



CLIMATE ENERGY FINANCE



An Australian Response to the US IRA

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11 September 2023

Climate Energy Finance (CEF) and the Climate Capital Forum (CCF) call for at least an extra \$100bn of government strategic public-interest capital investment into an Australian Renewables Industry Package and value-adding critical minerals industry development to crowd in \$200-300bn of private capital. This would be an appropriately ambitious response to the US Inflation Reduction Act (IRA), commensurate with Australia's domestic and export opportunity.

It is the strong view of the Climate Capital Forum and Climate Energy Finance that significant cleantech industry development incentivisation and demand-side stimulus, for example to households to electrify, are mutually complementary and are both essential to accelerate our whole-of-economy energy transition, leverage Australia's decarbonisation potential and maximise the economic, social and climate mitigation outcomes. To focus on one aspect at the expense of the other would be a costly strategic misstep that Australia can ill afford as we stand on the brink of unprecedented opportunity, not only to transition our homes and businesses, but to become a zero-emissions trade and investment leader.

The package we advocate should include capital allocations to federal financing authorities and direct budget support for key initiatives, such as electrification of everything and onshore battery supply chain manufacturing. The \$100bn is in addition to the some \$40bn allocated by the Federal Government to-date up to the 2023/24 budget.¹

The \$US800bn IRA is the largest subsidy program in world history and has catapulted the US into the global energy transition race. On the industry side it has pulled onshore an unprecedented boom in public and private investment into mining, refining, manufacturing and deployments of zero-emissions technologies of the future. It also injected a massive demand-side stimulus into the US economy including low cost financing for electrification of homes and businesses, direct electric vehicle rebates, and multiple incentives programs to electrify appliances and buildings. It is a model of the immense benefits of landmark public sector investment in economy-wide decarbonisation, reindustrialisation and cleantech supply chain, as we outlined in August [summary of its impacts](#), one year since its introduction.

Australia has some of the world's largest reserves of the critical minerals including lithium, metals and energy transition materials underpinning the global green revolution, as well as superabundant renewable resources. This gives us an extraordinary opportunity to value-add and export "embodied decarbonisation" by processing these materials onshore pre-export using zero-emissions power, to decarbonise our grid, and to rapidly transition our residential, commercial and industrial energy supply as we 'electrify everything'.

For Australia to leverage its potential for global leadership in energy transition, and the unprecedented benefits for the economy, investment, jobs and climate that this entails, public capital investment and industry incentivisation on a scale commensurate with our once-in-a-century opportunity is urgently required.

The gains to be made are nation-building. The August 2023 [NAB Powering Ahead](#) review identifies a \$435bn GDP uplift for Australia from trading in global decarbonisation to 2050.

Further details of CCF/CEF's policy recommendations on positioning Australia as a global leader in zero-emissions trade are in our earlier joint discussion paper.²

¹ Climate Energy Finance, [Federal Budget 2023/24](#), 9 May 2023

² Climate Capital Forum, [Modernising and decarbonising our economy to position Australia as a Global Leader in Zero Emissions Trade and Investment](#), January 2023

_____ CEF/CCF, *An Australian Response to the US IRA*, 11 September 2023

1. CAPITAL SUPPORT TO PUBLIC FINANCE AUTHORITIES >\$50bn

The Federal government should establish dedicated and significant direct federal debt, equity, infrastructure, grant, export credit and venture capital funding in partnership with state governments to strategically speed up Australia's transition in an Australian version of the US IRA, and prioritise majority Australian ownership of strategic new projects.

To do this, the Federal government should leverage and scale up existing established public finance organisations and those being currently set up. This includes the: ³

- [North Australia Infrastructure Fund \(NAIF\)](#)
- [Export Finance Australia \(EFA\)](#)
- [Clean Energy Finance Corporation \(CEFC\)](#)
- [Australian Renewable Energy Agency \(ARENA\)](#)
- [National Reconstruction Fund \(NRF\)](#)
- [Virescent Ventures VC](#)
- [DFAT's Australian Infrastructure Financing Facility for the Pacific \(AIFFP\)](#)⁴
- [Future Fund](#)

We advocate for significantly larger capital allocations to the NAIF, EFA, ARENA and CEFC for venture capital (VC), loan, equity, export credits, grant and infrastructure funding. The CEFC's mandate has been trebled to \$30bn, and we would suggest a similar trebling of NAIF, EFA and ARENA, AIFFP and Virescent Ventures allocations, tied to clearly enhanced / broadened climate and decarbonisation objectives and deploying the Powering the Regions Fund and Safeguard Mechanism to progressively internalise the cost of industry's carbon emissions. ⁵

Independent boards, management, reporting and governance structures will reduce the political and reputational risk to the Federal Government of being perceived to pick winners or make allocations based on electoral considerations, the way the previous government's Modern Manufacturing Initiative clearly did.⁶

Further, these Federal statutory bodies need to work constructively with state counterparts to crowd-in private capital, e.g. Queensland's \$100m Critical Minerals Investment Fund,⁷ [Hydrogen Industry Development Fund](#) and CleanCo, plus NSW's Energy Security Corp.,⁸ Victoria's Energy Innovation Fund and Western Australia's Clean Energy Future Fund.

Enhanced financial aid and EPC support for our Pacific and ASEAN neighbours under the AIFFP makes geopolitical strategic sense, particularly noting that these countries carry a disproportionate share of climate change mitigation costs even as Australia gets fossil fuel war-profits. AIFFP could be used by DFAT to meet multiple government objectives e.g. helping climate mitigation in our neighbours, building political connections (as called for by [ex-CEO Macquarie Group, Nick Moore](#)) and exporting key Australian engineering capacities to help facilitate capital deployment efficiently and at speed and scale.

³ We would include Snowy Hydro on this list, except for the growing evidence that this Government owned enterprise seems singularly incapable of delivering on nation-building infrastructure without a [600% capital cost blowout with next to no board accountability](#).

⁴ DFAT's [Australian Infrastructure Financing Facility for the Pacific](#)

⁵ Australian Government DCCEEW, [Powering the Regions Fund](#), 3 July 2023

⁶ The Guardian, ['Streamlined pork-barrelling': Labor takes aim at Coalition's \\$800m manufacturing grants program](#), 21 July 2021

⁷ InnovationAus.com, [Critical minerals win \\$100m following record Qld surplus](#), 8 December 2022

⁸ NSW Government, [Further \\$1.8 billion to power NSW to a clean energy future](#), 7 September 2023

Australia needs to provide public equity financing support as well as a prerequisite of a free equity carry on new project developments for First Nations to gain informed consent and buy-in before project proposals go for formal government approval, to both accelerate the determination timetable and acknowledge the absence of a formal treaty. A more formal and credible sharing of returns over the project life to the affected communities, particularly for transmission lines, would also reduce community opposition.

Future Fund

We recommend the mandate of the Future Fund, Australia's sovereign wealth fund, be revised to include a strategic national interest objective alongside the risk-return mandate.

Additionally, we would recommend a \$20bn allocation of capital – i.e., 20% of the total \$100bn additional investment commitment we outline – to the Future Fund into a discrete public equity fund to implement new patient strategic public equity investment into the critical minerals and metals, grid and firmed renewable sectors so as to give Australian firms the capacity to grow and value-add at speed and scale. These firms would ideally remain majority Australian owned, providing a corporate tax return to taxpayers on success.

Appointing Australian public interest directors and a commitment to world-leading ESG standards should be part of the equity injection. This due diligence could then help ensure public endorsement and investability of the project proposal, expediting the approvals process and helping crowd in foreign public and private capital, and pension funds.

Clean Energy Finance Corporation (CEFC)

It was pleasing to see an additional \$20.5bn capital lending capacity allocated to the CEFC in the last 15 months, including \$19bn for the Rewiring the Nation program,^{9 10} \$1bn for 'electrification of everything' lending support (via Household Energy Upgrades Fund) and \$500m for Venture Capital support via the Powering Australia Technology Fund.^{11 12}

The CEFC's mandated return objective on \$30.5bn of potential capital capacity is 2-3% above the 5 year Australian government bond rate (sensibly reduced from 3-4% pa previously) and includes a new expanded role in driving [Infrastructure Net Zero](#) aligned private-public collaboration for decarbonisation. The CEFC in FY2023 reports an all-time high public:private leverage – each \$1 of CEFC capital attracted an additional \$5.02 in private sector capital.¹³

- This includes \$1bn of debt through the Rewiring the Nation initiative committed to projects under the Tasmanian government's Battery of the Nation plan, including \$650m for the redevelopment of the Tarraleah hydroelectric power plant, which will double its capacity to 220MW, and a future pumped hydro project at Lake Cethana.
- In Victoria, a \$750m concessional loan will also be made available for the development of VNI West, so as to connect 4,000MW of new power generation.
- a \$100m commitment to the NSW Waratah Super Battery.
- Marinus Link, a now downsized 750MW sub sea link to the mainland.¹⁴

⁹ [CEFC receives new Investment Mandate](#), 22 July 2023

¹⁰ InnovationAus.com, [Rewiring the Nation: Vic. Tas first to benefit from \\$20bn plan](#), 19 October 2022

¹¹ [HESTA](#) 2 December 2021

¹² [InnovationAus.com](#) 23 November 2022

¹³ [CEFC confirms record renewables investment as race to net zero gathers momentum](#), 21 August 2023

¹⁴ Renew Economy, [Scale of Battery of the Nation project cut in half after huge cost blow-out](#), 3 September 2023

CEO Ian Learmonth says the CEFC aims to “take risks that others are not necessarily prepared to take” to unlock projects that may not otherwise get built. “For every deal, we ask whether the CEFC should be in there. Are we filling a market gap, are we crowding in the private sector? Will this company or project have some significant impact on decarbonising Australia in some way?”¹⁵

National Reconstruction Fund (NRF)

The NRF has likewise had a \$15bn capital allocation, of which \$3bn has been allocated to critical minerals value-adding including decarbonisation of energy supply.

The actual cost to the forward estimates is minimal. This is all leveraging the balance sheet of the Australian government, and should generate returns above the cost of borrowings, so only the operating costs and a provision for likely bad debts hits the forward estimates.

CEF also advocates for a capping of the diesel fuel subsidy at \$50m pa per consolidated group so as to raise \$14bn by 2030. We propose that 100% of the tax revenue gained from the FTC cap be directed into a special purpose fund within the National Reconstruction Fund. Revenues in the special purpose fund should be invested to scale domestic manufacturing and adoption of battery and electric vehicle (EV) zero-emission technology across Australia’s mining sector, electrifying Australian mining industry transport and driving embodied decarbonisation into our bulk commodity exports. Support could take the form of subsidy programs and production-based tax credits.

2. DIRECT BUDGET SUPPORT INTO CLEANTECH INDUSTRY DEVELOPMENT >\$50bn

We also call for a significant step in direct forward budget support for a range of key programs critical to decarbonisation and to rebuild public service capacities inhouse (clearly needed in the wake of the PwC scandal). In the last 18 months the current Federal government has initiated a number of new programs that are laying the necessary foundations, including the \$225m to Geoscience Australia; \$100m critical minerals development program; \$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; and \$105m for the New Energy Apprenticeship.¹⁶ We acknowledge the roles of the Net Zero 2050 and Sector Pathways,¹⁷ and the enhanced support for the Climate Change Authority (CCA).

Advanced Manufacturing & Production Tax Credits (AMTC / PTC)

An advanced manufacturing tax credit should be used to incentivise local content and local manufacturing. This should be time limited, e.g. to one decade, so the cost in the 4 year forward estimates would probably only be for 2/10 of the total decade cost of \$10-20bn, given the facilities would take, on average, ~2 years of construction. This is a ‘pay for delivery’ model, no investment, no jobs, no benefit, no cost to taxpayers.

This would also only subsidise the portion of manufacturing that is done locally, so does not cause inflation of the whole market, e.g. an AMTC for a decade to underpin the competitiveness of say a 1GW pa solar module manufacturing facility, such that Australia

¹⁵ Capital Brief, [Australia's \\$30b green bank faces a new kind of challenge](#), 8 September 2023

¹⁶ 2023/24 Budget, [Building a clean energy future](#)

¹⁷ Australian Government DCCEEW, [Net Zero](#), 28 August 2023

_____ CEF/CCF, *An Australian Response to the US IRA*, 11 September 2023

develops onshore diversification of solar module supply to China, whilst retaining price competitiveness for the 80% of modules imported (Australia should be deploying >5GW pa of rooftop solar and utility solar every year for the next few decades).¹⁸ This could be part of the wider strategic opportunity for Australia to develop onshore solar manufacturing supply chains. This should consider green polysilicon to leverage and develop Australia's silica / quartz resources.¹⁹

A production tax credit scheme could also incentivise processing of Australia's energy transition materials onshore.

In June, McKinsey identified that moving from unprocessed spodumene to refined lithium hydroxide (LHM) is a potential \$4.8-9.6bn pa export uplift for Australia,²⁰ and the head of Tesla Australia has advocated for a production tax credit of "less than 10%" as well as a 30% rebate for Australian cell manufacturing to put Australia on the map as a global lithium hydroxide processor and make Australia-based, battery-grade processing globally competitive, or risk losing out to the US and Europe.²¹

It is excellent that Federal Resources Minister Madeleine King has confirmed that tax breaks for critical mineral projects and lithium processing are "on the table", as the government seeks to compete with the United States and allied nations for international investment.²²

We recommend tax incentives for the onshore production of green iron, a blue-sky \$100bn pa value-add uplift opportunity to allow Australia, as the world's largest producer of iron ore, to secure its position in global green steel supply chains as our trade partners move to decarbonise, collaborating with world-leaders Baowu²³ and POSCO.²⁴ If Australia doesn't invest in preparation, we will miss out. Vale has announced a new MoU²⁵ to supply 100Mtpa of HBI (hot briquetted iron) beyond 2030 with the world-leading H2 Green Steel of Sweden as part of Vale's scope 3 emissions reduction target – something world 'leader' BHP hasn't got.

And in the largest private placement in Europe this year, H2 Green Steel has raised €1.5bn in equity from an investor group led by Altor, GIC, Hy24 and Just Climate to finance the world's first large-scale green steel plant and Europe's first giga-scale electrolyzer.²⁶ Showing how equity injections leverage debt financing, H2 Green Steel has assurances of €3.5bn in debt financing underpinned by a pledge from the Swedish National Debt Office of a "green credit guarantee" of €1bn. Equity leverages debt, public capital leverages private.²⁷

¹⁸ As recommended in the CEF report, [Solar pivot: a massive global solar boom is disrupting energy markets and speeding transition](#), 14 June 2023.

¹⁹ CSIRO, [Australian Silicon Action Plan](#), November 2022.

²⁰ Capital Brief, [Biden's support for EVs opens a door for Australian lithium](#), 2 September 2023

²¹ AFR, [Tesla boss urges Chalmers give tax breaks for lithium processing](#), 5 September 2023

²² AFR, [Tesla's call for tax breaks for lithium is 'on the table': minister](#), 6 September 2023

²³ AFR, [Rio, world's biggest steelmaker join forces on green iron plant in WA](#), 12 June 2023

²⁴ Small Caps, [POSCO reveals plans to pour \\$142 billion into new steel and green initiatives](#), 4 July 2023

²⁵ [Vale and H2 Green Steel sign agreement to study the development of green industrial hubs in Brazil and North America](#), 6 September 2023

²⁶ [H2 Green Steel raises €1.5bn in equity to build the world's first green steel plant](#), 7 September 2023

²⁷ Canary Media, [The world's largest low-carbon steel plant moves closer to completion](#), 8 September 2023

\$2bn Hydrogen Headstart

Beyond financing support, new areas of strategic development and domestic demand “pull” initiatives are needed to ensure the energy system disruption that green hydrogen (GH2) promises, but is still far from cost competitive today absent the clear pricing signal a high regulated carbon price would have provided. As such, successful GH2 industry development will require initial heavy government support to overcome first mover disadvantages and ensure we establish Australian EPC, engineering and supply chain capacity.

Regulatory modernisations are also required so Australia ‘learns by doing’ in the domestic context to ensure we are still in the race as the learning curves and global scaling-up of capacity drives costs of the likes of green hydrogen down to competitive levels. This is particularly the case given the absence of a carbon emissions price, meaning there is a massive ongoing grey-discount undermining technology and market development here.

As such, the \$2bn Hydrogen Headstart is a necessary if expensive subsidy to keep Australia in the global race. The massive renewable energy export superpower opportunities for Australia make the upside opportunities worth an initial public investment now. Australia is a trusted energy supply partner to North Asia, and so the longer term export opportunities for green ammonia, then possibly green hydrogen, and potentially sustainable aviation fuel (SAF) and e-methanol, justify the investment to help our key trade partners decarbonise – a market potential many times the size of the domestic demand opportunities e.g. green steel.

It would be useful to create a government policy creating a domestic demand pull for green steel, encouraging steel firms pivoting from outdated blast furnace to electric arc furnace technologies (such as GFG in Whyalla²⁸), rather than caving in to luddite boards like BlueScope demanding Safeguard Mechanism exemptions so they can prolong their high emissions profiles for another few decades even as their European competitors invest in the future.²⁹

These initiatives all work in tandem with the Safeguard Mechanism, the 82% renewables and 43% emissions reduction by 2030, and will need an [Australian Carbon Border Adjustment Mechanism](#) to protect our domestic trade exposed industries as they decarbonise at speed. This also builds energy resilience/energy security, given decentralised domestic zero emissions energy both creates resilient communities and improves our local economy.

3. ELECTRIFICATION OF EVERYTHING

Residential and Commercial & Industrial (C&I)

May 2023 saw the 2023/24 Federal Budget³⁰ commit \$1.3 billion to electrify households and enhance energy performance, including a \$1bn investment for the Household Energy Upgrades Fund, to be administered by the CEFC in partnership with banks and financial institutions, and \$300m for energy upgrades to social housing.

We modelled a 10 year interest free loan program for rooftop solar and behind-the-meter batteries, with ~\$500m pa for NSW for loans repaid 1/10 each year. With the scheme going

²⁸ GFG, [Coke Ovens Closure: Sun Sets On Coal In Our GREENSTEEL Voyage](#), 7 September, 2023

²⁹ [H2 Green Steel raises €1.5 billion in equity to build the world’s first green steel plant](#), 7 September, 2023

³⁰ Climate Energy Finance, Federal Budget 2023/24, 9 May 2023

_____ [CEF/CCF, An Australian Response to the US IRA, 11 September 2023](#)

for a decade, this is a \$2bn interest subsidy over the full 20 year life of the project. This would need to be NPV'd and expensed via the budget, but overcomes the balance sheet constraints to crowd-in and scale up deployments.

Industrial, grid and utility-scale

August 2023 saw the landmark Commonwealth-Western Australia Rewiring the Nation deal, providing \$3bn to accelerate grid electrification of the South West Interconnected System (SWIS) and the North West Interconnected System (NWIS), to be managed by the CEFC.³¹ This is the sort of infrastructure-enabling investment we are thinking of, particularly in light of the fact that the NWIS and wider Pilbara region has just 1-2% renewable energy penetration, a fraction of the [36.5% RE penetration of the NEM](#) in 2023 to-date.

Climate and Energy Minister Chris Bowen's [Capacity Investment Scheme \(CIS\)](#) for grid firming of renewable energy is another excellent initiative – locking in minimum revenue support to underwrite bank lending and returns for firming projects, with likely a very limited Federal Budget hit.

Its impact in accelerating decarbonisation of the grid nationally is evident. The first round for NSW in June 2023 expanded the NSW Energy Infrastructure Roadmap's firming tenders up to an additional 550 MW, more than doubling the 380 MW of firming capacity already committed by NSW.³² Assuming this process is replicated, expedited and expanded in NSW's next tender, locking in firming support sufficient to underwrite grid reliability ahead of the closure of the end-of-life, exceptionally expensive and high emissions Eraring coal power plant, CEF's recent research shows the [Lights Will Stay On](#).

August 2023 saw the latest tender under the CIS, with Victoria and South Australia to target 600 MW of dispatchable capacity with 4-hour equivalent duration across the two states, in line with the Australian Energy Market Operator's 2022 Integrated System Plan.³³

CEF/CCF supports Rewiring Australia's recommendations and policy actions on electrification of everything as part of an ambitious whole of economy response to the IRA:³⁴

Direct incentives for homes to electrify

Households need direct support to shift to the modern electric versions of their current fossil gas appliances, specifically to install: heat pump hot water heaters, heat pump space heaters (reverse cycle air conditioners), electric cooking, and to power those appliances install rooftop solar with storage capacity in household and community batteries. Up-front discounts on the purchase of electric appliances will make the choice to switch to electric easier for homes and further maximise the energy savings received by homes. Over the 10-20 year lifetimes of the EV and appliances the savings on energy bills more than pay for the up-front costs. The challenge is the credit or cash access to enable these downstream savings for both homeowners, renters, strata titles and high rise apartments, and this is

³¹ Industrialnews.co.uk, [Australian government dedicates AU\\$3bn to grid upgrades](#), 31 August 2023

³² Australian Government, [Capacity Investment Scheme](#)

³³ Joint media release: [Capacity Investment Scheme to power Victoria and South Australia with more cleaner, cheaper, reliable energy](#), 30 August 2023

³⁴ https://global-uploads.webflow.com/612b0b172765f9c62c1c20c9/639d4e51598a9c13b8a45a80_Electrification%20is%20anti-inflationary%20-%20Saul%20Griffith.pdf

_____ CEF/CCF, *An Australian Response to the US IRA*, 11 September 2023

particularly relevant in 2023 when fossil fuel hyperinflation is smashing many Australian households.

Support to electrify through accessible and affordable finance

Incentives and discounts should be paired with cheap, accessible finance. The CEFC should facilitate low-interest loans for electrification. Access to finance is also critical. In the best of all worlds, this would be paired with loan guarantees for electrified housing. Many homes may not have access to lines of credit; the government can play an important role as a guarantor. This is a low-risk bet for the government—the ongoing energy savings captured by newly electrified homes will cover the upfront costs of the capital investment over time.

Market certainty through building codes and regulations

Retrofitting buildings with energy efficiency isn't always the cheapest option, and we should embrace transforming our built environment as a long project best achieved through all-electric building codes with tighter envelopes. Building and electrical codes should be optimised to reduce the soft costs and installation costs of electrification. The national (with a ludicrous exemption for the Northern Territory, where energy efficient housing stock is needed most) introduction of BASIX from 1 October 2023 for new builds is a good, if overdue step in the right direction. The new standard cuts thermal energy use by at least 20% and will save new build homeowners on power bills permanently. That the NSW Minns government delayed this for another six months is poor policy, delaying the energy and efficiency transition.³⁵

Best-in-class vehicle standards with a sunset date for cars that produce emissions would promote Australia as a leader, not follower, on emissions reductions and put us at the front of the supply chain line.

Reform the tax system to disincentivise fossil fuels and incentivise electrification

Much of what is achieved in the IRA is through the tax system and incentivising tax concessions for electrification expenses. Removing subtle and hidden subsidies for fossil fuels and promoting tax incentives for zero-emission electrification should be a priority.³⁶ CEF recommends capping of the Fuel Tax Credit Scheme at \$50m pa per corporation and the redirection of the \$14bn regained tax revenues by 2030 into accelerating EV deployment in Australia's globally dominant heavy haulage mining sector, thereby making the likes of BHP, Rio Tinto, Glencore and Hancock Prospecting corporate leaders, following the leadership of Fortescue Metals Group, and embodying decarbonisation in our commodities exports. It is too onerous for one corporate to do this alone. We need strategic global collaborations, government support and a clear commitment to accelerate the currently hollow, backend loaded Net Zero Emissions targets (or worse, BHP's plan to increase emissions until 2030, rather than reducing them).

It is also beyond time Federal Treasurer Jim Chalmers actually made a meaningful upward adjustment to the to-date failed Petroleum Resources Rent Tax (PRRT). The \$500m pull-forward fiddle around the edges announced in the May 2023 Budget is a missed opportunity that could be rectified in the forthcoming MYEFO.³⁷

³⁵ NSW Government, [BASIX pause to help home buyers and builders](#), 15 August 2023

³⁶ www.climateenergyfinance.org

³⁷ The Guardian, [Labor's changes to gas tax will deliver little if any extra revenue](#), analysts say, 8 May 2023

_____ *CEF/CCF, An Australian Response to the US IRA, 11 September 2023*

Investment in electrifying public and social housing

The Australian government owns and funds much of Australia's housing for our lowest income households. These homes can be set to save on cost of living for the next decade if they have the support they need now to access solar and electrified appliances and cars. Public and social housing assets should be the starting place for investment in modern electric appliances, through both the proactive replacement of gas appliances as well as ensuring no new gas appliances are installed in homes when they break down. Low-income households stand to benefit proportionately much more from the low operational costs of electric vehicles.

Testing intensive electrification through community pilots

Now is the time to run trials of full electrification in Australian communities at scale. This should also address our regional communities where being ongrid currently means low reliability and high costs - many remote communities need electrification, building efficiency and rooftop solar with batteries to remove reliance on expensive, noisy, high emissions imported diesel gensets.

Pilots would be focussed in a particular suburb or postcode area and fully electrify 500-2,000 homes. This will create the knowledge and experience that enables a faster, smoother transition to bring along all Australian homes. These communities can be "living laboratories" for best practices. Demonstration communities will showcase the role electrified homes can play in reducing grid infrastructure costs, balancing the grid, and generating a significant proportion of their own energy. It will develop the industry, jobs, and frameworks required for Australia to lead the world in this transition, and output the products and learnings that Australia can export to the world.

Selling the benefits of electrification to the community

Historically Australia has been quite effective at public communication of publicly good policy. However, many households remain unaware that electrification is their most effective path to combating climate change. Many households are unaware that indoor and community air quality is our leading cause of respiratory illness and that both can be addressed through household and community electrification with renewables.

Industry should also be seen as a key demand management resource, rather than an excuse for the totally outdated demands for baseload power when we actually need firming power, load following and peak shaving orchestration. The opportunities for profit for Tomago aluminium smelter to be both a key enabler of the energy transition and the move to 100% renewables has been known for a decade, but Rio Tinto has invested in the opposite direction to build in reduced electricity demand flexibility, rather than more.

Building the skilled workforce for installations

Electrification can create hundreds of thousands of jobs. It's important that our workforce has the support to learn the skills they will need to install and service this future. We need a shared vision of the machines that will make up all future homes, so electricians, HVAC technicians, plumbers, and builders understand what homes will need and how they can use their skills and business to facilitate the transition. TAFE and industry lead RTO's would be a logical place to scale-up our commitment to zero-emissions workforce development. We

note the onshore manufacturing skills for batteries are already being developed by the likes of [Energy Renaissance](#) in Tomago Newcastle and [RedEarth](#) in Brisbane.

All of government(s) response

Emissions reduction is urgent and cuts across all layers of Australian governments. An effective program of electrification needs to be well-coordinated and holistic. The government should establish an Office of Electrification, which will act as a co-ordinating body within the Department of Climate Change, Energy, the Environment and Water and would be responsible for:

- National and state electricity policy and market design (e.g. wholesale demand response, two-sided market reform)
- Safety and technical standards: EV charges, DER management systems, vehicle-to-grid two-way charging, heavy vehicle battery swapping
- Workforce development (training, apprenticeships, accreditations, skill shortages)
- Supply chain (manufacturing, bilateral trade agreements)

A comprehensive and focussed R&D agenda that exploits Australia's strengths

Australia has an opportunity to become a world leader in electrifying the primary production of materials from ores and doing so with renewables. This however is reliant on increased funding for targeted primary industry and manufacturing. Emphasis on start-ups and innovators alongside at scale producers is needed to most effectively harness a diverse set of contributors.

Prioritise transition communities and use of existing infrastructure

The existing footprint of Australia's fossil industry, including mines and generation facilities, freight rail, transmission pipelines and transmission lines connects existing fossil industry communities. This footprint is significant and if repurposed for renewable generation and transition represents a pathway to transition communities and jobs towards our 21st century energy infrastructure.

4. CONCLUSION: WHY IS \$100BN OF NEW PUBLIC STRATEGIC CAPITAL REQUIRED?

The US IRA involves government subsidies and capital outlays likely to be well over US\$800bn, and has already underpinned over US\$500bn of new investment in onshore US manufacturing, four times the level ever reported previously in US history. The crowding in of private capital is staggering, and opens up a global technology and investment race.

China's response has been to double down on the accelerator, with even faster deployments of new manufacturing capacity and renewable energy installs. In the first seven months of 2023, China installed 97 GW of solar (1.5x the entire installed capacity of the Australian National Electricity Market (NEM)), growth of a staggering 158% year-on-year.

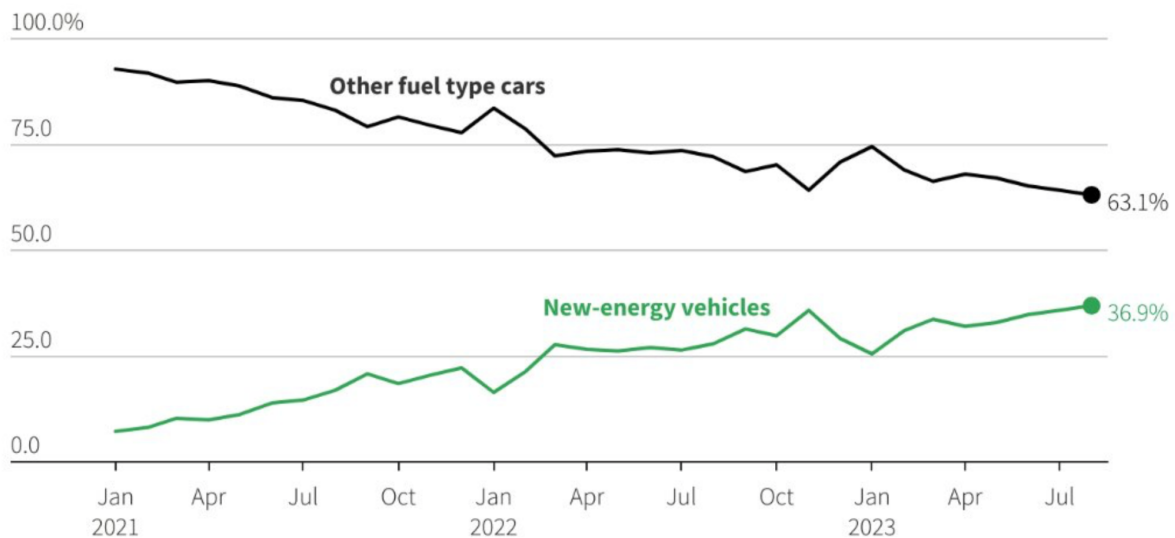
This is 5-10 times the solar investment rate of the US, #2 in the world. Total variable renewable energy installs of 133GW were up 117% year-on-year.

So far this year, the world's leading EV manufacturer, China's BYD, sold over 1.78 million passenger plug-in electric cars, which is 83% more than a year ago (building on a near

tripling of EV sales year-on-year in 2022).³⁸ China’s EV penetration hit a record high 36.7% share of total vehicle sales in August 2023.

There is nothing slow and orderly about the energy transition. It is a global technology and investment race at speed. And Australia needs to respond strategically with an effort that is proportionate to the massive export opportunity available to us to electrify everything, decarbonise and re industrialise our economy, thereby ensuring our energy and supply chain security, and export embodied decarbonisation in green iron, green aluminium and refined critical minerals.

Figure 1: EV share of total passenger vehicle sales by month, China³⁹



Source: CPCA, Reuters, Sumanta Sen, 8 September 2023

Rather than providing massive ongoing subsidies for imported fossil fuel use – a headwind undermining both our pivot to future-facing industries and our energy security imperatives – the Federal government must now find the courage to take on the vested interests of the global fossil fuel cartel, reforming the diesel Fuel Tax Credits Scheme and the PRRT as noted above. This could help fund the necessary taxpayer investment of another \$100bn of capital and direct budget support to accelerate the energy transition, reduce our reliance on hyperinflationary fossil fuels, and belatedly align Australia’s decarbonisation with the climate science.

If Australia has the political resolve and strategic foresight to seize the massive employment, investment and export opportunities ahead, we will be a renewable energy powered, value-added critical minerals and metals export superpower.

³⁸ InsideEVs, [BYD Plug-In Car Sales Reached Another Record In August 2023](#), 5 September 2023

³⁹ Bloomberg, [Chinese Car Sales Hit Record High for August on Export Growth](#), 8 September 2023

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