



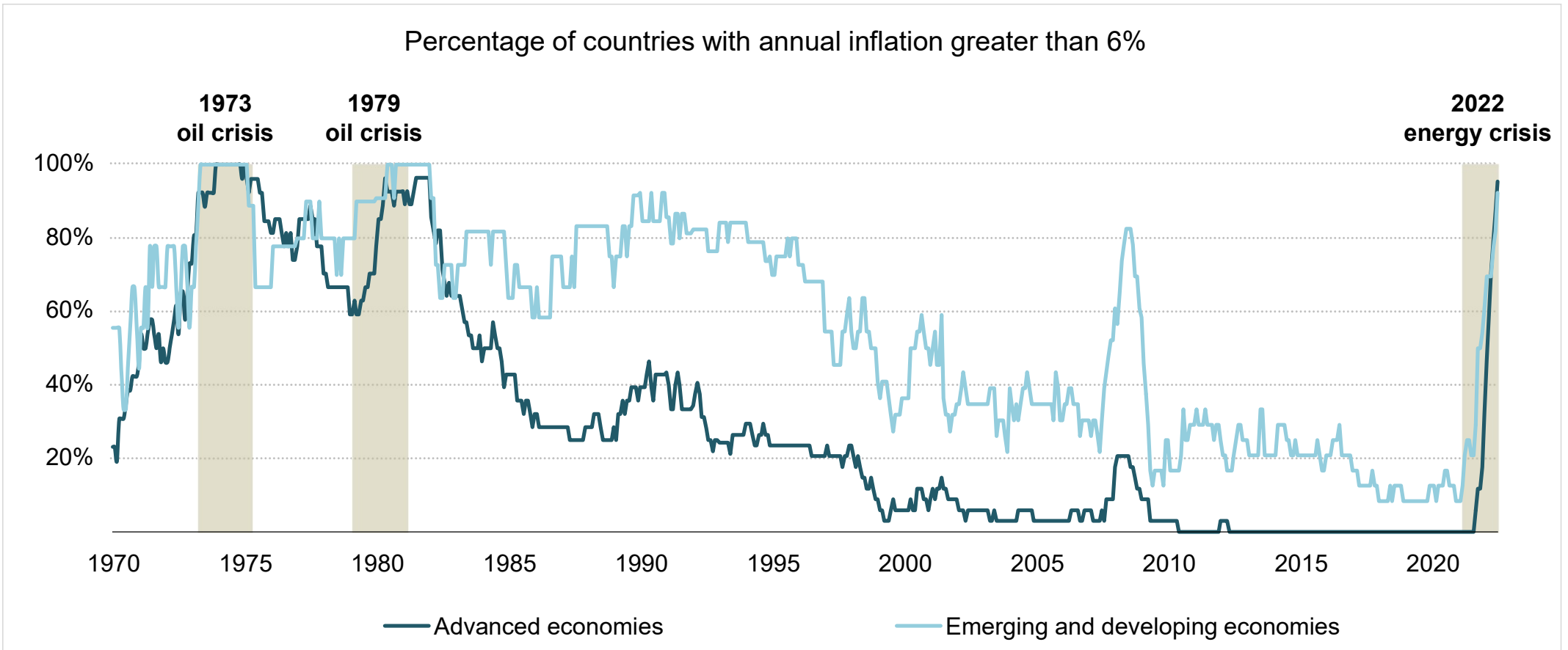
World Energy Outlook 2022

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International
Energy Agency

An energy shock of unprecedented breadth and complexity

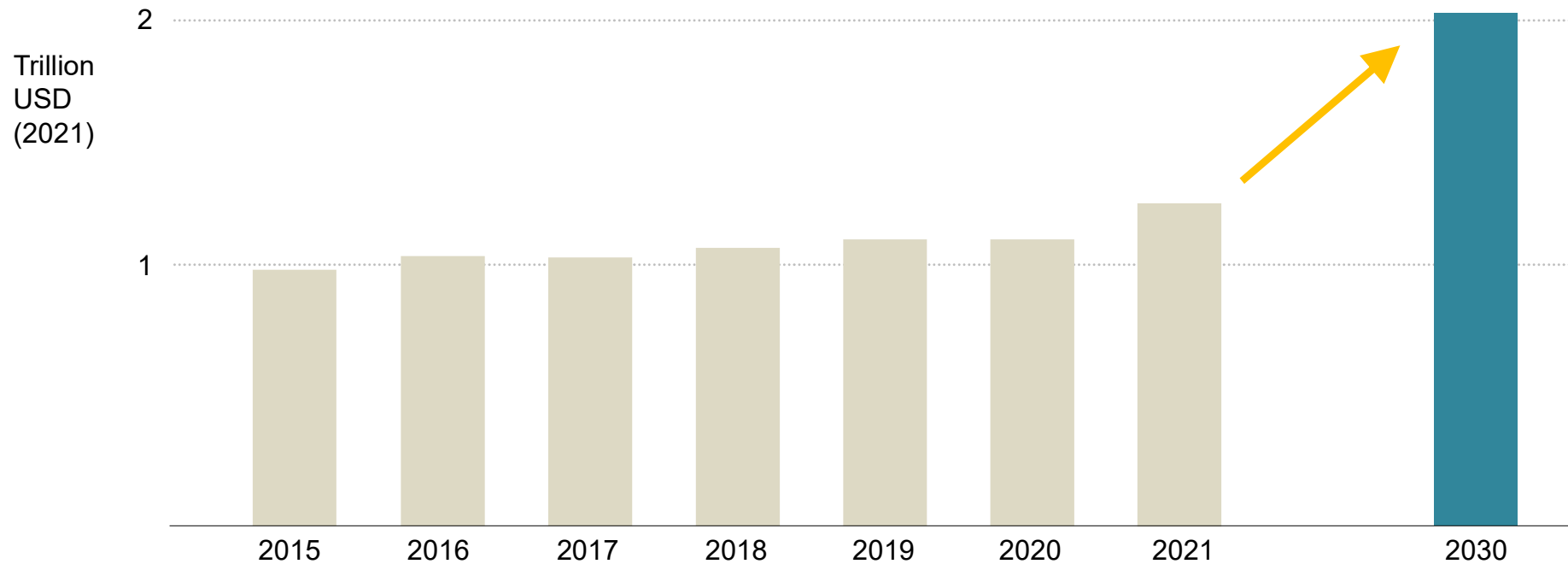


Exacerbating already tight energy markets, the Russian invasion of Ukraine has tipped the world into a global energy crisis of unprecedented breadth and complexity, affecting all countries and the vulnerable in particular

Government responses are fast-tracking the clean energy economy

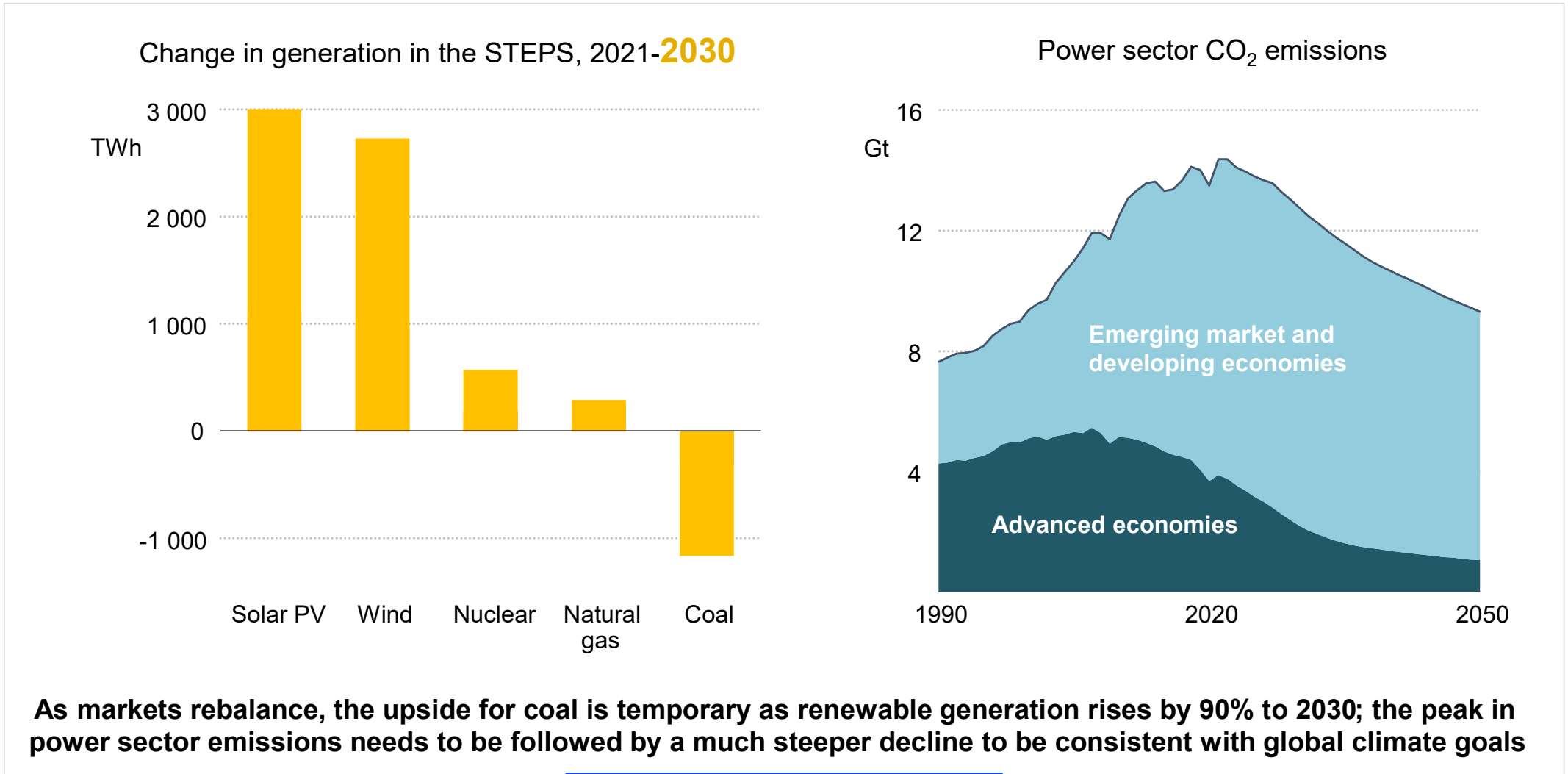


Clean energy investment in the Stated Policies Scenario



The US Inflation Reduction Act, the EU's Fit for 55 package, Japan's GX, China's new clean energy targets and India's solar revolution propel clean energy investment to new highs, but \$4 trillion is needed by 2030 to be on track for 1.5 °C

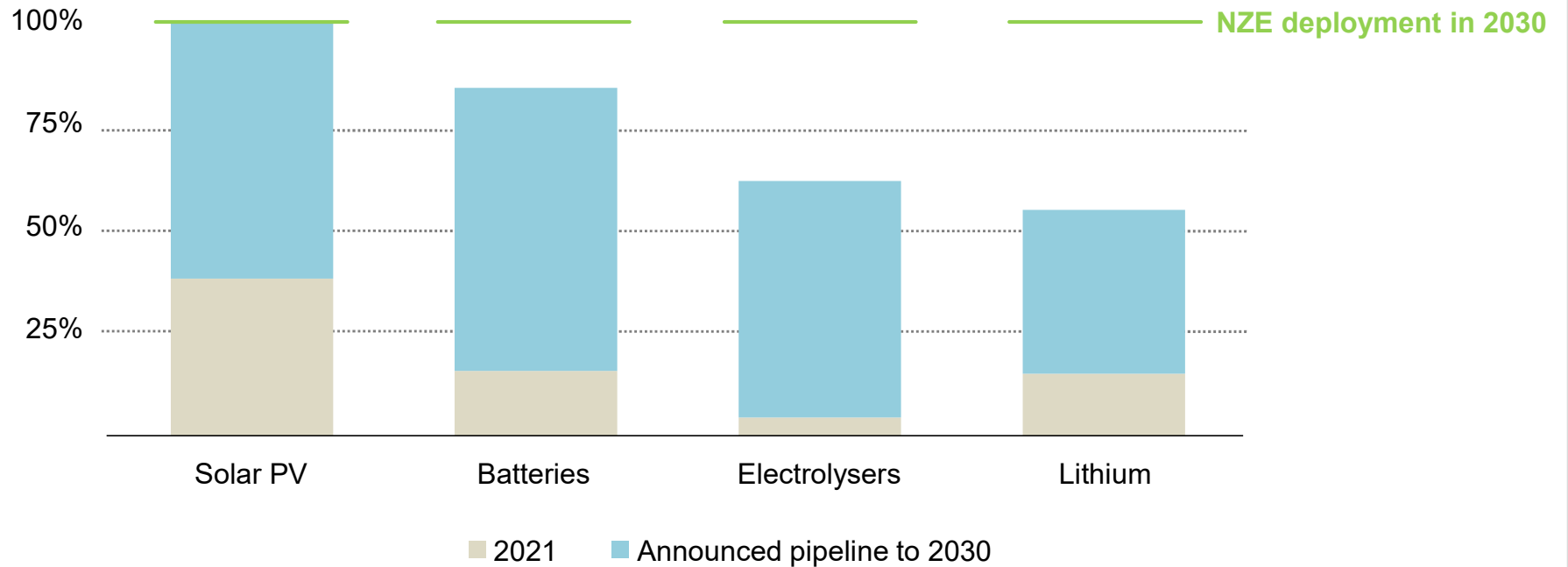
Electricity is turning the corner



Clean energy manufacturers prepare the ground for faster transitions

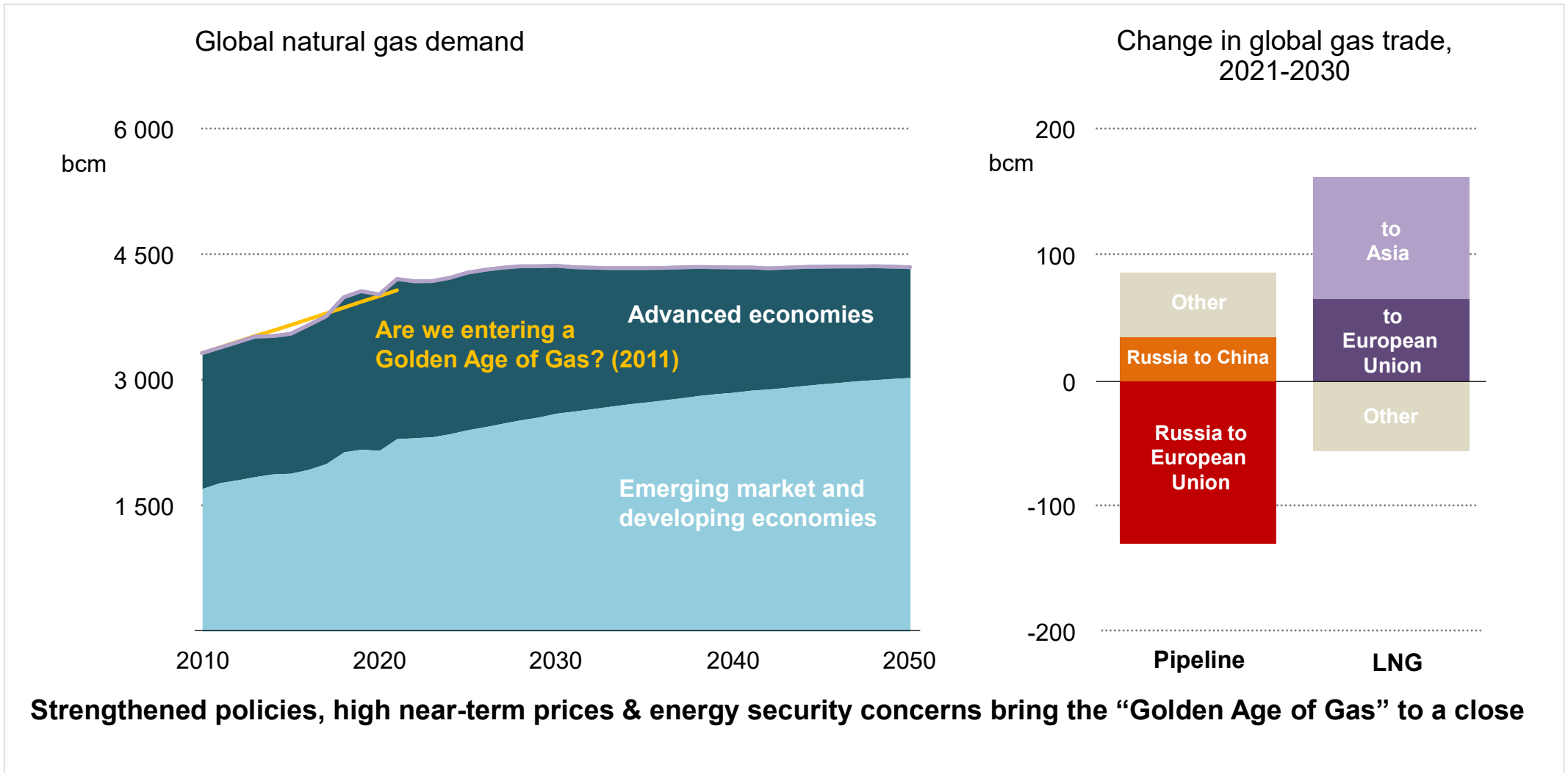


Announced manufacturing capacity pipeline compared with NZE Scenario deployment in 2030



Announced plans to scale up clean energy manufacturing capacity help to accelerate cost reductions and would, in some cases, approach the levels needed to put the world on track with a 1.5 °C pathway

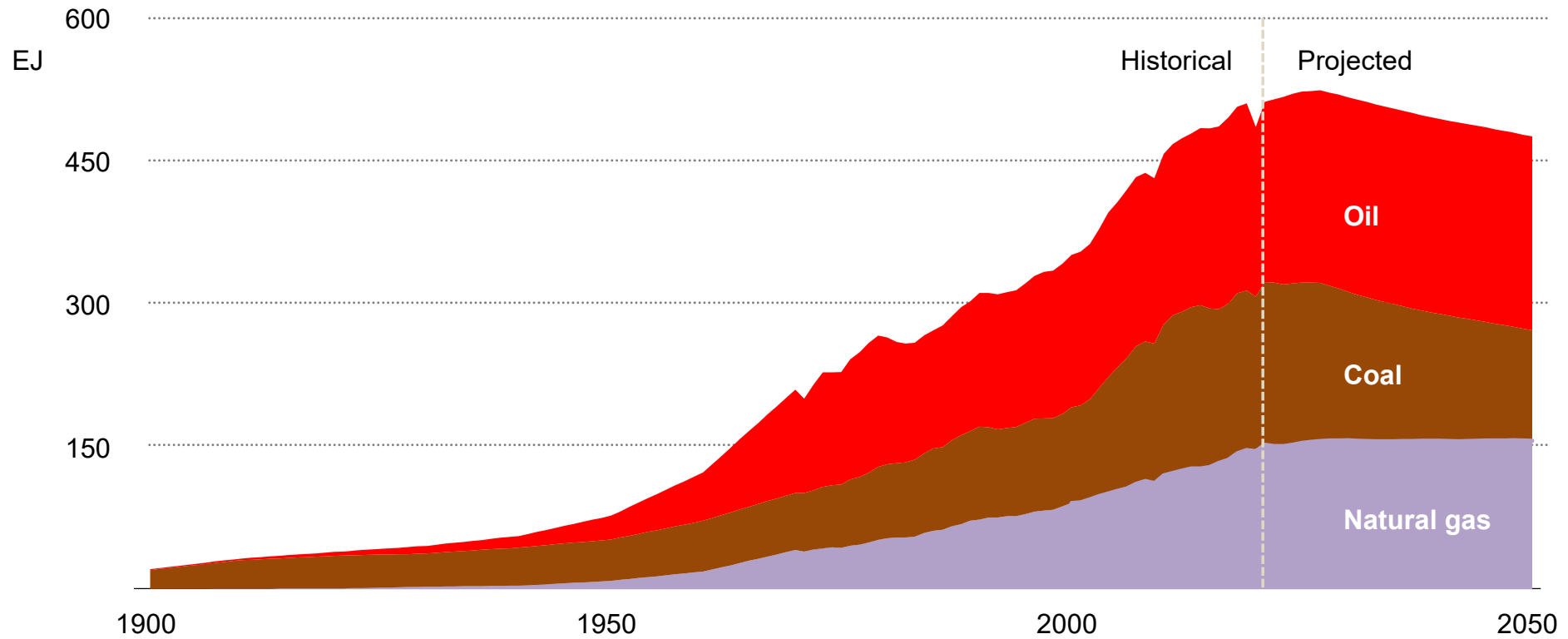
The era of natural gas demand growth is coming to an end



Peak fossil fuel demand is coming this decade

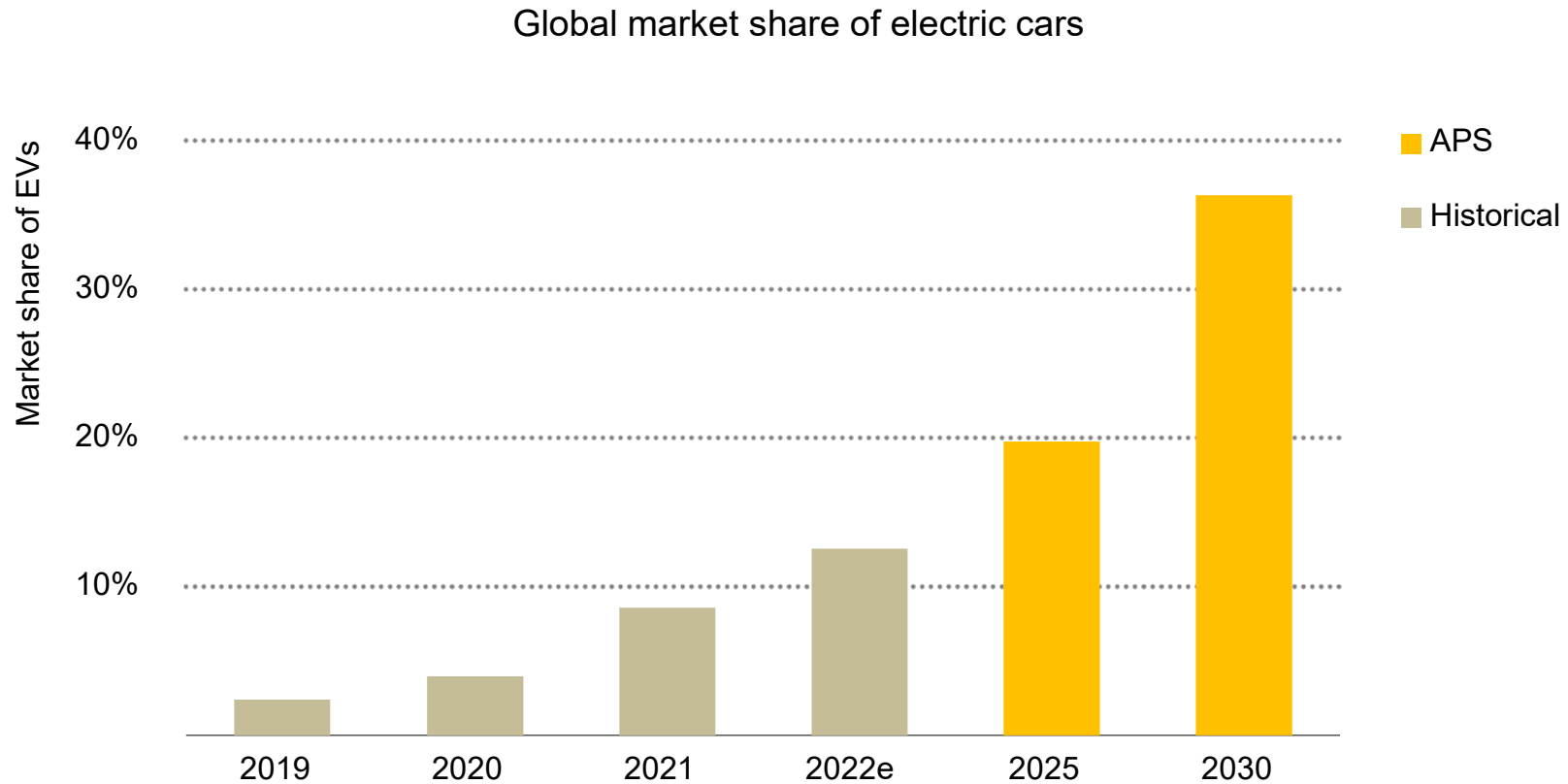


Fossil fuel demand in the Stated Policies Scenario, 1900-2050



Today's policy settings are now sufficiently strong that they produce a distinct peak in fossil fuel use before 2030

Spectacular growth in EVs signals a new energy economy taking root

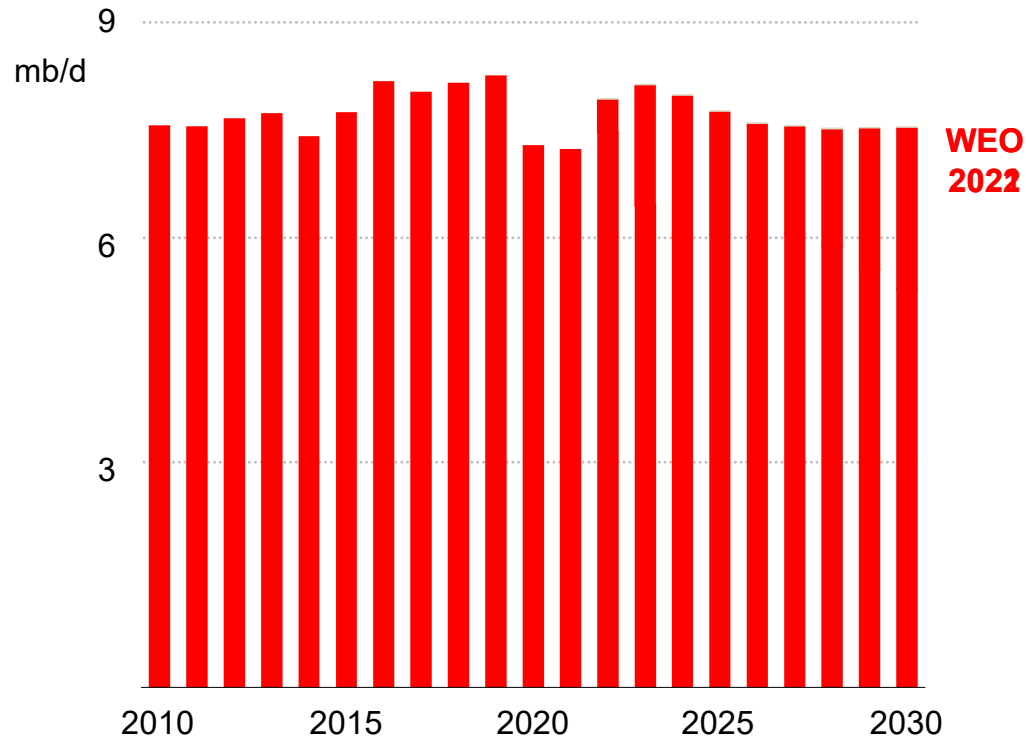


By 2030, more than one out of every two cars sold in the US, the EU and China could be electric. EVs are vital for making energy supplies more secure rather than continuing to rely on fossil fuels

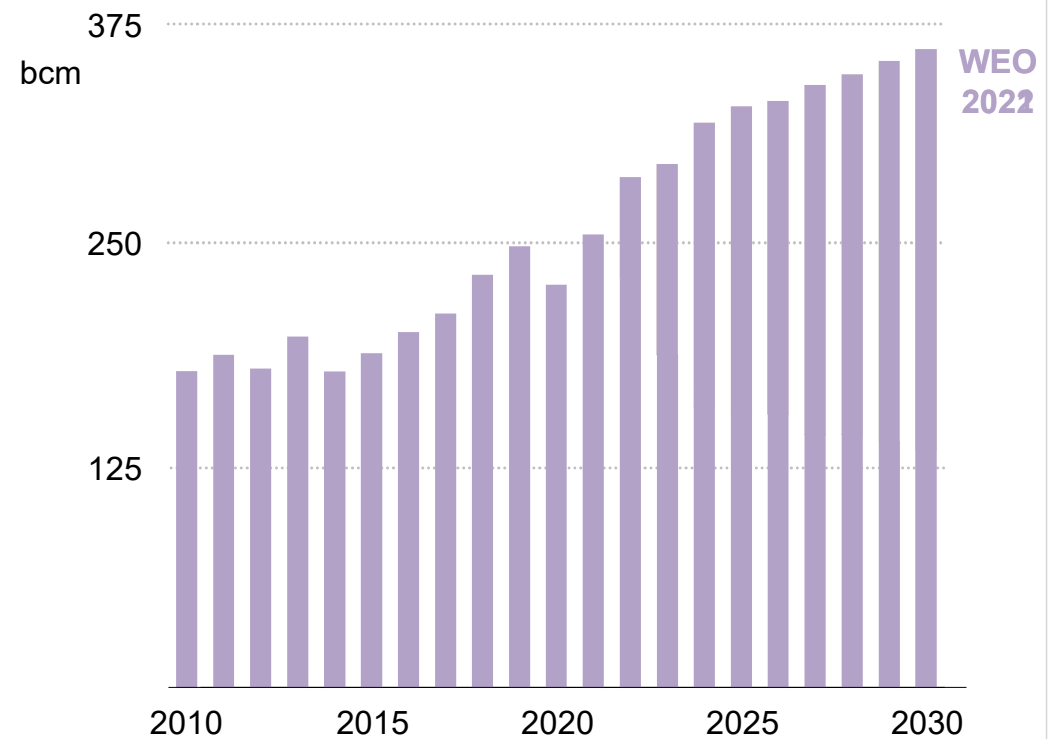
Russia faces a much-diminished role in international energy

Russian oil and gas exports in the Stated Policies Scenario

Oil exports



Gas exports

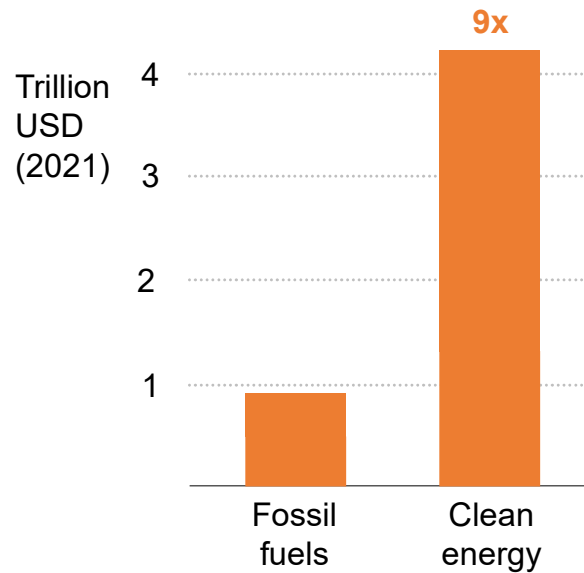


Russia's share of global oil and gas trade halves by 2030, with exports from the United States, Middle East, South America and East Africa – and enhanced efforts to reduce demand – filling the gap

A new energy security paradigm is needed for secure transitions

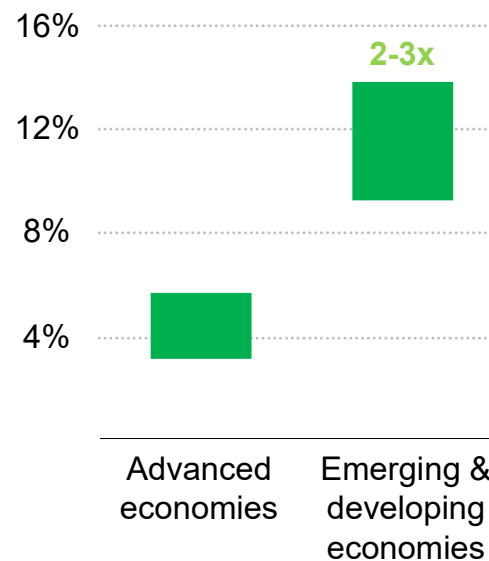
Scale up clean energy
to scale back fossil fuels

Investment in NZE Scenario, 2030



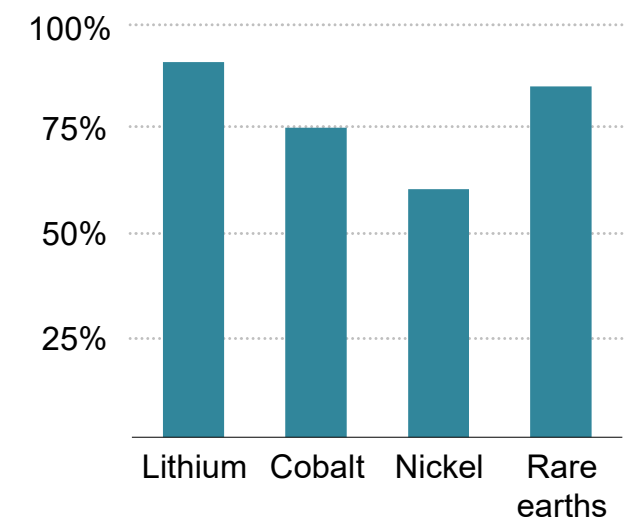
Lift emerging economies into the
new energy economy

Cost of capital for solar PV, 2021



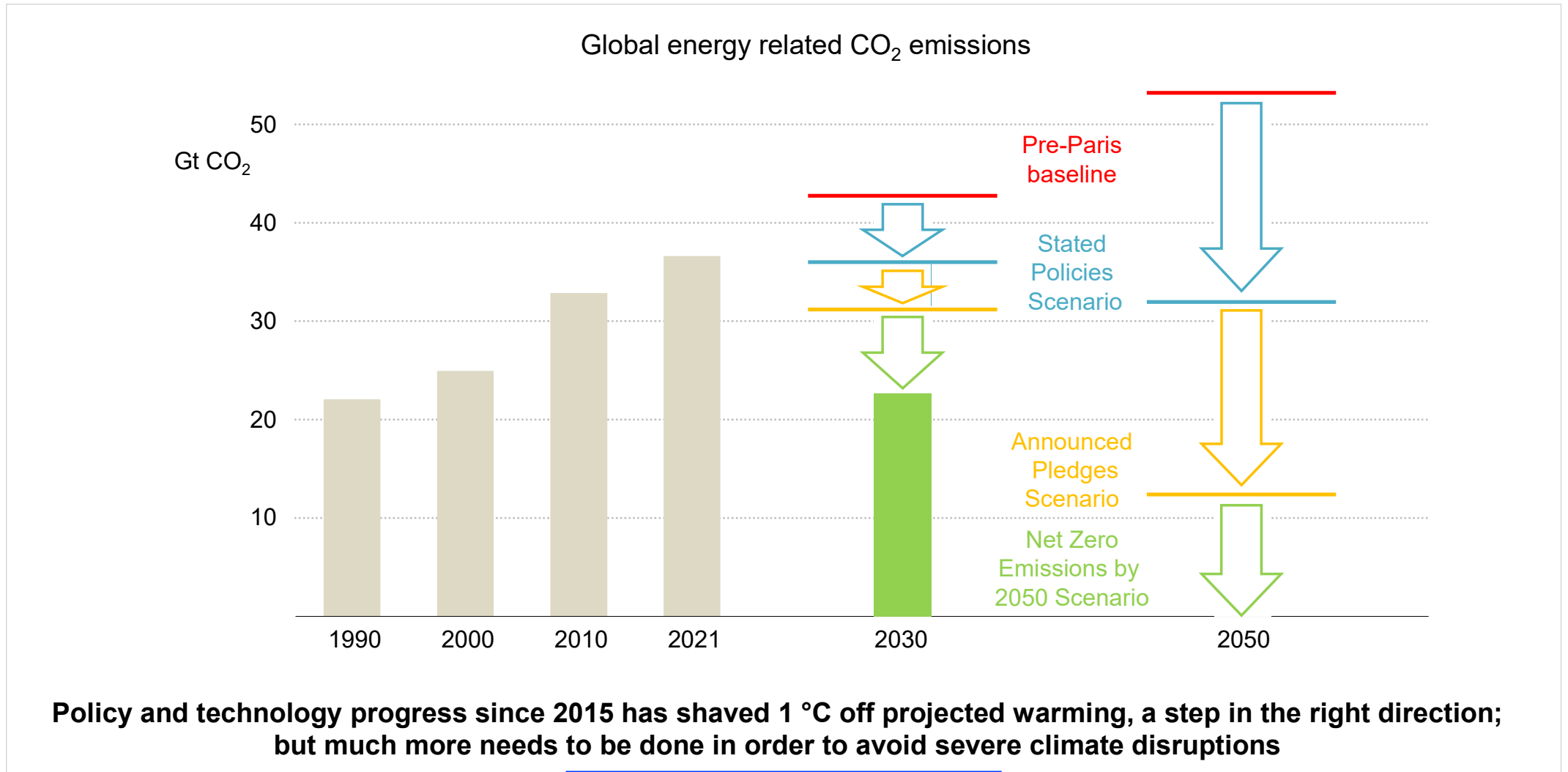
Manage new vulnerabilities

Share of top 3 countries in mineral production



For the duration of energy transitions, the clean energy and fossil fuel systems are *both* required to deliver energy services; assessing & managing the evolving co-existence of both systems is crucial

Keeping the door to 1.5 °C open



Conclusions

- Government responses to today's energy crisis are marking this out as a major turning point towards a cleaner and more secure energy system
 - Russia's invasion of Ukraine is prompting a wholesale reorientation of energy trade & investment flows, leaving Russia with a much-diminished position in global energy
 - Global fossil fuel use has grown alongside GDP since the Industrial Revolution: putting fossil fuel demand into reverse will be a pivotal moment in energy history
 - A massive surge in clean energy investment is vital to keep the door to 1.5 °C open; without this, avoiding renewed price volatility would require higher oil & gas investment, putting climate goals in jeopardy
 - Today's energy crisis provides a stark reminder of why we have to press ahead with energy transitions, & the importance of making change inclusive, affordable & secure
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