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# **Energy security in clean energy transitions: Insights from the World Energy Outlook 2022**

*Yasmine Aرسالane, International Energy Agency*

International  
Energy Agency

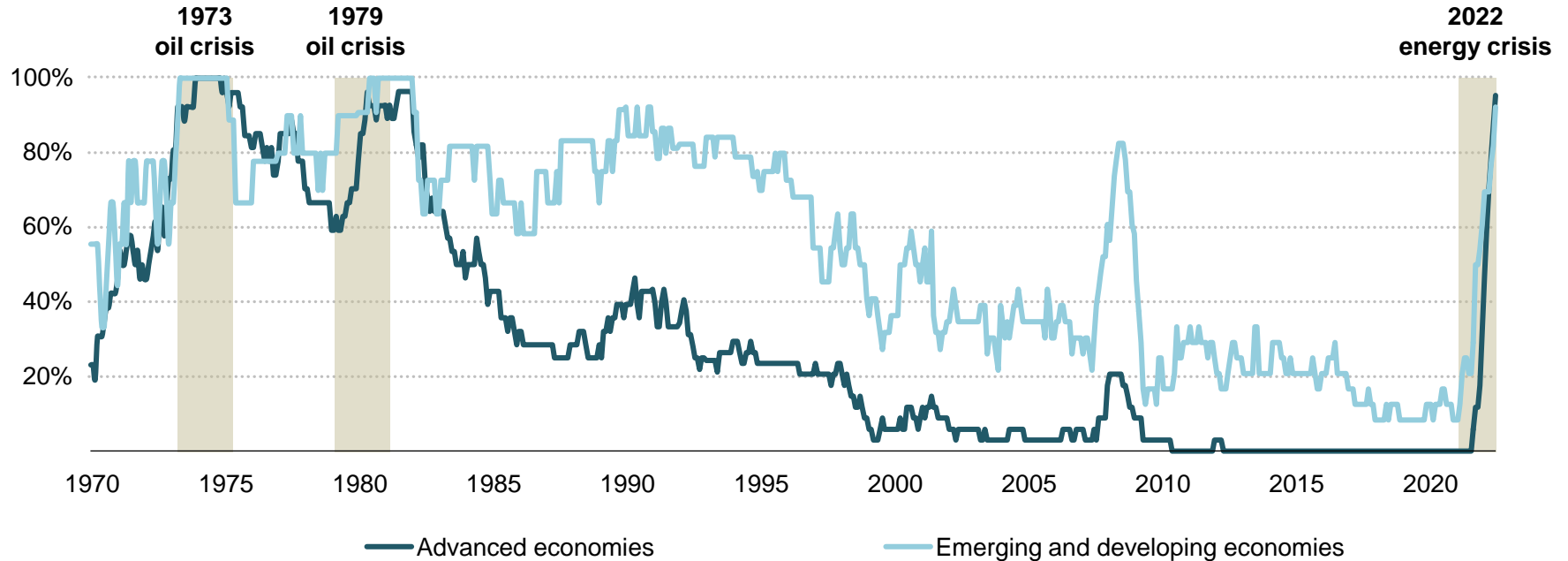
- Russia's invasion of Ukraine has plunged the energy sector into full-blown turmoil, cutting supplies from the world's largest fossil fuel exporter
- Oil & gas markets are facing major uncertainties amid today's geopolitical upheaval
- High energy prices have stoked inflation and created a looming risk of global recession

**Is today's energy security crisis a lasting setback for energy transitions, or a catalyst for accelerated action?**

- The new *Outlook* considers multiple scenarios:
  - **Stated Policies** (STEPS) reflects today's policy settings
  - **Announced Pledges** (APS) if country net zero and other pledges are met in full
  - **Net Zero Emissions by 2050** (NZE) – an updated roadmap to limit warming to 1.5°C

# An energy shock of unprecedented breadth and complexity

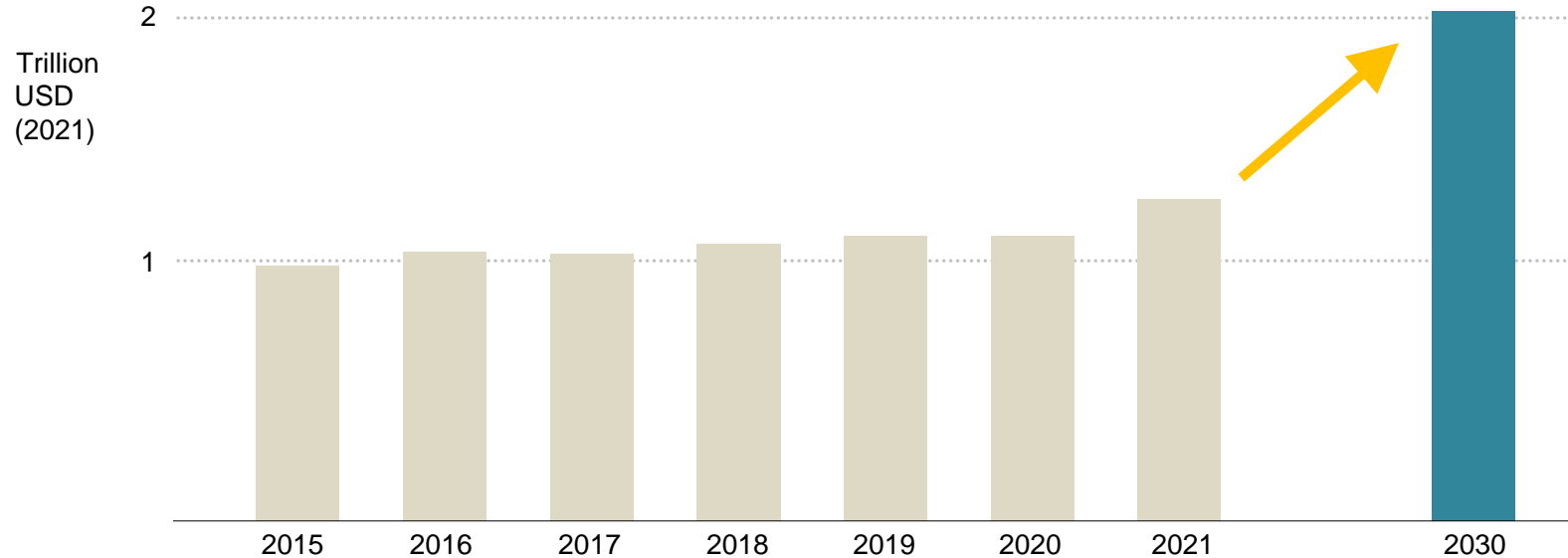
Percentage of countries with annual inflation greater than 6%



**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**

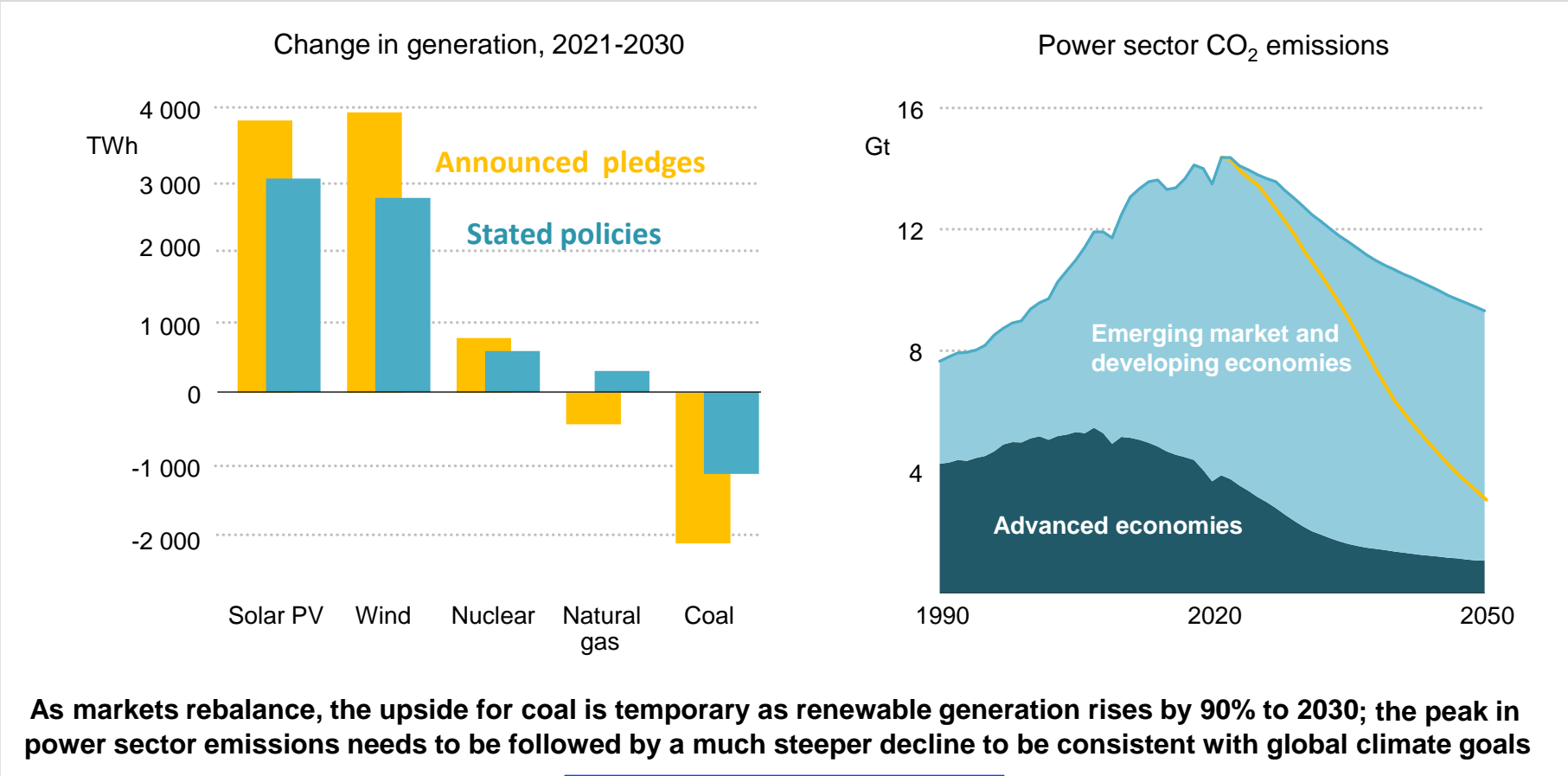
# Government responses are fast-tracking the clean energy economy

Clean energy investment in the Stated Policies Scenario



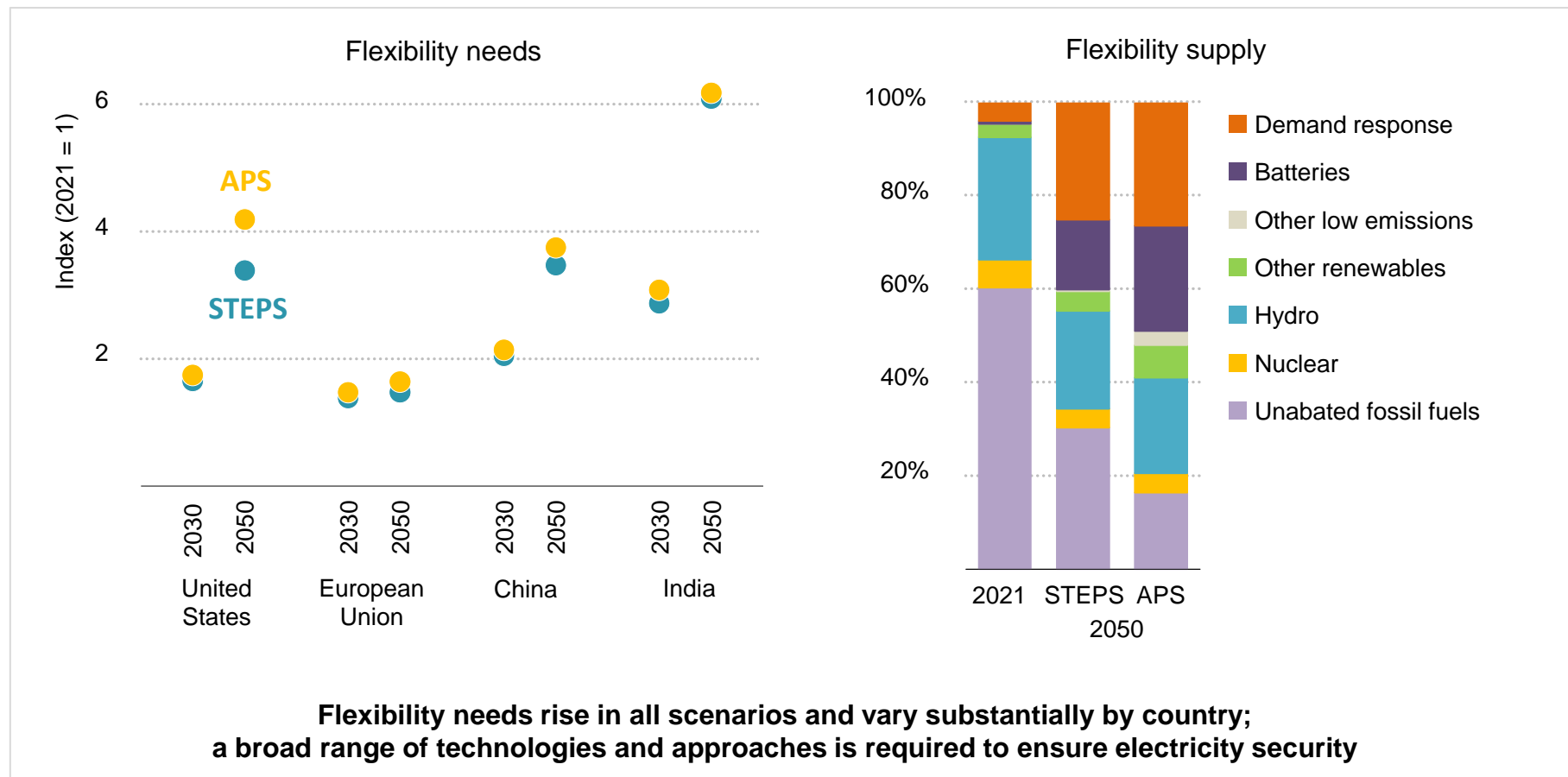
**The US Inflation Reduction Act, the EU's Fit for 55 package, Japan's GX, China's new clean energy targets and India's solar revolution propel clean energy investment to new highs, but \$4 trillion is needed by 2030 to be on track for 1.5 °C**

# Electricity is turning the corner

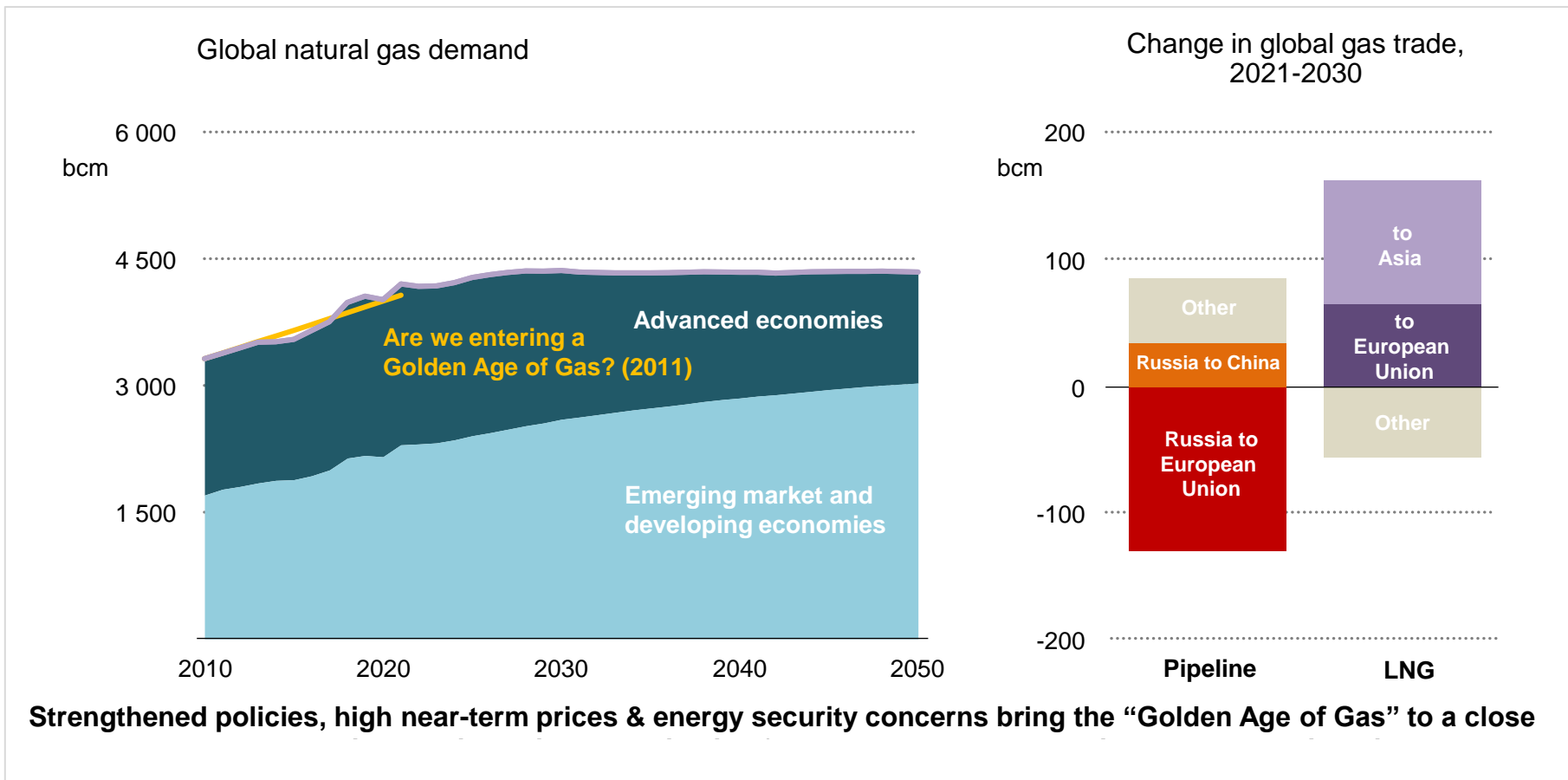


**As markets rebalance, the upside for coal is temporary as renewable generation rises by 90% to 2030; the peak in power sector emissions needs to be followed by a much steeper decline to be consistent with global climate goals**

# New challenges emerge to maintain electricity security

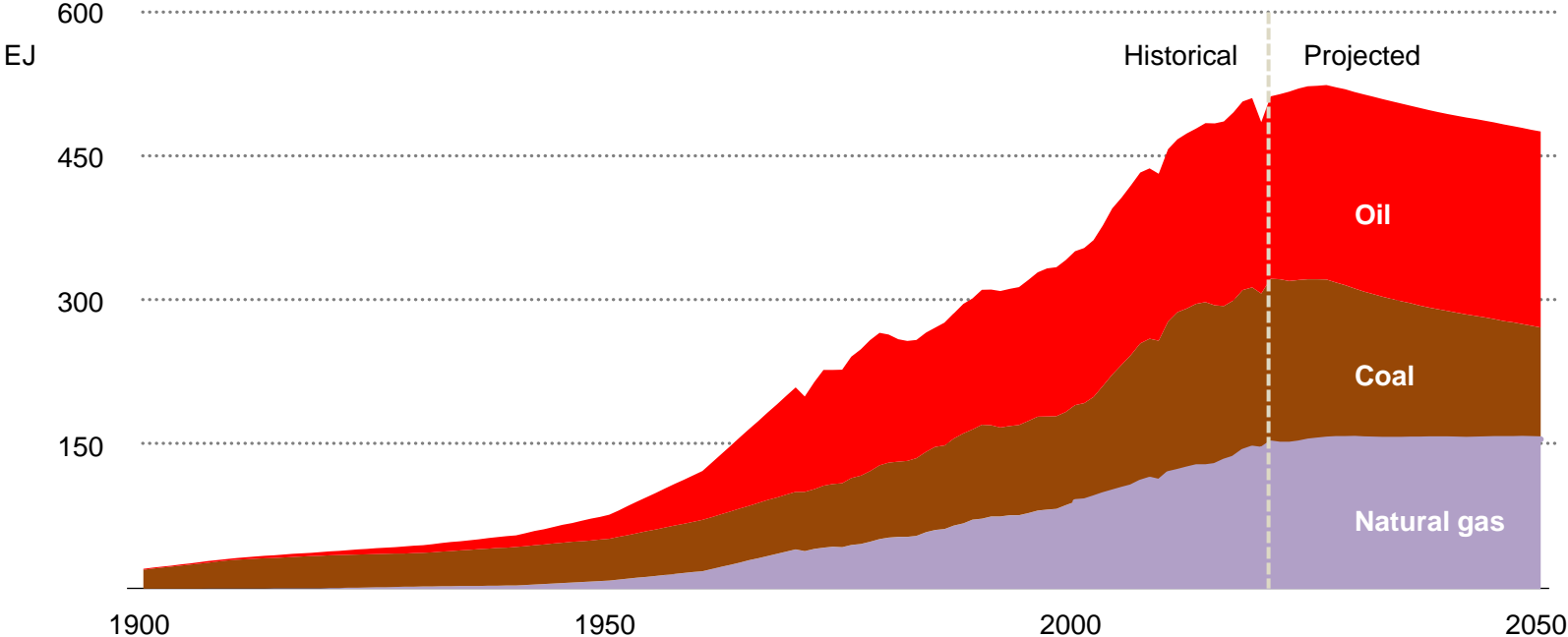


# The era of natural gas demand growth is coming to an end



# Peak fossil fuel demand is coming this decade

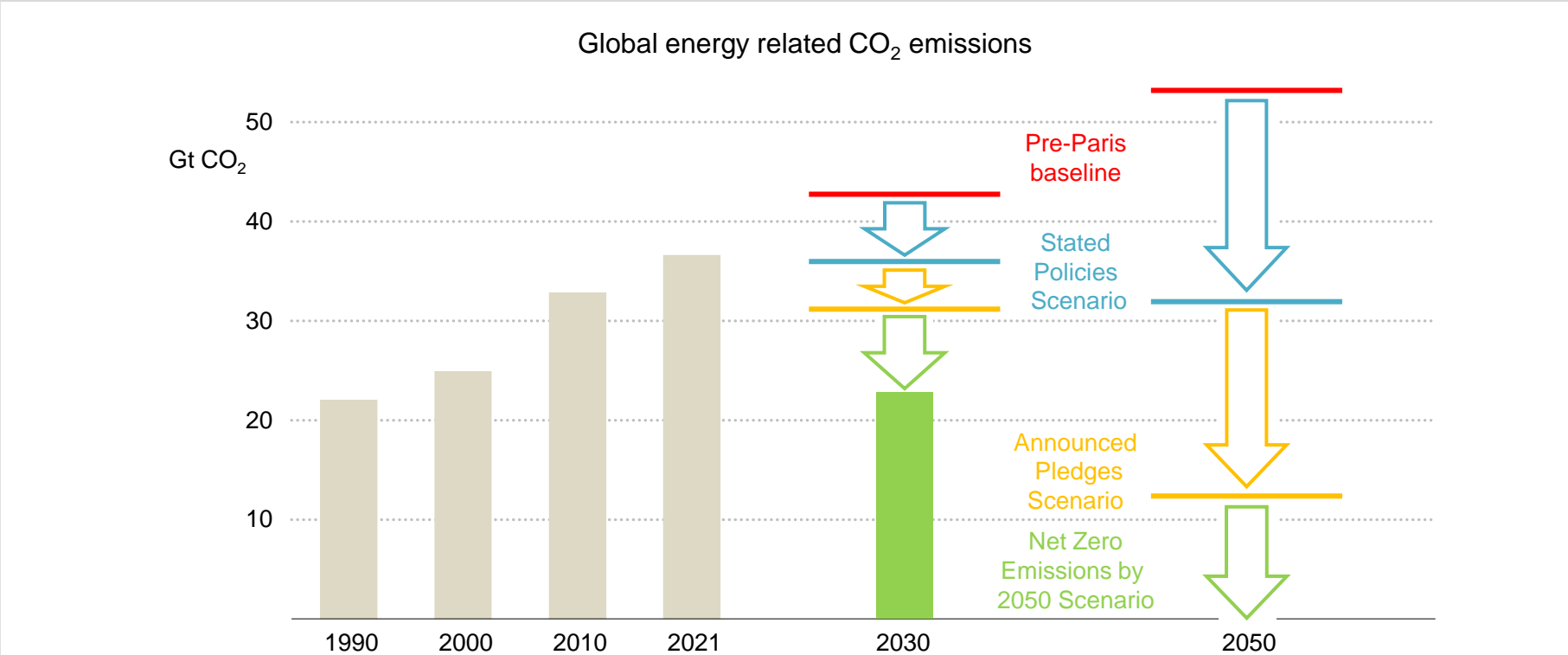
Fossil fuel demand in the Stated Policies Scenario, 1900-2050



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



# Keeping the door to 1.5 °C open



**Policy and technology progress since 2015 has shaved 1 °C off projected warming, a step in the right direction; but much more needs to be done in order to avoid severe climate disruptions**

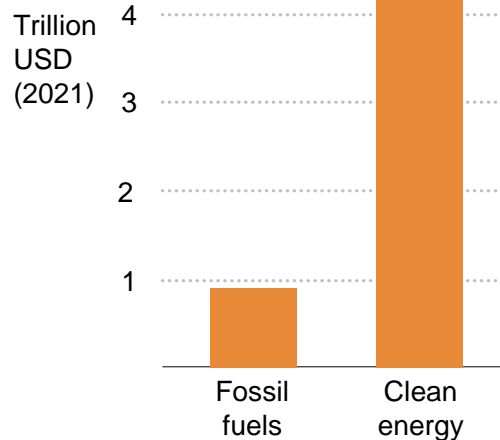
# A new energy security paradigm is needed for secure transitions

Scale up clean energy  
to scale back fossil fuels

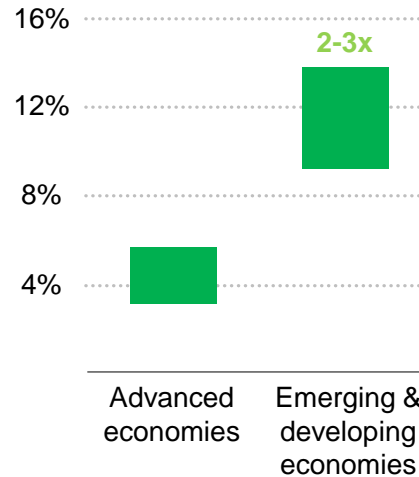
Lift emerging economies into the  
new energy economy

Manage new vulnerabilities

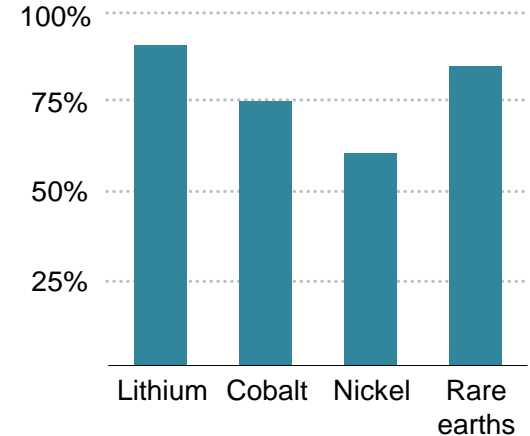
Investment in NZE Scenario,  
2030



Cost of capital for solar PV, 2021



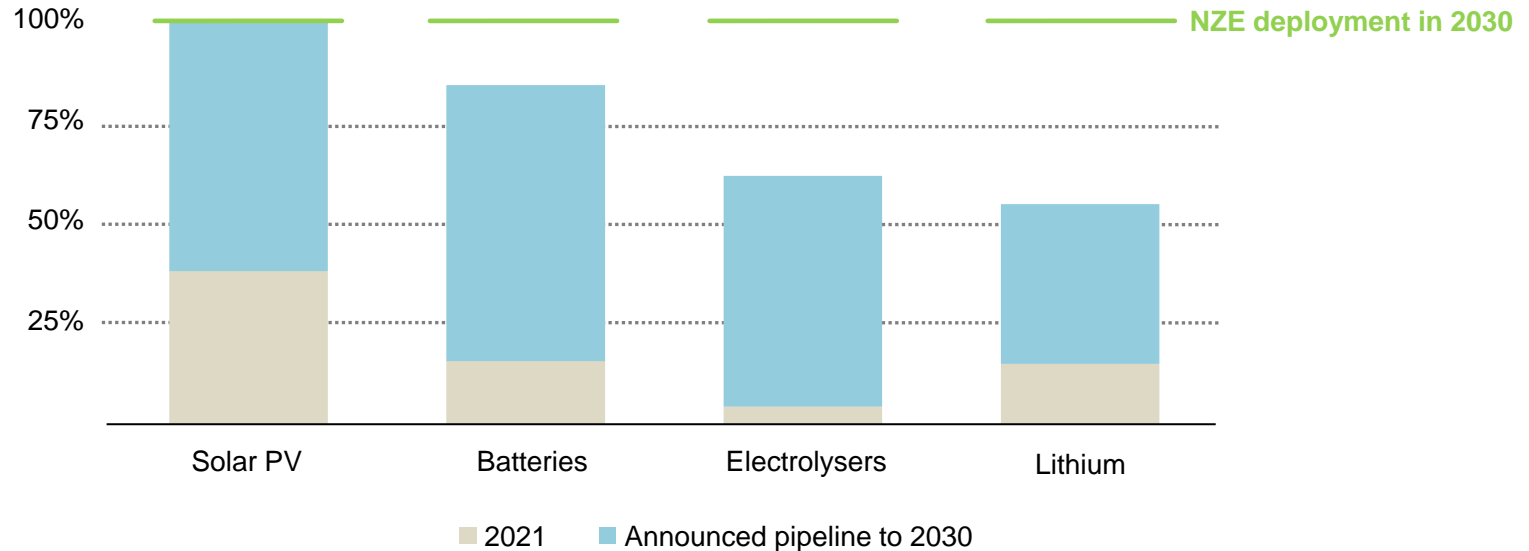
Share of top 3 countries in mineral  
production



**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**

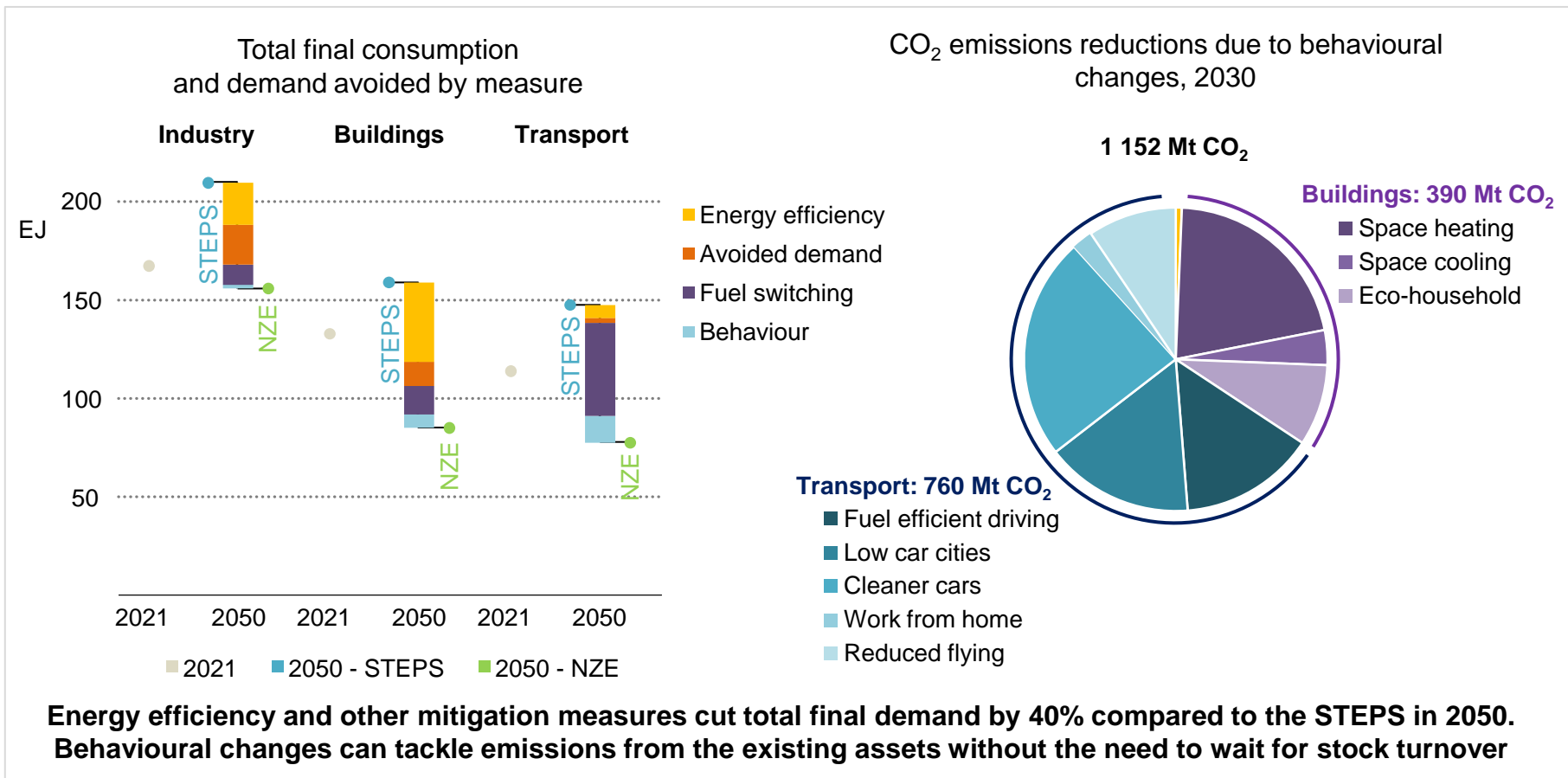
# Clean energy manufacturers prepare the ground for faster transitions

Announced manufacturing capacity pipeline compared with NZE Scenario deployment in 2030

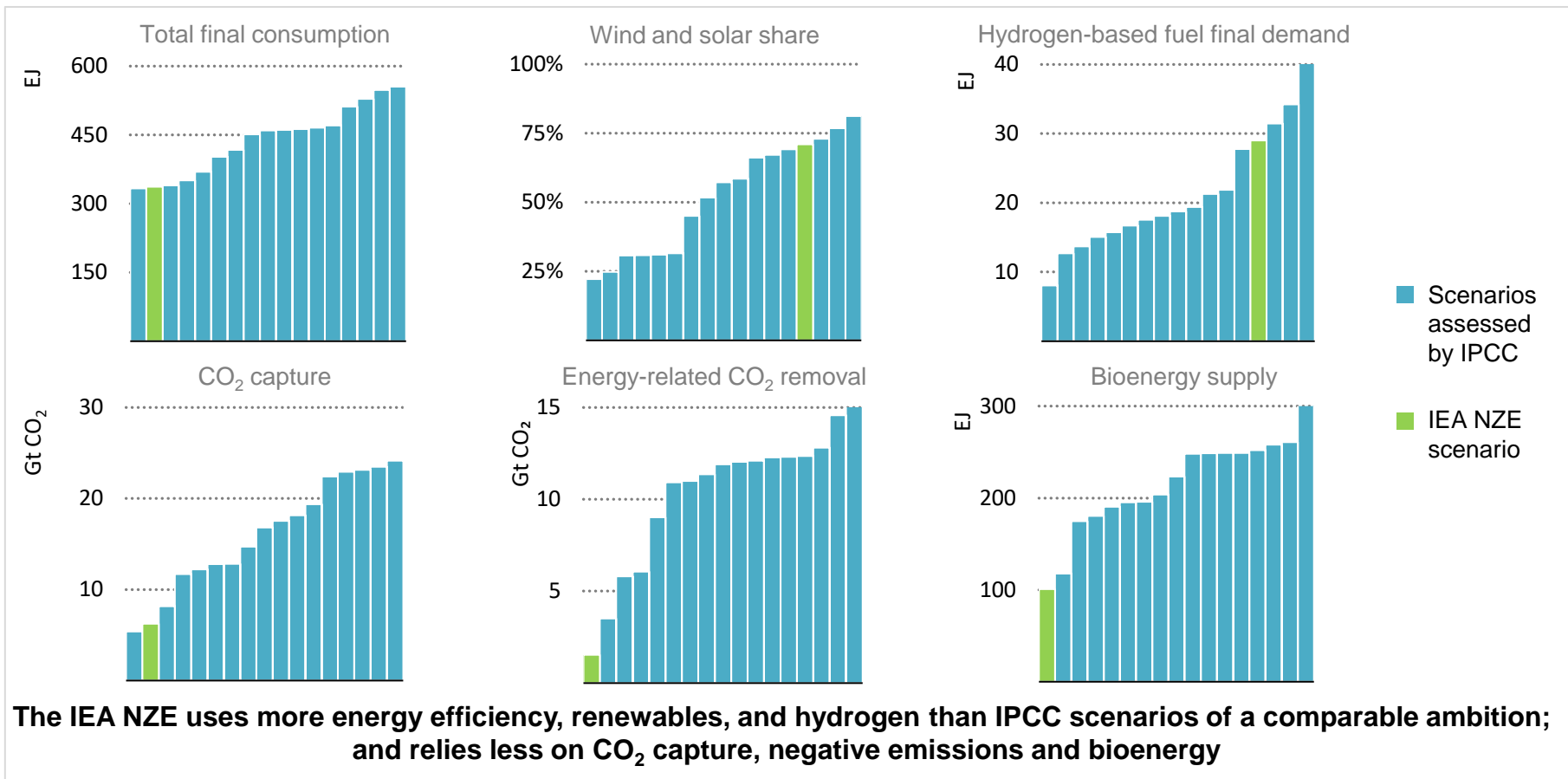


**Announced plans to scale up clean energy manufacturing capacity help to accelerate cost reductions and would, in some cases, approach the levels needed to put the world on track with a 1.5 °C pathway**

# Avoiding growth in energy demand is critical to net-zero transitions



# The IEA's NZE in 2050 compared with IPCC net-zero scenarios



iea