

CLIMATE ENERGY FINANCE

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**2024 Climate Tech Connect**

# **The Energy Transformation: Looking towards 2025**

**27 November 2024**

# Australian Hydrogen Council Forum

## Agenda – Reconstructing global iron and steel supply chains

**China is leading the world's installs of renewable energy (Oz is a laggard).**

**China is leading a global step change in cleantech manufacturing capacity**

**China cleantech is going global: ODFI + exports + offshoring manufacturing**

**Global Steel Sector Decarbonisation: Time for Australia to act: This is a 1Bn tonnes pa emissions reduction opportunity!**

**82% Renewables by 2030 – possible? Absolutely!**

# China is installing 22GW per month of RE

RE Momentum in 9MCY2024 has Slowed, it is 'only' +22% yoy

The month of September 2024 saw 27.8GW of RE commissioned

## New Capacity Installed in China in Jan-Sep 2024

		Jan-Sep 2024	Share of new adds (%)	Change (yoy %)	Sep-24	Share of new adds (%)
Thermal Power	GW	33.4	14%	-15%	4.8	15%
Hydropower	GW	8.0	3%	1%	1.4	4%
Nuclear Power	GW	1.2	0%	0%	0.0	0%
Wind Power	GW	39.1	16%	17%	5.5	17%
Solar Power	GW	160.9	66%	25%	20.9	64%
<b>Total capacity added</b>	<b>GW</b>	<b>242.6</b>	<b>100%</b>	<b>15%</b>	<b>32.6</b>	<b>100%</b>
Renewable Energy adds	GW	208.0	86%	22%	27.8	85%
Zero Emissions Capacity Adds	GW	209.2	86%	22%	27.8	85%
Investment in Completed Power Grid Project	1 billion yuan	398.2		21%	144.2	

Source: NBS, CEF Estimates

## 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*

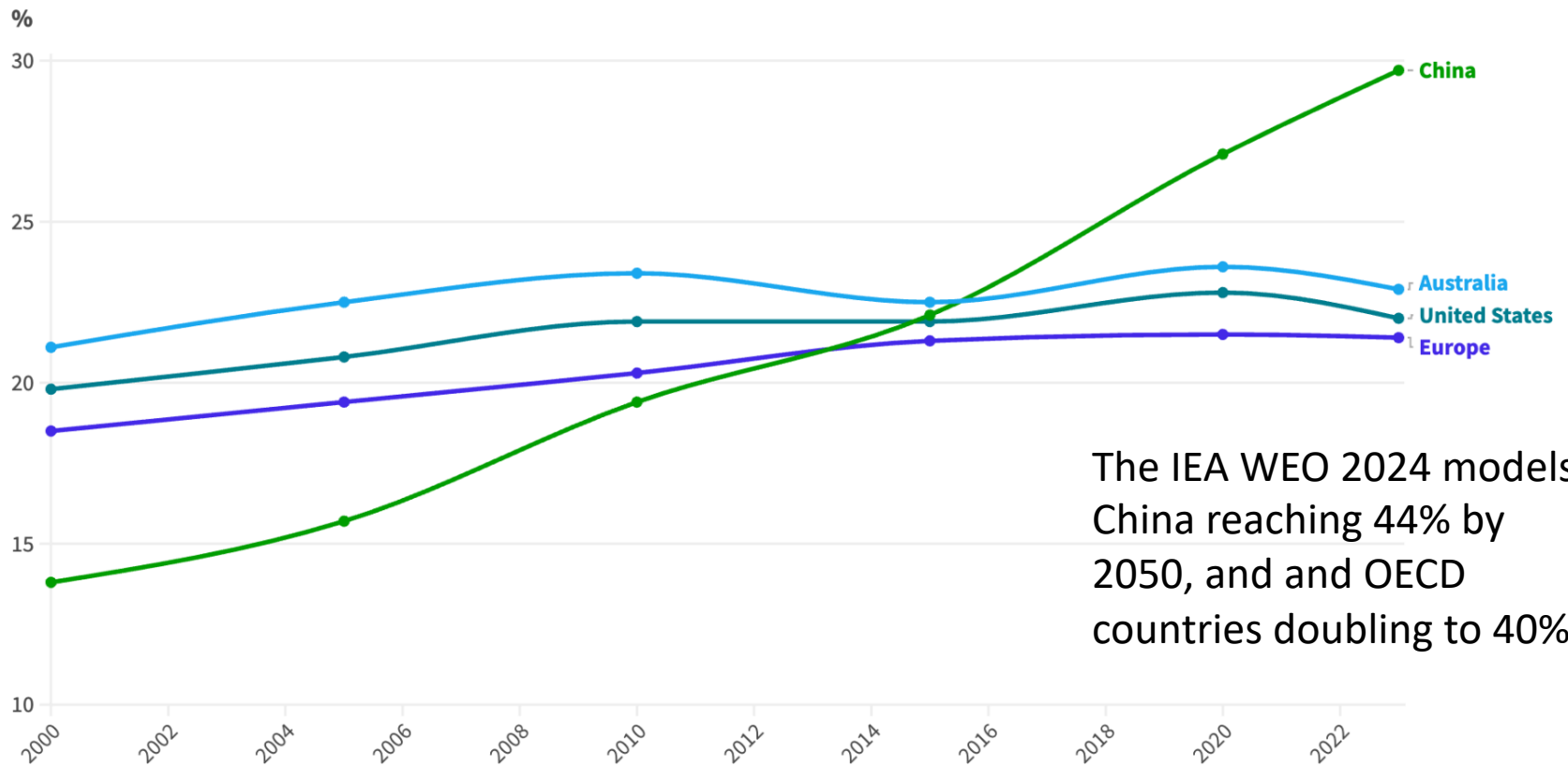
By Bloomberg News 16 July 2024

# China's Electrification of Everything

## China Leads the world on Progressive Electrification of Everything

### Share of final energy from electricity

China has leapfrogged United States, Europe and Australia in electrification

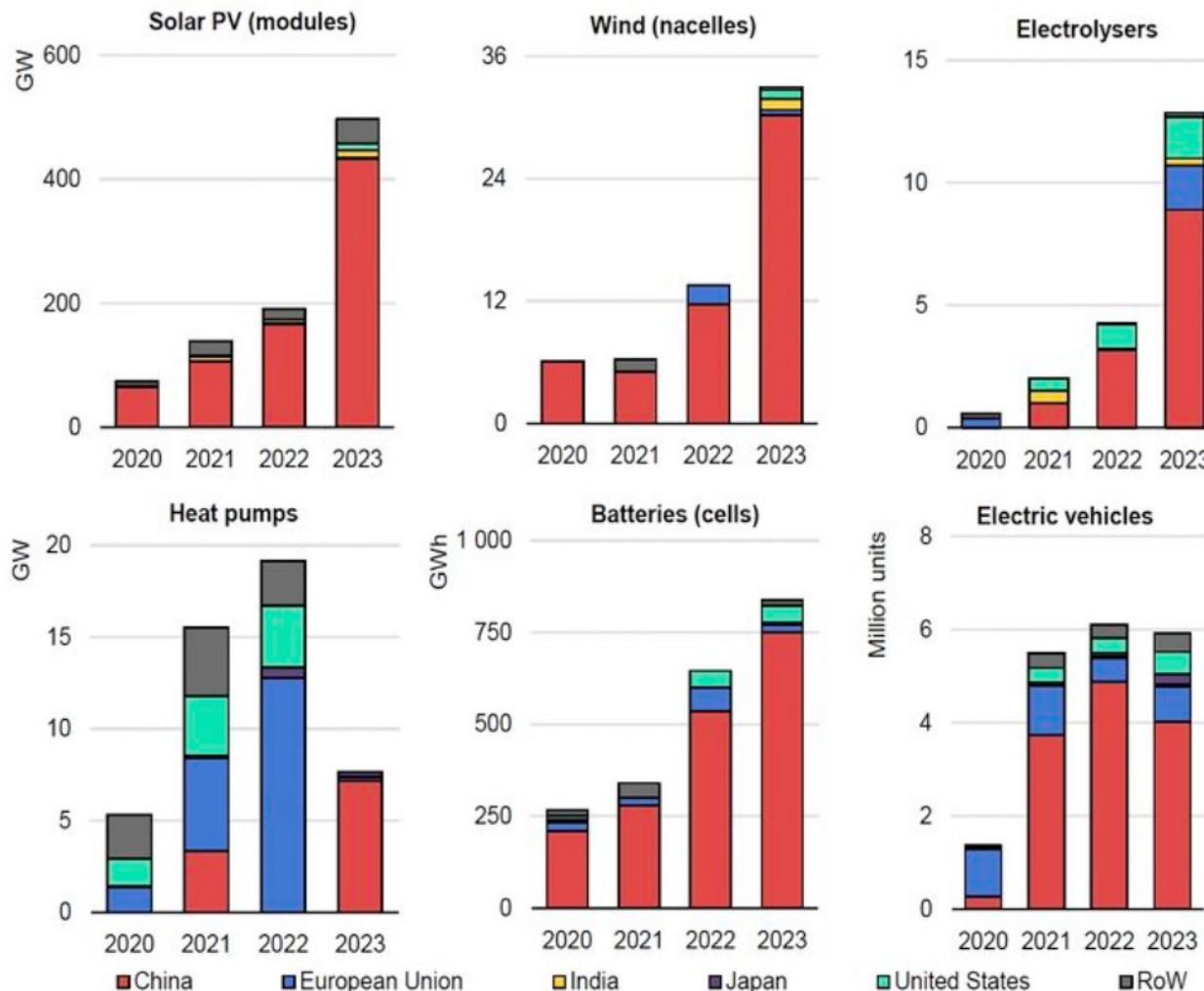


The IEA WEO 2024 models China reaching 44% by 2050, and and OECD countries doubling to 40%.

# China's Cleantech Manufacturing Dominance

## Global Cleantech Manufacturing Capacity Expansions by Year

Figure 1.6 Net manufacturing capacity additions for selected clean energy technologies by country/region, 2020-2023



# China's US\$115bn Cleantech ODFI since 2023

## China's response to the growing US and EU anti-China trade barriers

Investment						Date of	Expected	
US\$m	Technology	Company	Investment Partner	Location	news	Product	start of production	Confirmed / FID
8,100	Battery	CATL	n.a.	Debrecen, Hungary	May'2024	Battery Mfg, 100GWh	2025	Yes
5,600	NEV	Human Horizons	Ministry of Investment	Saudi Arabia	Jun'2023	NEV Mfg - MoU	n.a.	No
4,200	Hydro	Power China	n.a.	Tanzania	Feb'2024	Hydro-electricity - 2,115MW	2024	Yes
3,300	Grid T&D	China State Grid	n.a.	Brazil	Apr'2024	2*1,500km grid transmission lines	n.a.	Yes
2,600	Solar Farms	CEEC	ACWA & Aramco	Saudi Arabia	Feb'2024	2,600MW of solar farm	2024	Yes
2,450	Wind Farm & BESS	Goldwind	Omni Energy	NSW, Australia	Aug'2024	1.4GW wind, 200MW-2hr BESS	2028	No
2,360	Battery	Gotion	n.a.	Michigan, US	Aug'2024	Battery Mfg	n.a.	No
2,200	Battery	CALB	n.a.	Portugal	Jan'2024	Battery Mfg, 15GWh	2026	No
2,100	Solar Mfg	TCL Zhonghuan	RELC & Vision	Saudi Arabia	Jul'2024	20GW solar wafers pa	n.a.	No
2,000	Wind Farms	CEEC	ACWA Power	Uzbekistan	Aug'2024	to construct a 1GW wind farm	2026	Yes
2,000	Solar Farms	CGN	n.a.	Laos	Aug'2024	2,000MW of solar across 3 farms	2026	Yes
2,000	Hydro	CEEC	China Energy	Pakistan	Aug'2024	Hydro-electricity - 884MW	2025	Yes
2,000	BESS	Sungrow	Algihaz	Saudi Arabia	Jul'2024	BESS - 7,800MWh	2025	No
1,575	Battery	EVE Energy	n.a.	Coventry, UK	Mar'2024	Battery Mfg	n.a.	No
1,550	Battery Materials	Huayou Cobalt	n.a.	Acs, Hungary	Jul'2024	Cathodes, 100,000tpa	2026	Yes
1,500	Solar Farms	Jinko Solar	EDF & TAQA	Dhafrah UAE	Aug'2024	1,500MW solar farm	2024	Yes
1,500	Grid T&D	Southern Power Grid	Chilean partners	Chile	Apr'2024	1,342km grid transmission line	n.a.	No
1,500	Battery Materials	Shanghai Putailai	n.a.	Sundsvall, Sweden	May'2023	Graphite anodes, 100,000tpa	n.a.	No
1,500	BESS	BYD	Grenergy	Atacama, Chile	Sept'2024	BESS - 3,000MWh	2025	Yes
1,450	Battery	Envision AESC	n.a.	Kentucky, US	Sep'2023	Battery Mfg, 30GWh	2024	Yes
1,450	Battery	Envision AESC	n.a.	Douai, France	Nov'2023	Battery Mfg, 9GWh	n.a.	Yes
1,400	Battery	EVE Energy	n.a.	Debrecen, Hungary	Nov'2023	Battery Mfg, 28GWh	2025	Yes
1,400	Battery Materials	CATL	YLB Mining	Bolivia	Jan'2024	Lithium hydroxide, 50,000tpa	n.a.	Yes
1,350	Battery Materials	Shanghai Shanshan	n.a.	Finland	Oct'2023	Graphite anodes, 100,000tpa	n.a.	No
1,332	NEV	Geely's Volvo	n.a.	Košice, Slovakia	Jul'2022	NEV Mfg - 250,000 units pa	2026	No

Source: CEF Report: [China Outbound FDI, Oct'2024](#)

<https://climateenergyfinance.org/wp-content/uploads/2024/10/final--CEF-Report-China-Outbound-FDI-2-October-2024-2.pdf>

# Solar Step Change

## How China Came to Control 90% of the Global Solar Market



Australian Government  
Australian Trade and Investment Commission

21 October 2024

### SunDrive Solar and Trinasolar to manufacture solar panels in Australia

The joint venture will combine SunDrive's innovative technology with Trinasolar's manufacturing expertise.

China's Trinasolar is teaming up with Australia's SunDrive Solar to manufacture solar panels in Australia.

The 2 companies have signed a memorandum of understanding to form a joint venture (JV). The majority Australian-owned JV will aim to establish solar manufacturing capabilities in Australia.

SunDrive will lead an application for funding under the Australian Government's Solar Sunshot program to help advance the JV's solar module production. The funding will also support feasibility studies for further extending the solar manufacturing value chain at the AGL Hunter Energy Hub site.

The proposed manufacturing facility is expected to create 400 highly skilled jobs.

### Bringing world-class solar manufacturing to the region

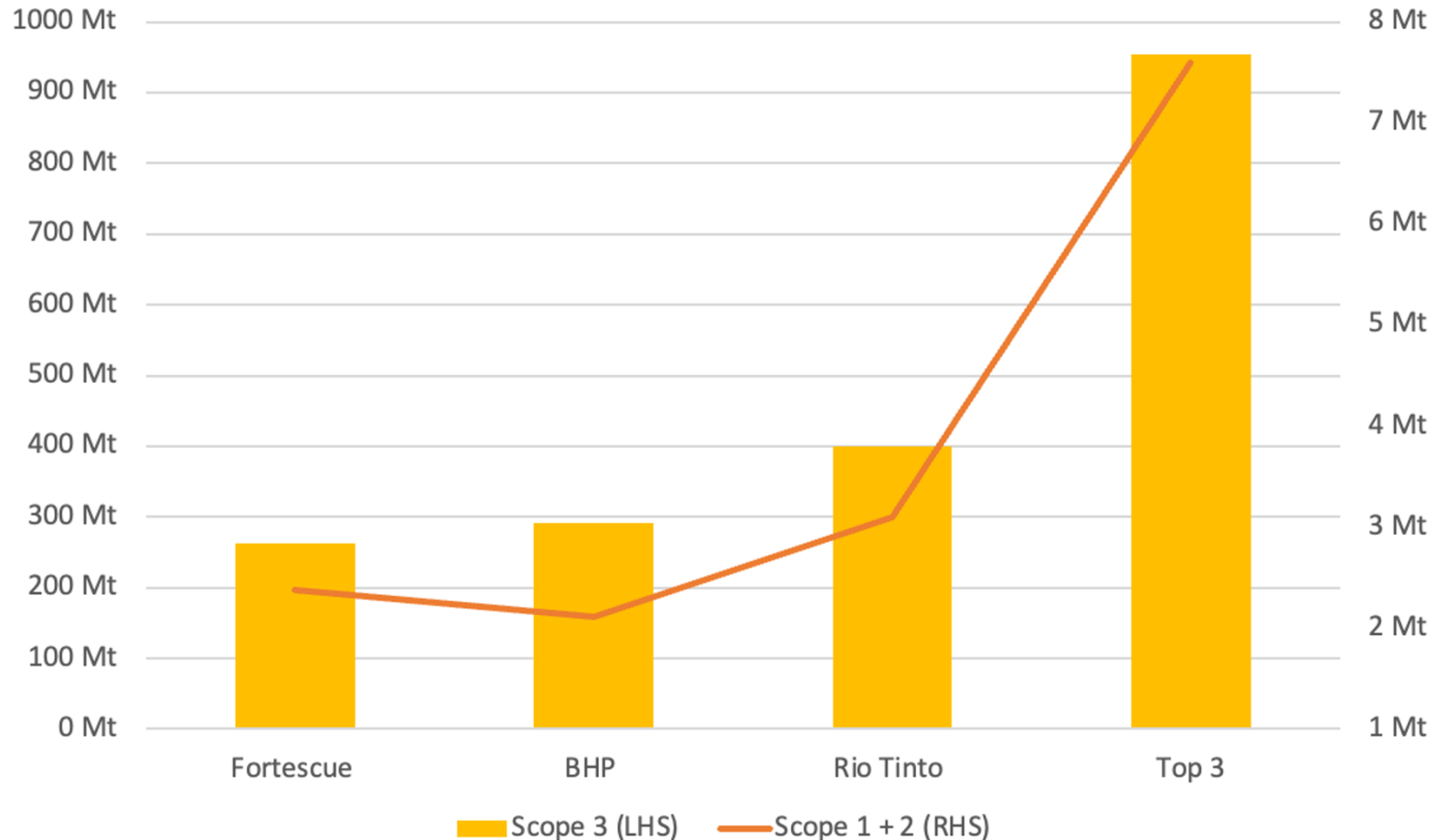
SunDrive Solar is an Australian solar technology company. Its copper metallisation technology has the potential to revolutionise solar manufacturing by replacing silver with copper, a more abundant and cost-effective material.

Trinasolar is a global provider of photovoltaic (PV) module and smart energy solutions. To date, the company has delivered more than 225 GW of solar modules worldwide. It has been serving the Australian market since 2009.

# Australia's Green Iron Challenge

## Low-Emission iron making – a 1Bn tpa opportunity for Oz

**Figure 8.4: Domestic Emissions Compared to Exported Emissions in Australian Iron Ore**



Source: CEF Report: **Green capital tsunami, Nov'2024**

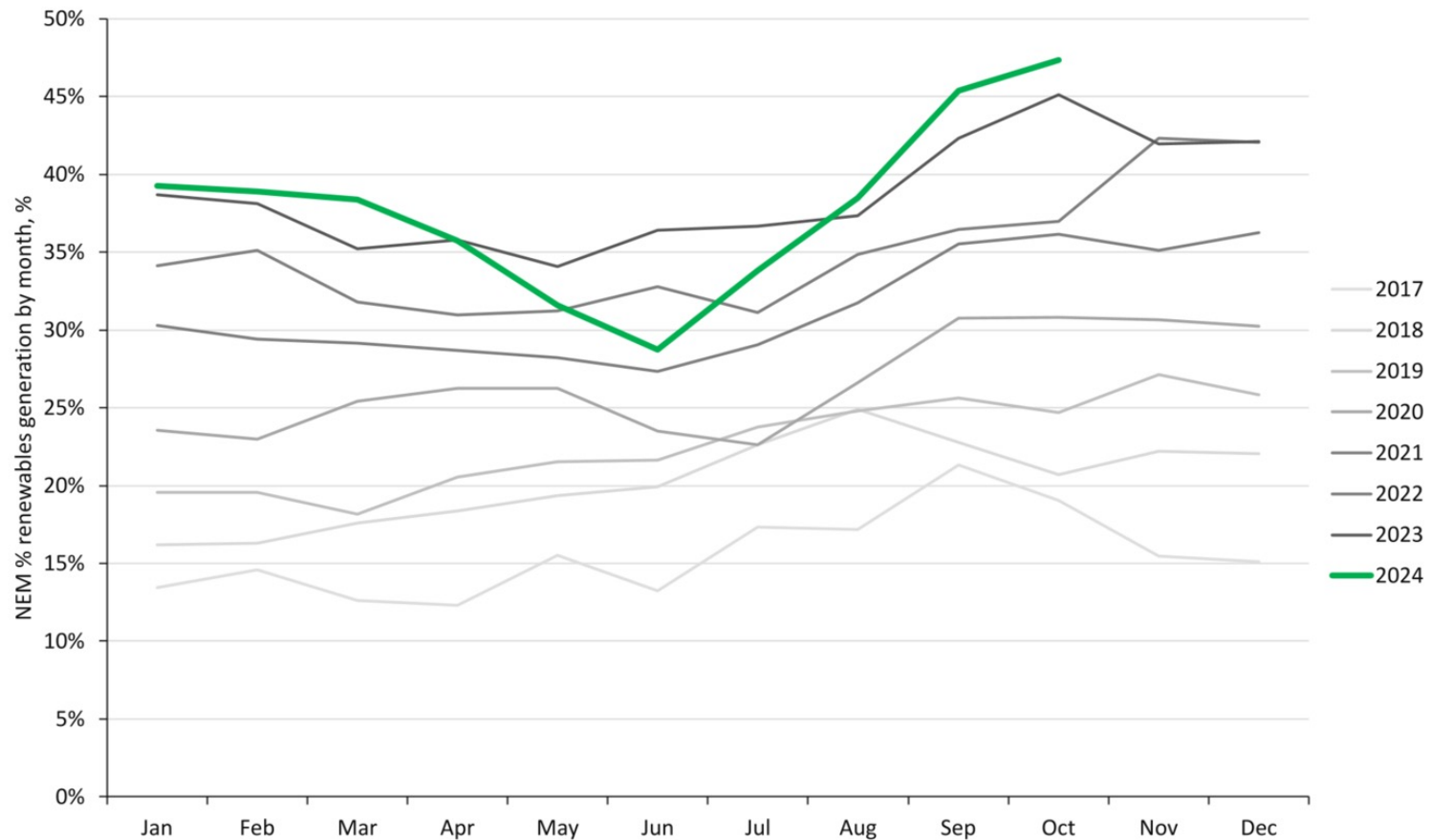
<https://climateenergyfinance.org/wp-content/uploads/2024/10/final--CEF-Report-China-Outbound-FDI-2-October-2024-2.pdf>



# Australia's Decarbonisation Challenge

## 82% Renewables by 2030 – possible? Absolutely!

Clean Energy Council report (Nov'2024): "The level of new generation investment in 3QCY2024 is close to the level that would be required to be sustained to reach Australia's target of 82% renewables generation by the end of 2030."



Source: Rystad Energy Research, Deep dive into the themes shaping the future of energy, Nov'2024

<https://www.rystadenergy.com/insights?s=>

# Australia's Decarbonisation Challenge

**82% Renewables by 2030 – possible? Absolutely!**

## Australia boasts 4 million rooftop solar installations with 25 GW capacity

Australia has recorded its four millionth rooftop solar installation maintaining its status as a world leader, with a total of 25 GW capacity, and which surpasses the amount of coal generation nationwide.

NOVEMBER 14, 2024 **EV FOLEY**

RESIDENTIAL PV

AUSTRALIA



Source: PV Magazine, 14 Nov'2024

<https://www.pv-magazine-australia.com/2024/11/14/australia-boasts-4-million-rooftop-solar-installations-with-25-gw-capacity/>

# Australia's Decarbonisation Challenge

## Momentum is Building, as is the Global Climate Crisis

Australia's climate ambitions have risen dramatically over 2023/24 (from a very low base), with the Federal Government bringing in:

- 82% renewables by 2030
- The Capacity Investment Scheme
- The Safeguard Mechanism
- Lots of new patient, strategic public capital (NRF, EFA, NAIF, ARENA, CEFC, Future Fund)
- Time bound resource onshore value-adding production tax incentives
- Vehicle Emissions Standards
- FMIA?

NSW State Government in Nov'2024 announced a new Renewable Energy Planning Framework. The Minns Labor Government has approved 29 renewable energy and transmission projects. These approvals will deliver 5.7GW of new energy generation and 6.3GW/15.4 GWh of storage.

2025 is the year to act. We desperately need to accelerate the speed and scale of deployments of all zero emissions industries of the future in the Australian economy, to reskill our workforce and position to benefit, rather than be left behind, relegated as a deindustrialized dig-and-ship quarry to the world.