



**CLIMATE ENERGY FINANCE**

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**The US IRA, Australia's  
response and the Budget**

**Argo Investments Board**

**11 May 2023**

# **Agenda: Global Energy Transition: the need for a strong public-private Australian budget response to the US IRA and EU Net Zero Industry Act**

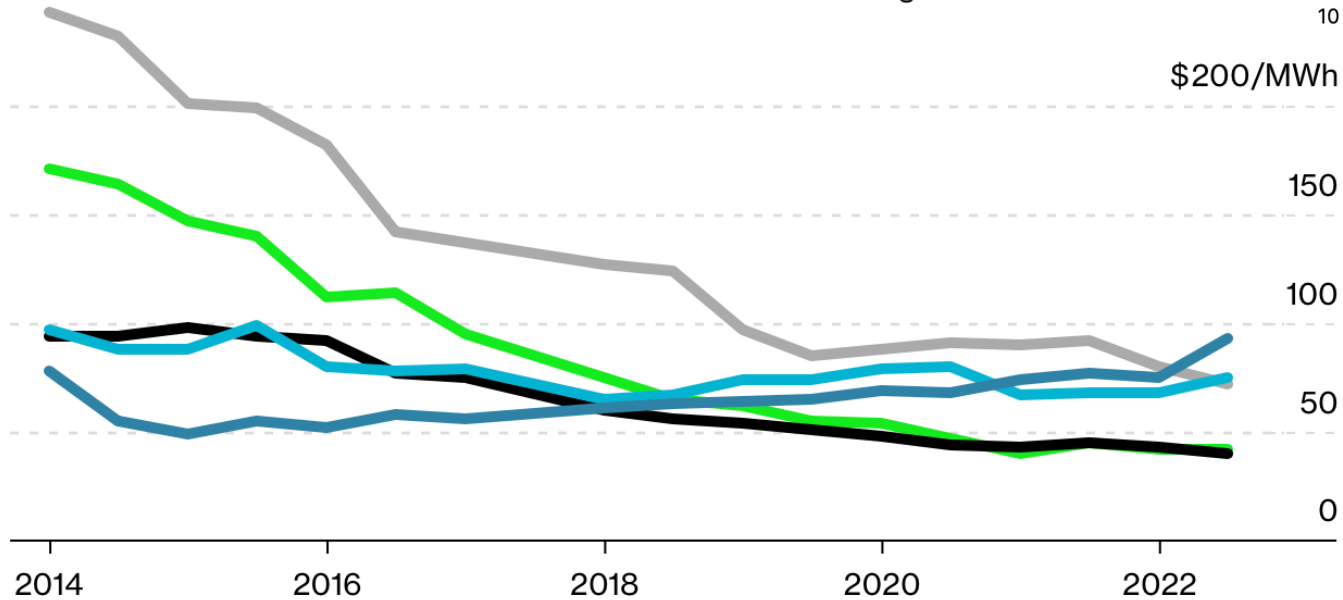
1. Key Energy Transition Themes
2. Energy Technologies: China leads the world
3. The US IRA and EU NZIA (Net Zero Industry Act), India's PLI, South Korea and Japan's GX Roadmap
4. Australian Federal Budget
5. Australia as a Renewable Energy Powered Value-adding Critical Minerals SuperPower

# 1. Key themes – Ongoing Deflation

## Rising Fossil Fuel Prices Have Made Renewables More Attractive

Even with rising costs, wind and solar are more competitive than ever

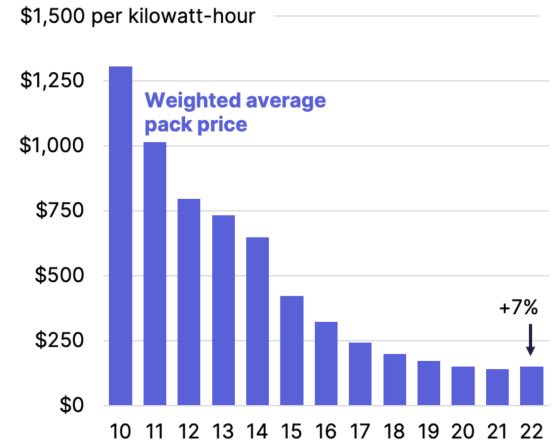
█ Solar   
 █ Onshore wind   
 █ Offshore wind   
 █ Natural gas   
 █ Coal



Source: BloombergNEF

Note: Figure shows the levelized cost of energy. Solar is with fixed-axis.

Battery system costs and energy storage system costs



# 1. Key themes – Pricing in CO<sub>2</sub> emissions

## The Five-Year EU ETS Pricing (€/t)

EU Carbon Permits (EUR) **93.71** +2.77 (+3.05%)

Since July 2021 China has operated the world's largest ETS.

December 2022 saw Japan's GX Roadmap propose a staged ETS from 2026.

The US IRA in 2022 put a US\$1,500/t cost on methane emissions.

Safeguard mechanism = Oz price on carbon



# 1. Nextera Energy vs ExxonMobil

**NextEra Energy, Inc. (NEE)** ★

NYSE - NYSE Delayed price. Currency in USD

**75.58** -0.48 (-0.63%) **75.58** 0.00 (0.00%)

At close: 04:00PM EDT

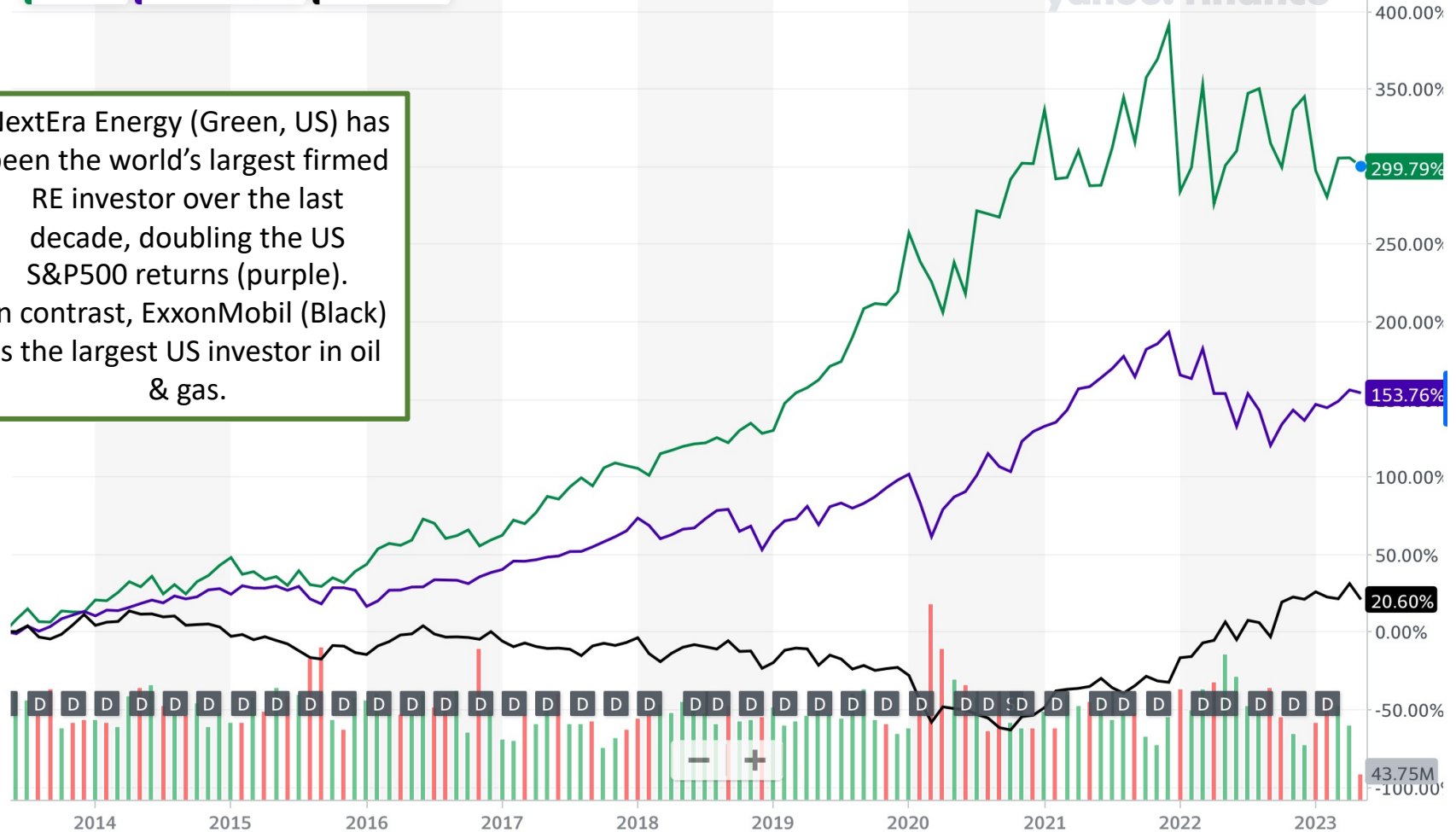
After hours: 07:59PM EDT

Indicators Comparison Events 06 May 2013 - 10 May 2023 1D 5D 1M 3M 6M YTD 1Y 2Y 5Y Max 1M

NEE 74.06 ^GSPC 3829.34 XOM 55.76 X

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NextEra Energy (Green, US) has been the world's largest firm RE investor over the last decade, doubling the US S&P500 returns (purple). In contrast, ExxonMobil (Black) is the largest US investor in oil & gas.



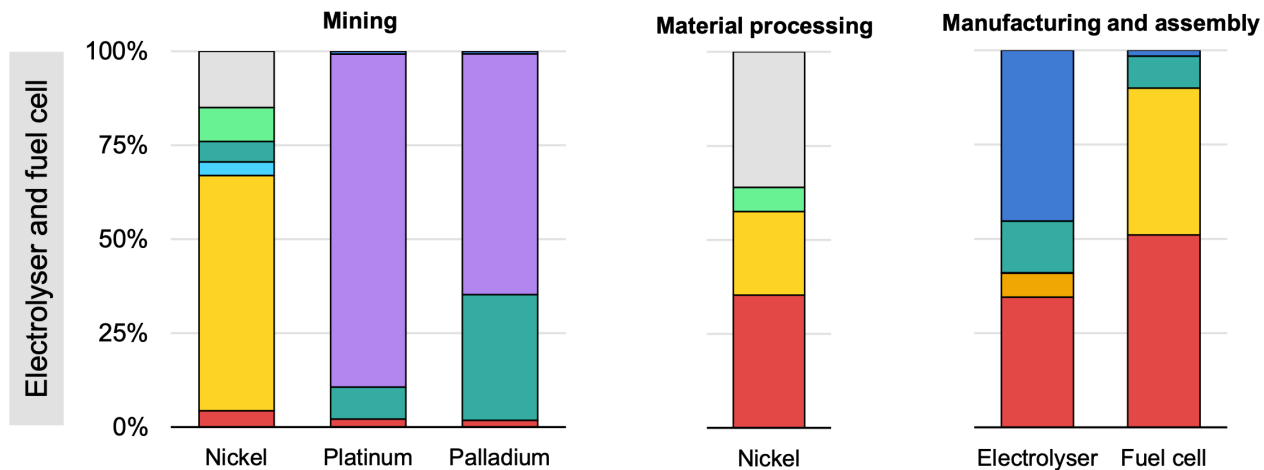
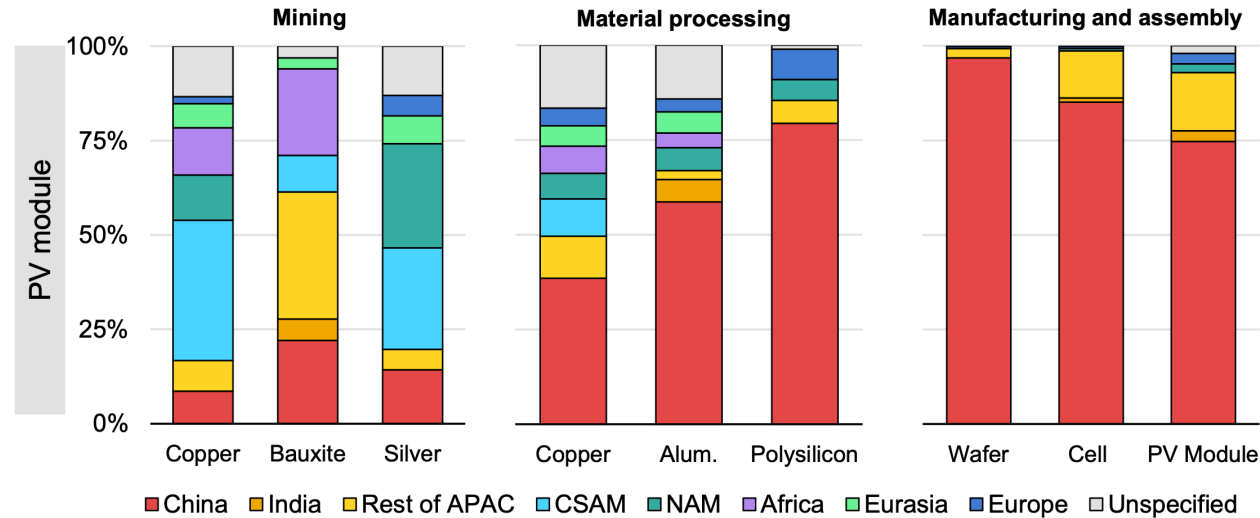
## 2. China Leads the World in Electric Vehicles

China has produced and sold 6.5 million EV/PHEV in 2022; growth of 94% yoy.  
 China sold ~60% of the world's EVs in 2022.  
 29% of all China car sales in 1Q2023 were EVs

<b>China Vehicle Sales Statistics</b>	<b>1QCY2023</b>	<b>YoY</b>	<b>CY2022</b>	<b>YoY</b>
<b>Total Vehicle Deliveries</b>	6,076,000	-7%	26,864,000	2%
<b>Passenger Vehicles</b>	5,138,000	-7%	23,563,000	10%
<i>of which BEVs</i>	1,080,000	13%	5,033,000	82%
<i>of which PHEVs</i>	431,000	75%	1,515,000	152%
<b>Commercial Vehicles</b>	938,000	-3%	3,300,000	-31%
<i>of which BEVs</i>	72,000	53%	331,000	80%
<i>of which PHEVs</i>	1,000	-10%	4,000	11%
<b>Vehicle Exports</b>	994,000	71%	3,111,000	54%
<i>of which NEVs</i>	248,000	106%	679,000	120%

## 2. China Leads the World on Mineral Processing

Supply chain security, cheap RE and resource ownership means Australia should be leveraging our new competitive advantages to lead the global energy transition





## 2. China Leads the World in Renewable Energy

China installed 50GW of Renewable Energy in 1QCY2023, and is on track to deliver their 1,200GW by 2030 RE target 5 years early

		1Q2023	Share of new adds	Change (yoy %)	1QCY2022
Thermal Power	GW	8.1	14%	39%	5.8
Hydropower	GW	2.7	5%	-21%	3.4
Nuclear Power	GW	1.2	2%	3%	1.2
Wind Power	GW	10.4	18%	32%	7.9
Solar Power	GW	33.7	57%	155%	13.2
Other (Biomass, W2E)	GW	3.0	5%	1200%	0.2
<b>Total capacity added</b>	<b>GW</b>	<b>59.0</b>	<b>100%</b>	<b>86%</b>	<b>31.7</b>
Renewable Energy adds	GW	49.8	84%		24.8
Zero Emissions Capacity Adds	GW	51.0	86%		25.9

*Source: NBS, CEF Estimates*

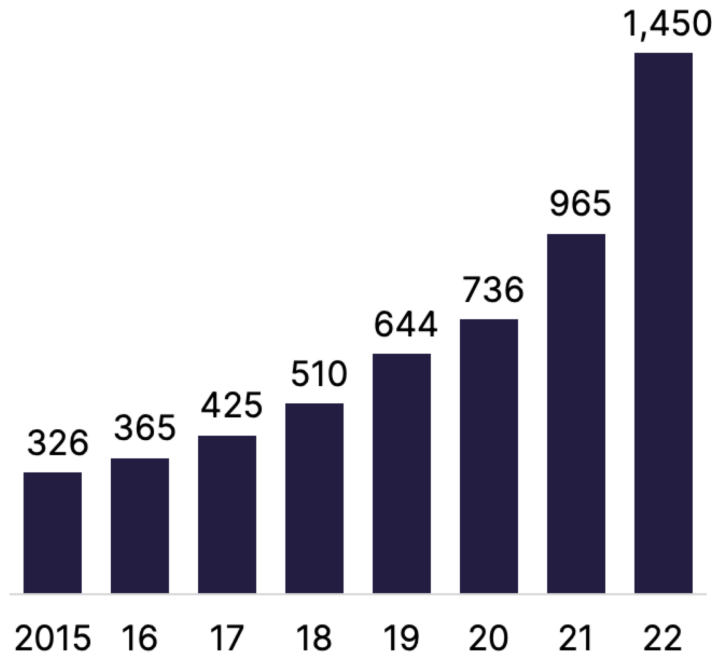


# 3. US Inflation Reduction Act 2022

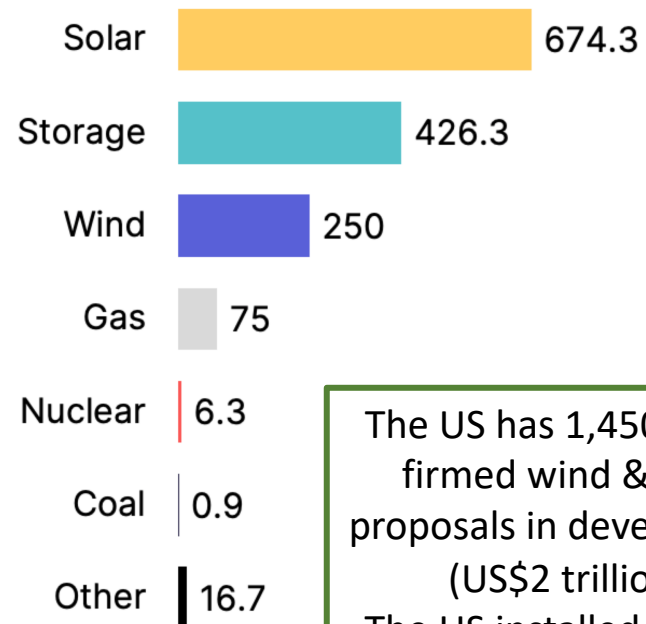
The US under President Biden has talked the talk, the IRA 2022 delivers serious firepower: >>US\$369bn + US\$400bn DoE Loan Program (>US\$1 trillion)

The US power interconnection queue has more generation capacity than is currently online

US interconnection queue, gigawatts



Interconnection queue, by resource



The US has 1,450 GW of firmed wind & solar proposals in development (US\$2 trillion). The US installed 5GW of batteries in 2022.

## DOE launches \$6B program to slash emissions from heavy industry

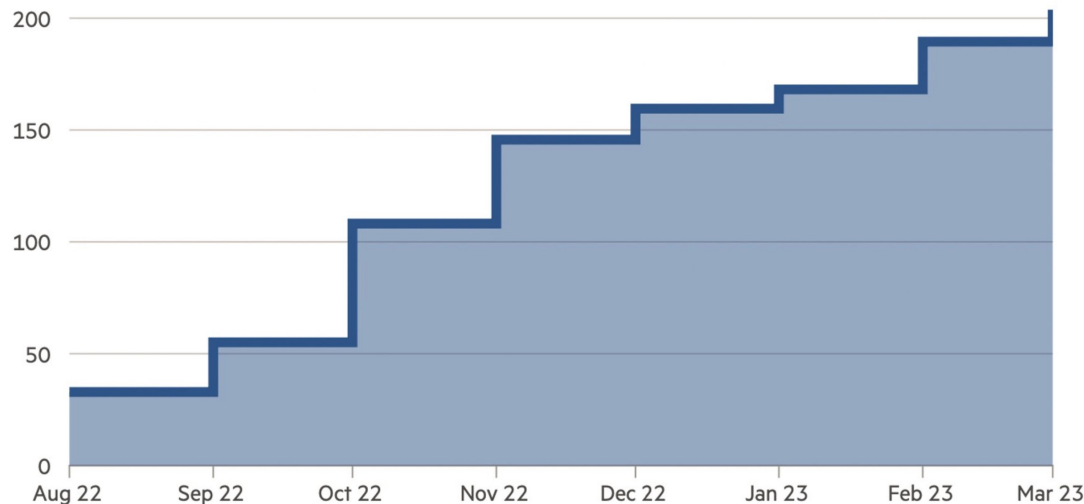
The Biden administration announced it will help fund projects to clean up the production of steel, cement, aluminum and other hard-to-decarbonize sectors.

# 3. US Inflation Reduction Act 2022

There is a resurgence in US manufacturing post the IRA


Clean tech and semiconductor investments top \$200bn since passage IRA and Chips Act

Cumulative total of all announced projects of at least \$100mn since August 2022, by month (\$bn)



**STRATEGY UPDATE**  
The site selection process for US Gigafactory has been concluded

- Announcement will be made shortly together with the selected state
- Nel aims to build a factory with 4 GW of production capacity, split between PEM and Alkaline
- The factory will be built in phases to match supply with demand
- No final investment decision has been made yet; the current Wallingford expansion is important to create the blueprint for PEM expansion



Source: FT 17 April 2023  
<https://www.ft.com/content/b6cd46de-52d6-4641-860b-5f2c1b0c5622>

# 3. EU Net Zero Industry Act 2023



Press release | 16 March 2023 | Brussels

## Net-Zero Industry Act: Making the EU the home of clean technologies manufacturing and green jobs

The aim that the EU's overall domestic share of strategic net-zero technologies manufacturing capacity is >40% of EU deployment needs by 2030.

Today, the Commission proposed the [Net-Zero Industry Act](#) to scale up manufacturing of clean technologies in the EU and make sure the Union is well-equipped for the clean-energy transition. This initiative was announced by President **von der Leyen** as a part of the [Green Deal Industrial Plan](#).

The Act will strengthen the resilience and competitiveness of net-zero technologies manufacturing in the EU, and make our energy system more secure and sustainable. It will create better conditions to set up net-zero projects in Europe and attract investments, with the aim that the Union's overall strategic net-zero technologies manufacturing capacity approaches or reaches at least 40% of the Union's deployment needs by 2030. This will accelerate the progress towards the EU's 2030 climate and energy targets and the transition to climate neutrality, while boosting the competitiveness of EU industry, creating quality jobs, and supporting the EU's efforts to become energy independent.

# 3. India's Solar Manufacturing PLI

## India launches second phase of solar production incentive scheme

Solar Energy Corp. of India (SECI) has started accepting applications from solar manufacturers under the second phase of the production-linked incentive (PLI) scheme, with an outlay of about \$2.4 billion.

NOVEMBER 22, 2022 **UMA GUPTA**

BALANCE OF SYSTEMS

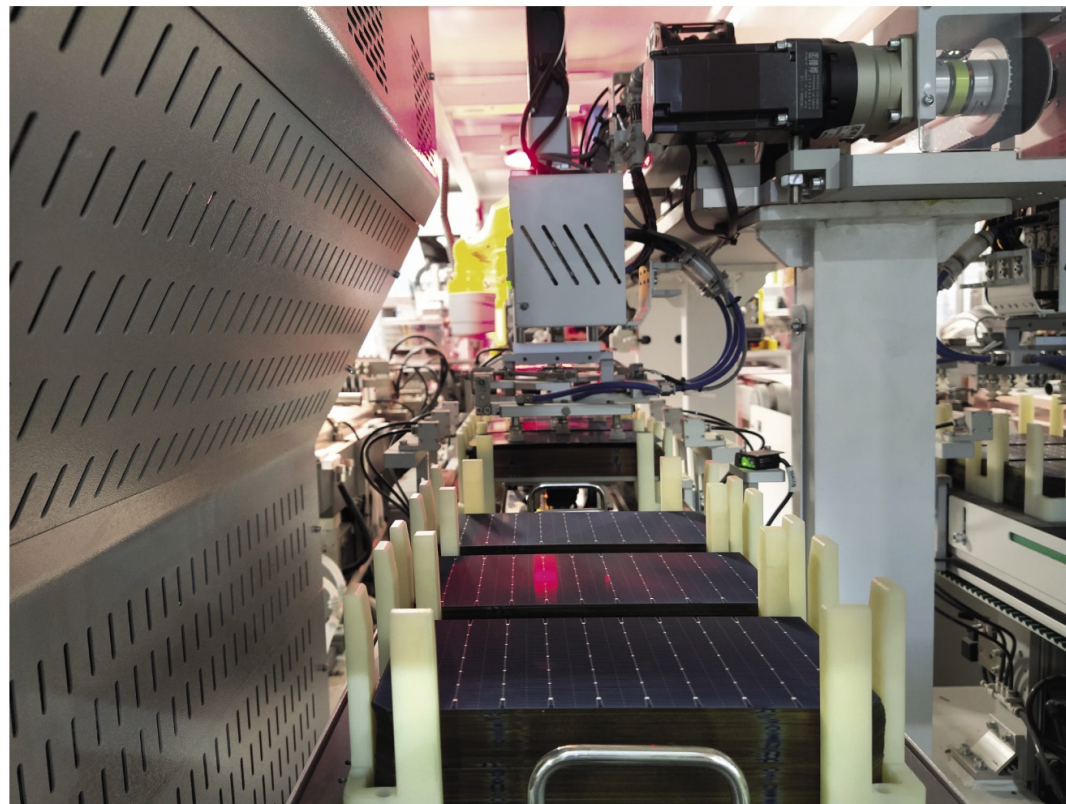
INVERTERS

MARKETS

MODULES & UPSTREAM MANUFACTURING

INDIA

MNRE secretary Indu Shekhar Chaturvedi said 21 Sept'2022 that the PLI would add 74 GW of solar module manufacturing capacity, an investment of Rs 94,000 crore.



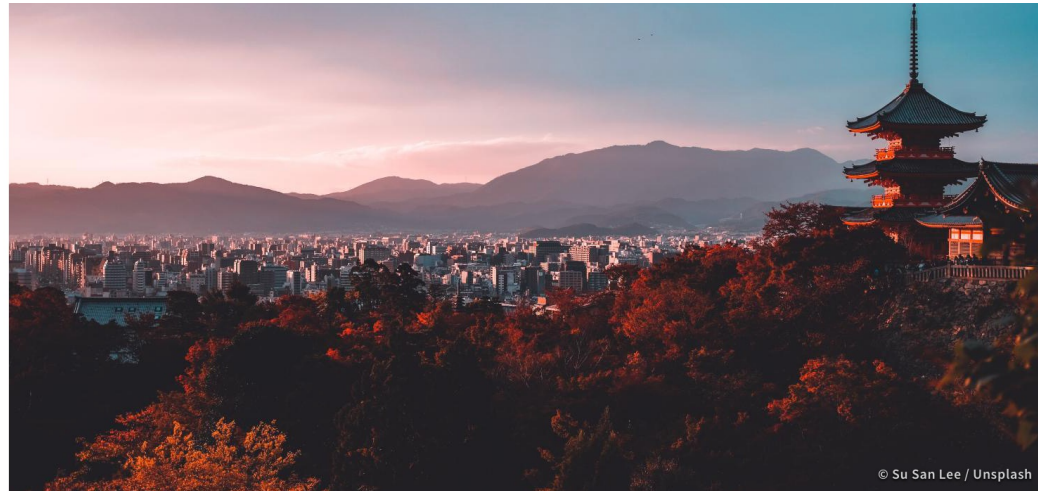
Source: PV Magazine's Uma Gupta 22 November 2022  
<https://www.pv-magazine.com/2022/11/22/india-launches-second-phase-of-incentive-scheme-for-solar-manufacturing/>

Image: Adani Solar

# 3. Japan's GX Roadmap

## Japan's Cabinet approves policy roadmap including plans for national ETS

METI's "Green Transformation" (GX) ten-year roadmap with ¥20 trillion in government support includes a 46% reduction in carbon emissions by 2030, a national ETS phased in from 2026, and "zero-emission thermal power" to decarbonise electricity by 2035.



On 10 February 2023, Japan's Cabinet approved the [Basic Plan](#) for the "GX: Green Transformation Policy", designed to help Japan reach its climate targets. Earlier in 2022, the Ministry of Environment, Trade, and Industry (METI) released the draft Basic Plan for public consultation, before compiling the final version towards the end of the year. The proposal comes at a time when Japan is facing an energy crisis, with energy in short supply and sharp increases in prices. To address these energy security challenges, Japan aims to continue moving towards "growth-oriented" carbon pricing.

The newly approved Basic Plan is a ten-year roadmap of Japan's decarbonization strategy. It outlines several carbon pricing instruments that will work in tandem to help Japan reach its NDC targets of a 46% reduction in greenhouse gases by 2030 and climate neutrality by 2050. These include the Green Transformation (GX) League (a voluntary baseline-and-credit system), a more traditional emissions trading system (ETS) later down the line, and a carbon levy.

Source: International Carbon Action Partnership 22 Feb 2023

<https://icapcarbonaction.com/en/news/japan-s-cabinet-approves-policy-roadmap-including-plans-national-ets> & J-REI 28 Feb 2023

<https://www.renewable-ei.org/en/activities/reports/20230228.php>



# 3. Canada

## The Canadian Critical Minerals Strategy

**FROM EXPLORATION TO RECYCLING:**  
Powering the Green and Digital Economy for Canada and the World

The Canadian Government has announced a sizeable **C\$3.8bn in funding to back the country's new critical minerals strategy in a bid to make Canada a global leader in producing electric vehicle (EV) batteries.**

Revealed by Canada's Prime Minister, Justin Trudeau, the new **58-page critical minerals strategy** details plans to significantly expedite the country's position in the **EV battery** supply chain globally. The document focuses on a range of critical minerals, including lithium, that will be essential for developing technologies for a greener future and how significant funding will be allocated to grow the industry, accelerating production and providing lucrative job opportunities.

Canada

Critical Minerals are the Building Blocks for the Green and Digital Economy



Source: Canadian Government Dec 2022,

<https://www.canada.ca/en/campaign/critical-minerals-in-canada/canadian-critical-minerals-strategy.html>

### 3. Korea's Refocus on the US IRA

#### Battery Makers Plow \$31 Billion Into Remaking Korean Steel Hub

*The city of Pohang built up a world class steel industry over decades. Now it's turning to EV batteries.*



The sun sets over the Posco steel mill in Pohang, South Korea, on July 17, 2018. The city is increasingly seen as the country's new capital for the electric vehicle battery industry.

A South Korean city home to one of the world's biggest steelmakers is betting its manufacturing expertise, billions of dollars in investments and government incentives can help it dominate a 21st century industry: electric vehicle batteries.

Companies in the south-eastern hub of Pohang — famous for **Posco Holdings Inc.** steel mills and one of the country's elite universities — are aggressively building out EV battery campuses as automakers hurry to find reliable suppliers outside China. Three South Korean giants in the global battery market — LG Energy Solution Ltd., Samsung SDI Co. and SK On Co. — have promised 40 trillion won (\$31 billion) in domestic investments with their local suppliers.

President Yoon Suk Yeol said 'the government and companies including Samsung Electronics Co. will pour US\$422bin into areas such as chips and EV in the nation's most aggressive effort yet to win a heated global race for tech supremacy'

Source: Bloomberg's Heejin Kim 16 March 2023  
<https://www.bloomberg.com/news/articles/2023-03-15/battery-makers-plow-31-billion-into-remaking-korean-steel-hub>



# 4. Australian Budget

The Australian Government budget position has improved, dramatically

## Underlying cash balance

Actual and forecasts

— Actual — October budget — Chris Richardson

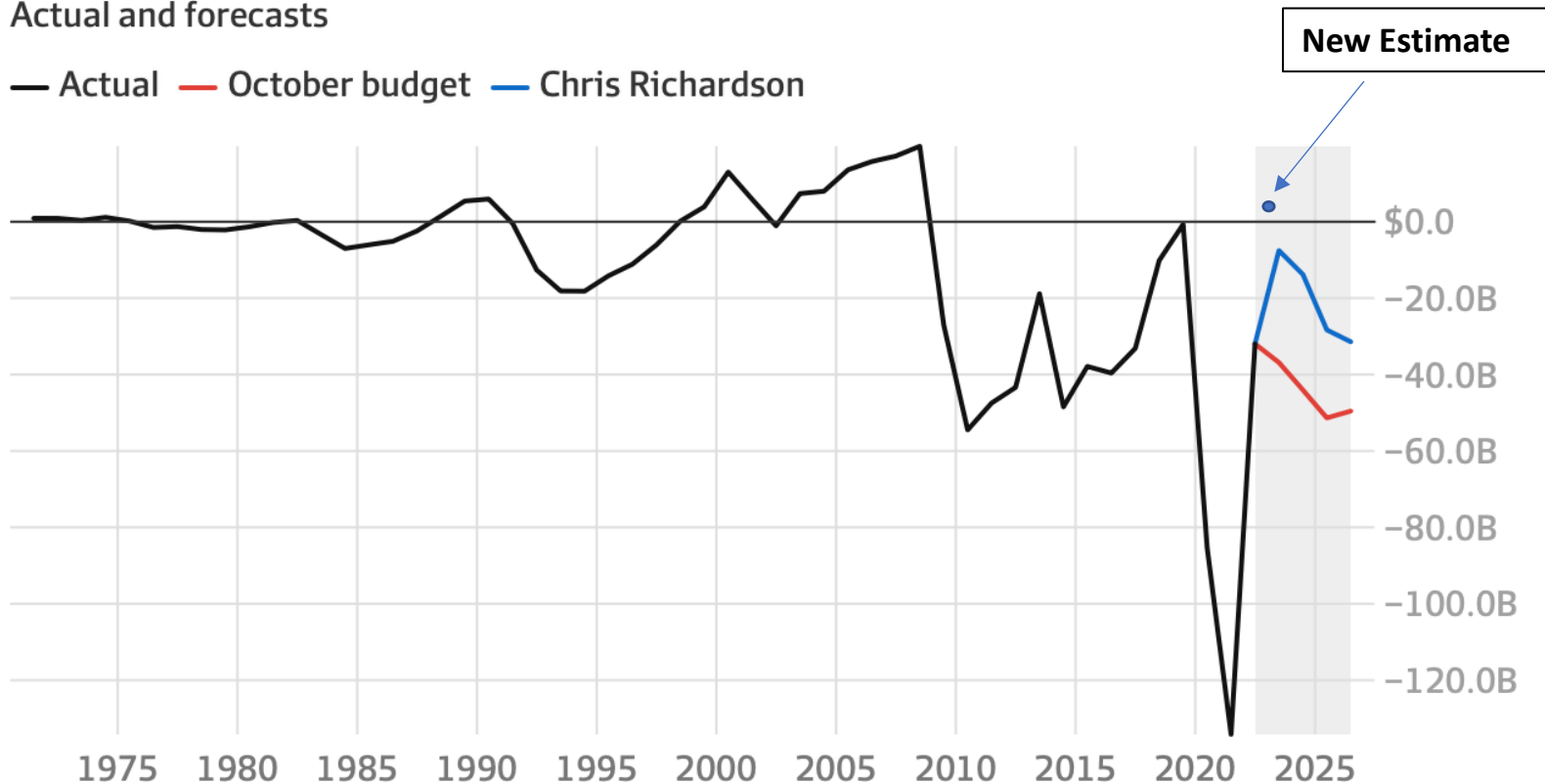


Chart: Michael Read • Source: Chris Richardson; Department of Finance

## 4. Australian Budget

New initiatives already announced in 2022/23

- \$20bn Rewiring the Nation => CEFC
- \$15bn National Reconstruction Fund : \$3bn renewables and low-emissions technologies, \$1bn mineral resources value-add
- \$1.9 billion Powering the Regions Fund
- **ARENA:** \$188m community batteries fund, \$25m Steel R&D fund, \$25m hydrogen R&D fund, \$146m Driving the Nation Fund, \$3m hot water control load demand mgmt, \$65m for Vast Solar CSP, \$50m HyGATE (GH2, green methanol), \$41m advanced solar R&D, \$176m for 8 battery projects, \$83m for First Nations Community Microgrids.
- \$2bn critical minerals funding by EFA
- \$525m Hydrogen Hubs funding
- \$100m Australian Made Battery plan for Queensland
- \$64m for distributed renewables for the Oz defence force

The promise of an electrify everything strategy will be a key policy for 2023.

## 4. Australian Budget

### New Zero Emissions initiatives in the 2023/24 Budget

- **Net Zero Authority:** \$83m + \$1.9bn Powering the Regions fund
- **\$2bn Hydrogen Headstart program:** for 2-3 GH2 commercial scale projects, most likely fossil ammonia replacement.
- **\$1.6bn Electrification of Everything:** \$314m for SME, \$1.0bn for residential upgrades (CEFC), \$300m for 60,000 social housing energy efficiency upgrades, \$37m NaTHERS
- **\$3bn co-funded cost of living energy cost relief**
- **\$2.4bn PRRT increase:** \$600m pa
- **Capacity Investment Scheme:** uncosted, to drive \$10bn in battery deployments
- **Critical Minerals Strategy:** Review pending by Minister Madeleine King

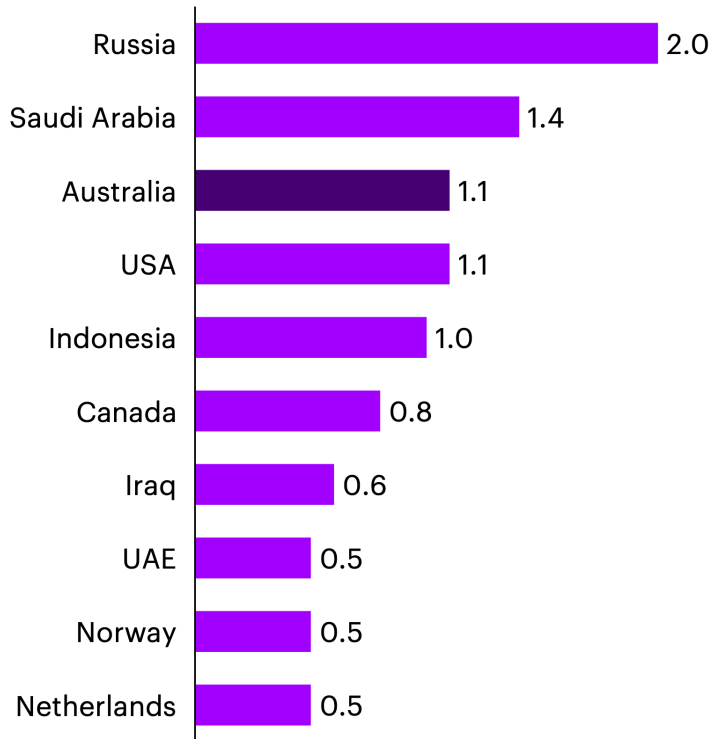
\$40bn public investment in decarbonisation

# 5. Australia Will be a Critical Minerals Superpower

Supply chain security, cheap RE and resource ownership means Australia should be leveraging our new competitive advantages to lead the global energy transition

**Figure 4: Global ranking of CO<sub>2</sub> emissions due to fossil fuel exports<sup>4</sup>**

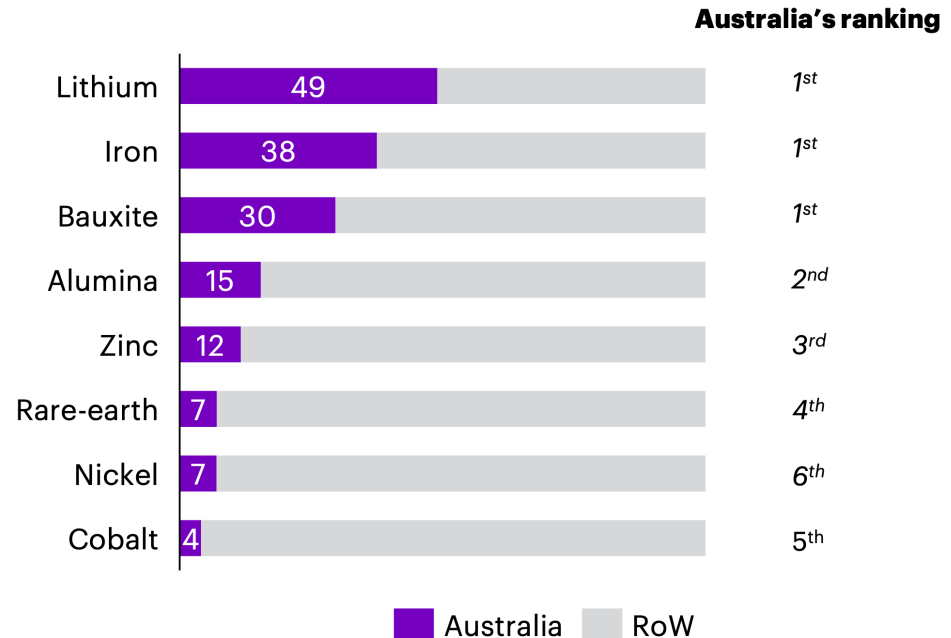
billion tonnes



**Figure 8: Australia's production of select metals and minerals essential for the energy transition<sup>3</sup>**

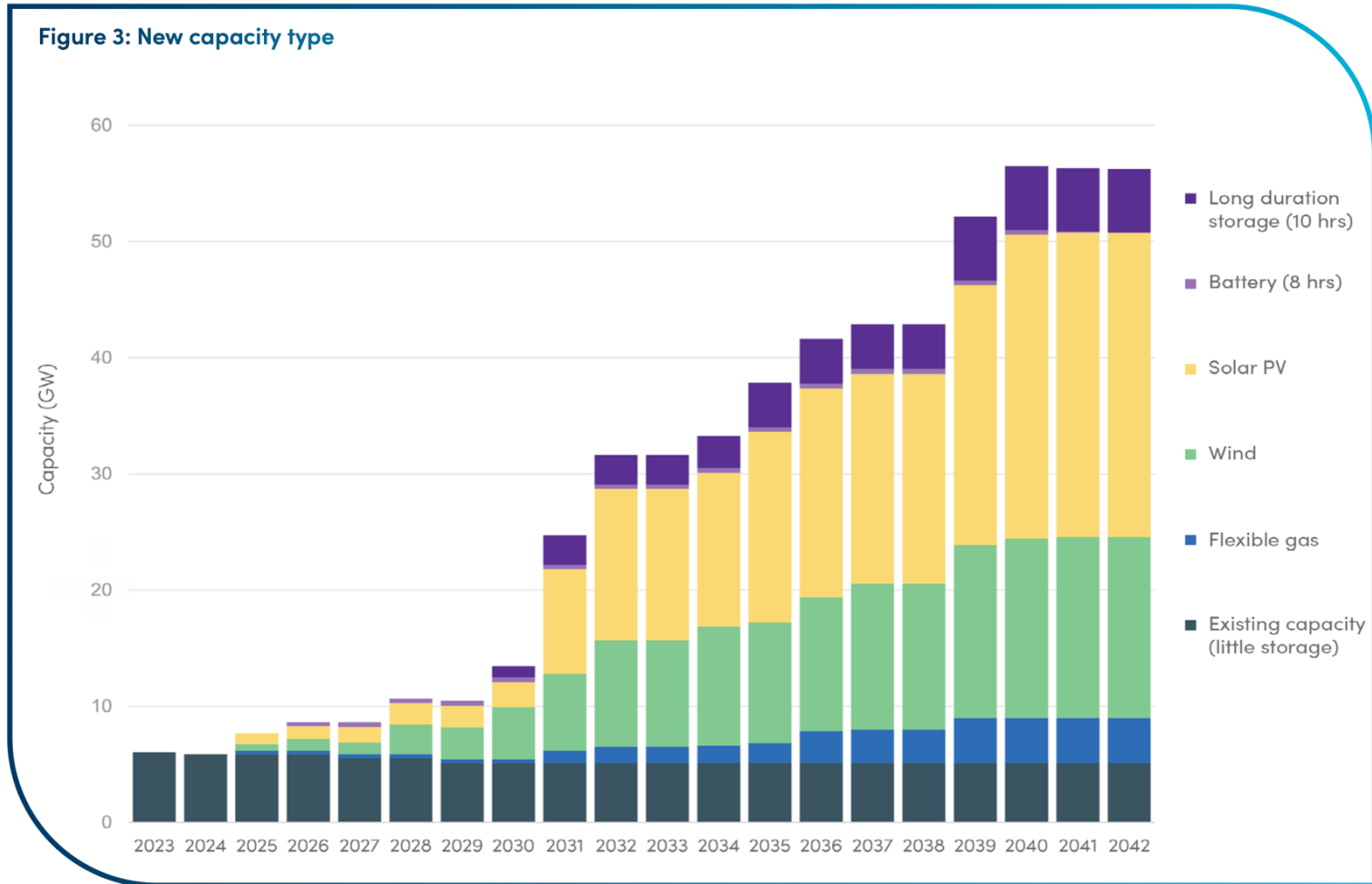
% of global production

2021



# 5. West Australian Energy Plan

50GW of new VRE + Storage by 2050 (vs 7GW total in 2023)



# 5. Australia Will be a Critical Minerals Superpower

Supply chain security, cheap RE and resource ownership means Australia should be leveraging our new competitive advantages to lead the global energy transition



Director of Communications at  
CEF: Annemarie Jonson

## A Critical Minerals Value-Adding Superpower

**Mapping Australia's 'once in a century' opportunity to lead the world in new economy minerals mining and renewables-powered onshore refining and manufacturing pre-export**

1 MARCH 2023

Shifting the narrative from one of fear of the cost, to excitement of the massive opportunity ahead!

—  
**Tim Buckley, Founder and Director, CEF**  
**Matt Pollard, EV Supply Chain Analyst, CEF**

*with a Foreword by Dr Alan Finkel*

CEF calls for \$100bn of public funding (Future fund, NAIF, EFA, ARENA, NRF, CEFC) to crowd-in \$200-300bn of private capital.