Energy Outlook
2020 edition

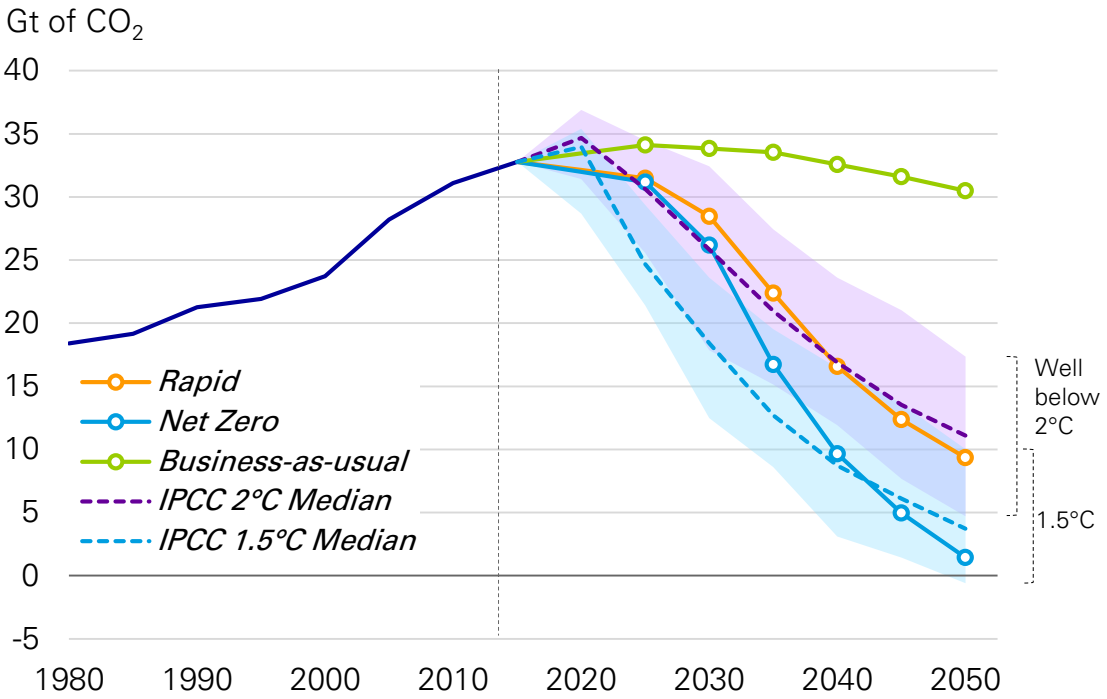
Michael Cohen
Chief US Economist & Head of Oil Analysis
Economic and Energy Insights

Key questions

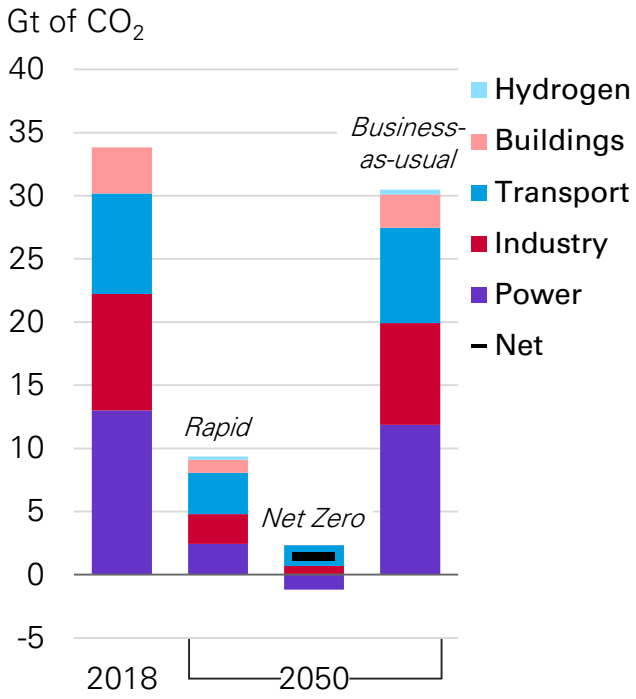
1. What do we know?
2. How will oil demand be affected by the mobility revolution?
3. What role could natural gas play in the energy transition?
4. Can wind and solar achieve high penetration in the power sector?
5. What does a net zero world look like?
6. What are the dangers of delaying the energy transition?

Three scenarios to explore the energy transition

Global carbon emissions from energy use



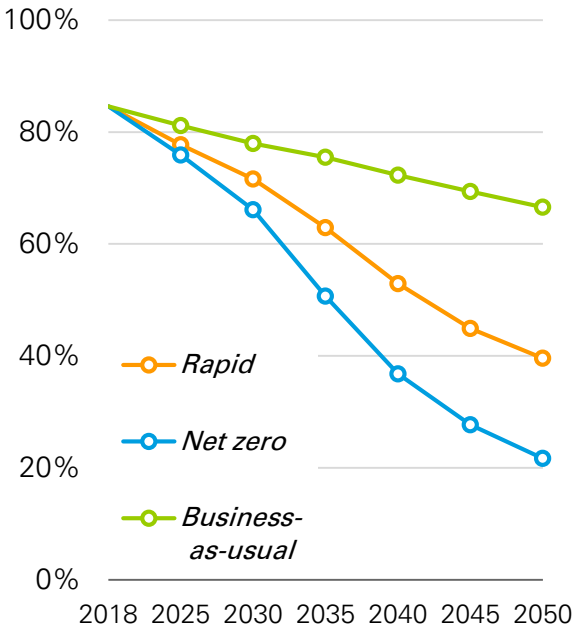
Carbon emissions by sector



Changing structure of global energy demand

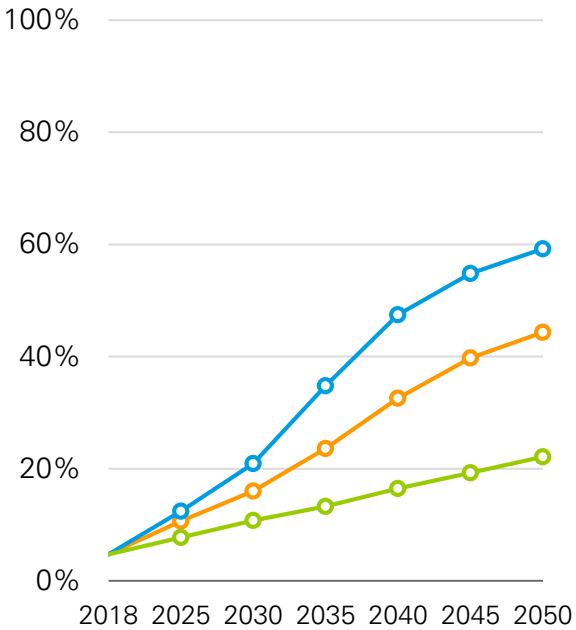
Fossil fuels

Shares of primary energy



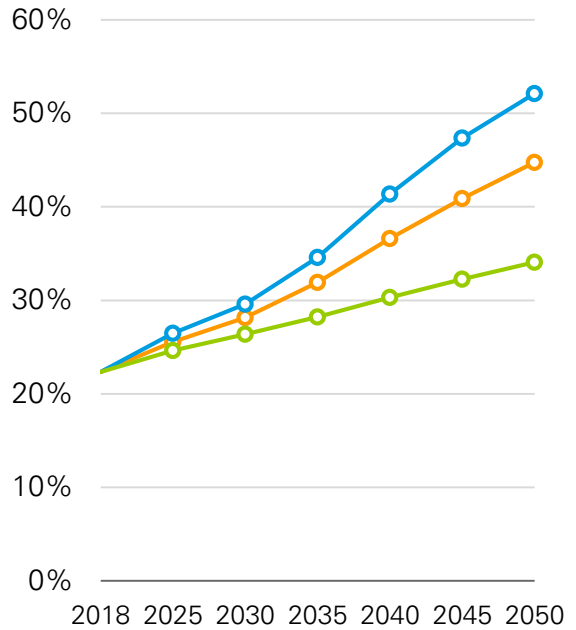
Renewables

Shares of primary energy

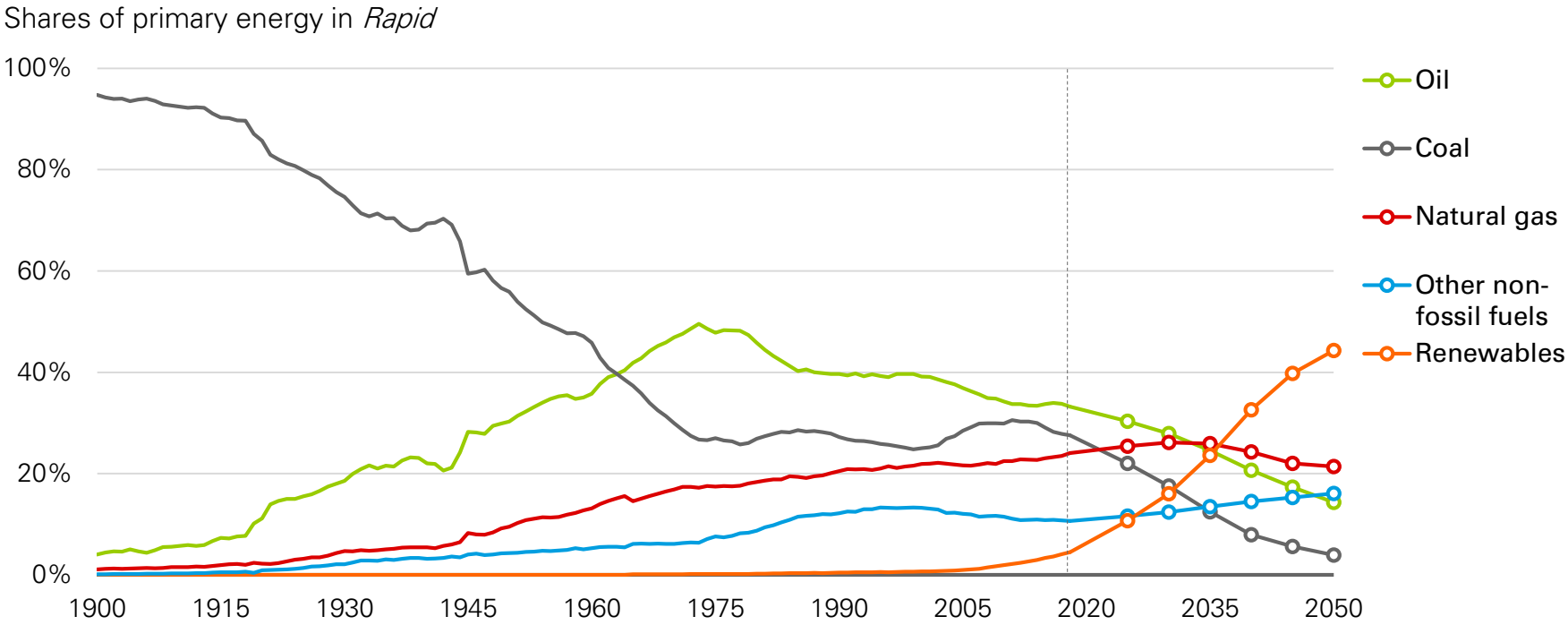


Electricity

Share of total final consumption

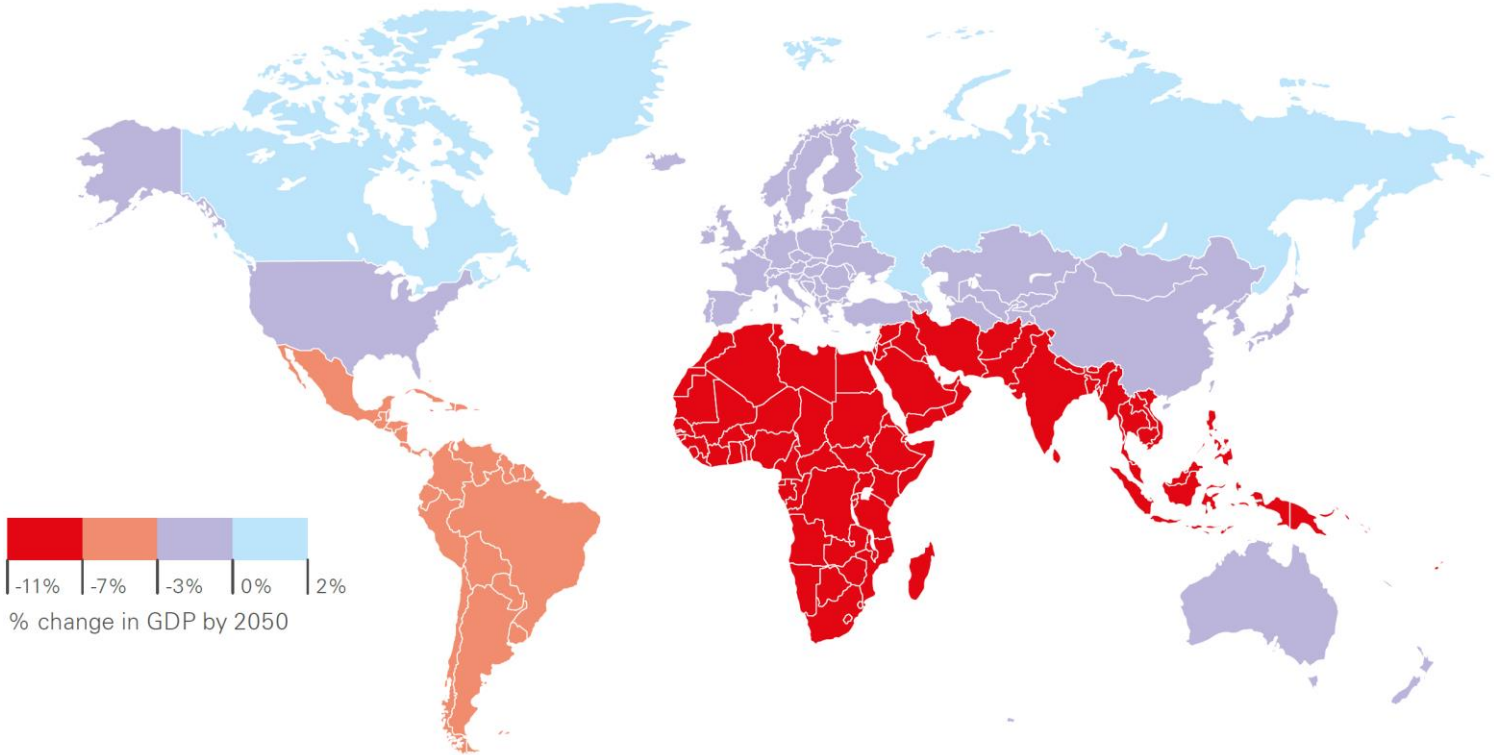


Changing structure of global energy system



The impact from climate change on growth…

Climate change impact on level of GDP in 2050



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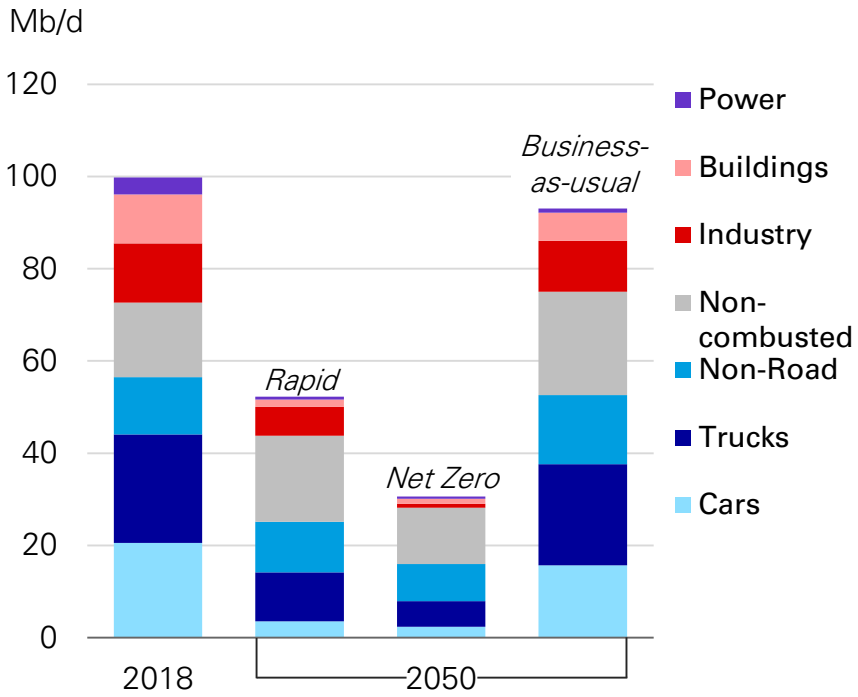
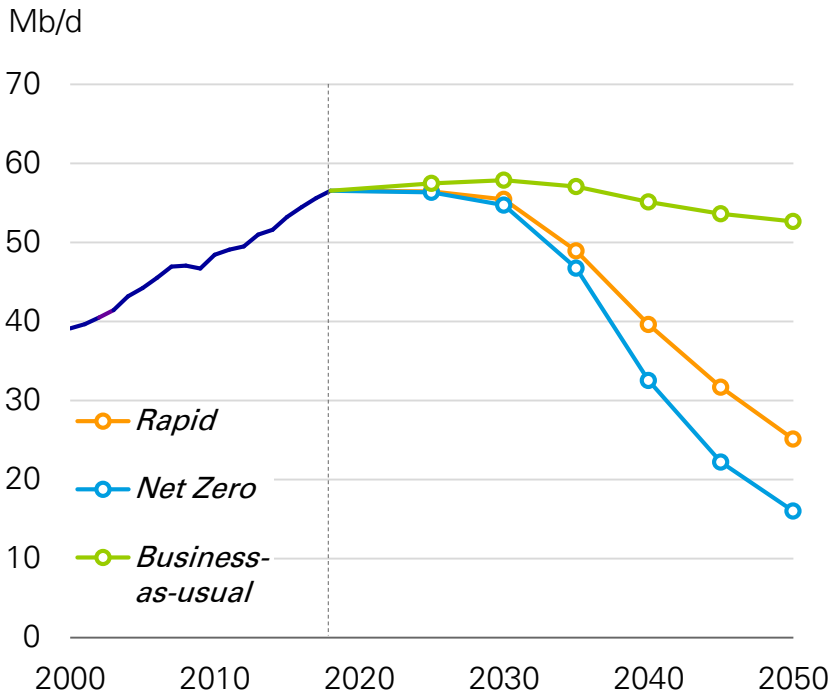
Transport dominates the outlook for liquid fuels demand

Liquid fuels demand by sector

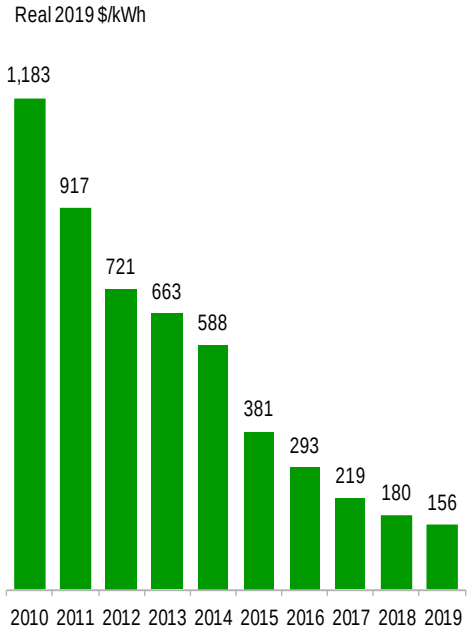


Consumption of liquid fuels in transport



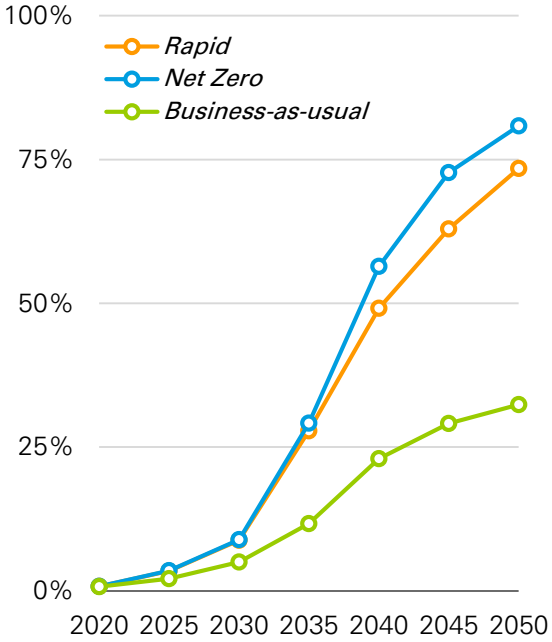
Electrification and emissions standards drive trajectory

20%/y reduction in battery costs since 2010



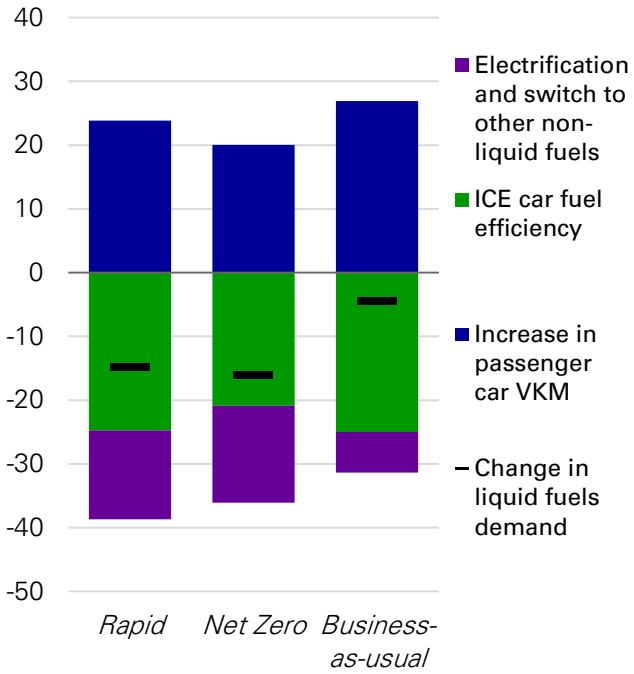
Source: BNEF

Share of car and truck vehicle kilometres electrified*



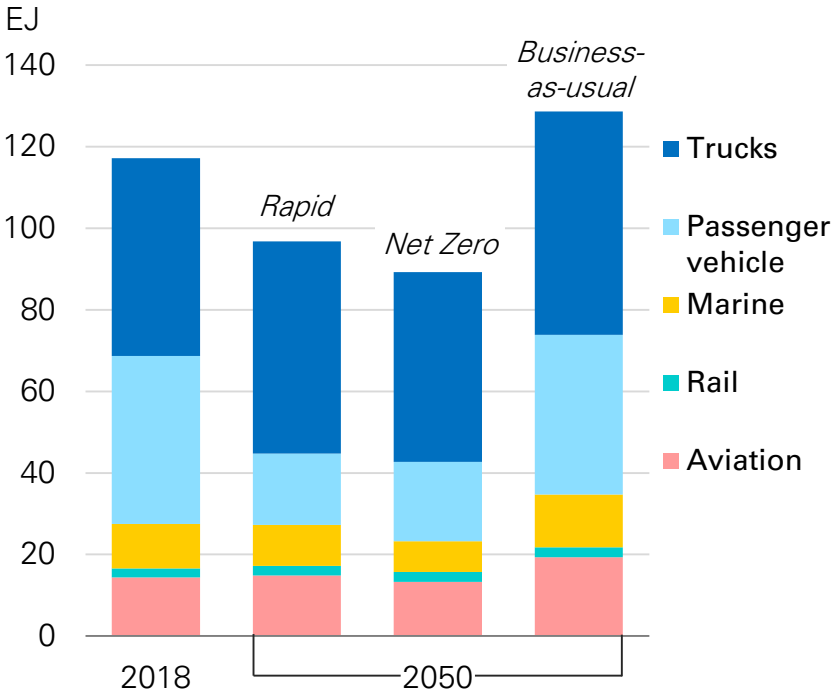
Factors impacting passenger car liquid fuels demand

Mb/d

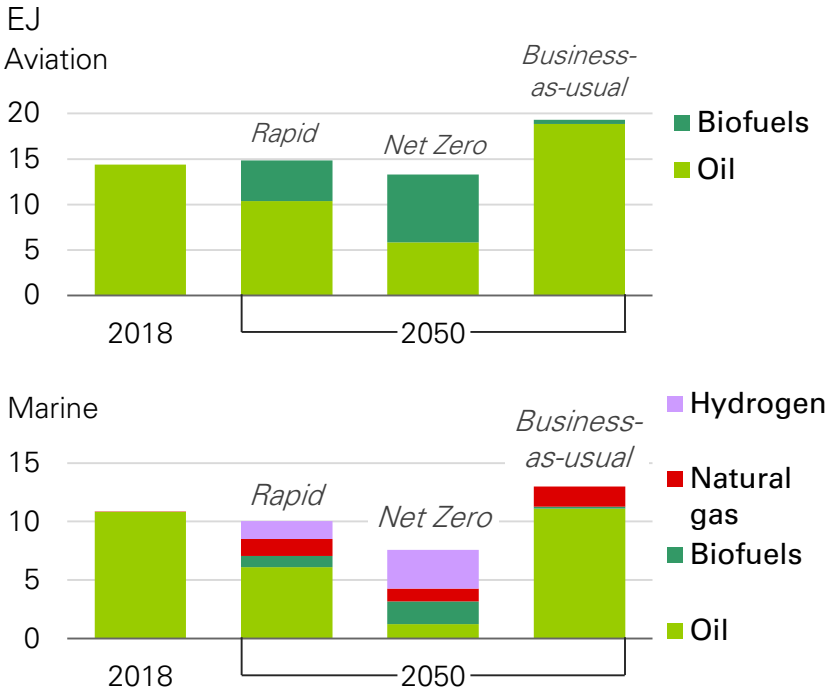


Biofuels and hydrogen play a key role in decarbonizing…

Total final energy demand in transport by mode



Aviation and marine demand by source



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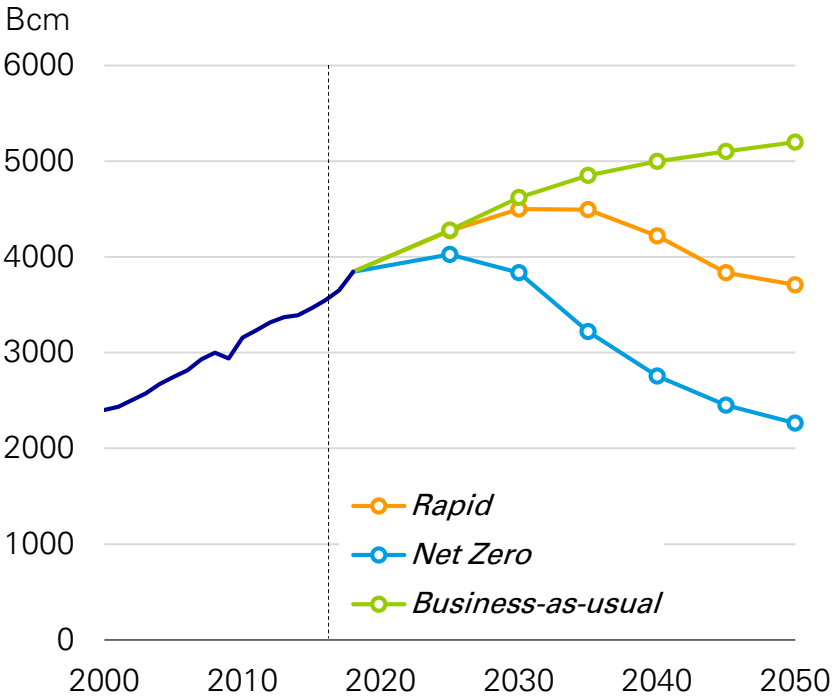
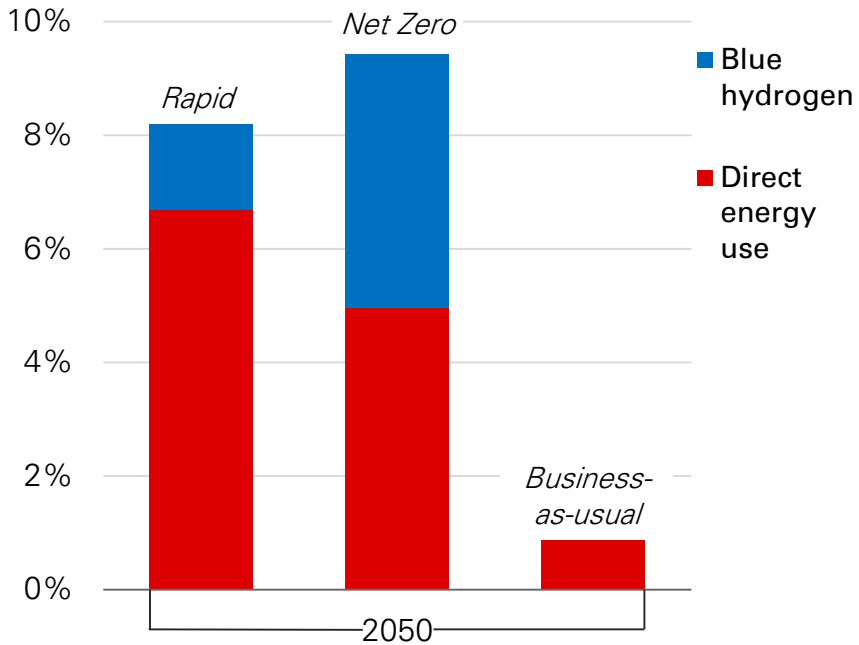
Outlook for natural gas

Natural gas consumption

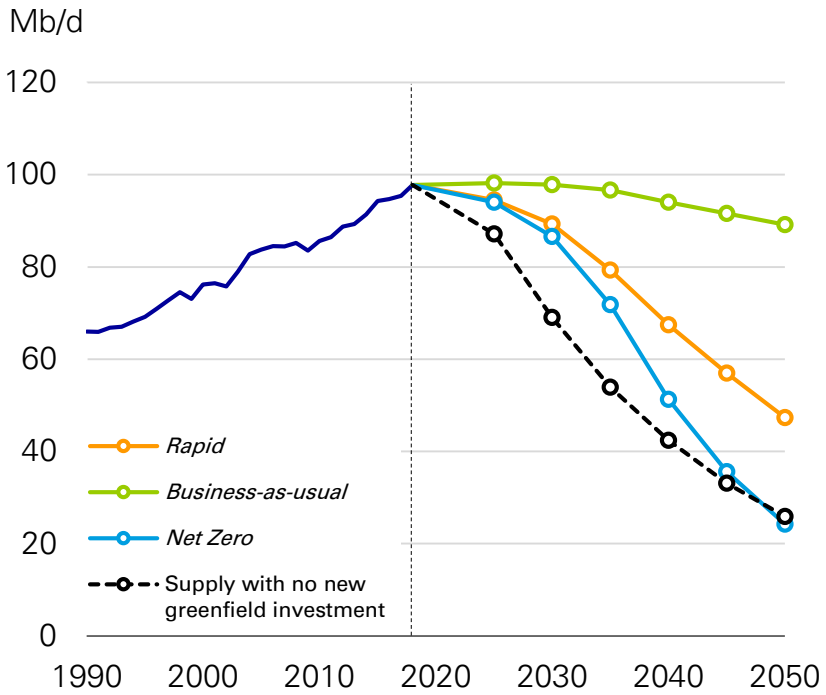


Natural gas with CCUS as a share of primary energy

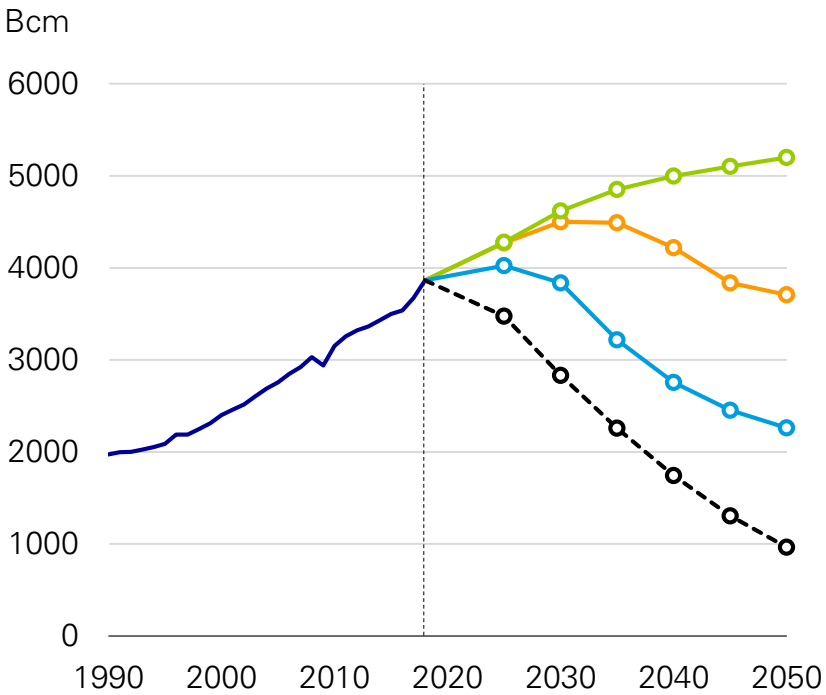


Significant investment in new oil and natural gas…

Consumption and production of oil



Consumption and production of natural gas



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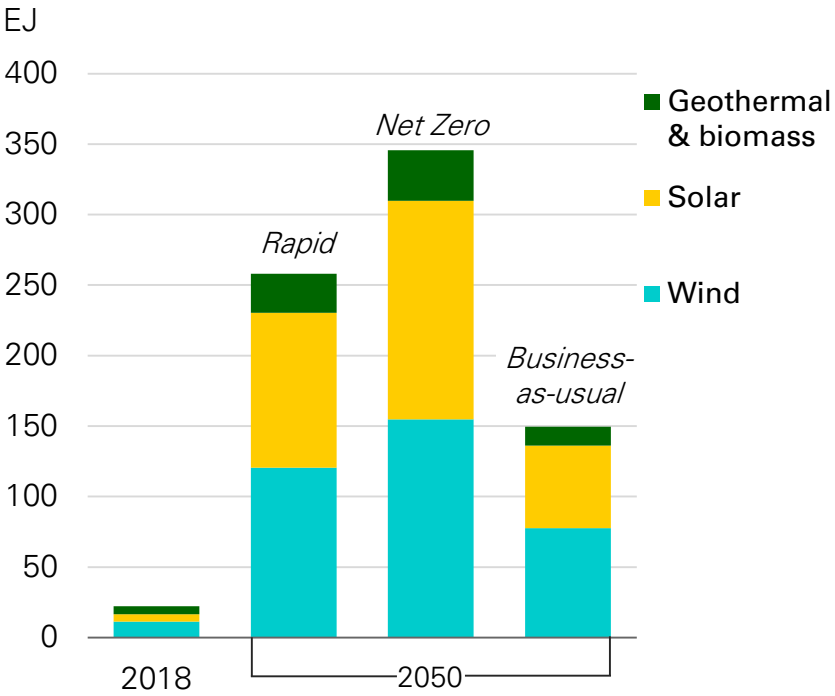
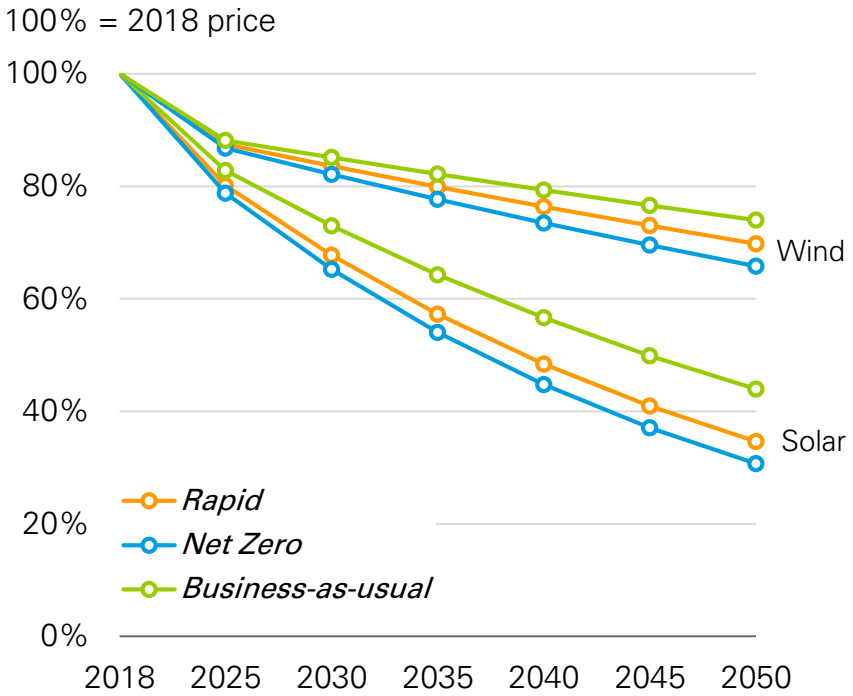
Renewable energy in power grows quickly

Renewable energy used in power sector

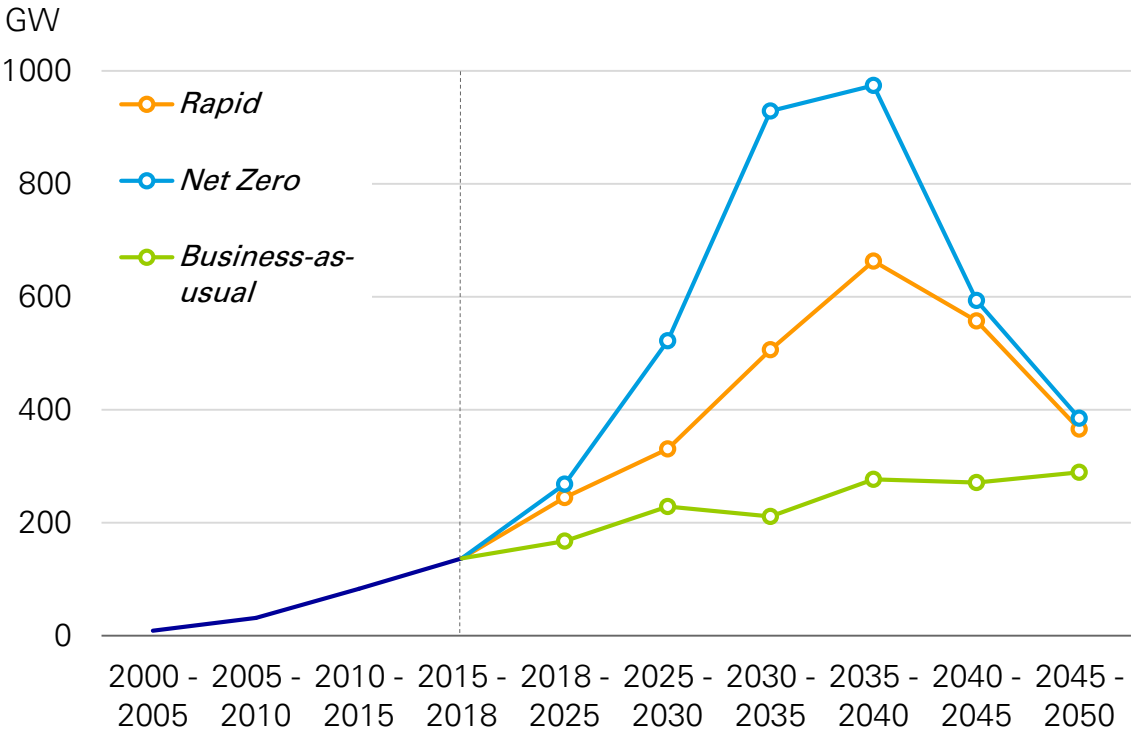


Cost of wind and solar energy

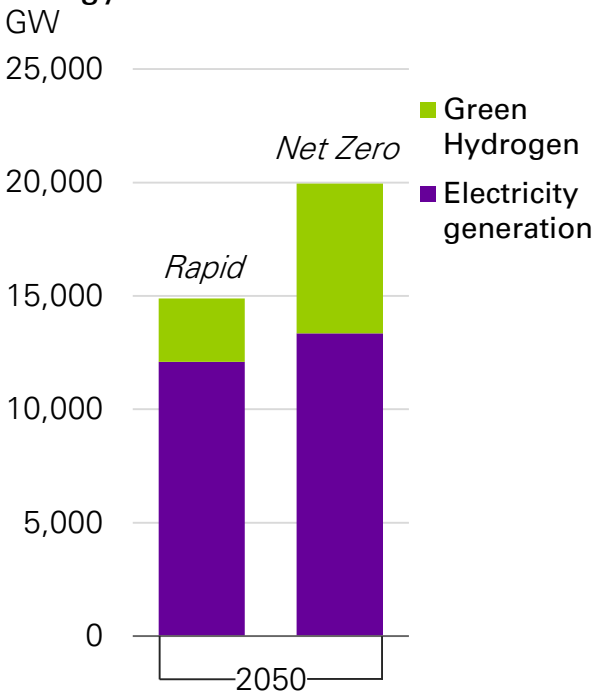


Rapid build out of wind and solar power capacity

Average annual increase in wind and solar capacity



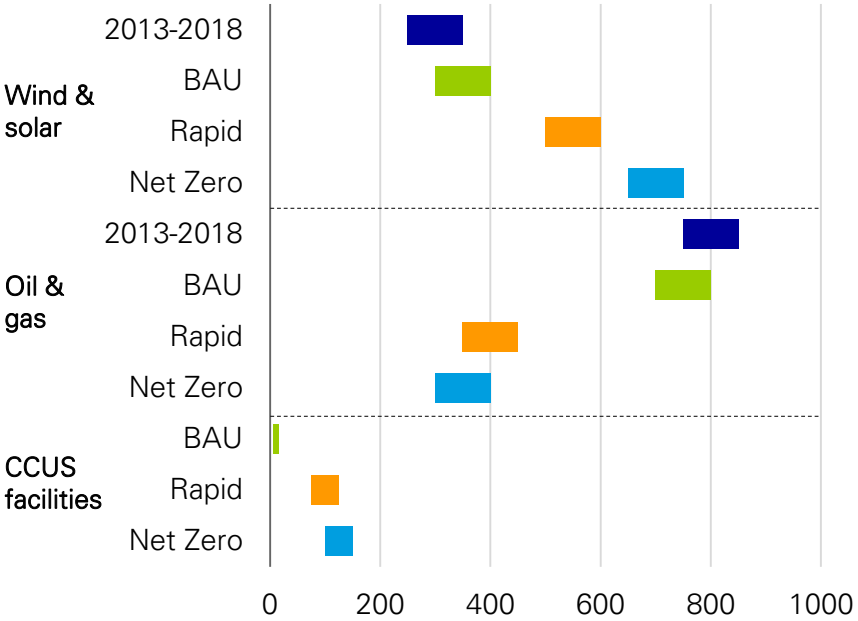
Installed capacity of wind and solar energy



Significant shifts in investment needed for the transition

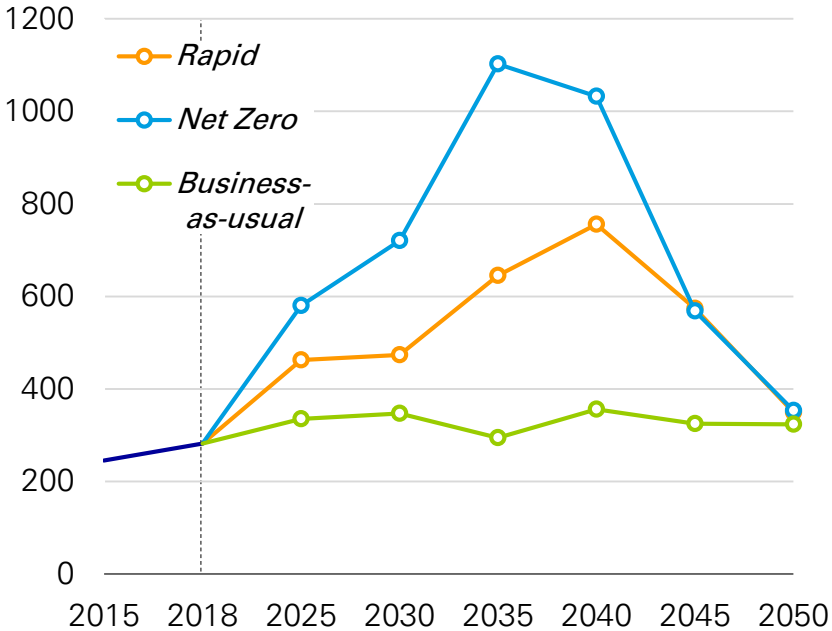
Average annual investment, history and 2020-2050

2018 US$ Billion



Average annual investment in wind and solar

Five-year rolling average, 2018 US$ Billion



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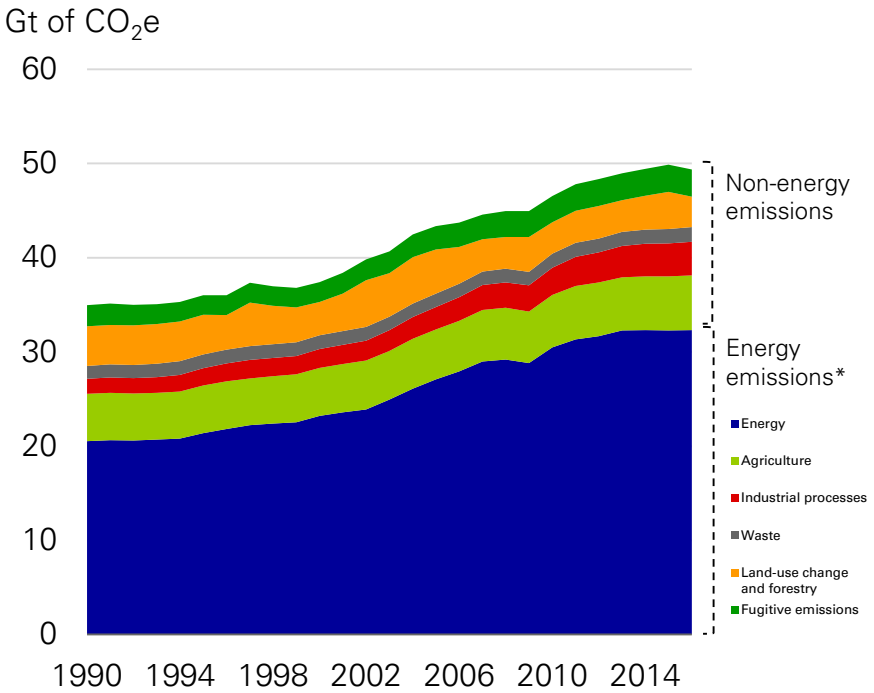
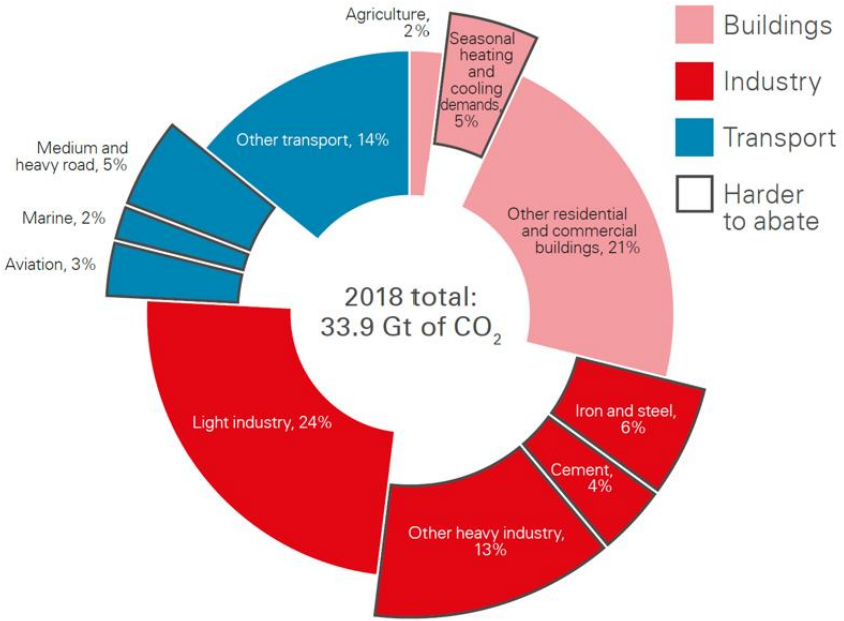
Carbon emissions from energy use

Global GHG emissions



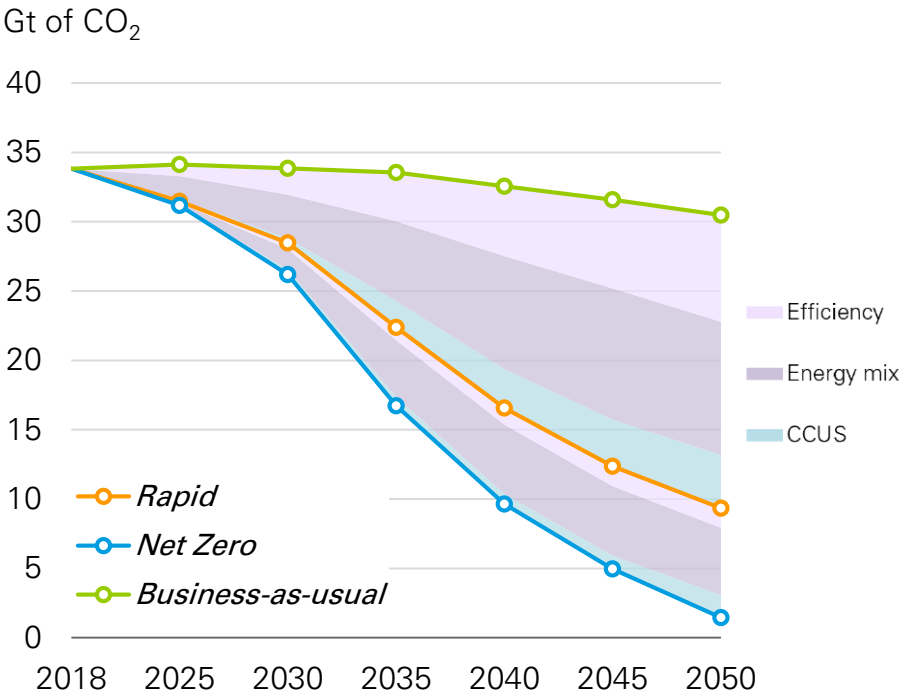
Carbon emissions from energy use, 2018



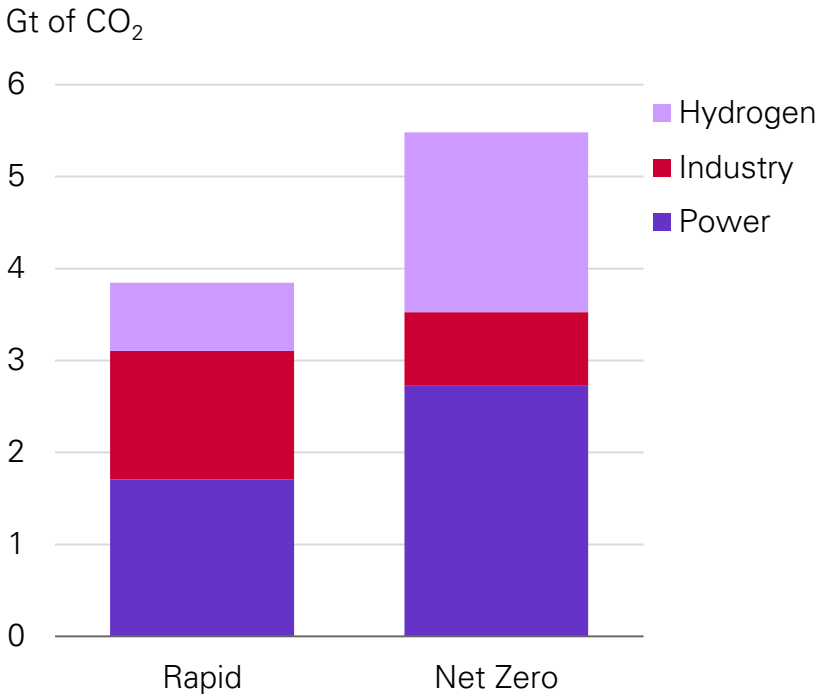
Source: WRI estimates. *_Energy Outlook_ definition, including only CO_2 emissions. Non-CO_2 emissions from Energy have been allocated to industrial processes

Efficiency & switching lower emissions in these scenarios

Carbon emissions from energy use

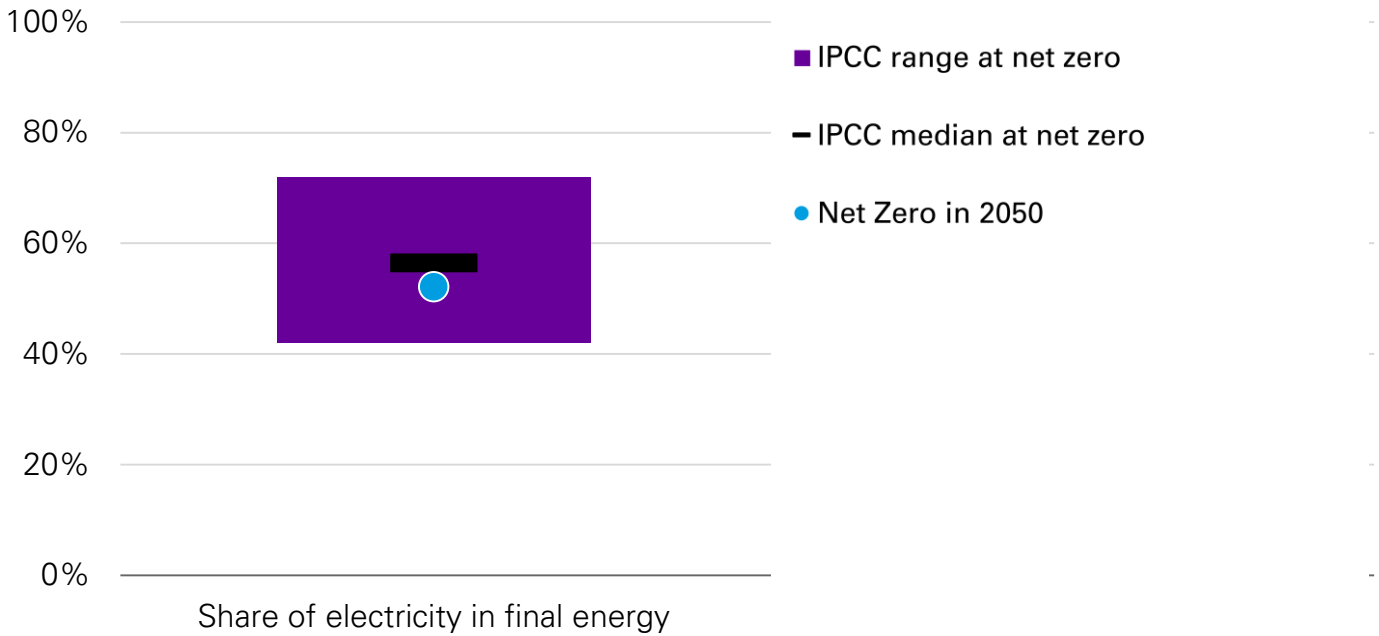


Carbon capture utilization and storage in 2050



Electrifying the world

Shares of electricity, wind and solar in IPCC scenarios and *Net Zero*



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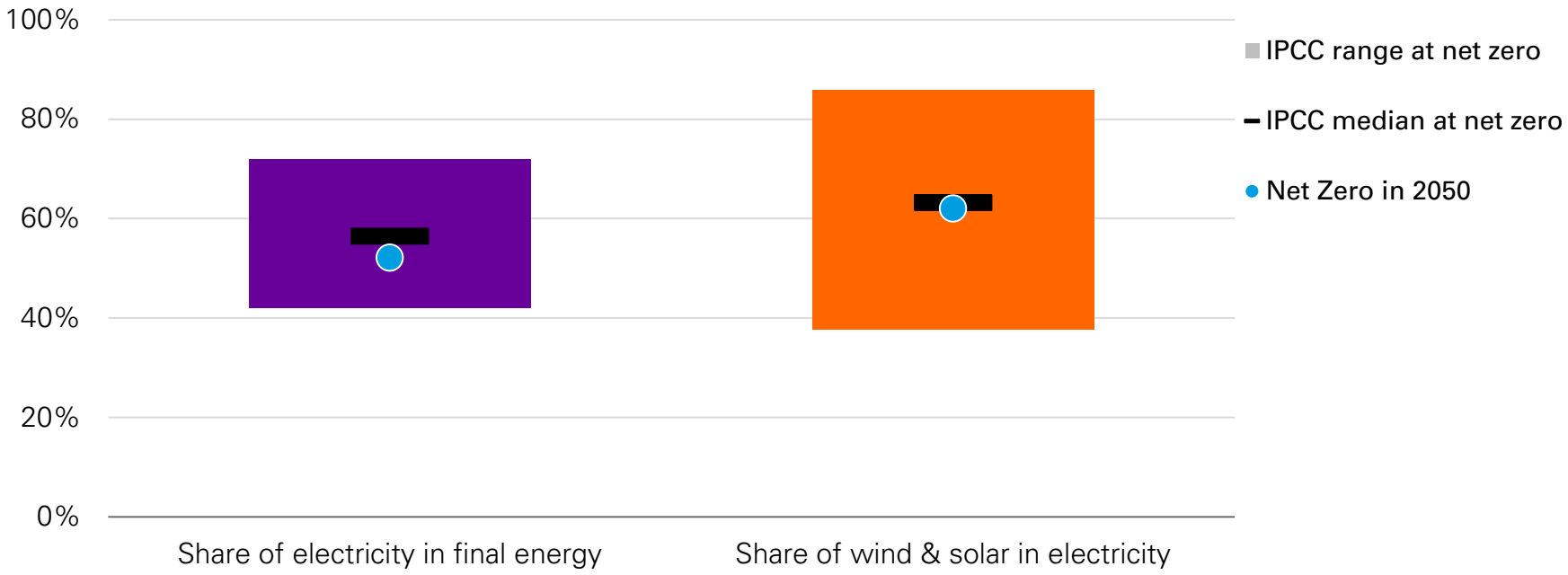
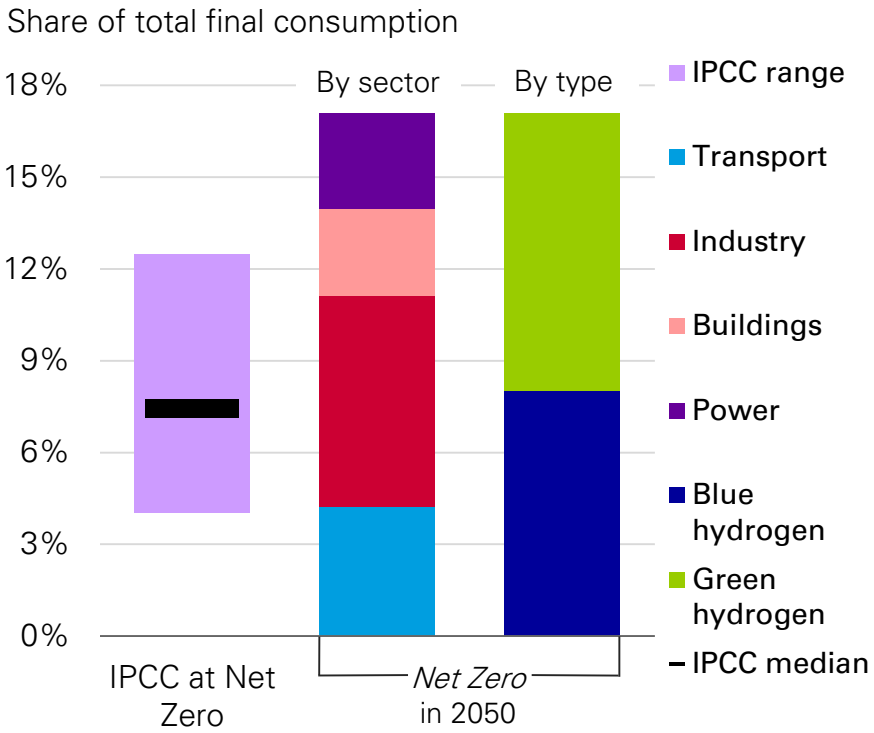


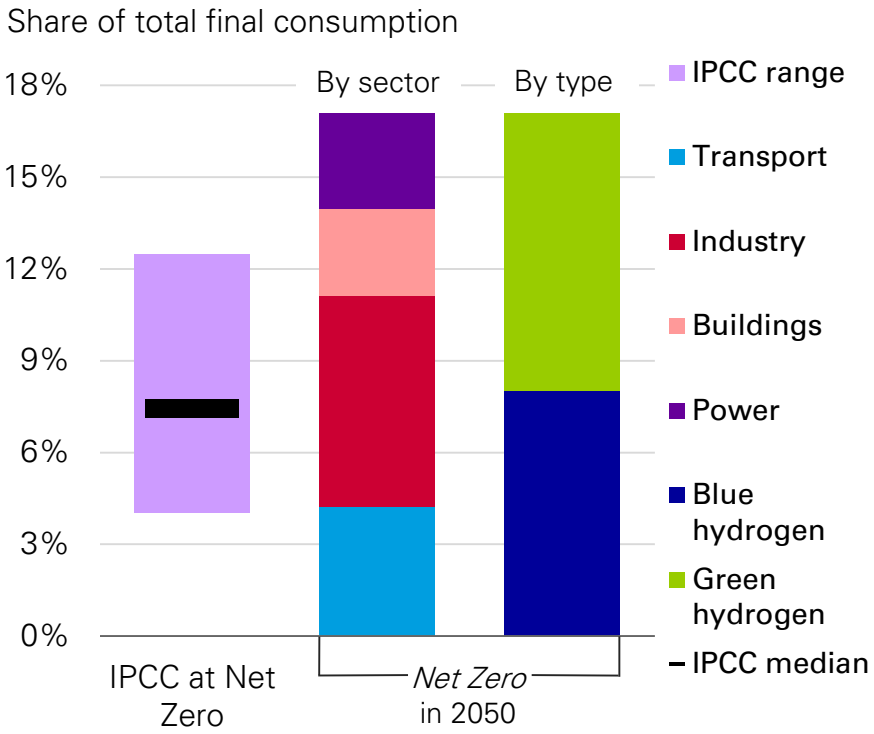
Increasing role for hydrogen…

Hydrogen in IPCC scenarios and *Net Zero*

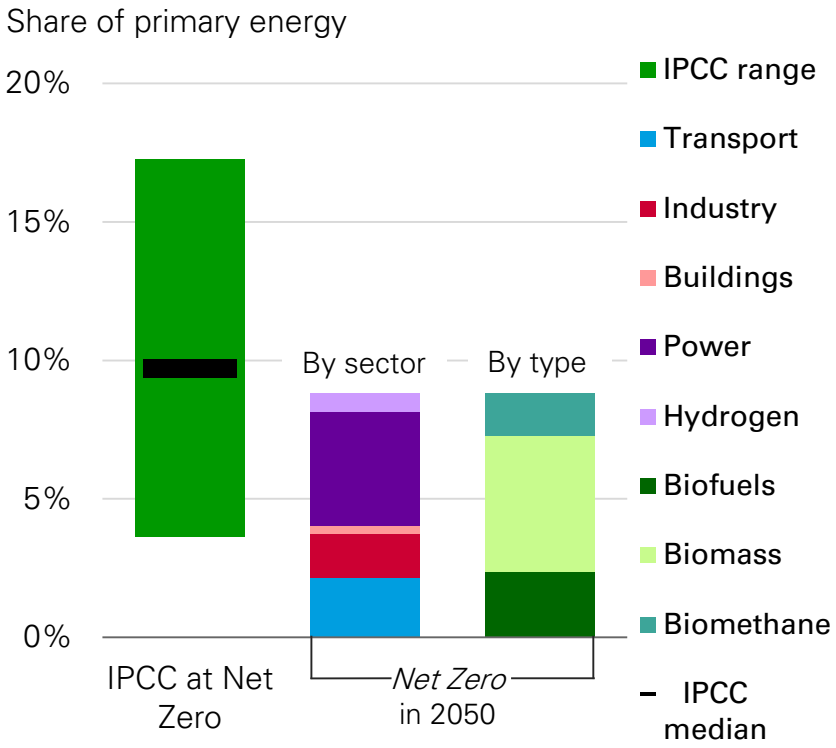


Increasing role for hydrogen…and bioenergy

Hydrogen in IPCC scenarios and *Net Zero*

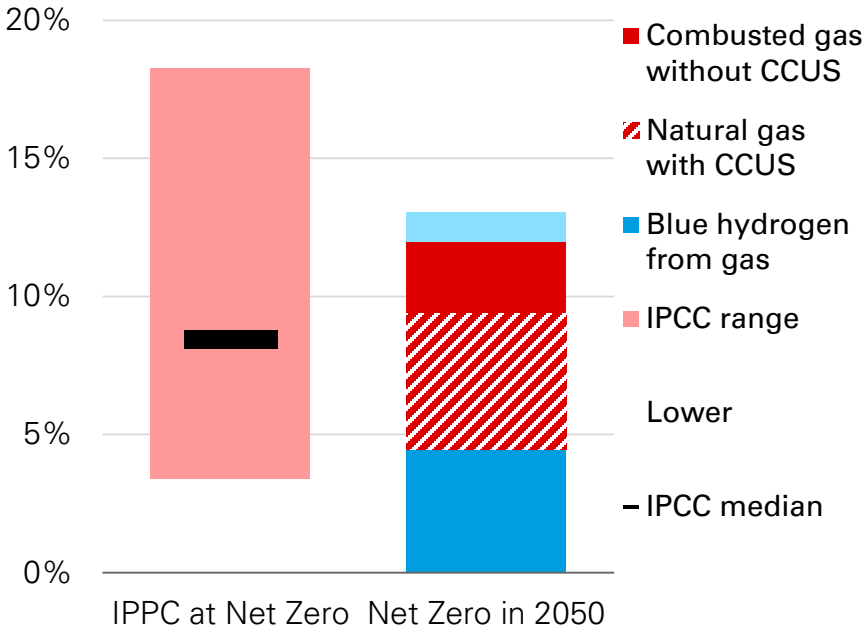


Bioenergy in IPCC scenarios and *Net Zero*



What role for natural gas…

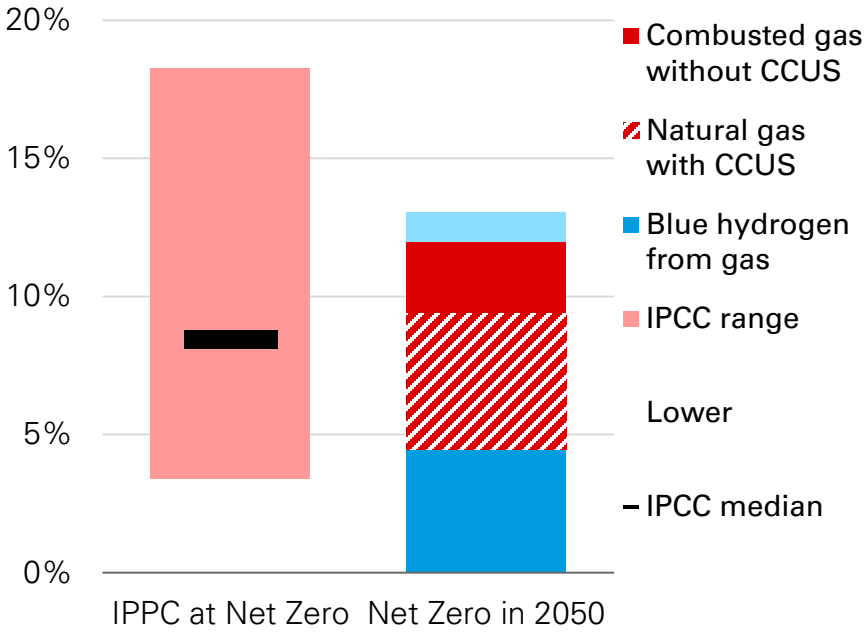
Natural gas consumption in IPCC scenarios and *Net Zero*
Share of primary energy



What role for natural gas…and oil?

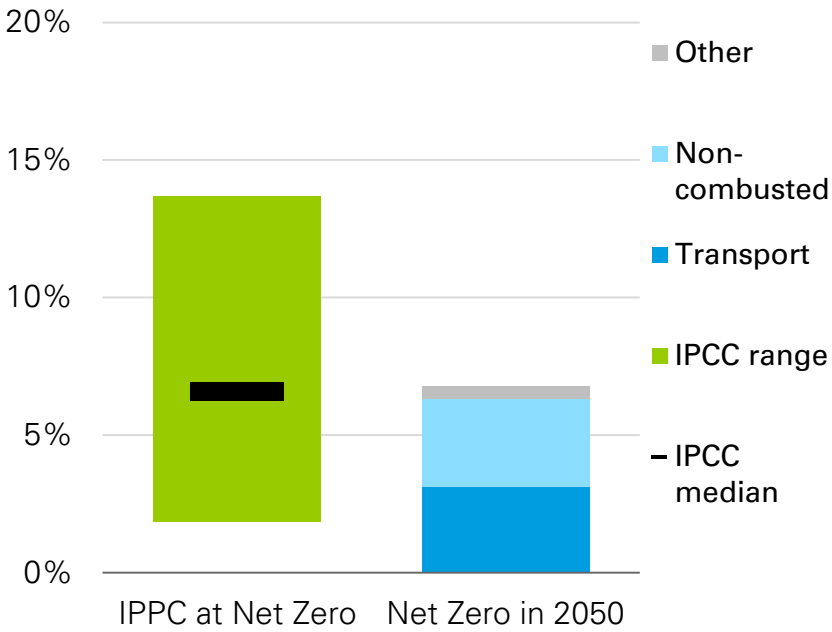
Natural gas consumption in IPCC scenarios and *Net Zero*

Share of primary energy



Oil consumption in IPCC scenarios and *Net Zero*

Share of primary energy



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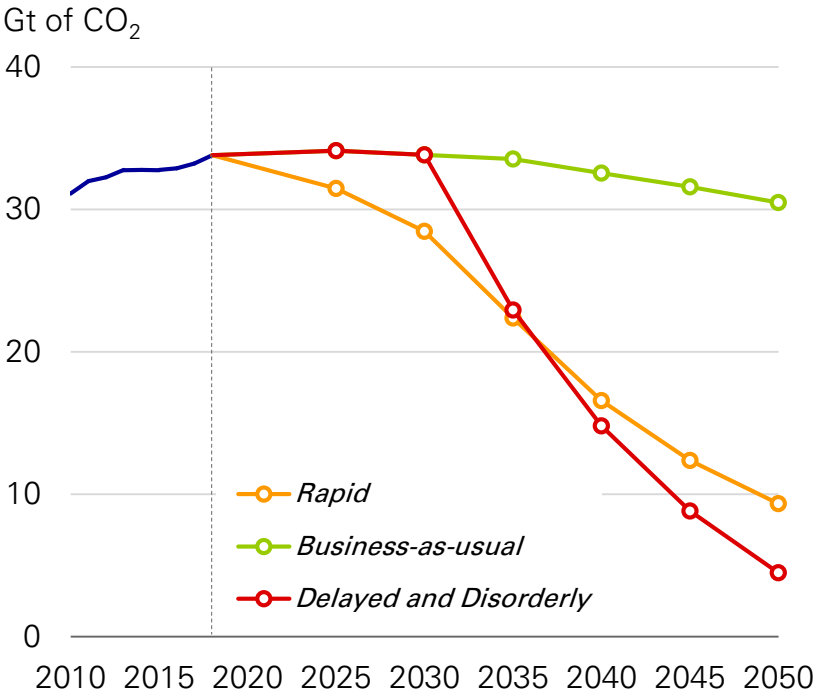
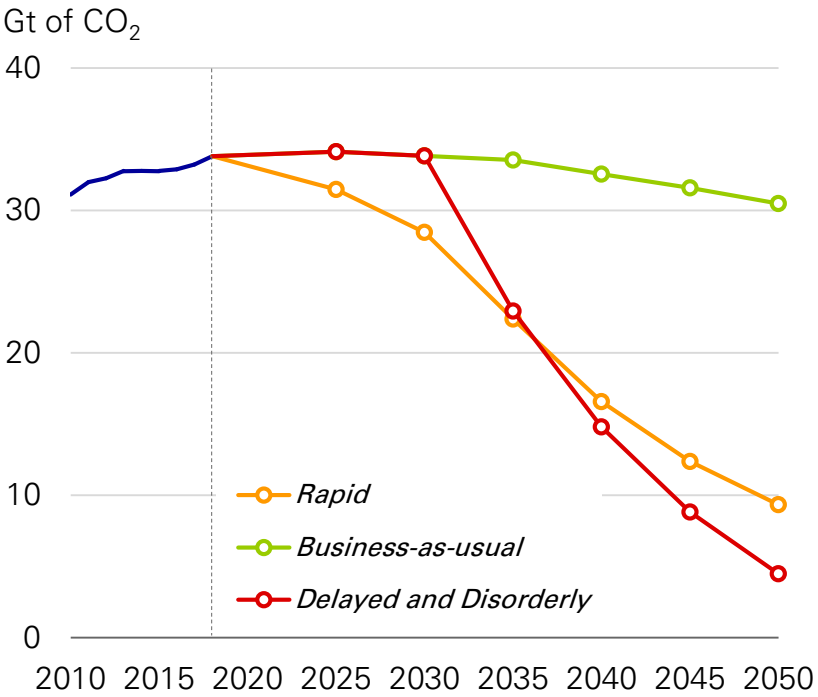
Delayed and Disorderly scenario

Carbon emissions

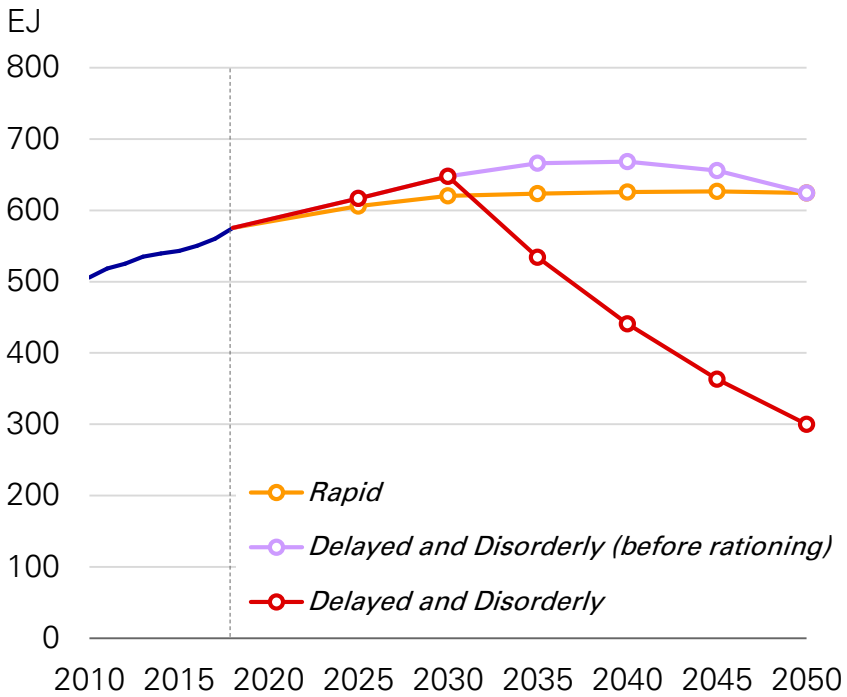


Delayed and Disorderly scenario

Carbon emissions



Primary energy consumption



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