



Tim Buckley, Director CEF  
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**La Caisse, Sydney**

**Energy System Transition**

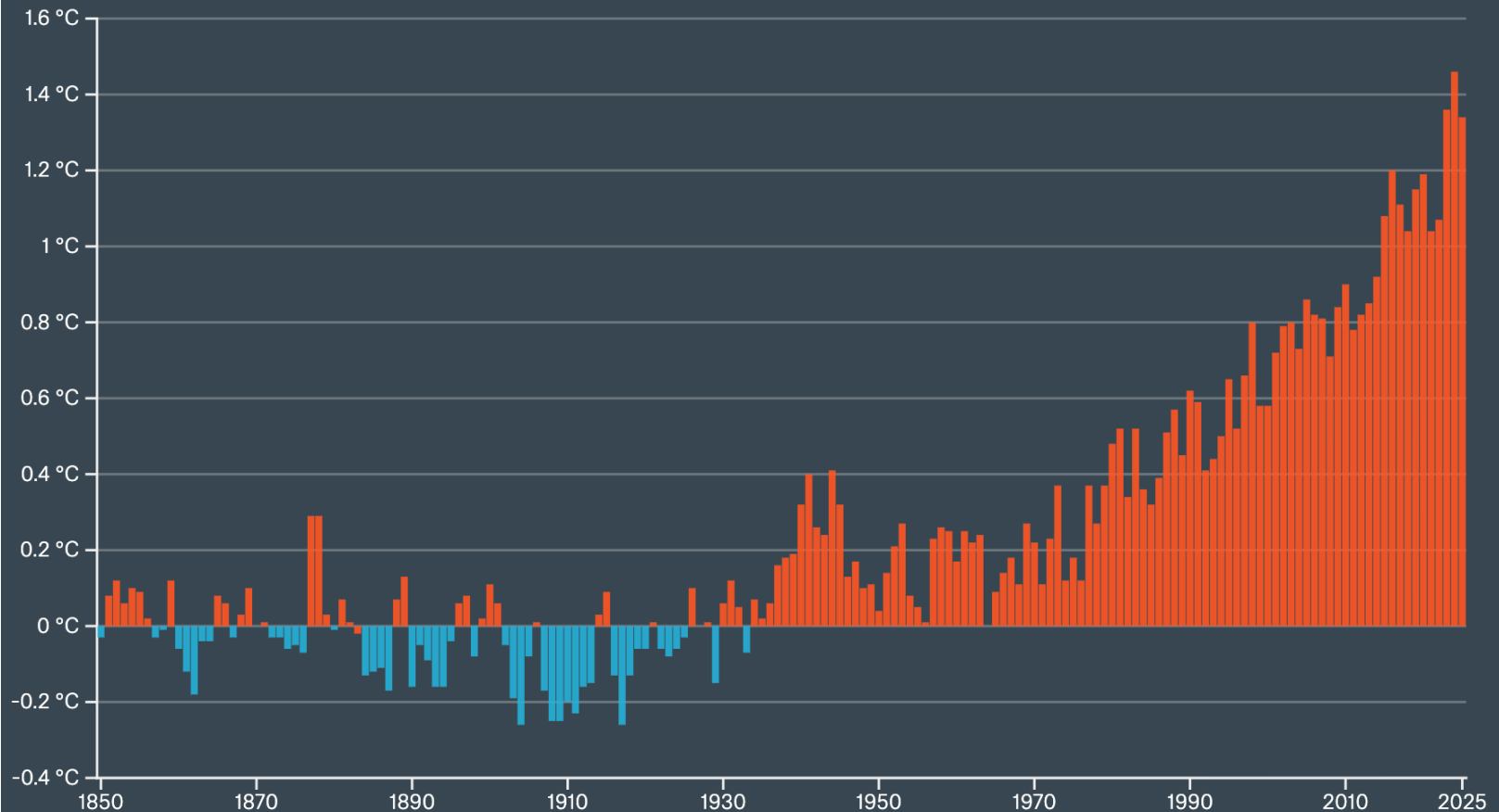
**25 May 2026**

# CEF accepts the climate science

**CEF is a public interest thinktank with no government or corporate funding**

The last 12 years were the warmest on record

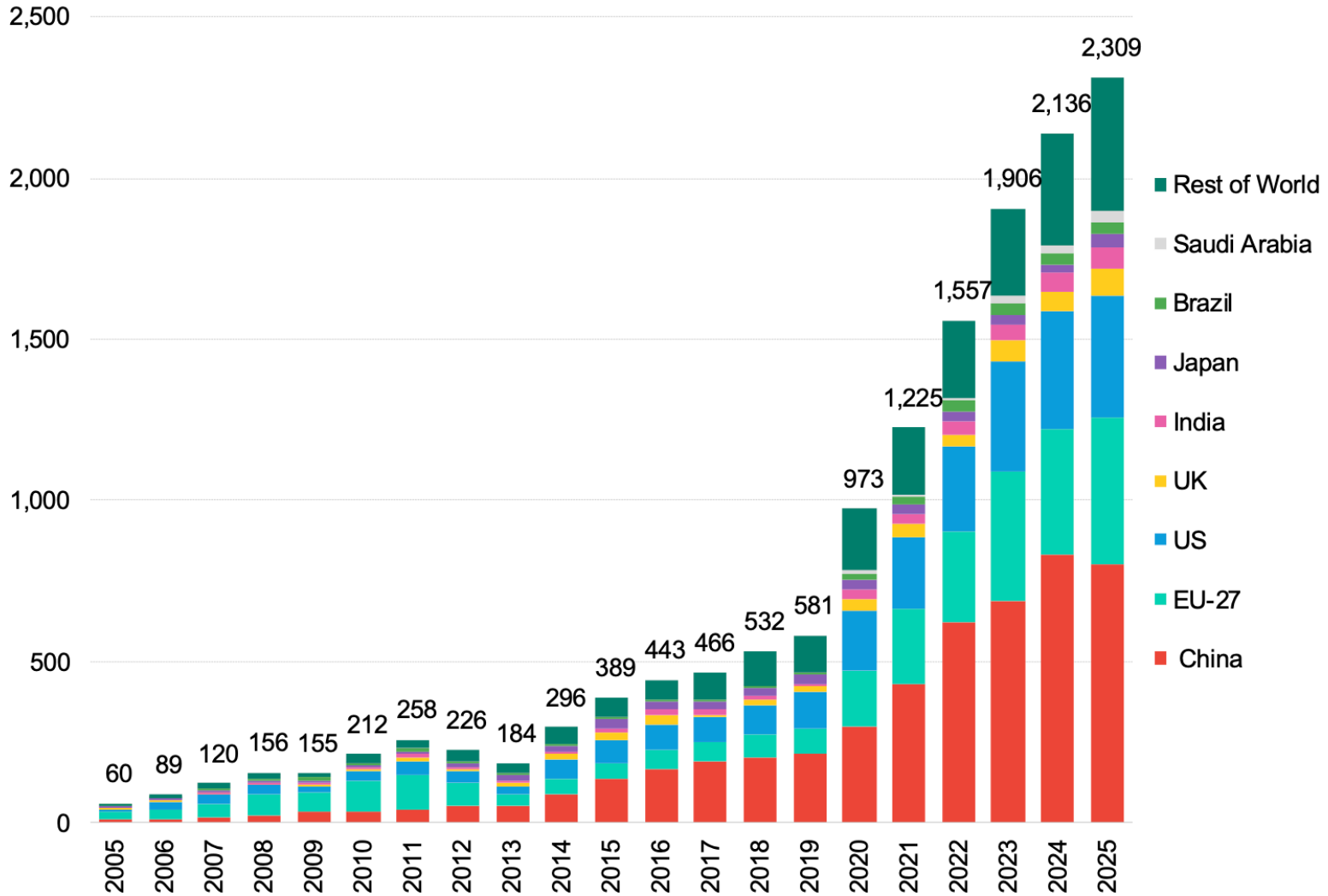
Global temperature anomalies compared to the 1850-1900 average



Source: Munich Re calculation, based on [NOAA data](#) (as at January 2026).

# Renewables, EV & Grid outspend Fossil Fuels >2:1

\$ billion **Global Energy Transition Investment, by Country, US\$bn: 2025 +8% yoy**



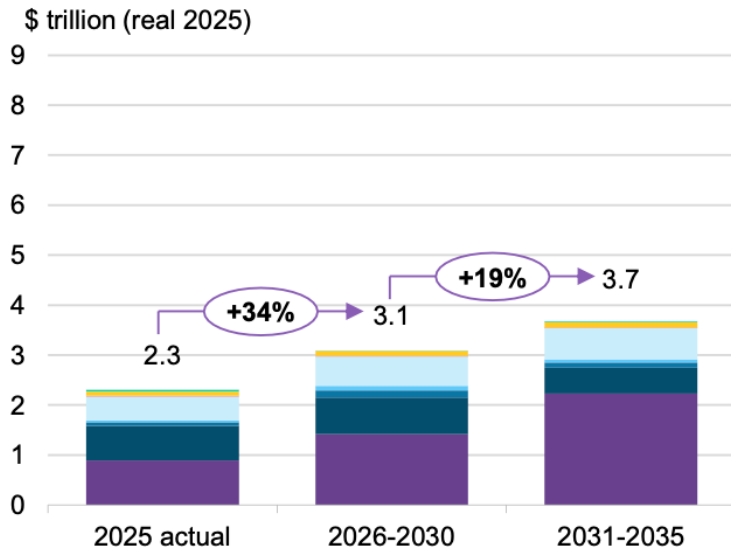
Source: BloombergNEF, Energy Transition Investment Trends, January 2026

# Annual Investment in Energy Transition needs to treble

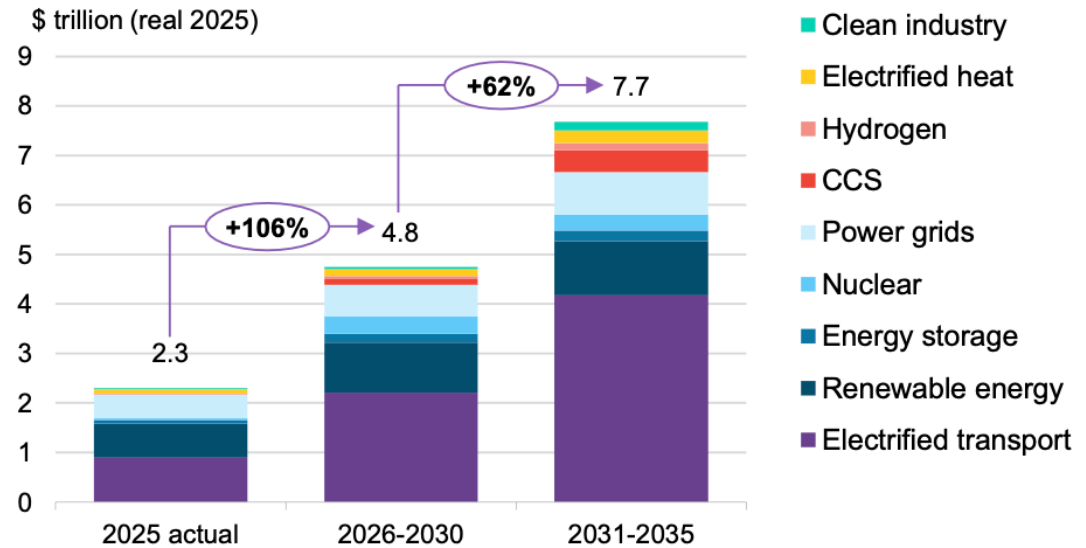
## Global Energy Transition Investment, by Technology, US\$ Trillion pa

Energy transition investment, 2025 actuals versus required annualized levels in NEO scenarios

### Economic Transition Scenario

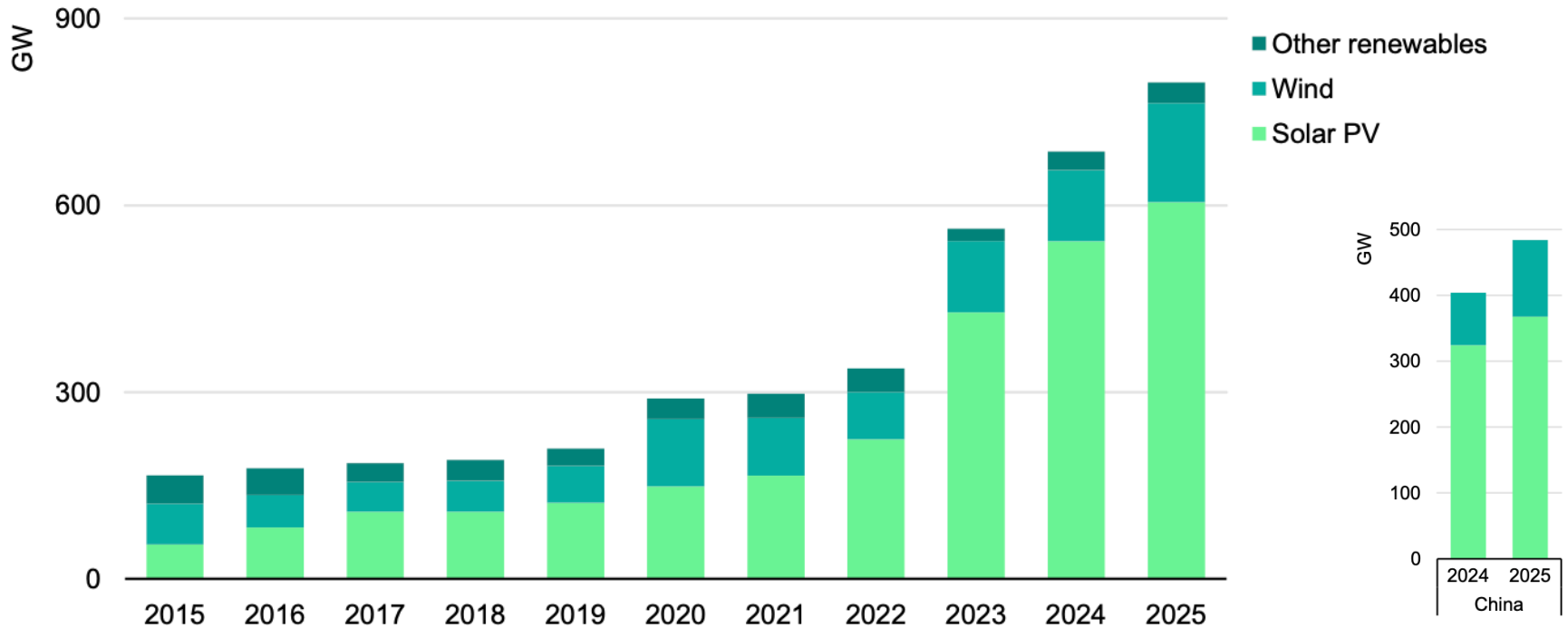


### Net Zero Scenario



# Global Renewable Infrastructure Capacity is Expanding, Rapidly

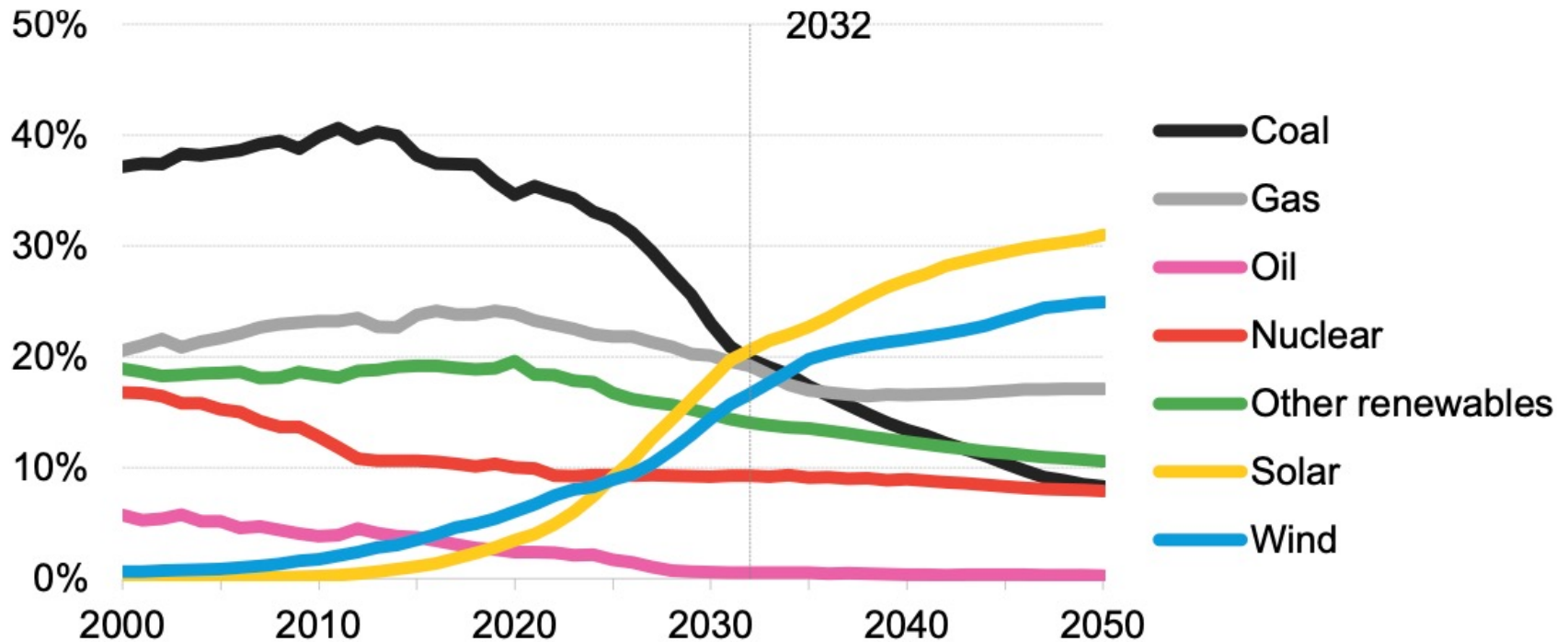
## Total renewable capacity additions by technology, 2015-2025



# Global Renewable Infrastructure Capacity is Expanding, Rapidly

## Share of global electricity generation by technology/fuel

Share of total generation

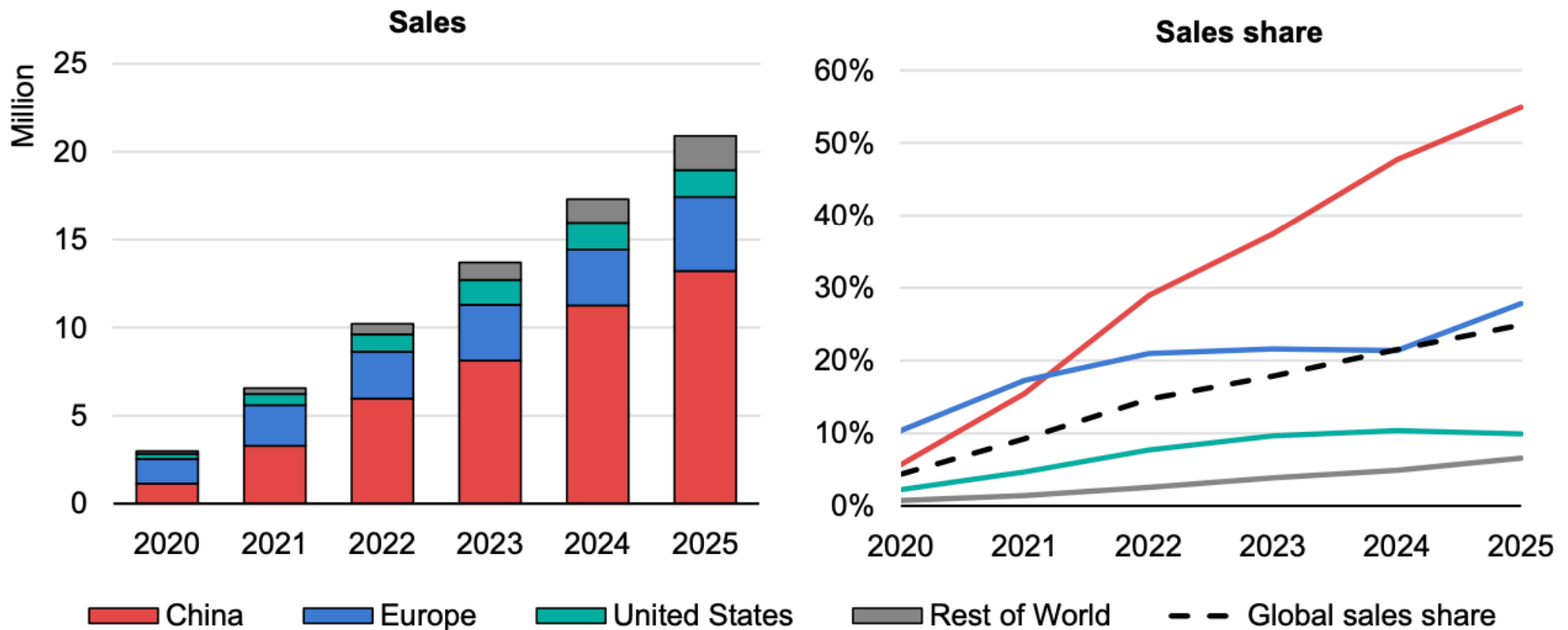


Source: BloombergNEF. Note: "Other renewables" includes all other non-combustible renewable energy, including hydro, bioenergy, geothermal and solar thermal.

# The World is Pivoting to EVs, led by China

This makes V2G increasingly important as the US attacks more nations and pushes up the price of oil, driving EV adoption

### Electric car sales globally and sales share for selected regions, 2020-2025



Note: Electric cars include battery electric and plug-in hybrid electric cars.

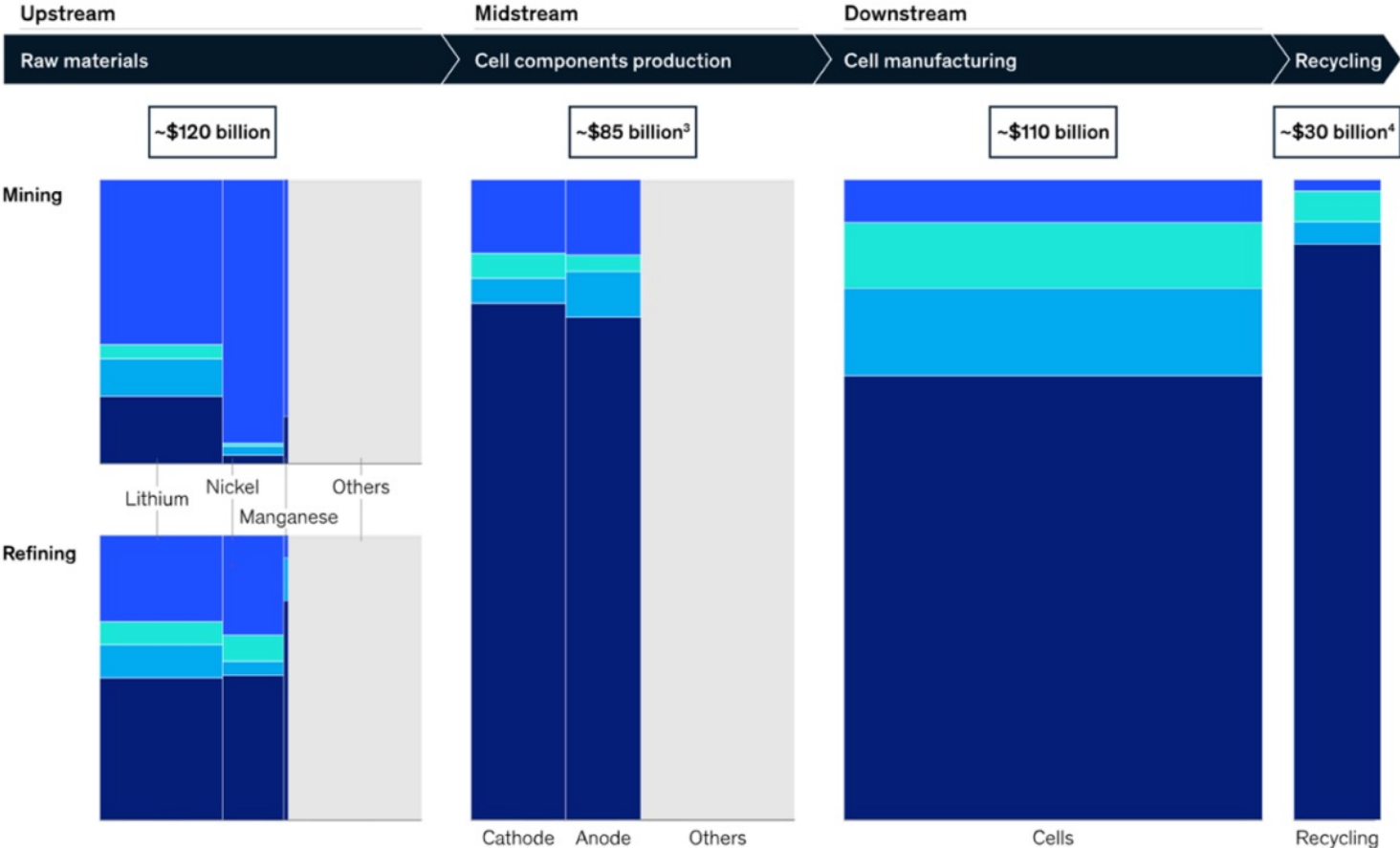


# Chinese Share of the Global Battery Supply Chain

**Figure 2.25: China Dominates Battery Materials Manufacturing Capacity: Cathode Active Material (CAM) Demand and Supply (t, 2025)**

Share of core steps along lithium-ion (Li-ion) value chain by project location, 2035 (estimated),<sup>1</sup> %

xx Total value add<sup>2</sup>    ■ China    ■ North America    ■ Europe    ■ Rest of world



Source: McKinsey, [Battery 2035: Building new advantages](#), 1 January 2026

# CEF's Report Advocating for Carbon Pricing

**Climate Energy Finance**

05 June 2025



## A Price on Carbon: Building Towards an Asian CBAM

A focus on the harmonisation and integration of carbon pricing mechanisms in Asia-Pacific for the steel, aluminium and cement value chains.

Authors:

**Matt Pollard**, Net Zero Transformation Analyst, CEF

**Tim Buckley**, Director, CEF

The Safeguard Mechanism was reformed in 2023. It will be reviewed by the DCCEEW in late 2026.

Australia's #1 trade partner, China will expand its national ETS by 50% by 2027.

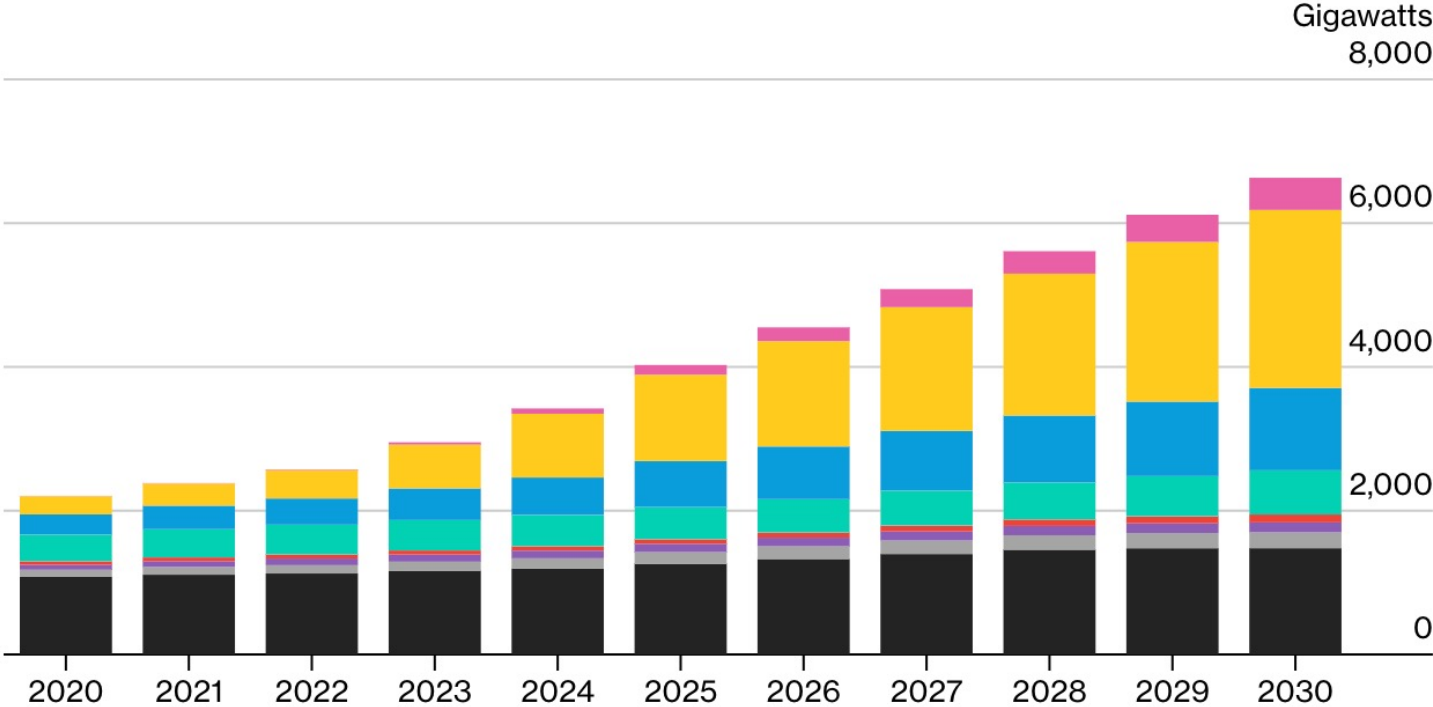
Australia needs to leverage the EU / UK ETS & CBAM into Asia to provide finance the price signal required.

# China is Moving in Decarbonisation, Rapidly

## China's Power Capacity Mix Diversifies as Wind and Solar Deployment Scales

China's cumulative installed capacity by technology

- Coal
- Gas
- Other thermal
- Nuclear
- Hydro
- Wind
- Solar
- Energy Storage



Note: Other thermal includes biomass and power generation from waste heat and pressure. Values are shown in alternating current.

Source: BloombergNEF, China Electricity Council, National Energy Administration.

Source: Bloomberg, Deutsche Bank Says China Is Energy 'Winner' in Age of War, 9 April 2026  
[https://www.bloomberg.com/news/articles/2026-04-09/deutsche-bank-declares-china-energy-winner-in-new-era-of-war?cmpid=BBD040926\\_GREENDAILY&utm\\_campaign=greendaily&utm\\_medium=email&utm\\_source=newsletter&utm\\_term=260409](https://www.bloomberg.com/news/articles/2026-04-09/deutsche-bank-declares-china-energy-winner-in-new-era-of-war?cmpid=BBD040926_GREENDAILY&utm_campaign=greendaily&utm_medium=email&utm_source=newsletter&utm_term=260409)

# China is Moving in Decarbonisation, Rapidly

But with strong electrification comes high electricity growth rates > GDP, as China substitutes imported oil for domestic electricity, including more coal.

## China's Power Generation Year-to-date April 2026 (TWh)

	4M2026 TWh	4M2025 TWh	% change yoy	Share of YTD26 Generation	Apr'26 TWh	Apr'25 TWh	Apr'26 Change yoy
Coal	1,890	1,820	3.8%	56.3%	427	413	3.4%
Gas	97	93	3.8%	2.9%	22	21	3.5%
Other fossil	5	5	3.9%	0.2%	1	1	3.4%
<b>Thermal</b>	<b>1,992</b>	<b>1,918</b>	<b>3.8%</b>	<b>59.4%</b>	<b>451</b>	<b>436</b>	<b>3.4%</b>
Bioenergy	66	63	3.8%	2.0%	15	14	3.4%
Hydropower	332	302	9.7%	9.9%	88	79	12.6%
Nuclear Power	151	158	-4.6%	4.5%	38	41	-8.3%
Solar Power	404	333	21.4%	12.0%	128	100	28.0%
Wind Power	410	409	0.4%	12.2%	106	105	0.4%
<b>Total power generation (TWh)</b>	<b>3,355</b>	<b>3,184</b>	<b>5.4%</b>	<b>100.0%</b>	<b>825</b>	<b>775</b>	<b>6.5%</b>
Variable Renewable Energy	814	742	9.8%	24.3%	234	205	13.9%
Zero Emissions	1,363	1,266	7.7%	40.6%	375	339	10.5%

Source: Ember; CEF Estimates; Note - this includes distributed energy resource generation

# CEF Chinese FDI reports: Rising Tide and Raw Power

Climate Energy Finance

08 December 2025



## Rising Tide:

### China's Outbound Cleantech Capital Surge Drives Global Collaboration Toward Net Zero

Authors:

**Caroline Wang**, China Analyst, CEF

Contributing editor:

**Dr AM Jonson**, Editorial director CEF

Climate Energy Finance

19 March 2026



## Raw Power:

### China locks-in global dominance of critical minerals and metals with \$120bn outbound investment surge

China's 'going global' strategy to secure value chains in zero-emissions industries is also boosting its partner economies, with lessons for Australia.

Authors:

**Tim Buckley**, Director, CEF

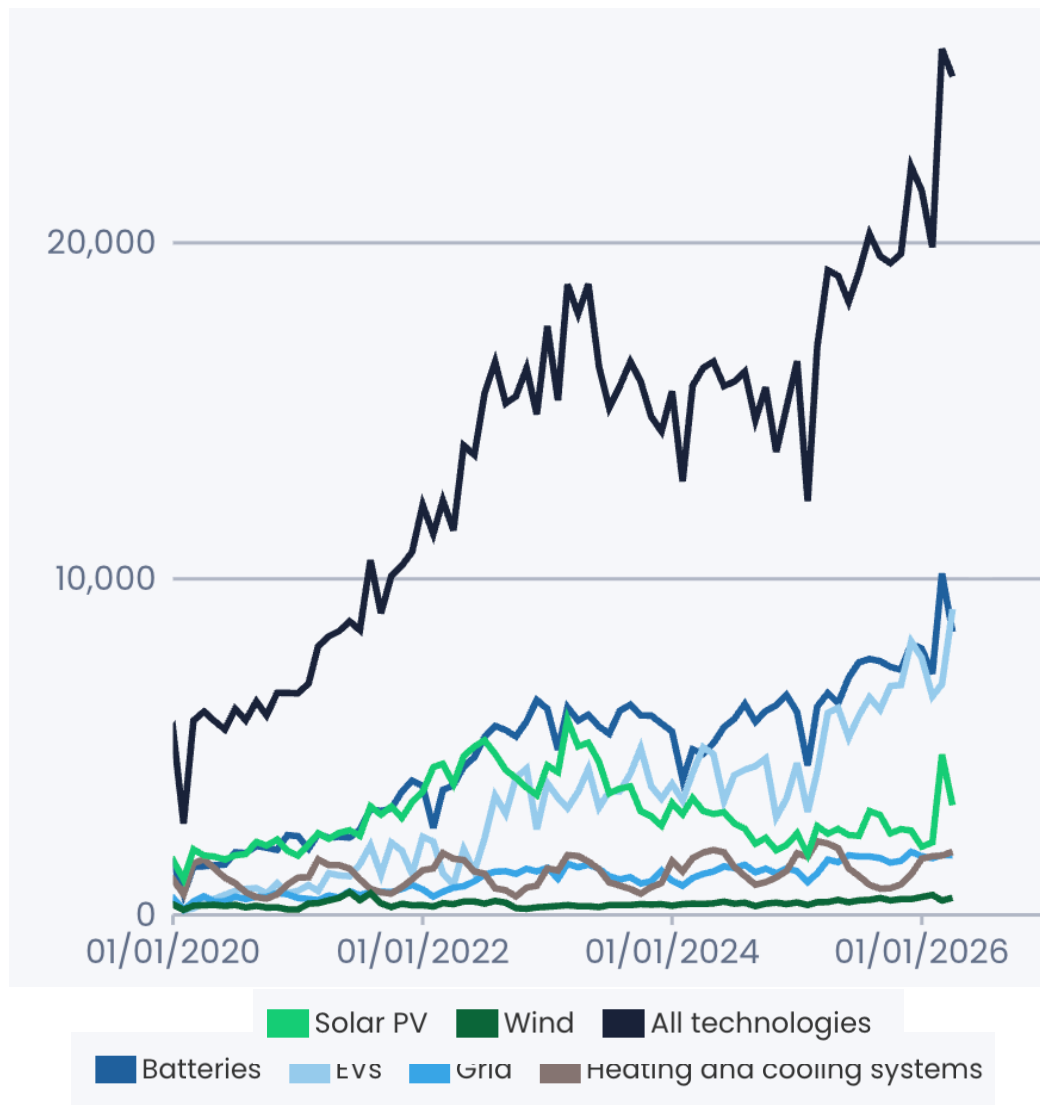
**Matt Pollard**, Net Zero Transformation Analyst, CEF

Contributing editor:

**Dr AM Jonson**, Editorial director CEF

# China leads the world in cleantech R&D, manufacturing, domestic deployments, OFDI and in exports.

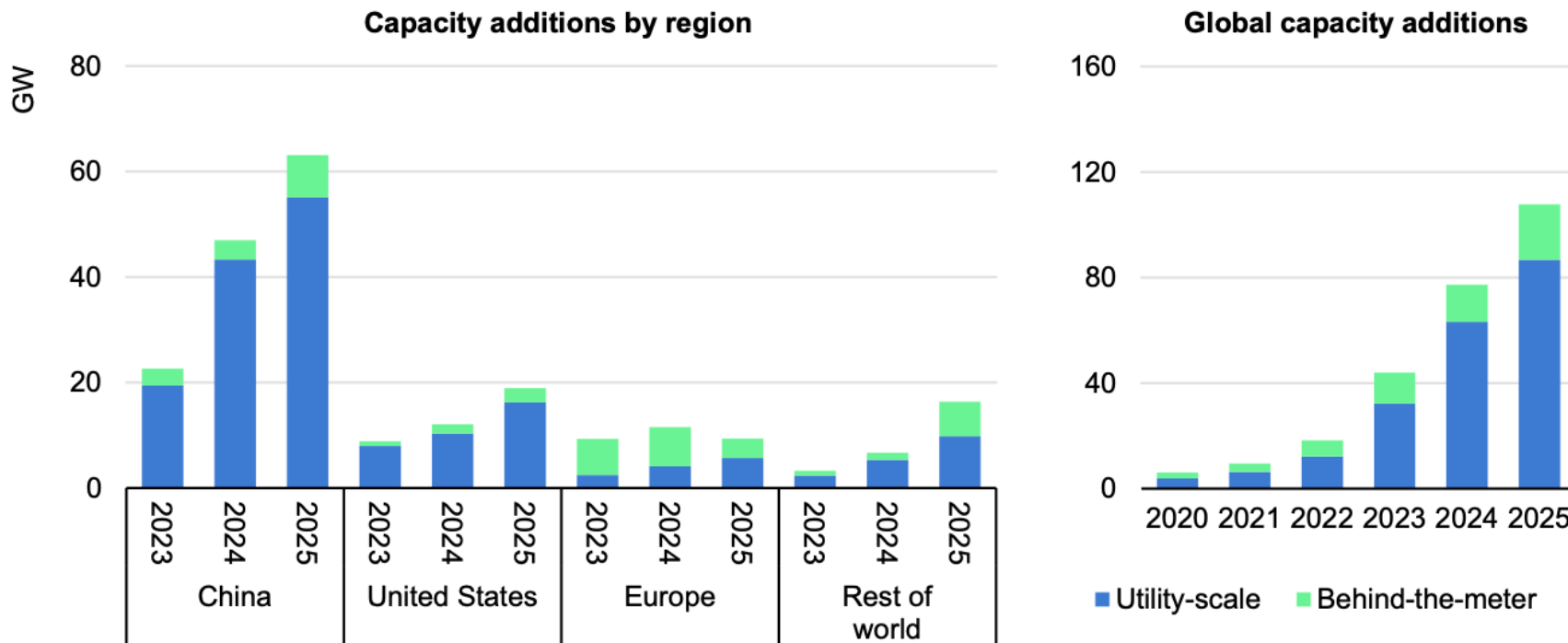
China's global cleantech exports by value, Monthly (US\$m)



<https://ember-energy.org/data/china-cleantech-exports-data-explorer/>

# Global Battery Storage Capacity is Expanding, Rapidly

Battery storage capacity additions in selected regions, 2023-2025, and global capacity additions, 2000-2025



Note: 2025 values are based on [Benchmark \(2026\)](#) data.

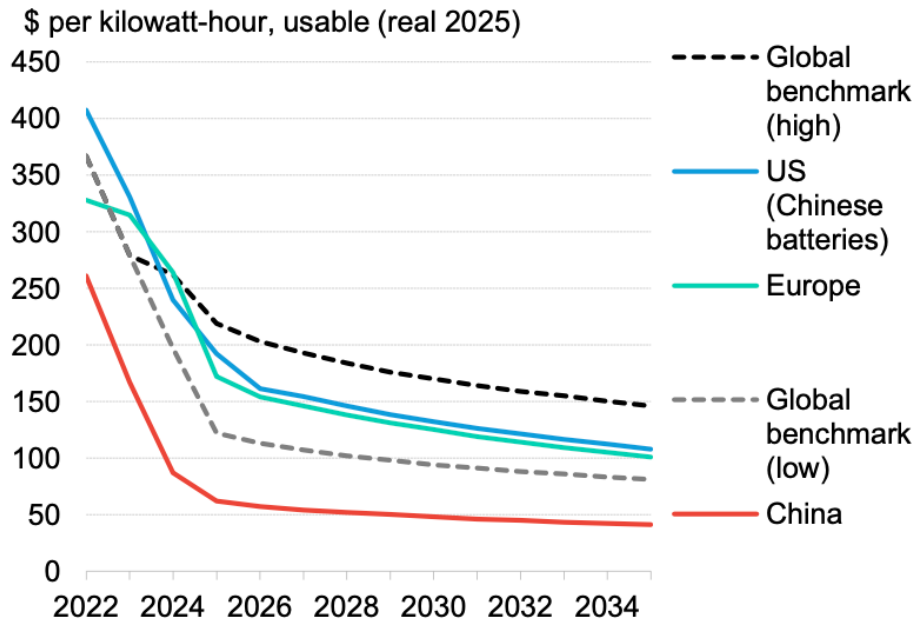


In year-to-date (YTD) to April 2026, [Benchmark Mineral Intelligence \(BMI\)](#) reports that global BESS installations have increased **29% yoy**.

# Batteries are the biggest energy system disruption in 2026

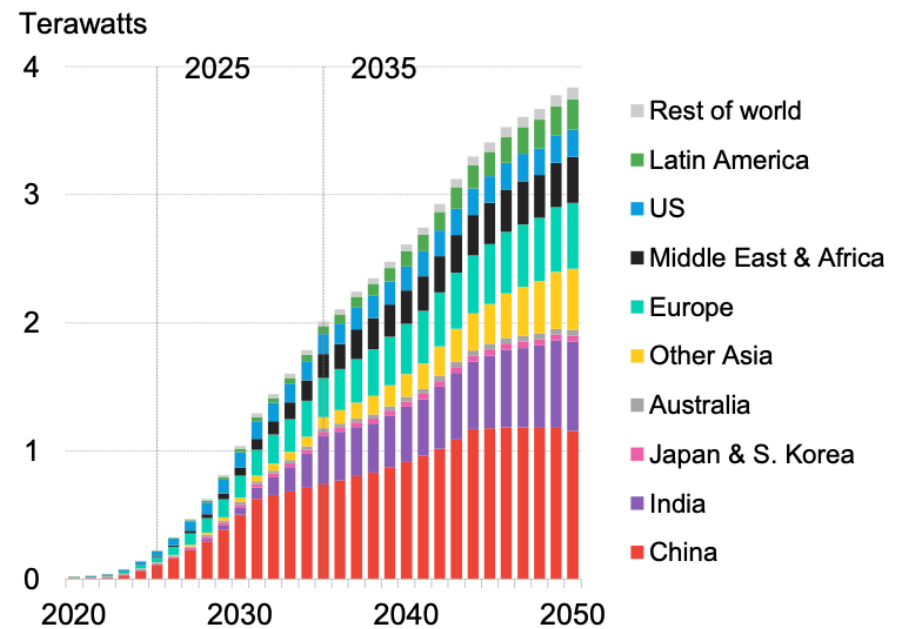
Battery technology continues to improve, and deflation is ongoing

**Figure 7: Forecast capex for a 4-hour turnkey energy storage system using LFP batteries, by region**



Source: BloombergNEF. Note: "LFP" stands for lithium iron phosphate battery. Pricing based on usable capacity.

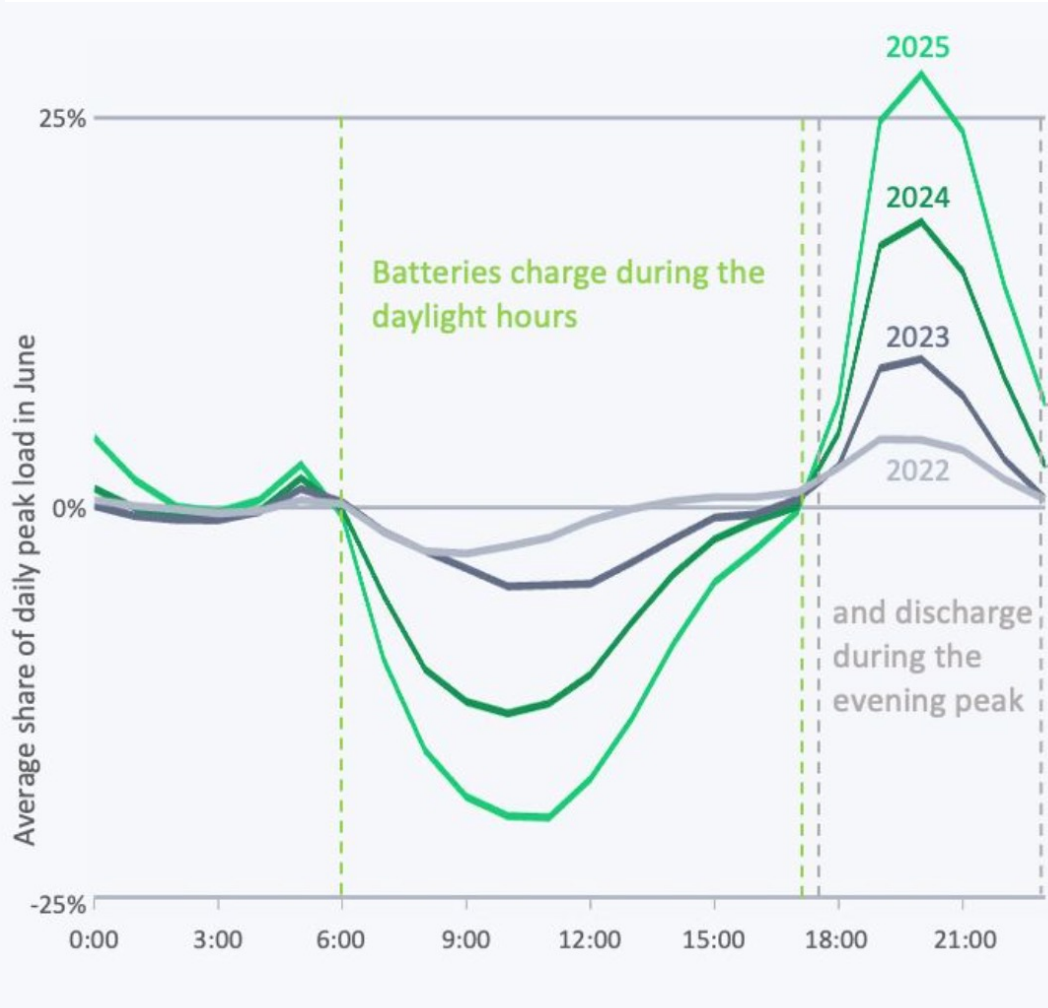
**Figure 8: Battery stationary storage cumulative installed capacity, Economic Transition Scenario**



Source: BloombergNEF. Note: Includes residential and utility-scale batteries.

# Batteries are the biggest energy system disruption in 2026

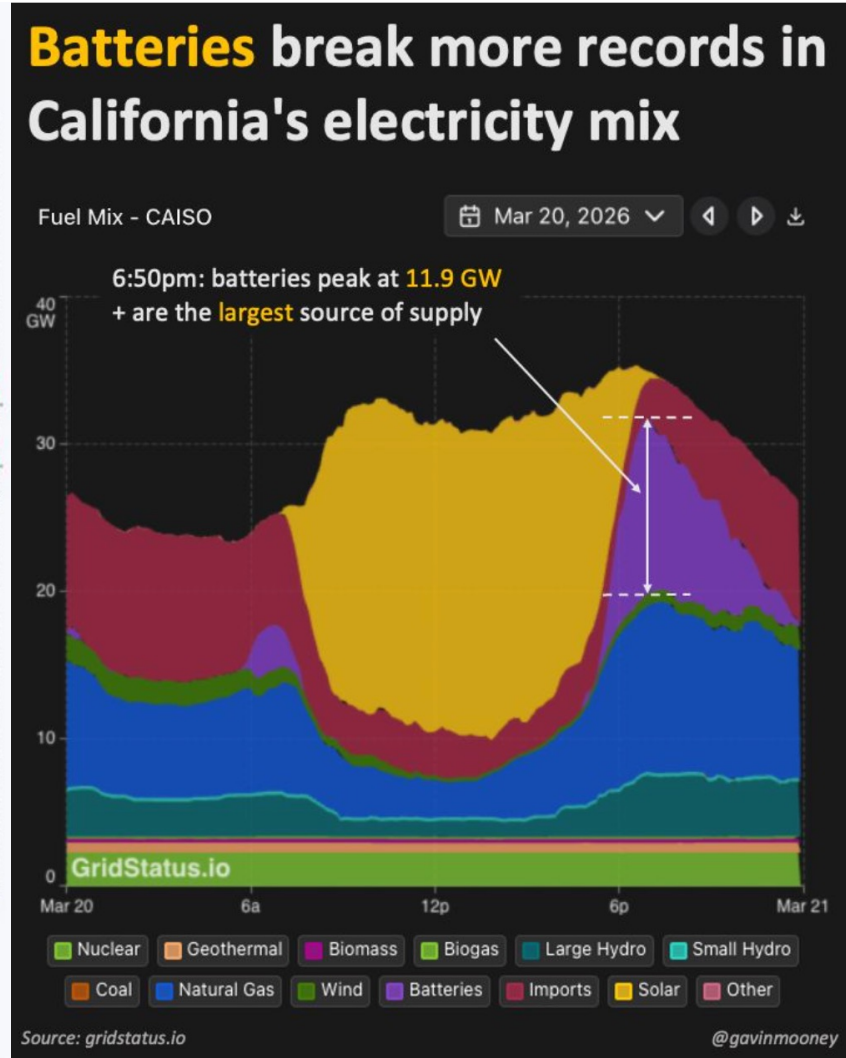
Solar + BESS + V2G => Accelerated Energy System Transformation: California



Original chart: Ember  
Data source: GridStatus

**EMBER**

@gavinmooney



Source: Gavin Mooney, Kaluza via LinkedIn



# The \$8bn Home Battery Scheme is a roaring Success

Solar + BESS + V2G => Accelerated Energy System Transformation

>360,000 home battery installs in just 10 months.



**Record battery growth is pushing power prices down**

3 weeks later we are at 400,000 installs and 11GWh.

Budget 2026 has \$8bn funding.

**Ryan Cropp** *Energy and climate reporter*

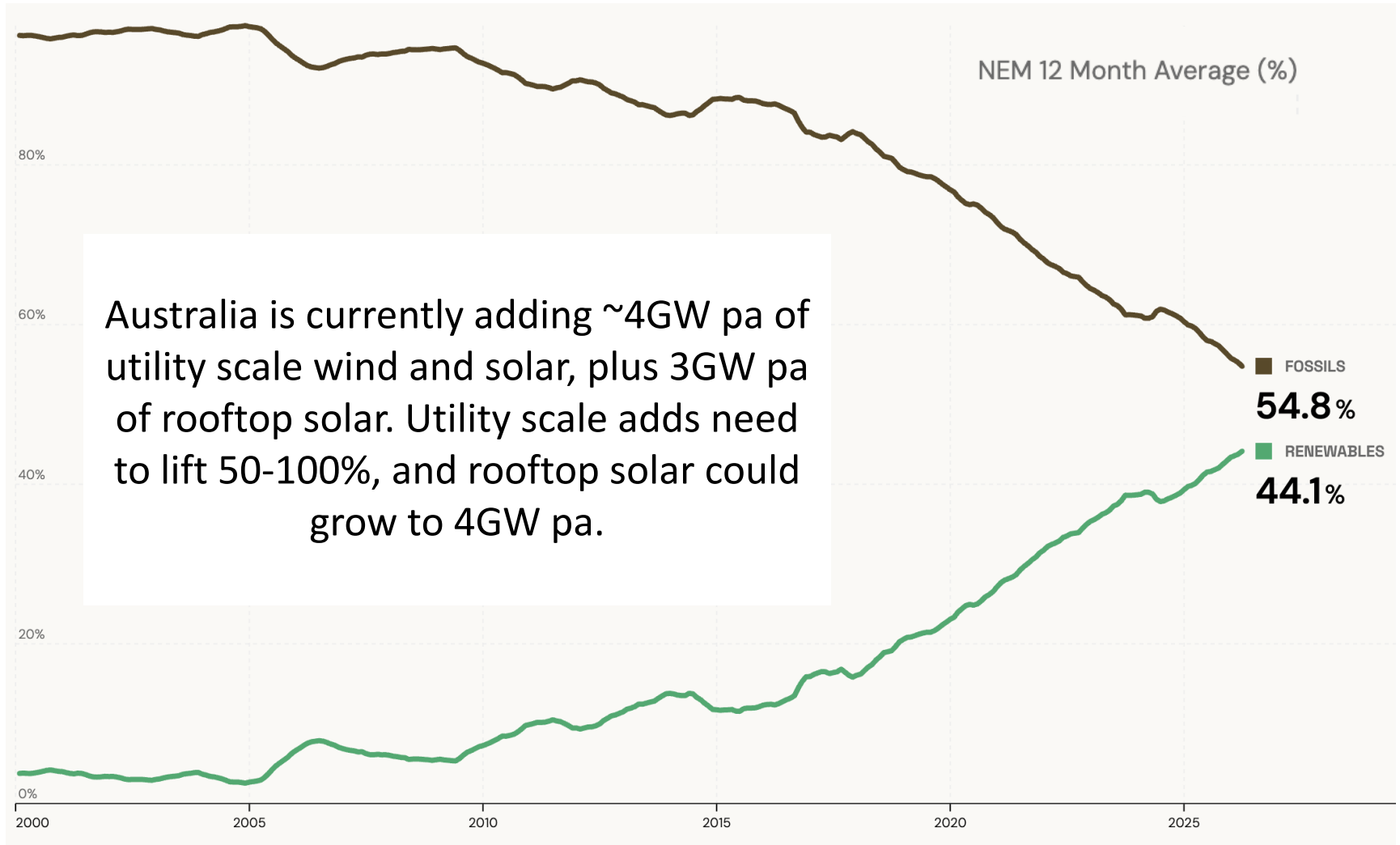
Apr 30, 2026 - 12.01am



**FINANCIAL REVIEW**

# Australia's NEM Moving Towards 82% Renewables

Moving towards 82% renewables by 2030; good progress, but we need to go faster



Source: TSI's Open Electricity