

bp Energy Outlook 2023 edition

Michael Cohen

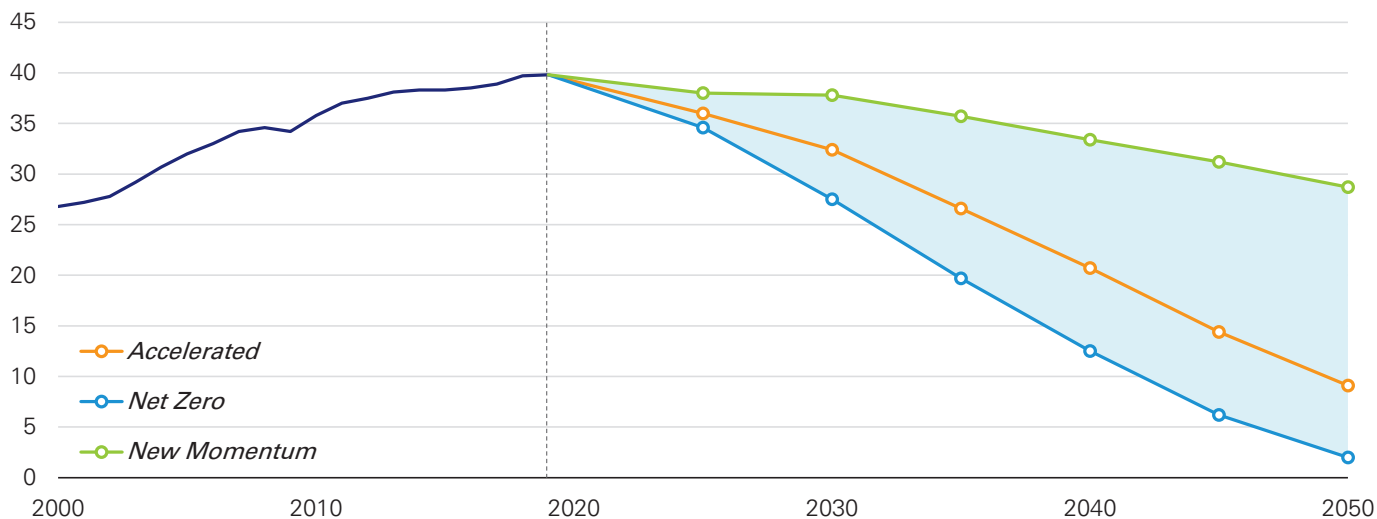
Head of Oil and Refining & Chief US Economist
Strategy, Sustainability & Ventures



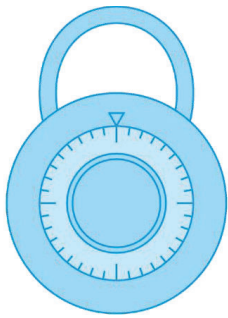
Scenarios used to identify core beliefs and quantify uncertainty

Global carbon emissions

Gt of CO₂e



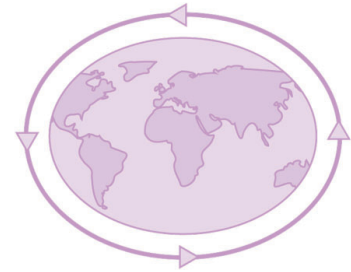
Modelling the impact of the Russia-Ukraine war: 3 channels



Heightened energy security



Weaker economic growth

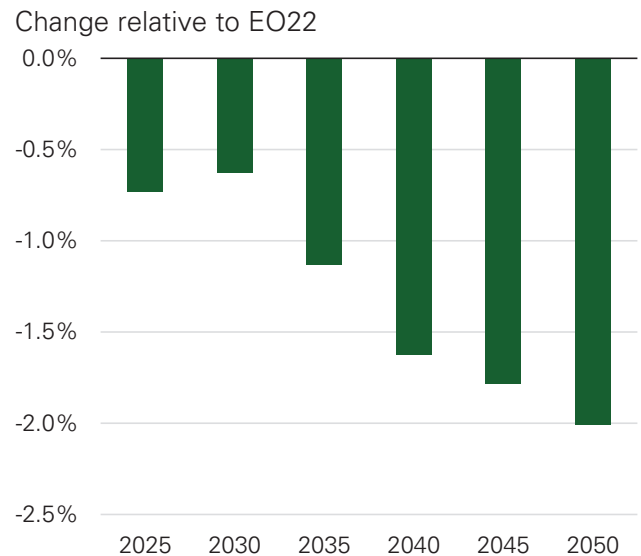
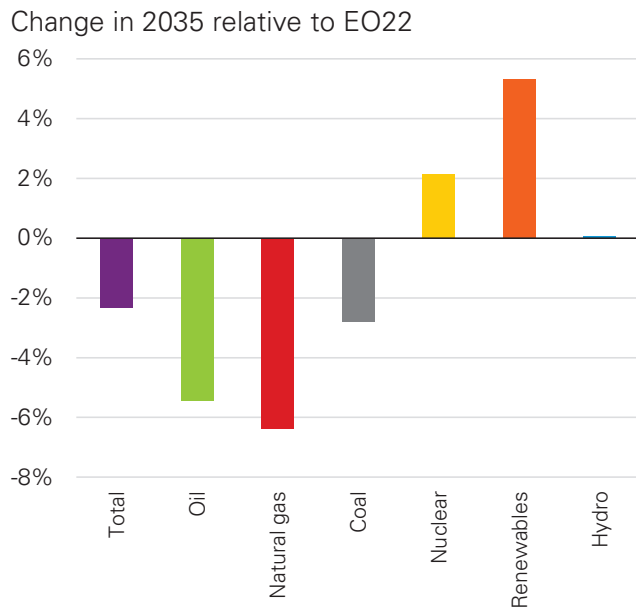


Changing mix of global energy supplies

Disproportionately large declines in oil and gas consumption

Change in primary energy in *New Momentum*

Change in carbon intensity in *New Momentum*

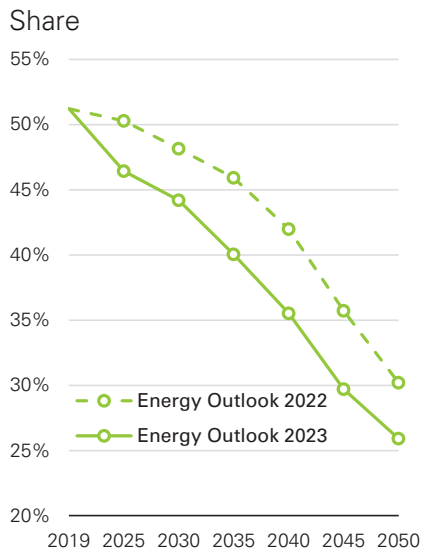




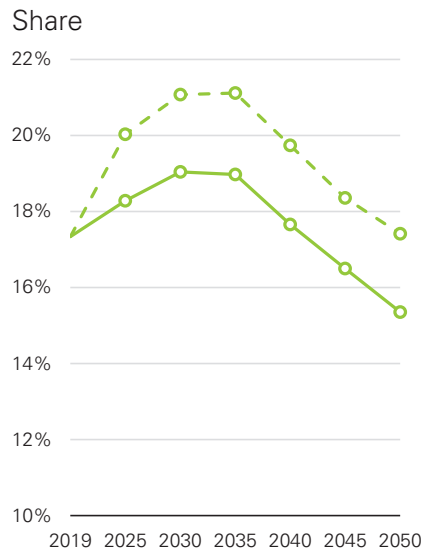
Energy concerns lead to permanently lower share of imported oil and gas

Oil & gas imports as a share of primary energy in *New Momentum*

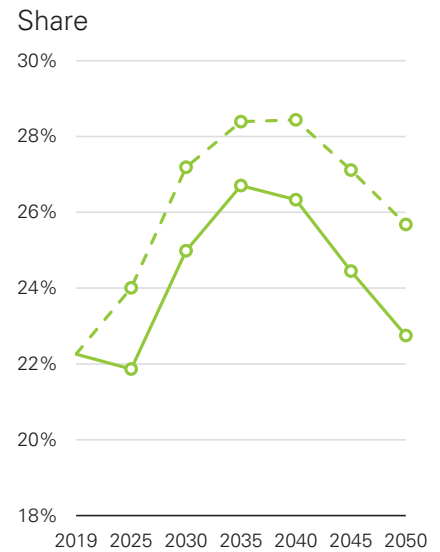
EU



China

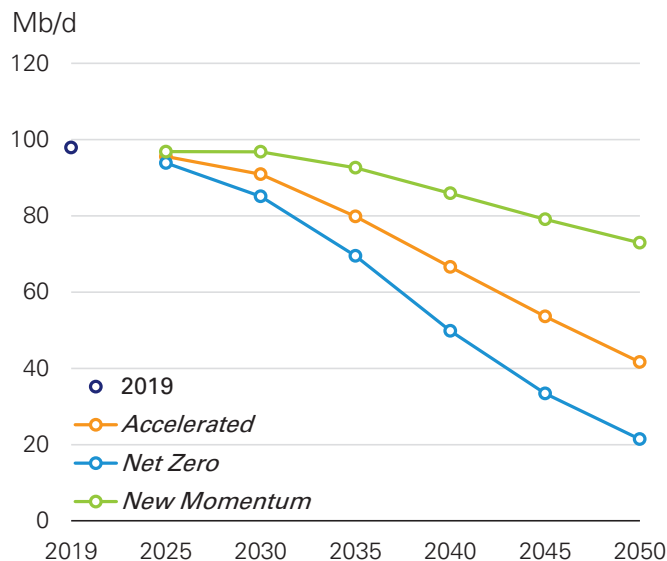


India

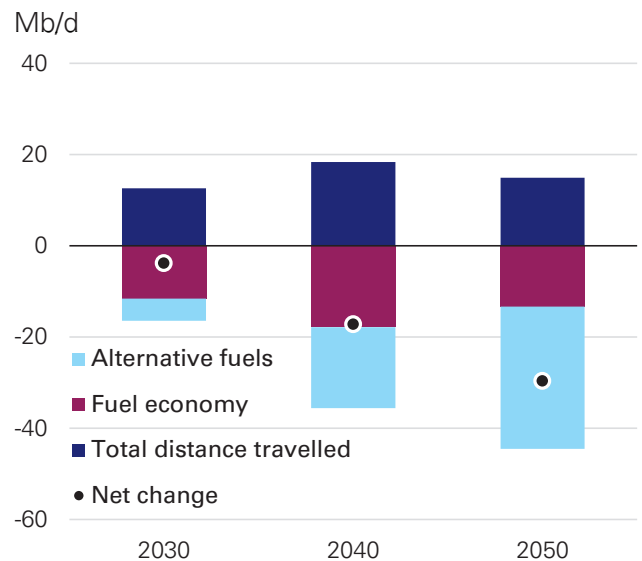


Oil demand declines due to transport electrification and efficiency

Oil demand



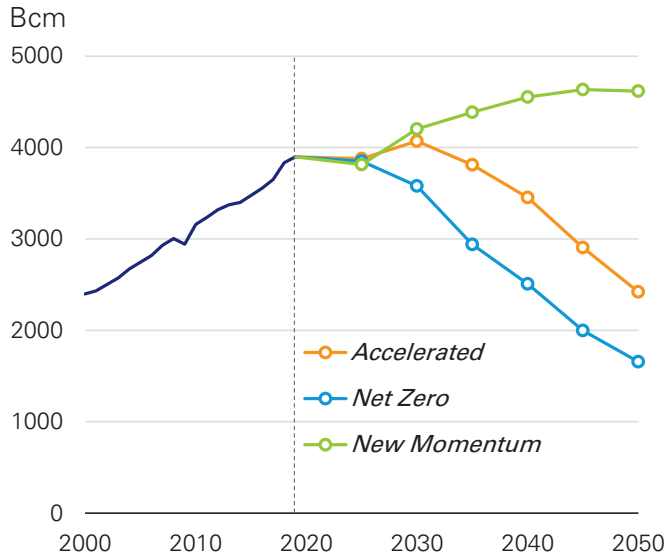
Change in oil demand in road transport versus 2019 in *Accelerated*



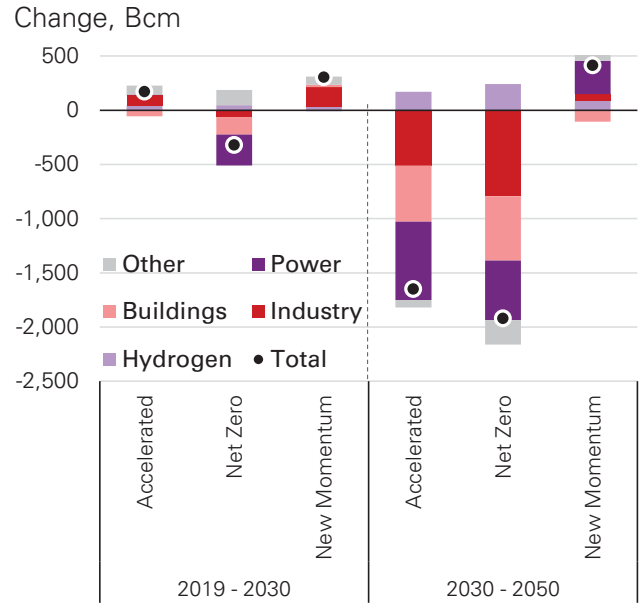
Outlook for natural gas subject to the speed of the energy transition



Demand



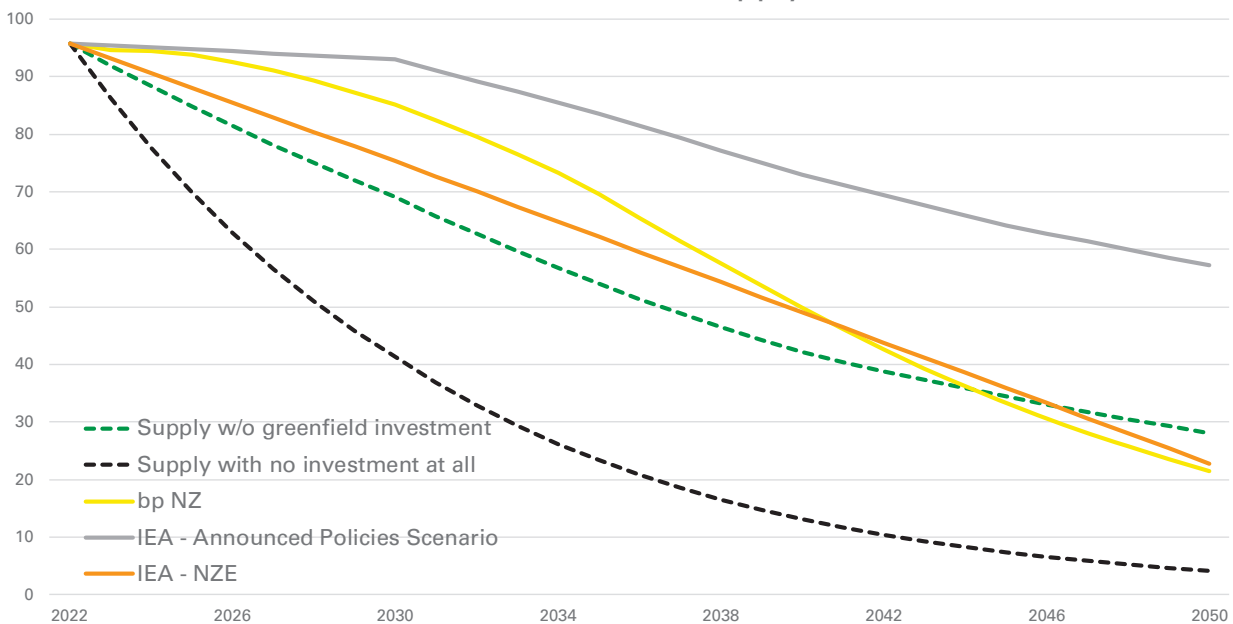
Change in demand by sector



Supply would fall faster without investment than NZ-aligned demand



Oil Demand and Supply

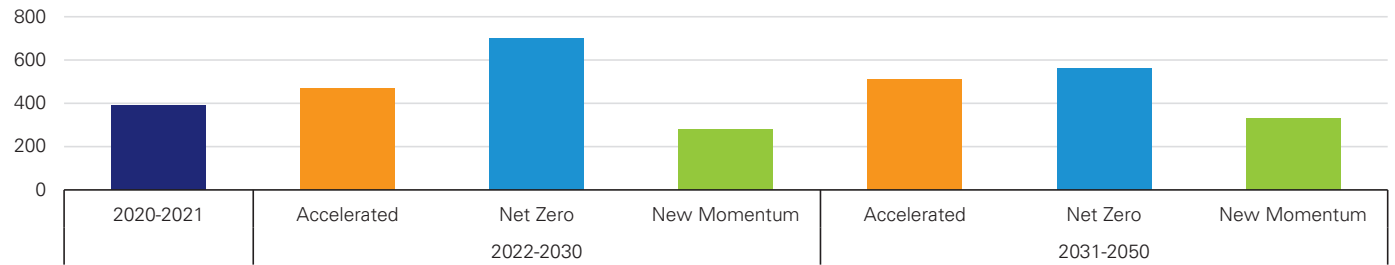




Need to scale up investment in clean energy while maintaining current levels in O&G

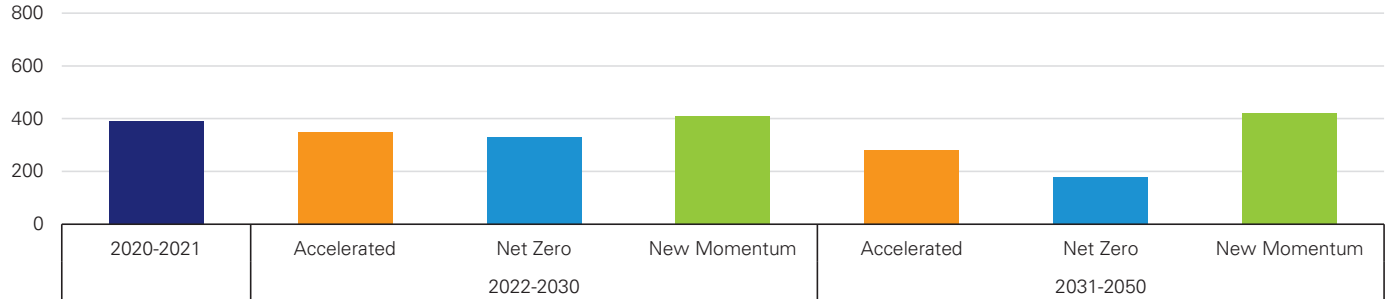
Wind and solar

\$2020 billion, annual investment



Oil and gas

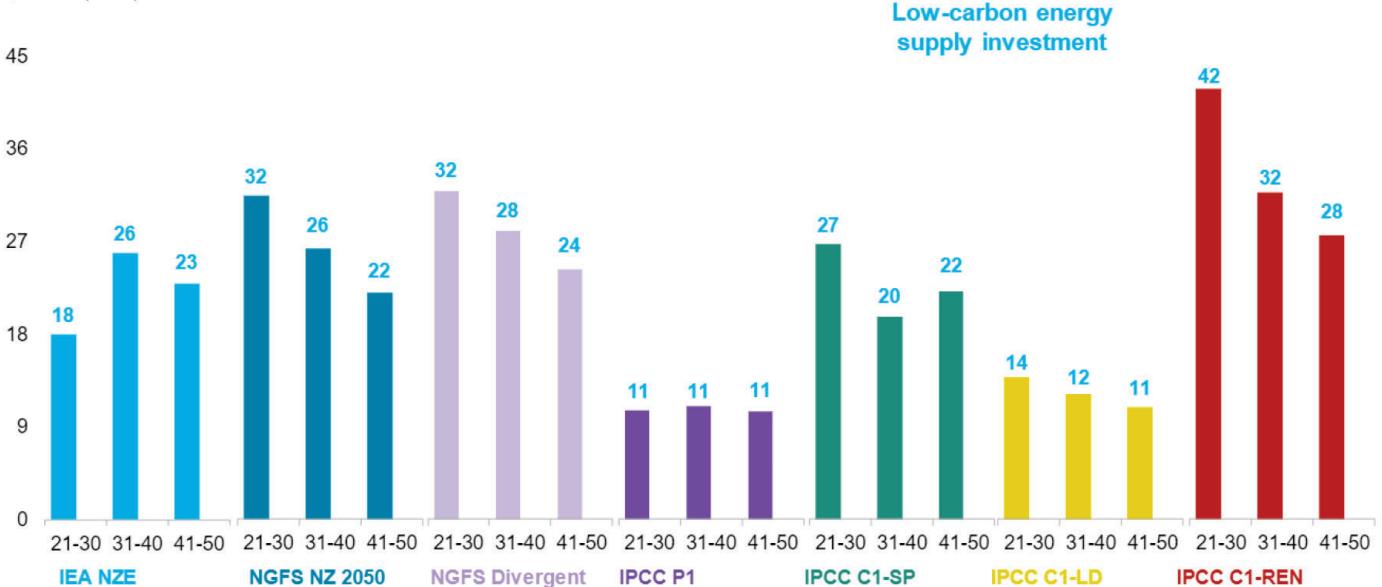
\$2020 billion, annual investment



1.5 degree climate scenarios require front loaded low carbon investment ...

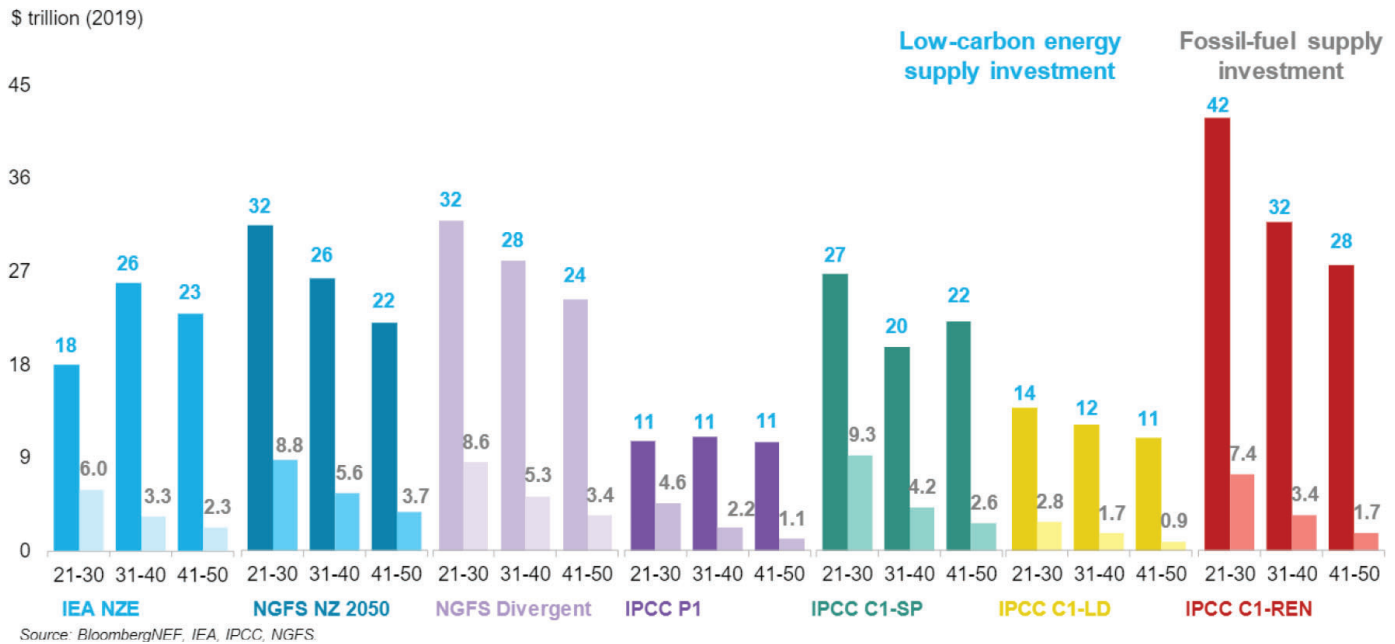


\$ trillion (2019)



Source: BloombergNEF, IEA, IPCC, NGFS.

...and declining fossil fuel supply investment across all scenarios



Key takeaways

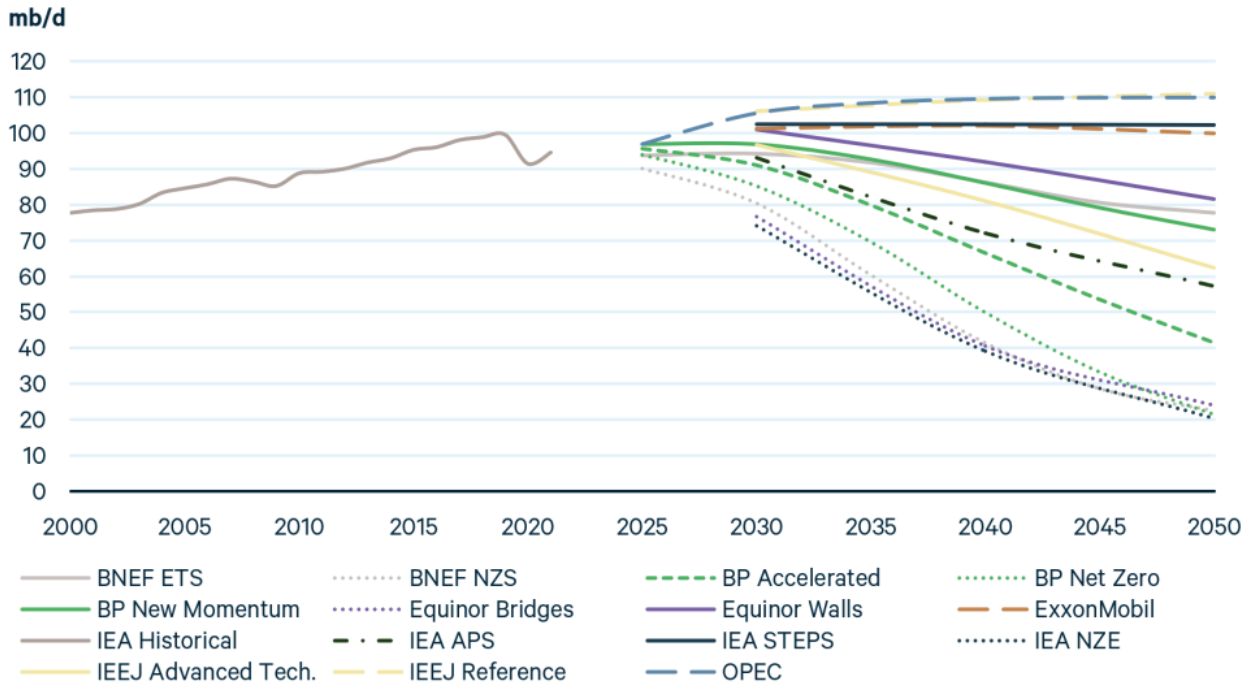


- The Russia/Ukraine war accelerates the energy transition, prioritizing locally produced energy and curbing economic growth.
- Yet oil and gas still play a crucial role in the energy system and require continued investment.
- Amid uncertainty, producers to focus on advantaged hydrocarbons
- Divergence in investment requirements due to outlook for oil demand
- All 1.5/2°C pathways involve rapid, deep GHG reductions in all sectors this decade.

Decisive and Orderly transition

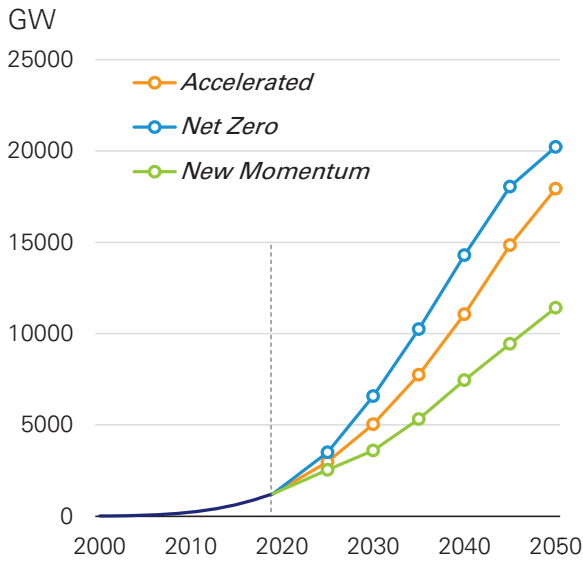
Backup

Wide range of uncertainty

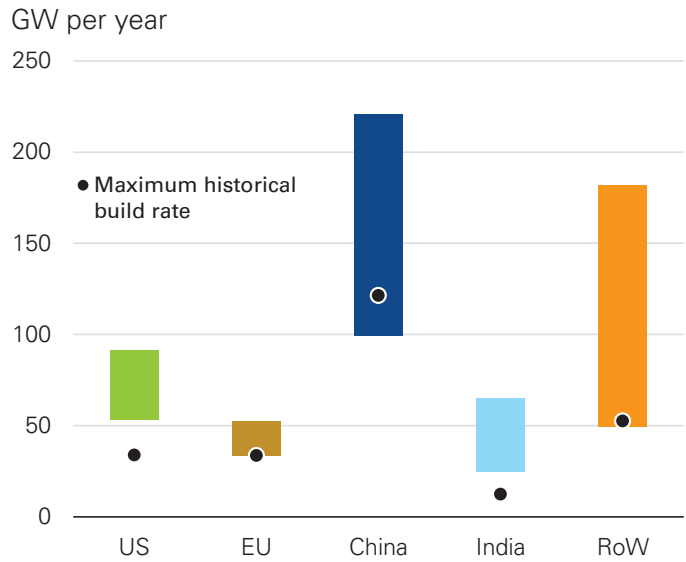


Wind and solar energy

Installed wind and solar capacity

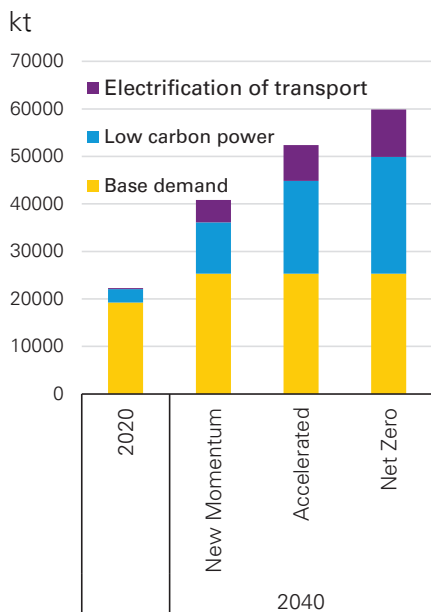


Range of wind and solar capacity build rates in the three scenarios (2022-35)

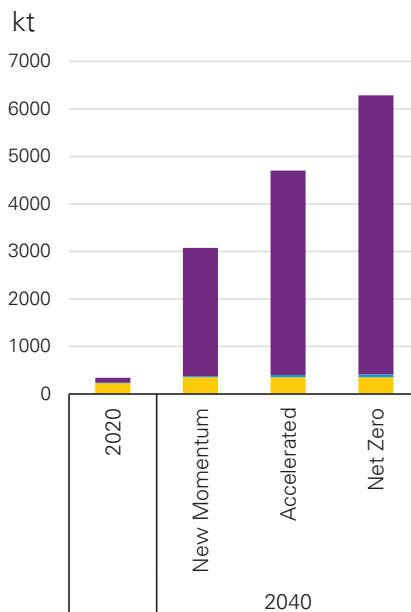


Outlook for critical minerals

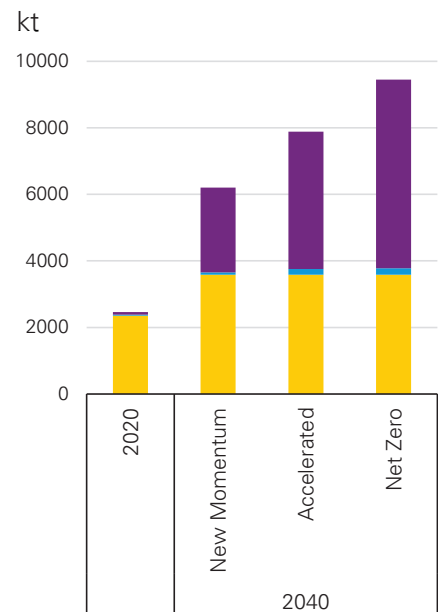
Copper demand

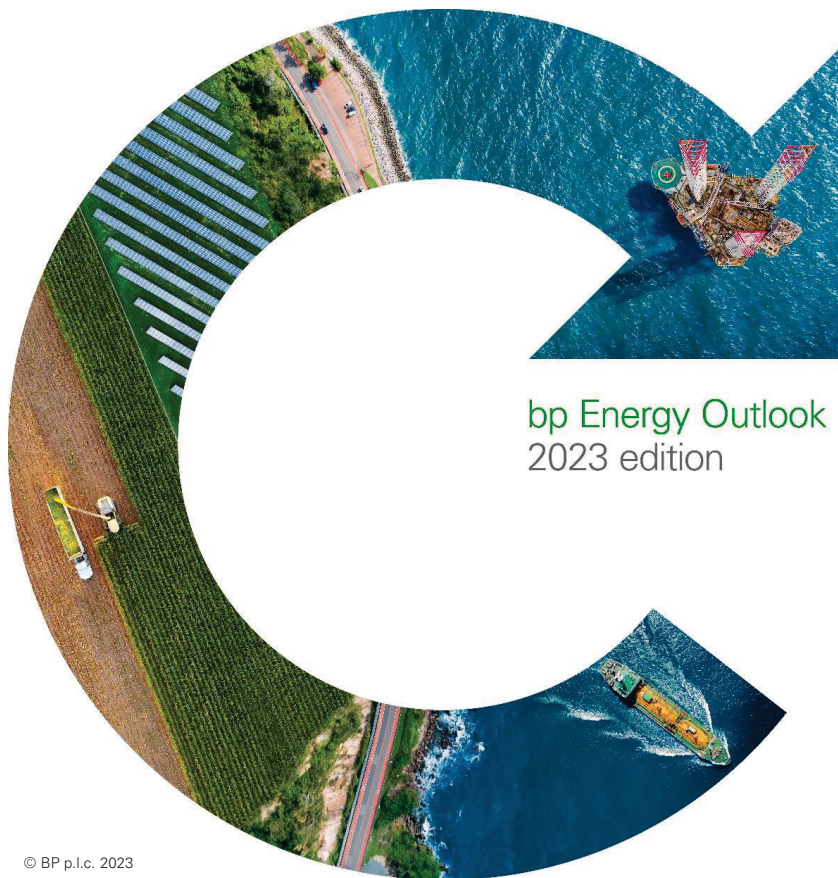


Lithium demand



Nickel demand





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