The US IRA, Australia’s response and the Budget

Argo Investments Board

11 May 2023

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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

Tim Buckley, Climate Energy Finance, Sydney – Please note CEF does not provide general or specific financial advice, this is public interest research.
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

Source: BloomberNEF
Note: Figure shows the levelized cost of energy. Solar is with fixed-axis.
1. Key themes – Pricing in CO$_2$ 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

Source: Trading Economics, Accessed 11 May 2023
1. Nextera Energy vs ExxonMobil

NextEra Energy (Green, US) has been the world's largest firmed 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

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

Source: China Association of Automobile Manufacturers, CEF, [Global EV Growth in 1QCY2023](#)
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.

<table>
<thead>
<tr>
<th>Source: NBS, CEF Estimates</th>
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<tbody>
<tr>
<td><strong>Total capacity added</strong></td>
</tr>
<tr>
<td><strong>Renewable Energy adds</strong></td>
</tr>
<tr>
<td><strong>Zero Emissions Capacity Adds</strong></td>
</tr>
</tbody>
</table>

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

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.

Source: Nat Bullard BNEF Feb 2023
3. **US Inflation Reduction Act 2022**

There is a resurgence in US manufacturing post the IRA

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**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)

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Source: FT 17 April 2023

https://www.ft.com/content/b6cd46de-52d6-4641-860b-5f2c1b0c5622
3. EU Net Zero Industry Act 2023

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

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

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
& J-REI 28 Feb 2023
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.

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

Canadian Critical Minerals Strategy

Source: Canadian Government Dec 2022,
President Yoon Suk Yeol said ‘the government and companies including Samsung Electronics Co. will pour US$422bn into areas such as chips and EV in the nation’s most aggressive effort yet to win a heated global race for tech supremacy’

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.

Source: Bloomberg’s Heejin Kim 16 March 2023
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 CO₂ emissions due to fossil fuel exports**

<table>
<thead>
<tr>
<th>Country</th>
<th>Emissions (billion tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russia</td>
<td>2.0</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>1.4</td>
</tr>
<tr>
<td>Australia</td>
<td>1.1</td>
</tr>
<tr>
<td>USA</td>
<td>1.1</td>
</tr>
<tr>
<td>Indonesia</td>
<td>1.0</td>
</tr>
<tr>
<td>Canada</td>
<td>0.8</td>
</tr>
<tr>
<td>Iraq</td>
<td>0.6</td>
</tr>
<tr>
<td>UAE</td>
<td>0.5</td>
</tr>
<tr>
<td>Norway</td>
<td>0.5</td>
</tr>
<tr>
<td>Netherlands</td>
<td>0.5</td>
</tr>
</tbody>
</table>

**Figure 8: Australia’s production of select metals and minerals essential for the energy transition**

<table>
<thead>
<tr>
<th>Metal</th>
<th>% of global production</th>
<th>Australia’s ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lithium</td>
<td>49%</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
</tr>
<tr>
<td>Iron</td>
<td>38%</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
</tr>
<tr>
<td>Bauxite</td>
<td>30%</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
</tr>
<tr>
<td>Alumina</td>
<td>15%</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
</tr>
<tr>
<td>Zinc</td>
<td>12%</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt;</td>
</tr>
<tr>
<td>Rare-earth</td>
<td>7%</td>
<td>4&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Nickel</td>
<td>7%</td>
<td>6&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Cobalt</td>
<td>4%</td>
<td>5&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Source: Business Council of Australia, Sunshot: Australia’s opportunity to create 395,000 clean export jobs, October 2021

5. West Australian Energy Plan

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

Figure 3: New capacity type

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

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

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.