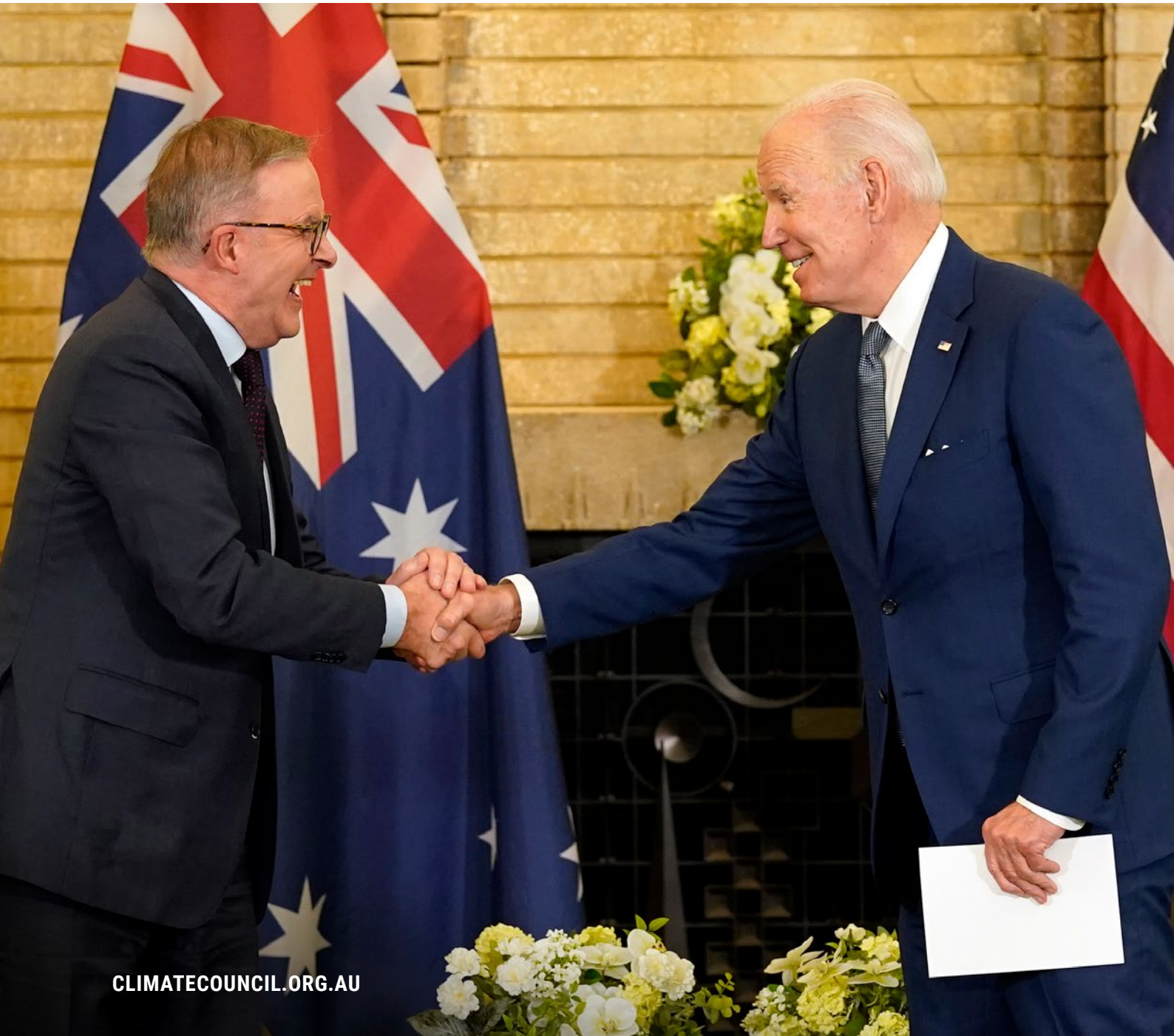
CLIMATE COUNCIL

CLIMATE ALLIES: AUSTRALIA, THE UNITED STATES AND THE GLOBAL ENERGY SHIFT



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Cover image: President Joe Biden shakes hands with Australian Prime Minister Anthony Albanese during the Quad leaders summit meeting in Japan, May 24, 2022 (AP Photo/Evan Vucci).

The Climate Council acknowledges the Traditional Owners of the lands on which we live, meet and work. We wish to pay our respects to Elders past and present, and recognise the continuous connection of Aboriginal and Torres Strait Islander peoples to Country.

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Key findings

1

The climate crisis is a national security threat for Australia and the United States (US)

- The climate crisis and the global race to a clean energy future is profoundly reshaping global geopolitics as well as the security and economic interests of Australia and the US, with action on climate change and energy now a key pillar of the Australia-US alliance.
- Climate inaction is leading to more frequent and intense disasters, such as fires and floods. In turn, this will lead to devastating consequences such as water and food shortages, mass displacement, damage to infrastructure and a rise in conflict.
- The Defence Strategic Review found extreme weather disasters are placing significant pressure on the Australian Defence Force.
- A recent Lowy Institute poll showed 89 percent of respondents saw climate change as a threat to Australia's vital interests.

2

Australia and the US are cooperating to ensure energy security in the Indo-Pacific region

- The energy shift is reshaping geopolitics in the Indo-Pacific, where countries are increasingly reliant on China as a source of critical minerals and clean energy products. Diverse and resilient clean energy supply chains are a key focus for the Quad partnership, consisting of Australia, India, Japan and the United States.
- China is the global leader in clean energy production and deployment and critical minerals refining - it has more than 80 percent of global solar panel production alone. As the US and China compete to provide clean energy technologies, they have also pledged to work together to implement the *Paris Agreement* and accelerate the shift to a net zero global economy.
- Australia remains well-placed to supply critical minerals to growing markets, such as for clean energy manufacturing in India. At the same time, both Australia and the US must work together with leaders of the Pacific, where the climate crisis is viewed as the number one threat, to drive an ambitious global agenda to cut emissions.

3

US investment in clean energy industries has turbo-charged the global energy transition. This represents an opportunity and a challenge for Australia

- The US *Inflation Reduction Act* (IRA) marks an inflection point in the world's energy and industrial transformation. The IRA is America's largest climate spend in history. It allocates AU$520 billion - around a quarter of Australia's entire GDP - to stimulate investment in renewable energy infrastructure and clean energy manufacturing.
- The IRA aims to diversify the supply of critical minerals and clean energy technologies to American industry. Already it has catalysed more than AU$220 billion in private investment in clean energy projects and a boom in new solar, battery and electric vehicle manufacturing facilities.
- When the world's largest economy makes a decisive move, it changes the game for everyone. Already, the IRA has encouraged other major economies to increase investments, including government stimulus packages from the European Union, Japan and Korea.
- Supporting US allies and free trade partners as alternative sources of critical minerals and renewable energy components, the IRA offers tremendous opportunities for Australia. However, the IRA is also redirecting global investment to the US - making it harder to attract capital and skilled workers for Australia's own energy transition and emerging clean energy exports.

4

Australia is well-placed to become a clean energy superpower - but we must act fast

- The world's energy and geopolitical landscapes are being reshaped. Through the IRA, the US has offered a tremendous opportunity to Australia, but one that requires us to respond with similar vision and commitment.
- The Australian Government already has a number of financing initiatives that are intended to support Australia's clean energy transitions, such as the National Reconstruction Fund and the Australian Renewable Energy Agency. However, industry analysts and government officials looking closely at the impact of the IRA on global capital flows suggest this will not be enough to secure Australia's place in the global race to a low-carbon economy.
- Without strategic government policy to support new industries, Australia could miss the opportunity to capitalise on its competitive advantages in clean energy production. For example, the IRA provides tax credits for renewable hydrogen that reduces production costs by up to 75 percent, making green hydrogen immediately cost-competitive against hydrogen made using fossil fuels. Labor's $2 billion plan to support renewable hydrogen in the 2023 Federal Budget is a step in the right direction, but more support will be needed.
- There's no time to lose. This is the make or break decade for climate action and the Australian Government should deliver a major package of initiatives aimed at developing our green export industries to replace exported fossil fuels. This should match the size and scale of this once-in-a-century economic opportunity.

1. Introduction

Australia and the United States have been security allies since the end of the Second World War. Today, both nations are cooperating to deal with the implications of a warming planet. Canberra and Washington have come to view the climate crisis as a threat to national security, and acting on climate change has become a key pillar of the Australia-United States alliance.

Working together to tackle the climate crisis is high on the agenda of the bilateral Australia-US alliance, as well as the Quad partnership. As this report explains, Australia and the US are increasingly working together to address the root causes of climate change - which will require both countries to cut greenhouse gas emissions as fast as possible - and to manage the economic and strategic implications of the global energy transition.

The United States has started to get serious about its transition to a clean energy economy. Last year, Congress passed the biggest-ever package of climate spending in United States history - the *Inflation Reduction Act* (IRA) - which allocates more than AU$520 billion[1] to stimulate investment in renewable energy infrastructure and clean energy technologies. This has turbo-charged the global clean energy transition, as major economies in Europe and Asia respond with their own support for clean energy industries.

For Australia, the IRA poses both opportunities and threats. Australia is a major exporter of critical minerals that are used in batteries and electric vehicles, and is set to expand mineral exports to the US and elsewhere. However, the IRA is also redirecting global investment to the US, making it harder to attract investment and skilled workers for Australia's own energy transition. American incentives for new clean energy industries also pose a challenge for Australia's emerging clean energy exports.

1 Based on exchange rates at the time the IRA legislation was passed.

Figure 1: President Joe Biden participates in an online roundtable on critical minerals in February 2022. The supply of critical minerals is a key element of the IRA, which aims to scale up battery manufacturing in the US.

American support for clean energy industries requires a policy response from the federal government. As Australia's federal treasurer Jim Chalmers explains: "we want to be beneficiaries, not victims, of the massive investments the Americans are making in clean energy technology" (Hartcher 2023). In the 2023 Federal Budget the Australian Government announced a *Hydrogen Headstart* program that will invest AU $2 billion to support the development of Australia's renewable hydrogen industry. This is a good first step that makes a key industry more competitive, but further policy initiatives will be needed to catalyse investment in Australia's clean energy industries.

Recognising that the landscape has shifted, the Climate Council recommends the Australian Government now deliver a major package of initiatives aimed at developing Australian green export industries and replacing exported fossil fuels over time. The size and scope of this package should reflect the once-in-a-century opportunity currently in front of Australia to become a supplier of choice for clean energy and clean manufactured goods. If we fail to rise to the challenge, Australia could miss a once-in-lifetime opportunity to transition to a clean energy superpower.

BOX 1: THE QUAD

What is the Quad?

The Quad is a partnership between Australia, the United States, India and Japan intended to shape regional order in the Indo-Pacific. The Quad emerged in response to shifts in the balance of power in Australia's near region. As China expands its engagement with the region, the four maritime democracies of the Quad are working closely together to reinforce shared principles and values that guide relations between nations. The Australian government describes the Quad as a "key pillar in Australia's foreign policy" (DFAT 2023).

Every year, leaders from the four Quad countries meet to discuss the region's most pressing issues and advance a shared agenda to promote an open, stable and prosperous Indo-Pacific.

What's on the agenda for the Quad in 2023?

Quad leaders are expected to discuss a broad agenda - including trade, maritime security, energy and climate action. Collaboration to ensure energy security - through diverse and resilient clean energy supply chains - will also be on the agenda, and is a key priority for the climate working group of the Quad.

At the 2022 Sydney Energy Forum - which brought together energy ministers from Quad countries and the broader region to consider the energy transition in the Indo-Pacific - Prime Minister Albanese explained Australia has a once-in-a-generation opportunity to pivot from a fossil fuel heavyweight to a renewable energy powerhouse (Albanese 2022). At the same summit, US Secretary for Energy Jennifer Granholm and Australian Minister for Climate Change and Energy Chris Bowen signed the 'Australia – United States Net Zero Technology Acceleration Partnership'.

Figure 2: The Quadrilateral Security Dialogue (the Quad) is a strategic security dialogue between Australia, India, Japan and the United States. Energy security is high on the agenda of the Quad partnership.

Clean energy supply chains continue to be high on the agenda for Australia and its Quad allies.

Figure 3: Australian Defence Force medical personnel in flooded areas of Pakistan. In late 2022, devastating flooding in Pakistan affected more than 30 million people and killed over 1,700 people.

2. The climate crisis: A shared security threat

The climate crisis is recognised as a national security threat in both the United States and Australia. Urgent, coordinated global action to reduce greenhouse gas emissions is needed to "secure a liveable and sustainable future for all" (IPCC 2022). Inaction will lead to more frequent and intense climate-fuelled disasters - heatwaves, droughts, floods, cyclones - and accelerated sea-level rise. In turn, these developments will have devastating consequences: species loss, ecological collapse, widespread damage to infrastructure, water and food shortages, mass displacement and a rise in conflict (IPCC 2021; Climate Council 2021).

Policymakers must treat the climate crisis with all the seriousness of traditional threats like war and geopolitical competition, and respond accordingly. The United States has been Australia's key security ally since the end of the Second World War. However, only in recent years has the Australia-US alliance recognised and vowed to work together to address the climate crisis including on shared security interests in the Indo-Pacific. Late last year, defence ministers from both nations declared climate action to be a "new pillar of the US-Australia Alliance" (DFAT 2022).

Australians also understand that climate change is a threat to national security. Recent polling by the Lowy Institute found that 89 percent of respondents see climate change as a threat to Australia's vital interests, and 62 percent see it as a critical threat (Lowy Institute 2022a). Similarly, polling from the United States Studies Centre found climate change is the most important international issue for Australian respondents – coming ahead of issues like security cooperation with the US and Japan, increasing trade and investment in Asia, and 'standing up to China' (Dean 2022). It also found that many Australians believe the alliance with the US should extend beyond traditional defence considerations. Seventy-seven percent of those polled said fighting climate change in partnership with the US was important for Australia (Dean 2022).

The United States and Australia both recognise climate change as a national security threat, with climate action now a pillar of US-Australia alliance.

Policymakers in the United States are factoring climate change into threat assessments and national security planning. The Biden administration has "put the climate crisis at the centre of US foreign policy and national security" (White House 2021). The latest US National Security Strategy simply states: "the climate crisis is the existential challenge of our time", and says that "of all of the shared problems we face, climate change is the greatest" (White House 2022).

In Australia, security leaders have warned for some time that climate change is a core national security issue (ASLCG 2021). The federal Labor government, elected in May 2022, shares this view. It commissioned the Office of National Intelligence to assess the risks of climate change for national security. It also commissioned a major review of Australian defence strategy, the Defence Strategic Review, released in April 2023. The review:

- Stated unequivocally that "climate change is now a national security issue", and found climate events are already placing significant pressure on the Australian Defence Force - which is strained by the need to respond to disasters while at the same time preparing for the military to play its traditional combat role (Department of Defence 2023).

- Found that as climate change accelerates it will significantly increase security risks in the Indo-Pacific region - including through "mass migration, increased demands for peacekeeping and peace enforcement, and intrastate and interstate conflict" (Department of Defence 2023).

Increasingly, defence personnel are being called on to respond to more frequent and destructive extreme weather events - including bushfires, floods, and intense cyclones. Since 2019, more than half of all Australian defence personnel have participated in humanitarian and disaster relief operations (Knott 2023). However, the Defence Force is not structured or appropriately equipped to act as a domestic disaster recovery agency.

An appropriate response to the security risks posed by the climate crisis requires both Australia and the US to bolster global efforts to cut emissions. During Australia-US ministerial consultations in November 2022, both nations pledged to work together to "drive stronger global action to address the climate crisis and to strengthen efforts throughout this critical decade to keep a limit of 1.5°C temperature rise within reach" (DFAT 2022).

Above all, Canberra and Washington must implement ambitious policies to cut emissions at home, including by ending coal-fired power, moving beyond gas, and investing in renewables infrastructure, re-thinking personal transport, and decarbonising industrial production. As the global shift to net zero emissions accelerates, both Australia and the US will also need to turbocharge their move away from fossil fuel exports and toward supplying clean energy and zero-carbon commodities.

Figure 4: President of the United States, Joe Biden and Prime Minister of Australia, Anthony Albanese at the ASEAN (Association of Southeast Asian Nations) Summit in Cambodia in 2022.

Responding to the security risks posed by the climate crisis demands both countries accelerate their own emissions reductions while working to bolster global efforts.

3. Climate allies in the Indo-Pacific

Australia and the United States need to cooperate to manage the security implications of the climate crisis itself, and of the energy transition in the Indo-Pacific. The shift away from fossil fuels and toward clean energy technologies has far-reaching strategic implications that are reshaping regional geopolitics. Energy security and effective action on climate change will depend on multiple partnerships and a spirit of cooperation.

Policymakers in Washington understand that investing in clean energy infrastructure is not only about avoiding catastrophic climate impacts but also about ensuring future prosperity and maintaining long-standing security partnerships. Major powers have invested heavily to gain global leadership in clean energy technologies, and to leverage unprecedented economies of scale from their huge domestic markets. For example, China is:

- The global leader in clean energy production and deployment and critical minerals refining today, after 15 years of heavy investment in renewable energy by subsidising the production of solar panels and batteries (Jaffe 2018). In 2021, developments within China alone accounted for 46 percent of the world's construction of new renewable energy infrastructure (O'Malley 2022).

- A major exporter of clean energy technologies and leads global production of solar panels, batteries, wind turbines and electric vehicles (EVs). More than 80 percent of global solar panel production is concentrated in China, and this is expected to reach over 95 percent by 2025 (International Energy Agency 2022a). China has also moved faster than many nations to develop international supply of critical minerals that are essential for clean energy technologies.

The Biden Administration now sees the US in economic competition with China to be a supplier of clean energy technologies. As US Secretary of State Antony Blinken explained in 2021: "[i]t is difficult to imagine the United States winning the long-term strategic competition with China if we cannot lead the renewable energy revolution" (US State Department 2021). Despite the competition, both nations know cooperation on climate policy is crucial for avoiding cataclysmic warming and maintaining regional peace and security.

In recent times, relations between the US and China have cooled, yet they have issued joint statements pledging to work together to implement the *Paris Agreement* and accelerate the transition to a global net zero economy (US State Department 2021). US climate envoy John Kerry continues to liaise with Beijing counterparts and explains that tackling climate change "has to be cooperative, notwithstanding other differences that do exist" because climate is a "universal global threat to everybody in every nation" (Reuters 2023).

The concentration of clean energy production and critical minerals processing in China presents an energy security challenge for countries in the Indo-Pacific, as they become increasingly reliant on a single country for components of batteries, wind turbines, solar panels and electric vehicles. Beijing has used its market power to try to pressure other nations to make policy decisions in its favour (McGregor 2022). This behaviour is not uncommon among major powers throughout history, but presents a new challenge for smaller countries in the region who are reliant on China for clean energy supply chains.

The shift to clean energy is reshaping regional geopolitics. Avoiding climate catastrophe depends on continued cooperation among all countries and developing diverse supply chains.

Australia is well placed to supply critical minerals - such as lithium and copper - that are crucial for booming clean energy industries.

Australia and the US are working together to strengthen energy security for countries across the Indo-Pacific as they move to decarbonise their economies, including:

- Ensuring countries have access to diverse and resilient clean energy supply chains, and are not reliant on any one country for clean energy technologies. These efforts at diversification should not be about presenting development partners with an us-or-them choice, but rather stepping up doing everything possible to support efforts towards decarbonisation and energy security.

- Working with strategic partners to develop more diversified clean energy supply chains (Department of Energy 2022). This is a priority focus for the climate working group of the Quad countries Australia, the US, Japan and India.

As countries move to diversify production, Australia is especially well placed to supply critical minerals - such as lithium, cobalt, nickel, copper and rare earth metals - that are crucial for booming clean energy industries. Australian miners are in pole-position to export critical minerals and component parts to the US for the manufacture of batteries and electric vehicles. Global demand for battery minerals like lithium is skyrocketing. There is expected to be a large gap between supply of lithium and expected US demand (Boyd 2022). This represents an economic boon for Australia, which is currently the world's largest producer and exporter of lithium. The value of lithium exports are already surging, having jumped from $4.9 billion in 2021-22 to $18.5 billion in 2022-23 (Department of Industry, Science and Resources 2023).

The International Energy Agency has also identified India as a pivotal country for diversifying clean energy supply chains and ensuring energy security (IEA 2022a). India is the largest country in the world by population, and is one of the fastest growing major economies (World Bank 2023). India is aiming to become a global manufacturing hub for solar voltaics, green hydrogen, batteries, and electric vehicles. This presents another huge opportunity for Australian mineral exporters, pivoting away from our traditional role of supplying India with fossil fuel exports like coal and gas while building substance into the growing Australia-India bilateral relationship.

Figure 5: The ShanXi DaTong DianDingShan Wind Farm in China has been operational since 2011. Today, China is the global leader in clean energy production and deployment, and critical minerals.

India is aiming to become a global hub for clean industries. Australia can pivot away from its traditional role of supplying India with fossil fuels and continue to deepen Australia-India bilateral trade and cooperation.

BOX 2: CLIMATE SECURITY IN THE PACIFIC ISLANDS

Figure 6: Australian Army soldiers deliver supplies to repair buildings on Galoa island (near Vanua Levu) in Fiji that were damaged by Tropical Cyclone Yasa in 2020.

To pursue shared security interests in the Pacific, Australia and the United States must work closely with Pacific island nations to tackle climate change. This includes deeper emissions cuts at home, and developing a regional strategy with island leaders to drive global ambition to cut emissions.

Pacific island nations see climate change as their primary security concern, and an existential struggle for survival. Compared with the prospect of conflict between major powers, island leaders see the impacts of the climate crisis - stronger cyclones, devastating floods, rising seas and dying reefs - as more immediate threats. In regional security declarations, Pacific nations have repeatedly affirmed climate change is the "single greatest threat" to the region (Pacific Islands Forum 2018).

Australia and the US also have other security concerns in the Pacific. China has a growing presence in the region and is seeking new security arrangements with island nations. In April 2022, Solomon Islands signed a security deal with China which could allow for Chinese military presence and ship resupply. This has alarmed security officials in Canberra and Washington who are concerned about the prospect of China using infrastructure loans to island governments as leverage to secure a naval base in the Pacific (Kilcullen 2023).

Stepping up with stronger actions on climate and energy security can ensure that the US and Australia remain valued partners to the region. In July 2022, Australian Prime Minister Anthony Albanese joined Pacific island leaders to formally declare a Pacific Climate Emergency (Pacific Islands Forum 2022). The Australian Government is also bidding to co-host a United Nations climate summit with Pacific island nations in 2026. Co-hosting the world's annual climate talks will be an opportunity to strengthen global climate ambition.

4. How the US is transforming the global clean energy landscape

The United States is the world's most powerful nation, and largest economy. In 2022, US Congress approved a major new economic package - the *Inflation Reduction Act 2022* (hereafter IRA) - that emphatically signals America's intention to become a clean energy powerhouse. This presents both a major opportunity, and a significant challenge for other countries including Australia.

The IRA allocates US$394 billion (AU$520 billion) to stimulate investment in renewable energy infrastructure and clean energy manufacturing. This is by far the biggest climate spend in US history - representing around a quarter of Australia's national gross domestic product (GDP) and eclipsing the US$90 billion allocated by the Obama administration in 2009. By 2030, measures contained in the IRA are expected to catalyse US$2.5 trillion (AU$3.7 trillion) in new investment - more than the value of Australia's current GDP - and create nine million new jobs (IGCC 2023).

The IRA is a positive package, in that it consists almost entirely of 'carrots' promoting clean energy technologies, with very few 'sticks' for regulating emissions. The IRA focuses on incentives like tax credits, loans and grants, that are expected to spur the creation of up to 1,000 new clean tech companies (Olick 2022). Early analysis suggests the IRA is working as intended, having catalysed more than US$150 billion (AU$220 billion) in private investment in clean energy projects and a boom in new solar, battery and electric vehicle manufacturing facilities in the nine months since the legislation passed. This surpassed total investment into US clean power projects commissioned between 2017 and 2021 (American Clean Power 2023).

The *Inflation Reduction Act 2022* - by far the largest climate investment in US history - presents both a challenge and an opportunity for Australia.

Figure 7: The Alta Wind Energy Centre in the Mojave Desert, California. With an installed capacity of 1,550 MW of capacity, it is one of the largest onshore wind farms in the world and the largest in the United States (Construction Review Online, 2023).

Global impact

Spending of this scale is transformational. The Biden Administration's willingness to use federal government loans to underwrite clean energy industries heralds a new age of government investment to achieve climate goals. Australian officials describe the IRA as "an inflection point in the global energy transformation" that is expected to "re-align global clean energy supply chains [by] drawing labour, capital and technology to the United States" (DCCEEW 2022).

The full impact of the IRA will be measured in its contribution to the global energy transition and emissions reduction task as other countries move to match incentives for clean energy investment. The European Union, for example, has announced its own Net-Zero Industry Act, aimed at scaling up manufacturing of clean technologies in Europe (European Commission 2023). Meanwhile, China continues to subsidise the production of renewable energy, electric vehicles and batteries to the tune of US$564 billion a year (Schonhardt 2023). These trends are driving a surge in investment. Last year, global investment in clean energy technologies - primarily renewables, but also clean transport and home electrification - passed US$1 trillion for the first time (Roston and Rathi 2023). The International Energy Agency suggests this could rise to US$3 trillion each year by the end of the decade (IEA 2023).

Australia needs to act with urgency. Japan has already negotiated a new trade agreement with the US covering critical minerals for electric car batteries, and the EU is looking for similar arrangements (Williams and Inaki 2023). We have leadership in the mining sector, but complacency will see us lose out on opportunities for value-added refining and manufacturing to more ambitious trade partners. If we don't act fast we could also miss our potential to help drive emissions reductions globally, to enhance global cooperation on climate and energy, and secure our own future prosperity. The opportunities and challenges that the IRA poses for Australia's economy is considered further in Section 5.

Domestic climate targets

The IRA is working to help the US meet its domestic climate targets. Without the IRA, the US would see a modest 30 percent reduction in emissions on 2005 levels by 2030 - well below the nation's legislated 50-52 percent goal. With the IRA, US greenhouse gas emissions could fall by up to 42 percent by 2030 (Kamin and Kysar 2023).[2] This gets the US a lot closer to achieving its 50-52 percent emissions reduction goal, but further action will be required by the federal government and state, local and private sector actors (Department of Energy 2022a).

Incentives built into the IRA encourage the manufacturing of batteries, electric vehicles, and renewable energy infrastructure in North America. Through these undertakings, the Biden administration intends to 'onshore' manufacturing industries, and provide high value blue-collar jobs in the so-called 'rust belt', where voters have been disillusioned by industrial decline over recent decades. Already, post-IRA investments in electric vehicles and battery manufacturing are helping to re-industrialise economically depressed regions of the US.

Electric vehicles

The IRA means the US has joined the global electric vehicle (EV) race in a big way. Today, more than 100 Chinese companies produce electric cars and buses. In 2022, Chinese firm BYD overtook Tesla to become the world's largest EV producer (Sito and Ren 2022). China also leads material processing for EV batteries. China accounts for more than half of rare earth metals production and two-thirds of all lithium-ion battery factories (Rapier 2019).

The IRA is set to transform the US car market, by providing $7,500 in tax credits for the purchase of new electric vehicles, which effectively brings forward purchase price parity for EVs by five years (Sahay, 2023). Because they are much cheaper to run, sales of EVs in the US are expected to boom. However, to qualify for the IRA tax credits, vehicles must be assembled in North America and satisfy requirements that critical minerals and battery components be sourced in North America or from US free trade allies. Multinational auto manufacturers have responded to these IRA incentives by shifting production to North America - announcing plans for dozens of new electric vehicle factories and battery projects across the US.

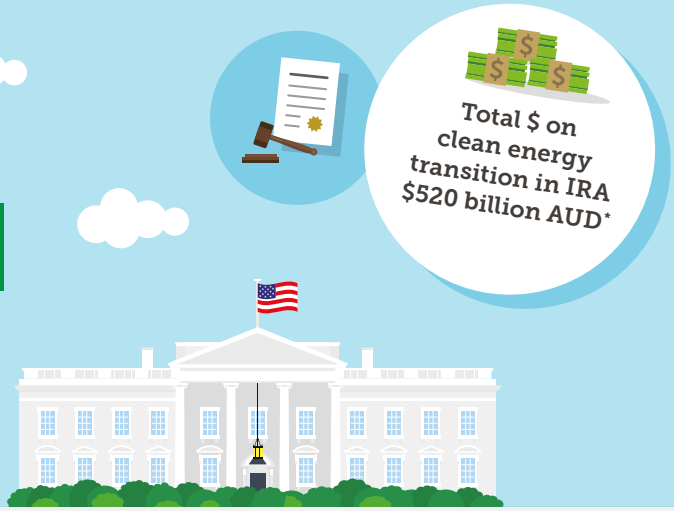
Electricity generation

Over the coming decade, the US will dramatically accelerate deployment of renewables for electricity generation. The IRA contains production tax credits that subsidise the production of clean electricity by up to US1.5c per kWh (or US$15/MWh), and investment tax credits for up to 30 percent of investment in renewable energy projects, including utility scale batteries (Clean Energy Council 2023). Billions of dollars are also allocated to finance new transmission infrastructure. Together, these measures are expected to create 60GW of new renewable energy capacity each year, which is double the amount the US installed in 2021 (O'Malley 2022). The IRA also stimulates investment in clean energy manufacturing. Since it was passed, new investments include 950 million solar panels; 120,000 wind turbines; and 2,300 grid-scale battery plants (White House 2023).

2 Note that there have been a range of estimates as to the emissions reduction that will be achieved under the IRA. Energy Innovation estimated a reduction of 37 to 41 percent; Rhodium Group estimated that the bill would cut emissions by 31 to 44 percent by 2040; and Princeton University researchers at the REPEAT Project projected a 42 percent reduction by 2030 (Mahajan et al. 2022; Larsen et al. 2022; Jenkins et al. 2022 respectively).

UNDERSTANDING THE INFLATION REDUCTION ACT

Select initiatives from the United States' biggest ever climate spend



RENEWABLE ENERGY

- $100 million by 2031 for planning and modelling interregional and offshore wind transmission
- Up to 1.5 cents production tax credit per kWh of renewable or zero-carbon electricity
- Up to 30% of investment in renewable or low-carbon energy projects
- Up to 30% of investment in geothermal heat pump projects
- $760 million in grants to states to help with siting transmission lines
- $2 billion of loans to finance transmission lines

INDUSTRY/ HYDROGEN

- Production tax credits for manufacturing components for renewable energy, batteries and for critical minerals
- Up to 30% of investment in industrial heat, recycling, waste reduction and energy efficiency and other projects
- Up to 10% bonus for domestic manufacturing and American-made products
- Up to $3 per kilogram of clean hydrogen

ELECTRIC VEHICLES

- Up to $40,000 for purchase of commercial clean vehicles
- $4,000 for purchase of used EV or plug-in hybrid
- Up to 30% of cost of charging station
- $7,500 for purchase of new EV

HOUSEHOLDS/ COMMUNITIES

- Up to 30% investment in residential renewable energy and battery storage projects
- Up to 30% of investment in projects that improve home energy efficiency
- Up to 10% bonus for projects in traditional fossil fuel industry communities

MISCELLANEOUS SPENDING

- Greenhouse Gas Reduction Fund: $27 billion in grants to act as seed capital for climate mitigation
- $5.8 billion for projects that reduce emissions of energy-intensive industries

Legend of investment measures

- Investment credit
- Grants
- Tax credit
- Loans
- Other spending

Private investment since the IRA was passed

In the six months since the IRA came into law, more than 100,000 clean energy jobs have been created in the US as a result of almost $90 billion invested.

Projected greenhouse gas emissions reductions from the IRA

Approximately 40 percent reduction on 2005 levels by 2030 - up from estimates of 30 percent reductions without the influence of the IRA.

Projections for private investment spurred by the IRA in the next decade

Up to 4.5 times more than the official initial estimate, comprising:^
- $182b for industrial sector;
- $36b for transport;
- $97b for buildings;
- $580b for power;
- $200b for green financing;
- $522b for manufacturing in the next decade.

*Based on exchange rates at the time IRA legislation was passed. ^Numbers are a total of official estimates plus estimated private-sector and additional US investment.

Primary Source: White House 2023. **Additional Sources:** Department of Industry, Science and Resources 2023; Ellerbeck 2023; Jenkins et al. 2022; Larsen et al. 2022; Mahajan et al. 2022; US Department of Energy 2022.

Disclaimer: All figures in US dollars unless otherwise stated. Information correct at time of publication.

Incentives and subsidies

The IRA contains incentives that make it cheaper for families to electrify their homes, including a rebate program that cuts the price of appliances like electric cooktops and heat pumps. Up to $4,000 worth of rebates are available per household, with the highest subsidies reserved for low income households (Clean Energy Council 2023). Tax credits are also available for the installation of rooftop solar and battery storage. Of course, cheaper household-level power generation also reduces the cost of running electric vehicles.

The IRA also contains subsidies for the production of low-emissions hydrogen. Hydrogen produced using renewable electricity will likely play a significant role in the global clean energy transition - for example, in industrial processes and as a fuel for long-haul freight transport. The IRA provides a subsidy of up to $3 per kilogram of renewable hydrogen produced, which applies to hydrogen plants built before 2032 (Clean Energy Council 2023). This immediately makes renewable hydrogen cost-competitive with hydrogen produced using fossil fuels and positions the US to be a major supplier of renewable hydrogen to key markets in North Asia (shipped as green ammonia). This presents another challenge for Australia, which is also positioning to provide renewable hydrogen into those markets. Globally, trade of renewable hydrogen is forecast to increase to 400 million tonnes a year by 2050, and nations which invest early in the development of these supply chains will have a considerable advantage (Deloitte Access Economics 2023; The Hydrogen Council 2022).

BOX 3: TIME TO STOP DRILLING!

While the US and Australia are stepping up their investments in clean energy and clean industries, both countries have continued to approve new fossil fuel developments.

Recent decisions by Australia's Northern Territory government to allow a full-scale onshore gas industry to go ahead in the Beetaloo Basin, and by the Biden administration to approve a large new oil project on federal land in Alaska, have been widely criticised by scientists as incompatible with tackling the climate crisis.

In addition to accelerating the development of new clean industries, meeting internationally agreed climate goals demands an immediate halt to new fossil fuel developments, and the managed phase out of existing fossil fuel infrastructure.

5. Australia: Becoming a clean energy powerhouse

Australia has a once-in-a-century opportunity to become a clean energy and industrial superpower. As major economies develop industrial policy to promote the clean energy transition, Australia is well-positioned to supply critical minerals and be a global leader in decarbonised industrial products. Developing new clean energy exports will enable us to play a major positive role in the world's efforts to tackle the climate crisis, helping to protect communities everywhere.

Australia can be a clean energy and industrial superpower. But we must act fast.

But we must act fast. The US *Inflation Reduction Act* is redirecting global investment to the United States in areas where Australia could also excel, such as renewable hydrogen, processing critical minerals and battery production. Indeed, Australia - with its mineral resource base and untapped renewable energy potential - has a distinct comparative advantage in these areas. However, this advantage won't last forever. If we don't move fast, we risk missing out on investment and trading opportunities as other nations attract capital and talent, and supply key markets with clean energy exports.

It is clear that Australians want the federal government to support clean energy industries. Recent polling from the Lowy Institute found 90 percent of respondents supported subsidies for renewable energy technologies (Lowy Institute 2022b). Enhancing Australia's competitiveness amid the rapid shift to a low-carbon global economy will require a strategic policy response to stimulate new investment in the clean energy and green manufacturing products of the future.

A CLEAN ENERGY SUPERPOWER: AUSTRALIA'S COMPARATIVE ADVANTAGE

Australia has world-class renewable energy resources. As the windiest and sunniest inhabited continent on the planet, Australia can produce low-cost renewable electricity, which provides a crucial commercial advantage in the development of clean energy industries such as renewable hydrogen. Australia also has globally significant reserves of iron ore, metals and critical minerals that will be needed in the global energy transition. Together, these commercial advantages provide us with the basis for prosperous new export industries in Australia.

Figure 8: Woolnorth Renewables operates two wind farms near Cape Grim in Tasmania - Bluff Point and Studland Bay - with an installed capacity of 64.75MW and 75 MW respectively (Woolnorth Renewables n.d.).

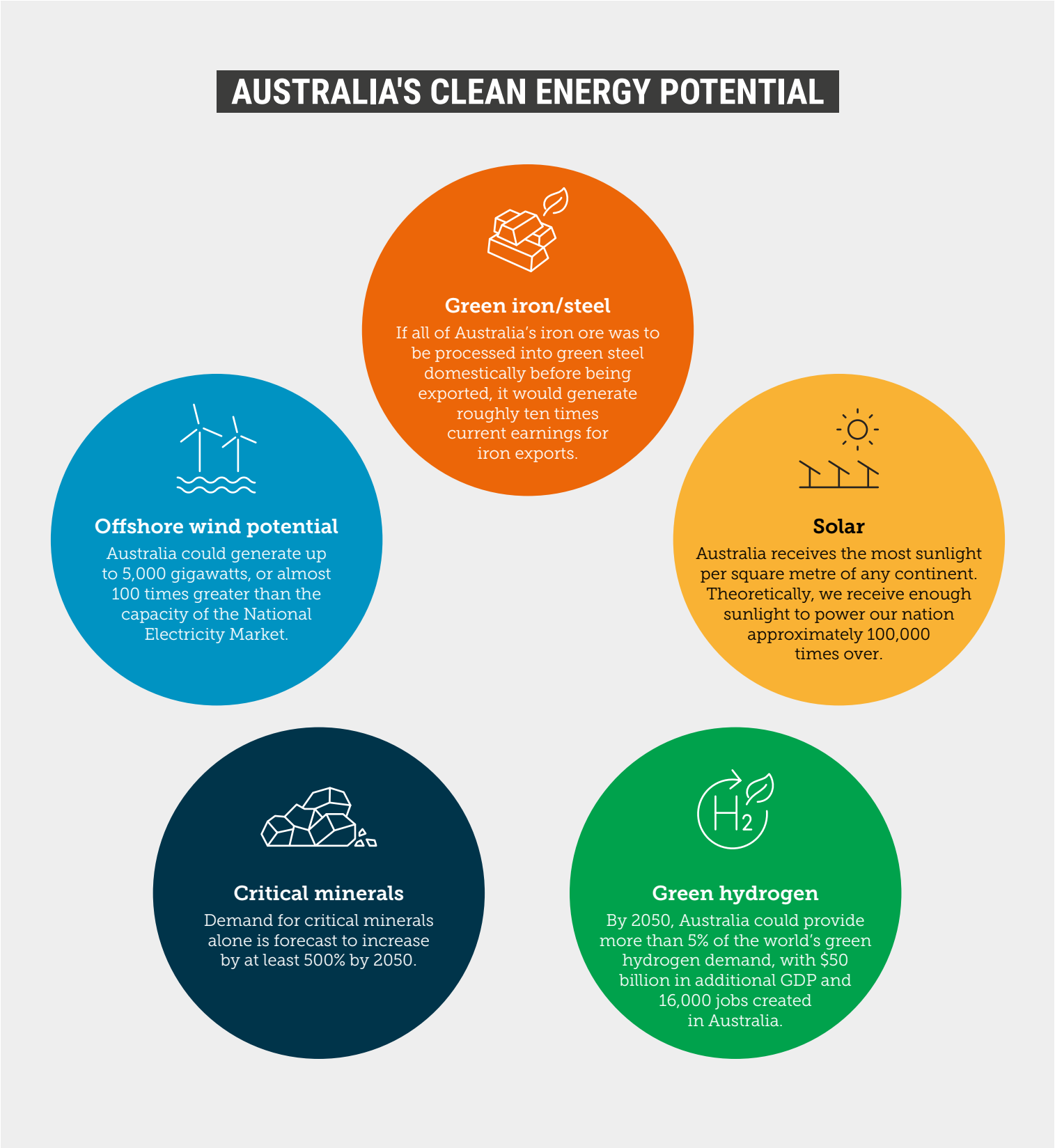


Figure 9: Australia's Clean Energy Potential. **Sources:** Australian Aluminium Council 2022; Climateworks Centre and Climate-KIC Australia 2023; DCCEEW 2023; Geoscience Australia 2021; Global Wind Energy Council 2021; Griffith 2022; World Bank 2019.

By contrast, Australia's existing fossil fuel industry has a limited future. According to the International Energy Agency, to meet the world's climate goals, fossil fuel demand must peak by 2025 at the latest (IEA 2022b). Australia's fossil fuel exports are expected to decline rapidly given their poor compatibility with the emissions targets of key trading partners (Burke 2023). The Australian Government must be proactive about managing the inevitable transition away from fossil fuel exports (Climate Council 2022).

Decarbonising traditional exports

Australian companies can use access to renewable energy and mineral resources to onshore and decarbonise key industrial processes. For example, rather than exporting iron ore or bauxite to China for refining into steel and aluminium, raw inputs can be processed here to make green iron, steel and aluminium using renewable energy resources (Climate Council 2023).

Australia is currently the world's largest exporter of both iron ore and the coking coal (which is used to convert iron into steel, for the most part in Chinese refineries). As the world's steel industry moves to decarbonise production, through direct-reduced iron and electric arc furnaces, Australia is well-placed to export green iron. Likewise, as a world leading supplier of bauxite, alumina and aluminium, Australia could become a world leading source of green aluminium.

Decarbonising mineral exports to China could be one of the single biggest contributions Australia can make to helping reduce global emissions. Recent estimates suggest that by exporting zero-carbon metals to Asia Australia could help cut global emissions by eight percent. This would be the equivalent of cutting all the emissions of Europe and the UK,or as much as Japan reaching net-zero twice over (Garnaut 2022). It could also be very lucrative: if all of Australia's iron ore was to be processed into green steel domestically before being exported, it would generate roughly ten times current earnings for iron exports (Griffith 2022; EY 2023).

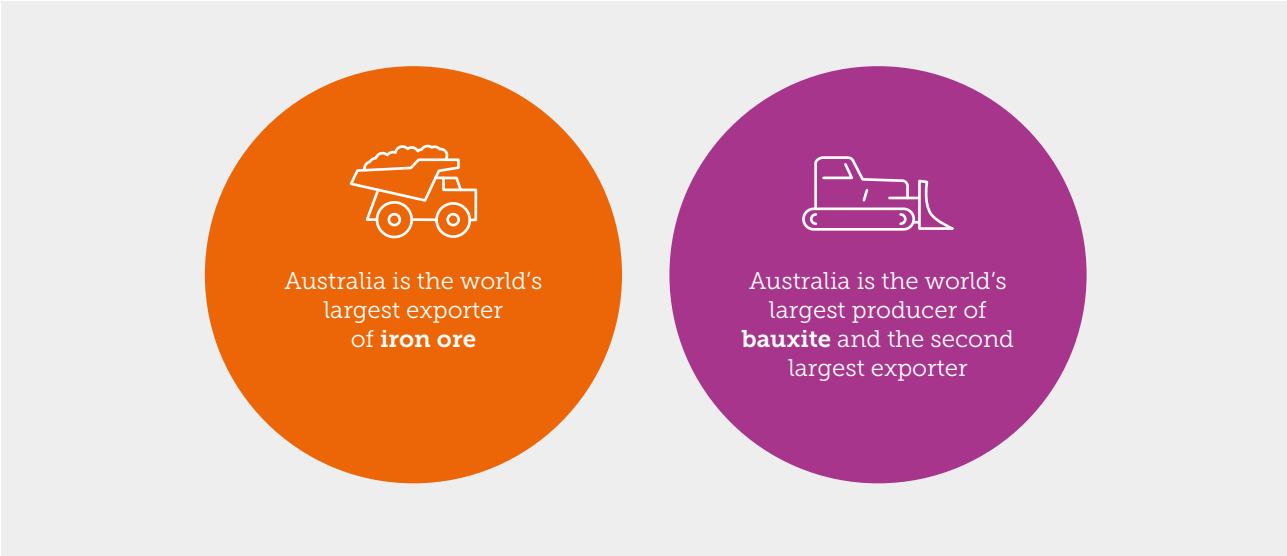


Figure 10: Australia's mineral wealth. **Source:** Australian Aluminium Council 2022; Geoscience Australia 2021.

Expanding critical mineral exports

Already a major mining nation, Australia has many of the minerals that are key to the energy transition. Australia is the world's largest exporter of lithium and third largest of cobalt - both important minerals in batteries - and is the second largest producer of rare earth elements, which are used for magnets in wind turbines and electric vehicles (Australian Government 2021). Australia also has significant reserves of other critical minerals such as tantalum, zircon and titanium, as well as nickel and copper.

As the world transitions toward clean energy technologies the value of critical minerals will overtake fossil fuel exports. Recent estimates suggest the value of Australia's lithium exports will equal the value of thermal coal exports as soon as 2028, while the value of Australia's lithium and base metal exports will match the value of all coal exports in the same year (Department of Industry, Science and Resources 2023).

As global investment in renewable energy and battery storage surges, demand growth for critical minerals will only grow. The International Energy Agency estimates

For Australia, the value of critical minerals exports will soon overtake those of fossil fuel exports.

Figure 11: The Greenbushes lithium mine in the town of Greenbushes, Western Australia. Operational for over 30 years, the mine is undergoing the construction of a third lithium processing plant and retreatment facility (Talison Lithium, 2021).

global export revenue from energy transition minerals will overtake revenue from coal in the next decade (IEA 2021). The International Monetary Fund estimates that these minerals will be worth US$17.6 trillion over the next two decades (Cranston and Mizen 2021; IMF 2021). The World Bank suggests demand for critical minerals will increase by at least 500 percent by 2050 (World Bank 2019).

While new markets for Australian critical minerals offer many new economic opportunities for Australia, any new industrial developments also carry risks of environmental and social harms. Similarly, new large-scale renewable energy developments, along with the transmission lines and other infrastructure required to transform our energy system, require large areas of land and other resources. Careful planning, meaningful local consultations, and appropriate environmental and social safeguards are essential to ensure that all communities benefit from Australia's clean energy and industrial transformation, and that potential harms are minimised. In particular, all developments and decision making must proceed in ways that enable First Nations people - who have sustainably cared for country for thousands of years - to continue to care for land, water and sacred places for thousands more and to share in the benefits of Australia's clean energy boom (First Nations Clean Energy Network 2022).

Securing our economic opportunity

The potential benefits for embracing clean energy export industries are vast - and will be measured in jobs, investment, and economic growth - as well as driving down global emissions. By conservative estimates, Australia's clean energy exports have the potential to generate 400,000 jobs by 2040 - with many of these jobs in the same regions and communities which are currently home to fossil fuel industries (Accenture 2023). Decarbonising heavy industry could add $40 billion per year to Australia's income by 2050 (EY 2023).

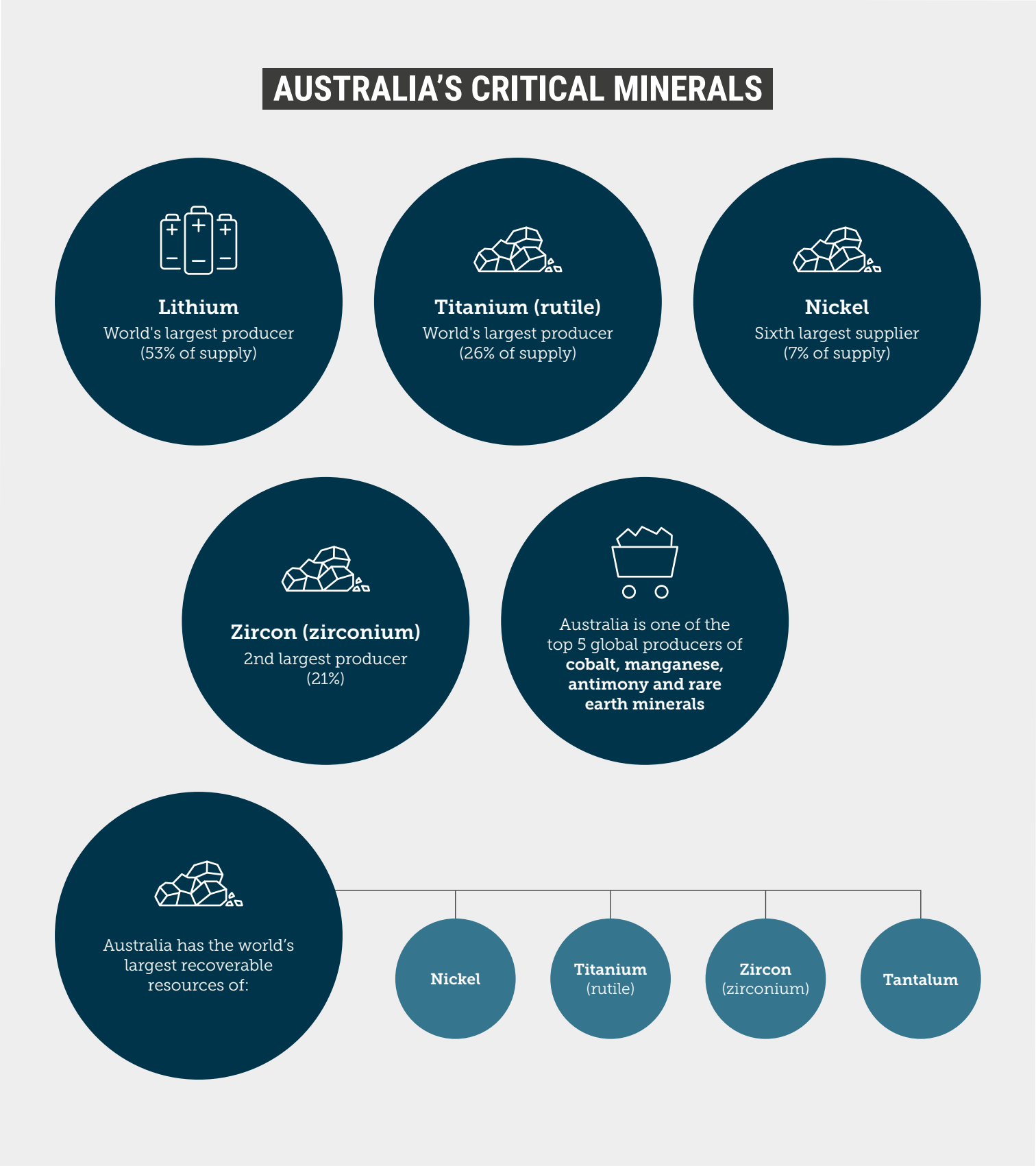


Figure 12: Australia's critical minerals. **Source:** Geoscience Australia 2021.

THE IRA: OPPORTUNITIES AND CHALLENGES FOR AUSTRALIA

The IRA in the United States - and other measures such as the Net-Zero Industry Act in the European Union - are likely to further grow opportunities for Australian exports. However, they are also changing the game in ways that present new challenges for Australia.

The IRA aims to diversify the supply of critical minerals and clean energy technologies to American industry. Most of the legislation's incentives for clean energy production and investment are available to US producers regardless of where they get the technology and inputs they use (Kamin and Kysar 2023). However, some of the provisions are aimed at reducing a dependence on China and diversifying production to the US and among its key allies - a concept known as 'friend-shoring'.

The US Deputy Special Climate Envoy Rick Duke says the IRA "is an explicit invitation to secure allies to join us in the supply chain work that's needed, starting with critical minerals, extraction and processing to allow for scaling up battery manufacturing and supply at an extraordinary unprecedented scale" (cited in Macdonald-Smith 2022).

For battery production, the IRA requires at least 40 percent of the value of critical minerals to come from the US itself or be sourced from an ally with which it has a free-trade agreement, like Australia. This threshold will increase to 80 percent by 2027. European nations, under the EU's Net-Zero Industry Act, are pursuing similar policy initiatives.

As both the United States and the European Union diversify their clean energy supply chains, Australian industry is presented with historic opportunity. With its world-leading reserves of critical minerals, Australia can position as a world leader in these industries (Climate Energy Finance 2023c).

The IRA could also help develop value-added mineral processing in Australia. US battery manufacturers are already investing in Australian facilities that would move from supplying raw minerals to processed materials, ready for the final stage of battery manufacturing in the US. Battery metals giant Albemarle is, for example, building facilities in the Pilbara region of Western Australia to process lithium hydroxide for shipping to the US (Ker and Thompson 2023).

More than just an opportunity, the IRA also challenges Australia to do more to attract investment in Australia's own clean energy industries. Key players in Australia's energy transition - such as the Clean Energy Council, the Clean Energy Investor Group, the Investor Group on Climate Change, and Fortescue Future Industries - argue that direct US government support is acting as a "giant magnet for clean energy investment", making it harder for Australia to attract green capital, equipment and skilled workers (Clean Energy Council 2023; CEIG and IGCC 2023; Fortescue Future Industries 2022).

"Friend-shoring" provisions in the *Inflation Reduction Act* could help Australia develop high value clean industries.

Without strategic government policy to support new industries, Australia could miss the opportunity to capitalise on its competitive advantages in clean energy production. Of particular concern are US subsidies for renewable hydrogen. The IRA provides tax credits for renewable hydrogen that reduces production costs by up to 75 percent, making green hydrogen immediately cost-competitive against hydrogen made using fossil fuels (Climate Energy Finance 2023b). This could see US producers outcompete Australian renewable hydrogen exports, significantly undermining potential exports in coming decades (Deloitte Access Economics 2023).

The Federal Government has taken an initial step down this path with a new *Hydrogen Headstart* program. Announced in the 2023 Federal Budget, the program will see the Australian government invest AU$2 billion in large scale renewable hydrogen projects, helping to bridge commercial gaps in early-stage projects (DCCEEW 2023). This is a welcome first step and will help to scale up the development of Australia's renewable hydrogen industry.

The Australian Government has also recently committed to establish a new National Net Zero Authority, to coordinate programs and policies across government which can attract new clean energy industries and set them up for success - creating new jobs and economic opportunities across regional Australia in particular. This will be crucial to ensure everyone gets to share in Australia's next era of prosperity as a renewables superpower.

Australia will need to develop further policy initiatives that respond to the accelerating global energy transition. This will require a combination of incentives to drive new investment,and regulatory and legislative measures which can ensure Australia's own climate commitments are met. Both approaches will be needed to see new clean industries thrive and set out a managed transition pathway for high polluting industries.

Figure 13: In February 2022, construction began on Fortescue Future Industries' (FFI) Green Energy Manufacturing Centre in Gladstone, Queensland. Once completed, it will help meet growing green hydrogen demand, which reached an estimated 87 million metric tons (Mt) in 2020, and is expected to grow to 500–680 Mt by 2050 (World Bank 2022).

Australia may not need to match the scale of investment that the US has made through the IRA - or the industrial policies of other major economies - because we have significant competitive advantages already. However, further investment will be needed to make sure we capitalise on those advantages. Importantly, the federal government has allocated AU$5.6 million for analytical work to identify how to leverage Australia's competitive strengths in renewable energy, critical minerals and highly skilled workforce to accelerate our clean industrial and manufacturing capabilities (DCCEEW 2023). This should provide a roadmap for additional investment in Australia's future as a clean energy powerhouse.

The Climate Council recommends the Australian Government delivers a major package of initiatives explicitly aimed at developing Australian green export industries. The size and scope of this package should reflect the once-in-a-century opportunity currently in front of Australia to become a supplier of choice for clean energy and clean manufactured goods. The window to act is already closing. Australia has significant comparative advantages in a lower-carbon economy. But without a strategic policy response and significant new government support to drive investment, Australia could miss a once-in-a-lifetime opportunity to transition to a clean energy superpower.

While the *Inflation Reduction Act* presents a tremendous opportunity to Australia, realising this opportunity will require us to respond with similar vision and commitment. New measures in the 2023 Federal Budget are an important start, though further steps are needed and the window to act is closing.

6. Conclusion

The climate crisis and the global race to a clean energy future is profoundly reshaping global geopolitics as well as the security and economic interests of Australia and the US. Action on climate change and energy is now a key pillar of the Australia-US alliance, as both countries work to protect their national security in the face of escalating climate crises, secure their economic futures in a world heading to net zero, and maintain their standing and influence amid growing geopolitical competition.

The US *Inflation Reduction Act* (IRA) marks an inflection point in the world's energy and industrial transformation, posing both opportunities and challenges for Australia. On the one hand, by supporting US allies and free trade partners as alternative sources of critical minerals and renewable energy components, the IRA offers tremendous opportunities for Australia. On the other hand, it has dramatically altered the playing field for some clean industries including renewable hydrogen, meaning Australia must work harder if it is going to play its part.

With its abundant sun, wind, land mass and minerals, deep capital markets and positioning as a trusted, stable energy exporter at world scale, Australia is well placed to thrive in a world heading to net zero. The Australian Government has promised to transition Australia to a clean energy superpower. Growing successful clean export industries will require long-term strategy and focused effort to incentivise the scale of investment we need - especially in light of the fiscal and policy stimulus being offered to clean energy industries in the US, Europe and China.

Recognising that the landscape has shifted, the Climate Council recommends the Australian Government now deliver a major package of initiatives explicitly aimed at developing Australian green export industries and replacing exported fossil fuels over time. The size and scope of this package should reflect the once-in-a-century opportunity currently in front of Australia to become a supplier of choice for clean energy and clean manufactured goods.

If Australia fails to signal and incentivise further investment, we risk missing out on economic opportunities and squandering our comparative advantage when it comes to helping tackle the global climate and energy crises. Positioning ourselves as a clean energy and critical minerals superpower is about getting ahead of the curve, which requires a coherent and ambitious suite of policies, incentives and investments.

For both the US and Australia, beyond the need to secure our economic futures as the world transitions beyond fossil fuels, stronger action on climate change and energy is a clear national security imperative. Working together, the US and Australia – as the world's largest economy and one of its biggest energy exporters respectively – can significantly influence the course of climate action globally, limiting future harms faced by communities everywhere. Nowhere is this more important than in the Pacific, where the US and Australia need to lift their joint game to maintain their standing and influence.

When the world's largest economy makes a decisive move, it changes the game for everyone. Through the IRA, the US has offered a tremendous opportunity to Australia, but one that requires us to respond with similar vision and commitment.

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