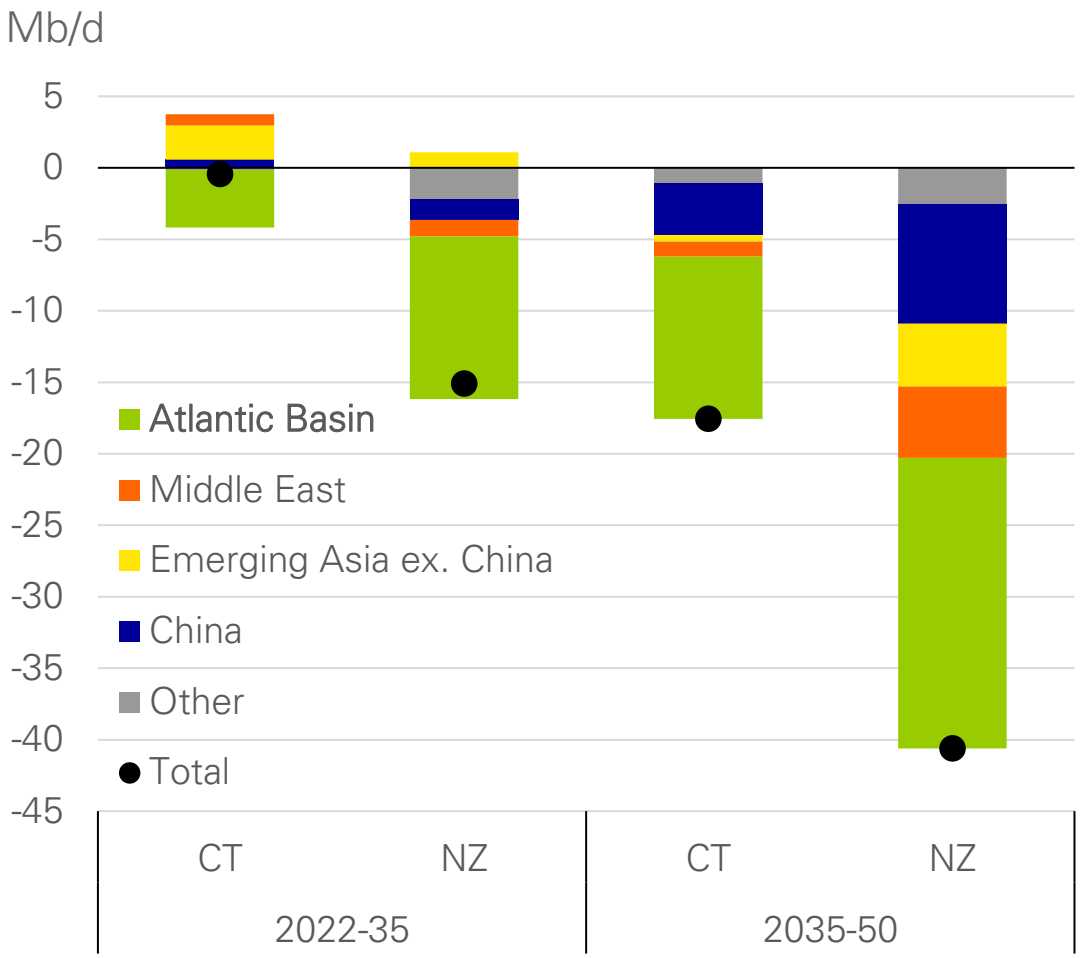


Fall in oil demand is reflected in the shifting patterns of product demand and refining activity

Product Demand

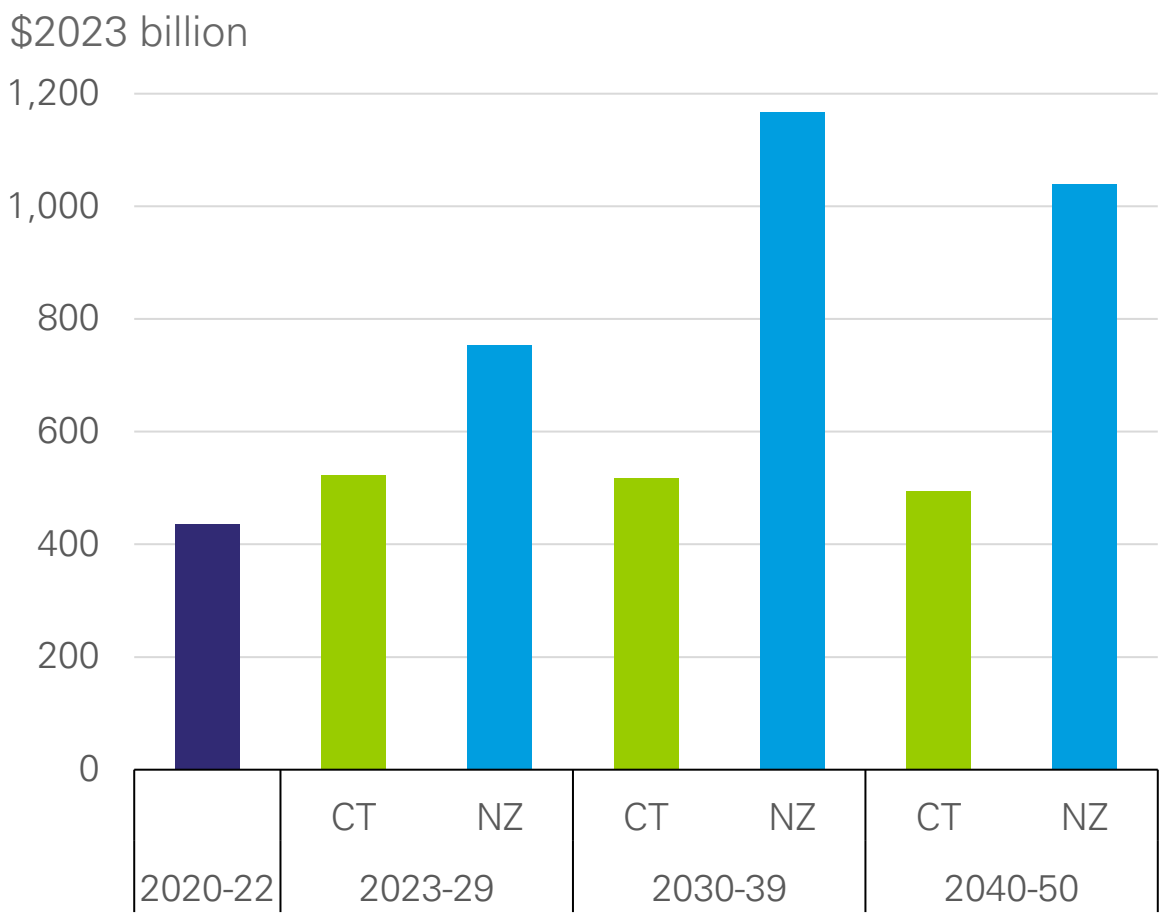


Change in refining throughput by region

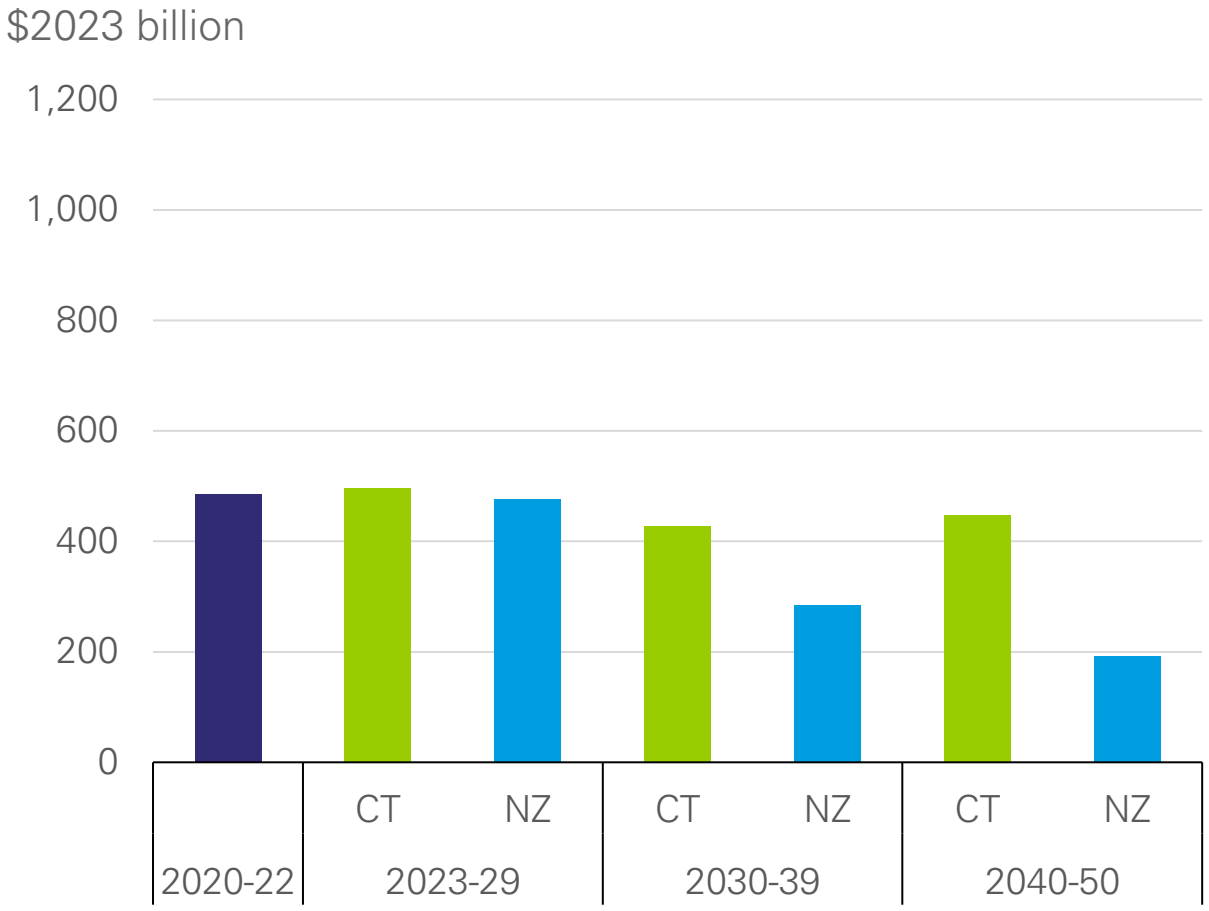


Investment in wind and solar needs to increase alongside continued investment in oil and gas

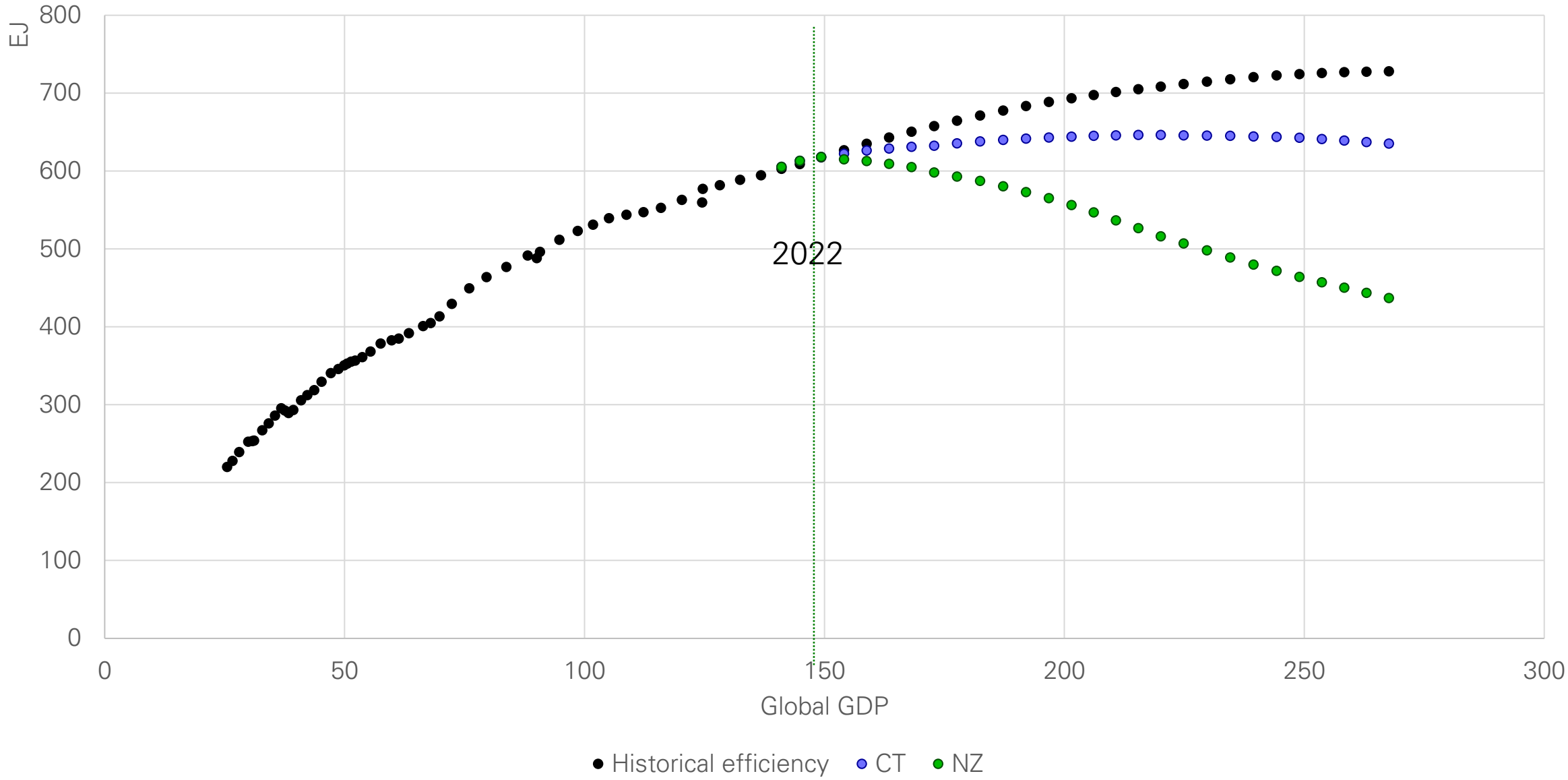
Average annual investment in wind and solar



Average annual oil and gas upstream investment

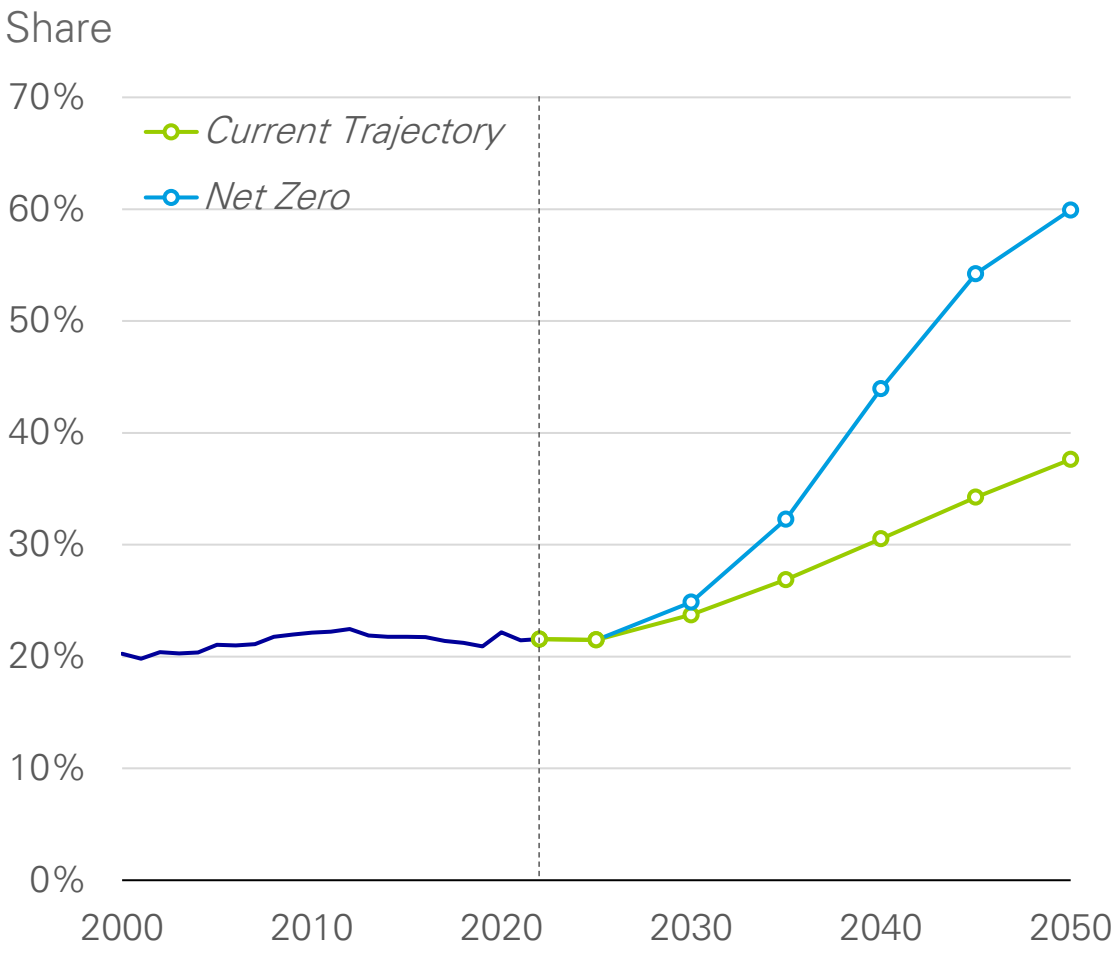


Primary energy 1970-2050 under alternative energy efficiency scenarios

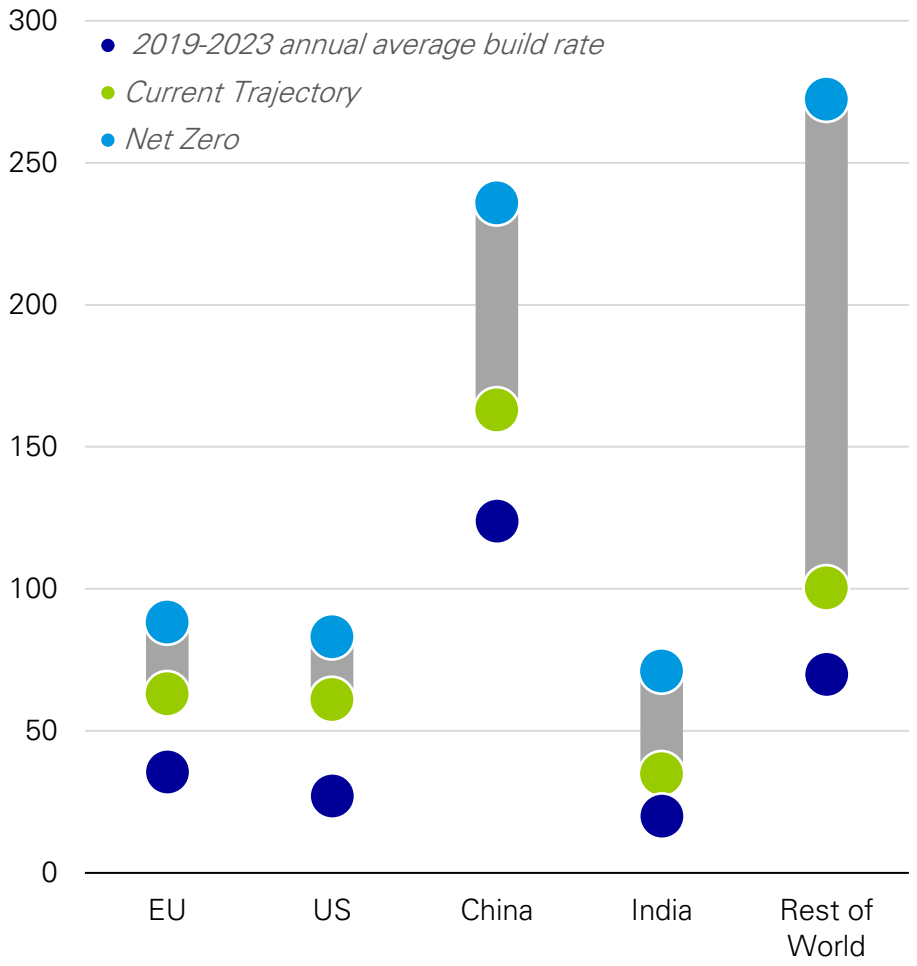


US energy system increasingly electrifies

Electricity as share of final **US** energy demand

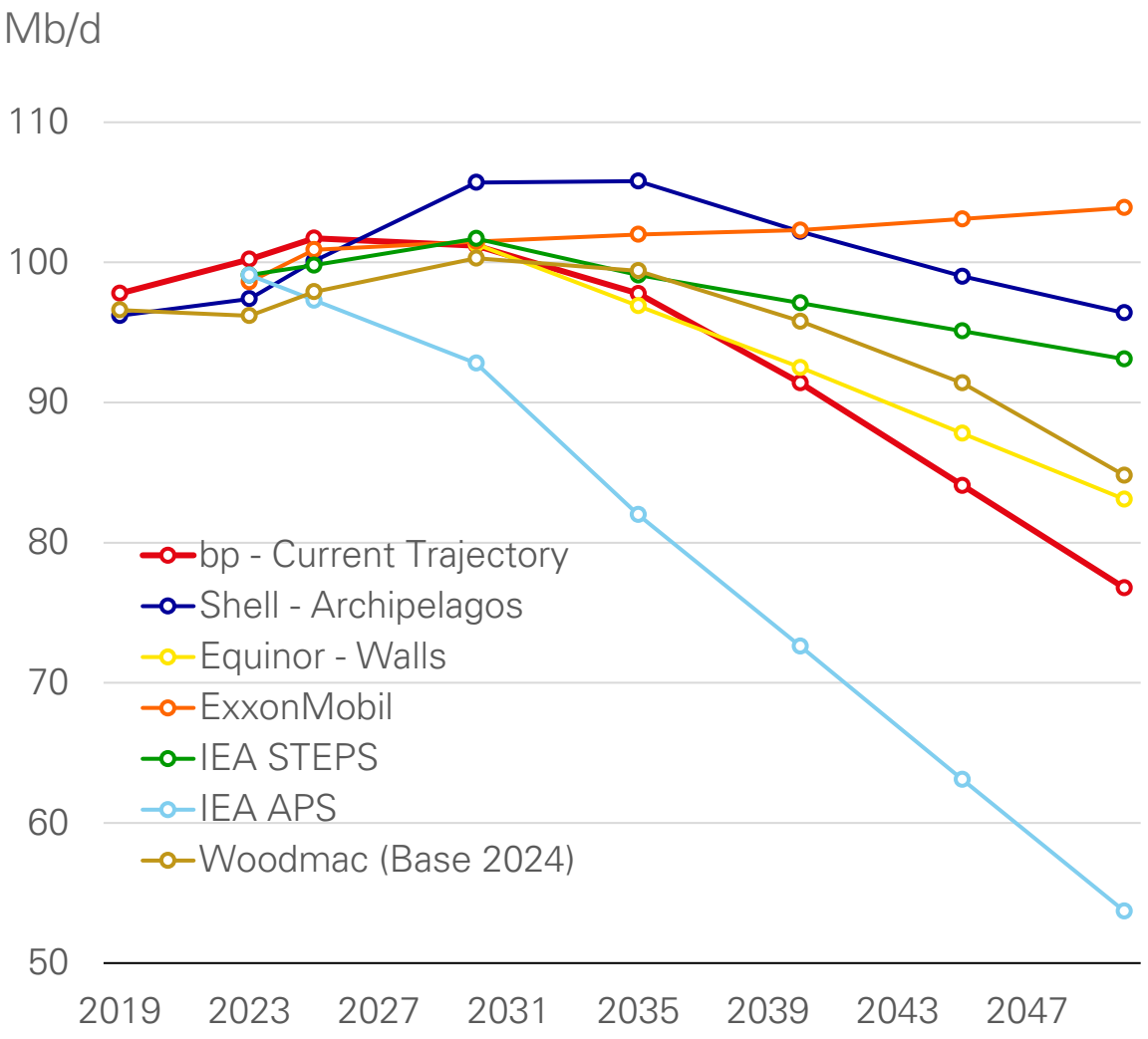


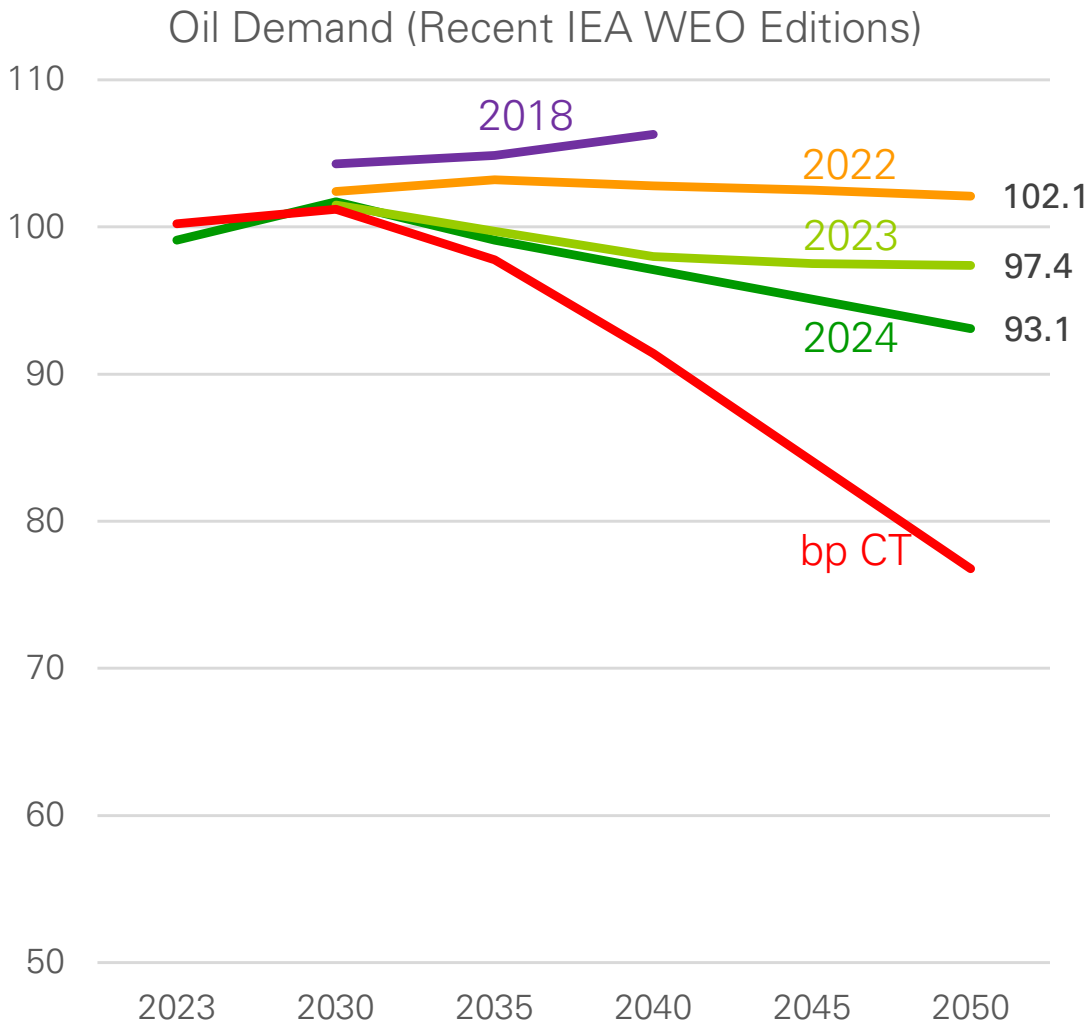
Average annual build rate of wind and solar (2024-35)



Oil Demand: Scenario design matters

Oil Demand Comparison to 2050





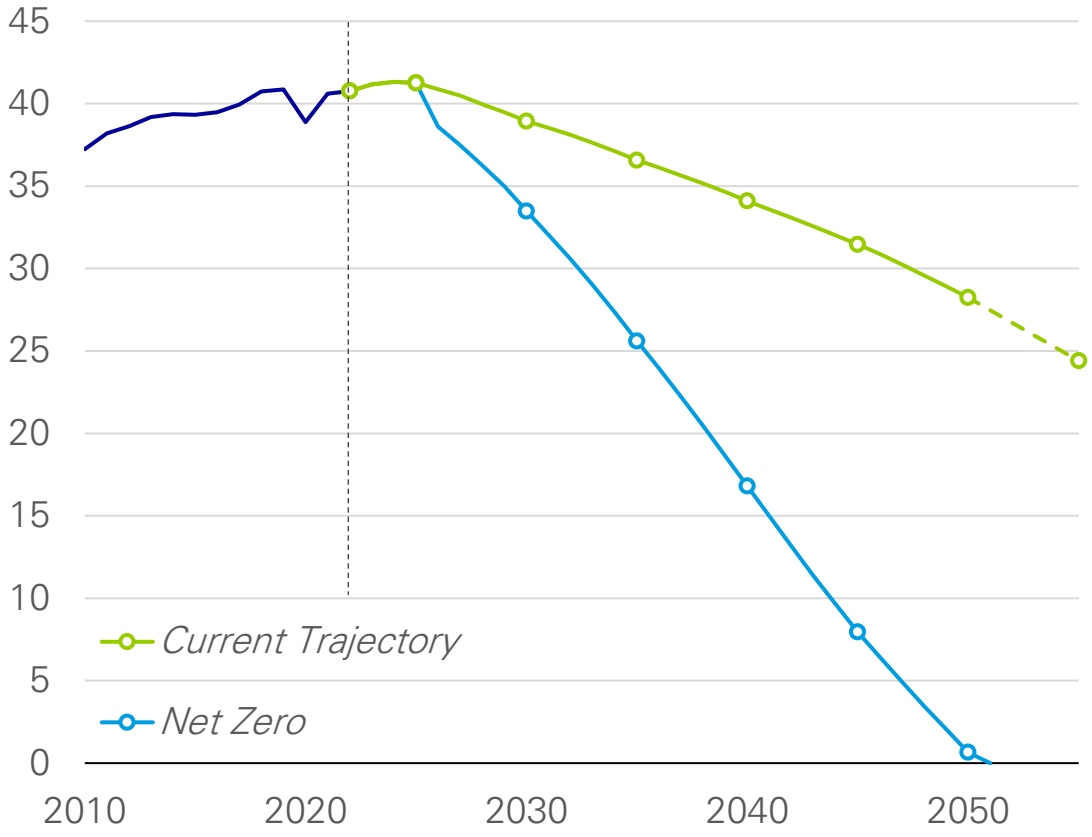
Source: IEA STEPS Scenarios: 2018, 2022, 2023, 2024

Implications of Delay

Implications of delay

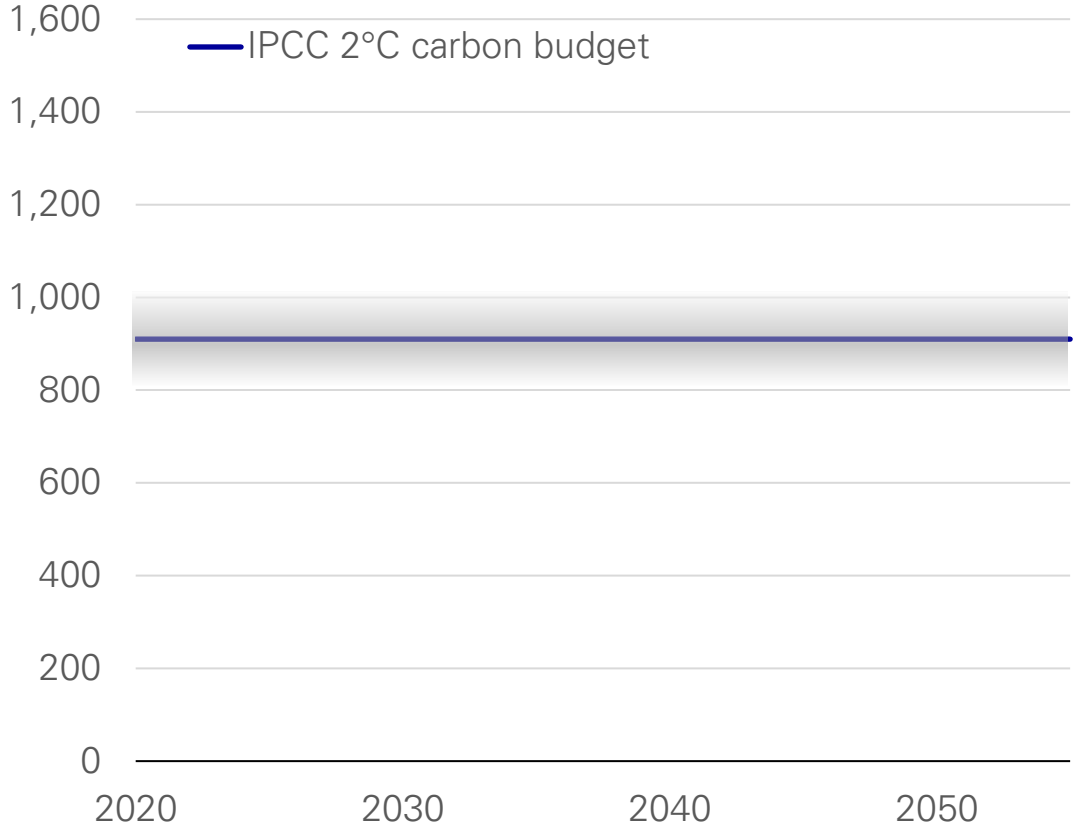
CO_2 emissions

Gt of CO_2



Cumulative CO_2 emissions, 2020 onwards

Gt of CO_2



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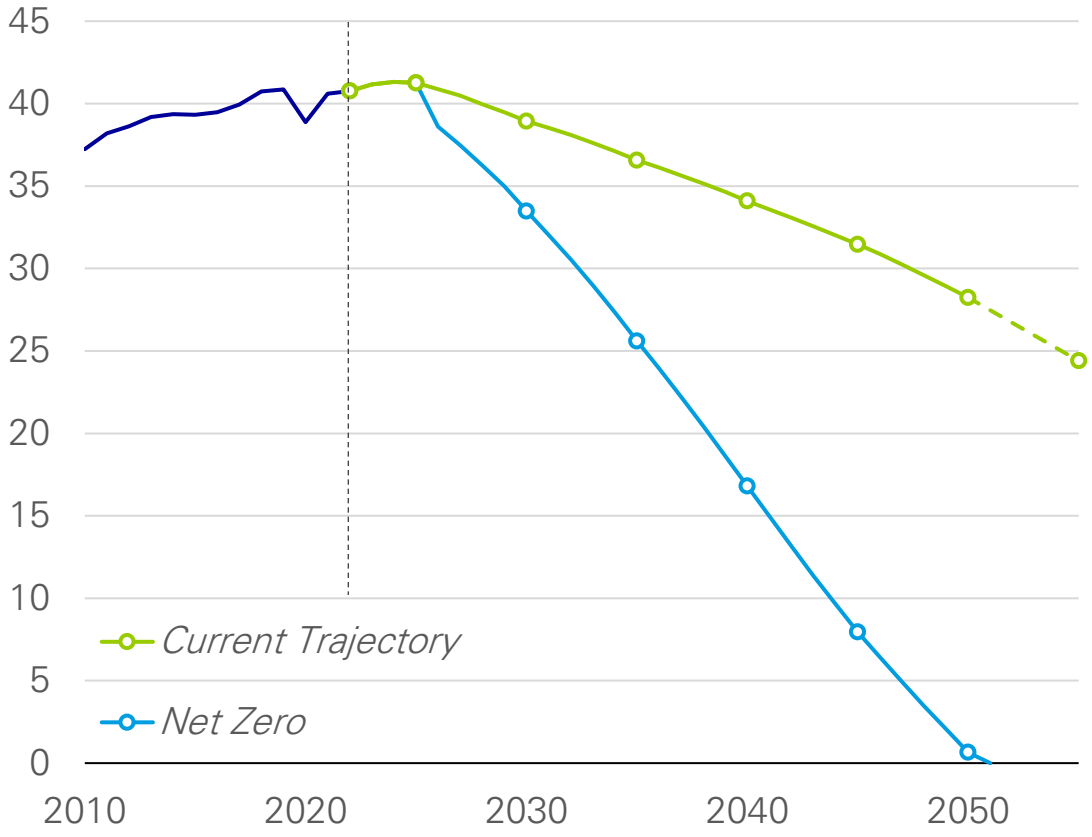

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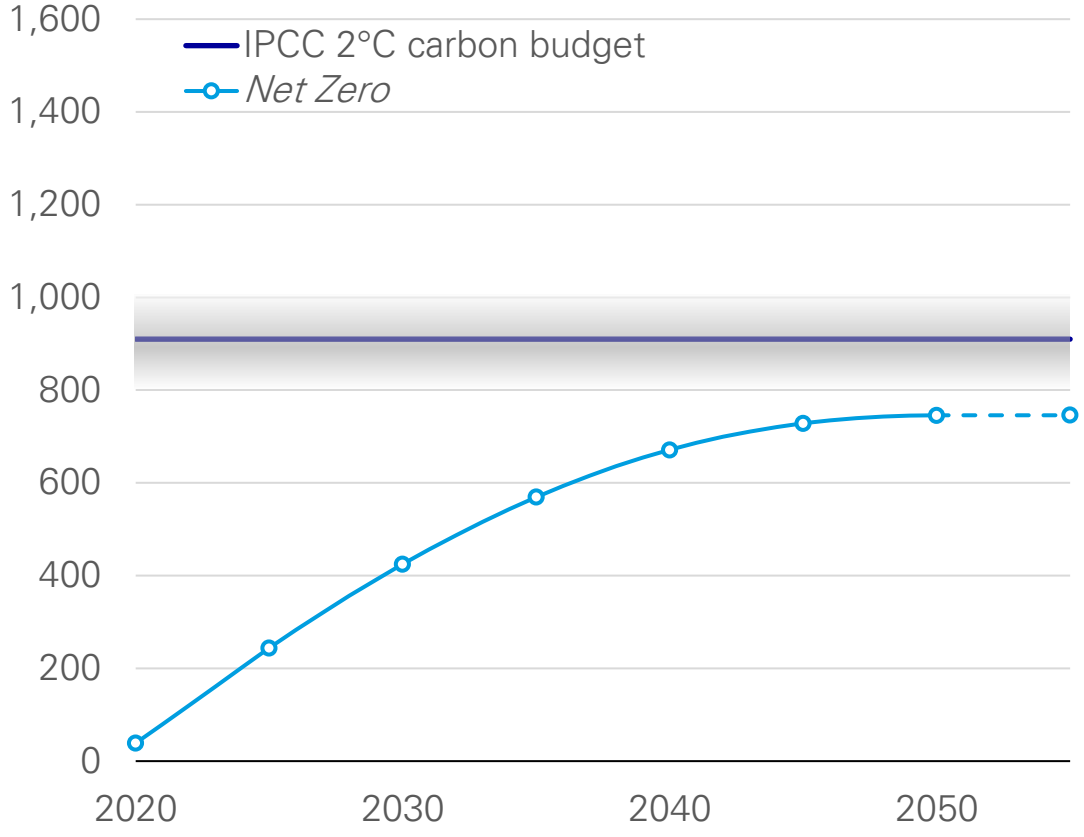

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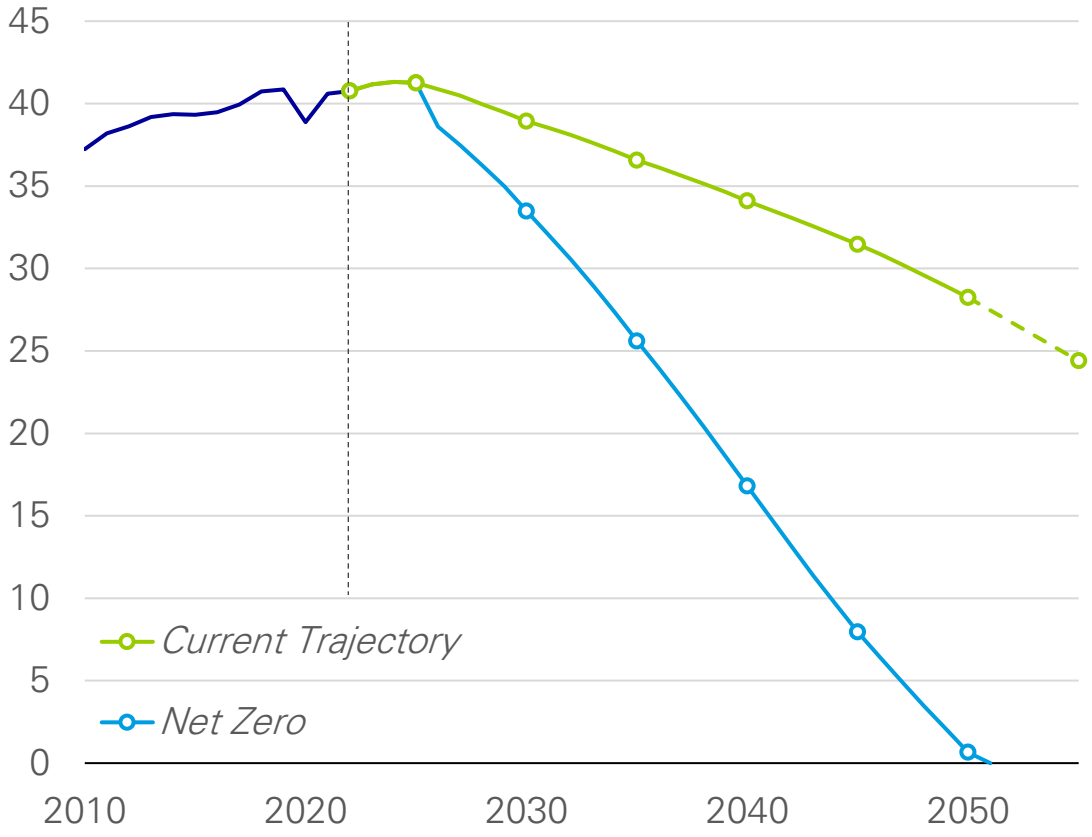

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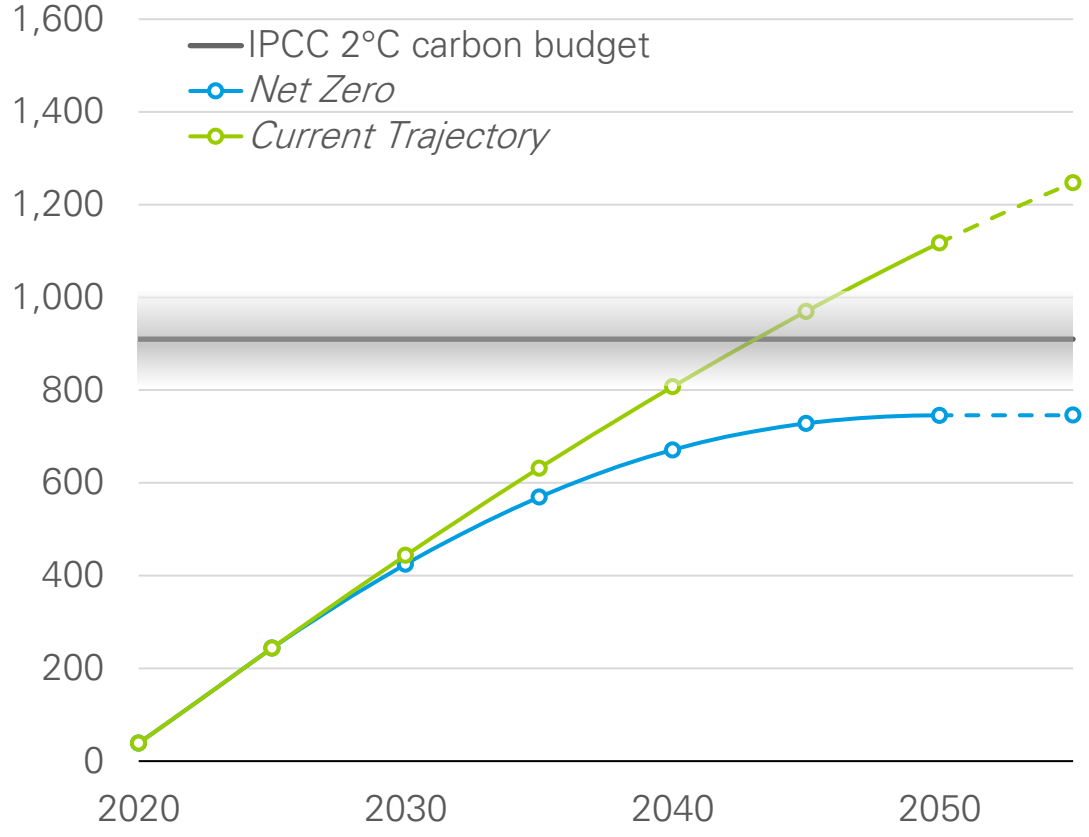
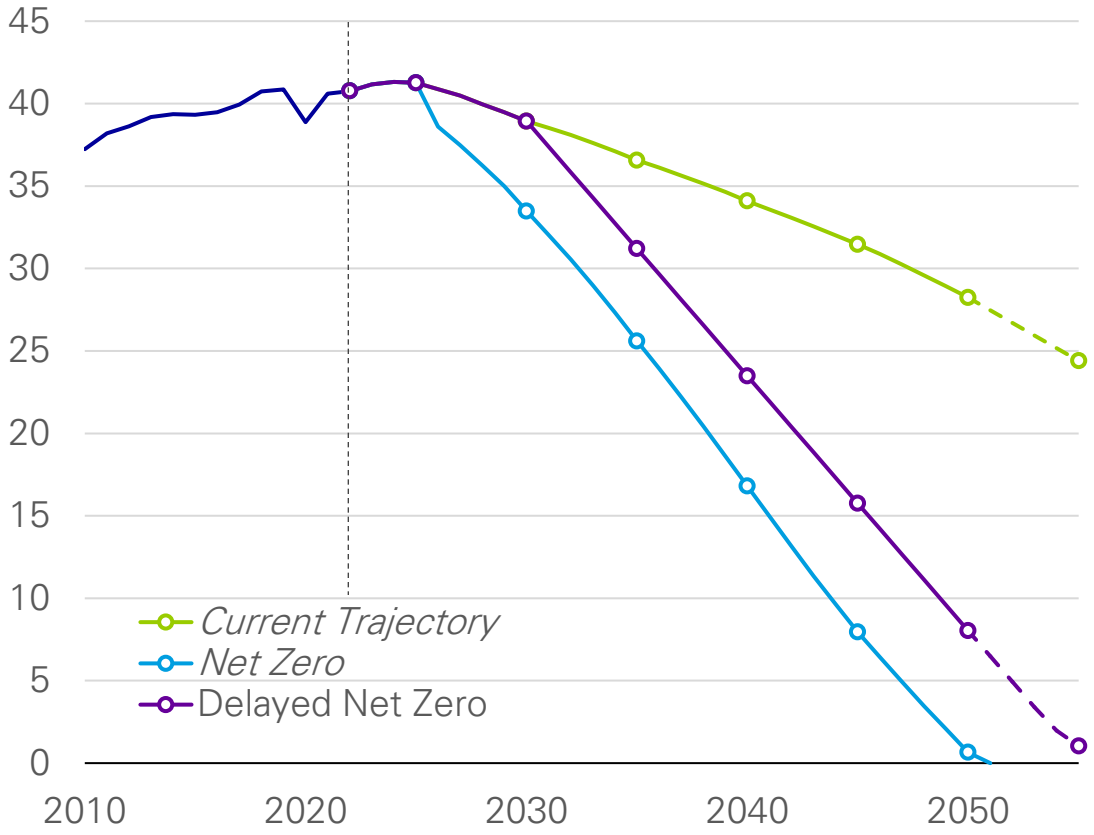


Implications of delay

CO_2 emissions

Gt of CO_2



Cumulative CO_2 emissions, 2020 onwards

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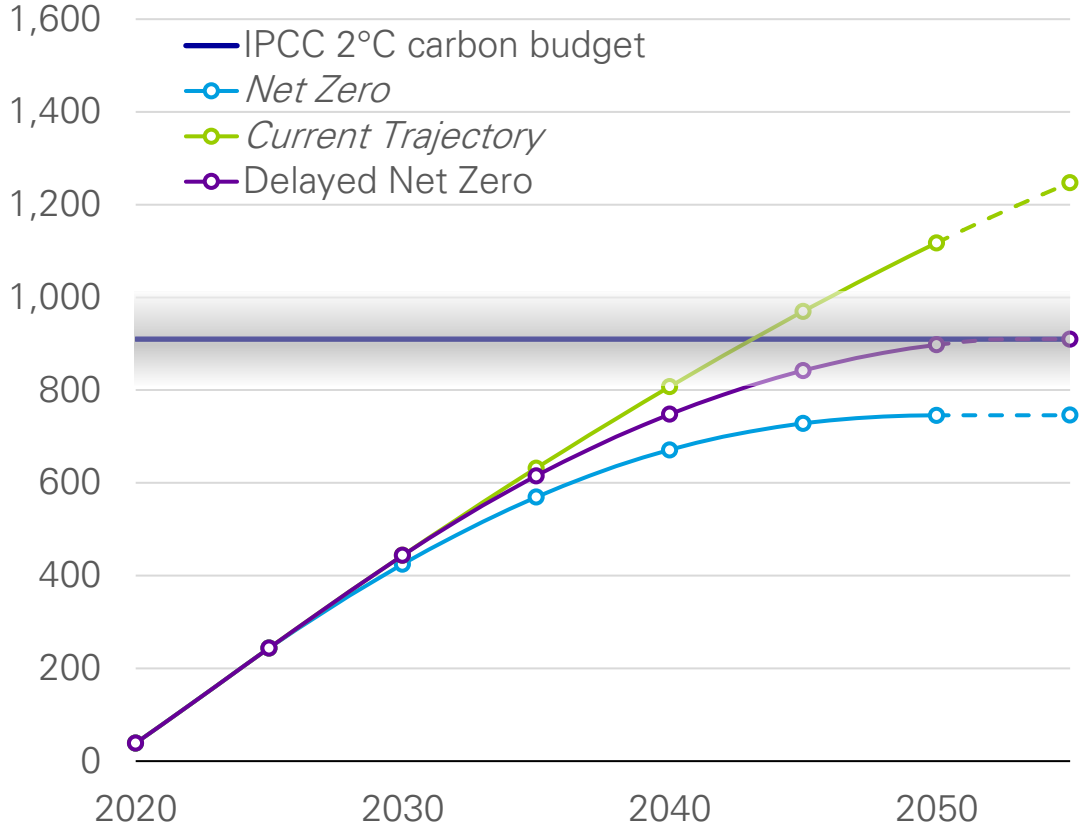

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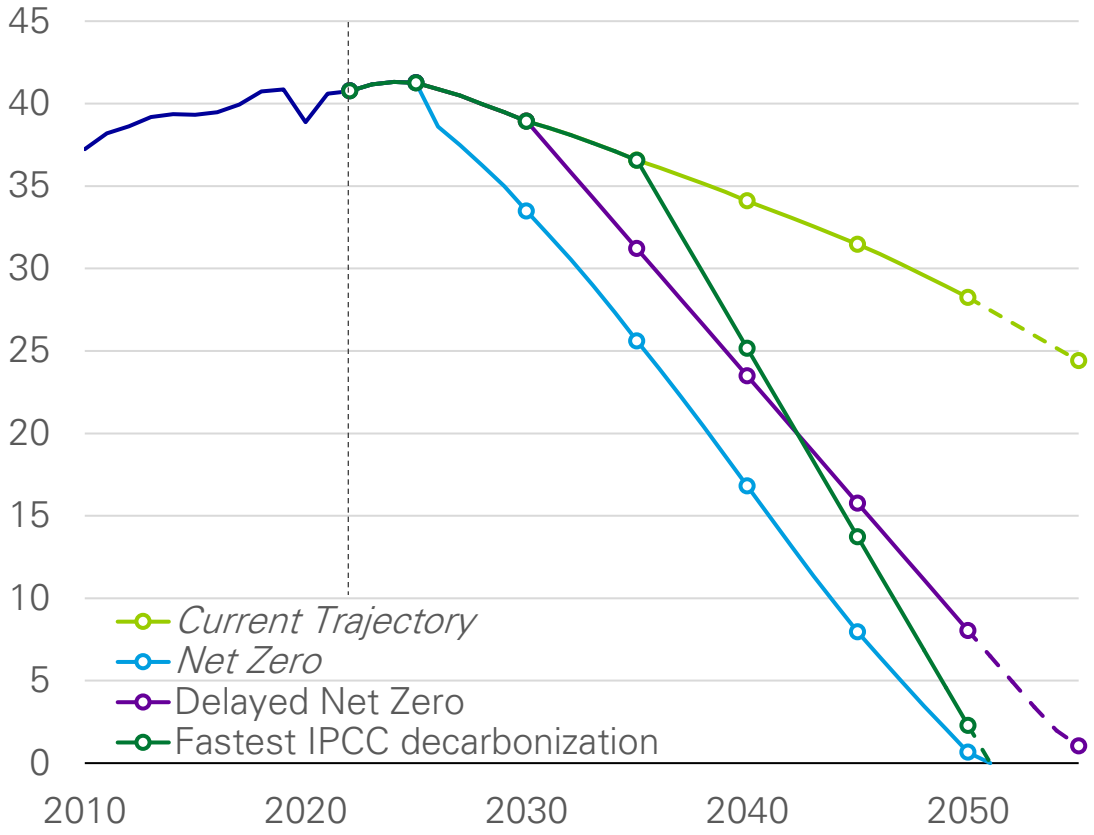

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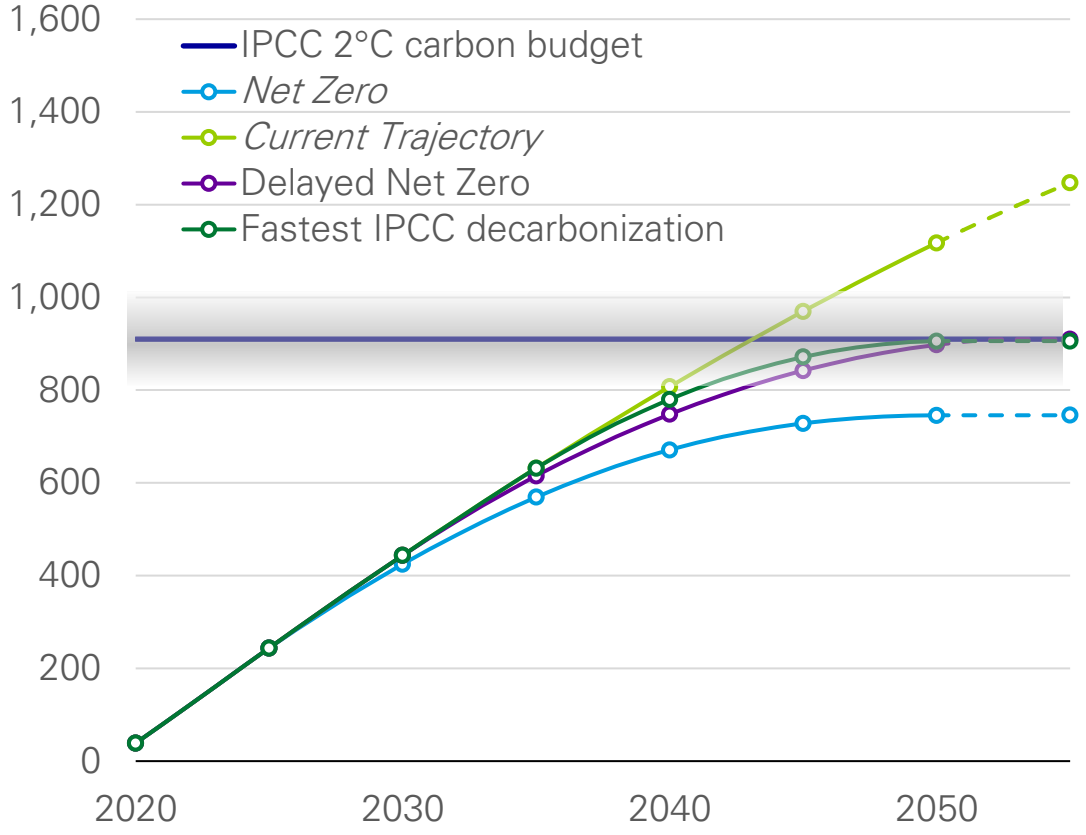
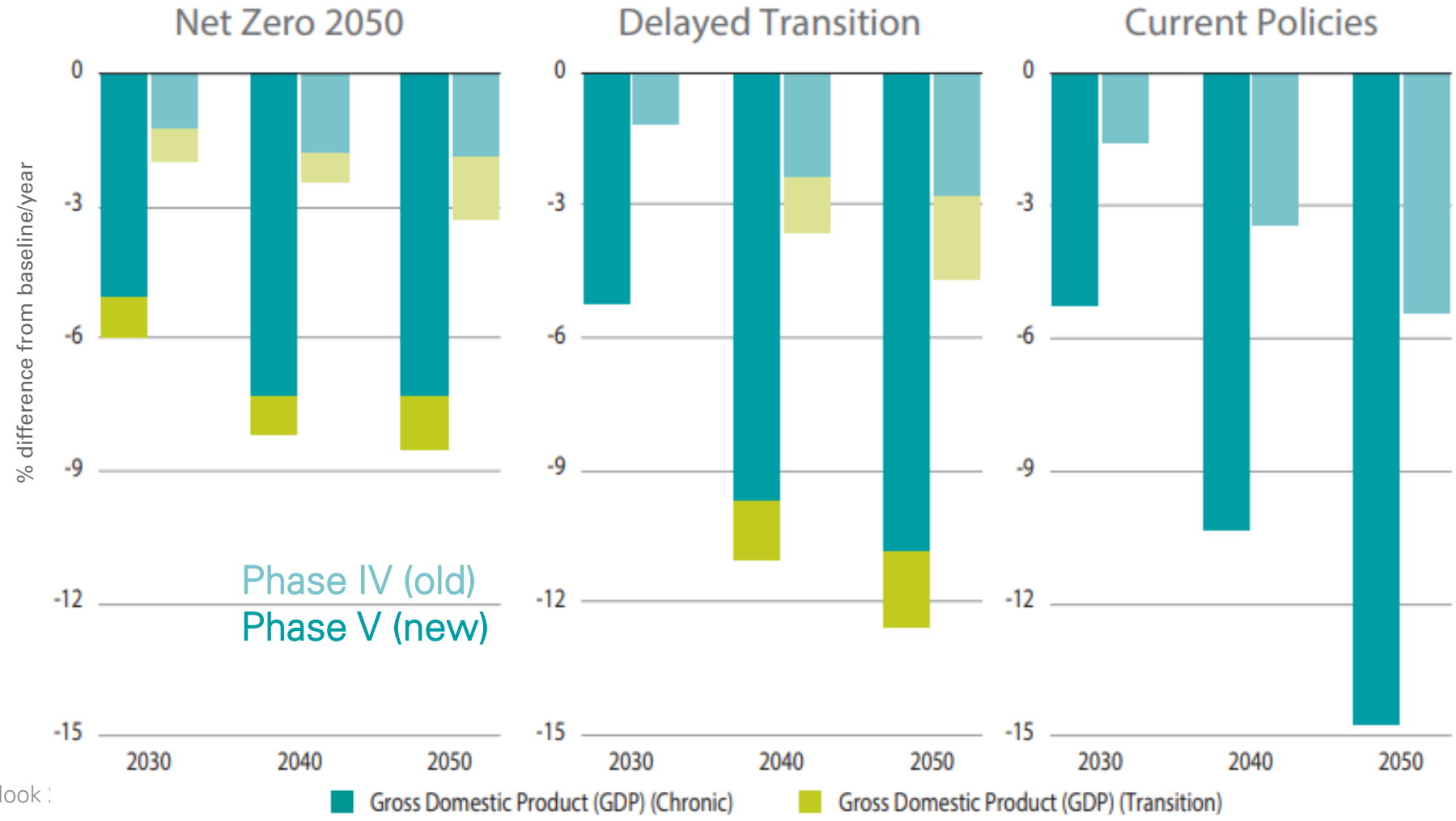


Implications of delay

Global GDP impact by risk source across scenarios compared with a baseline scenario in which no transition or physical risks occur



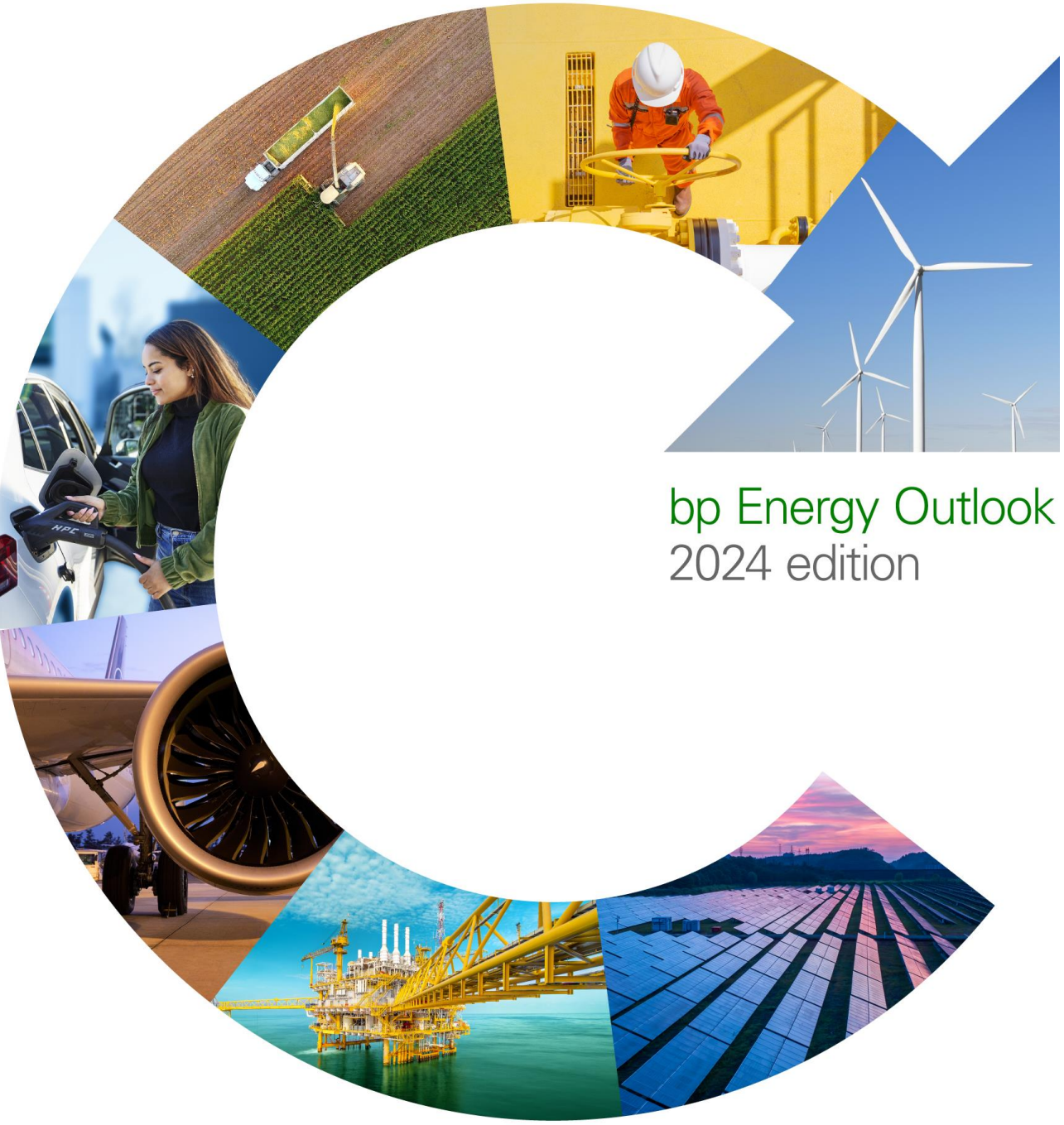
Source: NGFS long-term scenarios for central banks and supervisors, Nov. 2024.

Key messages

- US already in an energy substitution phase of the transition, but the move away from fossil fuels has been slower in other countries while energy demand increases quickly.

- Energy efficient technologies reduce the long term demand for fossil fuels. Variation among outlooks comes from scenario design and assumptions associated with efficiency.

- A delay much beyond the early to mid 2030s, would involve costly or ‘disorderly’ measures to keep emissions within a 2°C carbon budget. Cost of inaction greater than cost of action.



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