Tim Buckley, Director CEF
tim@climateenergyfinance.org

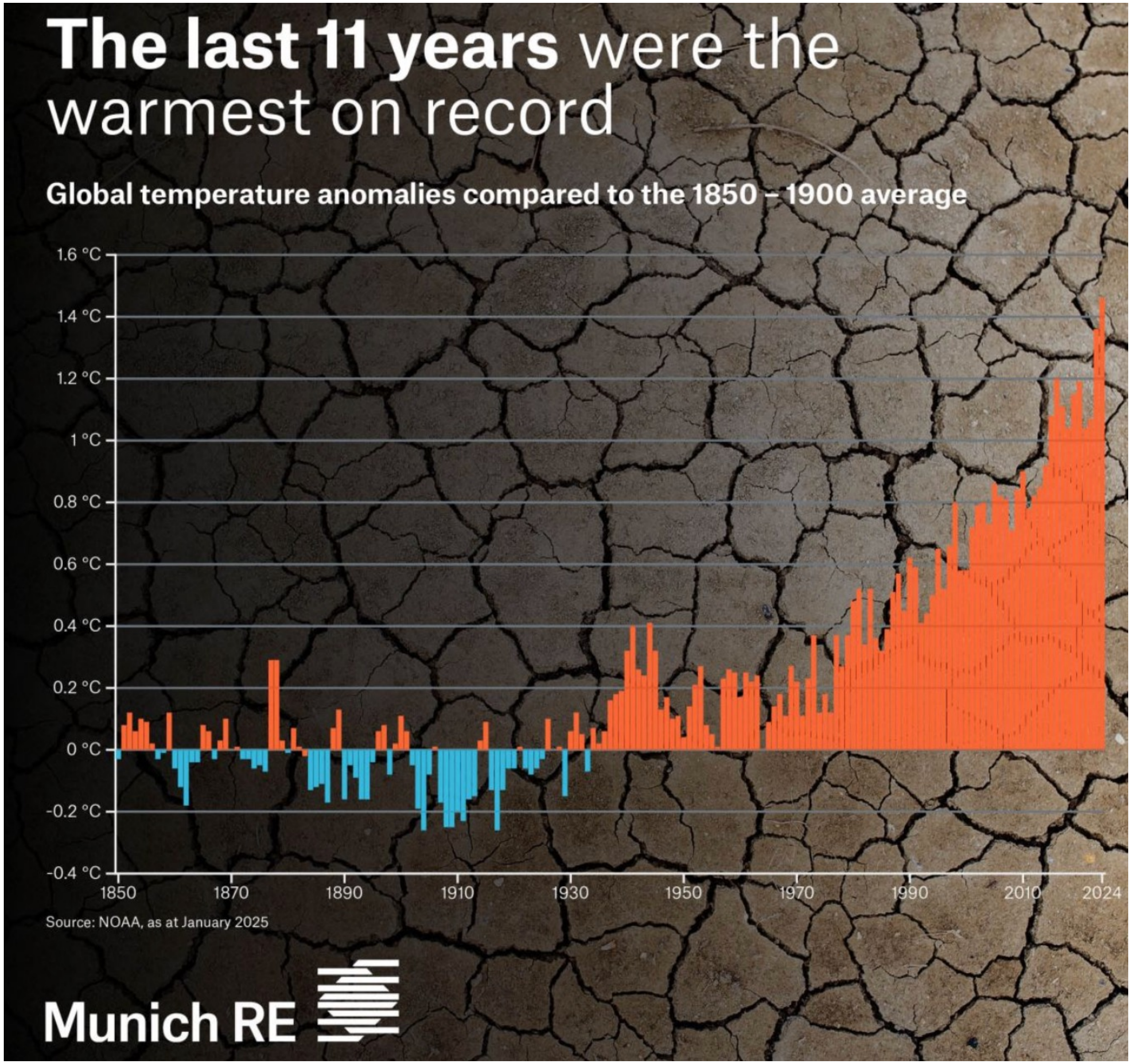
Noosa Power & Energy Conference

China's leadership in zero emissions industries of the future - the risks and opportunities for Regional Australia

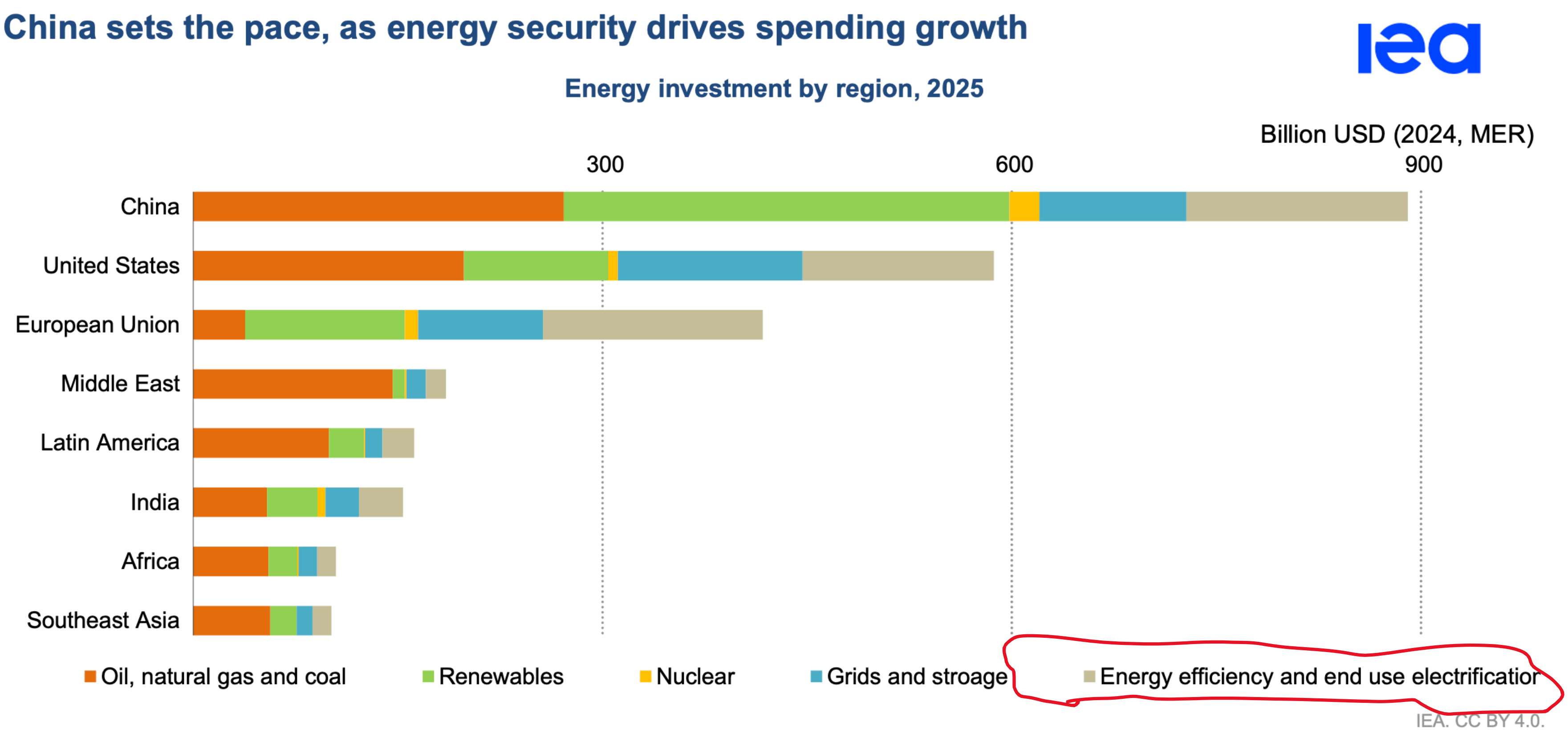
25 June 2025

CEF accepts the climate science

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



Global Cleantech Investment: China's Dominance



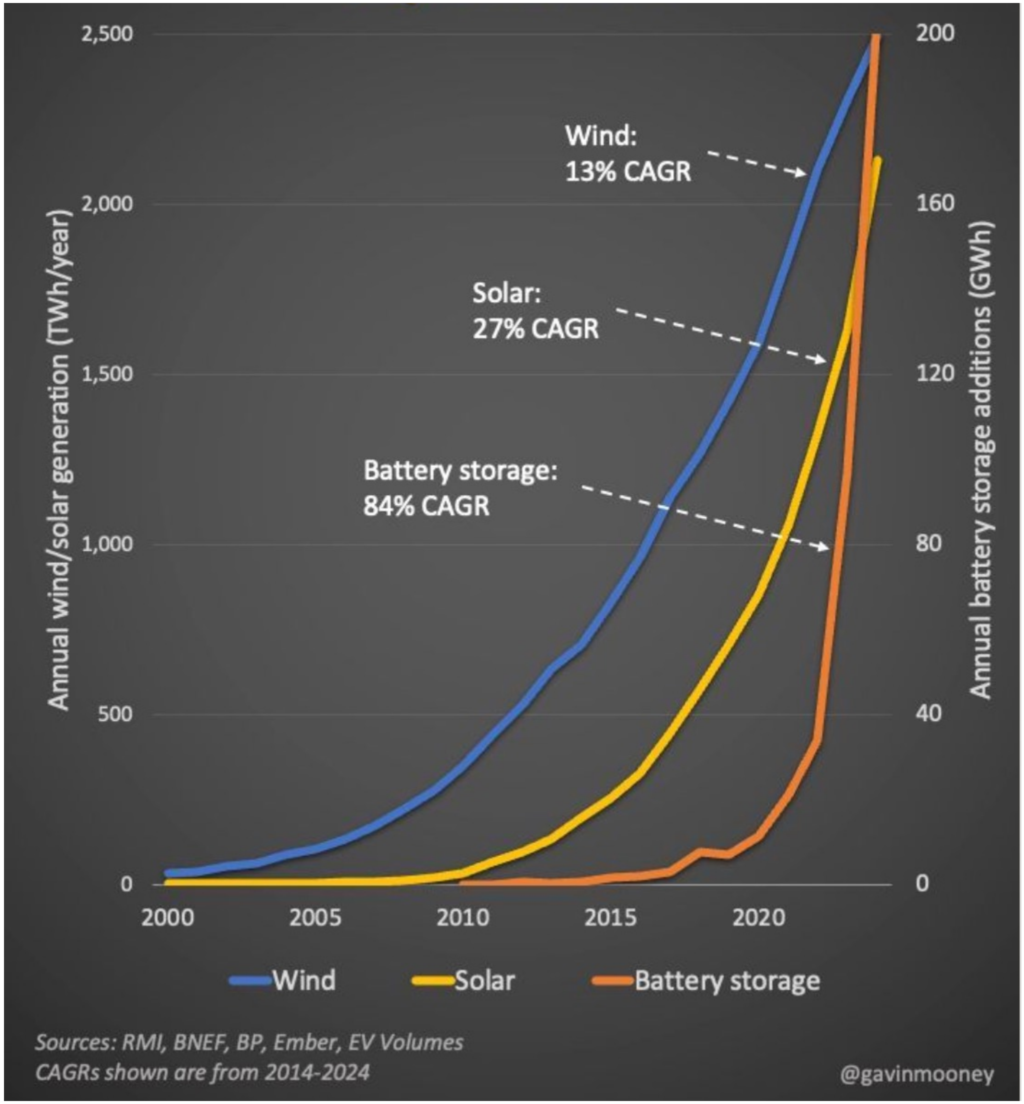
More than one-quarter of global energy investment takes place in China. Most of the growth in spending in recent years has been in fossil fuel importing countries looking to bolster their energy security by accelerating transitions

Note: 2025e= estimated values for 2025

Source: IEA World Energy Investments https://www.iea.org/reports/world-energy-investment-2025

Global Cleantech Investment is Accelerating

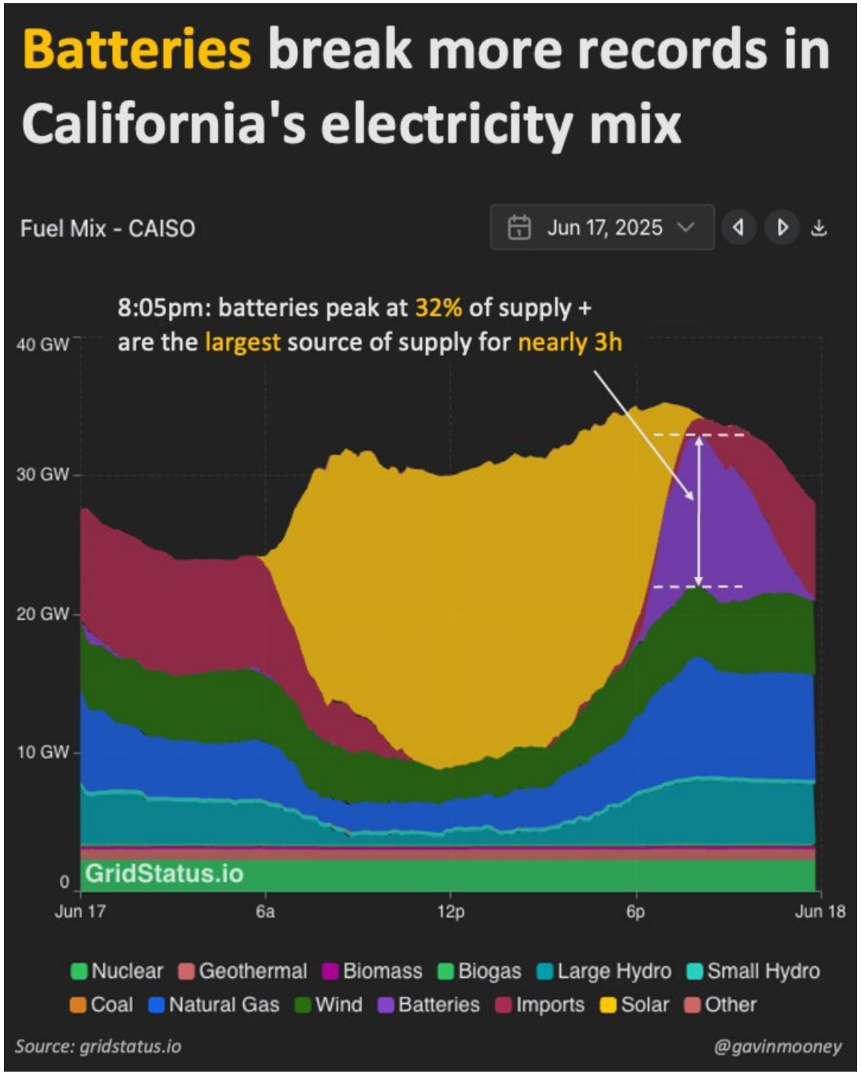
As Battery Prices fell 50% in 2 years, global Installations have Taken Off
Solar + BESS + V2G => Accelerated Energy System Transformation



Source: Gavin Mooney, Kaluza

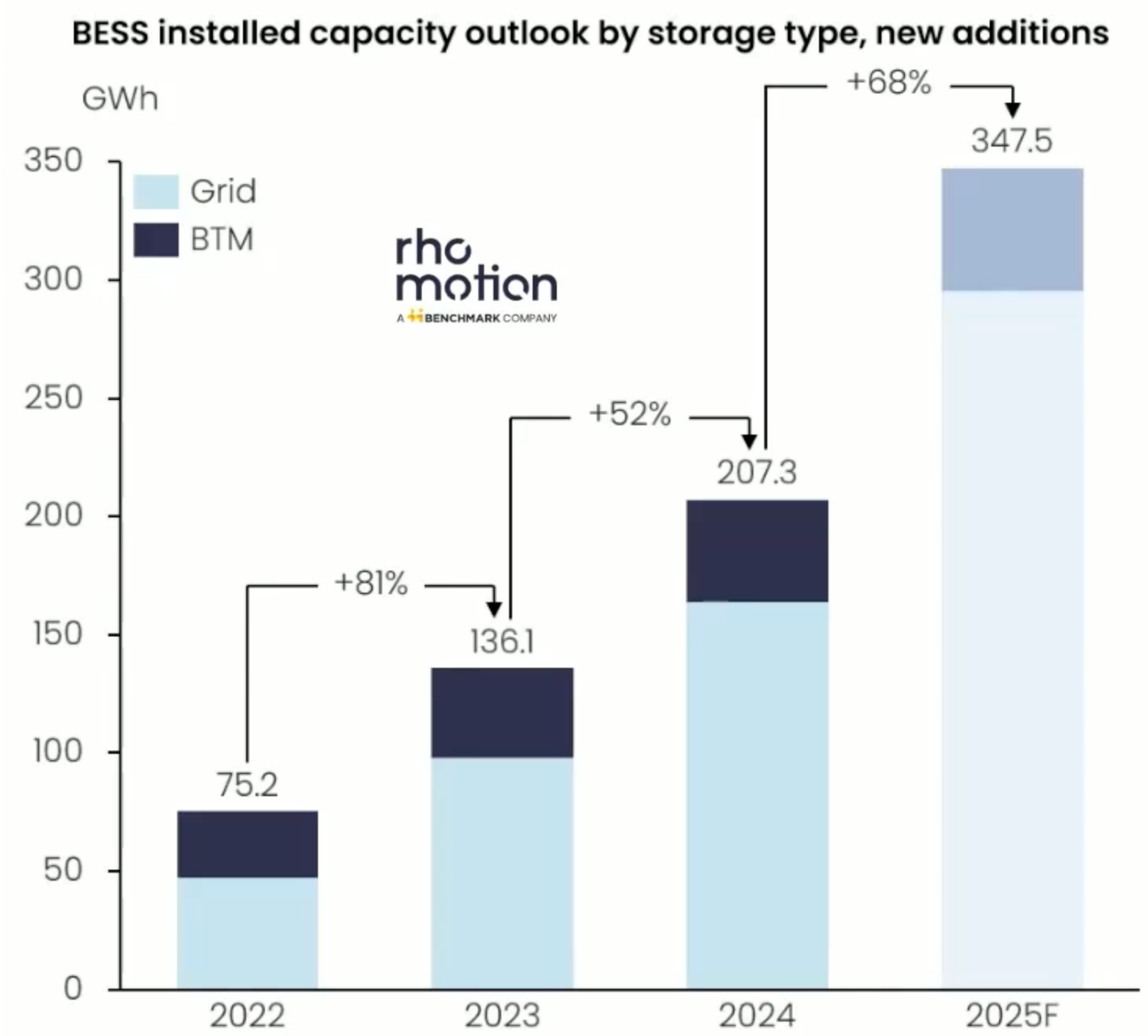
Global Cleantech Investment is Accelerating

Solar + BESS + V2G => Accelerated Energy System Transformation



Source: Gavin Mooney, Kaluza

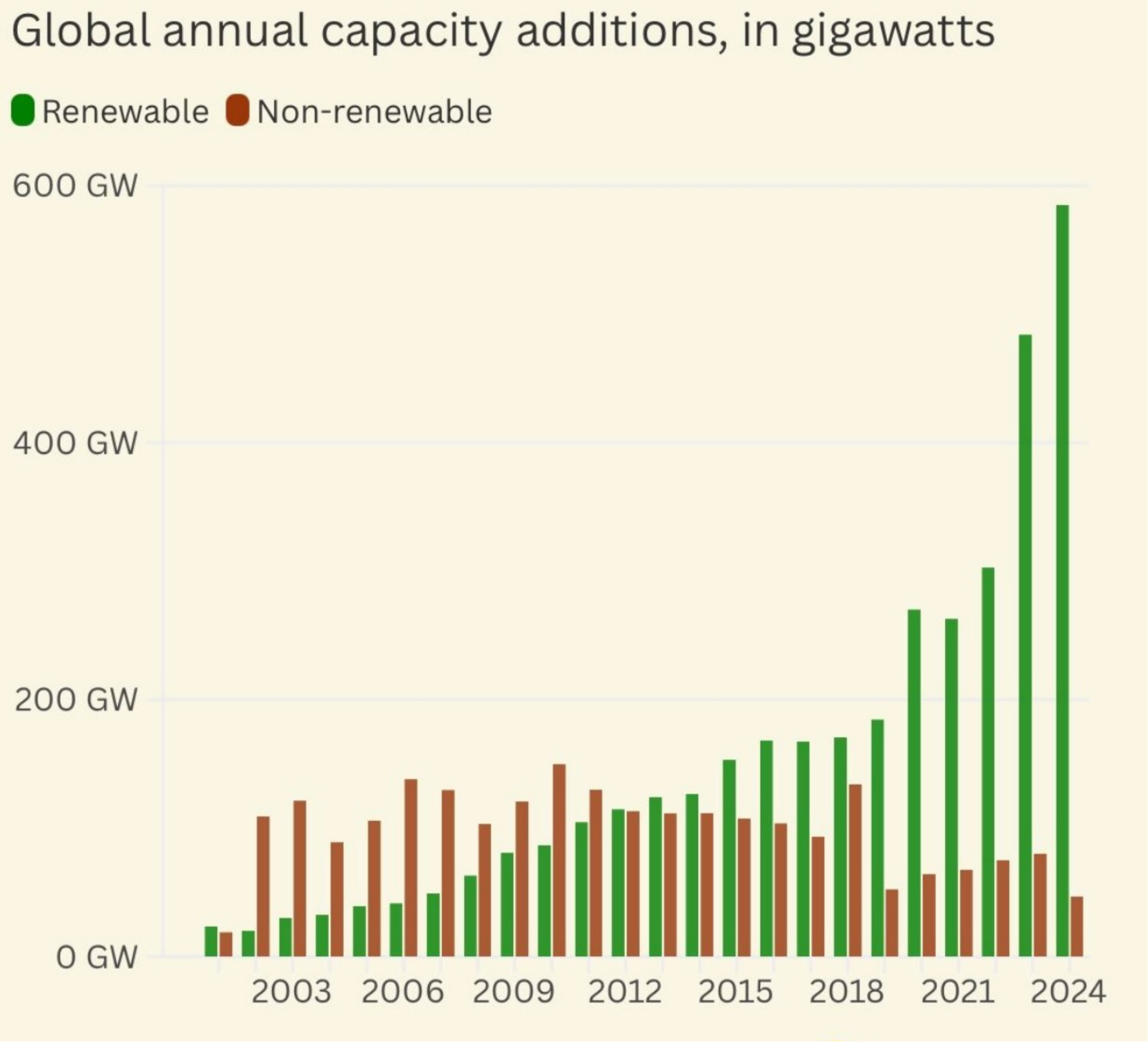
BESS + Solar + EV => Accelerating Transformation



Rho Motion March 2025 outlook

Global Cleantech Investment

Renewables Dominate new power plant installations

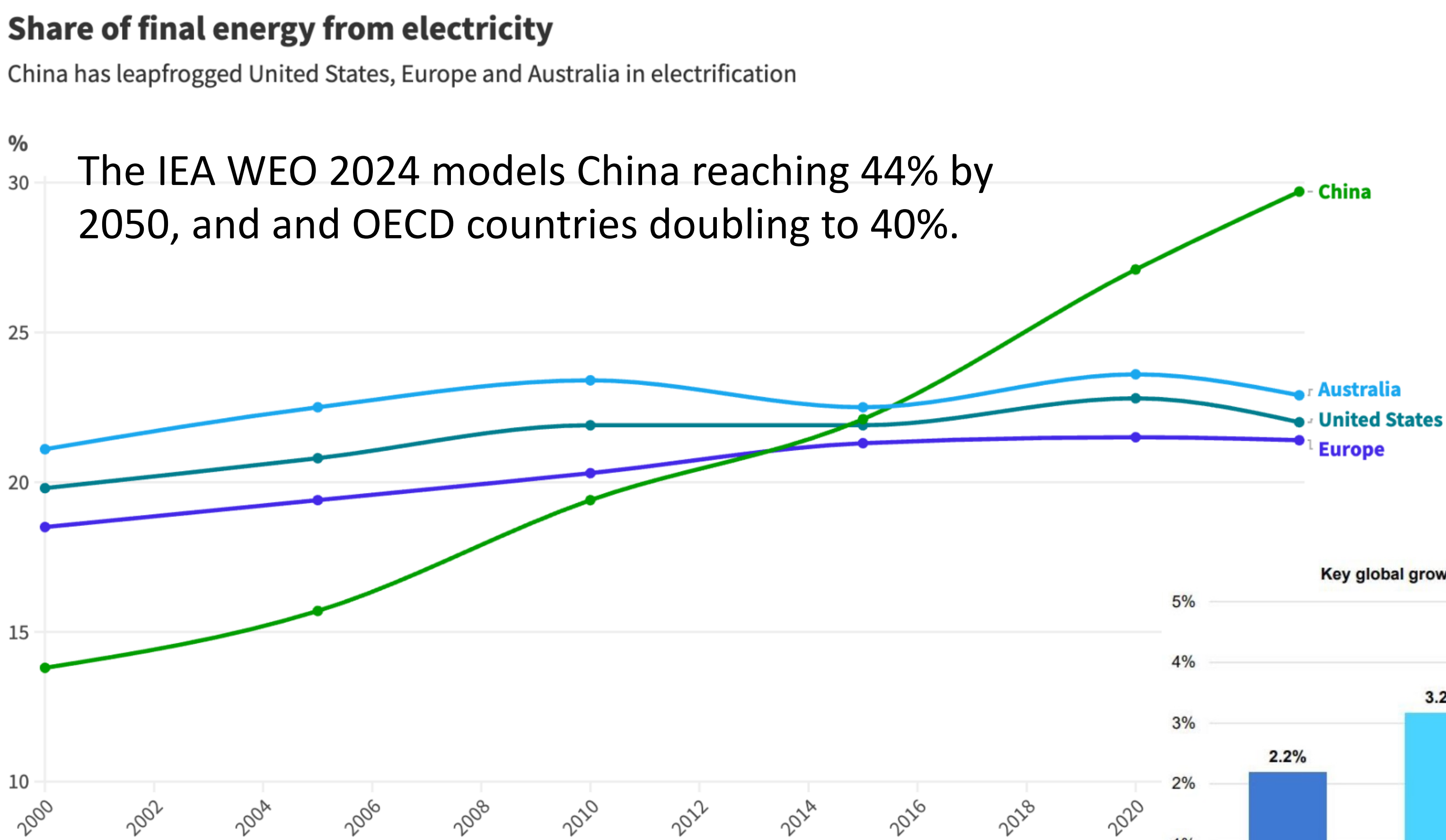


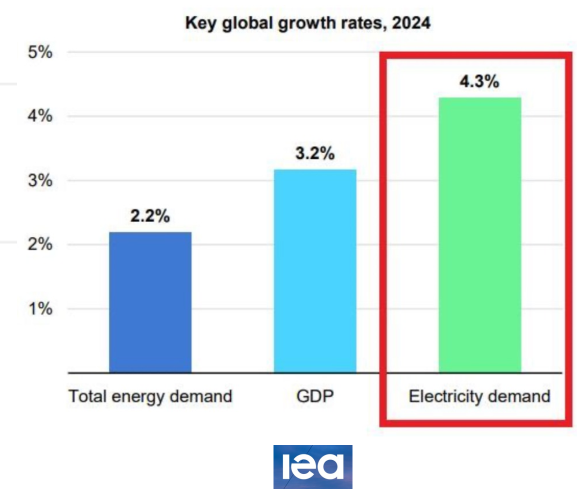
Source: IRENA, Canary Media

China's Electrification of Everything

China Leads the world on Progressive Electrification of Everything

The IEA WEO 2024 models China reaching 44% by 2050, and and OECD countries doubling to 40%.

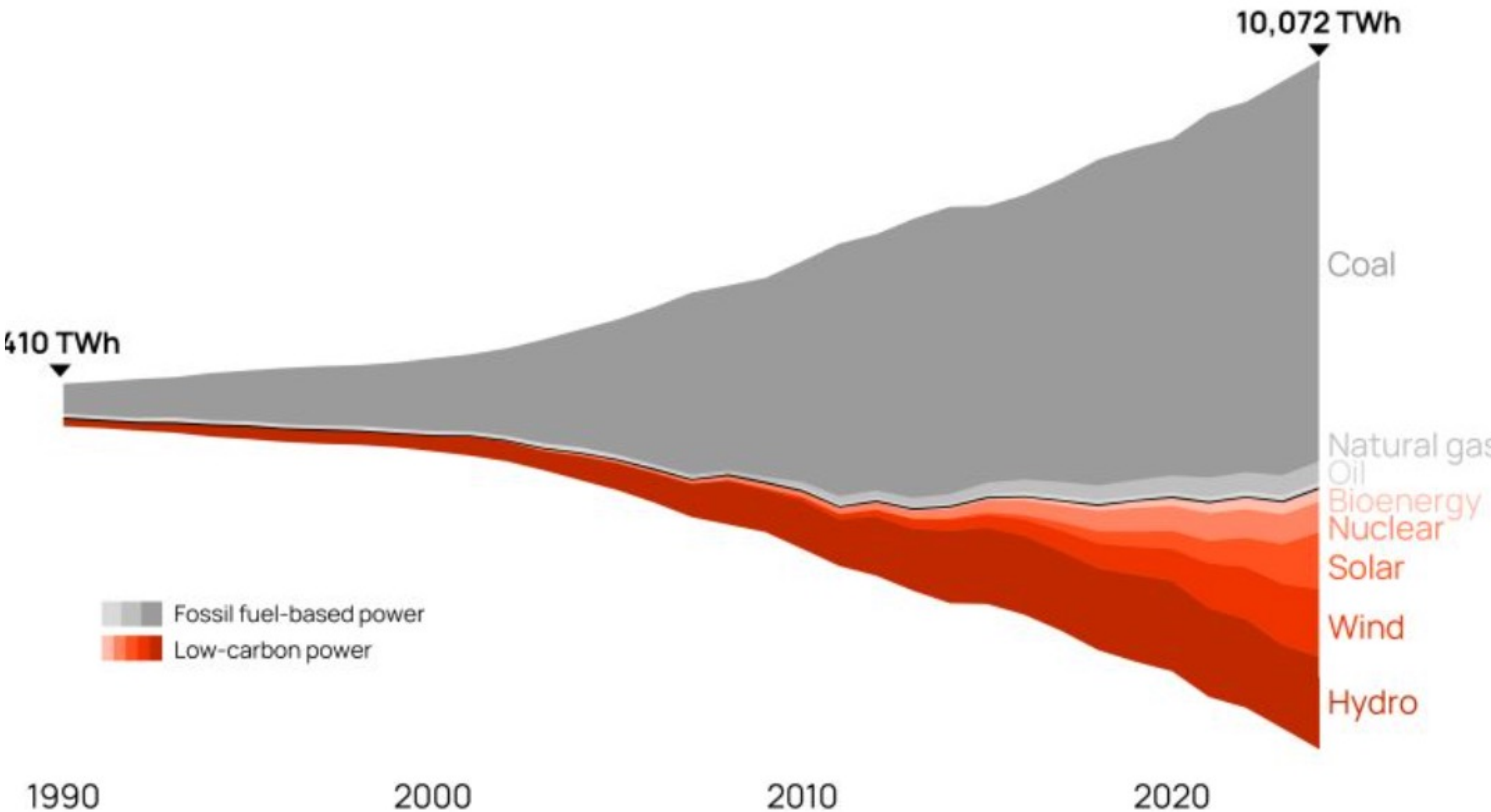




Source: CEF calculations, Enerdata

The Rise and Rise and Rise of China

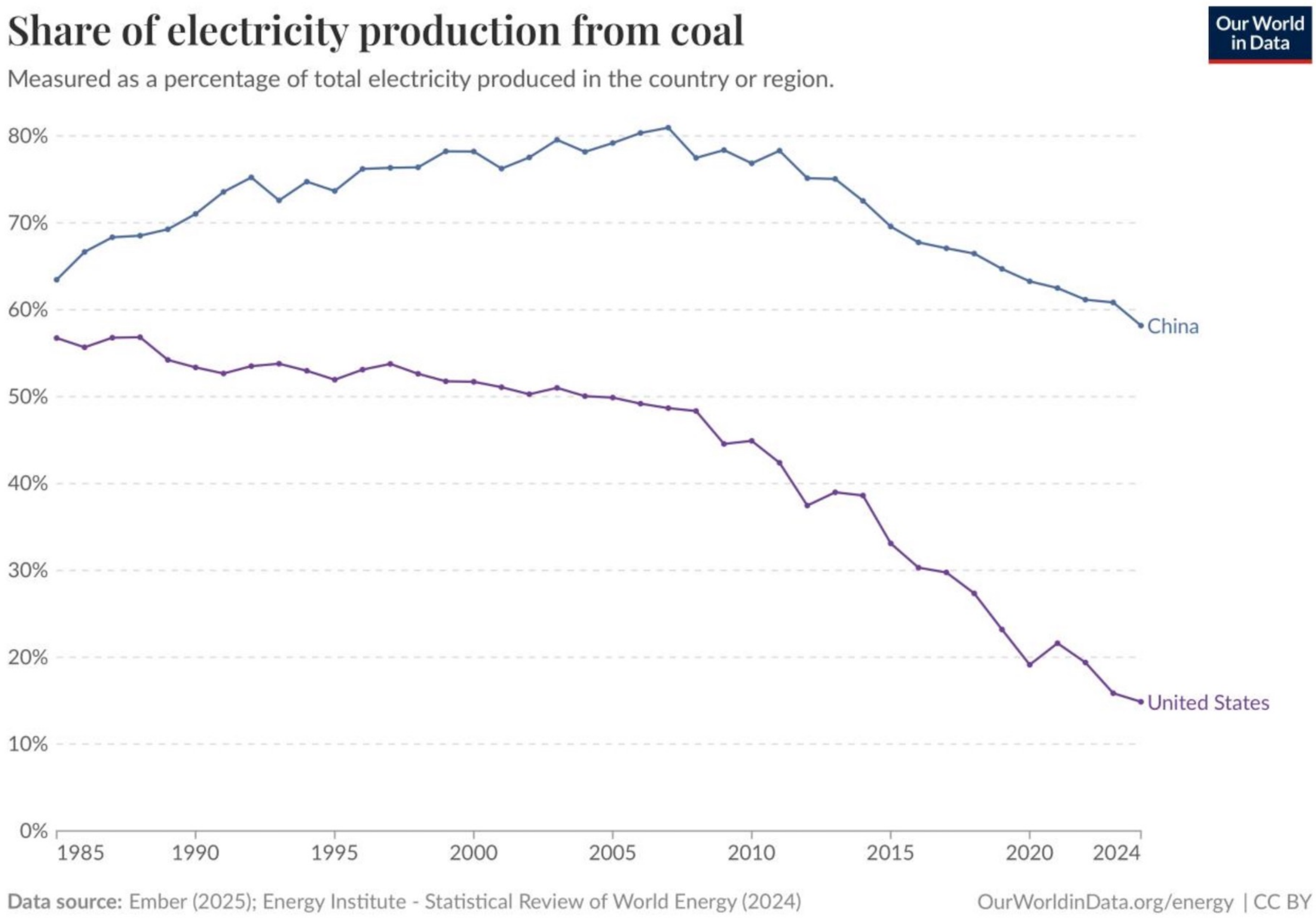
China's Electricity Mix – profound unprecedented growth over 1990-2024



Source: Orennia, via Jan Rosenow (on Linkedin)

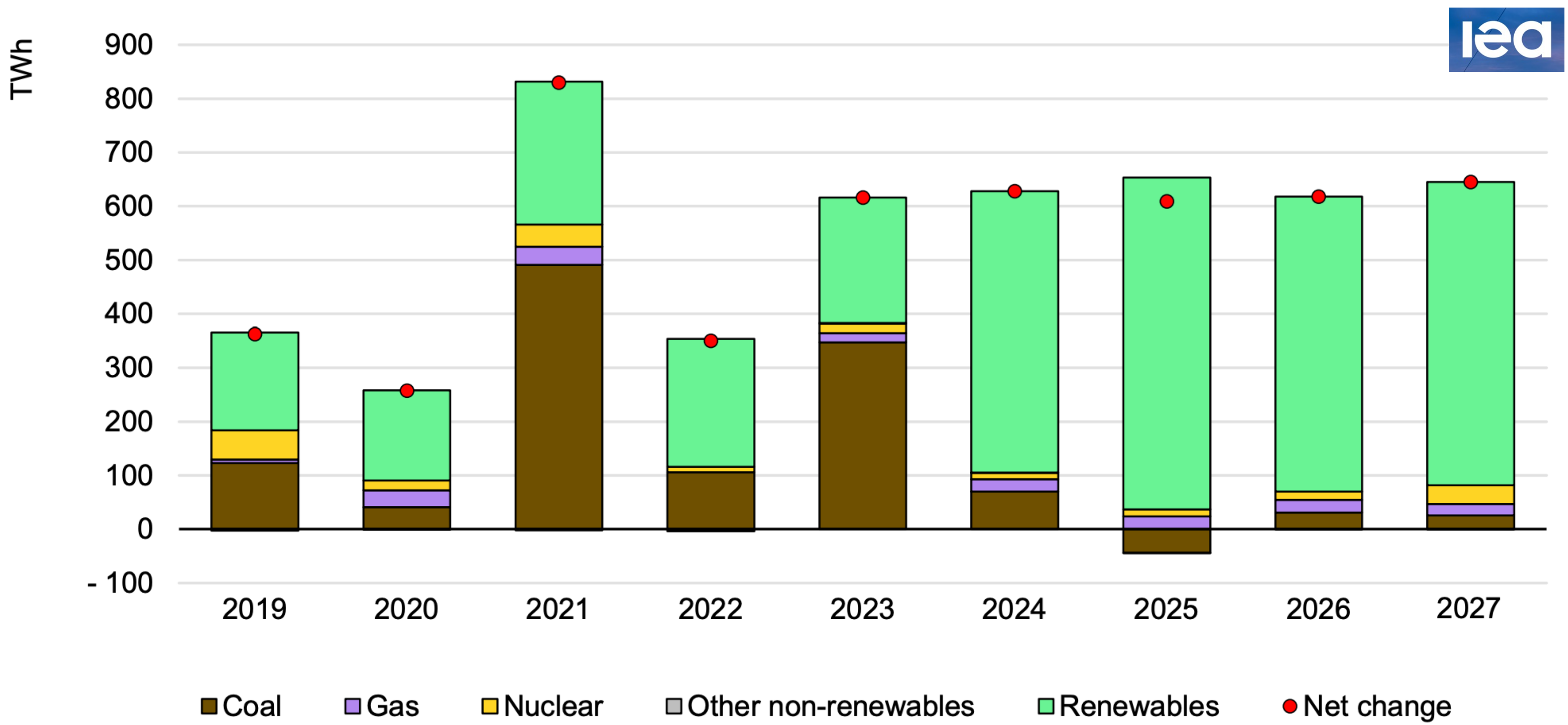
Global Cleantech Investment Dominance

Renewables Dominate new power plant installations



Peak Emissions in Chinese Electricity In Sight

Global Change in Electricity Generation by Fuel Source, 2019-2027 yoy



Source: IEA Electricity 2025

https://iea.blob.core.windows.net/assets/77522eb7-49c8-4611-851e-59bd5b93454c/Electricity2025.pdf

China is Moving in Decarbonisation, Rapidly

China is still adding flexible coal power plants (too much!), but utilization rates are down to average just 46% in 5MCY2025, balancing ever more VRE! China deployed 247GW of renewable energy capacity in 5M to-date CY2025. China deploys as much wind 4 days as Australia does each year.

New Capacity Installed in China in Jan-May 2025

		Jan-May'25	% Share of new adds	% yoy change	May-25	% Share of new adds
Thermal Power	GW	18	7%	45%	4.6	4%
Hydropower	GW	3	1%	-6%	0.6	0%
Nuclear Power	GW	-	0%	0%	-	0%
Wind Power	GW	46	17%	134%	26.3	21%
Solar Power	GW	198	75%	150%	92.9	75%
Total capacity added	**GW**	**265**	**100%**	**129%**	**124.4**	**100%**
Renewable Energy adds	GW	247	93%	142%	119.8	96%
Zero Emissions Capacity Adds	GW	247	93%	139%	119.8	96%
YTD power grid investment	US$bn	28		20%		

Source: National Energy Administration

CEF China Energy Update May 2025,
https://climateenergyfinance.org/wp-content/uploads/2025/05/Monthly-China-Energy-Update-May-2025-1.pdf

China is Moving in Decarbonisation, Rapidly

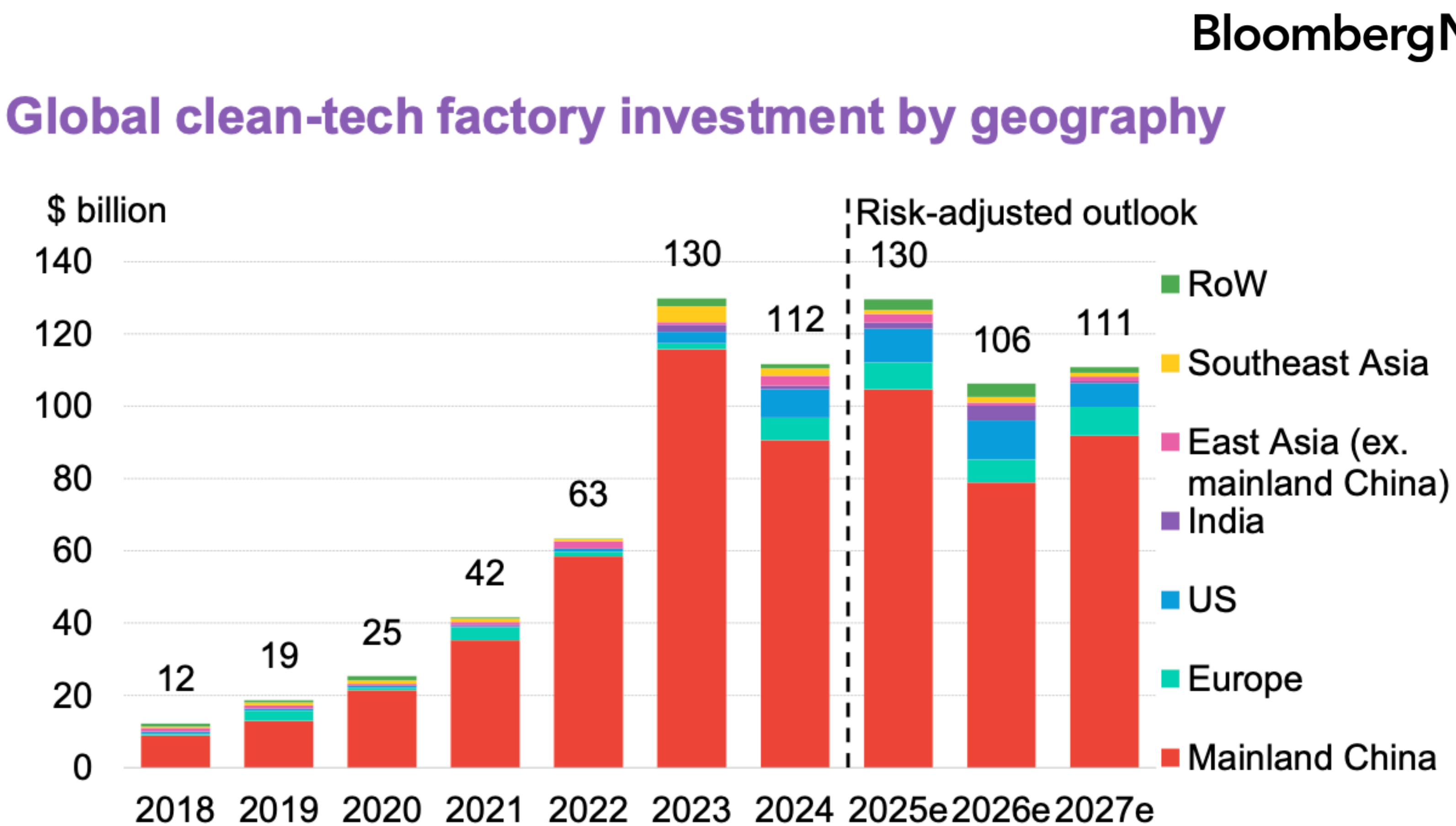
Thermal power generation -2.6% yoy YTD 2025, profound implications

China's Power Generation Year-to-date 2025 (TWh)

	Jan-May 25	Jan-May 24	% change yoy	May-25	May-24	% change yoy
Thermal	2,381	2,445	-2.6%	449.6	441.8	1.8%
Coal	*2,265*	*2,326*	-2.6%	427.7	420.3	1.8%
Gas	*109*	*112*	-2.6%	20.7	20.3	1.8%
Other thermal	*6*	*7*	-2.7%	1.2	1.2	1.7%
Bioenergy	75	77	-2.6%	14.5	14.2	1.8%
Hydropower	406	411	-1.3%	99.9	115.6	-13.6%
Nuclear Power	197	177	11.5%	38.4	36.0	6.7%
Wind Power	511	439	16.4%	99.7	84.4	18.1%
Solar Power	454	326	39.1%	103.8	81.4	27.5%
Total power generation	**4,024**	**3,875**	**3.8%**	**805.9**	**773.5**	**4.2%**
Variable Renewable Energy	965	766	26.0%	203.5	165.9	22.7%
Zero Emissions	1,643	1431	14.9%	356.3	331.7	7.4%

CEF China Energy Update May 2025,
https://climateenergyfinance.org/wp-content/uploads/2025/05/Monthly-China-Energy-Update-May-2025-1.pdf

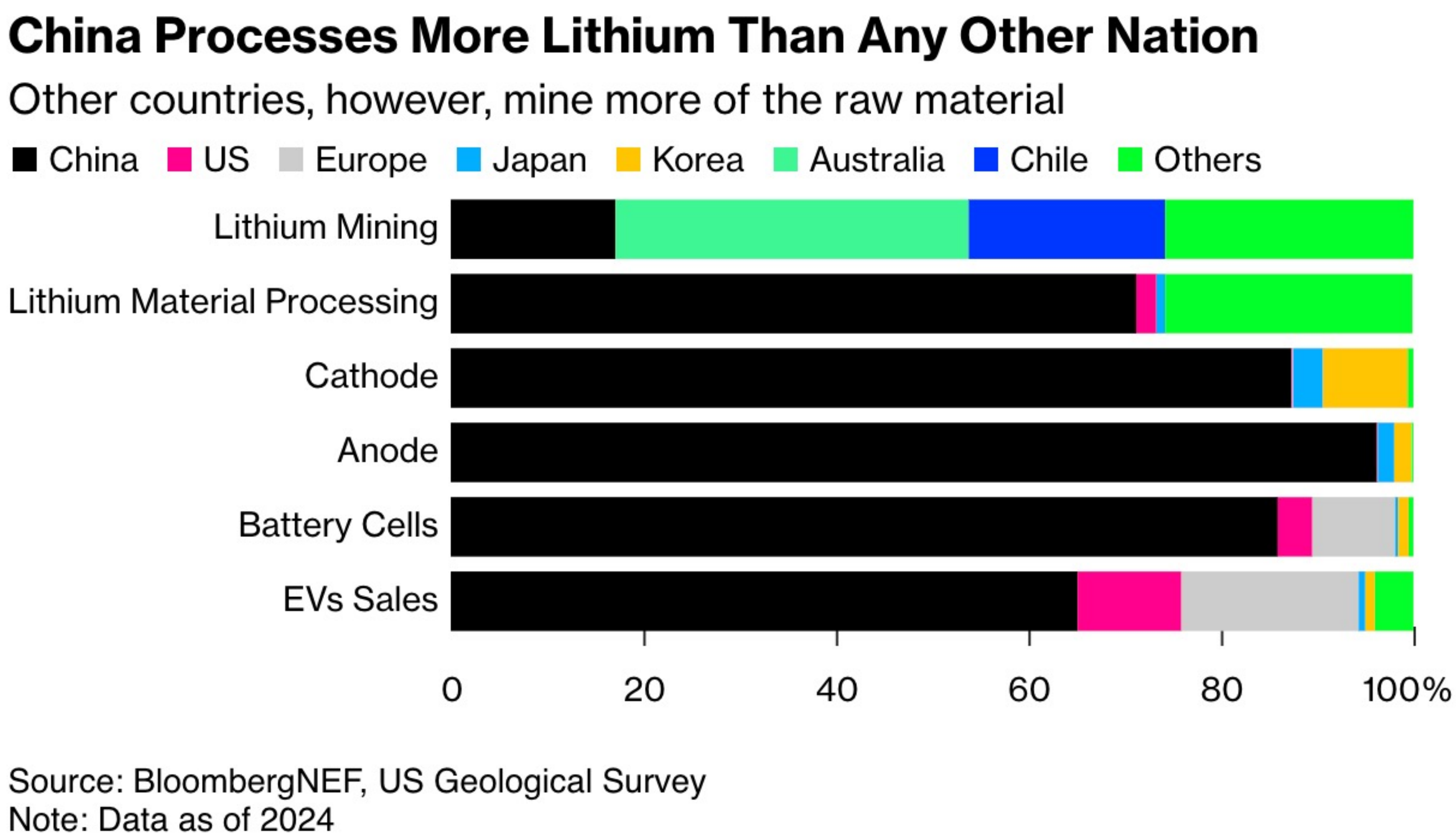
China's Global Cleantech Investment Dominance



Source: BNEF https://assets.bbhub.io/professional/sites/24/951623_BNEF-Energy-Transition-Trends-2025-Abridged.pdf

China's Global Cleantech Investment Dominance

China's total Global Domination of Battery Supply Chains



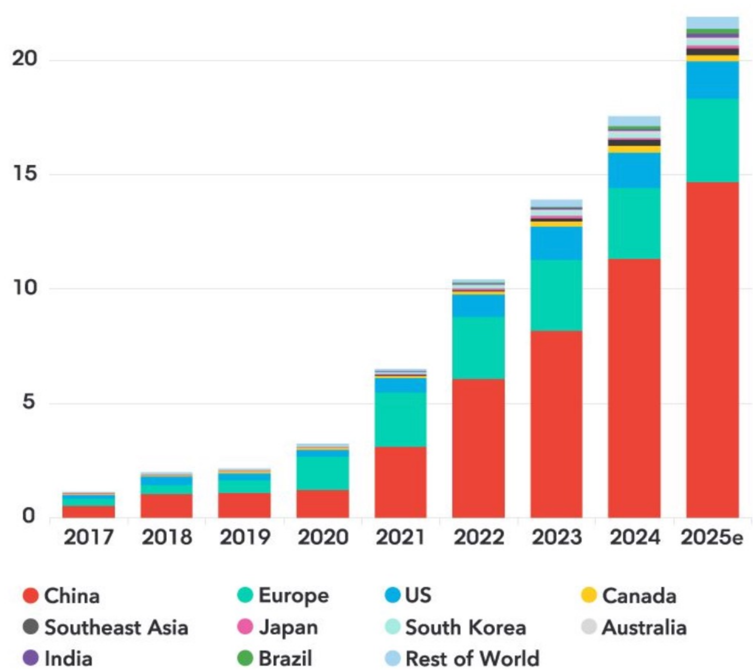
Bloomberg
https://www.bloomberg.com/news/features/2025-05-22/us-china-trade-war-beijing-bets-on-homegrown-lithium-for-high-tech-economy?utm_source=website&utm_medium=share&utm_campaign=linkedin

China's Global Cleantech Investment Dominance

Global EV Sales By Region

Global EV sales are on track for another record-breaking year, but some markets are experiencing a significant slowdown. 🚗📉

⚡ Electric vehicles are set to make up one in four cars sold globally in 2025.
⚡ China leads, with nearly two-thirds of all EVs sold.
⚡ The US market is slowing sharply amid policy uncertainty.
⚡ Emerging markets like Brazil and Thailand are seeing record adoption, d…
by affordable Chinese models.

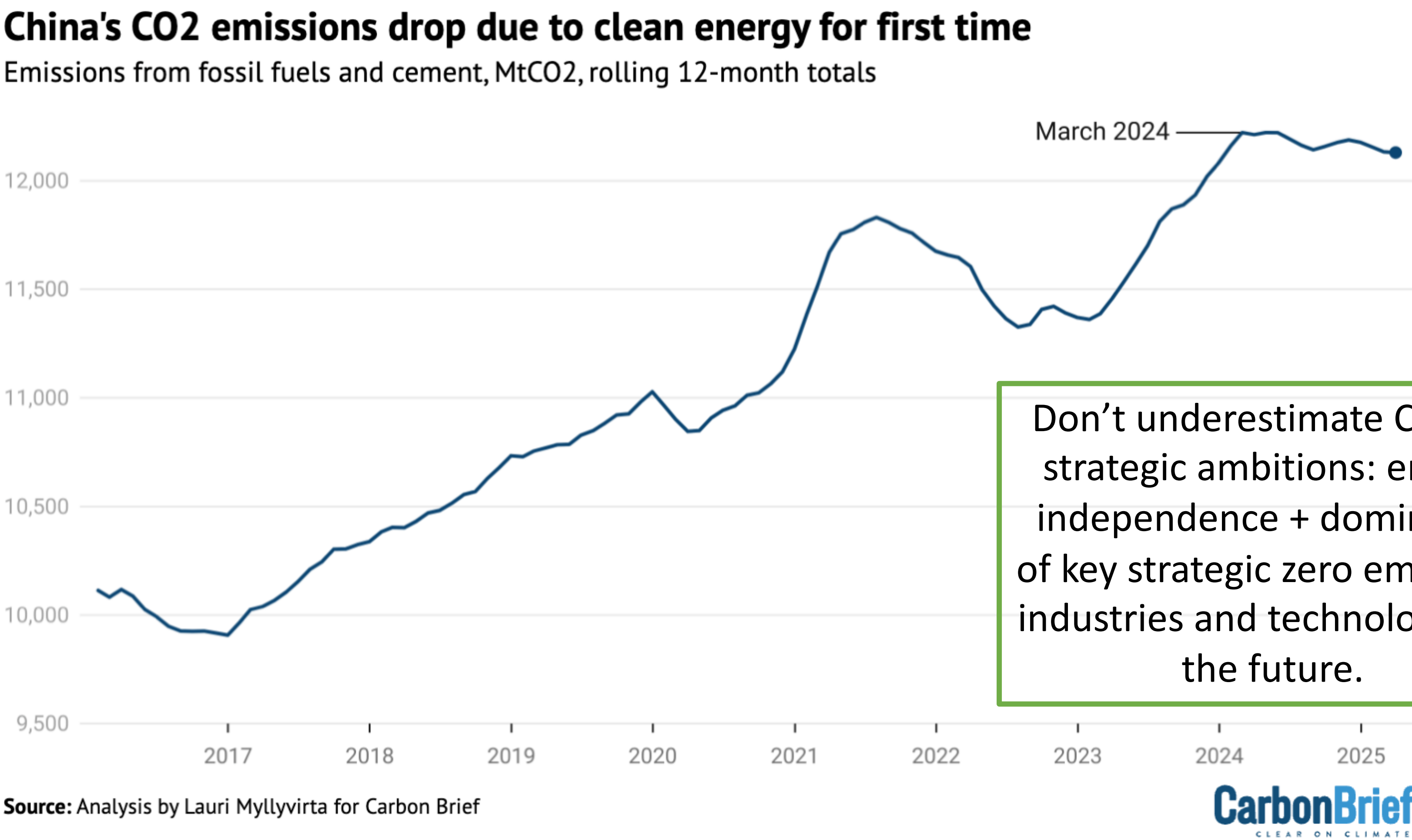


Source: BloombergNEF, MarkLines, Jato Dynamics
Note: Includes battery electric and plug-in hybrid passenger vehicles. 2025 is BNEF's forecast for the year.

BloombergNEF

China's electrification leadership drives decarbonisation

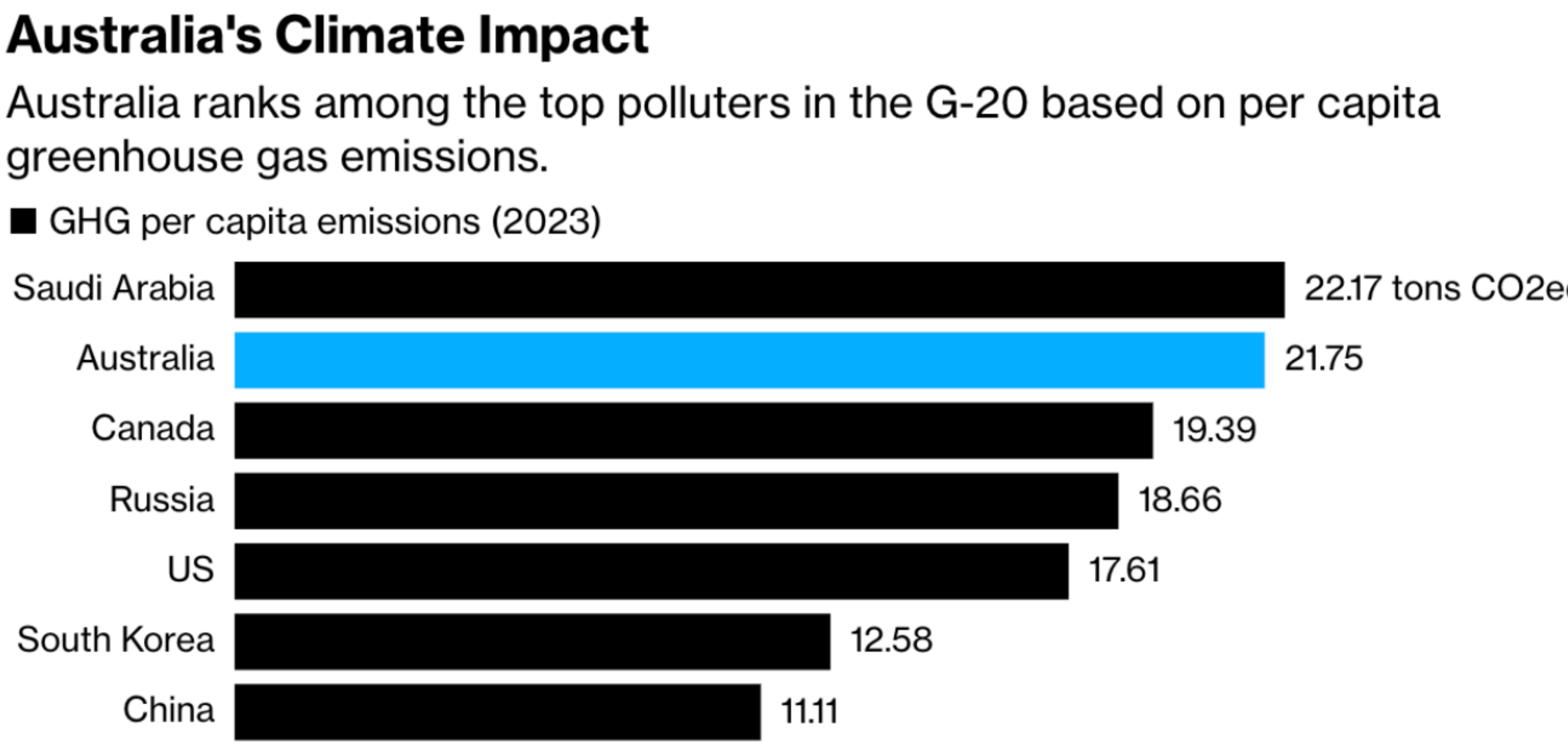
China's electrification is about energy security i.e. permanently reducing reliance on imported fossil fuels.



Don't underestimate China's strategic ambitions: energy independence + dominance of key strategic zero emissions industries and technologies of the future.

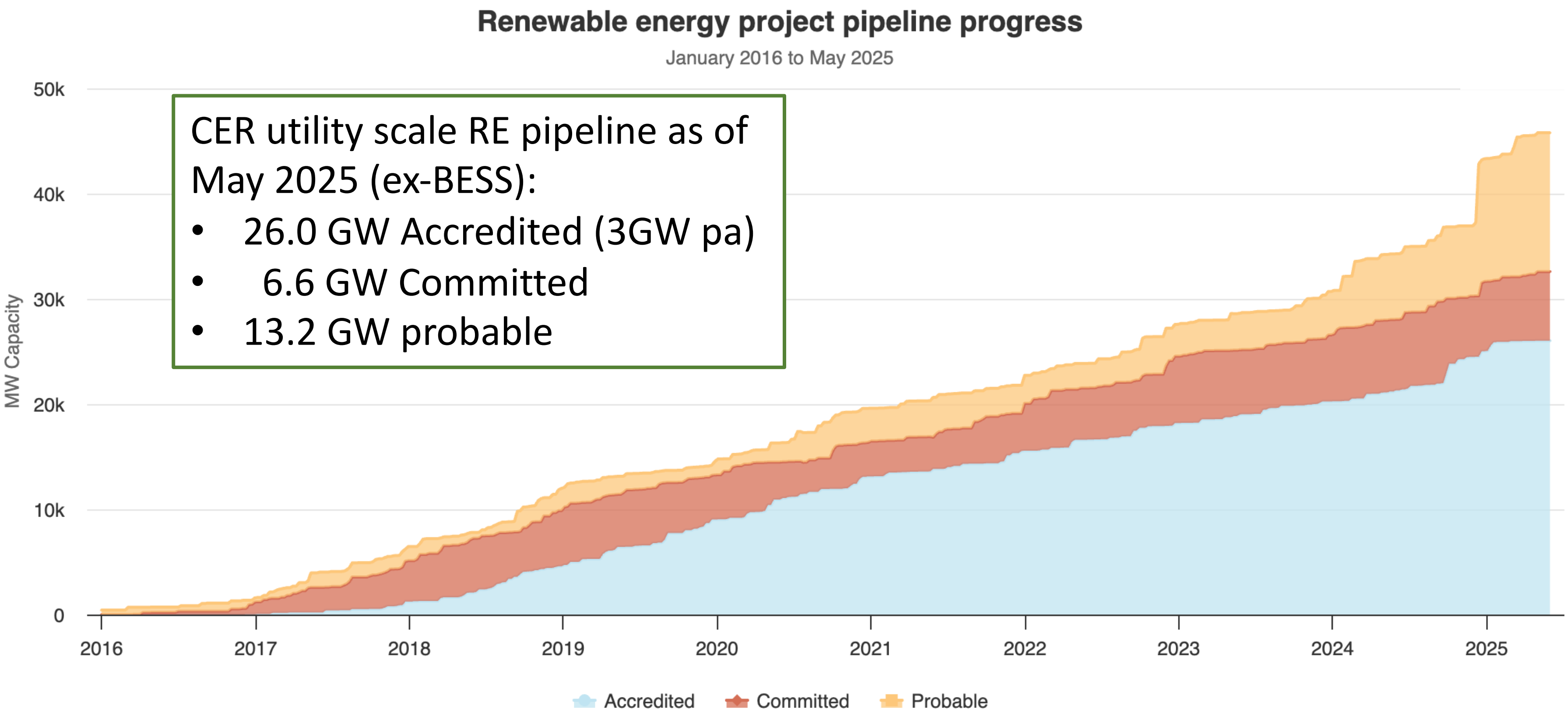
Source: CarbonBrief; https://www.carbonbrief.org/analysis-clean-energy-just-put-chinas-co2-emissions-into-reverse-for-first-time/

Australia is 0.3% of the world's population, but our fossil fuel exports contribute to ~4.5% of global fossil fuel CO_2 emissions



Australian Utility-scale Renewables Investment

The Clean Energy Regulator notes the sustained growth in large scale renewable energy pipeline of projects



CER utility scale RE pipeline as of May 2025 (ex-BESS):

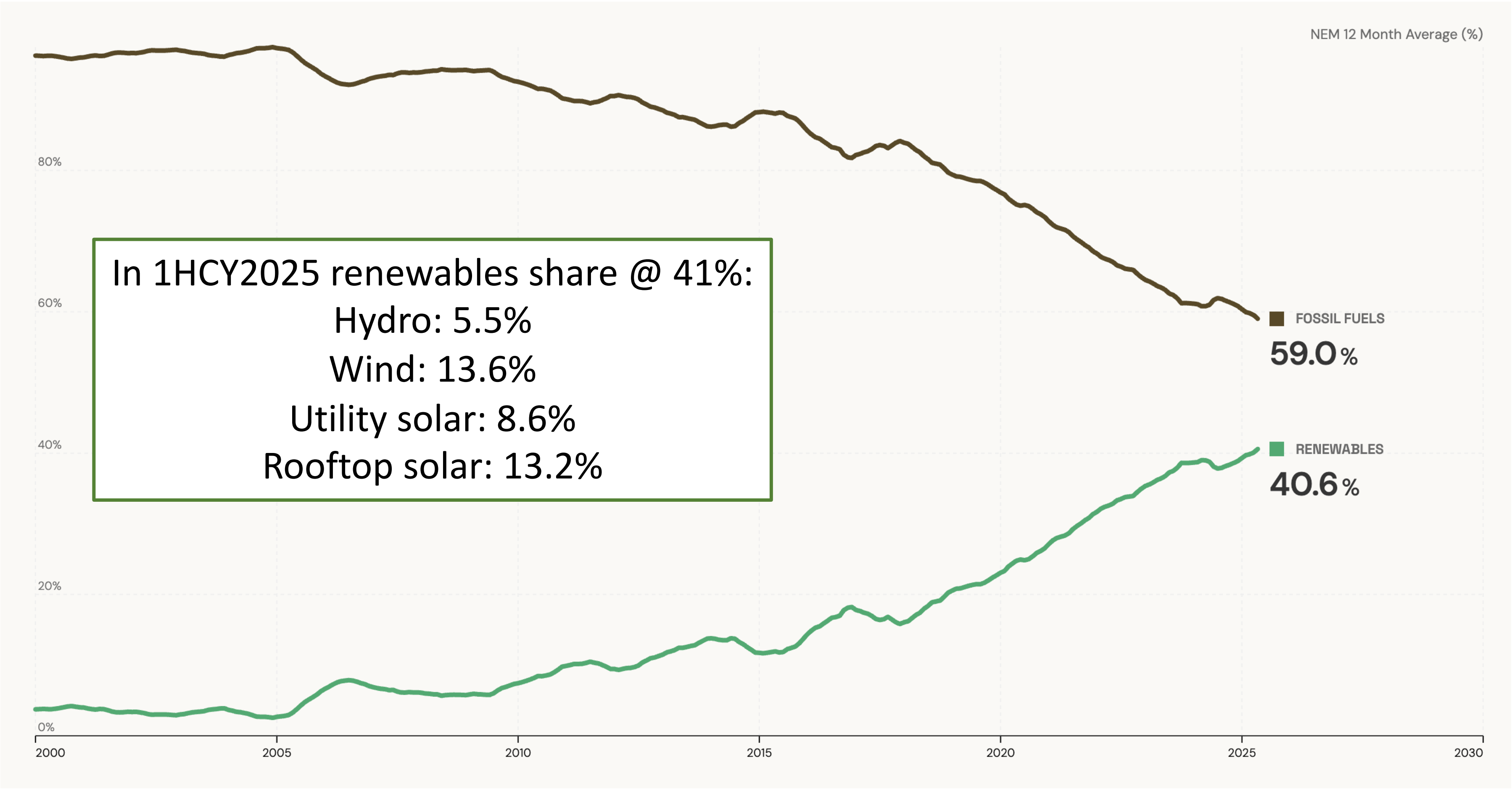
- 26.0 GW Accredited (3GW pa)
- 6.6 GW Committed
- 13.2 GW probable

Open Electricity puts June 2025 capacity at: 12.6GW solar, 14.0GW wind and 6.1GW/10.3GWh BESS operational, plus 21.8GW of rooftop solar.

Source: Australian Government, Clean Energy Regulator, 16 June 2025
https://cer.gov.au/markets/reports-and-data/large-scale-renewable-energy-data?utm_source=Clean+Energy+Regulator+-+Update&utm_campaign=b393bae0fa-LRET_May_monthly_data&utm_medium=email&utm_term=0_-b393bae0fa-73688735

Australia is Half-way to 82% Renewables by 2030

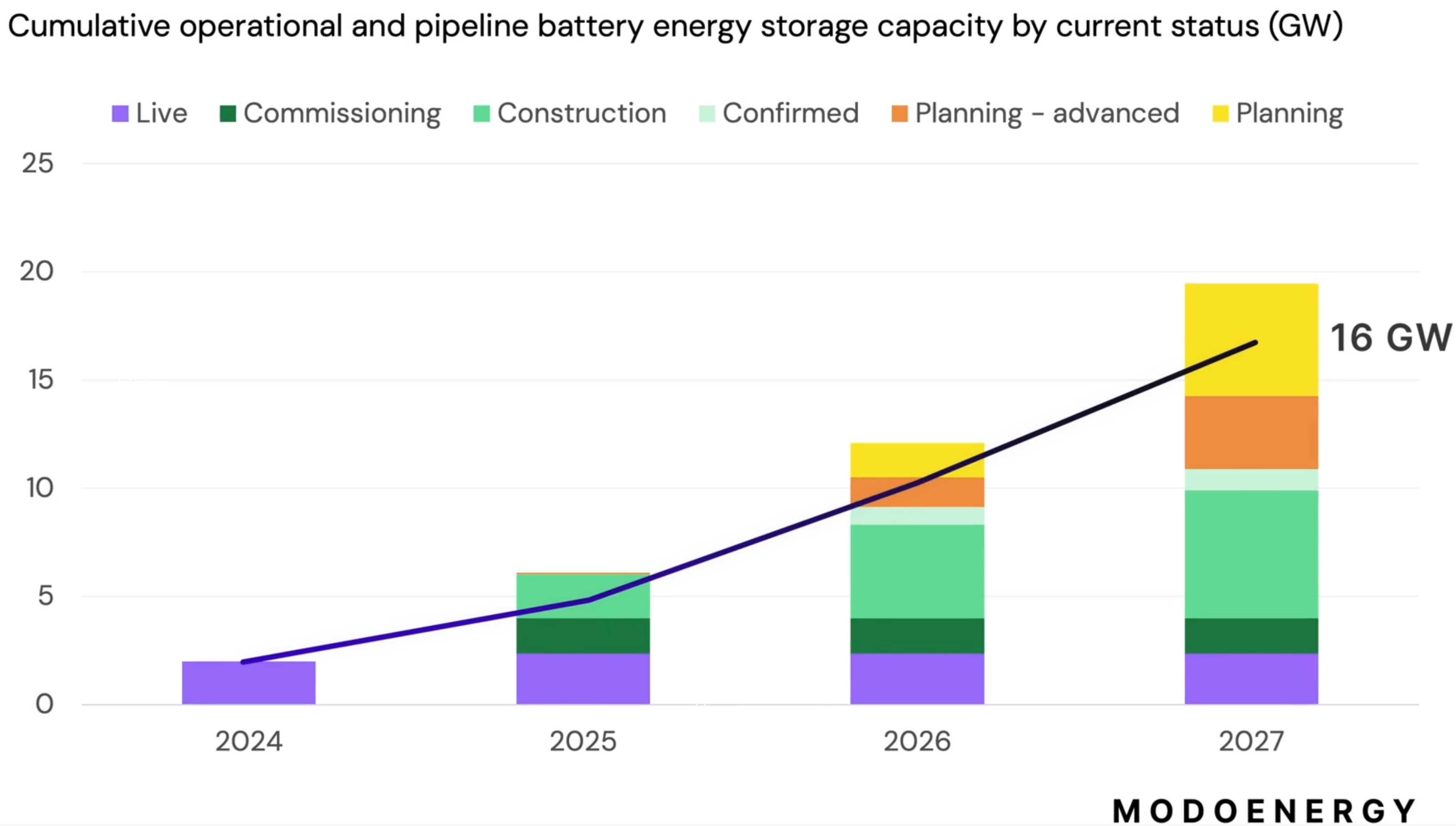
Australia has exceeded 40% renewable share on a 12-month rolling average, 46% in 4QCY2024, 41% in 1HCY2025



Open Electricity

Cleantech Investment

Australian BESS uptake is at record levels, soon to be boosted again by the Federal government's $2.3bn 30% battery rebate



Source: Wendel Hortop, Modo Energy 8 May 2025
https://www.linkedin.com/posts/wendel-rhys-hortop_355-mw-of-new-bess-capacity-coming-online-activity-7325278123048984577-91bO?utm_source=share&utm_medium=member_desktop&rcm=ACoAAAK_xL4BN5TFIx7F-X4g0YfwtHJ1QLTvZoQ

Australia is Responding to China's Challenge

Strategic public capital is a key facilitator, in the absence of a CO_2 price signal

FMIA, CIS, RTN, NRF, Future Fund, CEFC, ARENA, EFA, NAIF

Capacity Investment Scheme

The Capacity Investment Scheme (CIS) is an Australian Government revenue underwriting scheme to accelerate investment in:

- 23 GW of renewable capacity representing $52 billion in investment
- 9 GW of clean dispatchable capacity representing $15 billion in investment.

South Australia

Australian Associated Press

20 Feb 2025

Troubled Whyalla steelworks gets $2.4bn government bailout as hunt for new owner begins

"Crucial support:" Federal Labor launches $2bn green aluminium production credit scheme

RENEW ECONOMY Andrew Brown Jan 20, 2025

$19bn Rewiring the Nation Fund

The $19 billion Rewiring the Nation (RTN) Fund is a significant expansion of CEFC investment capacity, with a particular focus on facilitating the timely delivery of grid and transmission projects, using CEFC capital to accelerate the benefits of grid transformation to consumers, including helping to lower consumer energy costs.

Rio Tinto says aluminium could run on renewables and batteries

FINANCIAL REVIEW Feb 6, 2025

$200 million investment in critical minerals to build Australia's future

The Hon Ed Husic MP

Minister for Industry and Science

15 January 2025

The Albanese Government's National Reconstruction Fund Corporation (NRFC) will invest $200 million in Arafura Rare Earths to help build Australia's Future.

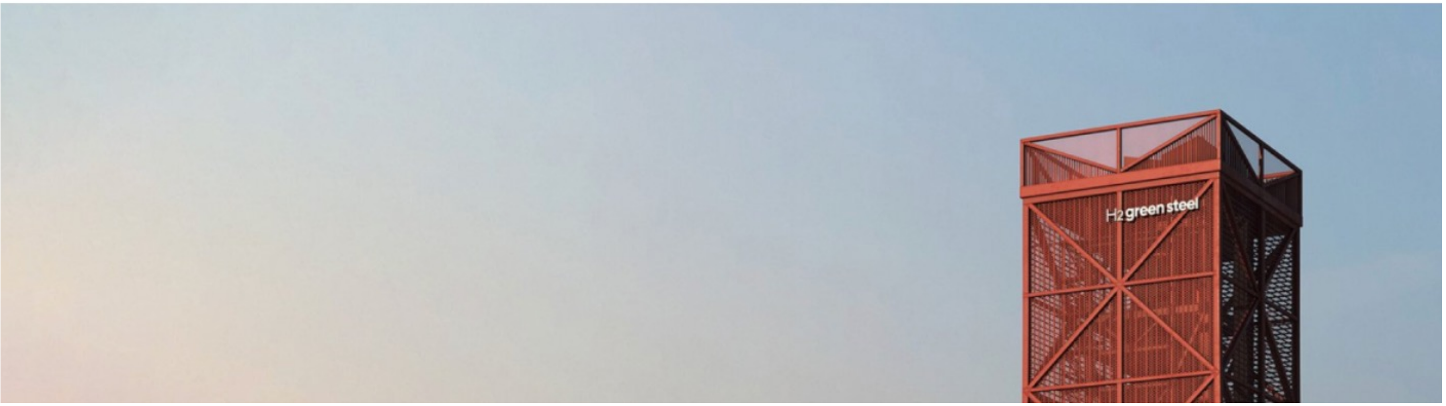
UNSW and JA Solar launch joint lab to accelerate the development and market deployment of advanced solar technologies - Dec 2024
新南威尔士大学与晶澳太阳能联合实验室成立，加速先进太阳能技术研发与市场应用

Australian green iron - a massive strategic opportunity

CLIMATE ENERGY FINANCE

Green Metal Statecraft:
Forging Australia's Green Iron Industry

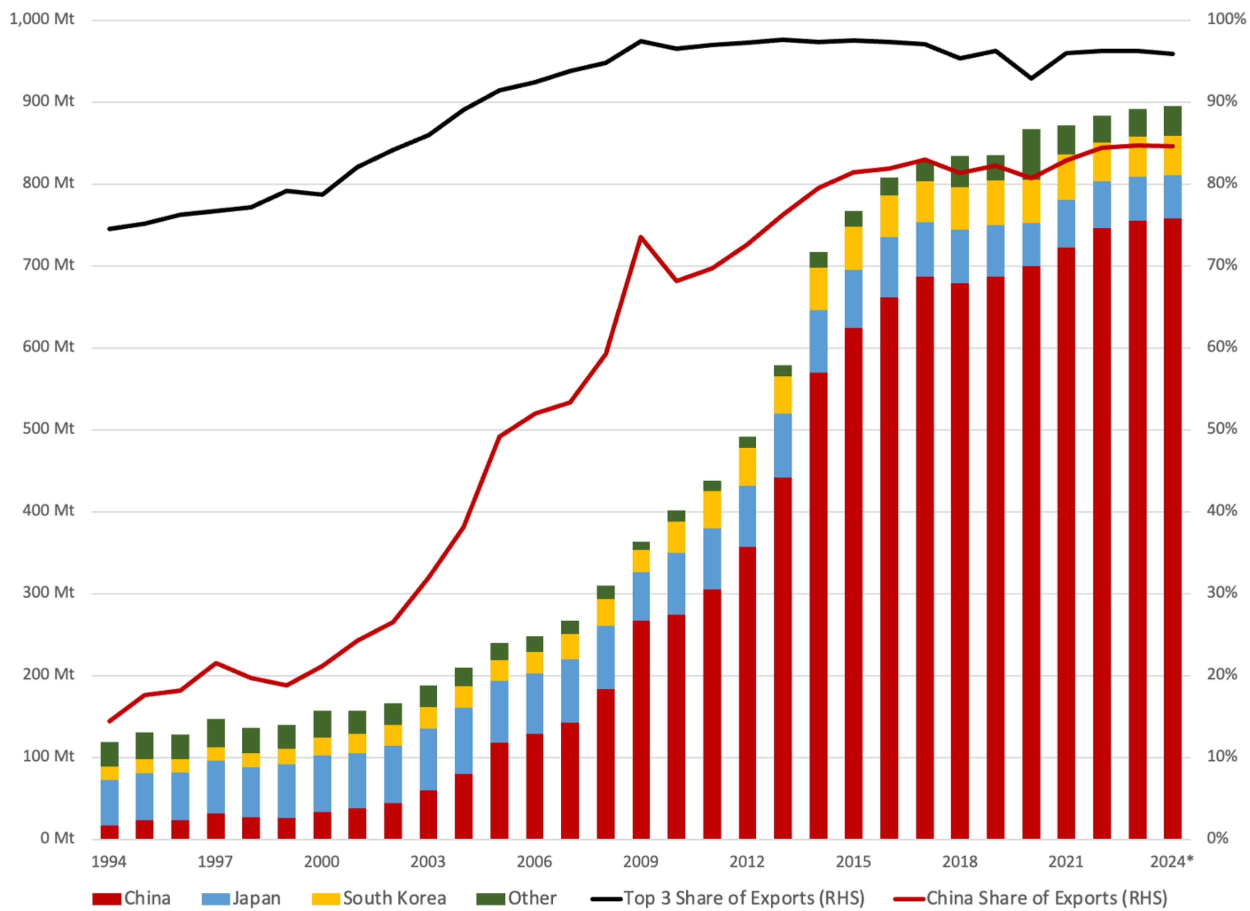
Matt Pollard, Net Zero Transformation Analyst, CEF
Tim Buckley, Director, CEF



https://climateenergyfinance.org/wp-content/uploads/2024/11/CEF_Green-Metal-Statecraft_FINAL.pdf

Australian green iron - a massive strategic opportunity

Australia's Iron Ore Export Markets



China accounted for 85% of Australia's A$138bn pa of iron ore exports, having delivered +6% CAGR in volume over the last decade. This has been a key partnership of profound strategic value for Australia.

But Chinese steel production likely peaked in 2020 (China's steel output was -3% yoy in 2024), scrap use is rising, and China is diversifying into Simandou, Guinea (120Mtpa).

Source: Office of the Chief Economist
Note: 2024 is annualised from 1H2024

CEF's Report Advocating for Carbon Pricing

Climate Energy Finance
05 June 2025

CLIMATE ENERGY FINANCE

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

Regional Australia investment opportunities:

- Mining (not fossil fuels)
- VRE Infrastructure
- BESS, PHS & Grid T&D
- Rooftop solar + BESS
- Aluminium Refining
- Green iron & EAF
- Recycling
- Green data centres
- Copper refining
- Solar – green polysilicon

Source: Climate Energy Finance, https://climateenergyfinance.org/wp-content/uploads/2025/06/CEF_A-Price-on-Carbon-Building-Towards-an-Asian-CBAM-Report_05June2025.pdf