



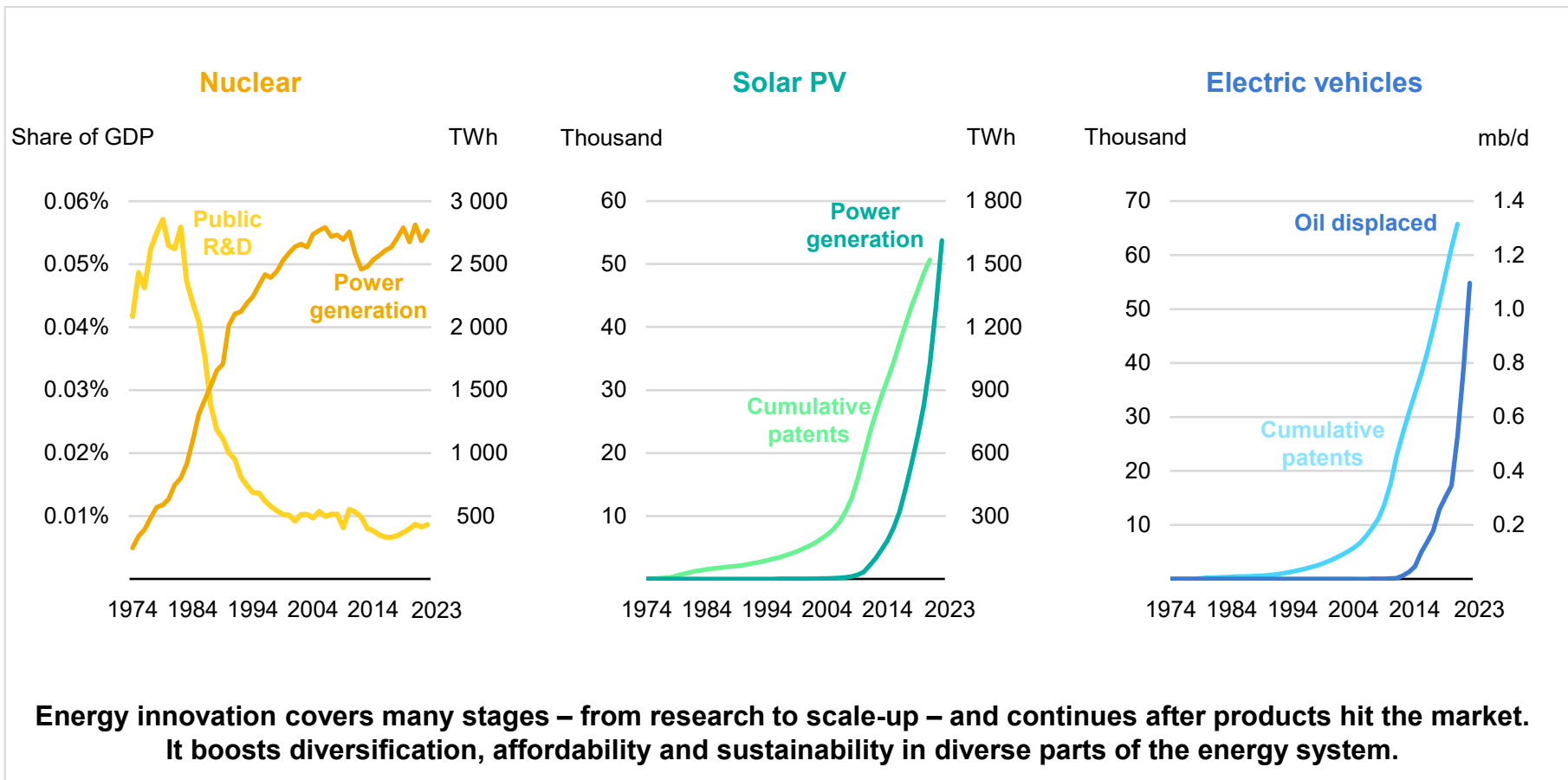
# State of Energy Innovation

Tim Gould, Chief Economist, IEA

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Session 3 Innovations to Overcome the Gap between Ideals and Reality

# Energy R&D has major real-world impacts on the energy system



# Energy R&D has impacts on society and the wider economy

## Mass-market spillovers from energy R&D



Initial Li-ion battery R&D was for storing renewable power



Li-ion batteries for smartphones and electronics



Processing seismic data to find oil and gas



Processing musical data for auto-tune

## Unconventional oil and gas technologies

2000: USA **imports** 46% of its oil & gas needs



2024: USA **exports** the equivalent of 10% of its needs



## Battery, EV and manufacturing technologies

2024: Share of EVs in car sales in China reaches 50%

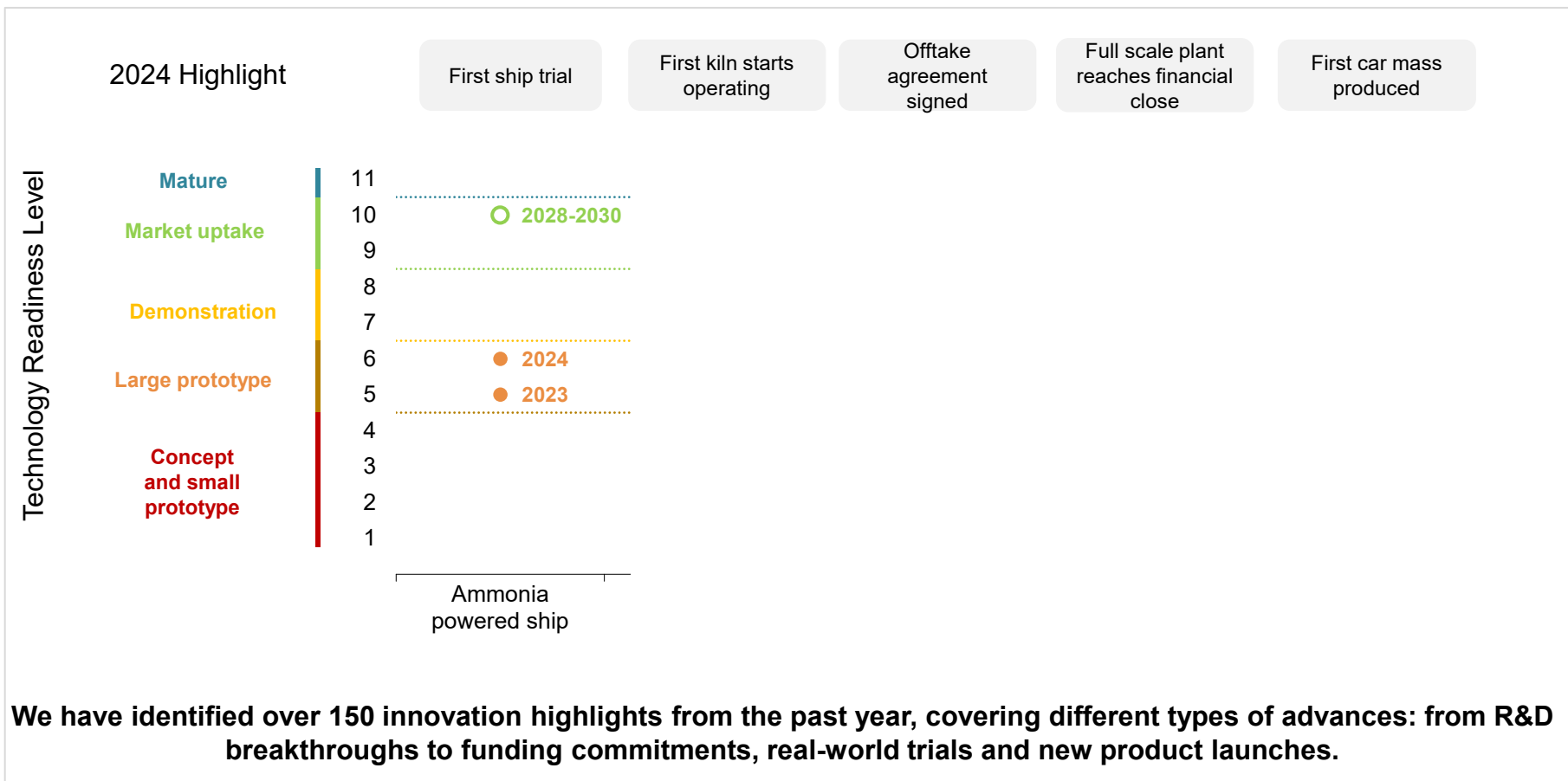


2024: China **imports** 8% **less oil**



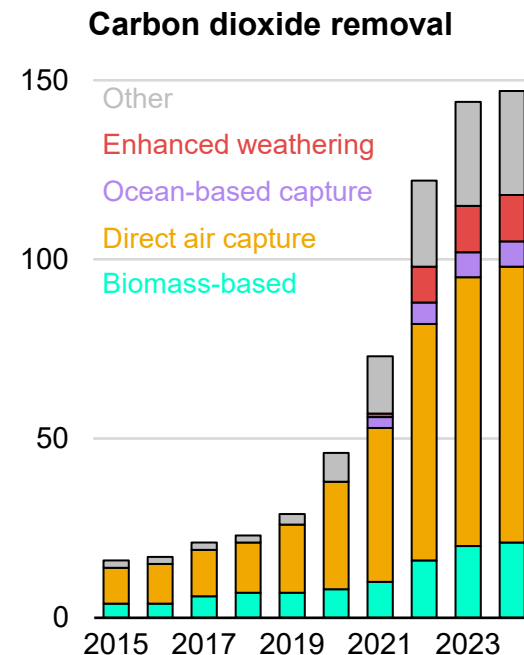
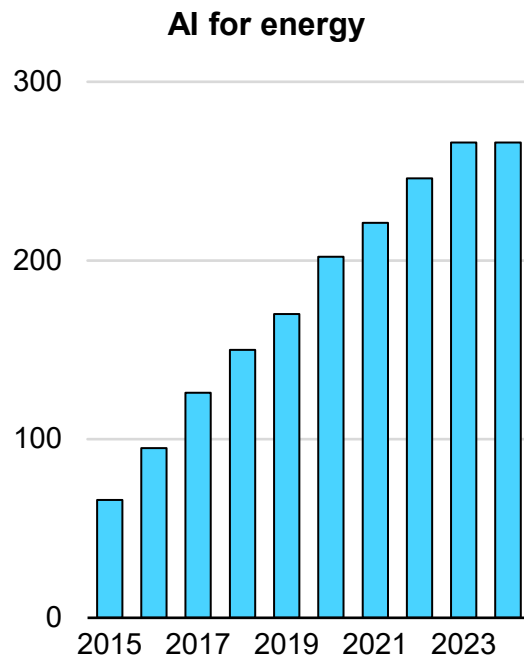
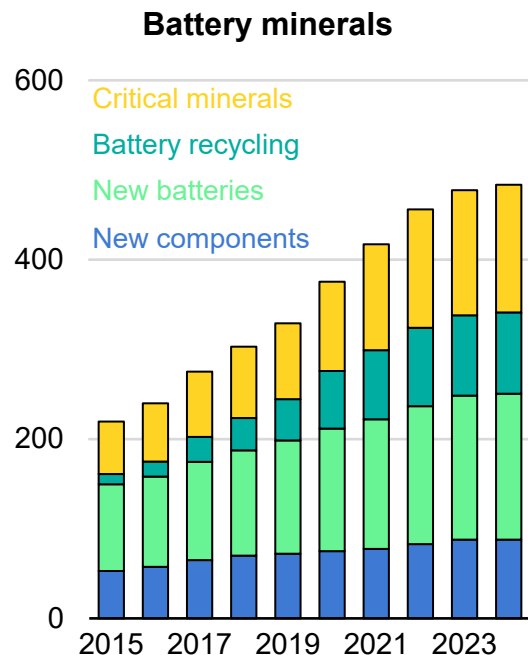
**The effects of energy R&D are felt far beyond the energy sector, with spillovers and trade impacts driving competitiveness and new industries.**

# A wealth of energy technology highlights from the past 12 months



# Three dynamic areas in focus: battery minerals, AI and CDR

Number of known start-ups, 2015-2024

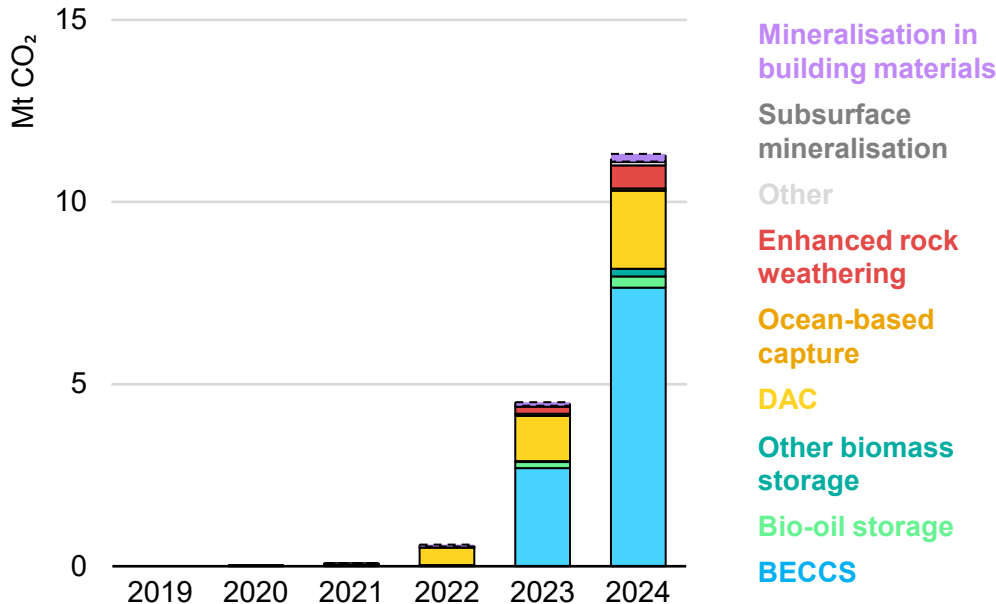


**There have been sharp increases in the numbers of start-ups being founded, but each sector must overcome unique challenges and policy needs to achieve widespread deployment.**

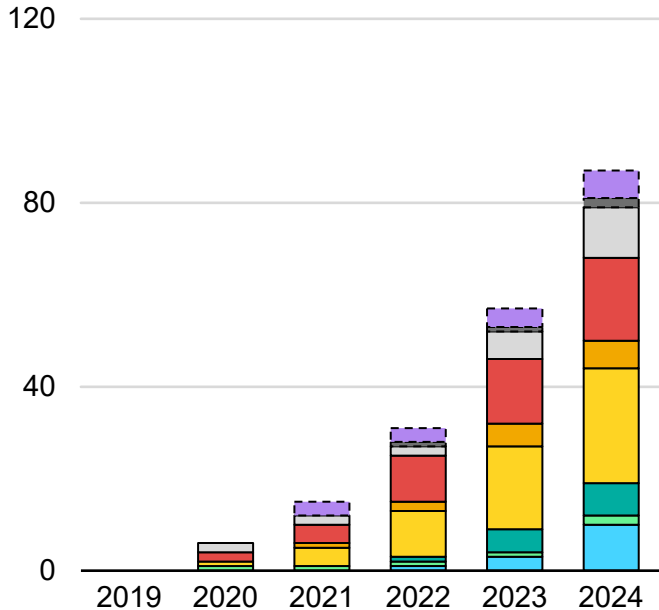
# Voluntary carbon markets have been critical to support expansion



Cumulative CDR credits sold for selected CDR approaches, 2019-2024



Number of companies selling credits 2019- 2024



**Advanced purchase agreements for CDR credits more than doubled between 2023 and 2024. BECCS and DACS make up three-quarters of cumulative credits sold, but other CDR approaches are growing their presence on markets.**

1

A global portfolio of pilot and demonstration projects

2

Open-access testbeds for CDR

3

Public procurement of CDR

4

Two-way flow of project data and research to improve MRV

