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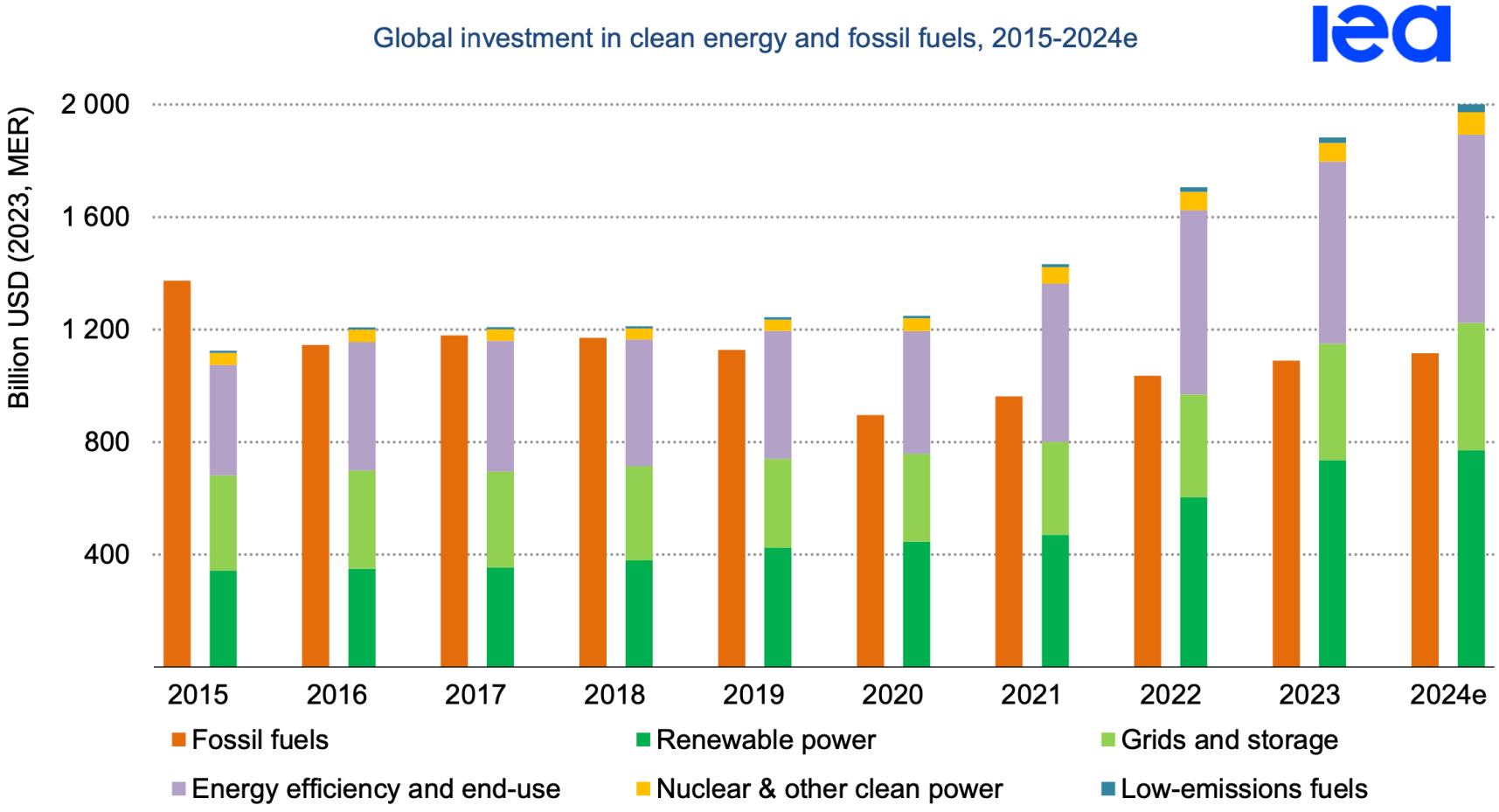
The global energy transformation and Implications for Australia

Trade and Investment Queensland

17 July 2024

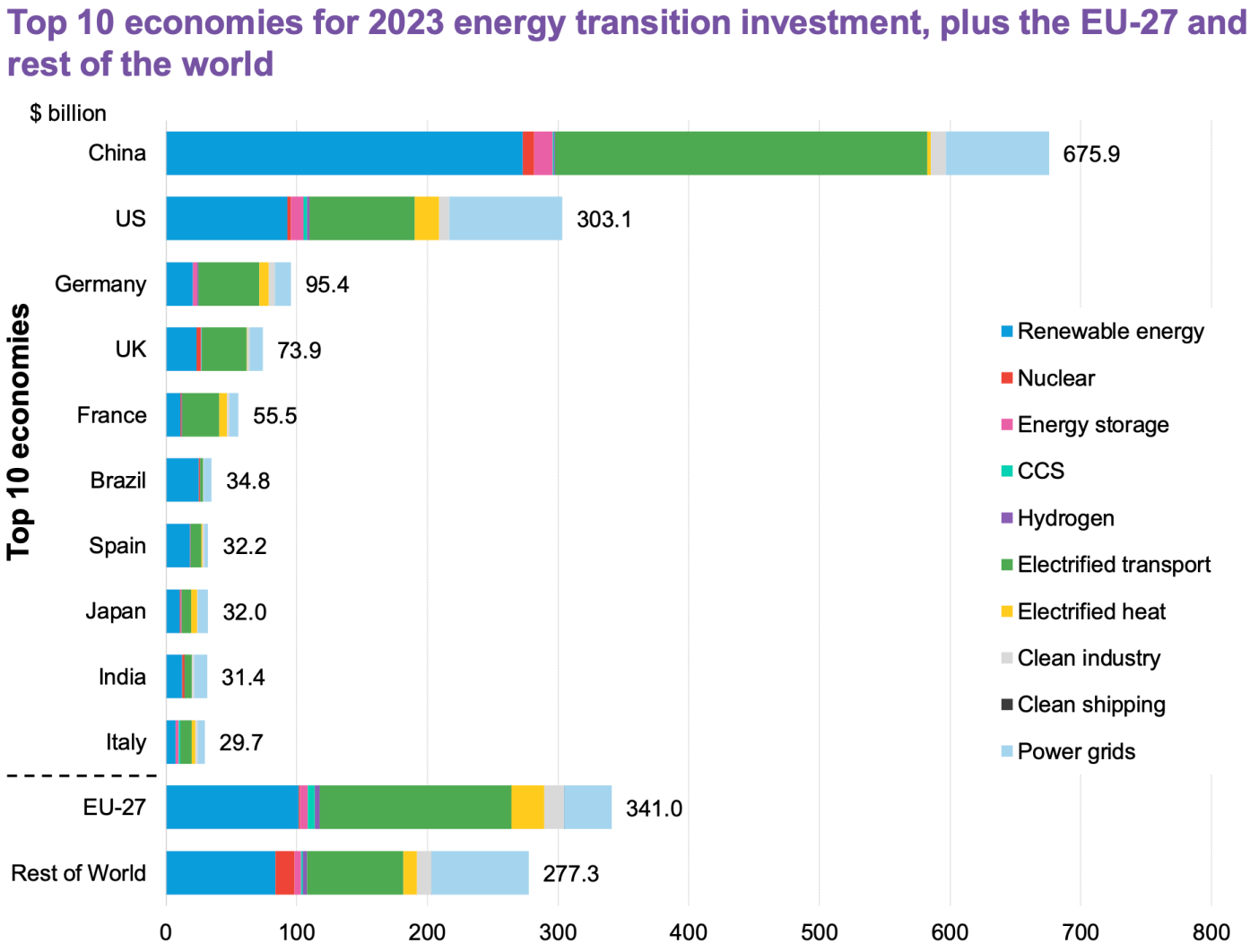
1. The Global Energy Transition

The world now invests almost twice as much in clean energy as it does in fossil fuels…



Source: IEA World Energy Investments 2024

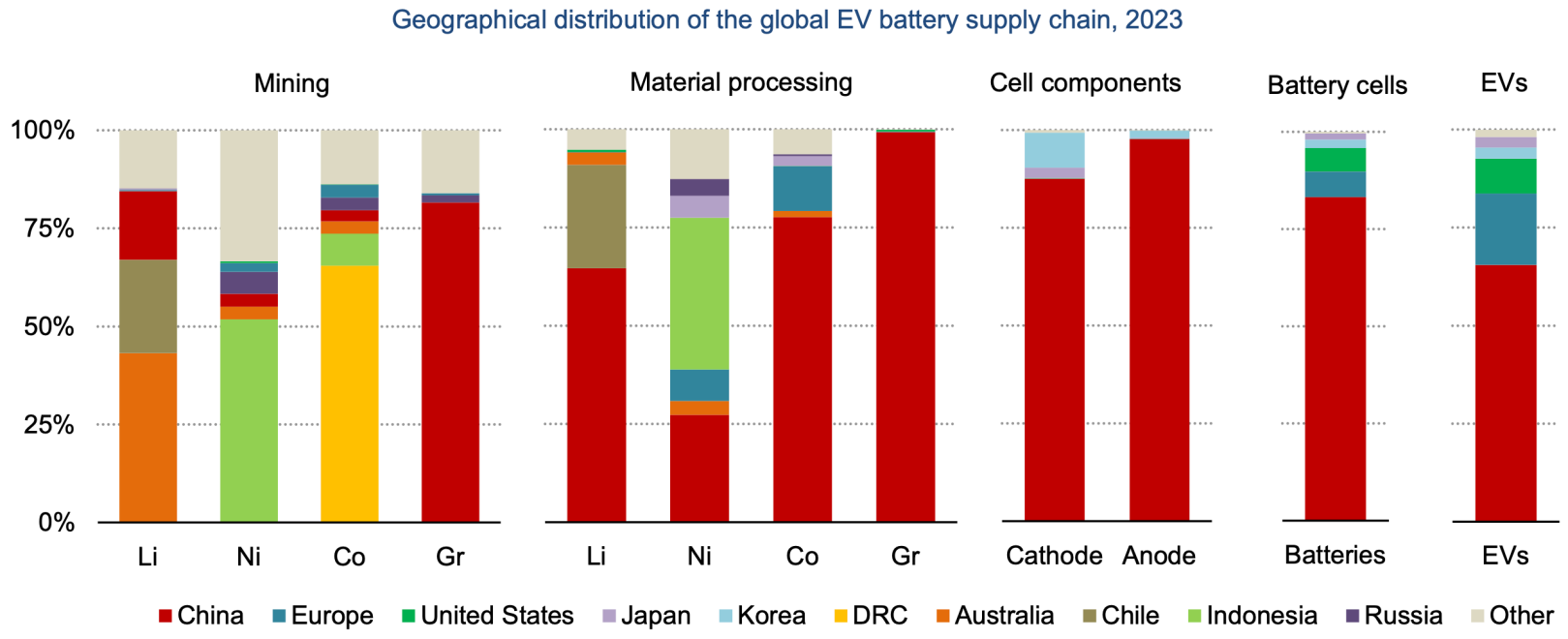
2. China Leads the World in Cleantech Investing



Source: BloombergNEF 30 Jan 2024

2. China Dominates Battery Manufacturing

China dominates the entire global battery-EV supply chain

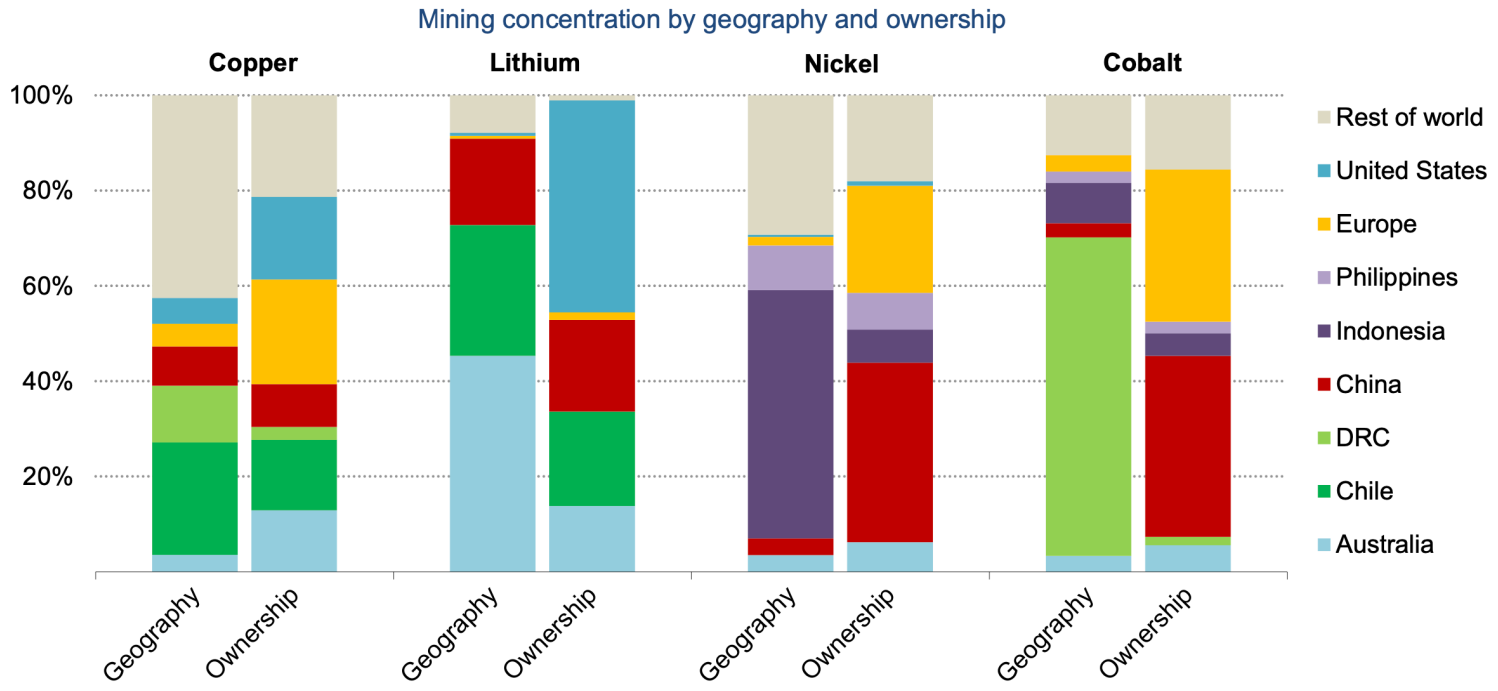


Source: IEA Critical Minerals Outlook Report May 2024

2. China is securing Battery supply chains

China market ownership is much lower than control

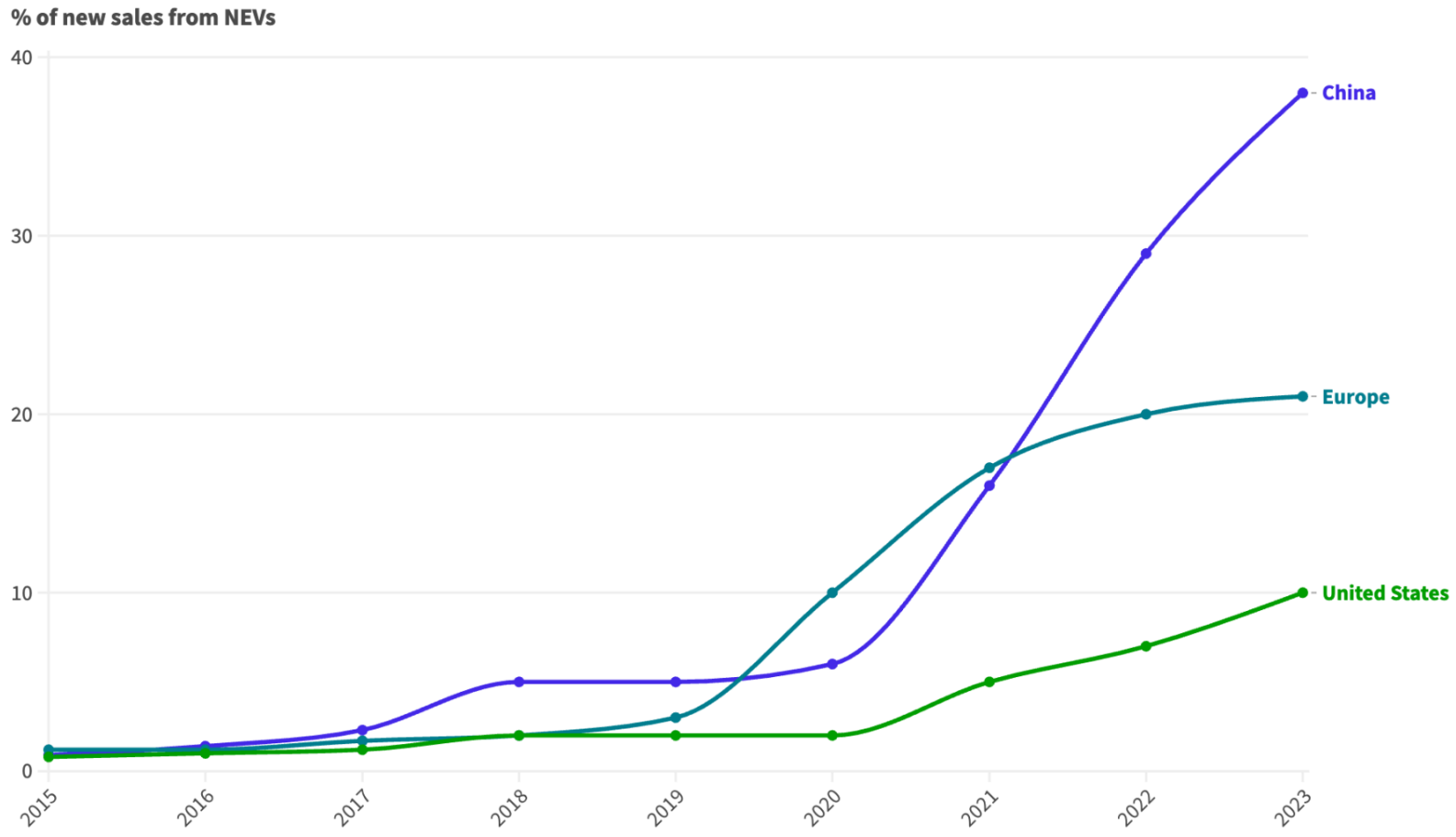
Mining concentration looks different if viewed through the lens of asset ownership, with US and European companies playing a greater role



Source: IEA Critical Minerals Outlook Report May 2024

2. China leads the Rising New Energy Vehicle Penetration

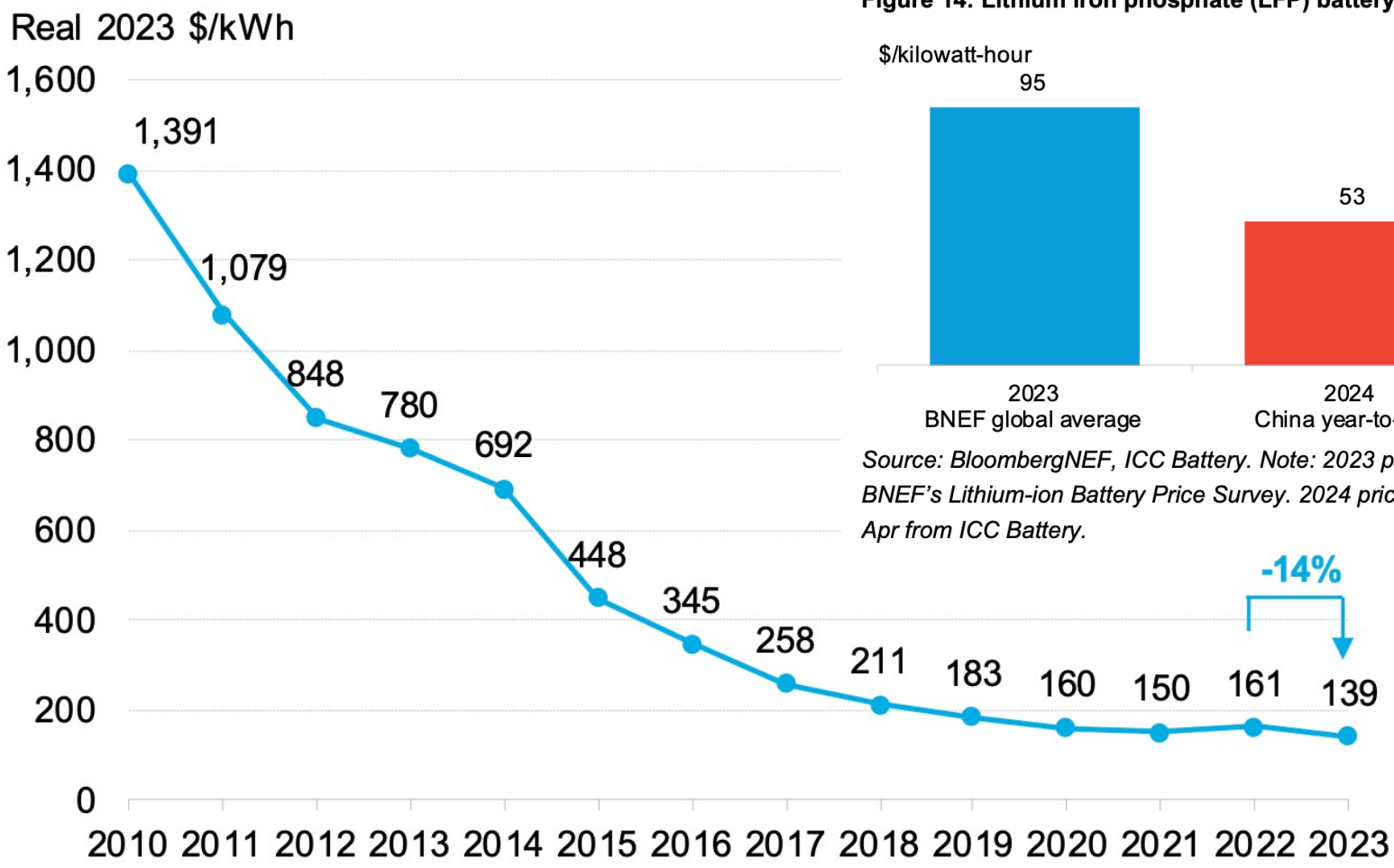
Figure 5.4: The Pivot to Electric Vehicles Manufacturing and Use in China is World leading



Source: CEF Calculations, IEA [52]

3. BESS Deflation

Volume-weighted average lithium-ion battery pack price



Source: BloombergNEF. Note: Historical figures have been adjusted to real 2023 dollars.

Figure 14: Lithium iron phosphate (LFP) battery cell prices

Source: BloombergNEF, ICC Battery. Note: 2023 price from BNEF's Lithium-ion Battery Price Survey. 2024 price from Jan-Apr from ICC Battery.

3. BESS + Solar => Disruption!

Sungrow secures 7.8 GWh battery storage deal with Saudi Arabia's Algihaz Holding

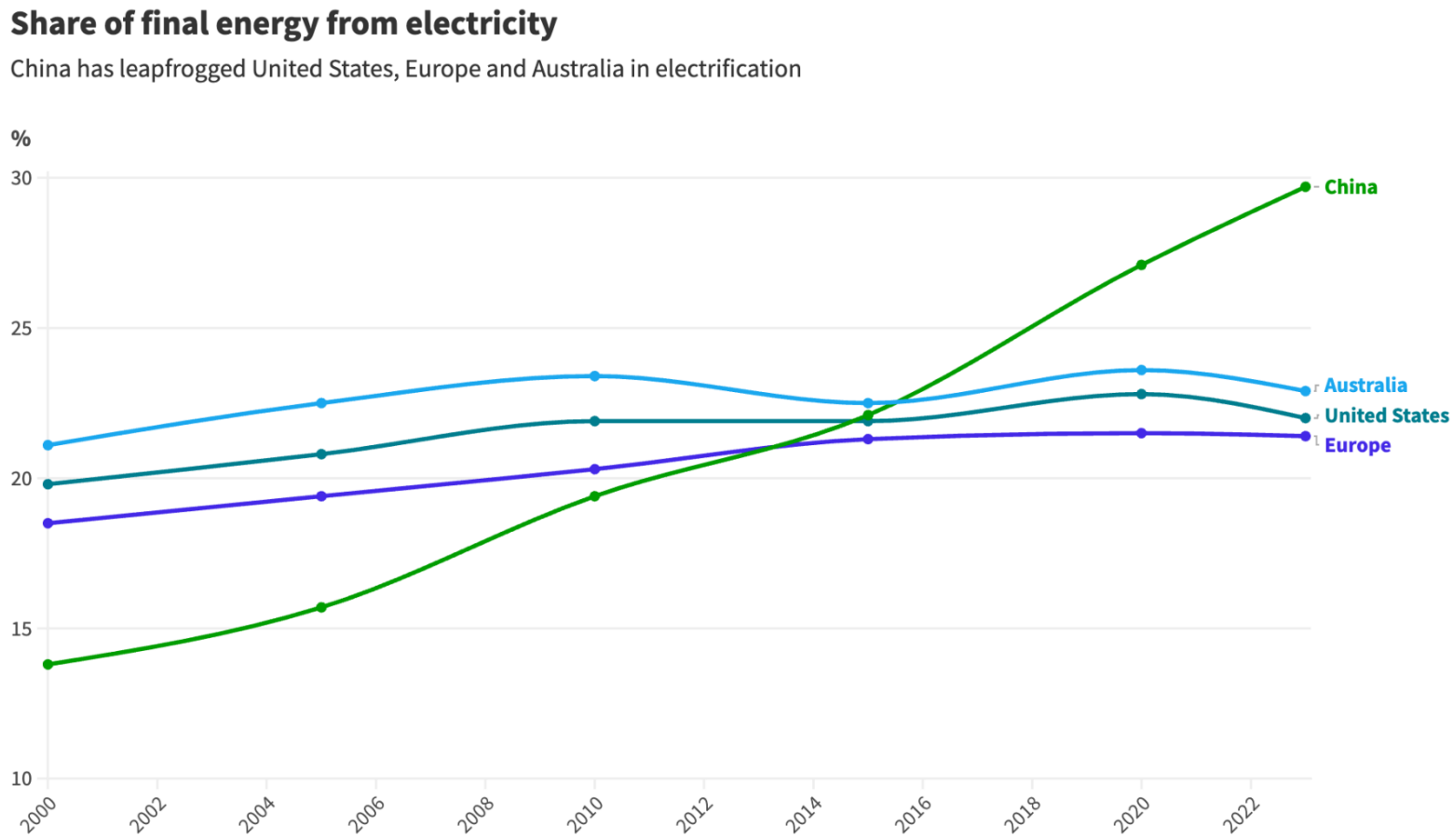
China's Sungrow has signed three landmark energy storage contracts with Saudi Arabia's Algihaz Holding, amounting to the world's largest grid-side storage order. Each project will have a capacity of 2.6 GWh, totaling 7.8 GWh.

By **Vincent Shaw** | Jul 16, 2024

Source: https://www.ess-news.com/2024/07/16/sungrow-secures-7-8-gwh-battery-storage-deal-with-saudi-arabias-algihaz-holding/

4. China's Electricity Generation Mix

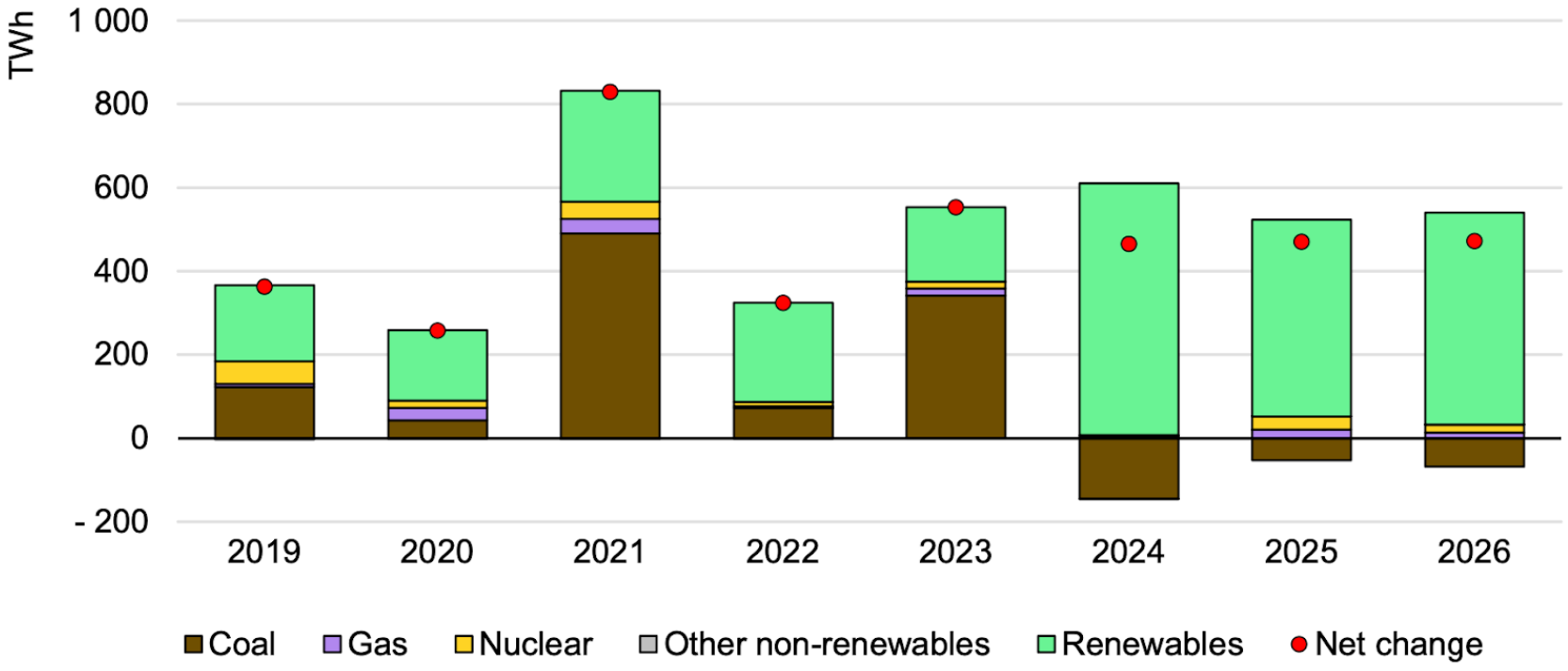
Figure 5.3: The Progressive Electrification of Everything in China is World leading



Source: CEF calculations, Enerdata

4. China's Electricity Generation Mix

Year on year change, TWh, 2019-2026



Source: *IEA Electricity 2024, Analysis and Forecast to 2026 page 90*

4. China installed 24GW per month of RE in 2023

CY2023 Capacity Installs was a Global Gamechanger, +99% yoy

New Capacity Installed in China in Jan-Dec 2023

		Jan-Dec 2023	Share of new adds (%)	Change (yoy %)	Dec-23	Share of new adds (%)
Thermal Power	GW	57.9	16%	30%	11.5	12%
Hydropower	GW	8.0	2%	-66%	0.2	0%
Nuclear Power	GW	1.4	0%	-77%	0.2	0%
Wind Power	GW	75.9	21%	102%	28.5	31%
Solar Power	GW	216.9	60%	148%	51.9	56%
Total capacity added	**GW**	**360.1**	**100%**	**78%**	**92.2**	**100%**
Variable Renewable adds	GW	292.8	81%	99%	80.4	87%
Zero Emissions Capacity Adds	GW	302.2	84%	92%	80.7	88%

Source: NBS, CEF Estimates

4. China is installing 20GW per month of RE

RE Momentum in CY2024 Has Slowed, but is still a Positive +17% yoy

New Capacity Installed in China in Jan-May 2024

		Jan-May 2024	Share of new adds (%)	Change (yoy %)	May-24	Share of new adds (%)
Thermal Power	GW	12.1	10%	-45%	2.9	11%
Hydropower	GW	3.4	3%	-21%	0.7	3%
Nuclear Power	GW	1.2	1%	0%	1.2	4%
Wind Power	GW	19.8	17%	21%	2.9	11%
Solar Power	GW	79.2	68%	29%	19.0	71%
Total capacity added	**GW**	**115.6**	**100%**	**10%**	**26.8**	**100%**
Renewable Energy adds	GW	102.4	89%	25%	22.7	85%
Zero Emissions Capacity Adds	GW	103.5	90%	25%	23.9	89%

Source: NBS, CEF Estimates

4. China is installing 20GW per month of RE

Generation mix is very different to capacity due to different capacity utilisation rates

China's Electricity Generation Mix in Jan-May 2024 (Adjusted for DER)

		Jan-May 2024	Share of Generation Jan-May	Change (y-o-y %)	Jan-May 2024 Adjusted	Share of Generation Jan-May Adjusted	May-24	Change. (y-o-y %)
Hydropower	TWh	409	11%	16.0%	409	11%	115	40.2%
Thermal Power	TWh	2,517	69%	4.0%	2,517	65%	454	-3.7%
Nuclear Power	TWh	176	5%	1.0%	176	5%	36	-2.4%
Wind Power	TWh	405	11%	10.5%	417	11%	77	3.8%
Solar Power	TWh	150	4%	38.8%	329	9%	36	49.1%
Total Power Generation	**TWh**	**3,657**	100%	**6.9%**	**3,849**	100%	**718**	**4.3%**
Variable Renewable Generation	TWh	554	15%	17.0%	746	19%	113	14.8%
Zero Emissions Power Gneration	TWh	1,140	31%	13.9%	1,331	35%	603	21.5%

Note: We have adjusted the solar YTD estimates to include estimated distributed energy resources (DER) generation
Source: NBS, CEF Estimates.

China's reported generation excludes distributed solar & wind (<30MW); capacity includes this. So VRE share is understated (19% not 15%).

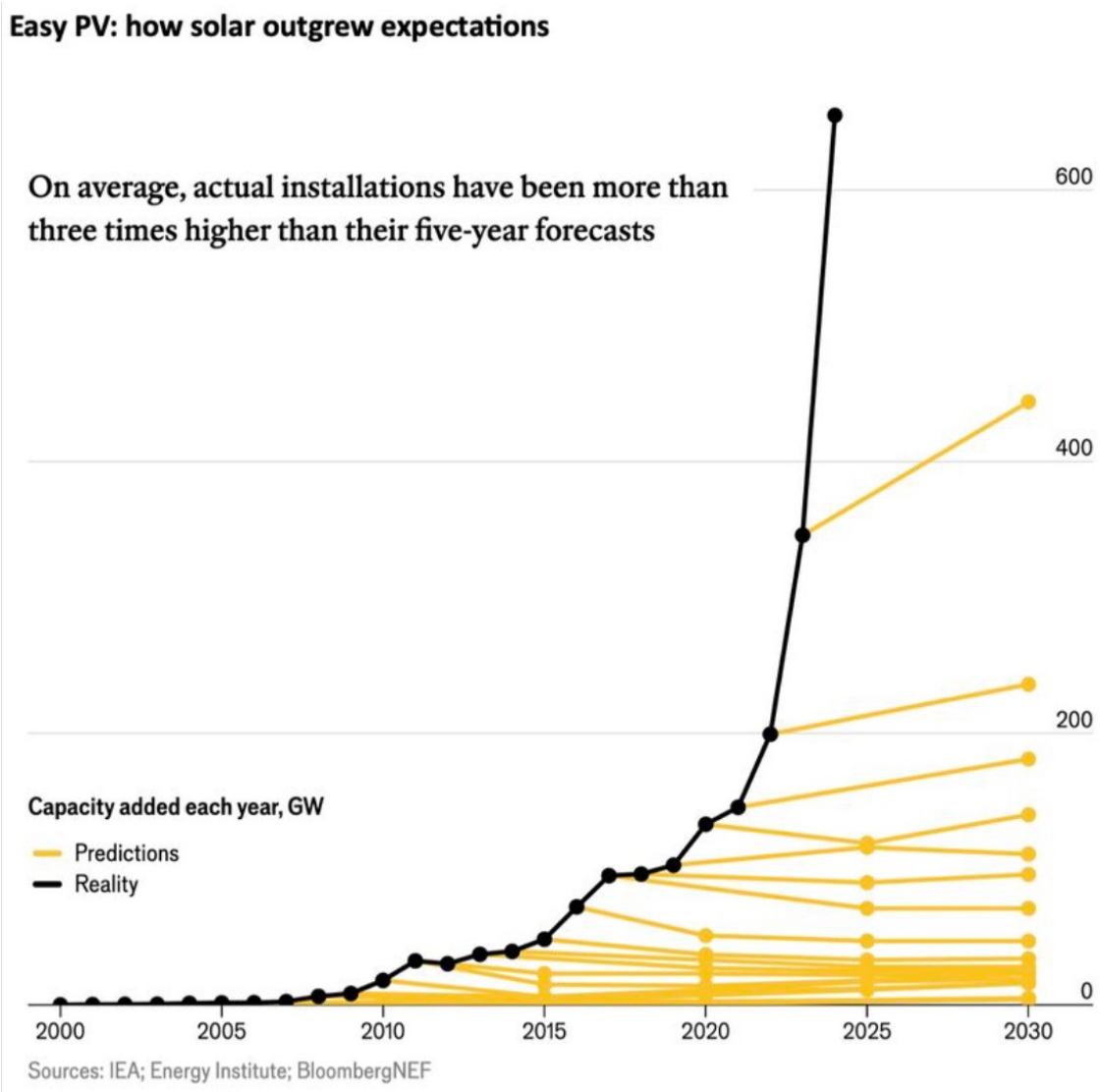
Xi Jinping's Great Economic Rewiring Is Cushioning China's Slowdown

Advances in EV, solar and semiconductors are helping the nation navigate its property slump

By Bloomberg News 16 July 2024

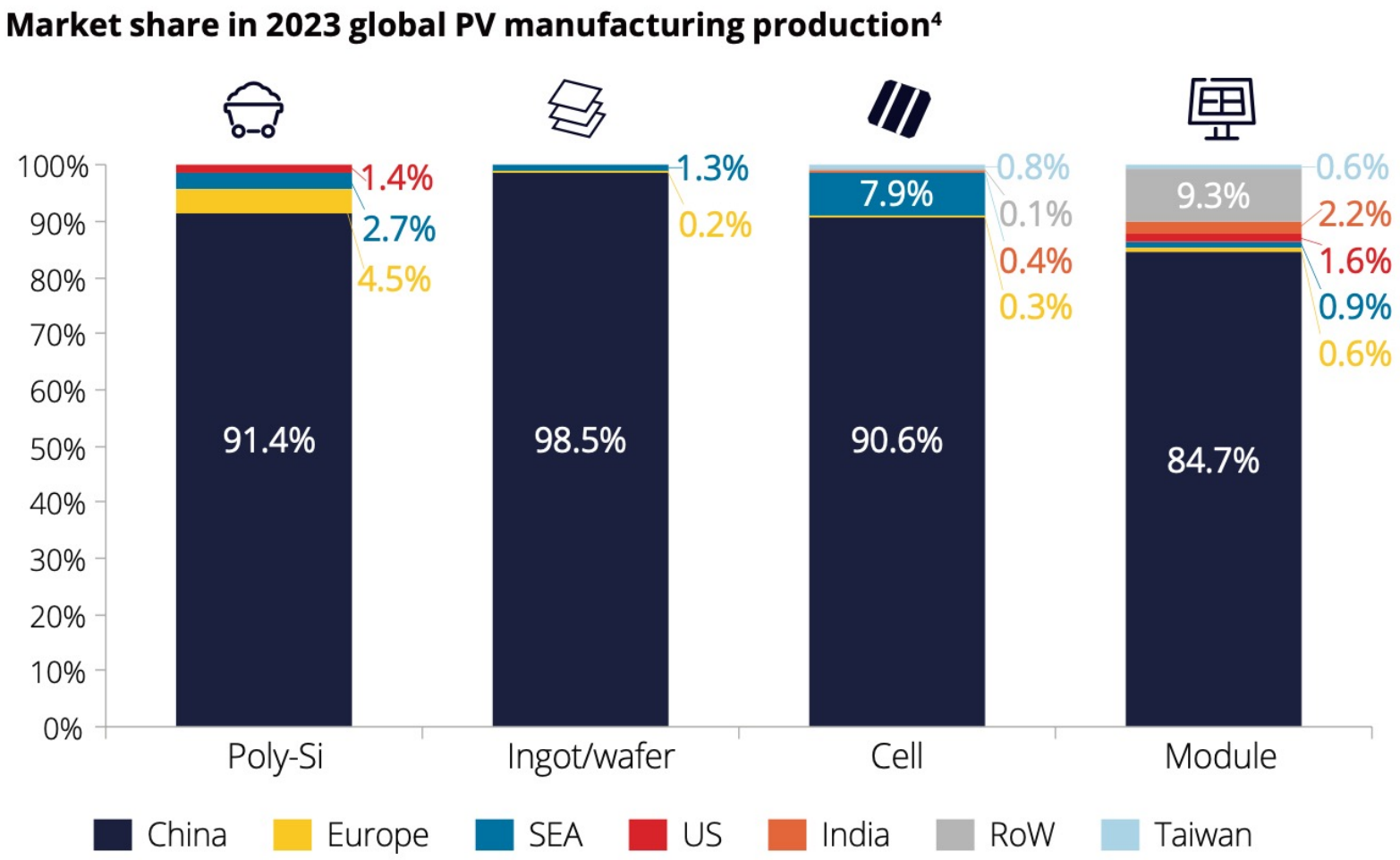
5. China Dominates Solar

Solar Growth is Accelerating, Globally. Way above any forecasts.



5. China's Solar Manufacturing Dominance

Undermines the FMIA strategy, unless done in partnership with global cleantech leaders



Source: *Australian PV Institute, S2S Roadmap, Feb 2024*

6. Australian Pivot from Fossil Fuel Exports to Green Metals

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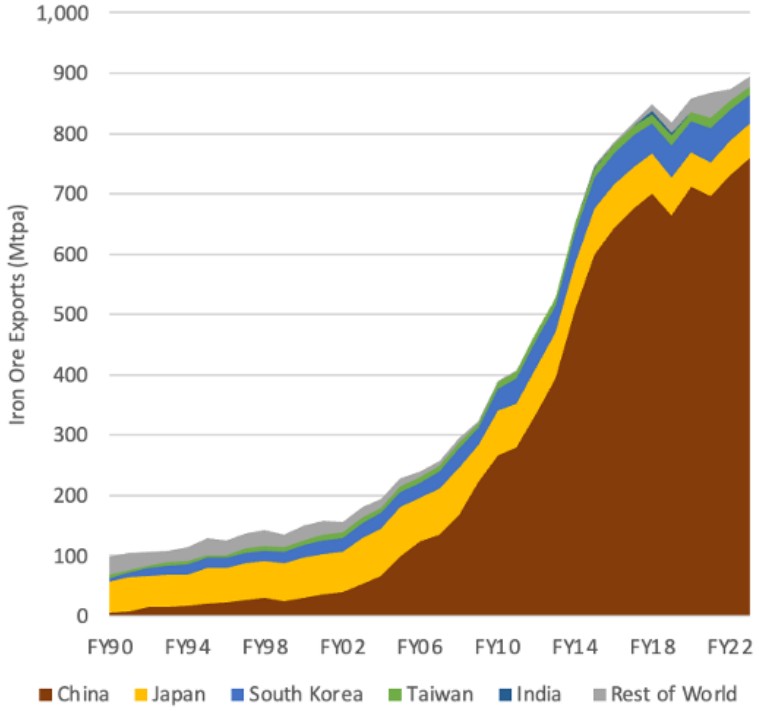
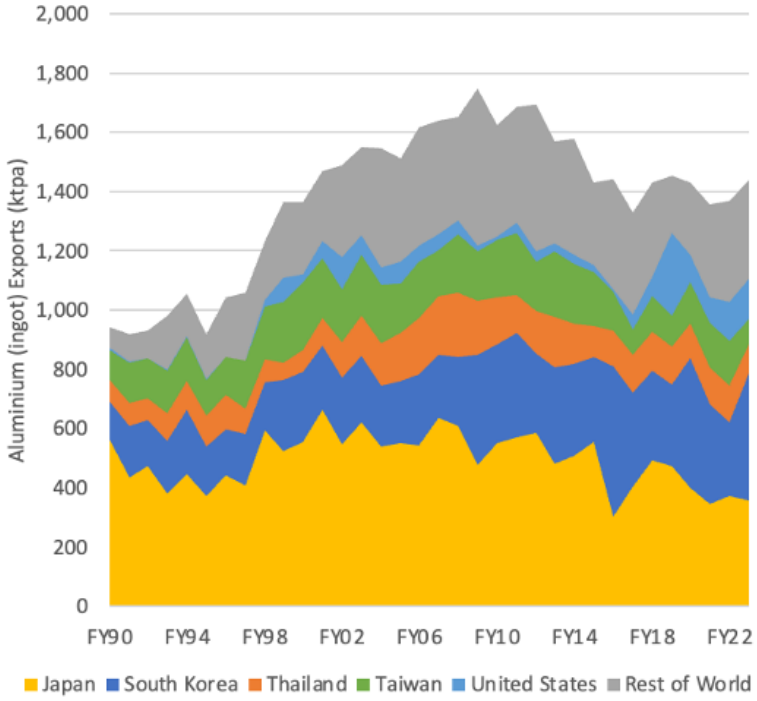
Unlocking Green Metals Opportunities for a Future Made in Australia

Consultation Paper Submission

Australian Iron and Aluminium Export Destinations by Volume





Source: Resource and Energy Quarterly June 2024

6. China is diversifying from Oz Resource Dependence

Rio Tinto's $34.3b African iron ore project gets green light

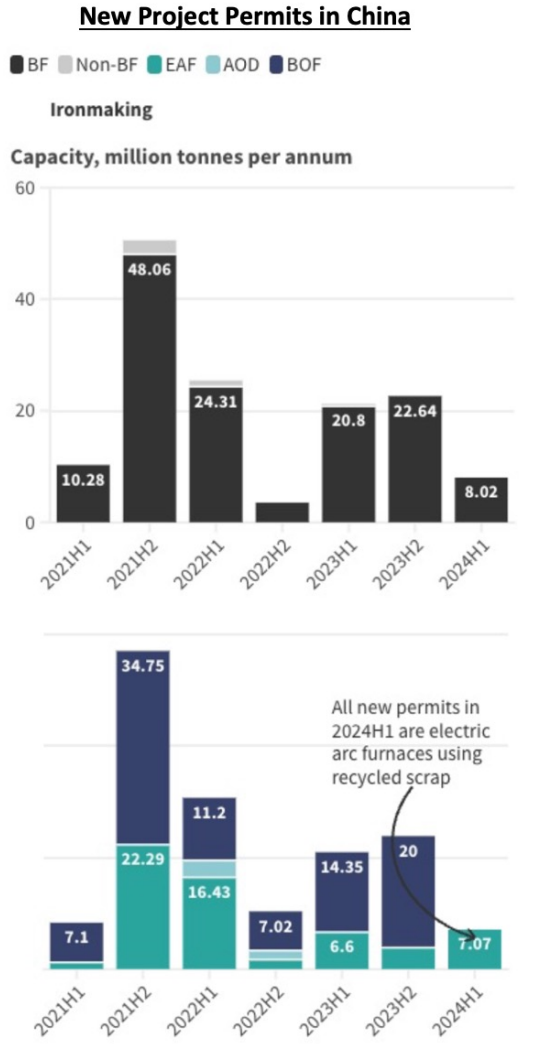
Peter Ker Resources reporter AFR Jul 16, 2024

Rio Tinto's $US23.2 billion African iron ore project has won final approval from the Guinean and Chinese governments, clearing the way for first production to begin within 18 months.

The long-awaited final approval for the Simandou iron ore project in Guinea came on the same day that Rio's flagship Australian iron ore division confirmed that a train derailment had hampered exports in 2QCY2024.

Rio Tinto's plan to develop Simandou has taken a step forward, having won final approval from the Guinean and Chinese governments

Simandou will initially comprise two neighbouring iron ore projects under different ownership, which will use shared rail and port infrastructure to get a combined tally of about 120Mt of iron ore to seaborne markets.



Source: Centre for Research on Energy and Clean Air

Source: https://www.afr.com/companies/mining/rio-tinto-s-34-3b-african-iron-ore-project-gets-green-light-20240716-p5jtyu