

REENERGISING INDO-PACIFIC RELATIONS: AUSTRALIA'S CLEAN ENERGY OPPORTUNITY

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Perth USAsia Centre



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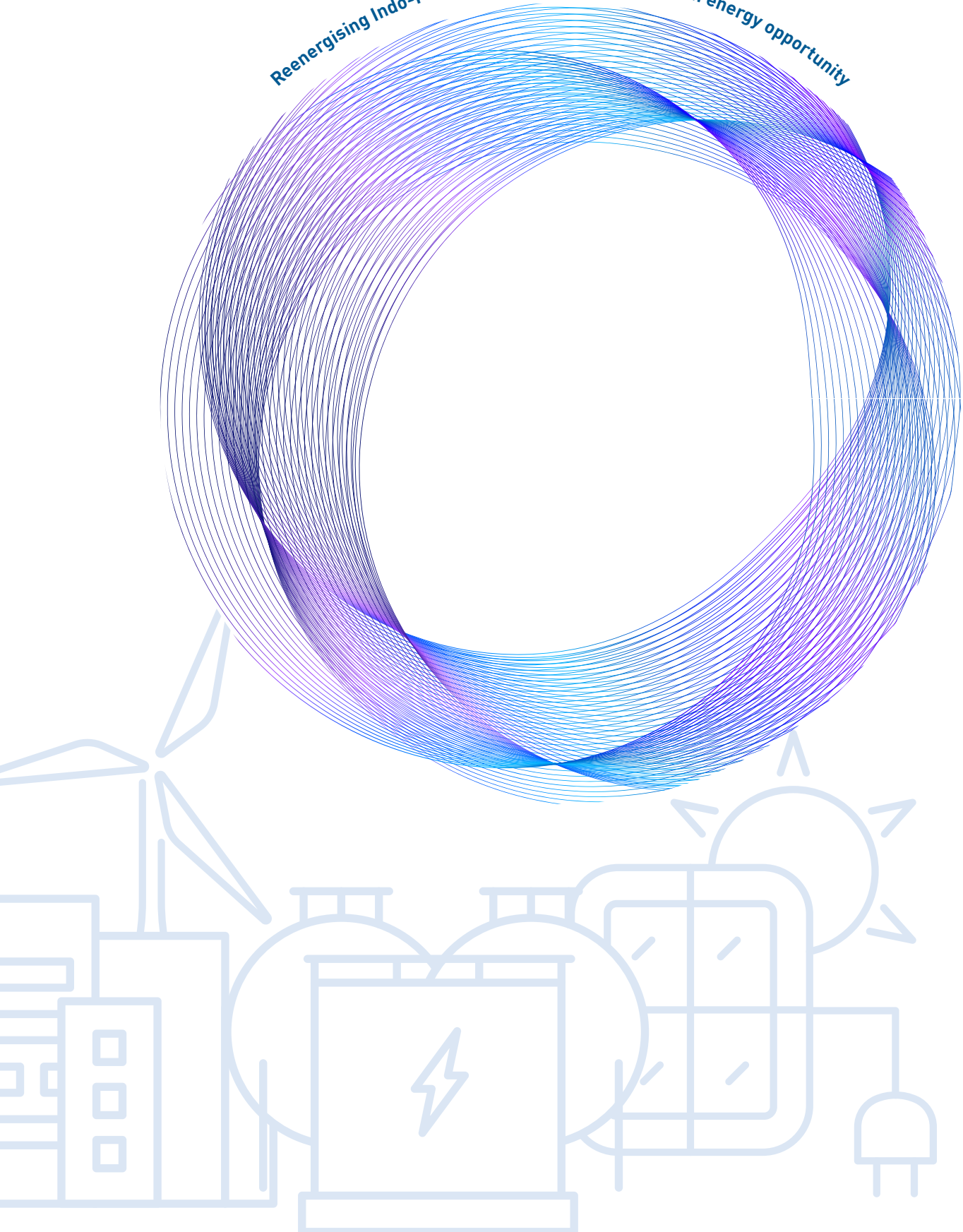
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Reenergising Indo-Pacific relations: Australia's clean energy opportunity





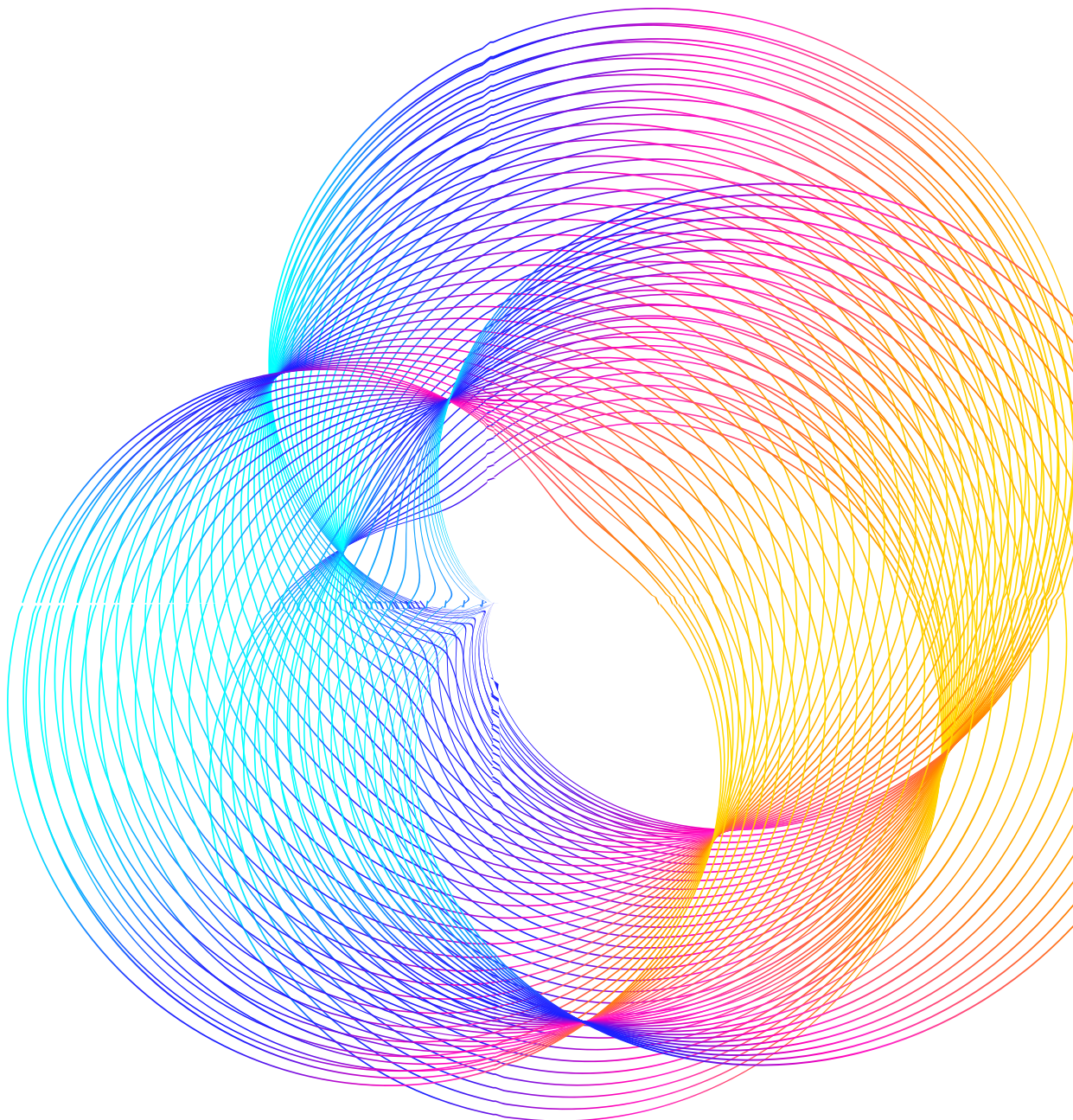
About the author



James Bowen is a Policy Fellow at the Perth USAsia Centre. His work focuses on energy, climate, geoeconomics and broader processes of Indo-Pacific integration. James was a Non-Resident Research Fellow at the Centre from 2018 to 2020. James was a Visiting Research Fellow at Berlin's Mercator Institute for China Studies in 2019. From 2015 to 2017 he worked at the International Peace Institute in New York City, editing its Global Observatory publication and contributing to programs on countering and preventing violent extremism.



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Foreword

A warming planet presents threats to our security the likes of which we have not seen before. Countries in the Indo-Pacific are some of the most vulnerable to the impacts of climate change - including changing rainfall patterns, stronger cyclones, sea-level rise and coastal inundation. The latest scientific assessment by the Intergovernmental Panel on Climate Change (IPCC) has made clear the danger we face: "Climate change is a threat to human well-being and planetary health. Any further delay in concerted anticipatory global action will miss a brief and rapidly closing window to secure a liveable future".

The urgent need to tackle the climate crisis, coupled with the growing economic advantages of renewable energy, is driving an unprecedented global energy transition. The Indo-Pacific - home to many of the world's most dynamic economies - is at the heart of this transition. Today, Australia is a major supplier of coal and gas to economies in the region. However, the shift toward net-zero emissions has fundamentally reshaped Australia's economic prospects. Key destination markets - such as Japan, China and South Korea, which account for two thirds of Australia's coal and gas exports - have set timeframes for phasing out fossil fuels. In the future, growing economies in the Indo-Pacific will continue to want Australian energy, minerals and commodities, but they will be seeking clean energy alternatives.

Australia is well placed to benefit from the energy transition in the Indo-Pacific. As the windiest and sunniest inhabited continent on Earth, Australia has world-class resources for renewable energy and has enviable reserves of critical minerals needed for clean energy technology. This is particularly true of Western Australia, where mining and refining of key minerals can offer new opportunities, as can manufacturing using clean energy. Australia's newly elected federal government has vowed to transform Australia into a clean energy superpower. The community and private sectors have important roles in pushing the federal government to now work quickly to make up for so much lost time.

The Climate Council is delighted to support this pioneering research from the Perth USAsia Centre. As this timely report explains, the clean energy transition will also rewire international relations in the Indo-Pacific. Australia will need to work closely with allies and partners to secure the opportunities of the energy transition, and ensure the clean energy supply chains of the Indo-Pacific are fair and well-governed.

The Sydney Energy Forum - which will take place on 12 and 13 July - is a key moment for Australia to shape the future of clean energy cooperation in the Indo-Pacific. There can be no doubt that Australia's economic and strategic interests are now tied to leading a rapid clean energy transition.

Amanda McKenzie

CHIEF EXECUTIVE OFFICER
The Climate Council





Executive summary

The Indo-Pacific sits at the heart of the global shift from fossil fuels to clean energy systems. The region is home to many of the world's most energy-intensive economies and this will only increase over time. Many Indo-Pacific countries are also key providers of the materials required for clean energy systems. Progress on climate change will depend on meeting the region's needs and maximising its abilities.

The energy transition will transform future regional relations. Renewable energy could provide many countries with enhanced self-sufficiency and diminish the problematic interdependencies that fossil fuels sustain. However, a whole new set of relationships is already arising around the critical minerals, technologies, resources, and industrial goods that underpin clean energy systems.

Clean energy supply chains and relationships must be diversified. China currently dominates many Indo-Pacific and global clean energy sectors and reaps most of the associated economic and strategic benefits. This has created vulnerabilities for the energy transition and broader system of Indo-Pacific relations. Other countries have untapped potential to improve supply chain resilience and create a fairer, more equitable, and well-governed Indo-Pacific transition. Australia and its allies and partners – particularly its Quad partners the United States, India, and Japan – could play a key role in this.

The Indo-Pacific requires a new multilateral framework for managing the energy transition. It is vital that developing states in sub-regions such as the Pacific and South and Southeast Asia are included in clean energy networks. It is also vital to guard against geopolitical risks from the energy transition, including harmful new interdependencies, difficult national transitions, and new “resource curses”. A broad-based framework for guiding future development would best ensure these needs are met.

The time is right to accelerate clean energy and associated climate action. Energy market chaos caused by Russia's war in Ukraine has consolidated the affordability and availability advantages of clean energy over fossil fuels in many regions. A well-resourced and highly coordinated response could turn crisis into opportunity. Placing more emphasis on the energy security and economic and strategic advantages of clean energy could see these become important drivers of decarbonisation.

Australia has vast potential to become a clean energy superpower. Australia has been a major beneficiary of the Indo-Pacific's fossil fuel dependence. Yet it is also well-placed to play a major role in the region's decarbonised future due to its clean energy assets and geopolitical alignments.

Key actions could secure Australia's economic and strategic advantage in the Indo-Pacific's clean energy future. These include developing a dedicated clean energy diplomacy program, providing developing countries with assistance in accessing and participating in supply chains, and helping to develop and lead a truly multilateral framework for meeting regional clean energy needs.



Introduction

The emissions-intensive Indo-Pacific region is central to the global shift from fossil fuels to clean energy systems now underway. The region's fast-growing economies are expected to consume 44 per cent of the world's energy by 2050¹. Fossil fuels such as coal currently dominate the regional energy mix. Indo-Pacific countries also have a particularly strong interest in successful climate change mitigation. Their typically large and/or vulnerable populations face growing exposure to threats such as changing rainfall patterns, stronger cyclones, sea level rise, and coastal inundation.

The necessary scale of the regional energy transition is huge, but activity is gathering pace. The Indo-Pacific is well-represented in the list of over 100 countries – representing more than 80 per cent of the global economy – now committed to achieving net zero emissions by around the middle of the century². Policies aimed at meeting these targets will transform relationships sustained by fossil fuels. More affordable and available renewables will improve energy security and erode troublesome interdependencies. This is particularly important in the wake of Russia's war in Ukraine, which has disrupted markets and increased clean energy's affordability and accessibility advantages.

Yet a whole new set of cross-border relationships is already arising, with repercussions that could last decades. Maintaining secure clean energy supply chains is already a growing diplomatic priority for Canberra and other governments. Sustaining new trade and investment relationships is particularly important for the critical minerals, technologies, resources, and industrial goods that underpin clean energy systems. This is crucial for meeting decarbonisation and energy security goals. In addition, countries with strong positions in clean energy supply chains will generate strong commercial returns. They will also be able to leverage these economic strengths for strategic advantage.

“Pursuit of decarbonisation, energy security, and economic and strategic advantage is driving clean energy activity across the Indo-Pacific”

The promise of improved energy security, and the geoeconomic and geopolitical returns of helping others on their clean energy journeys, could hasten Indo-Pacific decarbonisation and enhance broader regional stability. Yet strong and regionally coordinated policy commitments must overcome significant obstacles. These include the status of China as the Indo-Pacific's undisputed clean energy superpower. Australia



and its regional partners and allies are aware of the need to broaden and deepen supply chains and associated relationships. If successful, they could improve resilience and create fairer, more equitable, and better-governed participation in the region's clean energy future.

Australia has significantly benefitted from the Indo-Pacific's fossil fuel dependency and tailored much of its regional outreach towards sustaining it. Yet it could maintain a major, or play an even greater role in a more climate-conscious region. Australia has strong clean energy assets and a growing presence in emerging supply chains. It has compelling motivations to transition its domestic economy away from fossil fuels. It has equally strong economic and strategic concern for providing other countries with the materials to make their own transitions. This incorporates an ability to both leverage and bolster alignments with other prospective clean energy champions, including through the Quad with India, Japan, and the United States. The new Australian government has declared it will make the country a clean energy superpower. This could enhance Australia's regional relations for decades to come.



How clean energy is transforming Indo-Pacific relations

The world must rapidly transition to clean energy systems to achieve the goals of the 2015 United Nations Paris climate change agreement and head off the worst impacts of global warming³. The Intergovernmental Panel on Climate Change (IPCC), International Energy Agency (IEA), and other prominent institutions are clear in what is required: ending new fossil fuel investment and massively scaling up clean energy alternatives this decade⁴. Renewables, led by solar and wind, must dominate energy supplies to limit global warming to well below 2C°. Under the IEA's *Net Zero* by 2050 roadmap, for example, renewable energy provides about two-thirds of the world's mid-century energy mix⁵.

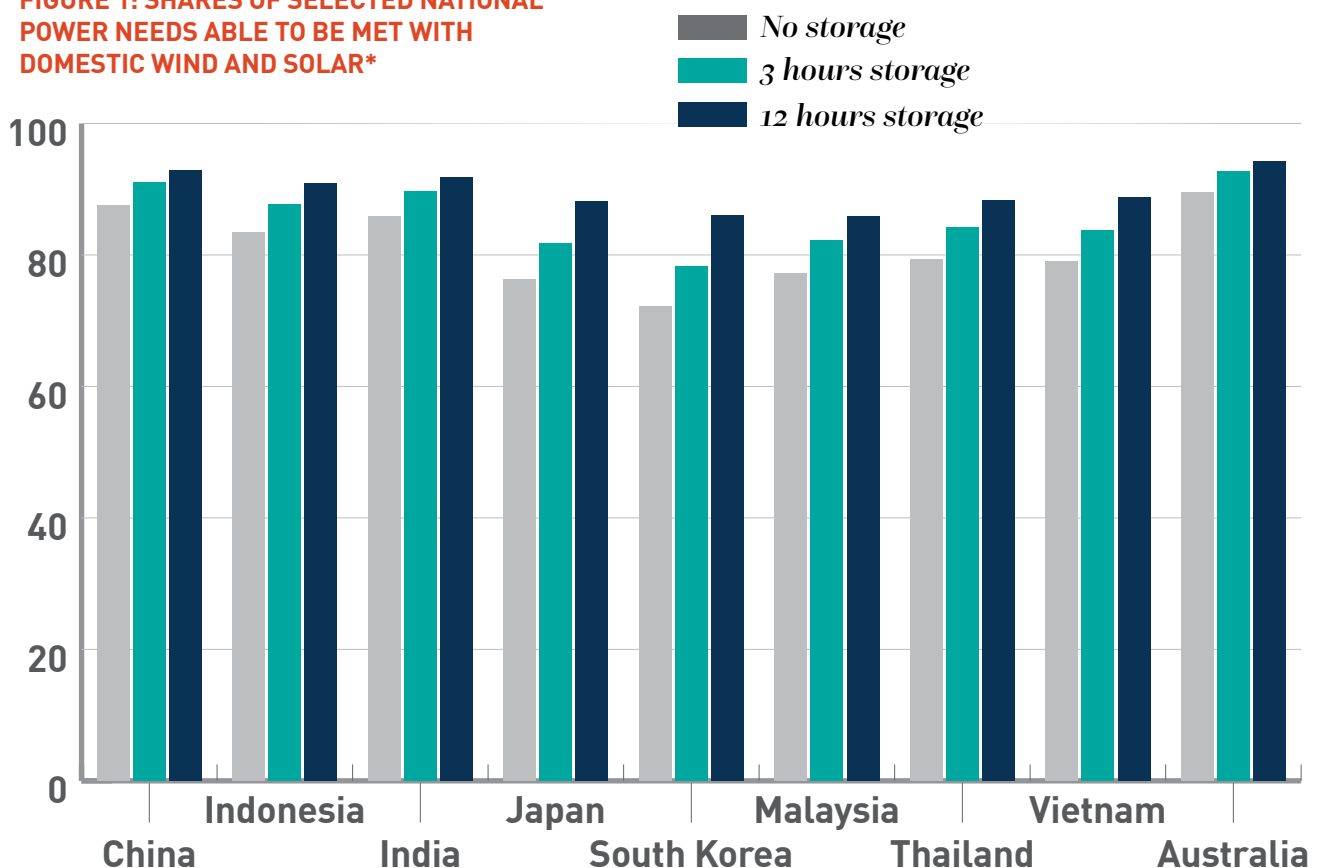
Private sector interests must provide most of the finance for this vision. Yet governments must contribute unprecedented economic and policy support to overcome the considerable inertia that characterises global energy systems⁶. Strong cross-border cooperation between public and private sector interests will enhance collective capacity.

“The Indo-Pacific region sits at the heart of the global energy transition.”

Much of the ongoing change will be concentrated in the Indo-Pacific region. Its economies are expected to account for 44 per cent of global energy consumption by 2050, up from 37 per cent in 2018⁷. The dominance of fossil fuels in the regional energy mix means its intensity of greenhouse gas emissions is higher still, at 52.4% of the global total⁸. The most important benefit of a successful regional transition would be enhanced security and prosperity via improved climate action. Low-lying islands in both the Indian and Pacific Oceans, for example, face an existential threat from sea level rise and natural disasters. Sub-regions such as South and Southeast Asia are also prone to combinations of large populations and low human development that make climate-linked conflict more likely⁹.

The clean energy transition will also reorder Indo-Pacific relations in and of itself. More affordable and widely available clean energy supplies could first provide many countries with improved energy security. Assessments in recent years have consistently shown that renewably generated electricity undercuts new fossil fuel capacity on cost in much of the world¹⁰. Many, if not most, Indo-Pacific countries may also be able to satisfy upwards of 90 per cent of their future electricity-dominated needs with domestic renewables coupled with adequate storage (see Figure 1).

FIGURE 1: SHARES OF SELECTED NATIONAL POWER NEEDS ABLE TO BE MET WITH DOMESTIC WIND AND SOLAR*



*PERCENTAGE OF DEMAND MET WITH VARIOUS STORAGE LEVELS, ASSUMING NO CAPACITY OVERBUILD.
SOURCE: AUTHOR'S CALCULATIONS FROM DAN TONG ET AL.¹¹



Transitioning to clean energy would in turn reduce regional reliance on volatile hydrocarbon markets and the authoritarian actors that have long dominated them. The Ukraine crisis has again brought the geopolitical challenges of such interdependencies into stark relief. India, for example, has resisted joining politically aligned advanced economies in embargoing Russian oil. This action largely stems from its dependence on international markets for upwards of 80 per cent of its oil needs¹². Many other Indo-Pacific economies face similar exposure; regional self-sufficiency of energy usage is expected to

drop from 72 to 63 per cent by 2050 and the Association of Southeast Asian Nations (ASEAN) sub-region is set to become a net energy importer in the next few years¹³.

Notions of 'energy independence' will, however, remain elusive in a new, clean energy world. Ensuring supply and demand of a new set of inputs is already an increasing cross-border priority. The most important interactions focus on the critical minerals, technologies, resources, and industrial goods which underpin clean energy systems (see Box 1).

BOX 1: THE BUILDING BLOCKS OF CLEAN ENERGY PARTNERSHIPS

Critical minerals

High volumes of minerals including lithium, nickel, copper, cobalt, and rare earths are critical to clean energy. The average mineral amount needed for a new unit of power generation has increased by about half since 2010. New midstream and downstream applications are similarly intensive; an electric vehicle requires up to six times the minerals of an internal combustion equivalent¹⁴. Critical minerals are in high demand in highly industrialised and manufacturing-heavy economies, such as those of Northeast Asia, as well as aspiring powerhouses in South and Southeast Asia. Many regional countries – including China, Australia, and Indonesia – are also well endowed with some of the most important minerals. Yet supply chains are typically insecure, due to factors including geological scarcity, environmental concerns, protectionist trade policies, and geopolitics.

Resources

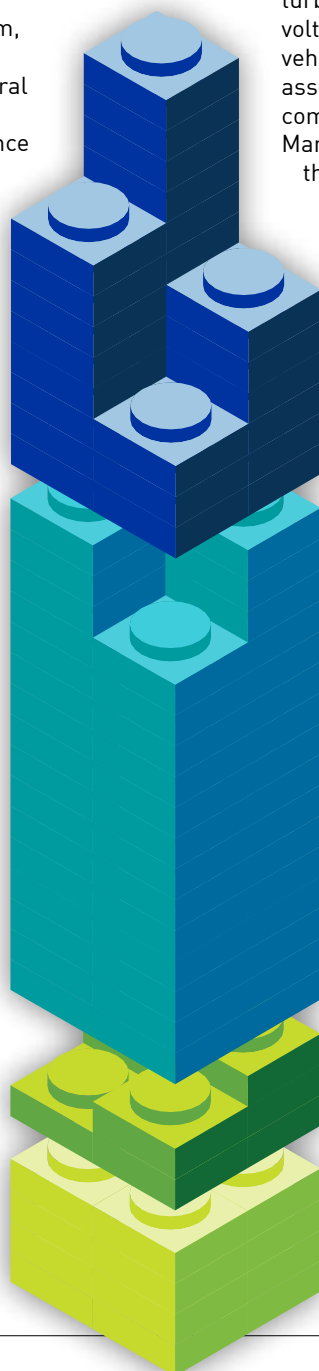
Cross-border commerce must also service some ongoing needs for energy resources. Countries with poor renewables, limited land, and other geophysical, economic, or socio-political barriers – such as Japan, Korea, Taiwan, Singapore, and smaller developing states – will still require imports of renewable electricity or other energy carriers, principally hydrogen and derivatives¹⁶. The latter can be transported via ship or pipeline and have a particularly important role in industrial decarbonisation.

Technologies

Critical mineral dynamics subsequently blend into value chains for new key technologies including solar panels, wind turbines, electrolyzers, batteries, high-voltage transmission lines, and electric vehicles. Processing and manufacturing associated with these are often highly complex and geographically fragmented. Many stages are also much more lucrative than mineral extraction when compared with other industrial activities. Lithium mining, for example, contributes only about 0.5 per cent of the total value generated in battery development¹⁵. Competition to attract midstream and downstream activity is already fierce.

Industrial goods

There could be an additional reordering of regional interactions around 'green' industrial goods produced with renewable energy, renewable hydrogen, and other inputs. This is a particularly vital sector for Indo-Pacific decarbonisation. The regional ratio of industrial greenhouse gas emissions is about 60 per cent higher than the global average¹⁷. Countries with clean energy advantages could benefit from this by attracting more value-added activity in particularly energy- and currently emissions-intensive sectors. Studies have, for example, found cost savings in co-locating renewable energy and hydrogen production near sites of decarbonised iron and steelmaking, as opposed to transporting energy to existing manufacturing sites¹⁸. Similar dynamics may emerge as processes are developed for decarbonising other internationally traded goods.





“Maintaining secure supply chains for the critical minerals, technologies, resources, and industrial goods that underpin clean energy systems is an increasing regional priority.”

Indo-Pacific countries have strong incentives to maintain effective access to, and positions in, supply and value chains for these materials. This will be key to realising their own decarbonisation and energy security goals. Economic and strategic opportunities will also flow from meeting the needs of others. Yet there are considerable obstacles to progress. The overriding concern is around facilitating massive levels of new investment in a timely and responsible manner. The IEA estimates achieving net zero emissions by 2050 will require annual global clean energy outlays to more than triple by 2030, to around US\$4 trillion. As the IPCC’s April 2022 report noted, there are additional geophysical, environmental-ecological, technological, and especially ‘institutional and socio-cultural’ barriers to the transition¹⁹. Actions by

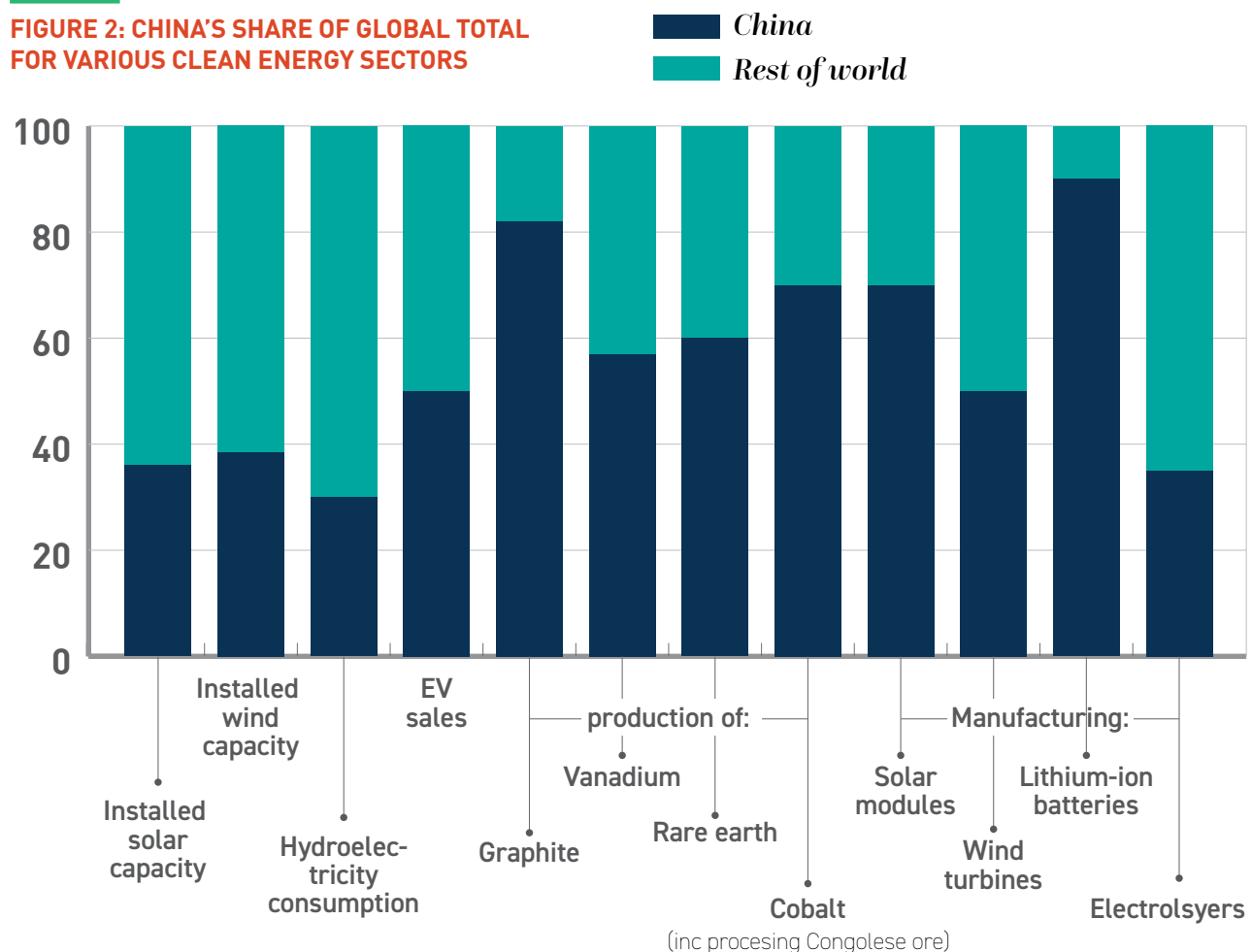
fossil fuel interests to frustrate progress and the need for just transitions that protect livelihoods sustained by carbon-intensive systems are prominent in this last category.

“Realising the Indo-Pacific energy transition will require trillions of dollars in new investment.”

One country, China, has already emerged as the clear frontrunner in accelerating clean energy activity, both regionally and globally. China boasts the world’s most emissions-intensive economy, yet it also has the greatest deployment of renewables, other clean energies, and associated technologies. It simultaneously dominates supply and value chains for many of these technologies and the critical minerals underpinning them (see Figure 2). China could also expand its role in emerging clean resource and industrial sectors in years to come. A national hydrogen strategy unveiled in March 2022 lay the groundwork for future domestic development and cross-border provision of electrolyser technology, and possibly hydrogen molecules²⁰.

SOURCE: AUTHORS CALCULATIONS FROM BP²³;
DABELSTEIN ET AL.²⁴; WILSON²⁵;
WHITWORTH ET AL.²⁶; IEA²⁷

FIGURE 2: CHINA'S SHARE OF GLOBAL TOTAL FOR VARIOUS CLEAN ENERGY SECTORS





The State Grid Corporation of China also retains ambitions of creating a massive international electricity grid that would enhance demand for Chinese technologies and energy²¹. China's two largest steelmakers, Baosteel and Hebei Iron and Steel Group, are progressing industrial activity, through efforts to develop green steelmaking²².

China's clean energy strengths have increased its relative energy security and reduced some exposure to the attendant geopolitics of global hydrocarbon markets²⁸. Meeting other countries' growing needs for clean energy inputs has generated significant economic returns and strategic interdependencies. Beijing has rolled out new exports and systems of interconnectivity via its Belt and Road Initiative (BRI). Policymakers are reportedly also reengineering this platform to provide more clean energy support following China's 2021-announced pullback from financing international coal²⁹.

“China’s supply chain dominance creates significant vulnerabilities for the Indo-Pacific transition.”

These Chinese interventions have kickstarted the Indo-Pacific energy transition. However, their great scale and heavily subsidised nature have also denied other countries opportunities for fair and equitable participation. Reports of poor governance outcomes, including environmentally damaging mining operations and forced labour in manufacturing, are also common³⁰. Concentrating so much activity in a single authoritarian country ultimately creates too many vulnerabilities. The supply chain disruptions that followed the Covid-19 pandemic and related lockdowns, as well as the Ukraine war, have reinforced the need for states to maintain trusted economic relationships and secure access to critical goods. China's clean energy partners also cannot ignore its history of coercion of economically interdependent countries. Australia has itself suffered harshly in recent years, with Beijing sanctioning exports including coal, wine, barley, and beef following political disagreements³¹.



Broadening and deepening regional supply chains

Many Indo-Pacific countries are aware they must play a larger role in clean energy supply chains and relationships. Yet this process must begin with acknowledging there is no easy way around China's dominance. The ongoing fallout from tariffs imposed on Chinese-manufactured solar panels heading to the United States is a prominent reminder of this. US presidents from Barack Obama through to Joe Biden have held valid concerns around unfair Chinese trade practices harming domestic manufacturers³². However, resulting higher costs have hampered US renewables growth. The Biden administration acknowledged this reality in June 2022, when it waived tariffs on panels coming to the US from Cambodia, Malaysia, Thailand, and Vietnam with suspected Chinese value chain involvement³³.

Countries with sufficient capacity should continue to pursue only selective uncoupling from Chinese supply chains, while building their own presence in parallel. Doing so in sectors where China dominates, such as solar manufacturing, will be a long-term proposition. Stronger near-term supply positions could, however, be achieved in still evolving areas, including batteries, and emerging prospects, such as hydrogen and green industrial goods. Success will depend on adapting some of the more benign elements of Beijing's approach – long-term industrial planning, utilisation of scale, and provision of strong financial support – while retaining commitments to market-based principles and high

governance standards. International coordination of efforts and resources is equally vital. The diversity of Indo-Pacific states, and often conflictual nature of regional relations, dictates that such processes will, at least initially, need to be managed by likeminded partners.





“Rushed uncoupling from China could jeopardise the regional energy transition.”

Elements of the necessary approach are already present in the Indo-Pacific critical minerals space. Sectoral strategies have been implemented by countries which will mostly be consumers, such as Japan, major producers, such as Australia, and 'prosumers' with interests in both sides, such as the US (see Table 1). Partnerships that exploit complementarities between these parties are key. Australia has, for example, worked with Japan, the US, Korea, and India to attract new investment in its mines and meet communal needs. An important recent outcome in this process was the Australia-India Economic Cooperation and Trade Agreement, which eliminated tariffs on most Australian critical minerals heading to India³⁴. Washington is also looking to retool its international finance agencies so that US taxpayers might join American industry in becoming major funders of Australian mines³⁵.





TABLE 1: MAJOR INDO-PACIFIC-FOCUSED CRITICAL MINERALS STRATEGIES³⁶

	COUNTRY	POLICY DOCUMENT	YEAR ADOPTED	PRIORITIES
JAPAN		STRATEGY FOR ENSURING STABLE SUPPLIES OF RARE METALS	2009	<ul style="list-style-type: none"> › Minimising risks associated with dependence on Chinese supply › Sponsoring development of new suppliers in third countries › Promoting recycling and use of alternative materials › Maintaining stockpiles
AUSTRALIA		CRITICAL MINERALS STRATEGY	2019	<ul style="list-style-type: none"> › Contributing to international value chains › Attracting investment › Spurring innovation › Developing supporting infrastructure
INDIA		CRITICAL NON-FUEL MINERAL RESOURCES FOR INDIA'S MANUFACTURING SECTOR: A VISION FOR 2030	2016	<ul style="list-style-type: none"> › Supporting growth of manufacturing industry › Upgrading institutional capacity › Promoting local processing › Developing international partnerships
UNITED STATES		CRITICAL MINERALS AND MATERIALS STRATEGY	2010	<ul style="list-style-type: none"> › Ensuring smooth energy transition › Strengthening supply chain › Research › Developing international partnerships

Cooperation between countries with differing comparative advantages remains important in the technology space. Battery and EV dynamics provide a good example. Japan and Korea have prominent positions in battery pack assembly – the only stage of the value chain where China does not dominate. Australia holds a strong position in mining, particularly for lithium, as does Indonesia, particularly for nickel. All parties have a subsequent interest in working to diversify midstream activity. This has precipitated arrangements such as a February 2022 Korea-Indonesia memorandum of understanding on developing bilateral value chains³⁷. A \$US9 billion deal between an LG-led Korean consortium and Indonesian partners for a “mine to manufacturing” project followed in April 2022³⁸.

“Australia and its allies and partners have strong strategies concerning critical minerals and clean energy technologies and are increasingly integrating their efforts.”

Similar arrangements remain possible, and desirable, in technology sectors such as solar. The US has supported India’s potential – owing to assets such as abundant low-cost labour and rising policy support from Prime Minister Narendra Modi’s government – to emerge as a top two or three solar manufacturer in the next few years³⁹. The US International Development Finance Corporation granted a US\$500 million loan to an American company building a panel plant in Tamil Nadu in December 2021⁴⁰. This will advantage the two countries’ manufacturing interests while maintaining the renewables rollout.

Important relationships around the cross-border trade in clean energy resources are also emerging. Hydrogen and its derivatives have dominated most recent activity. Japan and Korea have placed particularly large bets on utilising this fuel in transportation, power generation, and the industrial sector⁴¹. Japanese public and private interests have been the earliest movers in developing nascent supply chains in countries including Brunei and Australia (albeit based on fossil fuel production pathways to begin with).



The Japanese Bank for International Cooperation has also designated hydrogen an ‘essential resource’, which paves the way for further investments in developing countries in regions such as Southeast Asia⁴². Canberra has itself invested heavily in its relationships with Japan, Korea, and other importers. It is also accelerating associated domestic activity, including funding export-capable hydrogen hubs across the country. India’s *National Hydrogen Mission* of 2021 similarly aims to turn the country into a “global hub for fuel production and export”⁴³.

“Japan and Korea are leading demand-side activity in regional hydrogen market creation. Australia and India are prospective supply-side champions.”

There is also significant potential for cooperation on the direct trade in renewable electricity. Developers of the Sun Cable project are, for example, planning a 5000km-long transmission line from a massive solar farm in the north of Australia to Singapore, with the potential to provide up to 15 per cent of the island nation’s electricity⁴⁴. The Indonesian government has also discussed and laid some regulatory groundwork for sending solar exports to Singapore⁴⁵. Governments should direct more effort to promoting these bilateral electrification arrangements where proven to be economically sound. They are a more achievable form of integrating variable renewables than complex multilateral equivalents. An ASEAN-wide energy grid promoted since the 1990s has struggled to progress due to political, financial, technical, and environmental issues in coordinating so many parties⁴⁶.

Industrial decarbonisation is a still developing but vital frontier of partnership formation. Governments are looking to accelerate new processes for reducing emissions in sectors such as steelmaking, chemicals, and plastics. Washington, for example, announced new support mechanisms including major procurement pledges for green products resulting from new technological processes in February 2022⁴⁷. International partnerships, such as provisions of the US-Japan Competitiveness and Resilience Partnership, largely revolve around joint industry research and development⁴⁸.

“Initiatives such as the Korea-Australia Low Emissions Technology Partnership could expedite industrial decarbonisation.”

New patterns of cross-border trade in the industrial products that result from these processes will take some time to develop. They could, however, be expedited by ties such as the Korea-Australia Low Emissions Technology Partnership implemented in 2021, which is investigating a bilateral green iron and steel supply chain⁴⁹. Trade policy, such as a US-European Union proposal to erect barriers on higher carbon steel and aluminium – principally targeting dirtier imports from China – could also be key⁵⁰. Other Indo-Pacific governments should engage with this process or look to develop equivalents.



Enhancing the energy transition's inclusivity and governance

Most of this clean energy cooperation is occurring on a bilateral basis, motivated by participating countries' pursuit of energy security, decarbonisation, and economic and strategic interest, and further informed by the political difficulties of wider coordination. Yet larger alignments have considerable utility for establishing new standards and achieving necessary scale. There is an associated need for Indo-Pacific countries with significant capacity to aid those lacking easy access to, or clear roles in sustaining, clean energy networks. Broad-based engagement should also guard against some of the potential negative ramifications of the regional transition.

The 'Quad' of Japan, India, Australia, and the US has played a growing role in recent Indo-Pacific clean energy development. This reflects the considerable individual needs and abilities of its constituent countries, and the growing interests of the other countries with which the group interacts. The Quad has adopted a general focus on supply chain development, and specific interests in hydrogen, green shipping, and carbon capture, utilisation, and storage (CCUS), which might play a limited role in industrial decarbonisation⁵¹. Australia will host an important outreach vehicle, the Sydney Energy Forum, with support from other Quad members and the IEA in July 2022⁵². This will discuss ways to scale and accelerate the adoption of technologies and ensure resilient supply chains. It will focus on ultra-low-cost renewables, batteries and critical minerals, and hydrogen and ammonia.

“The Quad is well-calibrated to play a major role in Indo-Pacific clean energy outreach.”

High-capacity countries and groupings such as the Quad will ideally grow and develop their Indo-Pacific clean energy presence. There is an imperative to work with developing countries with significant decarbonisation needs and/or abilities but more limited capacity to meet and/or develop them. One of the energy transition risks which these higher capacity countries should also address is the potential for harmful new clean energy interdependencies resembling those common in the fossil fuel sector. Threats involving China are most prominent here and have some precedent; a notable 2010 incident saw Beijing embargo rare earths exports to Japan as suspected retaliation over a territorial dispute⁵³.

BOX 2. THE RESOURCE CURSE AND CRITICAL MINERALS

The resource curse refers to the observed propensity for poor developmental outcomes – including economic stagnation, corruption, political instability, and environmental degradation – in countries rich in natural resources⁵⁴. Recent investigations have considered the possibility that the energy transition might see these challenges shift from major fossil fuel to major critical minerals producers⁵⁵. Differentiating factors – such as less potential for massive economic rents – will likely minimise risks. Yet considerable attention must still be paid to ensuring at-risk countries maintain sufficient institutional capacity to sustainably manage minerals wealth and external interest in developing it. One important outcome would be equipping mechanisms for managing the existing resource curse with new capacity for responding to the energy transition. One example of these is the Extractive Industries Transparency Initiative, which provides a standard for governing oil, gas and mining value chains⁵⁶.

Another necessary concern is that some Indo-Pacific countries highly dependent on fossil fuel revenue might struggle to adapt to new realities. More than 45 per cent of East Timor's GDP is generated by oil and gas rents, for example, while Brunei and Papua New Guinea also have significant hydrocarbon reliance⁵⁷. Yet another risk is the potential for the 'resource curse' of poor social and environmental outcomes to affect countries who are institutionally poor but rich in critical minerals (see Box 2). Major nickel provinces Indonesia and the Philippines could see challenges as activity increases. A plethora of governance issues will also arise should critical minerals demand spark extractive activity in the many prospective deepsea regions of the Indian and Pacific Oceans⁵⁸.

“The regional energy transition should guard against new harmful interdependencies and resource curses and work to facilitate just transitions.”



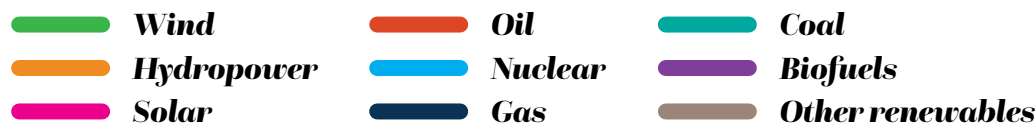
The ideal mechanism for managing this complex Indo-Pacific energy transition would involve a multitude of partners. Some governments have already launched platforms for fostering broad-based interactions of this nature. The US under President Biden has unveiled Clean EDGE (Enhancing Development and Growth through Energy) Asia – an update of the Trump-era Asia EDGE program – to provide technical and financial support to developing countries⁵⁹. Washington has also partnered with Tokyo in incorporating a clean energy financing and facilitation focus in their ongoing Japan-U.S. Mekong Power Partnership⁶⁰. India under Prime Minister Modi has built key multilateral institutions, such as the International Solar Alliance, which has a mission of connecting developing countries with new solar opportunities⁶¹.

High-capacity countries and groupings should consolidate their leadership of clean energy outreach and create an even more inclusive program of engagement focused on decarbonisation, energy security, and economic and strategic opportunity, with a commitment to strong governance standards and just transitions. The conditions for new commitments of this nature are currently ideal. Russia's war in Ukraine has compounded pre-existing pressures on energy and related commodity markets. Clean energy prices have increased, but not nearly as much as those for oil, gas, and coal⁶².

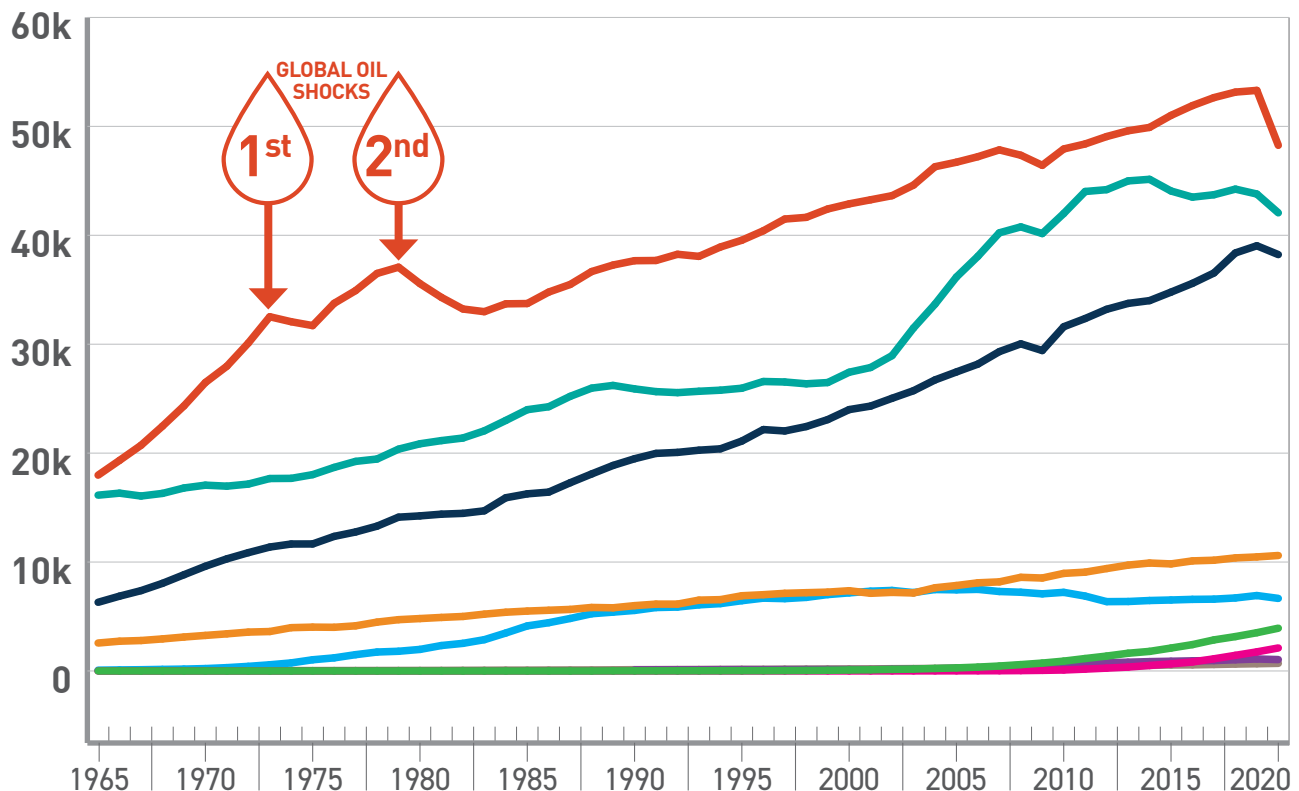
“The energy market chaos precipitated by Russia's war in Ukraine incentivises an accelerated energy transition.”

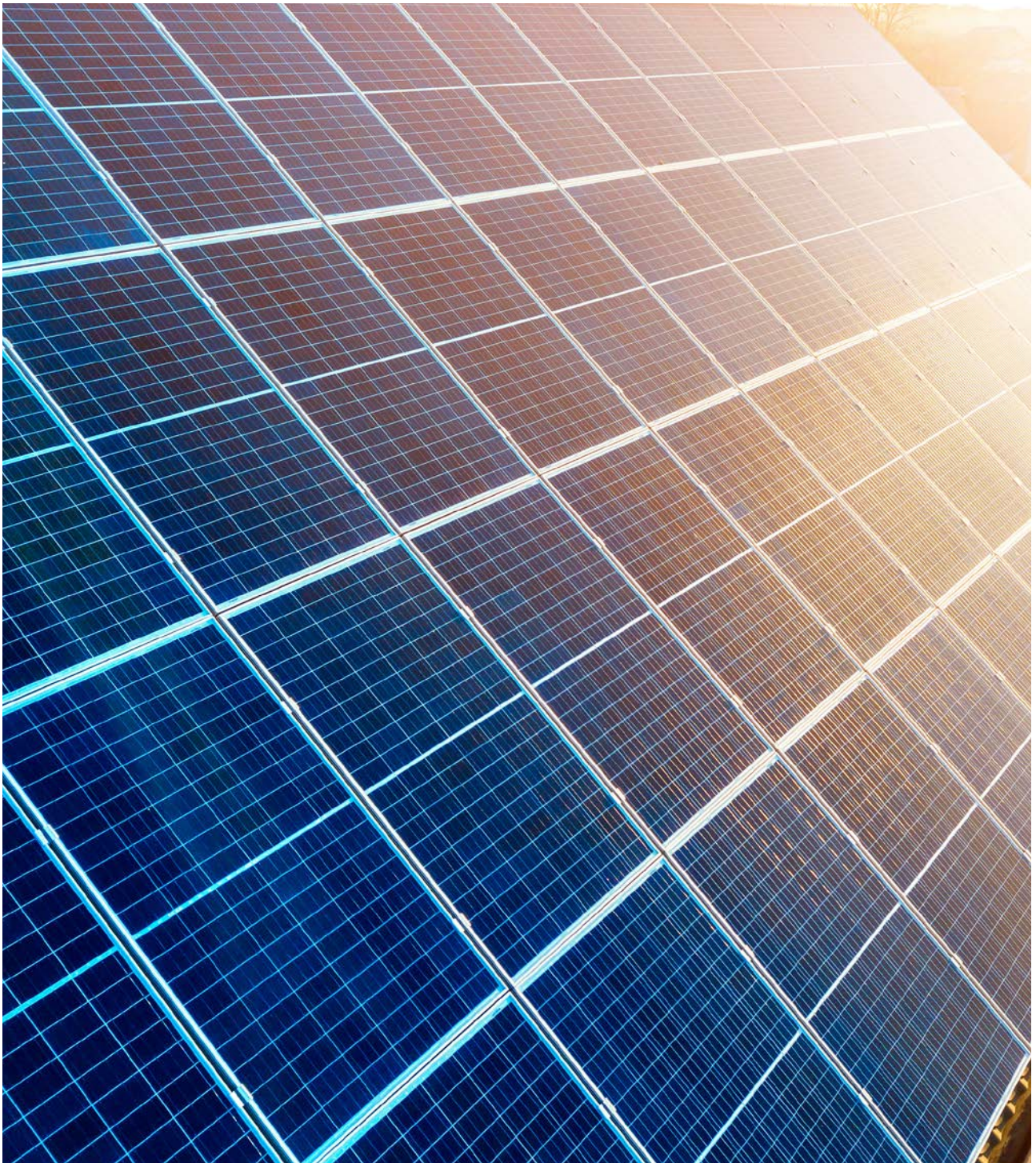
FIGURE 3: ENERGY MIX EFFECTS OF GLOBAL OIL SHOCKS

SOURCE: AUTHOR'S CALCULATIONS FROM BP⁶³.



Primary energy consumption by source (Twh)





Past energy crises, principally the global oil shocks of 1973 and 1979, have helped diversify the global energy mix, including towards clean energy, as well as different types and origins of fossil fuels (see Figure 3). Contemporary climate-minded policy responses should seek to repeat the first of these outcomes but retard the second. The 1970s oil crises also produced a new spirit of cooperation among major energy consumers,

typified by the formation of the IEA and its various contributions to collective energy security. Responses to current disruption should recapture this spirit, while recognising the new decarbonisation imperative, the energy security benefits of clean sources, and the shift in market power from the advanced West to the still developing Indo-Pacific.



Maximising Australia's superpower potential

Australia has benefitted both economically and strategically from the Indo-Pacific's dependence on fossil fuels, principally coal and natural gas, for which it is a major exporter. Yet it also has a strong incentive to embrace Indo-Pacific clean energy. Exploiting its considerable domestic assets and maximising national access to regional clean energy supply chains – including through its own well-balanced ongoing reliance on China – could help Australia meet its own decarbonisation goals and enhance its energy security. Australia is well-positioned to simultaneously become a major player in key clean energy supply chains. Existing alignment with many other key parties and groupings to the regional energy transition, principally the Quad, supports this mission.

Australia has taken small steps towards embracing its clean energy potential in the past few years. The new government of Prime Minister Anthony Albanese has promised far greater ambition. Albanese's victory speech of 21 May 2022 spoke of ending the "climate wars" that have long plagued the country's politics and of Australia becoming a "renewable energy superpower"⁶⁴. Canberra is yet to clearly define the envisioned characteristics of Australia's potential new superpower status. Yet the government would ideally adopt a maximalist interpretation that pursues newfound economic and strategic capabilities, both at home and abroad. This would incorporate efforts to enhance domestic energy security and decarbonisation, achieve a strong position in clean energy export markets, accelerate the Indo-Pacific transition in other supportive ways, and pursue beneficial new interdependencies that boost its own and the region's prosperity and stability.

“Realising Australia's potential as a clean energy superpower could deliver significant economic and strategic returns at home and abroad.”

Australia's journey towards clean energy superpower status would begin with an accelerated buildout of domestic electricity powered by the country's affordable and abundant wind and solar. This would be accompanied with significant investments in storage, transmission, and end use technologies such as EVs, as well as renewable hydrogen and derivatives in hard-to-abate applications. This would improve national energy security at a time of over-inflated energy prices. Australian domestic spot market prices for gas, for example, rose as much as 400 per cent in the month to June 2022 alone⁶⁵.

A major international cause of Australia's 2022 energy crisis – working in concert with many domestic factors – has been Russia's war in Ukraine. There are also longer-standing structural origins in the nation's dependence on fossil fuels and exposure to international markets, in which it participates as both a major exporter and importer. The most acute of these concern the oil sector, in which Australia has a near total dependence on foreign supply lines, due to a combination of falling domestic production and refining capacity and an inability to maintain an IEA-mandated storage level of the equivalent of 90 days' usage⁶⁶.

“Investing in new clean energy production, storage, transmission and consumption would help alleviate Australia's overdependence on volatile oil markets.”

Building out Australia's clean energy capacity would enhance the country's industrial competitiveness through lower costs. It would also improve its geopolitical operability. As it stands, Australia remains materially supportive of, and highly vulnerable to disruption of, fossil fuel markets. This status quo will continue to diminish its ability to weather sanctions against problematic hydrocarbon producers led by allies and partners. It also creates a more direct vulnerability through potential disruption of oil supply chains. This risk is especially severe at a time of growing Indo-Pacific contestation.

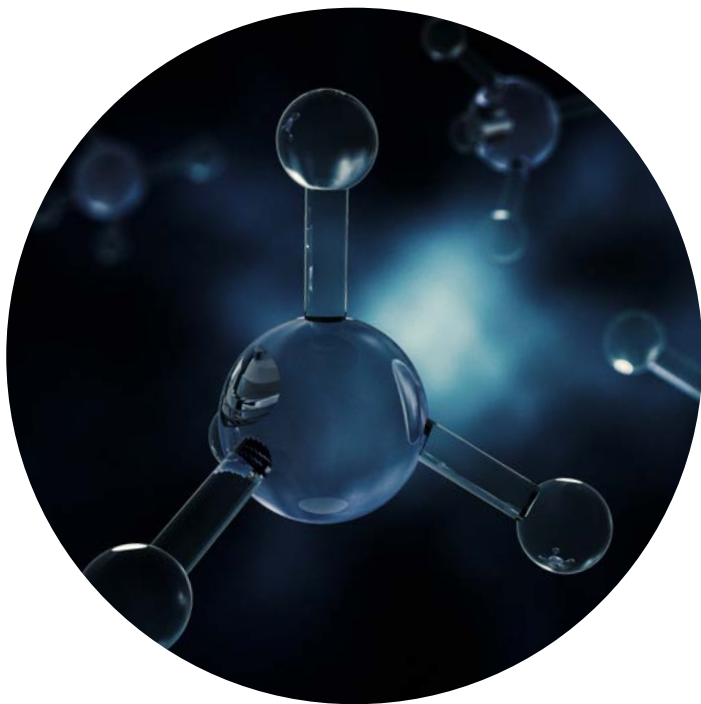
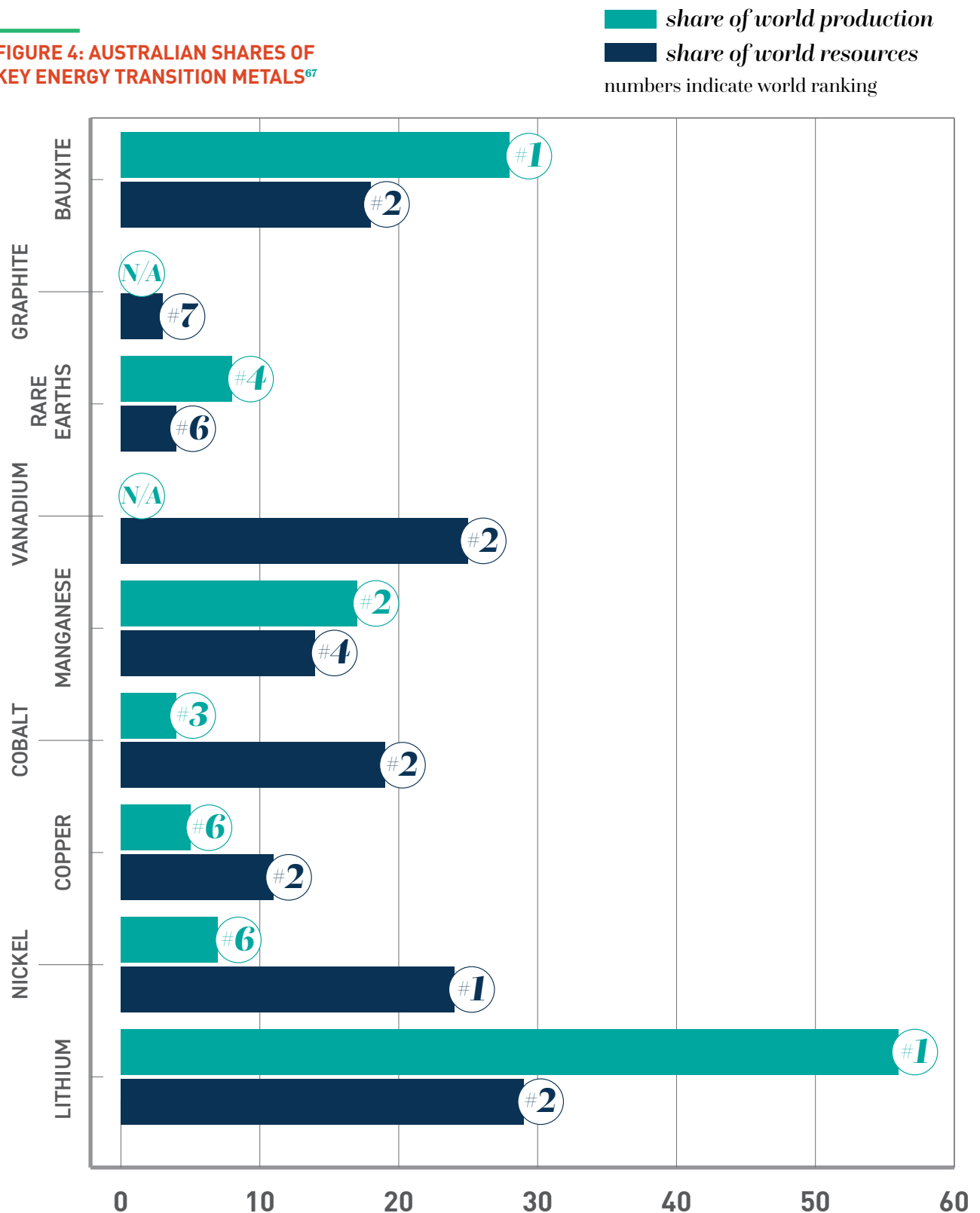




FIGURE 4: AUSTRALIAN SHARES OF KEY ENERGY TRANSITION METALS⁶⁷



Australia has a subsequent superpower capacity to meet other countries' decarbonisation and energy security needs, through new clean energy exports. Australia maintains some of the world's largest identified resources and often established production levels for numerous critical minerals required by the energy transition (see Figure 4). Domestic and foreign investors are looking

to develop these, along with opportunities for further value-adding in midstream and downstream activity for batteries and other technologies⁶⁸. The Australian Government's Critical Minerals Facility has provided rising financial support, such as a AU\$1.25 billion loan in April 2022 to a company building an integrated rare earths refinery in Western Australia⁶⁹.



Australia's growing interests in the hydrogen production space could also lead to a stronger technological position. Fortescue Future Industries is already building in Queensland what is reported to be the biggest electrolyser factory in the world⁷⁰.

Australian hydrogen production is itself taking off. There were 19 export-focused, predominantly renewables-powered, projects at the planning or trial stage as of the first half of 2022⁷¹. Australia's renewables and hydrogen capacity, combined with its existing strengths in extraction – and some limited processing – of minerals could also underpin strong positions in the future trade in green industrial goods. Investigations around the viability of onshoring production of green steel and other goods are ongoing, but exciting. In the meantime, domestic mining companies are already employing clean energy to help “green” the inputs to these materials. Fortescue Metals Group, for example, has made emissions reduction pledges that could produce zero carbon iron ore by 2030. It has also pledged to eliminate emissions from the international supply chains it services by 2040⁷². Rio Tinto is simultaneously investigating renewable energy and hydrogen pathways to reduce emissions from alumina refining, with co-funding from the Australian Renewable Energy Agency⁷³.

“Australia could become a leading exporter of many of the building blocks of clean energy systems.”

New Australian clean energy exports could provide significant commercial returns. Modelling by the think tank Beyond Zero Emissions in 2021 suggested a value of AU\$333 billion per annum – triple the estimated value of fossil fuel exports at the time – was possible by 2050⁷⁴. This is particularly important in the context of the likely sharp drop in Australia's fossil fuel exports heading to its current major energy trading partners China, Japan, and Korea, as they decarbonise. The Reserve Bank of Australia has estimated Australian exports of thermal coal to these countries could drop by 80 per cent and liquefied natural gas by half in line with their 2050 net zero commitments⁷⁵.

There will be a strong strategic component to Australia increasing its international clean energy presence. The promise of rewards in this sector would make Australian officials less likely to seek to prolong the life of fossil fuels by, for example, lobbying institutions such as the Asian Development Bank (ADB) to continue funding new coal-fired power capacity⁷⁶. New clean energy

opportunities would increase the alternative desire to advance regional decarbonisation. One potential flow-on effect might be renewed national support for the Green Climate Fund. The former Morrison government ended its contributions to this key provider of developing world climate finance in 2019⁷⁷.







A further positive step would be Australia joining the US government under President Biden in committing its development finance arms to exclusively fund clean energy over carbon-intensive developments abroad⁷⁸. Australia's Infrastructure Financing Facility for the Pacific is already investing in solar power projects in Papua New Guinea and Palau, and hydropower in the Solomon Islands⁷⁹. Canberra could make such pursuits an organising principle of its outreach. This could extend to directly assisting Indo-Pacific countries transitioning away from fossil fuels. One effort worthy of support is the Energy Transition Mechanism being developed by the ADB and a consortium of global financial firms. This aims to buy coal power plants in Southeast Asian countries – starting with Indonesia, the Philippines, and Vietnam – and retire them ahead of schedule⁸⁰. Canberra could also provide greater assistance to Jakarta in efforts to enhance the regional “sustainable energy transition”, which is one of the three priority issues of its current G20 presidency⁸¹.

“Realising growing economic returns would ensure Australia's foreign policy apparatus is tailored more to accelerating than frustrating international decarbonisation.”

Fully embracing its clean energy superpower destiny would inevitably improve Australia's reputation with important regional partners. Australia's previously lukewarm support for exploiting its climate change-mitigating strengths and contributing to international decarbonisation efforts have caused significant harm. One measure of this is Australia ranking 59th of 64 countries surveyed in the 2022 Climate Change Performance Index published by a consortium of non-government organisations⁸². Perceptions of Australia as a climate laggard have severely damaged its relationships with countries more committed to action. This prominently includes Pacific Island nations that consider global warming an existential threat⁸³. It extends to Australia's ally and major strategic partner the US, which has already made greater climate action a key priority of its evolving Indo-Pacific strategy^{84,85}.



TABLE 2: AUSTRALIA'S LOW EMISSIONS TECHNOLOGY PARTNERSHIPS⁸⁶

	COUNTRY	DATE	PRIORITIES
JAPAN		JUNE 2021	<ul style="list-style-type: none"> › Low emissions LNG › Clean ammonia › Clean hydrogen › CCUS › Carbon recycling › Low emissions steel and iron ore
SINGAPORE		JUNE 2021	<ul style="list-style-type: none"> › Clean hydrogen › Large-scale renewable electricity trade › Regional emissions measurement, verification, and reporting › Capacity building efforts › Low emissions fuels and technologies for shipping
GERMANY		JUNE 2021	<ul style="list-style-type: none"> › Clean hydrogen
UNITED KINGDOM		JULY 2021 (LETTER OF INTENT ONLY)	<ul style="list-style-type: none"> › Clean hydrogen › CCUS › Small modular nuclear reactors › Low emissions materials, including green steel › Soil carbon measurement
KOREA		OCTOBER 2021	<ul style="list-style-type: none"> › Clean hydrogen and ammonia › Low emissions iron ore and steel › Hydrogen fuel cell electric vehicles › Hydrogen power generation › CCUS › Energy storage › Solar › Critical minerals supply chains
INDIA		FEBRUARY 2022 (LETTER OF INTENT ONLY)	<ul style="list-style-type: none"> › Ultra low-cost solar › Clean hydrogen



There are already some signs of potential reputation improvement under the new Albanese government, which has accompanied its commitment to realising Australia's clean energy superpower potential with a more credible outreach to Pacific Islands on climate. Pacific leaders have, for example, welcomed Albanese's pledge to work with them to jointly host a future summit of key climate action negotiating body the Conference of the Parties to the United Nations Framework Convention on Climate Change⁸⁷.

Further clean energy and associated climate commitments would bring Australia new opportunities to burnish diplomatic partnerships and coalitions. Australia's existing efforts to develop supply chains for critical minerals, technologies, hydrogen, and green industrial goods have already reaped significant rewards in this respect. New trade and investment relationships have underpinned the 'low emissions technology partnerships' that Canberra signed – even under the less climate-conscious Morrison government – with four regional and two extra-regional governments in the past few years (see Table 2). Australia's emerging interests and abilities in clean energy have also informed the Quad's recent workstream and produced valuable outputs such as the Sydney Energy Forum.

“Australia should continue to build its Indo-Pacific clean energy diplomacy.”

Australia could and should significantly build on these clean energy relationships. It should expand existing bilateral and Quad commitments in this space. This should include increasing both the participation and scope of its efforts, by helping developing countries to access opportunities and monitoring and responding to negative impacts. Australia could help reduce potentially harmful clean energy interdependencies, including those with China. It could leverage its experience in transitioning from fossil fuel giant to clean energy superpower to assist others faced with similar challenges and opportunities. It could also exploit its strong mix of mining and institutional strength to aid other critical minerals-rich jurisdictions avoid the resource curse. The culmination of these efforts should be Canberra playing a key role, alongside its allies and partners in the Quad, in developing a multilateral initiative for an expedited but well-managed Indo-Pacific energy transition.





Policy recommendations

1

Promote the energy security and economic and strategic benefits of clean energy

Clean energy is increasingly more affordable and accessible than fossil fuels in many parts of the world. This is particularly true in the context of spiking fossil fuel prices caused by Russia's war in Ukraine. Strong clean energy supply and value chain positions are also a source of increasing economic and strategic advantage. Efforts to develop Indo-Pacific clean energy systems should emphasise these alongside climate benefits to enhance regional prosperity and stability.

2

Strike a balance between supply chain uncoupling and parallel building

The Indo-Pacific energy transition is vital to the global fight against climate change. Many regional economies are also highly vulnerable to the effects of global warming and have a strong interest in responding to it. Australia and its allies and partners should cooperate to introduce greater resilience to the most critical regional clean energy supply chains, while pursuing a fairer, more equitable, and better governed distribution of opportunities. They should, however, avoid a rushed uncoupling from China that could hamper progress on the overriding priority of regional decarbonisation.

3

Develop a clean energy diplomacy program

Australia has major advantages in the clean energy space and strong motivations to exploit them. The new federal government has pledged to make the country a clean energy superpower. This could entail the creation of new trade and investment opportunities in the key sectors of critical minerals, technologies, resources, and green industrial goods. There will also be opportunities to strategically leverage the regional ties that develop in these sectors. A new clean energy diplomacy program overseen by the Department of Foreign Affairs and Trade could realise this potential.

4

Expand the focus of clean energy outreach

Most Indo-Pacific clean energy interactions focus on connecting countries with high economic and political capacity. Greater attention should be paid to providing developing countries access to, and participation in, clean energy supply chains. High-capacity governments should also respond to potential challenges arising from the energy transition, including harmful interdependencies, difficult transitions, and resource curses. Developing countries across the Pacific and South and Southeast Asia need particular support.

5

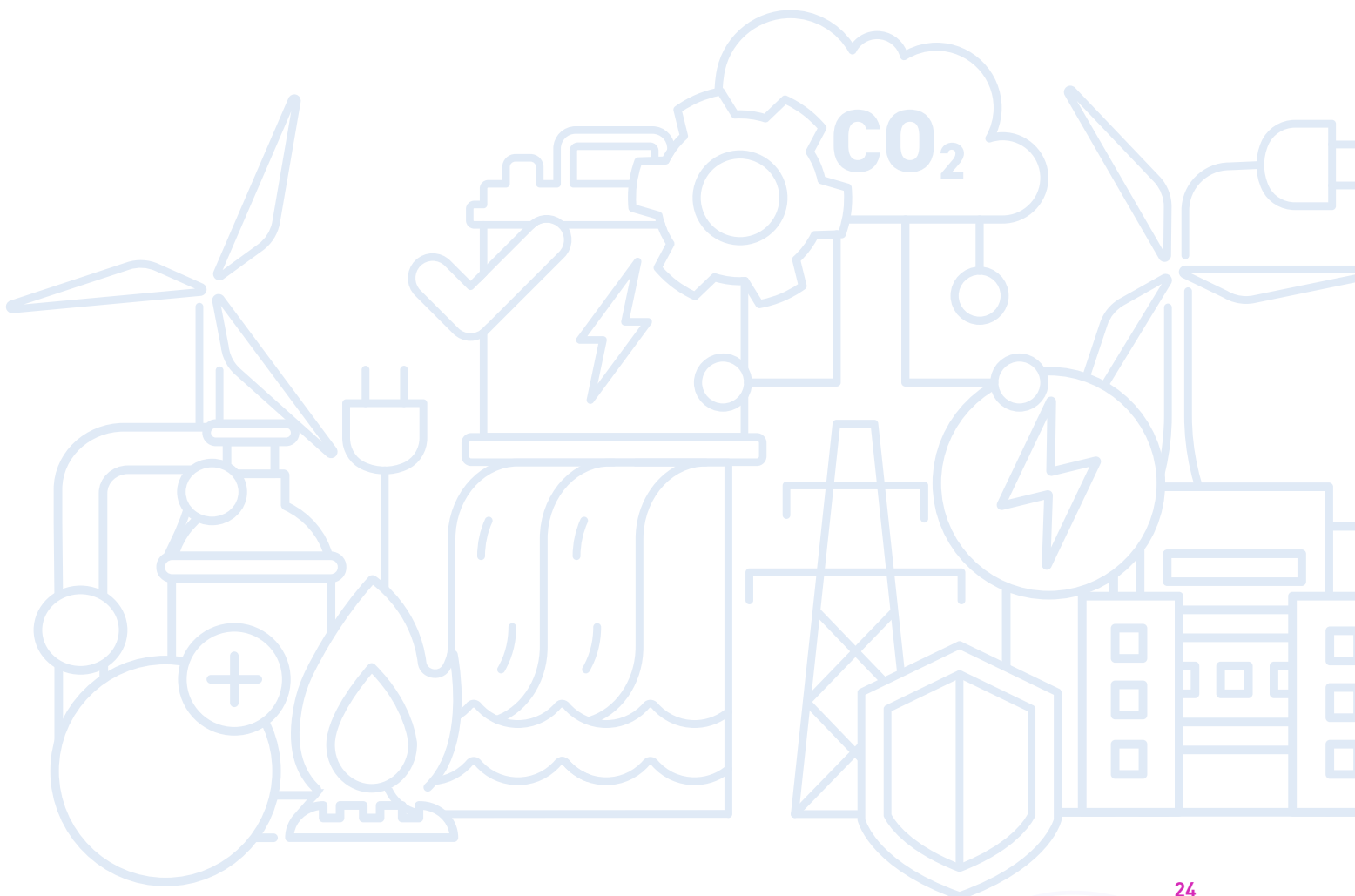
Work with partners to develop a truly multilateral Indo-Pacific clean energy program

An inclusive and well-managed energy transition depends on moving beyond bilateral and minilateral channels of engagement. Australia should work with its regional allies and partners to develop and lead a truly multilateral framework for engaging with and helping to meet the broader Indo-Pacific's clean energy needs. The Quad is well-equipped to lead this process. Its members have a range of complementary clean energy interests and abilities and regional outreach in this area is already an established area of activity.



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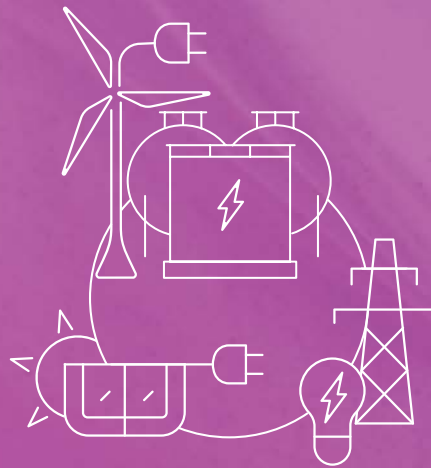


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