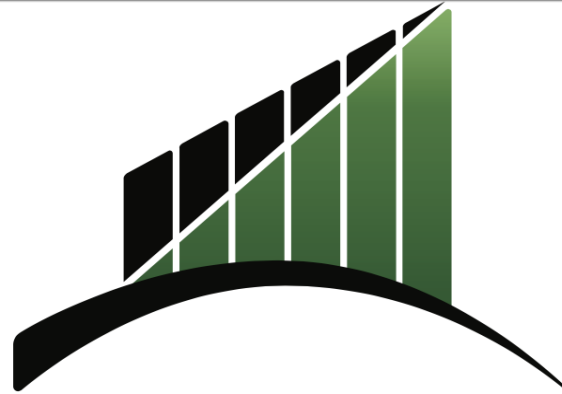


Tim Buckley, Director
Climate Energy Finance

Blair Palese, Founder
Climate Capital Forum
Ethinvest

The Global Energy
Transformation and
Australia's Response

Energy Estate
22 February 2024



CLIMATE ENERGY FINANCE



CLIMATE CAPITAL FORUM

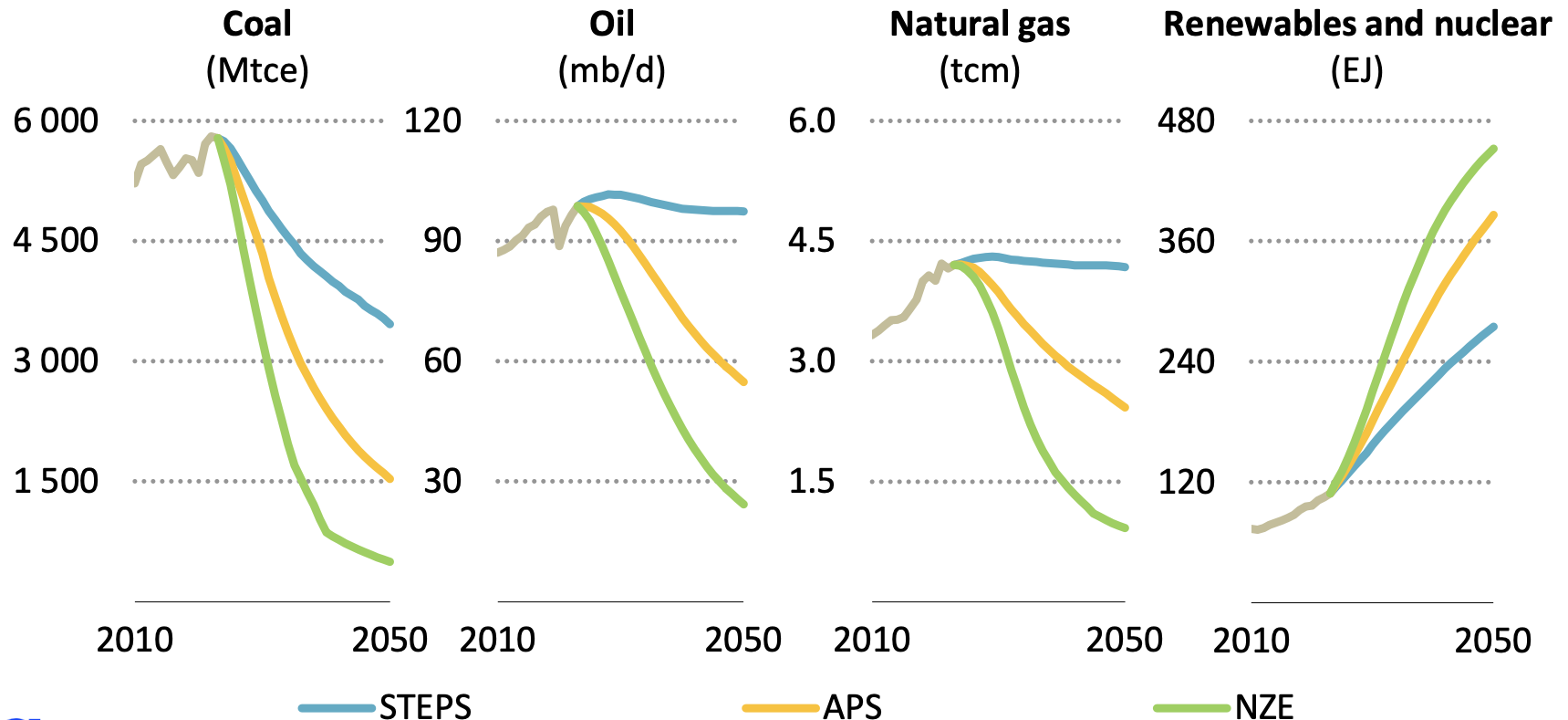
The Global Energy Transformation and Australia's Response to the US IRA

1. Introductions: Climate Capital Forum (Blair Palese, founder) & Climate Energy Finance (Tim Buckley, Founder)
2. The Global Energy Transition
3. China leads the world
4. The US IRA Changes Everything – A race to the top
5. Importance of critical minerals in the energy transition
6. The need for an Australian Response to the US IRA

Australia needs another \$100bn of public strategic capital to crowd-in \$200-300bn of private capital

2. The Global Energy Transition

Global total energy demand by fuel and scenario, 2010-2050



Low-emissions sources expand significantly and – for the first time – all fossil fuels peak and start to decline before 2030 in each scenario

Notes: STEPS = Stated Policies Scenario; APS = Announced Pledges Scenario; NZE = Net Zero Emissions by 2050 Scenario.

2. The Global Energy Transition

EU ETS & CBAM – World leading, yet to be replicated. The Australian Safeguard Mechanism is a good start but we need a CO₂ price.

Australian fossil fuel tax could raise \$100bn in first year alone, Rod Sims and Ross Garnaut say

Peter Hannam *Economics correspondent*

Wed 14 Feb 2024 01:00 AEDT



Revenue from carbon solution levy could subsidise green iron, aluminium and fuel production, veteran economists argue



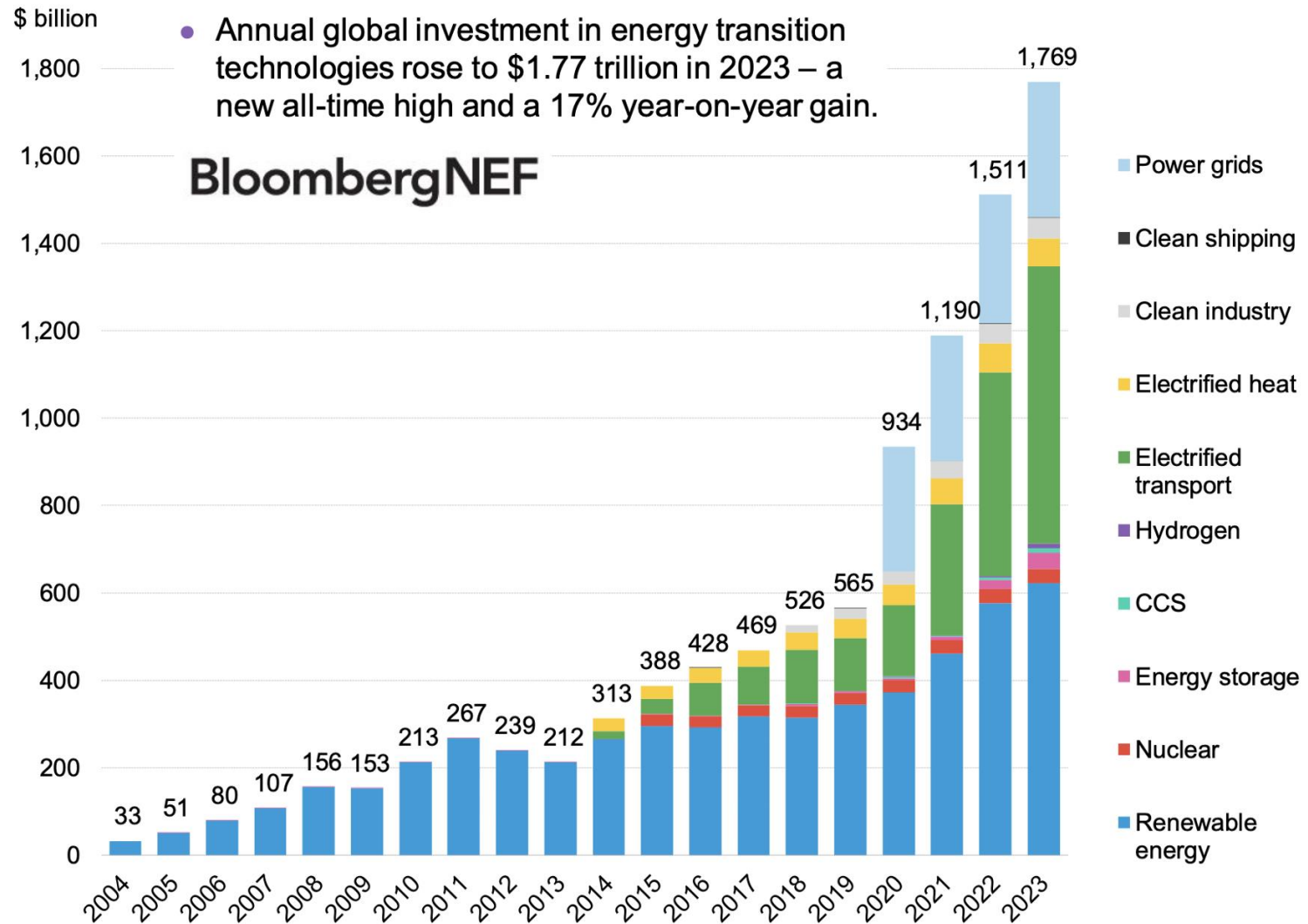
A tax on fossil fuel production could help fund Australia's transition to becoming a carbon-free energy giant, lower the cost of living and assist the world to cut greenhouse emissions, according to two veteran economists.

Ross Garnaut, a leading economist during the Hawke government, and Rod Sims, a former head of the competition watchdog, say a so-called carbon solution levy would raise \$100bn in its first year alone if introduced in 2030-31 and set at Europe's five-year average price of \$90/tonne of carbon dioxide equivalent.

This tax combined with other steps - including deploying the levy to subsidise as much as half the cost of new carbon-free iron, aluminium or fuel production plants - would allow Australia to exploit its abundant renewable energy resources to revive an increasingly moribund economy, they will say.

2. The Global Energy Transition

Global investment in energy transition, by sector



2. The Global Energy Transition

JPMorgan and State Street quit climate group as BlackRock scales back

Reduced participation means none of top five money managers fully back Climate Action 100+



JPMorgan Asset Management says it has made a 'significant investment' in its stewardship team and corporate engagement and 'the development of its own climate risk engagement framework over the past couple of years'

Patrick Temple-West and Brooke Masters in New York Financial Times 16 Feb 2024

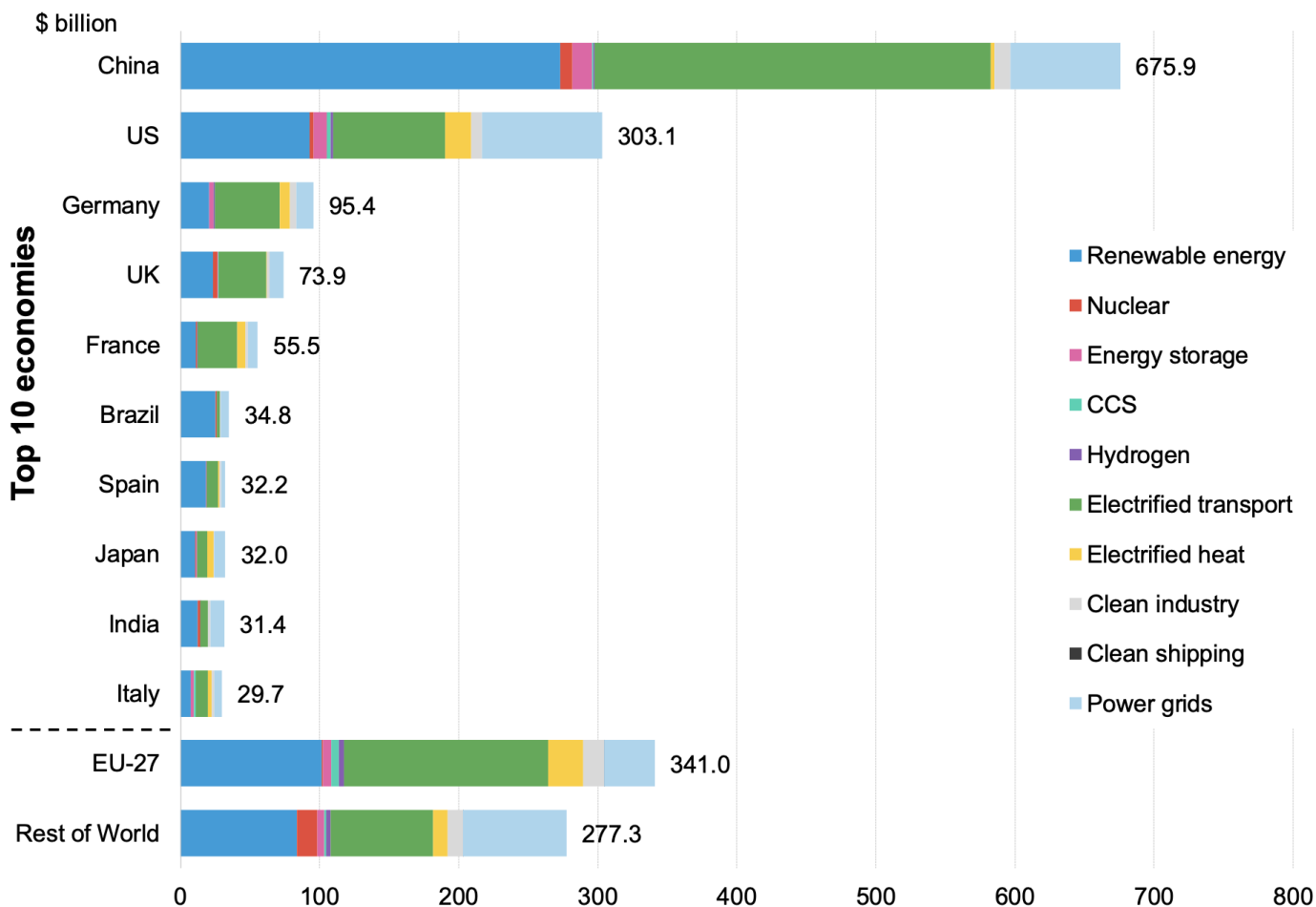
Two of the world's biggest asset managers are quitting an investor group set up to prod companies over global warming and a third is scaling back its participation, in a major setback to the ambitions of Climate Action 100+.

JPMorgan Asset Management and State Street Global Advisors both confirmed they were leaving Climate Action 100+. BlackRock, the world's largest money manager, is pulling out as a corporate member and transferring its participation to its smaller international arm.

The departures weaken the climate group's plan to use shareholder influence to step up pressure on polluting companies to decarbonise, because they mean that none of the world's five largest asset managers are fully behind the effort.

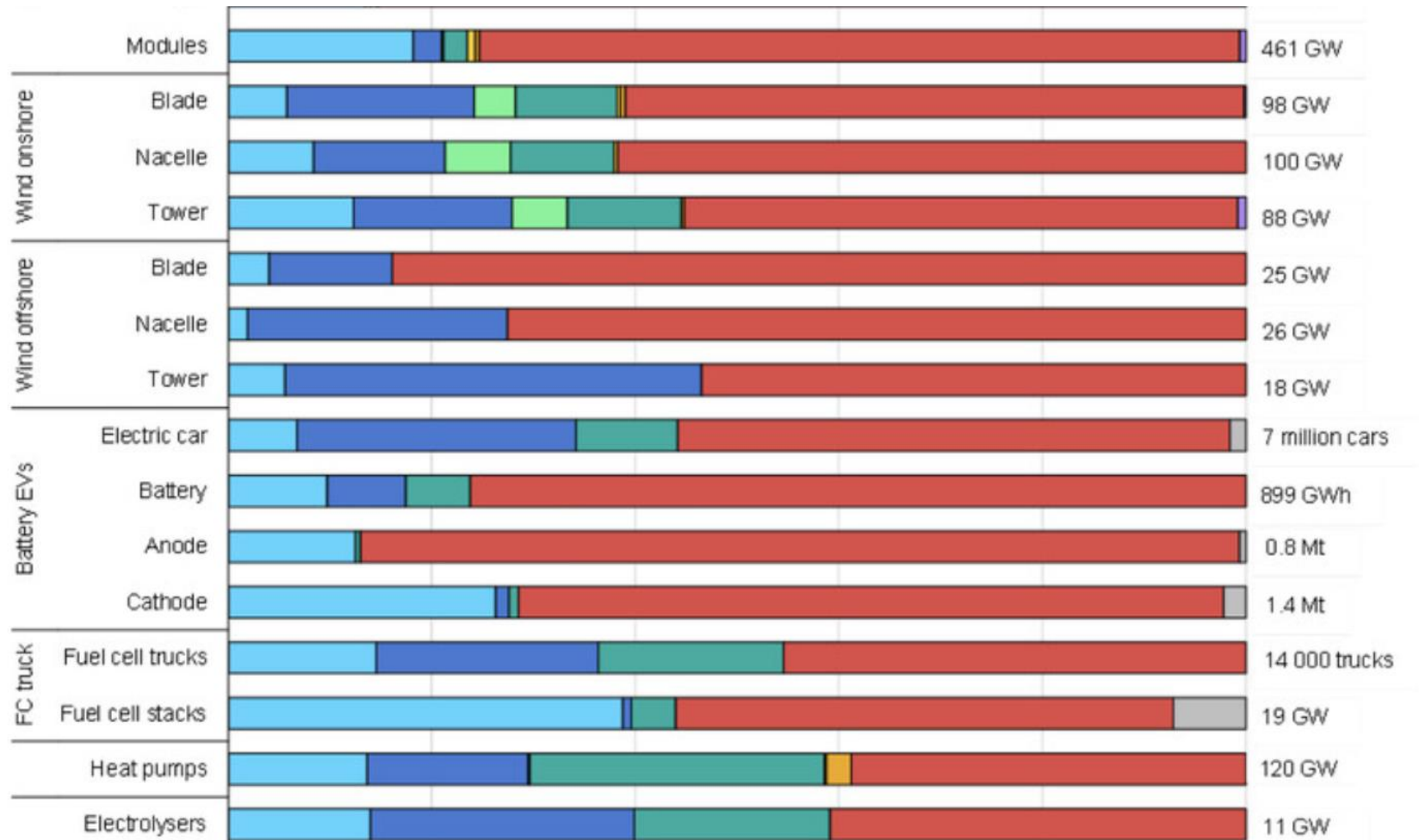
3. China Leads the World in Cleantech Investing

Top 10 economies for 2023 energy transition investment, plus the EU-27 and rest of the world



3. China Dominates Manufacturing

Supply-chains in all zero emissions technologies are heavily concentrated

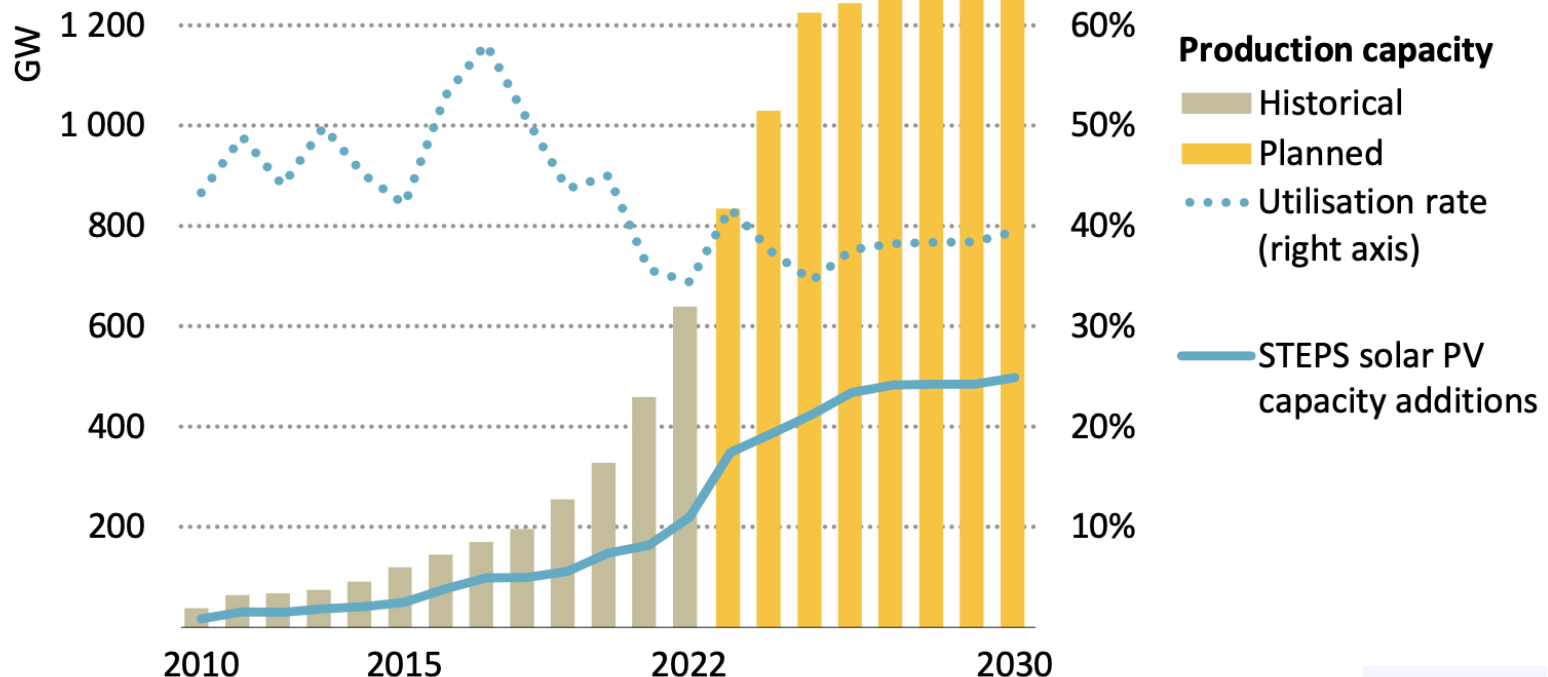


China's Dominance of all things Clean Tech

3. China Dominates Solar

Solar Growth is Accelerating, Globally. BNEF forecasts 392GW in 2023, +56% yoy, and module prices of US\$0.145c/w by end 2023.

Figure 1.10 ▶ Global solar module manufacturing and solar PV capacity additions in the STEPS, 2010-2030



Planned expansion of solar manufacturing outpaces solar PV capacity additions to 2030; its low utilisation rate presents a huge opportunity to accelerate clean energy transitions

3. China Leads the World in Renewable Installs

China installed 292.8GW of VRE in CY2023 (+99% yoy), and is on track to deliver their 1,200GW by 2030 RE target 6 years early

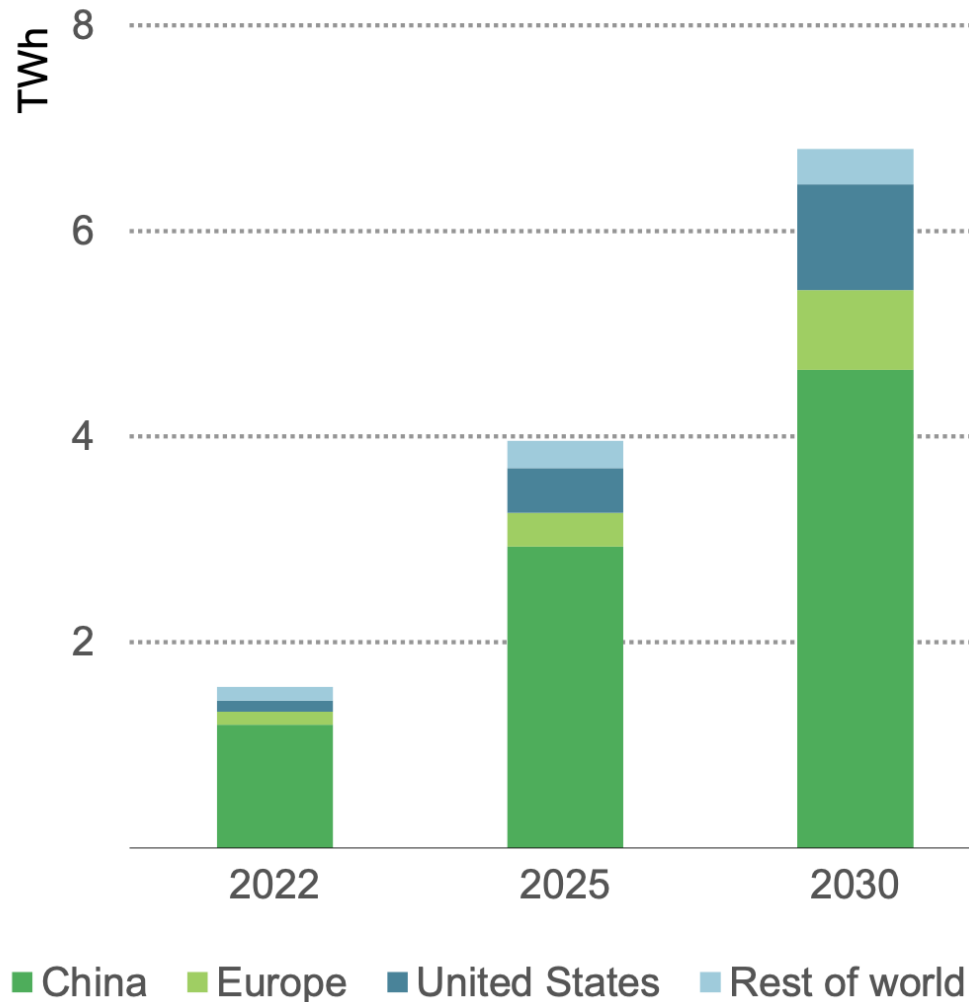
New Capacity Installed in China in Jan-Dec 2023

		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

3. China Leads the World in Batteries

Lithium-ion battery manufacturing capacity



4. US Inflation Reduction Act 2022

~US\$1,000bn funding => a resurgence in US manufacturing post the IRA

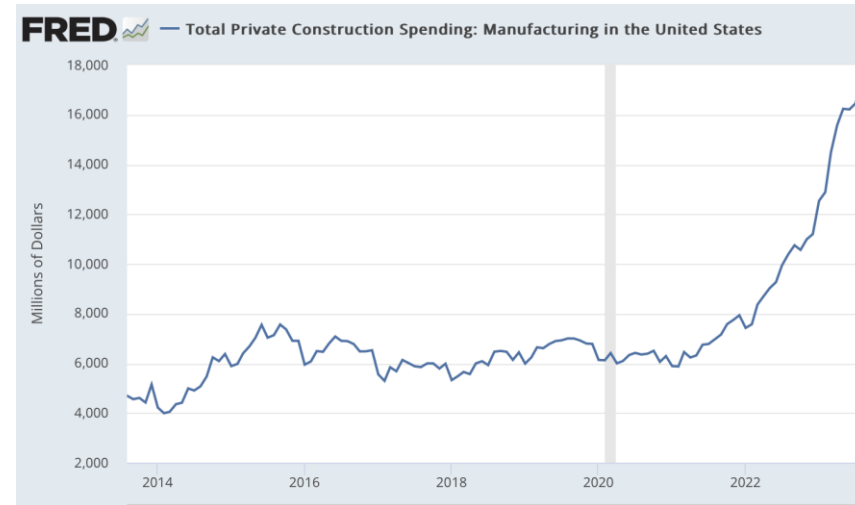


THE WHITE HOUSE

JULY 05, 2023

FACT SHEET: Bidenomics Has Driven \$500 Billion in Private Sector Investments Across the Country, Is Growing South Carolina's Economy From the Middle Out and Bottom Up

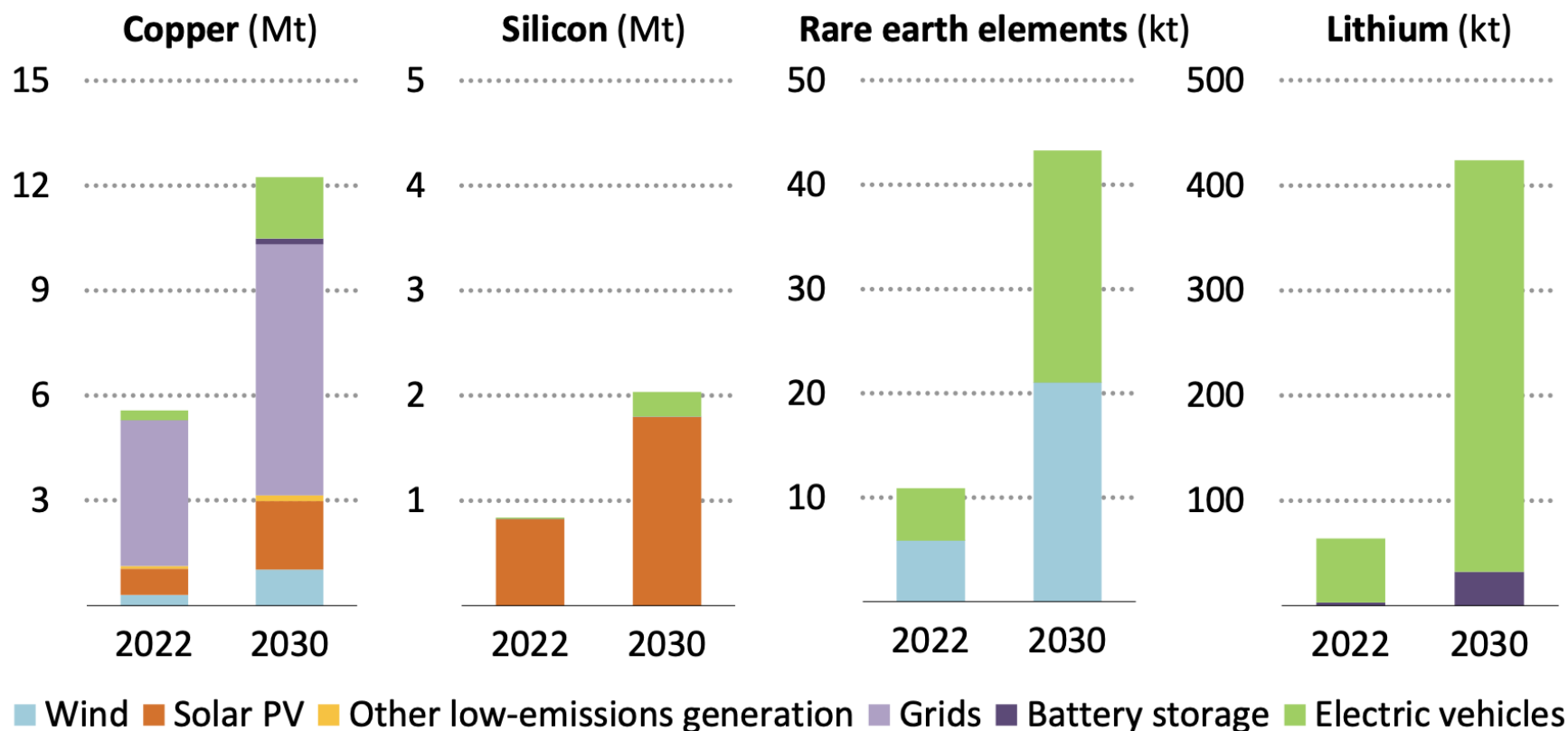
President Biden's economic agenda—Bidenomics—is growing the American economy from the middle out and the bottom up, not the top down. Tomorrow, President Biden will announce that companies have committed **over \$500 billion in manufacturing and clean energy investments** in the United States since the beginning of his Administration. The President will visit **South Carolina, where companies have announced \$11 billion** in manufacturing and clean energy investments, and the Biden-Harris Administration has already awarded **\$2.6 billion in funding for infrastructure projects**. The President will highlight that Enphase Energy is joining a growing list of companies beginning clean energy manufacturing operations in the United States—mobilized directly by President Biden's Inflation Reduction Act—**creating 1,800 new jobs nationwide, including up**



Source: The US Census Bureau, monthly to August 2023
<https://fred.stlouisfed.org/series/PRMFGCON>

5. Critical minerals in the energy transition

Demand for critical minerals for selected clean electricity supply and electrification technologies in the Announced Pledges Scenario (APS), 2022 vs 2030



IEA. CC BY 4.0.

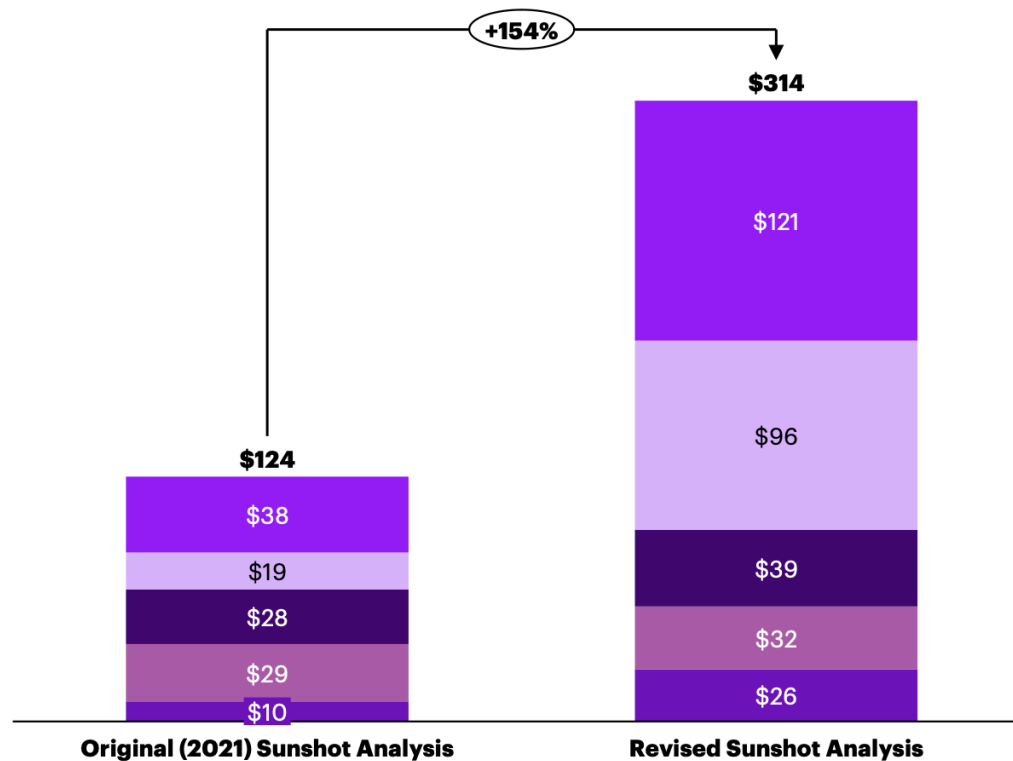
Electrification raises demand for key critical minerals by two- to seven-times by 2030

5. Australia and the energy transition

The Export Opportunity for Australia is Huge

The opportunity has increased to \$314b by 2040 in a high ambition scenario

Billions AUD per annum, 2040



5. Australia's Role in Green Iron

Swedish Industrialists Explore \$6Bn Green Steel Project in Canada

- *H2 Green Steel seeks access to Quebec's hydroelectric power*
- *Northvolt just announced \$5 billion battery plant in province*

By [Mathieu Dion](#) and [Rafaela Lindeberg](#) 9 October 2023 Bloomberg

Green iron value-adding powered by RE is a \$100bn pa export opportunity for Australia



An illustration of the future Boden site in Sweden

Sweden's [H2 Green Steel](#) is in talks with governments in Canada to build a factory in northern Quebec, as the young firm tries to deliver on a promise to customers — steel produced with minimal carbon emissions. The company is just starting on construction of its first plant in Boden, Sweden, with an ambitious goal to begin production by late 2025. Supply agreements have been signed with automakers including [Mercedes-Benz Group AG](#).

"We bring with us a portfolio of customers who want to have supply in North America," H2GS CEO Henrik Henriksson said as part of a Swedish delegation led by business mogul Marcus Wallenberg to meet officials including PM Justin Trudeau.

Source: Bloomberg

<https://www.bloomberg.com/news/articles/2023-10-09/swedish-industrialists-explore-6-billion-canada-steel-project>

6. Australia's Budget Response to-date



Create diverse, resilient and sustainable supply chains through strong and secure international partnerships

We will supply processed critical minerals to diversify global markets and support Australia's access to priority technologies. This includes working with international partners to build secure, resilient and sustainable supply chains that reduce market concentration. We will enhance our high environmental, social, and governance (ESG) credentials and our status as a trusted and reliable trading partner.

Build sovereign capability in critical minerals processing

We will move up the critical minerals value chain and increase Australia's footprint in downstream processing. We will make high-value products that build new industries and strengthen our domestic resilience to supply chain shocks.

Use our critical minerals to help become a renewable energy superpower

We will unlock our vast potential as a major supplier of the critical minerals needed to decarbonise the global economy. Australia's critical minerals sector will help the world decarbonise, including enabling Australia to reach our own legislated targets of 43 per cent below 2005 levels by 2030 and net zero by 2050.

Extract more value onshore from our resources – creating jobs and economic opportunity, including for regional and First Nations communities

This could add \$134bn to Oz GDP and create 262,600 new jobs by 2040 =>
“Proportionate” response:

- \$500m funding for NAIF
- \$225m to Geoscience Australia
- \$100m critical minerals development program.
- \$4bn EFA critical minerals facility
- NRF: \$3bn Low emissions tech
- NRF: \$1bn Resources value-add
- \$50m Australian Critical Minerals R&D Hub
- \$57m Critical Minerals International Partnerships
- Powering the Regions Fund: \$1.9bn
- \$3.1bn Australian Apprentices Incentive System
- \$500m Jobs & Skills Councils
- \$105m New Energy Apprenticeships

Another critical minerals review 2026

***Another \$100bn of public capital to crowd-in
\$200-300bn of private capital***

6. Australia and the energy transition

82% Renewables by 2030: A \$12bn pa investment domestically



The Hon Chris Bowen MP
Minister for Climate Change and Energy



Delivering more reliable energy for all Australians

23 November 2023

The Albanese Government will deliver more reliable electricity to all Australians through the expansion of the existing Capacity Investment Scheme (CIS) and the National Energy Transformation Partnership (NETP), in conjunction with the states.

This investment will supercharge available power in the energy grid, delivering the long-term reliable, affordable and low-emissions energy system Australians deserve as our grid changes.

Under the last Government, 24 coal plants with a total capacity of 26.7 GW announced their closure dates, but the LNP failed to deliver any policy to ensure replacement capacity.

This dangerous and irresponsible approach – including their failure to deliver a capacity scheme - is one of the reasons Australia's grid could face a difficult summer.

In contrast, the Albanese Government's CIS underwrites new renewable generation and storage, providing certainty for renewable investors and cheaper, cleaner energy for households and businesses. It also recoups money for taxpayers when revenues are high.

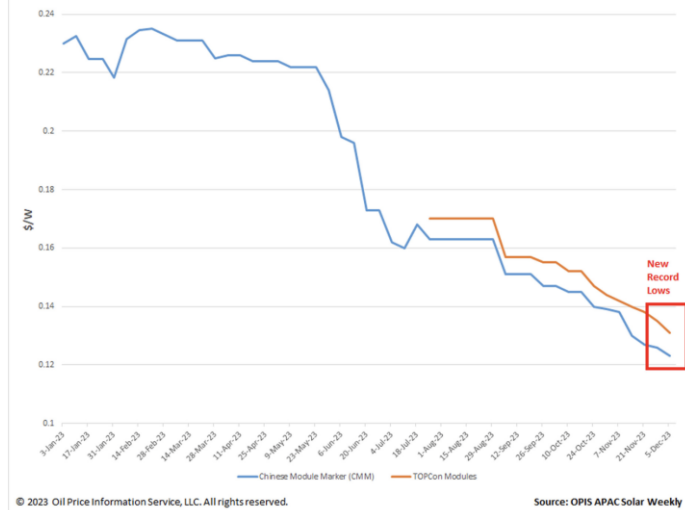
This expansion will take the CIS from the current pilot stage to 9 GW of dispatchable capacity and 23 GW of variable capacity nationally – for a total of 32 GW nationally.

NEM Wholesale prices and RE Share:

2021: A\$75/MW, 31.4%
2022: A\$191/MWh, 34.9%
2023: A\$93/MWh, 38.3%

Source: OpenNEM

China Module Prices in 2023



6. An Australian Response to the US IRA

‘Think big’: PM plans cash splash on green fund

Phillip Coorey Political editor Feb 15, 2024 – AFR

The Albanese government is planning a “think big” multibillion-dollar initiative to try to compete with the United States’ \$624 billion Inflation Reduction Act and similar schemes elsewhere, in a bid to drive the domestic development of clean energy technology.

In a speech to be delivered in Newcastle on Friday evening, Prime Minister Anthony Albanese will argue that if Australia is to become a renewable energy superpower, “the government has to be a partner in this, not just an observer”.



Jodie Haydon and Prime Minister Anthony Albanese depart after making a statement to the media on their engagement on Thursday.

“You can see that in the unprecedented investments the United States and the EU and Japan and Korea are making in their industrial bases,” he will say.

“We don’t have to go dollar-for-dollar in our spending, but we can go toe-to-toe on the quality and impact of our policies. In all of this, we must be prepared to think big.”

The speech will be delivered in the Hunter Valley, a region that faces an uncertain future as coal declines, but which also contains key Labor electorates.

The scheme, which said is likely to be a combination of subsidies and co-investment, will aim to stem the flow of capital to the US, where President Joe Biden’s IRA is acting as a magnet.



What do you
need to
succeed?

- Government policy/reform?
- De-risking
- Offtake contracts
- Other?

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The Global Energy Transformation and Australia's Response

