41ST PARLIAMENT

Economics and Industry Standing Committee

Report 3

Intergenerational challenges and opportunities for the Western Australian economy to 2041

Presented by
Hon P.C. Tinley, MLA

March 2022

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Economics and Industry Standing Committee

Intergenerational challenges and opportunities for the Western Australian economy to 2041

Report No. 3

Presented by

Hon P.C. Tinley, MLA

Laid on the Table of the Legislative Assembly on 24 March 2022

Inquiry Terms of Reference

The committee will inquire into and report upon identified intergenerational challenges and opportunities for the Western Australian economy, out to 2041.

The committee will take into consideration:

- the current structure of the WA economy
- key factors driving current demand for WA exports
- key factors that will affect demand for WA exports into the future
- actions being undertaken by relevant stakeholders to plan for identified trends in demand for WA exports
- key factors affecting inbound investment in major sectors of the WA economy.

The committee will report to the House by 24 March 2022.

Chair's Foreword

This is the first inquiry report tabled by this committee in the 41st Parliament. We decided to start with conducting a general inquiry into the health of the WA economy, viewing it through a business lens.

The ambition for the inquiry was to look at the Western Australian economy as a business and do what any business does—look for threats and opportunities.

In conceptualising WA as a portfolio-based business, we sought the views of identified stakeholders on what the economic and commercial environment will look like in 2041; what are businesses and supporting institutions doing to ensure our viability in 20 years?

> ***…. the decisions we make now are essentially binary. We grasp the opportunities in front of us and we set ourselves up for a prosperous, harmonious, cohesive society for the next 50 or 60 years. If it is business as usual, we go backwards, and we are in deep trouble.***
>
> *- Chief Scientist of WA*

Decisions made by the previous generation in the 1960s and 70s gave us 60 years of prosperity from our natural mineral and non-mineral endowment. A question to be asked is 'how do we replicate that success and leverage an intergenerational transfer of opportunities?'

A further question is then framed: In 2041 what is WA's global offering and what are the demand trends of current and emerging trading partners—and how will this shape the jobs of the future for the next generation?

Given WA's limited economic diversity and reliance on iron ore exports, asking questions about potential disruptions to demand for our exports is an obvious place to start. We received evidence about demand for iron ore from industry stakeholders and relevant government agencies.

With global steel demand anticipated to be close to peak levels, iron ore production is not expected to expand much further. The Department of Treasury takes the view that global steel production appears to have peaked, but over the 20-year timeframe covered by this inquiry, steel production is not expected to fall substantially.

My observation is that within 7 to 10 years we will see a reasonably significant inflexion point in global iron ore demand. Subject matter experts anticipate a plateauing of demand, with a shift in the type of product being sought, rather than a negative demand trend.

China in particular is expected to flat line in terms of crude steel production somewhere between 2025 and 2027. However, China will remain the biggest market for WA's iron ore.

Global iron ore demand is forecast to remain long and strong over the next 20 years; however, this does not mean that WA can continue to conduct business as usual. Maintaining market share isn't a given, and WA's lack of economic diversity and our

exposure to economic disruption remains an issue. In addition, competition for capital will likely intensify in a post-pandemic world where investors are more risk averse.

While WA remained resilient during the COVID-19 pandemic, the state's lack of economic diversity has been exacerbated. High iron ore prices and increased iron ore exports to China, coupled with significant disruption to other export industries—such as international education, tourism and primary industries—have meant that the state's diversification agenda has been significantly hampered.

The state government's economic development framework, Diversify WA, was established prior to the pandemic in 2019. It connects WA's economic strengths to global megatrends and identifies priority sectors where there are evident opportunities for growth and diversification in the short to medium term.

The state government is now refocusing the agenda. In October 2021 the Diversify WA strategy was updated, and a Supply Chain Development Plan 2021-22 was released. New priorities for the state in response to the COVID-19 pandemic were incorporated and new activities and sectors added.

The Targeted Diversification Acceleration Strategy—a strategy which identifies components of Diversify WA to be fast-tracked over the short to medium term—is being developed and implemented by a public sector oversight group comprised of departmental heads.

As part of our inquiry we also identified global megatrends shaping demand for WA's exports. These are explored in terms of future challenges and opportunities for the state.

We found that the global trend towards decarbonisation is overwhelmingly driving the economic challenges and opportunities of the future. Industry stakeholders from some of WA's largest export sectors conveyed to us the widespread recognition that decarbonisation will reshape their industries.

There are concerns about the pace of decarbonisation. WA's (and Australia's) progress towards carbon neutrality will be vital for the state's ability to compete with key competitors in the European Union and elsewhere, where movement towards carbon neutrality is more advanced.

On the positive side however, the world's transition to a low carbon and clean energy future will fuel global demand for battery technologies for use in electric vehicles and energy storage systems; renewable energy generation technologies such as solar panels and wind turbines; and, renewable hydrogen. WA's significant renewables advantage will stand us in good stead if we move now to take advantage of these opportunities. WA has some of the best wind and solar resources in the world and is richly endowed with many of the metals, non-metals and mineral elements considered necessary for a green energy future.

The state government has recognised the capacity to grow our renewable energy, hydrogen and future battery industries. These are currently prioritised under the Diversify WA strategy.

Tech, data and cyber trends are also playing an increasingly important role in shaping future jobs and demand for potential exports. Ongoing technological changes and the adaption of new technologies is a key factor identified by inquiry stakeholders as likely to impact on future demand for WA exports. Technological change is also acting as an employment disrupter with evidence pointing towards continuing changes in the number and type of jobs available in a range of sectors.

Innovation and technology are important for economic diversification. By increasing productivity and enabling value-adding and export growth in key sectors, new technologies and capability in digital and cyber fields have the potential to be a game changing in terms of how those industries compete the global market.

Global megatrends and the changes wrought by the global pandemic are creating a rapidly changing global investment environment. There is a trend towards more strategic investing, with a focus on considerations of risk, resilience and transparency.

The rise of ESG investing, a global megatrend underpinned by other megatrends (decarbonisation, technological advances such as automation), means that environmental, social and governance credentials are influencing investment decisions. Going forward, maintaining competitive advantage will necessarily include meeting ESG benchmarks.

Stakeholders in the resources sector who will be impacted by changing demand for iron ore exports are planning for the future. Major iron ore miners are aiming to transition to decarbonised operations, and pursuing a stake in renewable energy projects. Stakeholders in the resources sector more generally are also looking to increase production of rare earths and critical minerals. Many are also considering diversification into downstream processing and value-adding opportunities to take advantage of the current global markets.

As WA pursues a more diversified economy, securing foreign direct investment will be increasingly important. In this report we outline how investment decisions are made on balance, based on consideration of a range of factors. Also discussed is how these factors are rapidly shifting, and priorities being reconfigured, as a result of global megatrends and the rise of ESG investing.

We were told that now, more than ever before, WA needs to prosecute its own trade and investment policy, leveraging our unique brand. Targeted marketing of WA goods and services, along with building robust trade partnerships in key markets (largely in the Indo-Pacific region), are going to be essential into the future.

As WA moves into non-traditional markets as part of the Diversify WA strategy, requiring strategic marketing of the WA brand which dovetails into the Diversify WA strategy, the state government has an important role to play. This is done through WA's investment and trade ecosystem, comprised of public sector agencies and overseas trade offices working in collaboration with industry stakeholders, academia, and federal government agencies such

as DFAT and Austrade. Since 2017, this network has been managed by the Department of Jobs, Tourism, Science and Innovation, in particular, the Invest and Trade WA unit. The extent to which the plans for economic diversification will be successful will swing on political will and a vision of the possibilities of our region and the wider global economy. The social obligation of organised society is to transfer the quality of life enjoyed by post-war generations of Western Australians to our children and their children.

I would like to thank my fellow committee members for their diligent work on our first inquiry: Deputy Chair, Mr Vince Catania, MLA, and members, Mr David Scaife, MLA, Ms Emily Hamilton, MLA, and Dr Jags Krishnan, MLA.

I also acknowledge the work of the committee secretariat, Ms Vanessa Beckingham and Ms Sylvia Wolf, who have been masterful in attacking a broad enquiry such as this and keeping us at the higher-level assessment and out of the weeds in so many different areas. They have done it with professional zeal and single-minded determination while at the same time adapting committee business to a global pandemic. In addition, thank you to Ms Carmen Cummings, who assisted by undertaking a piece of research into other Australian jurisdictions' trade and investment functions.

The basis of this enquiry was to consider the 'business called Western Australia' and, in taking such a broad approach, any report will be, by design, limited in conclusions or recommendations. The committee avoided such a trap in making recommendations on limited investigations. The value of the report is the aggregation of disparate streams of knowledge to form a clearer picture of the economy of Western Australia and its future. The report will form the basis for the future work of the committee for the duration of the 41st Parliament of Western Australia.

HON P.C. TINLEY, MLA
CHAIR

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Executive Summary

In a rapidly changing world, the economic benefits that WA is reaping today are not guaranteed to be replicated for future generations.

Recently economies around the world have continued to experience disruption caused by the COVID-19 pandemic, the impacts of which have also been felt in WA. Having avoided some of the more devastating consequences that the COVID-19 pandemic has brought to other parts of the world, WA's rich endowment of natural resources has seen the state deliver a major budget surplus at a time where other regions may not have been so fortunate.

WA's economic performance has continued to be tied to export commodities over the past few decades. As a state, we are more dependent on international exports than any other state or territory in Australia. WA's dependence on one single commodity (iron ore) has increased over the past decade, leaving us highly dependent on one export commodity and one economy—our leading export partner China.

The resources sector continues to be a major source of employment for Western Australians, and a major contributor to the state's revenue. Although a highly concentrated economy has benefitted the state greatly—it also leaves us vulnerable to disruption. There are major global trends that have the potential to disrupt export-oriented and trade exposed economies like ours. Some of these can be seen as significant intergenerational challenges and opportunities that exist for the WA economy.

As the world faces a collective challenge to decarbonise in response to climate change, WA can leverage its competitive advantages to benefit the state economy and contribute to the global effort to decarbonise. WA has great capacity to grow its renewable energy, hydrogen and future battery industries. Worldwide efforts to decarbonise look set to drive demand for these future industries. The availability of renewable hydrogen also has great potential to benefit a lot of the state's other industries, which will support WA in diversifying its economy and creating future jobs.

Stakeholders across some of today's biggest export areas, recognise the challenge of decarbonisation. Iron ore producers in particular are investing in the development of renewable energy technologies, and broader research and development, in support of producing a competitive product.

There are still concerns though that WA will miss out on economic opportunities if the state does not move faster on decarbonisation, as investor sentiment and WA's trading partners are turning towards more sustainable portfolios and practices. Providing confidence that WA has pathways to achieve its decarbonisation ambitions will be necessary in supporting the state to secure investment for future industries.

Global populations are changing and the economic centre of gravity is shifting. The rapid urbanisation of our leading export partner—China—is unlikely to continue at the same rate.

Although China will likely remain WA's biggest market for iron ore, it looks set to flat line in terms of crude steel production by about 2025 to 2027.

Iron ore has been a key driver of growth for WA, and although it will continue to be an important part of the WA economy, it is unlikely to remain the key driver of growth. There is confidence that Indonesia, Vietnam and India will likely drive the next phase of economic growth in the Indo-Pacific region. WA's geographic location brings it in to close proximity to these growing economies and developing economic ties with these countries will complement WA's existing relationships with Japan, Korea and China. This, alongside a history of strong engagement in the region, offers competitive advantages to WA in growing future industries.

Geopolitical tensions and resurgent trade protectionism remain potential risks to highly trade exposed economies like WA's. Maintaining and building strong partnerships with the countries we share economic ties with, will be critical to future of the WA economy.

Rapid developments occurring in the realm of tech, digital and cyber—which have been described as Industrial Revolution 4.0—will shape the number and type of jobs available in a range of Western Australian sectors. Industry stakeholders appear confident that the types of jobs on offer in the future will shift to higher skilled roles.

There is space for WA to grow as a regional technology partner, with technological advances in mining having the potential to drive innovation in other sectors, such as agriculture, defence and space industries. Stakeholders have identified that positioning WA to be a leader in existing and future industries will require significantly increased investment in research and development by the state government.

The investment environment is changing due to these global trends. The rise of Environmental, Social and Governance (ESG) investing means that economic, social and environmental factors will increasingly influence investment decisions, and maintaining competitive advantage will require demonstrating compliance with ESG benchmarks.

WA has been fortunate to enjoy the prosperity delivered by the state's advantages in natural resources. However, many submitters to the inquiry warned against complacency, identifying that there are other competitive jurisdictions out there, competing for a finite amount of investment capital.

Competition for capital is likely to intensify as the world moves past the COVID-19 crisis and it is important that securing inbound investment is a strategic focus for the WA government. More than ever before, WA needs to pursue a trade and investment policy, leveraging our unique brand. Targeted marketing of WA goods and services, along with building important trade partnerships in key markets, is going to be essential into the future.

In moving beyond a transactional approach to a greater understanding of the cultural nuances and implications for building long-term trade relationships, WA as a trading partner will be able to weather the inevitable disputes and problems that arise from time to time.

It is essential to keep in mind that the economic benefits enjoyed by Western Australians today are largely a result of development measures put in place by previous generations in the 1960s and 1970s. If we want future generations to enjoy the same quality of life we've enjoyed, we need to act now on developing strong partnerships and pathways for future industries.

Findings and Recommendations

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In 2019–20 mining constituted 8.4 per cent of total employment in WA. This is significantly higher than equivalent national shares, where mining constitutes 2 per cent of total employment.

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While WA's GSP per capita is the highest of any Australian state or territory and 54 per cent higher than the average for Australia, WA's GDHI per capita is 7 per cent higher than the average for Australia. The ratio of GDHI per capita to GSP per capita is by far the lowest of any Australian state or territory.

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There is significant inequality between Indigenous and non-Indigenous household incomes in WA. Data show that in WA for most of the last decade, non-Indigenous household incomes have been higher than the equivalent national figures, whereas Indigenous household incomes have been lower than their national equivalents.

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WA's export industries continue to be dominated by raw materials—around half of Australia's goods exports originate from WA each year, with minerals, natural gas and agriculture accounting for nearly all of the state's exports.

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WA's goods exports are highly concentrated—China accounts for more than 60 per cent of goods exports; and the top five markets (China, Japan, South Korea, the United Kingdom and Singapore) account for more than 80 per cent of goods exports.

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WA's export-oriented economy is more dependent on international exports than any other state or territory in Australia.

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Services exports comprise less than 5 per cent of WA's total exports. They are less concentrated in terms of the category of service and export destination than the state's goods exports.

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WA's economic performance has become reliant on global demand for its commodity exports, particularly from China, which leaves the economy vulnerable to disruption.

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The resource sector's dominance of the WA economy is reflected in its contribution to the state's budget revenues. Recent modelling shows a 25 per cent fall in royalties revenues would require doubling the taxation effort across the rest of the economy to make up the shortfall.

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Economic benefits enjoyed by Western Australians today are largely a result of development measures put in place by previous generations in the 1960s and 1970s.

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WA has competitive advantages in the face of the global challenge of decarbonisation—particularly the capacity to grow the state's renewable energy, hydrogen and future battery industries.

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WA has large reserves of the minerals required for green energy production and storage, including lithium, nickel, cobalt, manganese and alumina. This provides WA with an opportunity to move beyond the extraction of minerals to contribute to green energy supply chains.

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Worldwide efforts to decarbonise will likely drive demand for renewable hydrogen and stimulate the development of international hydrogen supply chains.

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The availability of renewable hydrogen in WA will benefit many of the state's industries, which will support WA in diversifying its economy and creating future jobs.

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Decarbonisation is going to have a significant impact on how the global steel industry operates and the type of iron ore and feedstock that is sought by steelmakers.

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Industry stakeholders are confident that future demand for iron ore will not decrease in response to global efforts to drive down carbon emissions in iron ore processing and steelmaking. However, the risk is that over the longer term, low-grade ore with higher impurities will lose market share because there is an alternate supply of ore which doesn't require processing (processing is expensive and brings carbon into the process).

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Iron ore producers recognise the challenge posed by decarbonisation and are investing in the development of renewable energy technologies, and broader research and development, in support of producing a competitive product.

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Currently, there is no clear market for green steel—it is not yet competitive and does not attract a price premium. However, there is a strong expectation by investors that the extractives industry will decarbonise.

Finding 19 **Page 38**

There are concerns that WA will miss out on economic opportunities if it doesn't move faster on decarbonisation. Investors, and WA's trading partners, are increasingly looking for more sustainable portfolios and practices.

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The European Union will introduce a carbon border adjustment mechanism which will provide a disincentive for a product that has a carbon embodiment in it—this will impact Australian agriculture.

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Carbon tariffs can offer significant opportunities to WA, given the state's renewable energy advantages; being able to command a market premium for a product made with renewable energy will increase the state's competitive advantage in that market.

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Providing confidence to investors and trade partners that WA has identified pathways to achieve its decarbonisation ambitions will secure investment in future industries.

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The rapid urbanisation of our leading export partner—China—is unlikely to continue at the same rate. China's crude steel production will likely flat line by about 2025 to 2027. However, it will likely remain WA's biggest market for iron ore.

Finding 24 **Page 46**

China is aiming to diversify its current iron ore supply by means including: greater use of electric arc furnace steelmaking (which uses more scrap steel and less iron ore as inputs); increased domestic exploration and production of iron ore; and securing greater overseas reserves.

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WA will need to work harder to retain the significant iron ore market share that the state currently holds. Industry stakeholders recognise that retaining market share is a priority.

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WA's geographic location brings it in to close proximity to a number of significant growing economies in the Indo-Pacific. This, alongside a history of strong engagement in the region, offers competitive advantages to WA in growing future industries.

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Engagement with Indo-Pacific trading partners needs to be partnership-based, rather than simply transactional.

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Indonesia, Vietnam and India will likely be the driver of the next phase of economic growth in the Indo-Pacific. Developing economic ties with these countries will complement WA's existing relationships with Japan, Korea and China.

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Three new industries—critical minerals, batteries and hydrogen—provide WA with an opportunity to re-align its mining sector to the clean energy transition.

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Regional economic engagement projects require long time horizons to deliver benefits to the state—WA needs to act now on building these future industries and relationships.

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Geopolitical tensions and resurgent trade protectionism remain potential risks to highly trade exposed economies like WA's. Maintaining and building strong partnerships with the countries we share economic ties with will be critical to future of the WA economy.

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Ongoing technological changes and the adaption of new technologies is one of the factors identified by Treasury as likely to impact on future demand for WA exports. Increasing demand for critical minerals, many of which WA has access to, is one example.

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Technological change acts as an employment disrupter, and will continue to change the number and types of jobs available in a range of sectors.

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There is some concern that new technologies such as automation will displace many employment roles in the next five to ten years. However, with the right strategies in place, and which are enacted as soon as possible, there is potential to create future jobs in the tech, digital and cyber fields which are accessible for all Western Australians.

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There will need to be significant investment in upskilling and reskilling workers in WA. Technology, cybersecurity and artificial intelligence expertise will be increasingly sought after and digital literacy and reskilling will be important.

Finding 36 **Page 58**

It is likely that changes wrought by AI and automation will not be shared equally, given the shifting and increasing skills requirements. The digital divide could very likely increase and exacerbate existing inequalities. Facilitating an inclusive transition to quality jobs in the future for all Western Australians will require strong leadership from government.

Finding 37 **Page 59**

There are niche technology areas where WA has a local pool of human capital brought in for mining and remote operations. Given the right settings, these specialists could move into other sectors, creating a wealth of human capital in areas such as IT and cyber. The benefit of this type of transfer of human capital is often hard to measure but important.

Finding 38 **Page 59**

Innovation and technology are important for diversification. By increasing productivity and enabling value-adding and export growth in key sectors, new technologies and capability in digital and cyber fields have the potential to be game changing for WA's industry sectors and their competitive edge in the global market.

Finding 39 **Page 61**

There is growing recognition that while the resources sector has been WA's primary source of growth, the next chapter for WA is about capitalising on intellectual property, digitisation and technology developed in this sector to provide WA a new frontier.

Finding 40 **Page 63**

Technology and automation are critical to increases in productivity and reducing the agricultural industry's impact on the environment, while addressing longer term strategic risks and positioning the industry for competitiveness into the future.

Finding 41 **Page 63**

The agricultural sector is dominated by Small and Medium-sized Enterprises (SMEs) and family-owned businesses. The challenge for these businesses is the ability to rapidly scale up and become competitive in international markets, due to a lack of sufficient domestic market in WA. Furthermore, commercial ventures to scale and seek impact require growth in the sector in technology and digital tools.

Finding 42 **Page 64**

There is opportunity for growth in service exports to be facilitated by new technologies such as AI; for example, professional, scientific, and technical services, health care and social assistance and education services. Exploiting this opportunity requires innovation to keep abreast of technological change.

Finding 43 **Page 65**

There is a demonstrated need for increased government and business investment in Research and Development (R&D) to support innovation and drive the development of new technologies.

Finding 44 **Page 66**

WA's position as a resilient and prosperous mining and resources hub over the past three decades is thought to have dampened the impetus to invest in development markets and human capital for the future. Statistically WA lags behind most other states in terms of government and private investment in R&D.

Finding 45 **Page 67**

Collaboration within an innovation ecosystem can lead to new knowledge and product development, increased workforce education and skill levels, diversified income sources and improved commercialisation outcomes.

Chapter 6 – Inbound investment and the rise of ESG investing

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Foreign direct investment (where the foreign investor has control or a significant degree of influence over business decisions) has enabled more investments in capital in WA than would have been possible if economic expansion was financed through domestic savings.

Finding 47 **Page 71**

In the past WA has enjoyed positive net investment into the local economy, which has been dominated by mining. Foreign direct investment flowed into the resources sector due to its distinct competitive advantages.

Finding 48 **Page 74**

The investment environment is changing due to global megatrends. Investment decisions are shifting, largely driven by the digitisation and automation of production processes, rising environmental and social awareness, and changing geopolitical dynamics.

Finding 49 **Page 74**

The rise of Environmental, Social and Governance (ESG) investing means that economic, social and environmental factors will increasingly influence investment decisions, and maintaining competitive advantage will require demonstrating compliance with ESG benchmarks.

Finding 50 **Page 78**

In the past, procuring FDI outside the mining sector has not been a focus. However, If WA is to realise its potential in new supply chain opportunities, diversify its economy and remain competitive, attracting an ongoing and high level of FDI will be essential. This will be important in maintaining market share in major iron ore export markets and also in developing new markets and industries.

Finding 51 **Page 78**

Realising economic opportunities driven by global megatrends such as decarbonisation will require substantial investment. FDI will be important for investment in R&D, and capital will be needed for the commercialisation of large scale projects and new ventures as WA moves to a more diversified economy.

Finding 52 **Page 81**

When investors look to new opportunities, they look for certainty. This includes having a legislative and policy framework in place which provides long-term guarantees on key elements, clearly sets out the respective responsibilities of industry and government, and, ideally, mitigates as far as possible, any factors of structural disadvantage.

Finding 53 **Page 82**

New industries and sectors will be looking to the state government to provide appropriate regulation, taxation and royalty regimes which encourage capital investment and enable them to be competitive in the global market.

Finding 54 **Page 82**

For new sectors such as hydrogen, the challenge for the state will be determining appropriate legislative and policy frameworks (including taxation and royalties) and state-industry agreements.

Finding 55 **Page 82**

Investors also look at how easy it is to do business in a jurisdiction. Within a policy framework regulating an industry, efficient online regulatory processes which reduce duplication and streamline the interface between business and government are important.

Finding 56 **Page 84**

Access to land is vital for a broad range of sectors—from mature resource and agribusiness industries to emerging sectors like renewable energy and automation technologies. In order to be attractive to industry, it is important that industrial land is located strategically and is integrated with infrastructure.

Finding 57 **Page 85**

Supporting inbound investment requires having multi-use infrastructure in place which supports emerging industries and growing export markets. The scale of opportunity for the state is directly linked to the capacity of WA's utilities, transport network (ports, freight rail and road) and land supply to support planned growth.

Finding 58 **Page 85**

De-risking investment in new industries and markets—hydrogen, for example—will largely depend on the ability to access to common and multi-infrastructure. Investments and decisions that entrench monopolistic behaviour around access to infrastructure will be counter-productive to attracting investment in new industries and accessing new markets.

Finding 59 **Page 86**

There is a sense of urgency within government to identify industrial land and ports, as well as skill sets and workforces, to allow the take-up of opportunities for new projects.

Finding 60 **Page 87**

There has been considerable state government investment through the *WA Recovery Plan* and other initiatives in aligning the state government's asset investment program and infrastructure development in order to achieve project-ready industrial land.

Finding 61 **Page 88**

Ensuring project ready industrial land and the establishment of enabling infrastructure will require the ongoing resolution of land tenure issues. A balance will need to be achieved between competing land uses and differing industry stakeholder requirements in terms of this use. This will involve satisfying diverse industries such as the pastoral, agricultural, and renewable energy industries so that economic opportunities are realised. It will also involve ensuring traditional owners are adequately considered.

Finding 62 **Page 89**

Legislative changes to allow for the creation of a diversification lease under the *Land Administration Act* are being progressed in order to address land tenure issues, allowing for competing land use.

Finding 63 **Page 91**

The cyclical nature of commodities markets creates fluctuations in the labour market and employment, and often creates the situation where one industry (for example, mining) attracts employees at the expense of other sectors.

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Competition for capital is likely to intensify as the world moves past the COVID-19 crisis. As WA pursues a more diversified economy, securing foreign direct investment will be increasingly important.

Finding 65 **Page 95**

More than ever before, WA needs to prosecute its own trade and investment policy, leveraging a unique brand. Targeted marketing of WA goods and services, along with building important trade partnerships in key markets, is going to be essential into the future.

Finding 66 **Page 95**

The state government plays a key role through WA's investment and trade ecosystem. Since 2017, this network has gone through a significant transition, the effectiveness of which is yet to be seen.

Finding 67 **Page 96**

There are 30 overseas staff in trade offices located around the world, which is less than in the past. There has been a rebuilding phase following the 2019 review; over the next 12 months additional overseas positions and locations will be identified to build a presence in places where the key market opportunities exist for WA.

Finding 68 **Page 97**

The wider trade and investment network includes other WA departments which collaborate with Invest and Trade WA. The network also collaborates with industry stakeholders, academia, and federal government agencies such as DFAT and Austrade.

Finding 69 **Page 99**

The idea of developing WA's unique brand, which has been discussed over the years, needs renewed focus. WA is moving into non-traditional markets as part of the *Diversify WA* strategy. Diversifying away from the traditional markets for which we are known, such as iron ore, oil and gas, requires a re-brand, and then strategic marketing of this brand.

Finding 70 **Page 101**

Geographically we are part of the Indo-Pacific, but navigating the diverse cultures when doing business requires further effort. Cultural intelligence around building relationships with trade partners in the Indo-Pacific needs to mature if WA is to engage fully with opportunities in our region.

Finding 71 **Page 101**

WA's bilateral relationship with China must be nurtured in order to maintain this important trading partnership; any deterioration would have significant consequences for our economy.

Finding 72 **Page 103**

The invest and trade promotion function will be a key part of securing market share and inbound investment in the future and will require ongoing critical analysis to ensure that it is achieving optimal outcomes for WA.

Chapter 1

An inquiry into the WA economy 2021–2041

Inquiry rationale, scope and objectives – setting the scene

1.1 This is the first inquiry report tabled by this committee in the 41st Parliament, and it seemed appropriate to conduct a general cross-sector inquiry into the WA economy.

1.2 Given WA's lack of economic diversity and reliance on iron ore exports, asking questions about potential disruptions to demand for our exports seemed to be a good place to start.

Background to the inquiry – diversifying the economy

1.3 The WA government launched *Diversify WA* in July 2019, which codified a new framework for the economy.[1] It's main objective was to facilitate economic diversification to reduce over-reliance on the mining sector, drive productivity growth, and keep WA businesses competitive in a changing global economy. The framework connected WA's strengths to global megatrends and identified six priority sectors where opportunity for growth and diversification were evident.

1.4 Invest and Trade WA, the state's lead public sector body for investment and trade promotion, was also launched in 2019. Its role is to facilitate investment into WA and to assist local industries in accessing export markets.

1.5 In mid–2020, when it became apparent that the COVID-19 pandemic would create some economic disruption, many public sector initiatives were put on hold while the sector focused on responding to the economic impact of the pandemic through the *WA Recovery and Renewal Plan*.

1.6 Nearly two years on, WA has achieved a large measure economic resilience during the COVID-19 pandemic, carried by the strength of the resource sector. However, it is yet to achieve further diversification of its economic base, and in fact our reliance on China as an export market has increased:

> … the concern with the State's economic structure prior to the pandemic – the lack of diversity in our industry base and export markets – has only been amplified during the pandemic. High iron ore prices and increased iron ore exports to China, coupled with significant disruption to other industries such as international

1 Hon Mark McGowan, Premier, *Diversify WA launched to continue WA's economic recovery*, media release, 4 July 2019.

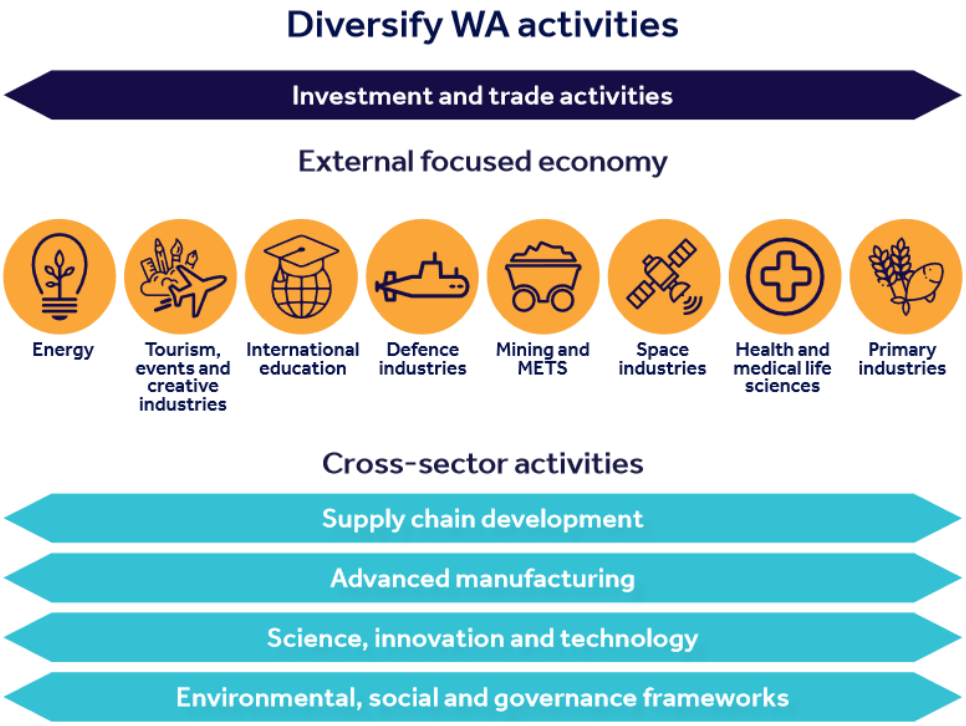
education, tourism and primary industries, has hampered the State's diversification agenda.[2]

1.7 In order to accelerate progress in line with the state's diversification agenda, the Jobs and Diversification Portfolio Oversight Group (the oversight group) was formed. It is comprised of a range of departmental heads, and can invite guests, such as the Chief Scientist, to advise it on relevant issues. The group shares information and provides strategic oversight and direction to inform the *Targeted Diversification Acceleration Strategy*; a strategy which identifies key components of *Diversify WA* to be fast-tracked over the short to medium term.[3]

1.8 The oversight group is focused on diversification opportunities which can be pursued over the next three to five years and will contribute to the acceleration of economic diversification.[4]

1.9 In October 2021 the *Diversify WA* strategy was updated and released, accompanied by the *Supply Chain Development Plan 2021–22*. New priorities for the state in response to the COVID-19 pandemic were incorporated and new activities and sectors added (Figure 1.1).

Figure 1.1: Diversify WA – updated sectors and activities[5]



2 Ms Rebecca Brown, Director General, Department of Jobs, Tourism, Science, and Innovation, Letter – additional information, 29 November 2021, p. 10.
3 ibid., pp. 10-11.
4 ibid., p. 3.
5 Department of Jobs, Tourism, Science, and Innovation, *Diversify WA July 2019-July 2021*, 2021, p. 3.

1.10 In the updated version of *Diversify WA*, the scope was clarified to make clear that the focus of *Diversify WA* is the strategic development of WA's external-focused economy.[6]

1.11 It also makes clear that in moving to diversify the economy the state government is prioritising sectors that have mostly recovered from the impact of the COVID-19 pandemic. Investable opportunities, both industry-specific and cross-sector, that are deliverable in the short to medium term are taking precedence. Identifying decisions needed to unlock private sector investment are key activities.[7]

1.12 Efforts towards growth and diversification in sectors substantially impacted by the COVID-19 pandemic have been constrained by public health measures, such as closed borders. The current focus for these sectors remains returning activity to pre pandemic conditions when public health measures allow.[8] Sectors impacted negatively by the pandemic 'are expected to take years to get back to 2018–19 level GSP contributions.'[9]

Inquiry objectives

1.13 The aim of the inquiry was to capture the big picture WA economy and identify global trends impacting on major industry sectors, particularly our export sectors. And as a part of this, determine what effect global trends are likely to have on the flow of foreign direct investment into the state.

1.14 The state government's economic development framework sets out a strategy for diversifying the WA economy (see above). We set out as part of our investigations to define the threats and opportunities for a diversified economy in the WA context.

1.15 Our goal was to frame the challenges and opportunities for the WA economy in the context of maintaining no net loss to employment and quality of life over the scope of the inquiry timeframe (2021–2041).

1.16 We set out to determine to what extent industry stakeholders were aware of, and responding to, global trends impacting on demand and supply factors. And furthermore, how stakeholders who gave evidence to the inquiry were contributing to a diversified economy by supporting innovation outside, or allied to, their sector.

A look at future demand for iron ore

1.17 We started from the assumption that the WA economy is domestically limited with 2.6 million residents, and is globally exposed as predominately an exporter of commodities with a trade relationship heavily reliant on China's demand for iron ore.

1.18 We began with an assumption that WA's reliance on iron ore exports (see chapter 2) means that any shift in demand for iron ore could have a significant impact on the WA economy. Given the potential scale of disruption to the economy, in particular to government revenue

6 Ms Rebecca Brown, Department of Jobs, Tourism, Science, and Innovation, Letter – additional information, 29 November 2021, p. 10-11.
7 ibid., p. 2.
8 ibid., p. 2.
9 Department of Jobs, Tourism, Science, and Innovation, *Diversify WA July 2019-July 2021*, 2021, p. 5.

and jobs, one of our inquiry objectives was to see how stakeholders in the mining sector are responding to emergent trends which may mean that disruption is indeed a possibility.

1.19 We began the inquiry with a question around whether there would be a downward trend in demand for WA iron ore exports in the future, based on the anticipation that global supply will increase and consumption decrease due to factors such as peak steel in China.

1.20 We were interested to hear that subject matter experts anticipate more of a plateauing of demand, with a shift in the type of product being sought, rather than a negative trend.

1.21 While global iron ore demand is forecast to remain long and strong over the next 20 years, this does not mean that WA can continue to rely on it to fund our way of life. Maintaining market share isn't a given, and in the changing investment environment current and future projects will need to compete for capital investment in a global economy where investors are more risk averse post-pandemic.

1.22 In any event, stakeholders in the resources sector who could potentially be negatively impacted by any disruption to demand for iron ore exports are certainly planning for the future. Major iron ore miners are transitioning to decarbonised operations, and pursuing a stake in renewable energy projects.

1.23 Stakeholders in the resources sector more generally are looking to increase production of rare earths and critical minerals. Many are also considering diversification into downstream processing and value-adding opportunities to take advantage of the current global markets.

Inquiry scope

1.24 We set out to map the WA economy, identifying in particular the reliance on exports.

1.25 In scope was consideration of factors that are influencing, and will continue to influence, global demand for WA exports. Consideration of global factors likely to influence the flow of foreign direct investment into the state was also included.

1.26 We sought a range of stakeholder views on expected demand for WA exports, and what might change in the future. We also sought evidence on action being undertaken by stakeholders in the relevant industry sectors, in anticipation of such changes.

1.27 This inquiry did not investigate in detail any particular industry or sector; rather this inquiry is intended to be a 'snapshot' of where the WA economy is headed and what challenges and opportunities present, based on current trends. A future inquiry may investigate one or more sectors and/or industry specific areas of innovation.

1.28 In this report, where a future industry or opportunity is discussed, it is line with those identified by the government in the state's economic development framework. As noted above, in moving to diversify the economy the state government is prioritising sectors that have mostly recovered from the impact of the COVID-19 pandemic.

Challenges and opportunities for WA – key inquiry findings

1.29 This century 'began with a strong demand for raw materials' and was 'characterised by the global economic crisis and growing concern about climate change.'[10]

1.30 According to WA's state planning strategy, the period to 2050 will be 'characterised by growing diversity, the development of renewable energy, evolution of digital economy, an ageing population, globalisation and an orientation towards sustainable living.' [11]

1.31 Evidence presented to the inquiry highlighted four global megatrends that are shaping the global economy, and driving (or otherwise impacting) demand for current and future exports. These are:

- A shift to a decarbonised future.
- A shifting global economy centred on emerging Asian economies and their growing middle class.
- Trends in technology, digital and cyber—sometimes referred to as the Industrial Revolution 4.0—which is changing demand for resources and disrupting jobs through new technologies such as artificial intelligence and automation.
- A rapidly changing investment environment and the rise of ESG investing which is changing the way decisions are made around foreign direct investment (FDI).

1.32 Global megatrends are changing the world economy to such an extent that by 2041 continued population growth will have expanded by about 1.4 billion people. The world economic centre of gravity will be increasingly centred on Asia; it is forecast that by 2050, the five largest economies will be China, the United States, India, Indonesia and Japan.

1.33 In addition to global megatrends which are shaping demand for our exports, the COVID-19 pandemic has altered the global economic landscape. It triggered a significant fall in the global flows of FDI in 2020, and has accelerated a shift in investor focus (see chapter 6). Supply issues during the pandemic 'have highlighted vulnerabilities across industries, and the importance of reducing dependence on imports and building resilience and sovereign capability to secure local health and medical supply chains.'[12]

1.34 In the future, while the state's current industries will remain important, they will not drive growth as they have for the last two decades. Fortunately, WA is well-positioned to create new industries and trade relationships aligned to the Indo-Pacific of 2041.The Indo-Pacific region will be a key factor in shaping future demand for our exports (see chapter 4).

1.35 In the short term, WA's economy will be shaped by skills and labour shortages; climate change and the move to decarbonisation; and, our bilateral trade relationship with China (and any impact on iron ore exports).

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10 Western Australian Planning Commission, *State Planning Strategy 2050: Planning for sustained growth and prosperity*, June 2014, see inside cover - Western Australia: time series 1850–2050.

11 ibid.

12 Ms Rebecca Brown, Department of Jobs, Tourism, Science, and Innovation, Letter – additional information, 29 November 2021, p. 10.

1.36 In the decades ahead, decarbonisation will provide both challenges and opportunities for WA to diversify away from its reliance on iron ore exports. Investment led by the private sector in renewables is being seen as a strong growth opportunity for WA. However, encouraging investment requires addressing some intergenerational challenges. These are discussed in chapters 5 and 6, and are summarised following:

- Keeping abreast of technological advances and facilitating innovation, research and development to grow new globally competitive industries.
- Legislative and policy frameworks which encourage inbound investment; in particular, regulating and incentivising new industries with appropriate regulation (including taxation and royalties) and state-industry agreements. And once these are established:
  - maintaining efficient online regulatory processes which reduce duplication and streamline the interface between business and government.
- Project-ready industrial land, with multi-use infrastructure and port access, to support emerging industries and growing export markets.
- The resolution of land tenure issues, including legislative reform (already underway), to accommodate competing land uses and industry requirements.
- Mitigating labour and skills shortages: this is one of WA's most pressing issues in the immediate future, and is also a longer term issue in terms of ensuring that future generations have skill sets that meet demand in a world where new technologies and digitisation are changing jobs and the way we live.

Are we moving fast enough in the right direction?

1.37 The overwhelming takeaway message from our inquiry is that the global megatrends impacting demand for WA exports are taking shape at an increasingly rapid pace and the scale of change required, particularly over the next ten years, is significant.

1.38 The scale and pace of decarbonisation is accelerating, which means that opportunities in meeting demand for greener products and renewable energy options must also be acted on quickly. A timely transition to a net zero emissions economy has been modelled, and indicates that if achieved in WA there could be 195,000 additional jobs by 2070.[13]

1.39 Over the next ten years, for example, iron-making and steel-making processes will be moving to being greener, which will mean increased demand for higher grade input ores (or other feedstock) with less impurities (see chapter 3).

1.40 The global drivers that will have the steel manufacturers changing will intersect with growing demand for a different product. Over this ten years, or thereabouts, steel manufacturing companies will focus on energy efficiencies and carbon capture and storage to reduce their emissions profile while still using existing steel-making processes. After that point in time, they will consider which technology investments are needed to decarbonise further. This will most likely be led by Japan, as the majority of Japan's blast furnaces were built around 40

13 Department of Water and Environmental Regulation, *Shaping Western Australia's low-carbon future: Developing sectoral emissions reduction strategies to transition the economy to net zero*, December 2021, p. 7.

years ago—they are coming close to the point in time where those steel manufacturers need to make an investment decision on what is next (see chapter 3, in particular Box 3.4 'A ten-year inflection point, as explained by the MRIWA').

1.41 The economic cost of inaction on decarbonisation is significant 'as frameworks for international trade and global finance move to penalise carbon-intensive economies, businesses and sectors.'[14] Chapter 3 includes a timeline for sectoral emission reduction strategies, which shows sectoral strategies finalised in 2023.[15] The *WA Renewable Hydrogen Strategy* aims to ensure that by 2030 WA's 'market share in renewable hydrogen exports is similar to its share in LNG today.'[16]

1.42 Another major shift that we can expect to see within the next decade, according to industry experts, is changes to demand for WA's iron ore. By 2025 iron ore exports may experience some disruption, with a forecast drop in prices and demand from China beginning to plateau in terms of crude steel production (see chapter 4). China will remain a very large market for iron ore, however there are some who predict that there won't be enough growth in non-China to fully offset demand until around 2030.

1.43 While iron ore demand is forecast to remain long and strong over the next 20 years, this does not mean that WA can continue to rely on it to fund our way of life. Maintaining market share isn't a given, and in the changing investment environment current and future projects will need to compete for capital investment in a global economy where investors are more risk averse post-pandemic.

1.44 In addition, the changes brought about by trends in technological advances, data and digitisation (see chapter 5) will continue to change the employment landscape over the next ten years. Expertise in technology, cybersecurity and artificial intelligence will be increasingly sought after and digital literacy and reskilling will be the key to preparing people for jobs in the future.

1.45 If predictions by the World Economic Forum hold true, by 2025, globally, we will start to see quite a large displacement of jobs brought about by a shift in the division of labour between humans and machines, with even more new roles emerging in technology, cybersecurity and artificial intelligence. The challenge for WA will be to have the settings in place to create an agile workforce that is able to participate in the job market in the future (see chapter 5).

1.46 As we moved through our inquiry it became apparent that the WA government is also recognising these time pressures and the increasingly rapid pace of shifting demand and changing investment priorities. We commend the government on its joined-up approach to the external facing 'business' of the WA economy.

1.47 The government appears to be moving quickly to address obstacles to diversification, with a focus on outcomes achievable within three to five years. Amongst other things, it is

14 Department of Water and Environmental Regulation, *Shaping Western Australia's low-carbon future: Developing sectoral emissions reduction strategies to transition the economy to net zero*, December 2021, p. 7.
15 ibid., p. 18.
16 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 9.

addressing decarbonisation, facilitating opportunities in hydrogen, and assessing requirements for future workforce skills.[17]

17 A list of WA's economic development plans and initiatives which align with investment and trade activities in 2021–2022 can be found in the *Western Australian Investment and Trade Plan 2021–22*, Department of Jobs, Tourism, Science and Innovation, Western Australian Government, October 2021, pp. 2-3.

Chapter 2

Current structure of the WA economy

2.1 A look at the WA economy at this point in time confirms that the state remains a major exporter of raw materials (with a heavy leaning on iron ore in particular). Recently, economies around the world have continued to experience disruption caused by the COVID-19 pandemic, the impacts of which have also been felt in WA. Having avoided some of the more devastating consequences that the COVID-19 pandemic has delivered to other parts of the world, WA has in many ways been fortunate.

2.2 WA's rich endowment of natural resources has seen the state deliver a major budget surplus at a time where other jurisdictions in Australia and other parts of the world have been experiencing budget deficits. WA's recent economic performance is largely attributable to iron ore exports to China. The state's economic performance has been tied to export commodities over the past few decades—over this time WA's dependence on one single commodity (iron ore) has increased.

2.3 Although a specialised economy has delivered benefits to WA, it remains the case that a lack of diversity makes our economy particularly vulnerable to disruption, and while the COVID-19 pandemic is receiving considerable focus at the moment for evident reasons—it is not the only force shaping global trends and disruptors that affect our economy.

2.4 Climate change is impacting WA's economy. This is particularly evident in changes to demand as major economies move to decarbonise (see chapter 3).

2.5 As an export-oriented economy in a highly globalised world, WA continues to be shaped by global population changes. Urbanisation, population growth and increasing middle-income cohorts in the Indo-Pacific region are shaping demand for WA exports. The development of relations between WA and its trading partners (in particular in the Indo-Pacific region) was grounded in the work of previous generations and we continue to benefit from these relationships today. These relationships with our trading partners will be critical to the future of our economy (see chapter 4).

2.6 Technological change is reshaping industries and jobs. Here in WA we are seeing new and emerging technologies being adopted, particularly within the mining sector—automation is a leading example of this (see chapter 5).

2.7 In this chapter we take a closer look at the WA economy today and how these trends are taking shape currently, before looking ahead to how they might shape the future of our economy.

A snapshot of the WA economy

2.8 The Department of Treasury (Treasury) identifies different ways of examining the structure of the WA economy.

Box 2.1: How to look at and analyse our economy

There are several ways of looking at and analysing the structure of the WA economy:

By industry, using:

- the sum of the estimated value of each industry's production, as measured by the Gross Value Added (GVA, industry output minus intermediate consumption). Total industry GVA net of taxes plus subsidies (not broken down by industry) equals Gross State Product (GSP); and
- employment in each industry as an indicator of the structure of the economy; and
- the sum of the estimated value of income (labour income and profit), combined with net taxes and subsidies equals GSP; and

By expenditure category. This approach measures total expenditure in the economy on goods and services. This includes international exports and imports of goods and services. The value of expenditure categories, including a balancing item which largely represents interstate trade of goods and services, sums to GSP.

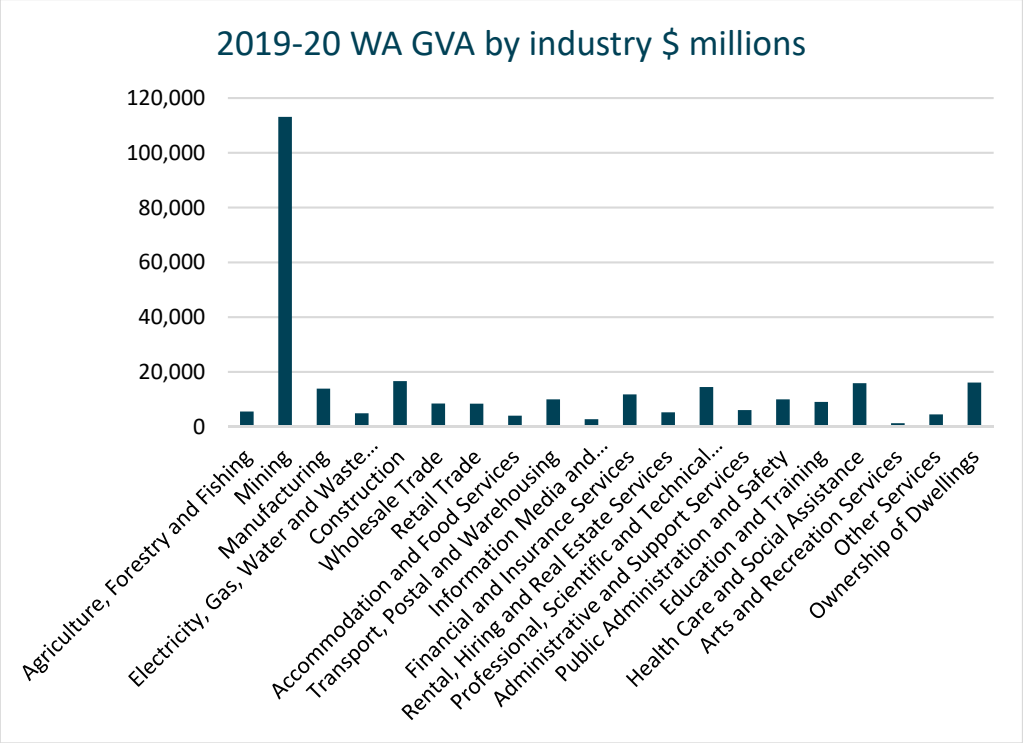
There are two ways of measuring economic activity:

- in real (chain-weighted) terms. This effectively measures the volume of activity abstracting from changes in price from year to year. The volume of activity is summed across different products using prices in a reference year to obtain a dollar value of activity in the reference year. Changes in the dollar value of activity relative to the reference year are solely the result of changes in volumes not prices; and
- in nominal (current price) terms. This measures the value of production in dollars at the time of production or sale of a good or service. Changes in the nominal value from one year to another reflect changes in both volumes and prices.

The real measure of GSP is often preferred as it is effectively an inflation adjusted measure of GSP—where inflation is the combined change in prices of all goods in the economy. Removing the impact of inflation allows like for like comparisons over time. The production and expenditure estimates of GSP are available in real and nominal terms. The income measure is only available in nominal terms.

Source: Submission 8, Department of Treasury, p. 2.

Figure 2.1: GVA by industry (chain volume)[18]



2.9 In 2019–20 the real value of GSP was $292 billion. Mining accounted for 40.2 per cent of total production in the state—compared to 11.1 per cent nationally. The next two largest sectors, construction and health care and social assistance, accounted for 5.9 per cent and 5.6 per cent of industry production, respectively.[19]

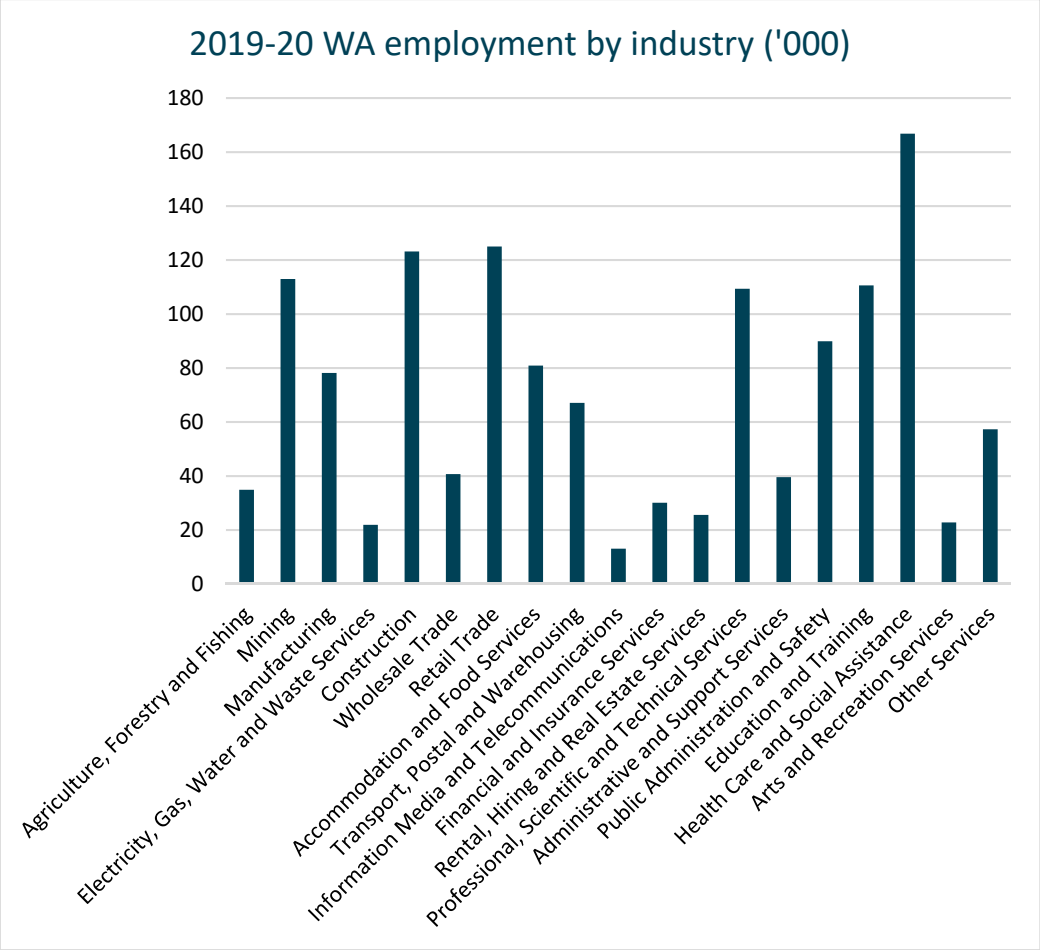
2.10 In 2019–20 mining constituted 8.4 per cent of total employment in WA. This is well above equivalent national shares, where mining constitutes 2 per cent of total employment.[20]

2.11 The mining industry's share of total employment (8.4 per cent) is not as large as its share of GVA because of the capital-intensive nature of the industry. Reflecting this, mining's capital stock accounted for 44 per cent of WA's capital stock in 2019–20.[21]

2.12 In 2019–20, health care and social assistance was the largest employing industry in the state (12.4 per cent of total employment), followed by retail trade and construction. However, healthcare in WA contributes less than its population share of national employment in the sector (9.5 per cent).[22]

18 Table created based on information from Submission 8, Department of Treasury, p. 3.
19 Submission 8, Department of Treasury, p. 2.
20 ibid., p. 3.
21 ibid., p. 4.
22 ibid.

Figure 2.2: 2019–20 WA employment by industry[23]



2.13 Across all industries, WA accounted for 10.6 per cent of national employment in 2019–20 which is broadly consistent with the state's share of the national population (10.4 per cent).[24]

Finding 1

In 2019–20 mining constituted 8.4 per cent of total employment in WA. This is significantly higher than equivalent national shares, where mining constitutes 2 per cent of total employment.

GSP by expenditure

2.14 In 2019–20 net international trade represented the largest component of the WA economy. Exports of goods and services (which contributes to GSP as it represents international spending on goods and services produced in the state) were valued at $173 billion (in real terms) or 59 per cent of GSP.[25]

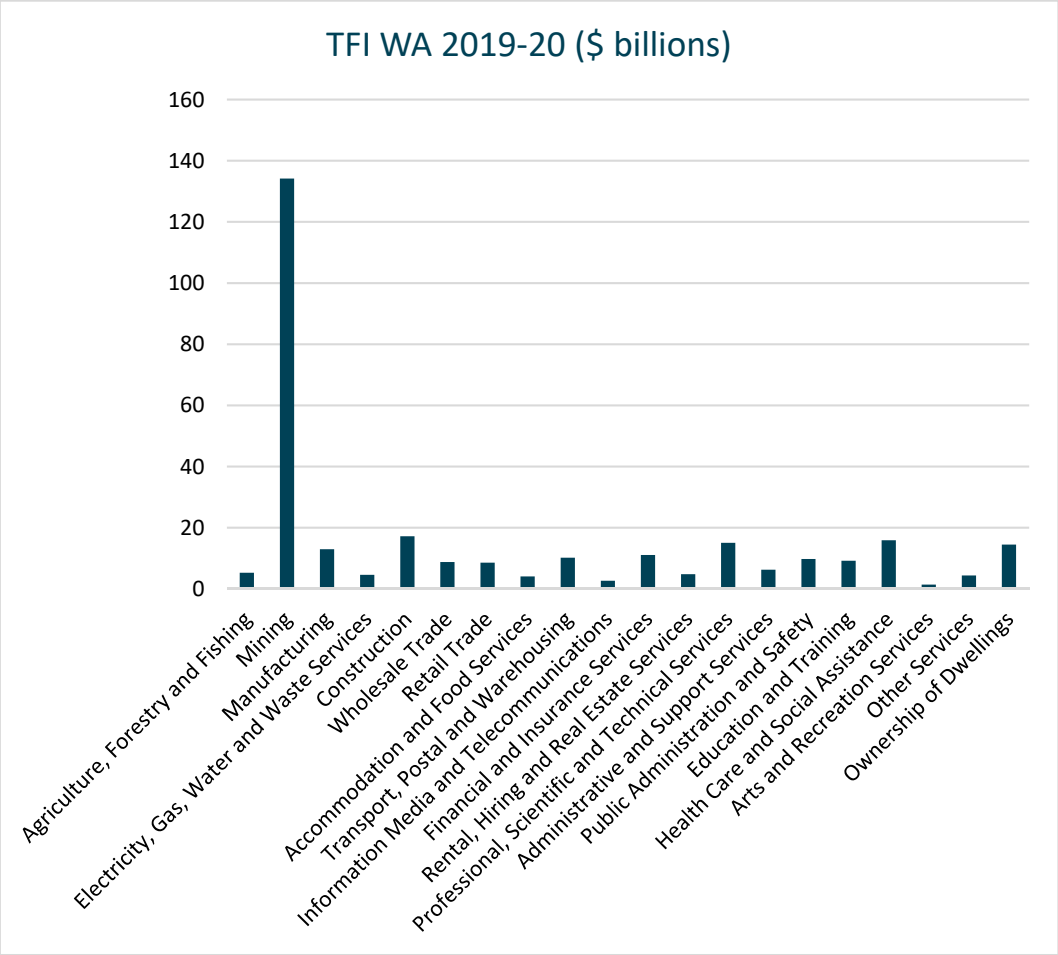
23 Table created based on information from Submission 8, Department of Treasury, p. 3.
24 Submission 8, Department of Treasury, p. 4.
25 ibid.

2.15 International imports of goods and services (which detract from GSP, because they represent spending by WA residents on goods and services produced overseas) were valued at $44 billion or 15 per cent of GSP. In net terms, international trade contributed $128.8 billion or 44 per cent of GSP.[26]

GSP by income

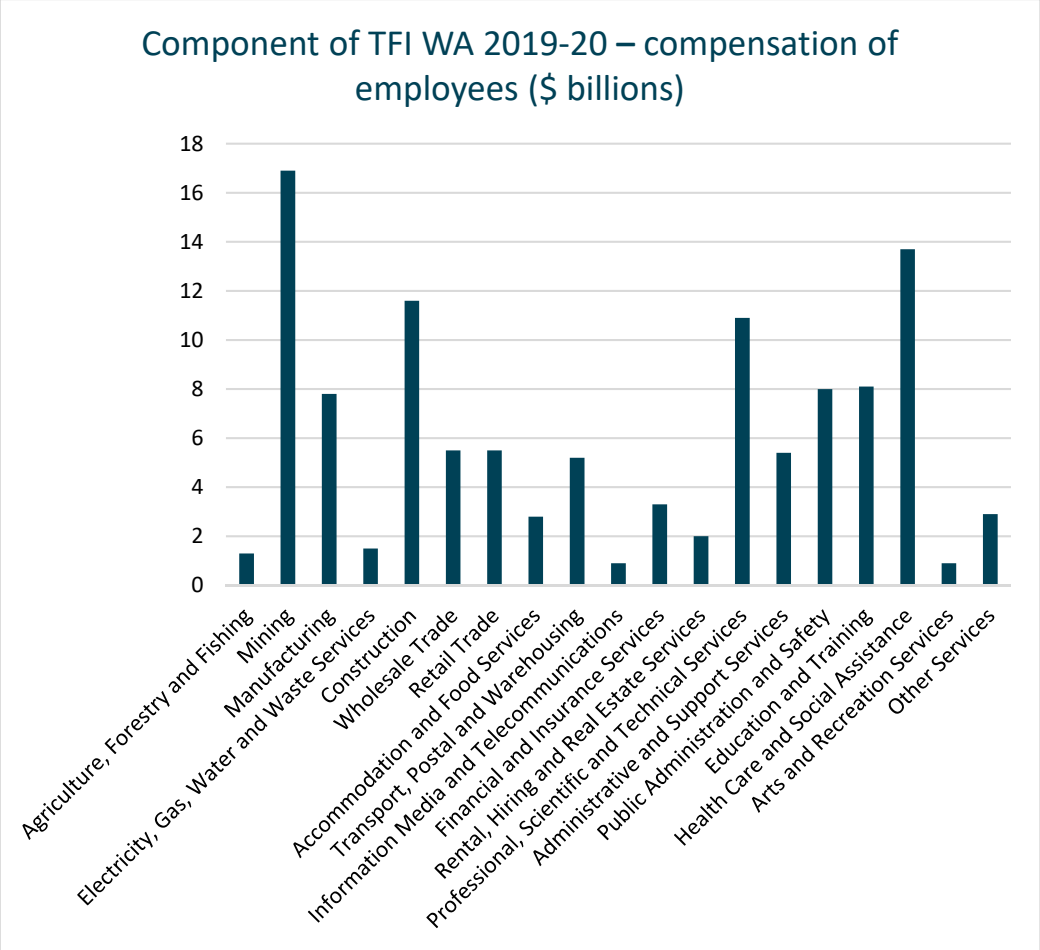
2.16 In 2019–20 GSP by income was valued at $301 billion. Mining is again the dominant sector of the WA economy, accounting for 44.6 per cent of Total Factor Income (TFI) in the state.[27]

Figure 2.3: TFI WA 2019–20 ($ billions)[28]



26 Submission 8, Department of Treasury, p. 4.
27 ibid.
28 Table created based on information from Submission 8, Department of Treasury, p. 5.

Figure 2.4: WA component of TFI – compensation of employees 2019–20 ($ billions)[29]



2.17 In 2019–20, 87.4 per cent of mining income was gross operating surplus mixed income (very loosely, a measure of profit) with the remainder being the compensation of employees.[30]

Standard of living

2.18 The Department of Jobs, Tourism, Science and Innovation (JTSI) identifies that an aspect of WA's economic structure is how economic output translates into economic outcomes for people and communities in the state. While GSP is a generally accepted measure of the size of an economy, it does not necessarily provide a good indication of people's real-life economic experiences.[31]

2.19 The table below compares GSP per capita with Gross Household Disposable Income (GDHI) per capita for each of the states and territories for 2019–20.

29 Table created based on information from Submission 8, Department of Treasury, p. 5.
30 Submission 8, Department of Treasury, p. 4.
31 Submission 17, Department of Jobs, Tourism, Science and Innovation, pp. 4-5.

Table 2.1: Comparison of GSP per capita and GHDI per capita[32]

	GSP per capita, 2019-20 ($)	GHDI per capita, 2019-20 ($)	Ratio of GHDI per capita to GSP per capita, 2019-20
New South Wales	77,413	53,435	0.69
Victoria	70,346	48,107	0.68
Queensland	70,365	48,164	0.68
South Australia	62,887	46,695	0.74
Tasmania	61,272	48,855	0.80
Australian Capital Territory	97,066	92,810	0.96
Northern Territory	106,040	67,704	0.64
Australia	77,807	51,394	0.66
Western Australia	**119,861**	**55,101**	**0.46**

2.20 While WA's GSP per capita is the highest of any Australian state or territory and 54 per cent higher than the average for Australia, WA's GDHI per capita is 7 per cent higher than the average for Australia. Further, the ratio of GDHI per capita to GSP per capita is by far the lowest of any Australian state or territory. There are a number of factors that drive this outcome. In particular, given the mining industry's high share of WA's GSP combined with its level of foreign ownership, a relatively higher proportion of the income from WA's economic output leaves the state.[33]

2.21 Although incomes may be higher in WA on average, there remains significant inequality amongst household sectors. UnionsWA identified that data from the Australian Institute for Health and Welfare show that in WA for most of the last decade, non-Indigenous household incomes have been higher than the equivalent national figures, whereas Indigenous household incomes have been lower than their national equivalents.[34]

Finding 2

While WA's GSP per capita is the highest of any Australian state or territory and 54 per cent higher than the average for Australia, WA's GDHI per capita is 7 per cent higher than the average for Australia. The ratio of GDHI per capita to GSP per capita is by far the lowest of any Australian state or territory.

Finding 3

There is significant inequality between Indigenous and non-Indigenous household incomes in WA. Data show that in WA for most of the last decade, non-Indigenous household incomes have been higher than the equivalent national figures, whereas Indigenous household incomes have been lower than their national equivalents.

32 Table created based on information from Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 5. Note: GSP and GHDI per capita presented in nominal terms. Household income includes wages and salaries, salary sacrifice, non-cash benefits, bonuses, termination payments, government pensions and allowances, profit/loss from own unincorporated business, net investment income and private transfers less income tax, the Medicare level and the Medicare levy surcharge.

33 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 5.

34 Submission 3, UnionsWA, p. 5.

WA's exports and trading partners

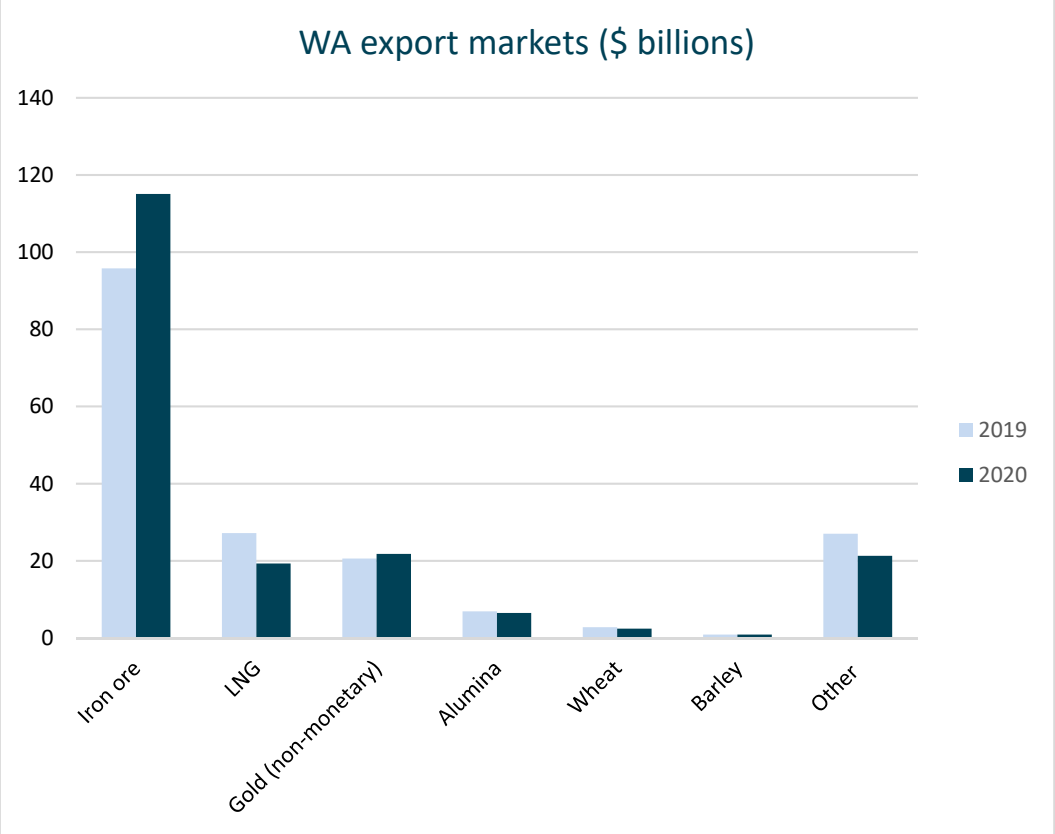
Goods exports

2.22 Accounting for approximately 95 per cent of WA's exports by value, goods are WA's dominant export type.[35] Current demand for WA's exports is characterised by high volumes of exports and/or high commodity prices, which together are supporting high export values. Reflecting this, the value of exports in 2020–21 totalled $222 billion, a record annual value.[36]

2.23 Currently (and historically) WA's key export industries have been dominated by raw materials. Around half of Australia's goods exports originate from WA each year, with minerals, natural gas and agriculture accounting for nearly all of the state's exports. [37]

2.24 WA's goods exports are highly concentrated with three commodities accounting for around 80 per cent—iron ore, Liquefied Natural Gas (LNG) and gold.[38] The bulk of WA's growth has recently occurred in these three major commodity exports.[39]

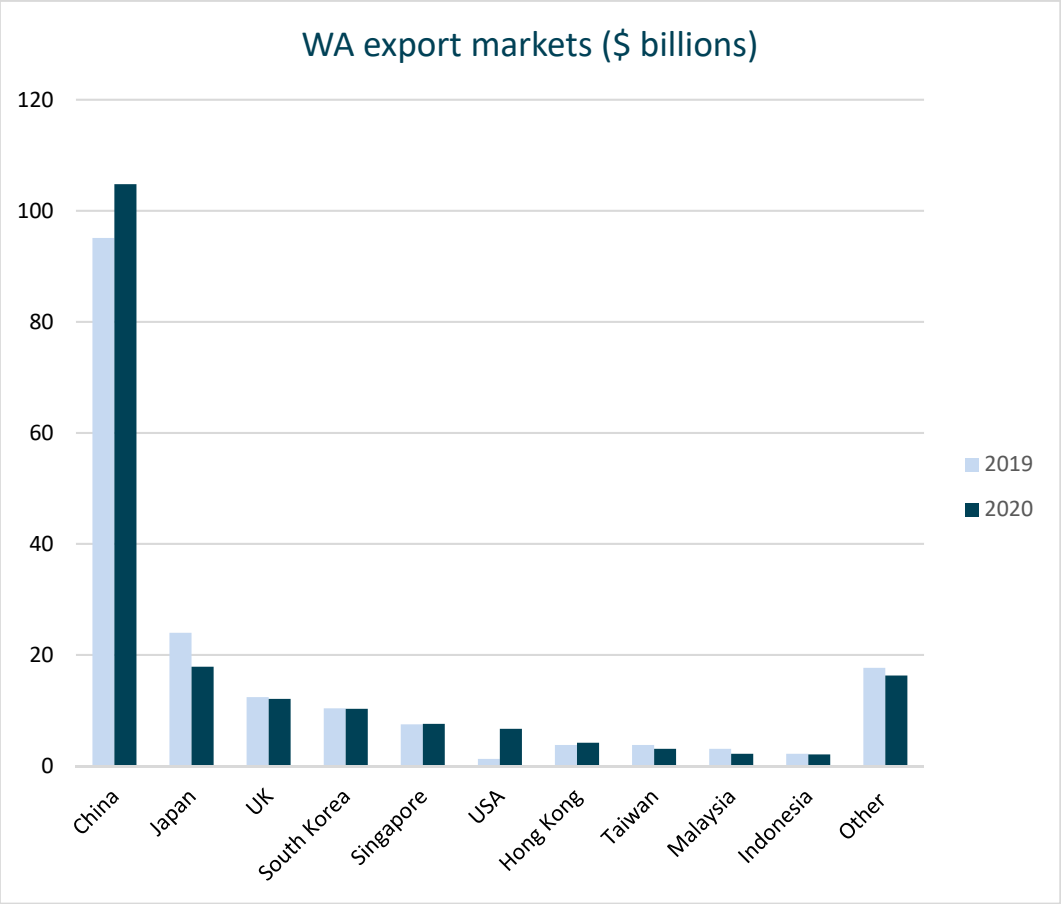
Figure 2.5: WA exports by commodity 2019 and 2020 ($ billions)[40]



35 Submission 8, Department of Treasury, p. 7.
36 ibid.
37 Department of Jobs, Tourism, Science and Innovation, *Western Australia's economy and international trade*, 7 July 2021, accessed 7 July 2021, <https://www.wa.gov.au/government/publications/western-australias-economy-and-international-trade>.
38 Submission 8, Department of Treasury, p. 7.
39 Submission 12, Infrastructure WA, p. 6.
40 Table created based off information from Submission 8, Department of Treasury, p. 10.

2.25 WA's goods exports are also highly concentrated. China accounts for more than 60 per cent of goods exports; and the top five markets (China, Japan, South Korea, the United Kingdom and Singapore) account for more than 80 per cent of goods exports.[41]

Figure 2.6: WA export markets 2019 and 2020 ($ billion)[42]



Finding 4

WA's export industries continue to be dominated by raw materials—around half of Australia's goods exports originate from WA each year, with minerals, natural gas and agriculture accounting for nearly all of the state's exports.

Finding 5

WA's goods exports are highly concentrated—China accounts for more than 60 per cent of goods exports; and the top five markets (China, Japan, South Korea, the United Kingdom and Singapore) account for more than 80 per cent of goods exports.

41 Submission 8, Department of Treasury, p. 7.
42 Table created based on information from Submission 8, Department of Treasury, p. 10.

Resources sector

2.26 The Department of Mines, Industry Regulation and Safety (DMIRS) described the resources sector as the major driving force in shaping the WA economy, providing the following observations:

- In 2020, the sector was valued at more than $174 billion, led by iron ore ($116 billion), LNG ($27 billion), and gold ($17 billion).
- It is the largest industry sector in WA, accounting for 39 per cent of the WA economy in 2019–20.
- The sector made the largest contribution to the state's economic growth for the last financial year.
- The resources sector dominates the state's export earnings.
- Iron ore, petroleum (LNG, condensate and oil), gold, alumina (including bauxite) and nickel are the state's five largest merchandise exports.[43]

2.27 Infrastructure WA recently commissioned Deloitte to produce a report, which included an economic assessment of WA. The report found:

- WA has an export-oriented economy and is more dependent on international exports than any other state or territory in Australia.
- Commodity exports dominate WA's export profile. In particular, the resources sector has historically driven and shaped WA's economy. In 2019–20 iron ore accounted for 55 per cent of the value of WA's international merchandise exports, compared to 15 per cent in 1999–2000. Twenty-seven per cent of merchandise exports by value was accounted for by LNG and gold.[44]

2.28 Within the resources mix, one single export commodity stands out as particularly important—iron ore.

Finding 6

WA's export-oriented economy is more dependent on international exports than any other state or territory in Australia.

Iron ore

2.29 WA is the world's largest iron ore supplier, accounting for 39 per cent of global supply in 2020, followed by Brazil (16 per cent). Asia accounted for 80 per cent of global iron ore demand in 2020, with China (63 per cent), India (8 per cent), Japan (4 per cent), and South Korea (3 per cent) having the largest shares.[45]

2.30 The value of iron ore exports increased strongly (by $19.3 billion or 21.4 per cent) in 2020, increasing its share of the total value of exports from around 53 per cent in 2019 to more

43 Submission 9, Department of Mines, Industry Regulation and Safety, p. 2.
44 Submission 12, Infrastructure WA, p. 3.
45 Submission 13, Rio Tinto, p. 3.

than 60 per cent in 2020. This was largely due to an increase in iron ore prices as the volume of iron ore exports only increased by around 4 per cent.[46]

2.31 No other market for iron ore is as large as China's. In 2020–21, the value of WA's exports to China reached $134 billion (up 36.2 per cent).[47] China accounted for 82 per cent of WA's iron ore exports in 2020. Since 2000, the increase in WA iron ore exports to China accounted for more than 90 per cent of the total increase in the state's iron ore exports over the period.[48]

2.32 The state's export dependence on iron ore has increased significantly over time

Agriculture

2.33 WA's agriculture exports rose 3 per cent to $8 billion in 2020–21.[49] WA's markets for agriculture exports are more diversified than its markets for mining exports. China accounted for 18 per cent of the state's agriculture exports in 2020–21 and was a large market for a range of products, notably wool and meat and live animals.

2.34 Other markets in Asia feature prominently, such as Japan (8 per cent), South Korea (7 per cent), Vietnam (6 per cent), Thailand (5 per cent) and the Philippines (4 per cent). WA also exports agricultural products to Europe and the Middle East. Germany is a major market for the state's canola seed, while Saudi Arabia has become a large market for the state's barley exports.[50]

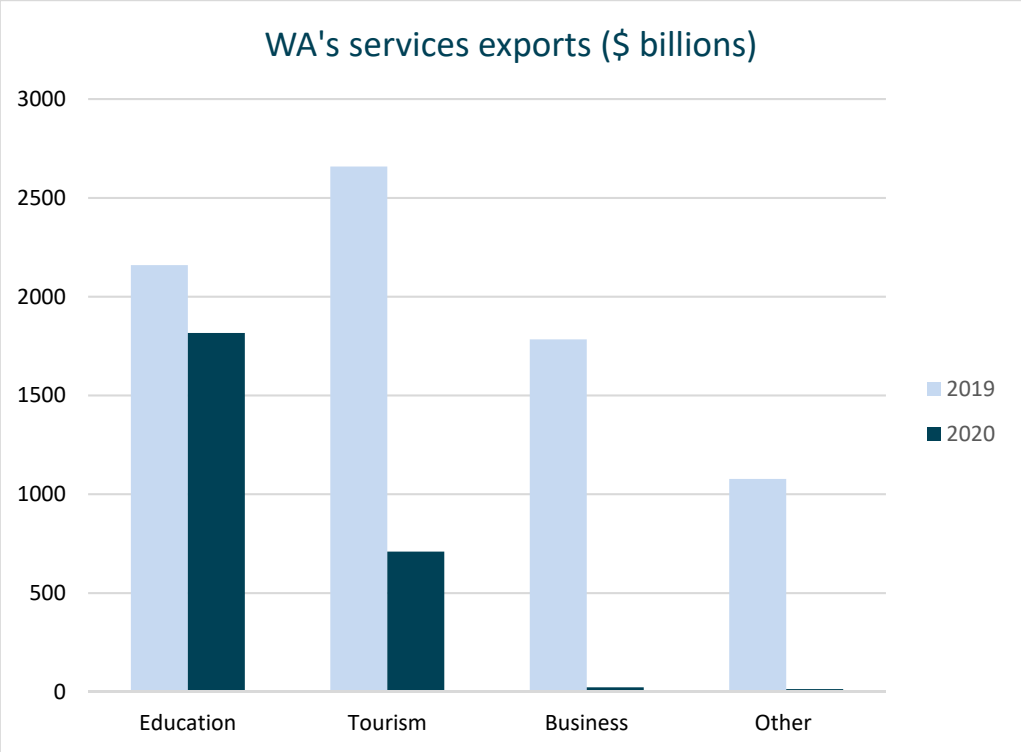
Services exports

2.35 WA's services exports are more diverse than the state's goods exports, in terms of both the category of service and the export destination. However, services exports comprise less than 5 per cent of total exports, which means that this diversity doesn't translate widely across the WA economy.[51]

2.36 The Committee for Perth identifies how Australia's shift towards service sector employment and exports has been less apparent in WA. However, the growth in some service industries in WA such as professional, scientific, and technical services, has been strongly linked to mining sector investment, growth and performance and associated population growth.[52]

46 Submission 8, Department of Treasury, p. 9.
47 ibid., p. 7.
48 Submission 8, Department of Treasury, p. 7.
49 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 9. (This total excludes confidential items).
50 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 9.
51 Submission 8, Department of Treasury, p. 8.
52 Submission 1, Committee for Perth, p. 4.

Figure 2.7: WA's services export categories ($ billions)[53]



Education

2.37 Although WA's service exports are less concentrated than its goods exports, for education services (which accounted for 28 per cent of services exports pre-COVID-19), a significant proportion of international students (around 40 per cent) come from just two countries—China and India. The ASEAN-3 (Singapore, Malaysia and Indonesia) account for a further 14 per cent of students.[54]

2.38 The COVID-19 pandemic and closed international borders are driving down demand for international education.

2.39 Many international students arrived in the state before COVID-19 travel restrictions were imposed and some international students enrolled in courses but remained overseas either studying online or deferring their studies.[55]

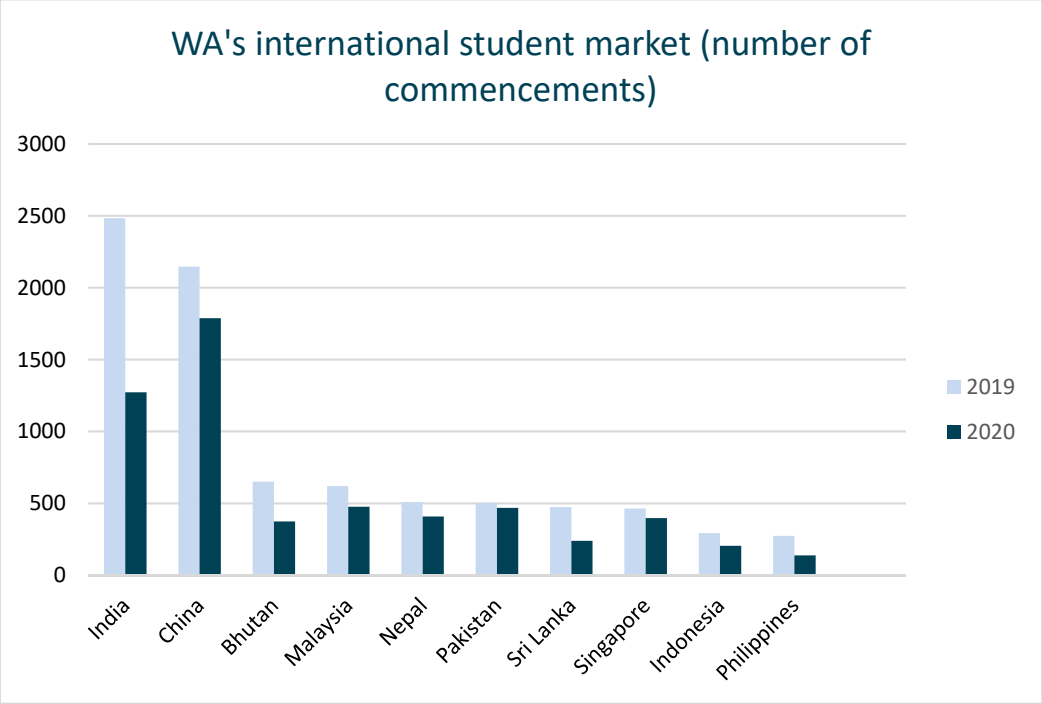
2.40 WA had around 32,800 international student enrolments between January and June 2021—around 17 per cent lower than the same period in 2020. This decline owed to travel restrictions that prevented new and existing international students from arriving in WA.[56]

2.41 Southeast Asia, particularly Malaysia and Singapore, has traditionally been a strong international education market for WA, with the Philippines now the strongest growing individual market in the region. International student enrolments from all other markets

53 Table created based on information from Submission 8, Department of Treasury, p. 11.
54 Submission 8, Department of Treasury, p. 7.
55 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 13.
56 ibid.

have been trending down over the past five years. The fall has also been evident in many European markets.[57]

Figure 2.8: WA's international student market (number of commencements)[58]



Tourism

2.42 The tourism export market is more diversified than the international student market.[59] For tourism services, 45 per cent of visitor numbers and visitor spend is from ASEAN-3 together with China and the United Kingdom.[60] The United Kingdom is the single largest market by visitor numbers while China is the largest market by visitor spend.[61]

The main factor affecting current demand for tourism in WA is the COVID-19 pandemic. The closing of international and interstate borders and restrictions on gatherings, plus requirements for social distancing, have had a significant impact on the tourism industry over the past 18 months. International visitor expenditure in WA fell from over $2.1 billion in the year ending March 2020 to $50 million in the year ending March 2021—a fall of over 97 per cent. Similar results were experienced Australia wide.[62]

2.43 In 2019 (the last year before the COVID-19 disruption) most international tourists to WA originated from the United Kingdom, Singapore, Malaysia, China and New Zealand. The

57 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 13.
58 Table created based on information from Submission 8, Department of Treasury, p. 11.
59 Submission 8, Department of Treasury, p. 10.
60 ibid., p. 7.
61 ibid., p. 10.
62 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 13.

proportion of visitors from these countries has remained relatively stable over the ten years prior to the COVID-19 pandemic.[63]

Figure 2.9: WA's international visitor marker (total visitors 000s)[64]

Finding 7

Services exports comprise less than 5 per cent of WA's total exports. They are less concentrated in terms of the category of service and export destination than the state's goods exports.

A lack of complexity and a reliance on one trade commodity and one trading partner

2.44 Throughout the inquiry, stakeholders commonly described how the lack of diversity in WA's economy leaves it vulnerable to disruption. Over 76 per cent of WA's exports go to just three destinations: China, Japan and South Korea. The WA economy is now more concentrated, both in absolute and relative terms, than it has been in the past 25 years.[65]

2.45 The Committee for Perth pointed out that WA is more dependent on mining than any other state is on any other industry, meaning disruption to the mining sector could have a significant negative impact on the performance of the economy.[66]

2.46 Infrastructure WA identified how WA's economy is undeniably linked to the strength of the resources industry. However, the industry is cyclical and vulnerable to external factors affecting demand and pricing. This has acute impacts on WA as a whole, as well as regional

63 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 13.
64 Table created based on information from Submission 8, Department of Treasury, p. 11.
65 Submission 15, Department of Primary Industries and Regional Development, p. 3.
66 Submission 1, Committee for Perth, p. 3.

and rural economies and communities that are highly dependent on the resources sector for employment and growth.[67]

2.47 WA's economic performance has become reliant on strong global demand for its commodity exports, particularly from China, which leaves the economy vulnerable to disruption. An aspect of particular concern is the potential disruption to government revenue.

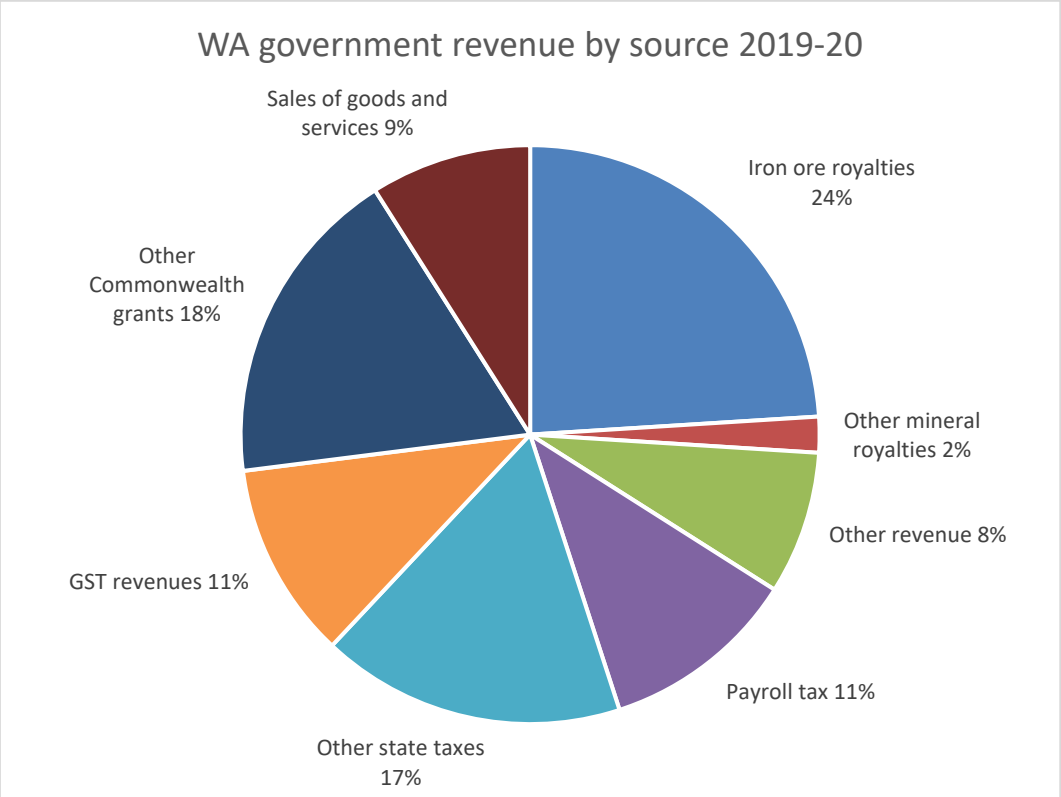
Finding 8

WA's economic performance has become reliant on global demand for its commodity exports, particularly from China, which leaves the economy vulnerable to disruption.

WA government revenue by source

2.48 The resource sector's dominance of the WA economy is reflected in its contribution to the state's budget revenues.

Figure 2.10: WA government revenue by source 2019-20[68]



2.49 The strength of the resource sector in recent years has directly contributed to the strength of the state's budgetary position. But the reverse would also be true if global economic volatility resulted in a drop in international demand for our resources. The resulting fall in royalties revenues and employment would be directly felt in the state's budget.

67 Submission 12, Infrastructure WA, p. 3.
68 Figure created based on information from Submission 5, Perth USAsia Centre, p. 3.

2.50 The impact on royalties revenues has been modelled by Treasury. According to their analysis, a 25 per cent fall in royalties revenues would require doubling the taxation effort across the rest of the economy to make up the shortfall. [69]

2.51 Treasury outlined how in 2020–21, WA received $13.8 billion in direct revenue from the resources sector, summarised in the table below.

Table 2.2: Estimated revenue from the mining sector in 2020-21 ($m)[70]

Estimated revenue from the mining sector in 2020-21 ($m)	
Royalty Income	
Iron ore	11,355
Petroleum – state component	3
Alumina	91
Diamonds	8
Mineral sands	30
Nickel	86
Gold	407
Copper	70
Lithium	50
Other	82
Total Royalty Income	**12,181**
Tenement Lease Rentals	**132**
North West Shelf grants (a)	**144**
Payroll tax from mining companies	**1,031**
Transfer duty (b)	**23**
Total Mining	**13,811**

69 Mr Alistair Jones, Executive Director, Economic Business Unit, Department of Treasury, *Transcript of Evidence*, 13 November 2021, p. 4.

70 Mr Michael Barnes, Under Treasurer, Department of Treasury, Letter – additional information provided, 3 November 2021, p. 1. (a) includes compensation for changes to Commonwealth crude oil excise arrangements. (b) this data only includes duty assessments on direct transfers of mining property. It excludes landholder duty which is assessed on acquisitions in corporations and unit trusts that hold land assets in WA, which include mining tenements and associated infrastructure, valued at more than $2 million. When assessing landholder duty, RevenueWA does not record the specific land assets that were held by the corporation or unit trust, and so it is not possible to extract how much landholder duty was associated with the resources sector. The total amount of duty will therefore be higher than what was provided.

Finding 9

The resource sector's dominance of the WA economy is reflected in its contribution to the state's budget revenues. Recent modelling shows a 25 per cent fall in royalties revenues would require doubling the taxation effort across the rest of the economy to make up the shortfall.

The emergence of WA's economy

2.52 During the course of the inquiry, stakeholders offered the view that the way in which the state's economy had developed reflected the vast wealth that was on offer through its enviable endowment of natural resources.

2.53 JTSI described how the structure of the WA economy has been influenced over time by the physical and geographical attributes of the state—in particular, the state's large land mass and coastline; the mineral and petroleum resources located within or close to the state; and the distance between the state's major population centres and other Australian and overseas cities.[71]

2.54 JTSI also noted that 'in recent decades, WA's economic structure has been affected by economic policies such as trade liberalisation that have encouraged a movement in activity towards industries in which the state has a comparative advantage.' The growth of a number of Asian economies has exacerbated this, leading 'to an increase in demand for the state's export commodities as well as an increase in supply of lower-cost manufactured goods (in some cases, substituted for domestic production).'[72]

> ***While the overall outcomes over the past 20 years have been positive, they have been driven to a large extent by mining. When we consider the next 20 years, we should ask whether the same drivers are able to sustain our economic growth.***
>
> *- Department of Jobs, Tourism, Science and Innovation*

2.55 Infrastructure WA recognised that WA's exports over the last 20 years have been largely driven by WA's changing trade relationship with China, driven by its own rapid economic expansion.[73]

2.56 JTSI told us that given the future timeframe the inquiry is looking at to 2041, it was useful to first look back 20 years.

2.57 Over the 20 years up to 2019–20, WA's GSP grew at an average annual rate of 2.7 per cent. Taking a closer look at growth over this 20-year period to 2019–20—the mining industry's share of GSP grew from 19 per cent to 43 per cent.[74]

2.58 WA's 'economic growth has on average been higher than Australia's economic growth over the past 20 years, because that growth has been concentrated in the mining industry.'

71 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 4.
72 ibid.
73 Submission 12, Infrastructure WA, p. 6.
74 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, *Transcript of Evidence*, 18 August 2021, p. 2.

However, 'the outcomes for average annual growth in employment have been similar: two per cent for Western Australian and 1.9 per cent for Australia.'[75]

2.59 Looking at broader economic indicators, JTSI raised doubt as to whether the same economic drivers of the past would successfully sustain economic growth going forward.[76]

2.60 Perth USAsia Centre made the point that the benefits we are reaping today are a result of measures put in place in the 1960s and 1970s.[77] This was in the context of looking at WA's iron ore exports, in terms of both the current volume and price of the export commodity.

Box 2.2: An industrial history of Western Australian iron ore

Perth USAsia Centre identified an under-appreciated, intergenerational dimension to WA's regional economic ties, providing a history of the iron ore industry as an example.

- The development of an iron ore industry in the state's north was first proposed in the mid–1950s, in order to leverage recently-discovered mineral endowments to develop the region beyond what the existing pastoral industry could support.
- Initial attempts to replicate the 'integrated' industrial model of the eastern states (co-located iron mining and steel production) were made. However, the infrastructural challenges of developing an integrated steel industry in the state's north proved uneconomic, and the state government pivoted to an 'exports first' model for the iron ore industry.
- A regional partner was found in Japan, whose post-war industrialisation was driving rapid demand for natural resources in which Japan was poorly-endowed. Japanese steel mills sponsored the development of two large-scale export projects in the mid-1960s—Rio Tinto's Hamersley Iron and BHP's Mt Newman—by extending long-term sales contracts and equity investments.
- Within a decade, the 'first iron ore boom' saw the Pilbara become the world's only large-scale exporter of iron ore, establishing a seaborne trade in the commodity for the first time.
- In the 1980s and 1990s, the industrialisation of Korea, Taiwan and China also saw these countries develop trade relationships with the WA iron ore industry. This diversified its customer base and eliminated its sole dependence on Japanese partners.
- In the early 21st century, China's shift to a 'heavy' stage of industrialisation saw its steel industry rapidly grow to quickly become the world's largest. Given the low quality of its domestic reserves it looked to WA as an iron ore supplier and became the state's largest export market in 2005.
- The burgeoning relationship with China triggered a 'second iron ore boom' in the mid–2000s, of a similar form to the first Japan-sponsored boom of the 1960s. Chinese steel mills extended long-term contract and equity investments to new projects, greatly expanding production levels.
- Rio Tinto and BHP were able to greatly expand their local presence, while a third producer—Fortescue Metals Group (Fortescue)—successfully joined the sector. Investment in new mines and infrastructure drove rapid inward migration and employment growth, and subsequent increases in output delivered significantly greater volumes of iron ore royalties to the state government.

Source: Submission 5, Perth USAsia Centre, pp. 3-4.

75 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, *Transcript of Evidence*, 18 August 2021, p. 2.

76 ibid.

77 Dr Jeffrey Wilson, Research Director, Perth USAsia Centre, *Transcript of Evidence*, 11 August 2021, p. 2.

2.61 In mapping out this history as part of WA's economic development, Perth USAsia Centre went on describe how although occurring on a smaller scale—similar development models have characterised the growth of the state's natural gas, lithium and rare earths sectors.[78]

2.62 One of the key observations in looking at the history of the WA economy is the recognition that decisions made decades ago about WA's key export industries have been critical in shaping aspects of the economy today, supporting a prosperous state.

Finding 10

Economic benefits enjoyed by Western Australians today are largely a result of development measures put in place by previous generations in the 1960s and 1970s.

Looking forward

2.63 Throughout the inquiry, we heard a great deal about the COVID-19 pandemic and planning for recovery, which has been a major focus in planning across the economy.

2.64 It is also important to consider other global trends, which have been gaining momentum over many years, and which will also impact the economy in the long term.

> Over the past 18 months the focus of economic policymakers, not only in Western Australia but the rest of the country and the rest of the world, has been on managing the ongoing disruption to the economy from the COVID-19 pandemic. While this has necessarily been a priority, there has also been a recognition that the actions taken to manage the COVID-19 pandemic, and the pandemic itself, will have longer term implications for the economy and for society. But it is not all about the pandemic. There are global trends that have been present for many years that will continue to impact Western Australia's economy.[79]

2.65 The following chapters seek to understand how key stakeholders are navigating emerging trends that are shaping the WA economy today, and which seem likely to shape the economy for future generations.

78 Submission 5, Perth USAsia Centre, p. 4.

79 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, *Transcript of Evidence*, 18 August 2021, pp. 1-2.

Chapter 3

A world moving to decarbonisation

Climate change is driving global efforts to decarbonise

3.1 Decarbonisation in response to climate change will be a major trend shaping future economies. Throughout the inquiry we were told how the global trend towards decarbonisation offers both significant challenges and opportunities for the WA economy.

3.2 The ways in which the impacts of climate change shape economies were considered by KPMG, which outlined how climate change gives rise to physical disruptions of delivery in key markets and is driving a rapidly accelerating shift away from fossil fuels.[80]

3.3 Industry stakeholders from some of WA's largest export sectors conveyed to us the widespread recognition that decarbonisation will reshape industry areas.

WA has the potential to take advantage of a global race to decarbonise

3.4 DMIRS told us that the world's transition to a low carbon and clean energy future will be a key factor impacting demand for WA resources. Decarbonisation will fuel global demand for battery technologies for use in electric vehicles and energy storage systems, renewable energy generation technologies such as solar panels and wind turbines, as well as renewable hydrogen.[81]

3.5 Inquiry stakeholders commonly emphasised WA's significant renewables advantage.

3.6 JTSI advised that the challenge of decarbonisation is a positive for WA, noting that the state has the capacity to grow its renewable energy, hydrogen and future battery industries. This will assist the state's decarbonisation, and contribute to the global effort.[82]

3.7 The Department of Primary Industries and Regional Development (DPIRD) outlined how WA has some of the best wind and solar resources in the world and is richly endowed with many of the metals, non-metals and mineral elements considered necessary for a green energy future. The growing interest in green energy investment creates a significant opportunity for WA.[83]

3.8 WA has substantial reserves of the minerals required for green energy production and storage, including lithium, nickel, cobalt, manganese and alumina. With the world shifting to

80 KPMG, *Geopolitics and the Australian minerals industry*, 2021, p. 19.
81 Submission 15, Department of Mines, Industry Regulation and Safety, p. 5.
82 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, *Transcript of Evidence*, 18 August 2021, p. 3.
83 Submission 15, Department of Primary Industries and Regional Development, p. 7.

a low emissions future, there is an opportunity for WA to move beyond the extraction of minerals and contribute to the domestic green energy supply chains.[84]

3.9 JTSI outlined opportunities for WA as the composition of global energy demand changes:

> Japan and South Korea (two of the largest LNG importers) have signalled a shift towards lower emission alternatives, such as hydrogen. To be part of this transition in these and other markets, WA is implementing the WA Renewable Hydrogen Strategy, to ensure that by 2030, its market share in renewable hydrogen exports is similar to its share in LNG today. Given natural endowments of sunshine, wind and available land, as well as existing supply chain and customers, WA is well positioned to pursue hydrogen exports in the coming decades.[85]

Finding 11

WA has competitive advantages in the face of the global challenge of decarbonisation—particularly the capacity to grow the state's renewable energy, hydrogen and future battery industries.

Finding 12

WA has large reserves of the minerals required for green energy production and storage, including lithium, nickel, cobalt, manganese and alumina. This provides WA with an opportunity to move beyond the extraction of minerals to contribute to green energy supply chains.

WA has the potential to develop renewable hydrogen for export—and for decarbonising local industries

3.10 CSIRO identified that international decarbonisation drivers will likely stimulate the development of international hydrogen supply chains. As such, research, development and innovation is needed to support the scale up of a hydrogen export industry based on hydrogen carriers such as liquid hydrogen and ammonia.[86]

3.11 DMIRS told us that renewable hydrogen is expected to play an increased role in the global energy mix of the future as the world moves towards decarbonisation. It has potential uses in energy applications such as transport, heat, power generation and storage, and as a carbon-neutral feedstock for a variety of industrial processes.[87]

Finding 13

Worldwide efforts to decarbonise will likely drive demand for renewable hydrogen and stimulate the development of international hydrogen supply chains.

84 Submission 10, Department of Primary Industries and Regional Development, p. 7.
85 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 9.
86 Submission 10, CSIRO, p. 4.
87 Submission 9, Department of Mines, Industry Regulation and Safety, pp. 5-6.

Hydrogen supporting jobs of the future

3.12 Perth USAsia Centre emphasised that in thinking about jobs of the future, clean energy and hydrogen offer significant opportunities—not only as an export opportunity, but also as an 'opportunity to substitute for coal in our grid once Collie is not able to supply that and do that domestically.'[88]

3.13 We heard how the availability of clean energy and hydrogen has 'knock-on' effects for many of the state's other industries.[89]

3.14 Treasury has modelled the benefits of a major hydrogen project, over the life of the project, and we heard that they are quite substantial. In considering the benefits of hydrogen, Treasury told us that probably the most interesting aspect is, that the benefits exist more from the ability for hydrogen to deliver cheap energy for WA, which the state can then use to diversify the economy.[90]

Box 3.3: Hydrogen is forming a part of Woodside's new energy business

Woodside told us that while it expects LNG demand to remain strong, producers will need to remain cost competitive and reduce their carbon emissions to compete in the market. The major LNG producer identified how it has set emissions reductions targets in line with its aspiration of net zero by 2050, planning to meet these targets by avoiding emissions through facility design and operation, and by offsetting emissions by acquiring and originating carbon offsets.

Woodside identified that it is establishing a new energy business with a focus on low and zero carbon energy sources, including hydrogen, which it says is a key part of its strategy to decarbonise its business and fulfil customer demand. The intention is that this new energy business can be scaled at the pace of the energy transition.

Source: Submission 19, Woodside Energy, p. 2.

Finding 14

The availability of renewable hydrogen in WA will benefit many of the state's industries, which will support WA in diversifying its economy and creating future jobs.

Decarbonising WA's biggest export commodity: *a case study in iron ore*

3.15 Increasing global momentum towards decarbonisation is shaping the future of industry areas with high carbon emissions.

3.16 During the course of the inquiry we heard decarbonisation characterised as a major disruptor in the iron ore industry—one which offers both challenges and opportunities.

3.17 WA's reliance on iron ore exports (see chapter 2) means that a shift in demand for iron ore could have a significant impact on the WA economy. Given the potential scale of disruption to the economy, in particular to government revenue and jobs, one of our inquiry objectives was to see how stakeholders are responding to emergent trends.

88 Dr Jeffrey Wilson, Perth USAsia Centre, *Transcript of Evidence*, 11 August 2021, p. 12.
89 ibid.
90 Mr Alistair Jones, Department of Treasury, *Transcript of Evidence*, 13 October 2021, p. 6.

3.18 Industry stakeholders are acutely aware of the impact that decarbonisation is having upon global demand for iron ore and are responding.

3.19 Fortescue has a target to achieve net zero operational emissions by 2030, which is underpinned by a pathway to decarbonisation that is focussed on investing in renewable energy and eliminating the use of diesel in its mining fleet.[91]

3.20 Rio Tinto recognises that as it works to meet current and future demand for iron ore, it will need to address the challenges of climate change through decarbonisation.[92] Rio Tinto told us that it has set itself a net zero emissions target from its operations by 2050 and has committed more than US$1 billion in investment towards its climate change targets.[93]

Shifting global demand

3.21 One of the clear messages we heard was that future demand for iron ore is not expected to decrease as a result of global efforts to drive down carbon emissions in iron ore processing and steelmaking. Rather, we will witness a shift in demand (see Box 3.3: Changing demand for iron ore).

3.22 The Minerals Research Institute of Western Australia (MRIWA) highlighted that in considering demand for iron ore, the grade and type of ore is an important distinction:

> One thing that we need to acknowledge is that there will always be a market for our high-grade lump and fines. I think the long-term opportunity for Western Australia is looking at what we do with the low-grade and the magnetite ores that we have in this state.'[94]

3.23 Rio Tinto noted that ores that are going to be higher in iron and lower in impurities will be scarcer and will therefore attract a premium.[95]

3.24 MRIWA has commissioned a report into green steel which it anticipates will offer insights into the market dynamics surrounding the future of iron ore and green steel. It will address questions about the size of potential markets, and whether there is a viable opportunity in green steel in the future.[96]

Through all of the work we have been looking at about what does it mean of operating and living in a low carbon environment, the good news for us is that there is always going to be a need for resources, even construction resources and steel. The key challenge for us is how do you do that from having less carbon in the whole overall process. That is something we are certainly very focused on.

-Rio Tinto

91 Fortescue Metals Group, *FY21 Climate Change Report*, August 2021, pp. 4-5.
92 Submission 13, Rio Tinto, p. 9.
93 ibid.
94 Ms Nicole Roocke, Chief Executive Officer, Minerals Research Institute of Western Australia, *Transcript of Evidence*, 17 November 2021, p. 1.
95 Mr Simon Richmond, Vice President Global Procurement, Rio Tinto, *Transcript of Evidence*, 17 November 2021, p. 9.
96 Ms Nicole Roocke, Minerals Research Institute of Western Australia, *Transcript of Evidence*, 17 November 2021, p. 8. (The report is due to be completed in April 2022)

Box 3.4: Changing demand for iron ore

Current demand is largely for haematite ore

Almost all global demand for iron ore is derived from the manufacture of steel. And most of the global iron ore trade (70 per cent) is in the form of haematite.

In terms of both volume and value, the vast majority (96 per cent) of WA iron ore production is in the form of haematite ore which is shipped directly to market where it is used as feedstock in the steel manufacturing process.

Haematite is generally a less expensive feedstock option. It typically requires only crushing and screening or minimal beneficiation and processing before sintering, whereas magnetite ore requires more extensive downstream processing before it is suitable for use as feedstock.

However, magnetite ore is increasingly important

The nature of demand for iron ore is changing. This is occurring primarily in response to decarbonisation and increasingly stringent environmental protection policies of governments worldwide. Traditional steel manufacture is a significant greenhouse gas emitter and polluter.

By 2035, it is estimated that around half of all steel production will be derived from non-primary pathways. As the calculus of production shifts and environmental outcomes see higher weightings, in order for production from raw ore to be competitive with re-smelting of scrap, further improvements will require either new steelmaking technologies described by industry as 'radical' or new sources of feedstock. For the former option (that is, radical new technologies) while there are some concepts in the early stages of development, none are yet commercialised, and market adoption beyond small-scale trials or demonstration plants is not expected until after 2030 at the earliest.

For the majority of global steel production (particularly in East Asia), improvements in environmental outcomes can only be achieved over the medium term by an increasing shift toward higher purity processed feedstocks, principally in the form of magnetite concentrates or pellets.

Accordingly, industry's focus on lower cost haematite—while likely to remain strong for the foreseeable future—is increasingly moderated by a growing appetite for magnetite derived feedstock.

Higher purity processed feedstocks such as magnetite concentrates or pellets, generally command a price premium over direct shipping (haematite) ore in steel mills targeting higher grade output. However, they deliver significant benefits over the entire lifecycle of steel production, including reduced input, process and waste management costs, and importantly, reduced environmental impacts, with pelletised iron not requiring sintering and delivering drastically lower process energy input.

The usage of processed feedstock in China alone is expected to increase by over 40 per cent by 2023.

The challenges and opportunities for WA

WA's key trading partners for iron ore exports (China, Japan, South Korea) host some of the most polluting and least carbon-efficient steel industries in the world. Thus, the net effect of their stated regulatory and policy responses is likely to be a reshaping of their demand patterns, as their domestic industries apply new value-in-use calculations to varying feedstock sources.

Demand for traditional haematite feedstock is unlikely to decrease. However, demand for alternate feedstock is expected to increase, creating a potential opportunity for nations hosting significant magnetite resources, such as WA.

WA is increasing its production of magnetite ore; however, this amount is still a small percentage of overall production. At present, the downstream processing required for magnetite is expensive for iron ore producers, making it hard to compete in the current global market.

Source: Australian Venture Consultants, *A Case for a Fair and Reflective Royalty Regime for the WA Magnetite Industry*, Chamber of Minerals and Energy of Western Australia and the Association of Mining and Exploration Companies, Western Australia, December 2020.

The industry is responding to decarbonisation

3.25 As established above, decarbonisation is going to have a huge impact on how the global steel industry operates and the type of iron ore and feedstock that is sought by steelmakers.

3.26 Treasury told us some of WA's producers that have lower quality ore, such as Fortescue, are looking at their production process with a view to making it greener so that they can remain competitive into the future.[97]

3.27 Fortescue is pursuing a pathway to become a major green energy and hydrogen exporter—if successful, this would provide Fortescue with low cost and readily available energy. This is advantageous because, although magnetite-derived feedstock produces less carbon emissions than haematite in steel making, it is expensive for iron ore producers to process magnetite into feedstock. Downstream processing is energy intensive; low cost energy would be a significant advantage in processing both magnetite and haematite.

3.28 Rio Tinto told us that decarbonising is one of the iron ore producer's top priorities, as well as finding a pathway for Pilbara ores in this new environment, stating:

> The issue with the Pilbara ores is that…the quality is different. We have Canadian ores, and the quality is different to those that come in a higher concentrate or pellet form. The issue is that that requires beneficiation, so you have to effectively improve that, and that is quite expensive—so, the sinter plants or bringing heat into it is a way that is actually doing that, and that also brings carbon into the process. Our challenge, and we are spending a lot of time and lots of different partnerships to try and find a solution to this, is actually about: what is the pathway for Pilbara ores? It is more than a Rio Tinto issue, obviously, and we are working with the state and the CSIRO on some research and development. We are working with our customers on some research and development around what sort of solutions are there. We do not have the answer to that, but we know we have to be working through what are the different pathways to take that in.[98]

Finding 15

Decarbonisation is going to have a significant impact on how the global steel industry operates and the type of iron ore and feedstock that is sought by steelmakers.

Finding 16

Industry stakeholders are confident that future demand for iron ore will not decrease in response to global efforts to drive down carbon emissions in iron ore processing and steelmaking. However, the risk is that over the longer term, low-grade ore with higher impurities will lose market share because there is an alternate supply of ore which doesn't require processing (processing is expensive and brings carbon into the process).

97 Mr Alistair Jones, Department of Treasury, *Transcript of Evidence*, 13 October 2021, p. 6.
98 Ms Rowena Albones, Chief Financial Officer, Rio Tinto, *Transcript of Evidence*, 17 November 2021, p. 4.

Finding 17

Iron ore producers recognise the challenge posed by decarbonisation and are investing in the development of renewable energy technologies, and broader research and development, in support of producing a competitive product.

Global green steel ambitions

3.29 MRIWA told us that part of the issue surrounding the move to green steel is that at the moment there is not necessarily a market for green steel, in that it is not yet competitive and is not necessarily attracting a price premium. However, there is certainly an expectation by investors that the extractives industry will decarbonise.[99]

3.30 MRIWA outlined the shift in demand for iron ore and steel products over the next ten years, as consumer expectations around decarbonisation take shape. This is captured in Box 3.5.

Box 3.5: A ten-year inflection point, as explained by the MRIWA

When you look at what industry analysts are saying, they are effectively saying that over the next ten years, the technology will be developed such that the iron-making and steel-making process will be able to go greener, and that, in going greener, they will need to have higher grade input ores going into their processes that have less impurities in them. At the moment, the technology is not quite there to be able to do it at scale.

In conversations that we have had with steel manufacturing companies who have interests in buying ore from WA, their view is that for the next ten years, they are going to be focusing their time and effort on energy efficiencies and carbon capture and storage as a way for them to reduce their emissions profile. That is only going to get them so far though. After that point in time, they are then looking at what technology investments are needed to be able to go greener.

The reason why none of them are rushing to do this is because the majority of steel is made through a blast furnace process. Blast furnaces can be relined every 15 years. Due to the cost of them, they are not about to retire assets that still have a usable life. The usable life of a blast furnace, given that it can be relined every 15 years, is in that 45 to 50 years' horizon.

When you look at the average age of blast furnaces globally, the key movers for this are likely to be Japan. The majority of Japan's blast furnaces were built around 40 years ago—again, this is the logic for why the ten-year time inflection is going to be important. They are coming close to the point in time where those steel manufacturers need to make an investment decision on what they do next, because they have basically sweated their assets as much as they can.

Whereas if you look at countries like China and South Korea to a lesser degree, they went through an extensive rebuild of all of their blast furnaces in the last 15 to 20 years—China in particular, when they moved their blast furnaces closer to the ports where their iron ore exports were coming in.

The imperative to change and shift in the short term is less because they have these assets that they need to, effectively, continue to sweat and continue to use and they will be able to keep relining them and get those energy efficiencies. That, hopefully, gives some context as to what are some of the global drivers that will have the steel manufacturers having to change, and then why we will need to be thinking about in that ten-year time horizon doing something differently because, at that point, the customers will be demanding a different product.

Source: Ms Nicole Roocke, Minerals Research Institute of Western Australia, *Transcript of Evidence*, 17 November 2021, pp. 1-2.

99 Ms Nicole Roocke, Minerals Research Institute of Western Australia, *Transcript of Evidence*, 17 November 2021, p. 7.

Finding 18

Currently, there is no clear market for green steel—it is not yet competitive and does not attract a price premium. However, there is a strong expectation by investors that the extractives industry will decarbonise.

Will decarbonising iron ore move WA along a pathway to green steel manufacturing?

3.31 The state government has committed $1 million to investigating green steel manufacturing or the viability of inputs into green steel. GHD in partnership with ACIL Allen has recently been appointed to undertake that work, which is looking at mapping the scenarios along which WA could engage on green steel.[100]

3.32 MRIWA reports that WA has significant under-utilised magnetite resources and a potential green hydrogen production capacity, which would enable the state to participate in the emerging green steel industry.[101]

3.33 Multiple scenarios along a continuum exist, through which WA could do this, including:

1. Continuing to export iron ore; creating green hydrogen and exporting overseas for steel making.
2. Producing direct-reduced iron locally, initially using gas-based direct reduction then subsequently through hydrogen direct reduction, and exporting overseas to be refined to steel.
3. Producing steel locally, exporting semi-finished products for overseas fabrication.[102]

3.34 MRIWA finds these scenarios are not mutually exclusive and could establish a development pathway for WA.[103] It describes how the lead time for WA to capture this emerging opportunity means there is a need to start now to enable the state to have a comprehensive understanding of the ore characterisation, policy and incentive frameworks, land availability and capabilities needed.[104]

3.35 We were told the commissioned report will be complete in April 2022.[105] The findings of the report will be an important component in understanding the development pathway that is most beneficial for WA, in a context of increasing global demand for green steel.

100 Ms Nicole Roocke, Minerals Research Institute of Western Australia, *Transcript of Evidence*, 17 November 2021, p. 7.
101 Minerals Research Institute of Western Australia, *Green Steel: How can WA support the ambitions of the global green steel industry*, accessed 8 December 2021, <https://www.mriwa.wa.gov.au/challenges/green-steel/>.
102 ibid.
103 ibid.
104 ibid.
105 Ms Nicole Roocke, Minerals Research Institute of Western Australia, *Transcript of Evidence*, 17 November 2021, p. 4.

WA will miss out on export opportunities if it does not decarbonise

3.36 There are concerns that as a state we will fall behind unless we move faster on decarbonising the economy.

3.37 We heard how WA has the most emissions intensive economy of any state in Australia, which continues to increase despite national level commitments to the Paris Agreement, and the net zero emissions by 2050 aspiration set out in the *WA Climate Policy*.[106]

> ***Unless more meaningful action is undertaken across WA's economic sectors, the state stands to risk foregoing finance and trade opportunities and be less competitive as carbon pricing and other policy instruments, such as the EU Carbon Border Adjustment Mechanism, become more widespread.***
>
> *- Infrastructure WA*

3.38 Infrastructure WA told us:

> It is clear that investor sentiment and WA's trading partners are turning towards more sustainable portfolios and practices. The state's emissions profile will gain increasing attention and scrutiny as other jurisdictions decarbonise their economies. [107]

3.39 The Committee for Perth identified how climate change will be a critical factor impacting demand for exports in WA, and is expected to influence the capacity for free trade in the future. Climate change responses are also impacting, and have the potential to impact on, the ability of WA companies to attract overseas investment.[108] (See chapter 5 for further discussion on investment).

3.40 DPIRD noted WA's significant carbon footprint, outlining how in 2019, WA's emissions rose to 91.9 million tonnes. While for WA's 56 per cent of exports, this 91.9 million tonnes is only around 17 per cent of Australia's total greenhouse gas emissions, it is 21 per cent above emissions in 2005, the benchmark year for measuring whether Australia meets its Paris agreement targets.[109]

3.41 This growth in emissions is primarily a result of the resources boom, which has led to a doubling of the size of our economy between 2000 and 2016, as well as increasing carbon emissions from the state's agriculture sector.[110]

3.42 DPIRD told us that WA's and Australia's progress towards being carbon neutral will be vital for the state's ability to compete with key competitors in the European Union (EU) and elsewhere, where movement towards carbon neutrality is more advanced.[111]

106 Submission 12, Infrastructure WA, p. 11.
107 ibid.
108 Submission 1, Committee for Perth, p. 6.
109 Submission 15, Department of Primary Industries and Regional Development, p. 8.
110 ibid.
111 ibid.

Finding 19

There are concerns that WA will miss out on economic opportunities if it doesn't move faster on decarbonisation. Investors, and WA's trading partners, are increasingly looking for more sustainable portfolios and practices.

European Union carbon border adjustment mechanism: *a case study looking at WA's agricultural industry*

3.43 During the inquiry we heard that the EU will introduce a carbon border adjustment mechanism, which is going to provide a disincentive for products with a carbon embodiment.[112] According to experts, the carbon border adjustment measures will definitely impact Australian agriculture.[113]

3.44 Perth USAsia centre outlined how, in a scenario where carbon border adjustment mechanisms are in place, the ability to have a clean energy industry generated by renewables, using hydrogen to get it from where the wind turbine is to where the manufacturing is done or where the crops are grown, is a huge advantage.[114] Effectively it enables an Australian product to be sold internationally.[115]

> ***While a lot of the Australian and state discussion about some of these carbon tariffs has been, 'This is bad. We have to advocate against them, because they are going to be protectionist against our industries', for a state like WA, which is the most renewable energy-endowed jurisdiction in the country and Australia is the most renewably endowed country in the world, this is actually a huge opportunity…***
>
> *- Perth USAsia Centre*

3.45 Perth USAsia centre highlighted how WA's renewable energy opportunity is not just an opportunity in itself, but is valuable in that renewable energy can be used to command a market premium by virtue of the fact that a product was made with renewable energy.[116]

3.46 KPMG echoed this observation in a recent report, which found that a carbon border adjustment mechanism can be seen as a potential risk for some Australian exports—and an opportunity for those who decarbonise production methods.[117]

112 Dr Jeffrey Wilson, Perth USAsia Centre, *Transcript of Evidence*, 11 August 2021, p. 12.
113 ibid.
114 ibid.
115 ibid.
116 ibid., p. 13.
117 KPMG, *Geopolitics and the Australian Minerals Industry*, Australia, 2021, p. 21.

3.47 DPIRD recognises decarbonisation as a key challenge when considering global demand for goods within its portfolio areas. WA is a highly traded, open economy—more open than any other state and territory. Being trade exposed has an upside when all is going well, but there are also some challenges in terms of outlook:[118]

> 82 per cent of Australia's exports are now going to markets that have a net zero target. That is 82 per cent of all of our exports across the country. That is pretty significant, given where we are at and where we will be in terms of our future living standards and the impact on those. So, that is one significant challenge.[119]

3.48 KPMG highlighted that aside from the EU, the United States, Canada, Japan and the United Kingdom are also considering carbon border adjustment mechanisms. While the idea of a carbon border adjustment mechanism has been under discussion for many years, it seems that there is now genuine political will to implement such a mechanism.[120]

3.49 In considering the preparedness of WA for a carbon border adjustment mechanism, DPIRD told us how although it is a federal-led responsibility, the department is across the issue and working in cooperation with other key state agencies such as JTSI, as well as industry.[121]

Finding 20

The European Union will introduce a carbon border adjustment mechanism which will provide a disincentive for a product that has a carbon embodiment in it—this will impact Australian agriculture.

Finding 21

Carbon tariffs can offer significant opportunities to WA, given the state's renewable energy advantages; being able to command a market premium for a product made with renewable energy will increase the state's competitive advantage in that market.

WA's low-carbon future

3.50 It is becoming increasingly important for WA to have pathways in place to decarbonise sectors of the economy.

3.51 In December 2021 the state government released its strategy, *Shaping Western Australia's low-carbon future: Developing sectoral emissions reduction strategies to transition the economy to net zero* (the low-carbon future strategy).

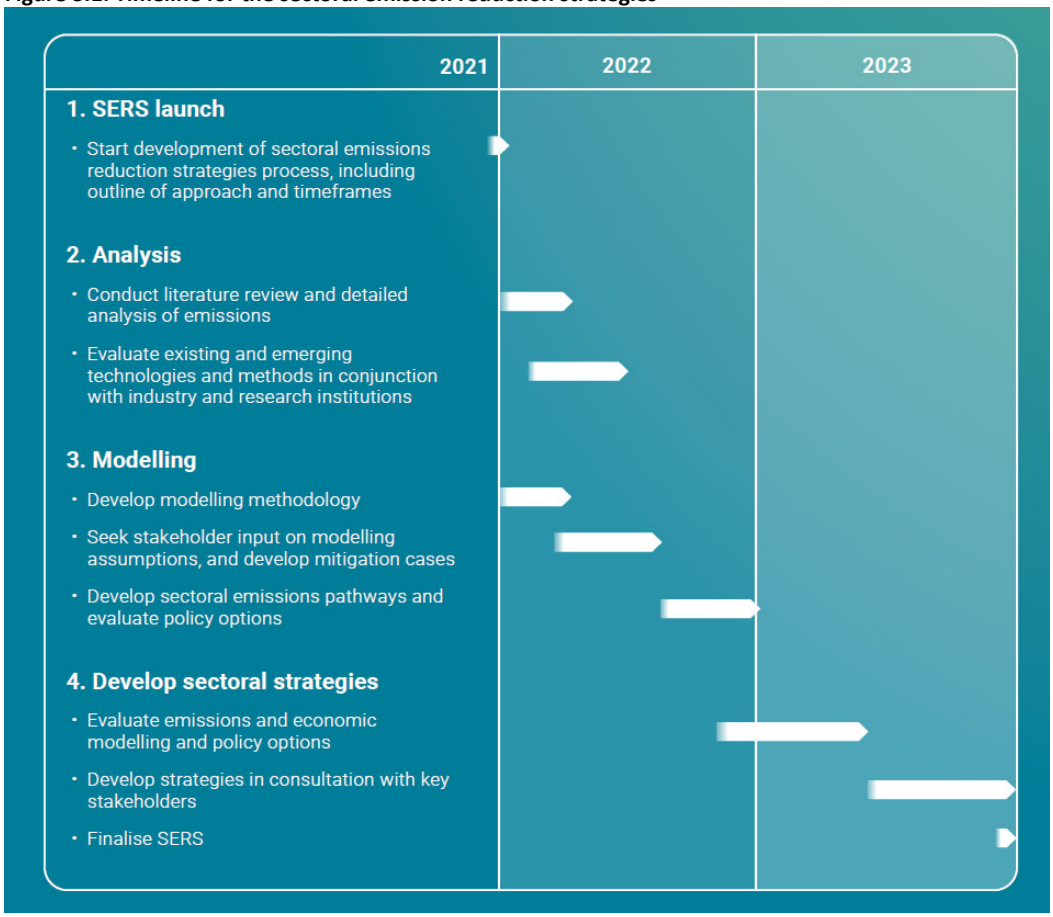
118 Mr Liam O'Connell, Acting Deputy Director General, Department of Primary Industries and Regional Development, *Transcript of Evidence*, 24 November 2021, p. 2.
119 ibid.
120 KPMG, *Geopolitics and the Australian mineral industry*, 2021, p. 21.
121 Mr Liam O'Connell, Department of Primary Industries and Regional Development, *Transcript of Evidence*, 24 November 2021, p. 8.

3.52 The low-carbon future strategy outlines how the pace and scale of decarbonisation is accelerating and the economic cost of inaction is significant.[122]

> The net zero transition is not a choice between our environment and our economy. Modelling by Deloitte Access Economics underscores the benefits of a coordinated transition to a net zero emissions economy, showing an $890 billion increase to GDP and 195,000 additional jobs by 2070, with significant benefits for regional Australians… The risks of not moving quickly are also becoming increasingly apparent, as frameworks for international trade and global finance move to penalise carbon-intensive economies, businesses and sectors.[123]

3.53 Through the strategy, the government outlines its intention to set targets to reduce emissions from government enterprises in the coming months. The strategy notes that the government is considering interim targets for the broader economy to enhance uptake of existing abatement technologies, accelerate innovation, and encourage new investment.[124]

Figure 3.1: Timeline for the sectoral emission reduction strategies[125]



122 Department of Water and Environmental Regulation, *Shaping Western Australia's low-carbon future: Developing sectoral emissions reduction strategies to transition the economy to net zero*, December 2021, p. 4.
123 ibid., p. 7.
124 ibid., p. 4.
125 ibid., p. 18.

3.54 While the government has set the high-level ambition for decarbonisation, the strategies for emissions reductions will be developed through consultation and in partnership with relevant stakeholders.[126]

3.55 The timeline for sectoral emission reduction strategies (see Figure 3.1 above) shows there is significant work to be undertaken over the following years before any potential strategies are finalised.

3.56 The low-carbon future strategy notes that other jurisdictions have already developed plans and strategies to support the transition of their economies toward net zero emissions, and generate clean energy jobs and investment.[127]

3.57 The state government is set to release further information on the timing and consultation approach in early 2022.[128] The establishment of clear pathways to decarbonise industry areas will be critical in providing confidence that WA has the ability to achieve its decarbonisation ambitions. In doing so, it will be in a position to secure ongoing investment in both current and future industries (this is discussed further in the context of inbound investment at chapter 5).

Finding 22

Providing confidence to investors and trade partners that WA has identified pathways to achieve its decarbonisation ambitions will secure investment in future industries.

126 Department of Water and Environmental Regulation, *Shaping Western Australia's low-carbon future: Developing sectoral emissions reduction strategies to transition the economy to net zero*, December 2021, p. 12.
127 ibid., p. 6.
128 ibid., p. 19.

Chapter 4

A changing global economy

The future of WA exports is unlikely to look like it has in the past

4.1 The large scale development of natural resource exports that has been a success story for WA's economy, will not characterise future growth of our economy in the same way.

4.2 Iron ore in particular has been a key driver of growth for WA, but future demand for iron ore exports will take a different shape.

4.3 The rapid urbanisation of our leading export partner—China—is unlikely to continue at the same rate. China's demand for iron ore is generally forecast to plateau and although its demand for iron ore appears likely to remain high, it will not boom as it has previously.

Iron ore will continue to be an important part of the Western Australian story, but it is unlikely to remain the key driver of growth.

- Department of Treasury

4.4 Over the past decades we've continued to observe increasing urbanisation not only in China, but also other nations in the Indo-Pacific region. This trend is anticipated to continue into the future but will occur at different rates across nations, providing opportunities for emerging markets and trading partners. Global development will shape significant structural change in the global economy.

4.5 More than ever before, the globalised economy is inter-connected and shifting geopolitical dynamics pose significant disruption risks to highly trade exposed economies, such as WA's. For example, recent events unfolding in eastern Europe between Russia and Ukraine provide a timely reminder of how widely economic impacts can be felt across the global economy. This emphasises the importance of maintaining and building strong relationships with trading partners, as well as diversifying our exports to create sector agility and increase economic stability in the face of economic disruption.

Shifting demand for iron ore

4.6 Throughout the inquiry, we heard widespread recognition that we are witnessing (or will soon witness) peak steel in China. With global steel demand expected to be close to peak levels, iron ore production is not expected to expand much further.[129] As WA's key export commodity, any change in demand for iron ore has implications for future economic growth.

129 Mr Alistair Jones, Department of Treasury, *Transcript of Evidence*, 13 October 2021, p. 2.

4.7 Treasury told us that global steel production appears to have peaked, but over the period of time covered by this inquiry (20 years), steel production is not expected to fall substantially.[130]

4.8 We received evidence that China in particular will probably flat line in terms of crude steel production by about 2025 and 2027. However, China will remain the biggest market for WA's iron ore.

4.9 Rio Tinto recognised that peak steel in China is being widely discussed. Given where China is in its development cycle, Rio Tinto anticipates its rate of growth of slowing, but not evaporating.[131]

Box 4.6: Rio Tinto on peak steel consumption

If you go back through Japan, Korea, Taiwan, Europe, the United States, most economies follow a pretty similar development cycle in terms of steel consumption per capita.

You start off, and relatively underdeveloped nations are predominantly agricultural based. You then go through a period of rapid industrialisation and urbanisation. We see a huge number of people moving off from agricultural things into industrial roles. That is certainly what we have witnessed in China over the last two or so decades. We have had an extremely steep ramp-up. Steel consumption does peak at some level.

There is a slowdown in the rate at which you can build bridges and roads and so on and so forth, but it does not evaporate. Peak steel in Japan was probably reached in the 80s. That is true. But Japan is still a huge steel producing nation of the world. So, ultimately, as we look at our key markets, we see the rate of growth of China slowing, but we do not see it evaporating, so China will broadly remain.

Source: Mr Simon Richmond, Rio Tinto, Transcript of Evidence, 17 November 2021, p. 2.

4.10 Rio Tinto told us that globally, 'while we see growth in steel declining, it will not go negative.' There is an expectation that global steel production will rise 'over the medium term; not at the same rates, but it is still growing.'[132]

4.11 Recent Wood Mackenzie forecasts show that Asia's iron ore demand will fall by 199 million tonnes between 2020 and 2050. The forecast increase in demand from the rest of Asia (444 million tonnes) will likely be more than offset by forecasted lower demand from China (down 615 million tonnes) and Japan, South Korea and Taiwan combined (down 28 million tonnes).[133]

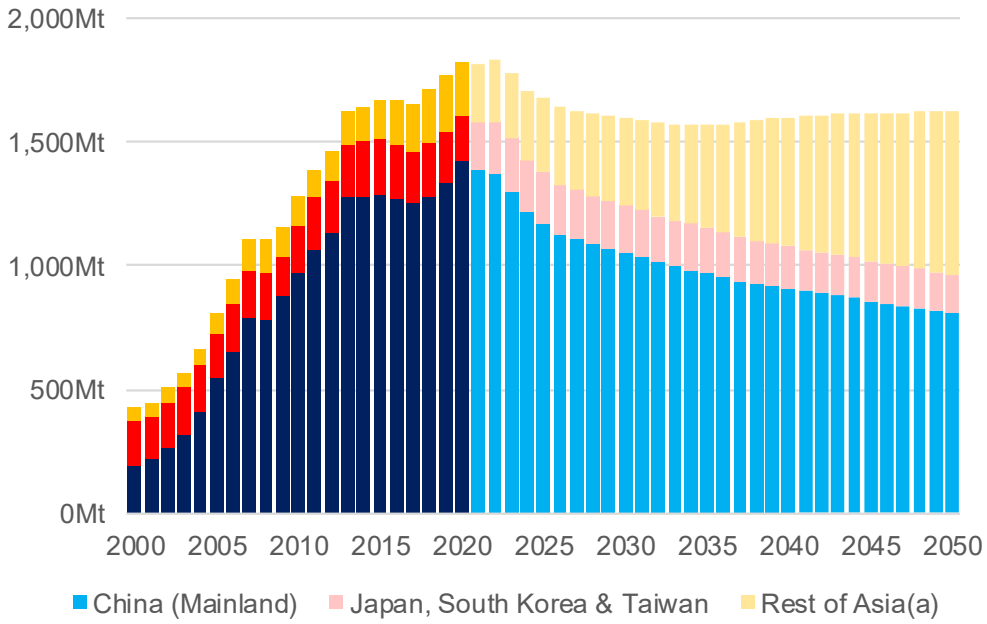
4.1 Over the next decade, growth in markets outside China, while appearing substantial, could be somewhat misleading. We heard that there is probably not enough growth in non-China markets to fully offset in the short term what is happening in China.

4.2 In the short term China will likely peak around 2025 or 2027 and South-East Asia and other countries are still building their integrated steelworks. There is no great apparent

130 Mr David Christmas, Director, Economic Business Unit, Department of Treasury, *Transcript of Evidence*, 13 October 2021, p. 5.
131 Mr Simon Richmond, Rio Tinto, *Transcript of Evidence*, 17 November 2021, p. 2.
132 ibid., p. 3.
133 Department of Jobs, Tourism, Science and Innovation, *WA Iron Ore Profile*, November 2021, p. 1.

opportunity in terms of significant increase in global steel demand in that time. This is expected to adjust by around 2030, with modest growth of crude steel production.

Figure 4.1: Iron ore demand (total iron ore consumption) in Asia: Calendar years[134]



Mt = Million tonnes. (a) India, Indonesia, Vietnam and other Asian countries.
Source: Wood Mackenzie, Global Iron Ore Markets Iron Ore Q3 2021 (Quarterly).

4.3 Alongside slowing growth, China's intention to diversify its iron ore supplies may also shape future demand.

China is diversifying its iron ore supplies

4.4 In May 2021 the Chinese government announced an aim to diversify its current iron ore supply. China's new plan includes a target of 45 per cent self-sufficiency in steelmaking raw materials by 2025. This plan includes a combination of: greater use of electric arc furnace steelmaking (which uses more scrap steel and less iron ore as inputs); increased domestic exploration and production of iron ore; and securing greater overseas reserves.[135]

4.5 We heard that China is expected, over time, to use more scrap. However, this is unlikely to happen at a rapid pace. Rather, it is anticipated that there will be a progressive increase in China's scrap usage over time.[136]

4.6 For the time being, reduced competition from other major iron ore producing nations is working in Australia's favour.[137] Recently, our major competing supplier of iron ore in Brazil,

134 Department of Jobs, Tourism, Science and Innovation, *WA Iron Ore Profile*, November 2021, p. 1.
135 Australian Department of Industry, Science, Energy and Resources, *Commonwealth of Australia Resources and Energy Quarterly December 2021*, December 2021, p. 42.
136 Mr David Christmas, Department of Treasury, *Transcript of Evidence*, 13 October 2021, p. 5.
137 KPMG, *Geopolitics and the Australian minerals industry*, 2021, p. 11.

Vale, was impacted by a number of disasters, and heavily by the COVID-19 pandemic, which put us in an advantageous position.[138]

4.7 Australian iron ore looks to be in a strong position until 2025, where prices are forecast to come down. Iron ore output from South America and Africa is expected to increase over this period.[139]

4.8 KPMG outlined how China is evaluating possible iron ore mines in Africa, including large deposits in Madagascar and Gabon.[140] China is also investing in infrastructure to assist in shipments from Brazilian producer Vale, which is aiming to regain its position as the world's leading iron ore producer.[141]

Retaining market share will be a challenge

4.9 We heard that going forward, WA will have to work harder to retain the huge iron ore market share that Australia and state enjoy.[142]

> ***…the focus should be on maintaining the market share that we have and incrementally growing it where we can, but recognising that the demand profile is not going to grow materially from here.***
>
> *- Mr Adam Handley*

4.10 Industry stakeholders told us that retaining market share is a key priority, which will position us to then capture any growth in demand world-wide. We heard that although that growth may not be phenomenal, it still looks to be long and strong.

Finding 23

The rapid urbanisation of our leading export partner—China—is unlikely to continue at the same rate. China's crude steel production will likely flat line by about 2025 to 2027. However, it will likely remain WA's biggest market for iron ore.

Finding 24

China is aiming to diversify its current iron ore supply by means including: greater use of electric arc furnace steelmaking (which uses more scrap steel and less iron ore as inputs); increased domestic exploration and production of iron ore; and securing greater overseas reserves.

Finding 25

WA will need to work harder to retain the significant iron ore market share that the state currently holds. Industry stakeholders recognise that retaining market share is a priority.

138 Mr Alistair Jones, Department of Treasury, *Transcript of Evidence*, 13 October 2021, p. 5.
139 KPMG, *Geopolitics and the Australian minerals industry*, 2021, p. 11.
140 ibid.
141 ibid.
142 Mr Adam Handley, National Vice President and Immediate Past President (WA branch) of the Australia China Business Council and Mr Kobus van der Wath, Chief Executive Officer, Axis Group International, *Statement of Evidence*, 24 November 2021.

Driving future growth for WA

4.11 Given that iron ore will remain important for WA, but will not be the key driver of growth into the future, there is recognition that it is important to consider future pathways for the economy. JTSI commented that given it is likely WA's iron ore exports will begin to decline in the next 20 years, the key challenge will be 'how do we diversify the sources of growth to other sectors and ensure the economy can generate high-quality jobs?'[143]

While the state's current industries will remain important, they will not drive growth in its regional economic relationship as they have for the last two decades. Fortunately, WA is well-positioned to create new industries and relationships aligned to the Indo-Pacific of 2041.

- Perth USAsia Centre

Global economic distribution

4.12 Treasury described how some of the more definitive factors likely to impact on demand for WA exports include:

- continued world population growth, which the United Nations projects will expand by about 1.4 billion people by 2041;
- increasing global incomes;
- ongoing urbanisation;
- a continuing shift in the world economic centre of gravity to Asia, with PwC estimating in 2017 that by 2050, the five largest economies will be China, the United States, India, Indonesia and Japan.[144]

4.13 Treasury told us that an expanding population, with increasing income globally, will continue to underpin the demand for minerals and other resources. In this context, resources that are inputs to the construction of infrastructure to house, feed and provide services to the growing population will always be in demand.[145]

> …mining, energy and agriculture will continue to be part of the global demand mix and, given its natural endowment of resources, including renewable and technology-friendly resources, Western Australia will remain a key supplier.[146]

Growth and opportunities in the Indo-Pacific

4.14 WA's geographic location brings it into close proximity to a number of significant growing economies.

143 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, *Transcript of Evidence*, 18 August 2021, p. 2.
144 Mr Alistair Jones, Department of Treasury, *Transcript of Evidence*, 13 October 2021, p. 2.
145 ibid.
146 ibid.

4.15 The state government recognises the opportunities emerging in the Indo-Pacific. *Diversify WA* identifies that 'with close proximity and trade relationships with Asia, Western Australia now has an unprecedented opportunity to engage in the Indo-Pacific and prosper within and beyond our traditional operating sectors.'[147]

4.16 For example, Indonesia holds vast potential as a market for WA goods and services exports, and it has grown significantly as result of the IA-CEPA, with WA's first horticultural products supplied under that agreement.[148]

4.17 There is also underutilised potential in relation to the WA-India economic relationship. The committee's predecessor in the 40th Parliament tabled a report about WA's relationship with India and set out a range of recommendations by which to grow this important relationship. The report recommended that priority be given to building investment, technical partnerships, and sector specific engagement in critical minerals, METS and services.[149]

4.18 In looking to future opportunities for engagement, the Perth USAsia Centre emphasised the significance of strong Indo-Pacific partnerships that have historically supported the growth of WA's economy. We heard how there is an important, but often under-appreciated, intergenerational dimension to WA's regional economic ties.[150]

> ***The resource sectors which currently underpin prosperity were not established recently, but many decades ago, and have subsequently matured into the internationally-engaged powerhouses the state benefits from today.***
>
> *- Perth USAsia Centre*

4.19 Perth USAsia Centre outlined how the growth of WA's iron ore, natural gas, lithium and rare earth sectors have all been characterised in a similar way:

> Each of these sectors have emerged in response to the changing industrial needs of Indo-Pacific partners, have developed with partner support in the form of long term sales contracts and investments, and within a decade have established Western Australia as a world's leading producer of the commodity in question. [151]

4.20 The developmental story of these resource sectors offers key insights for the future growth of WA industries.[152]

147 WA Government, *Diversify WA*, July 2019, p. 62.
148 Mr Liam O'Connell, Department of Primary Industries and Regional Development, *Transcript of Evidence*, 24 November 2021, p. 3.
149 Economics and Industry Standing Committee, *Turning to India: Investing in our Future*, 19 November 2020.
150 Submission 5, Perth USAsia Centre, p. 3.
151 ibid., p. 4.
152 ibid.

Box 4.7: Perth USAsia Centre's three key insights for future growth of WA industries

(1) An orientation to Indo-Pacific markets provides the scale needed for success…WA is fortunate to be located in the Indo-Pacific, a region that contains nearly half the world's population and is currently the epicentre of global growth. An export orientation to large and fast-growing Indo-Pacific markets—initially Japan, followed by other regional partners and then China—has allowed the state to develop industries at competitive scale.

(2) Indo-Pacific economic ties must be partnership-based, rather than purely transactional. The state's trade relationships with Japan and China did not simply involve exporting iron ore at arm's length. Rather, partners were integral to the development of projects from the outset. The industry was developed in response to an emerging need of the partner, and its establishment pioneered the development of a new global market that did not exist prior. Customers were involved from the beginning as full partners, and supported industrial development through long-term sales contracts and investments that created durable ties between the state and the region.

(3) The time horizon of major industrial initiatives is measured in generations, not years. While iron ore is the backbone of the state's economy in 2021, the groundwork for the industry was laid four generations ago in its post-war development efforts. Young Western Australians are today reaping a harvest sowed by their great-grandparents…As economic currents in the Indo-Pacific have changed over time, new opportunities are presented which could not have been conceived by those who initiated these industries.

Source: Submission 5, Perth USAsia Centre, pp. 4-7.

Finding 26

WA's geographic location brings it in to close proximity to a number of significant growing economies in the Indo-Pacific. This, alongside a history of strong engagement in the region, offers competitive advantages to WA in growing future industries.

Finding 27

Engagement with Indo-Pacific trading partners needs to be partnership-based, rather than simply transactional.

Opportunities for WA's regional economic engagement

4.21 Perth USAsia Centre identified a number of areas which appear promising for replicating the state's past success at economic engagement with the Indo-Pacific.

Perth USAsia Centre—opportunities for economic engagement in the Indo-Pacific
At the sectoral level, three new industries—critical minerals, batteries and hydrogen—provide WA with an opportunity to re-align its mining sector to the clean energy transition. Demand for all three products will soar as new energy technologies penetrate the industrial ecosystem, and the state is well-endowed with the natural and human capital required to become the region's leading supplier.[153]
At the relationship level, three countries—Indonesia, Vietnam and India—will prove critical for the state's regional engagement. These three economies have emerged as the driver of the next phase of Indo-Pacific economic growth, and developing economic ties with them today will complement the state's existing relationships with Japan, Korea and China.[154]

153 Submission 5, Perth USAsia Centre, pp. 5-6.
154 ibid.

4.22 We were cautioned that although many of the industries that will drive the next phase of global development are those in which WA has competitive advantages, and will be led by economies in the Indo-Pacific, it is critical for WA to act now.[155] We observed throughout the inquiry a widespread recognition of how critical it is for WA to build and maintain relationships with its trading partners.

> ***…given the long time horizons involved in regional economic engagement projects, it is essential the state commence efforts to build these industries and relationships today.***
>
> *- Perth USAsia Centre*

Finding 28

Indonesia, Vietnam and India will likely be the driver of the next phase of economic growth in the Indo-Pacific. Developing economic ties with these countries will complement WA's existing relationships with Japan, Korea and China.

Finding 29

Three new industries—critical minerals, batteries and hydrogen—provide WA with an opportunity to re-align its mining sector to the clean energy transition.

Finding 30

Regional economic engagement projects require long time horizons to deliver benefits to the state—WA needs to act now on building these future industries and relationships.

Strong regional relationships are essential to the future of the WA economy

4.23 During the inquiry, we heard about shifting geopolitical dynamics that pose risks to highly trade exposed economies like ours. The importance of maintaining and building strong relationships with trading partners is clear, as is the need to diversify the exports we have on offer.

4.24 KPMG identified that the rise of economic nationalism and protectionism is a geopolitical megatrend that will have an impact on demand for WA exports in the future. We heard that this trend is already having negative impact on free trade and open markets in the global economy:

> There is a trend towards some countries seeking to secure their global supply chains for strategic commodities and resources deemed important to national security rather than relying on free trade and global markets.[156]

4.25 DPIRD commented that geopolitical tensions and resurgent trade protectionism remain potential risks to WA's export industries, particular given our heavy reliance on a small number of export markets:

> Exporting a narrow band of largely unprocessed products to a narrow number of markets means that the WA economy is highly exposed to global fluctuations in commodity prices and adverse changes in one or two markets.[157]

155 Submission 5, Perth USAsia Centre, p. 5.
156 Submission 14, KPMG, p. 3.
157 Submission 15, Department of Primary Industries and Regional Development, p. 9.

4.26 KPMG described how the operating principles and assumptions of the 1990s and early 2000s no longer apply to the world in which the Australian minerals industry now operates:

> Rather than openness, multilateralism, globalisation and free trade, the geopolitical context is characterised by rising strategic competition, inequality, lack of trust, protectionism, nationalism, disruption, and, importantly, consumer awareness and expectations of business.[158]

4.27 The Committee for Perth identified how globalisation has been beneficial for the WA economy. However, over time concerns have emerged about the impact of globalisation on national sovereignty, regional jobs and inequality, 'as some people, firms and regions boast enormous winner-takes-all gains from access to global markets and technological advancement while others bear considerable loss.'[159]

Globalisation, the process by which the world has become more interconnected as a result of increased trade, capital flows, communications, and cultural exchange, has benefitted WA by helping the state to overcome the limitations of its relatively small size and gain economies of scale through access to larger markets.

- Committee for Perth

4.28 We heard how these concerns have been exacerbated as a result of the COVID-19 pandemic, as economies and businesses around the world have placed an increased emphasis on building local markets.[160]

4.29 The Chief Scientist observed that '…the geopolitical scene has changed quite dramatically and we need to be acutely aware of what we offer and what other nations are trying to do in this period of immense change.'[161]

4.30 The rapidly changing geopolitical landscape and potential risk factors highlight how important it is to establish and maintain strong relationships with our key trading partners.

4.31 Perth USAsia Centre, in describing the Indonesia-Australia Comprehensive Economy Partnership, gave an example of the importance of strong person-to-person connection in trade relationships (see the case study on the following page: *Indonesia-Australia Comprehensive Economic Partnership (IA-CEPA)*).

158 KPMG, *Geopolitics and the Australian minerals industry*, 2021, p. 4.
159 Submission 1, Committee for Perth, p. 5.
160 ibid.
161 Professor Peter Klinken, Chief Scientist of Western Australia, *Transcript of Evidence*, 11 August 2021, p. 1.

Case Study 1

Indonesia-Australia Comprehensive Economic Partnership (IA-CEPA)

The IA-CEPA agreement took effect just before coronavirus. While it is a federal-level free-trade agreement, if you look at the industries that are included in it, it is a list of WA opportunities, really, so it is very configured to the state's interests, particularly around some things to do with agriculture.

That agreement establishes Australia as Indonesia's most preferred agricultural trade partner. It is the best agricultural deal anyone has ever got with Indonesia and gives us leverage and market access that nobody else has. Most of the industries where Indonesia imports agricultural products from Australia are WA industries, and they are often…high-value things, particularly around horticulture, fruit and vegetables, processed foods, more high value protein like meat as well, so it is the kind of high-value agriculture that the state is competitive in internationally.

The great challenge around the IA-CEPA agreement is its implementation, because many of the provisions were not just reducing a tariff from ten per cent to five per cent but often, particularly in agriculture, it involves regulatory cooperation. We need to have a system for expedited veterinary checks for exports, for example. That is not a set-and-forget provision; it is actually something where our federal and state department veterinarians have to work with their Indonesian counterparts to set up new standards and ways to talk to each other about permits and things like that.

The great challenge is that that has been nearly impossible to do on a person-to-person level because of coronavirus in the time that the agreement has been in place. Many of the implementation committees that were established to put that stuff in play once the agreement took effect simply have not been able to function because you cannot work out an arrangement for doing customs inspections on Australian oranges going into Indonesia when you do not have travel…That is a vexing problem because it effectively means the benefits of IA-CEPA are sitting there unimplemented while we have these border settings arranged.

I understand as much of that work that could be done by Zoom calls has been done by Zoom calls, but when we are talking about veterinary inspections, you can only do so much in a Zoom call; you actually do need to go up there and look at a cow.[162]

4.32 Although the COVID-19 pandemic largely put a halt on travel between WA and our key trading partners, it will be important for the state to regain momentum building these relationships through in-person connections once more. The government recognises this through its *Reconnect WA* package (see chapter 7).

Finding 31

Geopolitical tensions and resurgent trade protectionism remain potential risks to highly trade exposed economies like WA's. Maintaining and building strong partnerships with the countries we share economic ties with will be critical to future of the WA economy.

162 Dr Jeffrey Wilson, Perth USAsia Centre, *Transcript of Evidence*, 11 August 2021, p. 11.

Chapter 5

Technology, digital and cyber trends

Industrial Revolution 4.0

5.1 The rapid developments occurring in the realm of tech, digital and cyber have been described as Industrial Revolution 4.0. The depth and breadth of this change 'will fundamentally change every aspect of the average Australian's life in ways that we can't even imagine—and indeed, already is.'[163]

5.2 As a part of 'setting a 20-year vision to inform infrastructure planning' Infrastructure WA commissioned Deloitte to 'undertake analysis of macro trends and drivers expected to drive the State's long term economic development trajectory.'[164] Infrastructure WA advised that 'Deloitte's analysis identified 39 drivers of change, which aggregated into eight themes, or macro trends that are already shaping current and future economic opportunities.'[165]

5.3 One of the eight macro trends is technological change. The research concluded that 'advances in technology are changing the way our economies and day-today lives function. Future prosperity will be underpinned by adoption of new technologies and full digitisation.'[166]

5.4 WA businesses are increasingly looking to the adoption of new technologies to deal with current disruptions, trends and changes in the economy. According to the Committee for Perth *Future of Work* business survey, '95% of WA businesses surveyed planned to adopt new technology to improve productivity and gain access to new markets.' The Committee for Perth found that most commonly adopted currently are digital technologies, 'while AI [artificial intelligence] technologies are expected to be most commonly adopted in the future.'[167]

5.5 Increasing demand for automation technology is expected by WA-based suppliers, with accelerated demand already occurring due to skills shortages.[168]

5.6 Ongoing technological changes and the adaption of new technologies is one of the 'more definitive factors' identified by Treasury as likely to impact on future demand for WA

163 Mark Crosweller, *Anticipate, Prepare, Respond: Geopolitical Megatrends and Business Resilience*, KPMG, Australia, June 2021, p. 6.
164 Submission 12, Infrastructure WA, p. 7.
165 ibid.
166 ibid.
167 Submission 1, Committee for Perth, p. 7.
168 Caitlin Paroczai, 'Businesses looking to switch to automation technology need skilled workers ', *The West Australian* (web-based), 4 February 2022, accessed 17 February 2022, <https://thewest.com.au>.

exports.[169] Increasing demand for critical minerals, many of which WA has access to, is one way this trend is impacting WA exports—see the case study following.

Case Study 2

An increasing demand for critical minerals

Global megatrends such as decarbonisation and the industrial revolution 4.0 are stimulating investment in and demand for battery minerals and rare earths used in electric vehicles, energy storage systems, renewable energy technologies and high-technology electronics.

While they are often overlooked, 'critical materials are highly important for modern, technological societies.'[170]

'As the global energy transition drives us towards cleaner and renewable sources of energy, demand for critical materials will only grow in coming years.'[171]

Due to their use 'in a range of high-tech applications across a variety of sectors such as renewables, aerospace, defence, electric vehicles, telecommunications and agri-tech, critical minerals are essential 'for the economic and industrial development of major and emerging economies.'[172] For example, they are essential for the economic development of the Indo-Pacific.[173]

However, 'contemporary critical materials value chains are neither secure nor sustainable.'[174] The scarcity of critical minerals means they are vulnerable to supply constraints. Due to this scarcity, many countries are now looking to make strategic investments in critical minerals projects as a means to secure supply. [175]

China has the majority market share of rare earths and critical minerals.

However, WA has capacity to produce many of these minerals, or has identified significant geological reserves for future extraction. For example, WA has access to lithium, rare-earth elements, cobalt, titanium, zirconium, manganese, platinum-group elements, tantalum, graphite, vanadium and tungsten.[176]

Demand for these resources is expected to lead to increasing exports of WA minerals in coming years. There is 'growing investment in the extraction of these minerals' in WA and we are 'well placed to capitalise on global demand and address potential shortages.'[177]

169 Mr Alistair Jones, Department of Treasury, *Transcript of Evidence*, 13 October 2021, p. 2.
170 Dr Jeffrey Wilson, *Critical Materials for the 21st Century Indo-Pacific*, Perth USAsia Centre, May 2019, p. 7.
171 ibid.
172 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 24.
173 Dr Jeffrey Wilson, *Critical Materials for the 21st Century Indo-Pacific*, Perth USAsia Centre, May 2019, p. 7.
174 ibid.
175 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 24.
176 Submission 9, Department of Mines, Industry Regulation and Safety, p. 5.
177 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 24.

5.7 There are other ways in which this trend is impacting, and will continue to impact, the WA economy. Technological change is acting as an employment disrupter, changing the number and types of jobs available in a range of sectors.

5.8 At the same time, innovation and technology have been identified as important for diversification. By increasing productivity and enabling value-adding and export growth in key sectors, new technologies and capability in digital and cyber fields have the potential to be game changing in terms of how those industries compete in the global market.

5.9 One message conveyed in inquiry evidence is that there is a demonstrated need for increased government and business investment in Research and Development (R&D) to support innovation and drive the development of new technologies.

Finding 32

Ongoing technological changes and the adaption of new technologies is one of the factors identified by Treasury as likely to impact on future demand for WA exports. Increasing demand for critical minerals, many of which WA has access to, is one example.

Employment disruption as a result of Industrial Revolution 4.0

5.10 Industrial Revolution 4.0 will mean that 'technologies driven by AI will continue to fundamentally change the world and the way we work and live.'[178]

AI may not lead to massive unemployment. Instead, AI technology will create more jobs than it automates.

- World Economic Forum

5.11 New technologies improve competitive advantages and create opportunities. However, they are also disruptive for employment due to:

- AI and automation leading to a loss of traditional employment in activities which lend themselves to these technologies
- an increasing number of 'knowledge economy' jobs which require technology, data and cyber skills.

5.12 Since the COVID-19 pandemic, technological advances and the automation of many tasks have accelerated. Many are concerned about this trend leading to the widespread loss of jobs in the coming decades.[179]

5.13 A 2018 PwC report found that 'contrary to some predictions' automation will not 'lead to mass technological unemployment by the 2030s any more than it has done in the decades since the digital revolution began.'[180]

178 World Economic Forum, *Don't fear AI. It will lead to long-term job growth*, 26 October 2020, accessed 18 October 2021, <https://www.weforum.org/agenda/2020/10/dont-fear-ai-it-will-lead-to-long-term-job-growth/>.

179 ibid.

180 PwC, *Will robots really steal our jobs? An international analysis of the potential long term impact of automation*, PricewaterhouseCoopers LLP, 2018, p. 2.

5.14 PwC proposes that, in fact, 'any job losses from automation are likely to be broadly offset in the long run by new jobs created as a result of the larger and wealthier economy made possible by these new technologies.'[181]

5.15 However, it is likely that there will be a disruption of labour markets, and its effect will be unequal. PwC suggests that the impacts of automation will vary widely between countries and sectors.[182] For example, those with lower levels of education will be disproportionally affected.[183]

5.16 The World Economic Forum in 2020 reported across 15 industries and 26 economies 'that by 2025, 85 million jobs may be displaced by a shift in the division of labour between humans and machines, while 97 million new roles may emerge that are more adapted to the new division of labour between humans, machines and algorithms.'[184]

5.17 Skills-sets in which demand is expected to increase include:

- data analysts and scientists
- AI and machine learning specialists
- robotics engineers
- software and application developers
- digital transformation specialists.

5.18 The acceleration of automation, coupled with increasing cybersecurity risks, are seeing increasing demand for specialists in process automation, information security analysis, and the internet of things.[185]

5.19 The World Economic Forum predicts that by 2025, half of all workers in the countries surveyed will have required some upskilling or reskilling as a result of changing jobs.[186]

5.20 The mining sector in WA is one of our most technologically advanced sectors with increasing application of AI and automation technologies. There are mixed views around whether mining will continue to employ as many people into the future. Stakeholders in the resources sector are confident that the types of jobs on offer will just shift to higher skilled roles.

5.21 Other modelling suggests that the WA mining sector will contribute less to employment growth in the future. Baseline forecasts referenced by Infrastructure WA 'suggest the mining sector will continue to contribute strongly to output growth, but its contribution to

181 PwC, *Will robots really steal our jobs? An international analysis of the potential long term impact of automation*, PricewaterhouseCoopers LLP, 2018, p. 2.
182 ibid., pp. 2-4.
183 ibid., pp. 30-32.
184 World Economic Forum, *Future of Jobs Report 2020*, Geneva, 2020, p. 5.
185 ibid., pp. 29-30.
186 World Economic Forum, *Don't fear AI. It will lead to long-term job growth*, 26 October 2020, accessed 18 October 2021, <https://www.weforum.org/agenda/2020/10/dont-fear-ai-it-will-lead-to-long-term-job-growth/>.

employment growth is expected to decline due to technological change in digital and automation, with increasing contribution from service driven industries.'[187]

5.22 There will need to be significant investment in upskilling and reskilling workers in WA. Infrastructure WA identified in its research that technology, cybersecurity and artificial intelligence expertise will be increasingly sought after and 'digital literacy and reskilling will be important.' [188]

5.23 A shifting of skills requirements across WA industries has been recently reported by the Committee for Perth, which finds that 'national-level data indicate the presence of a considerable skills mismatch' Australia-wide. It finds that over time, WA has seen an increase in demand for workers with a Certificate III qualification and above, necessitating training to meet this changing demand. The Committee for Perth suggests that 'understanding how to better utilise the skills of workers will be important for meeting immediate and longer-term skill needs.'[189]

…we are going through the third and fourth industrial revolutions right now. It is the fastest period of change in humankind. There are plenty of people who feel very uncomfortable at the moment because they cannot keep up with what is going on.

I think that in a wealthy multicultural society like ours, we need to make sure that we do not allow our society to fracture. We need to be making decisions now that will have us as a cohesive, clever, courageous, confident society by 2041 or further.

- Chief Scientist of Western Australia

5.24 The challenge for WA in the future will be to have the settings in place to create an agile workforce that is able to participate in the new roles created by technological advances.

5.25 The other inherent challenge will be to make sure no-one is left behind. It is likely that changes wrought by AI and automation will not be shared equally, given the shifting and increasing skills requirements and the implications this has for education. The digital divide could very likely increase and exacerbate existing inequalities.[190]

Finding 33

Technological change acts as an employment disrupter, and will continue to change the number and types of jobs available in a range of sectors.

187 Submission 12, Infrastructure WA, p. 3
188 ibid., p. 7.
189 Anh Tram Lee, *The Western Australian Labour Market: Insights into Immediate Challenges*, Committee for Perth, February 2022, p. 2.
190 World Economic Forum, *Don't fear AI. It will lead to long-term job growth*, 26 October 2020, accessed 18 October 2021, <https://www.weforum.org/agenda/2020/10/dont-fear-ai-it-will-lead-to-long-term-job-growth/>.

Finding 34

There is some concern that new technologies such as automation will displace many employment roles in the next five to ten years. However, with the right strategies in place, and which are enacted as soon as possible, there is potential to create future jobs in the tech, digital and cyber fields which are accessible for all Western Australians.

Finding 35

There will need to be significant investment in upskilling and reskilling workers in WA. Technology, cybersecurity and artificial intelligence expertise will be increasingly sought after and digital literacy and reskilling will be important.

Finding 36

It is likely that changes wrought by AI and automation will not be shared equally, given the shifting and increasing skills requirements. The digital divide could very likely increase and exacerbate existing inequalities. Facilitating an inclusive transition to quality jobs in the future for all Western Australians will require strong leadership from government.

Leveraging tech skills and human capital between industries

5.26 The shifting skills requirements across sectors and likelihood that in the future human capital will attract a higher value than traditional assets (for example, land or labour), leveraging any advantage in skills resources within WA seems prudent.

5.27 Perth USAsia Centre told us that there are niche technology areas where WA has a local pool of human capital brought in for mining and remote operations. The mining sector trains and employs specialists who, given the right settings, could move into other sectors. This creates a wealth of human capital in areas such as IT and cyber.[191] The benefit of this type of transfer of human capital is often hard to measure, but important – 'absolutely key benefits for the state.'[192]

5.28 The IT and cyber industries are dominated by economies of agglomeration so any investment to exploit this would require a niche strategy based on where WA's capacity lies. Automation technology is one niche area where WA has advantage due to our highly developed mining and Mining Equipment, Technology and Services (METS) sector.[193]

5.29 Perth USAsia Centre told us that:

> While there are downsides to automation in the mining industry in terms of direct employment, the upside is engineers train in automation, which very often is actually an IT skill rather than a physical engineering skill. In particular niche areas in the IT and cyber industries, the state would have that kind of kernel on which you could build that based on certain skill sets that are common in the resources industry that we have got. If the state is going to make a play in those spaces, that

191 Dr Jeffrey Wilson, Perth USAsia Centre, *Transcript of Evidence*, 11 August 2021, p. 10.
192 ibid., p. 6.
193 ibid., p. 10.

would be the area that you would pick out, say, things around automation engineering, particularly around remote operations. [194]

Finding 37

There are niche technology areas where WA has a local pool of human capital brought in for mining and remote operations. Given the right settings, these specialists could move into other sectors, creating a wealth of human capital in areas such as IT and cyber. The benefit of this type of transfer of human capital is often hard to measure but important.

Science, innovation and technology supporting diversification and economic growth

5.30 The WA government has identified that science, innovation and technology is a key cross-sector activity supporting diversification and increasing the productivity, competitiveness and resilience of businesses.[195]

5.31 Ideally, this creates jobs, as high productivity enables businesses to pay higher wages and attract skilled workers. In the long run, innovation is thought to 'facilitate the creation of a more agile labour market, where workers have the skills and flexibility to move to jobs that have positive long-term prospects.'[196]

5.32 The ability to innovate means industries (and the economy in general) can adapt to meet sectoral challenges and take up new opportunities presenting due to global megatrends.[197]

5.33 We heard how advances in technology 'enable value adding and export growth in traditional goods-producing export sectors such as agriculture, manufacturing, and mining', while also potentially enabling diversification into new export sectors and markets, for example, service exports.[198]

Finding 38

Innovation and technology are important for diversification. By increasing productivity and enabling value-adding and export growth in key sectors, new technologies and capability in digital and cyber fields have the potential to be game changing for WA's industry sectors and their competitive edge in the global market.

The mining and METS sector – a world leader in technology and innovation with potential for export growth and value-adding

5.34 To date, the mining sector has supported WA in maintaining a strong economic position. In turn, the mining industry supports a number of downstream and service industries—the $114 billion METS sector.

194 Dr Jeffrey Wilson, Perth USAsia Centre, *Transcript of Evidence*, 11 August 2021, p. 10.
195 Department of Jobs, Tourism, Science, and Innovation, *Diversify WA July 2019-July 2021*, 2021, p. 17.
196 ibid.
197 ibid.
198 Submission 1, Committee for Perth, p. 6.

Box 5.8: The WA METS sector

WA's METS sector is the global resources technology base for the Asian and Indian Ocean regions, centred on servicing the global scale resource projects operating in WA.

The CME member survey for 2018–19 reported that the resources sector purchased from 14,464 businesses operating in WA. Of these businesses, the Industry Capability Network notes that there are 1,702 specialised METS companies in the state.

Western Australian based METS companies are held in high regard internationally for being technology leading and able to operate in the world's harshest and most remote conditions.

According to the Mining Journal Intelligence: Global METS Investment Report 2020 of the 100 top METS companies globally, 77 operate in WA, of which 22 are head quartered in the state.

Attracted by the strength of WA's mining sector, many international METS companies have chosen to expand their operations to include Perth, through acquisitions, partnerships or establishing their own operations.

Some of the international companies servicing the mining sector through their Western Australian operations include ABB, Atlas Copco, Sandvik, Hitachi, Komatsu, METSO, Outotec, Thyssen Krupp and General Electric.

Source: Department of Jobs, Tourism, Science and Innovation, *The METS sector in Western Australia*, 19 January 2021, accessed 8 February 2022, <https://www.wa.gov.au/organisation/department-of-jobs-tourism-science-and-innovation/mining-equipment-technology-and-services>.

5.35 Infrastructure WA submits that 'the breadth and scale of the WA's resources industry has made it a globally significant producer of key commodities. Its willingness to embrace technology and innovation has helped it become a world leader.'[199]

5.36 The R&D contribution of mining companies based in WA will continue to ensure that WA's mining and METS sector remains at the forefront of the technology frontier. Industry partnerships with universities and suppliers have the potential to support the commercialisation of research and technological advancements.

5.37 For example, as the world moves towards the goal of decarbonisation, WA resources companies are investing in R&D to support opportunities in hydrogen and downstream processing, as well as technologies to produce green steel.[200]

5.38 Another opportunity is downstream value-adding activities for critical minerals (see case study above). The WA government has prioritised key actions for 2021–22 which include attracting 'investment in pre-cursor/ cathode active materials manufacturing to support WA to move up the global battery value chain.'[201]

5.39 We were told that with continued leadership in innovation and technology, there is opportunity to increase the export potential of the METS sector. DPIRD submits:

> With significant domestic activity, Australian METS companies are well placed to leverage their dominance in the domestic sector to export machinery, research, development and intellectual property to the world.

199 Submission 12, Infrastructure WA, p. 5.
200 Mr Simon Richmond, Rio Tinto, *Transcript of Evidence*, 17 November 2021, p. 5.
201 Department of Jobs, Tourism, Science and Innovation, *Diversify WA: Supply Chain Development Plan 2021-22*, 2021, p. 21.

> There are significant opportunities for future export growth as the Australian METS and resources sector harnesses the opportunities of automation and technology to increase productivity, improve safety and reduce the environmental footprint of our resources projects.[202]

5.40 Rio Tinto suggests that 'WA should aim to be a significant regional and global technology partner, with technological advances in mining driving innovation in other sectors, such as agriculture, defence and space industries.'[203]

5.41 There is growing recognition that while the resources sector has been WA's primary source of growth, the next chapter for WA is about capitalising on intellectual property, digitisation and technology developed in this sector to provide WA a new frontier.

Finding 39

There is growing recognition that while the resources sector has been WA's primary source of growth, the next chapter for WA is about capitalising on intellectual property, digitisation and technology developed in this sector to provide WA a new frontier.

Innovation and technological advancement to grow the agricultural and food sector and increase export potential

5.42 Assisting the agriculture and food sector to become more competitive is an important part of diversifying the WA economy. We were told that while the sector is not a 'silver bullet to diversification' it is 'an important mix in the solution or the way forward.' [204]

5.43 Australia-wide, food and beverage manufacturing is the largest remaining manufacturing sector and is growing. In WA approximately 58, 000 people are employed in agriculture and food production/food processing. As a sector, food and beverage value-add or processing has seen a growth in the number of jobs in the past few years across the state.[205]

5.44 There is opportunity in the decades ahead to capitalise on the expected increased demand from the Indo-Pacific region for high-value protein. Currently, there is also strong demand from the traditional commodity markets in grains, red meats, horticulture and seafood.[206]

5.45 Businesses in the sector are predominantly small and medium-sized family-owned businesses. It was suggested to us that the more competitive these SMEs become, the more they employ, invest and create flow-on opportunities in the regions. In short, we were told that 'agriculture and food and beverage processing has the largest direct and indirect benefits of any sector across the state.'[207]

202 Submission 15, Department of Primary Industries and Regional Development, p. 4.
203 Submission 13, Rio Tinto, p. 7.
204 Mr Liam O'Connell, Department of Primary Industries and Regional Development, *Transcript of Evidence*, 24 November 2021, p. 3.
205 ibid.
206 ibid., p. 4.
207 ibid., p. 4.

5.46 DPIRD advised that technology and automation are critical to increases in productivity and reducing the industry's impact on the environment, while addressing longer term strategic risks and determine how to position the industry for competitiveness into the future.[208] For example, digital tools designed to provide climate data for drought preparation aim to help farmers assess risk and impact caused by climate change.[209]

> ***Australia and WA needs to really think innovatively about how we engage with biosecurity … so we can even get to those markets.***
>
> *- Department of Primary Industries and Regional Development*

5.47 We heard that 'agricultural innovation is a national agenda' and that 'WA is working with the Commonwealth government, and in particular the R&D corporations, notwithstanding that some agricultural issues are quite specific to WA.[210] For example, DPIRD works with bodies such as the Australian Food and Grocery Council in relation to post–farm gate opportunities, food and beverage processing, and value-adding opportunities.[211]

5.48 Innovation and technology is helping address sustainability, for example, work 'around environmental capital, soil biology, building resilience of farmers—so innovation in terms of carbon farming in the low-carbon environment.'[212]

5.49 Biosecurity and the increasing number of incursions is another issue facing the industry which is being addressed through R&D, and while, according to DPIRD, 'there is a way for the state to go … there is great opportunity.'[213]

5.50 In a sector dominated by SMEs and family-owned businesses, the challenge for these businesses is the ability to rapidly scale up and become competitive in international markets, because of the lack of sufficient domestic market in WA. We heard that businesses move east or somewhere like Singapore, once a certain point is reached, 'especially if they are based in regional WA .'[214]

5.51 Commercial ventures to scale and seek impact require growth in the sector in technology and digital tools, according to the CSIRO.[215]

208 Mr Liam O'Connell, Department of Primary Industries and Regional Development, *Transcript of Evidence*, 24 November 2021, pp. 3-5.
209 Cally Dupe, 'Two new drought tools designed to give farmers 'best available climate data' to prepare for drought ', *Countryman* (web-based), 30 December 2021, accessed 17 February 2022, <https://www.countryman.com.au/>.
210 Dr Alison Wilson, Executive Director, Strategy and Coordination, Department of Primary Industries and Regional Development, *Transcript of Evidence*, 24 November 2021, p. 5.
211 Mr Liam O'Connell, Department of Primary Industries and Regional Development, *Transcript of Evidence*, 24 November 2021, p. 4.
212 Dr Alison Wilson, Department of Primary Industries and Regional Development, *Transcript of Evidence*, 24 November 2021, p. 5.
213 ibid., p. 6.
214 Mr Liam O'Connell, Department of Primary Industries and Regional Development, *Transcript of Evidence*, 24 November 2021, p. 4.
215 Submission 10, CSIRO, p. 6.

Finding 40

Technology and automation are critical to increases in productivity and reducing the agricultural industry's impact on the environment, while addressing longer term strategic risks and positioning the industry for competitiveness into the future.

Finding 41

The agricultural sector is dominated by Small and Medium-sized Enterprises (SMEs) and family-owned businesses. The challenge for these businesses is the ability to rapidly scale up and become competitive in international markets, due to a lack of sufficient domestic market in WA. Furthermore, commercial ventures to scale and seek impact require growth in the sector in technology and digital tools.

Service exports growth facilitated by new technologies

5.52 The changing employment landscape brought about by the Industrial Revolution 4.0 includes the trend towards a global trade in services. Alongside this, investment in R&D, data, software, patents and new business models is increasing.[216]

5.53 Changing demand from markets such as Indonesia, which are becoming more sophisticated, is expected to give rise to opportunities for export growth in services and technology in industries where WA has export capability.

> ***Building WA's capacity as a technologically advanced exporter of services will … be important for both export and employment growth. This means developing highly competitive, innovative, and advanced businesses within the State, and ensuring that the State can attract and retain the skilled and talented people to support service sector employment growth within the State***
>
> *- Committee for Perth*

5.54 The Committee for Perth notes that new technologies such as AI can facilitate growth in service exports; for example, 'professional, scientific, and technical services, health care and social assistance and education services.'[217] However, exploiting this opportunity requires innovation to keep abreast of technological change.[218]

5.55 For example, sectors such as retail trade, information media and telecommunications have seen increased productivity due to digitisation, with a corresponding shift to these sectors becoming less labour-intensive, with declining employment. WA will miss out on export growth in these sectors if they 'fail to keep up with the global pace of technological change and if more jobs shift offshore as a result of becoming remote and mobile.'[219]

216 Submission 12, Infrastructure WA, p. 7.
217 Submission 1, Committee for Perth, p. 6.
218 ibid., p. 7.
219 ibid., p. 6.

Finding 42

There is opportunity for growth in service exports to be facilitated by new technologies such as AI; for example, professional, scientific, and technical services, health care and social assistance and education services. Exploiting this opportunity requires innovation to keep abreast of technological change.

The need for increased investment in research and development to support innovation and technological advancement

5.56 *Diversify WA* notes that investment in R&D will enable WA industries to adapt to global changes and mitigate the impact of supply chain disruptions in the long-term by building competitive advantages, increasing business productivity, and fostering innovation.[220]

Are we falling behind on the global innovation (technology) frontier?

5.57 According to a recent CSIRO working paper, 'the global innovation frontier represents the current state of human technological knowledge, and is the 'highest' frontier of the representative country that faces no barriers' to achieving this frontier. This frontier is moved further out as technological advancements are made. The report cites 'a body of empirical evidence [which] suggests Australia is behind the global innovation (or technology) frontier.'[221]

Our "peers" in the G20 are all leaping ahead in terms of technology. They are all using those skills to promote their economies. I worry.

- Chief Scientist of Western Australia

5.58 Evidence to this inquiry highlighted concerns about this. The Committee for Perth submits that as a nation Australia 'has been falling behind in the technology race due to limited investment in the development of new technologies…'.[222]

5.59 The CSIRO working paper supports this, finding that 'Australia's R&D expenditure share of GDP [Gross Domestic Production] lags behind the OECD average … and has been decreasing over the past decade.'[223] Australian Bureau of Statistics (ABS) data show business expenditure on R&D in Australia as half the OECD average and the lowest it has been since 2003, and Commonwealth government expenditure the lowest since 2005.

5.60 In WA, the METS sector has established WA's position as a world leader in technological innovation in the mining sector. However, 'other sectors are less technologically advanced' for example, 'some service industries which are still on a path toward digitisation.' [224]

5.61 The Committee for Perth suggests that WA's position as a 'resilient and prosperous mining and resources hub over the past three decades …dampened the impetus to invest in

220 Department of Jobs, Tourism, Science, and Innovation, *Diversify WA July 2019-July 2021*, 2021, p. 17.
221 CSIRO Futures, *Quantifying Australia's returns to innovation*, Canberra, November 2021, p. 18.
222 Submission 1, Committee for Perth, p. 3.
223 R&D spend is 1.6% for Australia from 1984–85 to 2019–20 compared to the OECD average of 2.2% from 1991 to 2019. CSIRO Futures, *Quantifying Australia's returns to innovation*, Canberra, November 2021, p. 19.
224 Submission 1, Committee for Perth, p. 6.

development markets and human capital for the future.' And that WA lags behind most other states in terms of government and private investment in R&D.[225] This conclusion is supported by ABS statistics.[226]

5.62 This is concerning given that investment in R&D encourages the development of new innovative ideas through scientific research and drives advances in technology.[227]

$1 of R&D investment on average creates approximately $3.5 of economy-wide benefits, or an average annual return of 10% for the whole economy.

- CSIRO

5.63 The importance of investment in R&D is demonstrated by the CSIRO working paper cited above, which reports on results which suggest that 'economy-wide returns to innovation remain high compared to private investment returns' and that 'innovation investment made to-date has been worthwhile and increasing future investment could capture substantial economy-wide returns.'[228]

5.64 The Committee for Perth has identified a general recognition amongst the 'resident and business community that WA needs to invest in developing future industries and markets, and that positioning the State to be leaders in existing and future industries will require significantly up-scaled investment in research and development.'[229] For example, WA has recognised opportunities in life sciences and medical tech capability—described by JTSI as a burgeoning ecosystem in which R&D investment is needed.[230]

5.65 The Committee for Perth suggests that the WA state government increase investment in R&D to levels comparable with other Australian jurisdictions. [231]

5.66 Infrastructure WA notes that approaching the innovation frontier can be achieved by the state 'leveraging its existing leadership in advanced technology to create a robust technology start-up and investment ecosystem.'[232]

Finding 43

There is a demonstrated need for increased government and business investment in Research and Development (R&D) to support innovation and drive the development of new technologies.

225 Submission 1, Committee for Perth, p. 3.
226 Australian Bureau of Statistics, *Research and Experimental Development, Government and Private Non-Profit Organisations, Australia 2016-17 financial year*, and *Research and Experimental Development, Government and Private Non-Profit Organisations, Australia, 2018-19* accessed 8 February 2022, <https://www.abs.gov.au/>.
227 Economics and Industry Standing Committee, *Growing WA through Innovation: The Western Australian Government's role in fostering innovation to expand and diversify the economy*, June 2016, p. 59.
228 CSIRO Futures, *Quantifying Australia's returns to innovation*, Canberra, November 2021, p. 19.
229 Submission 1, Committee for Perth, p. 3.
230 Mrs Linda Dawson, Deputy Director General, Industry, Science and Innovation, Department of Jobs, Tourism, Science and Innovation, *Transcript of Evidence*, 18 August 2021, p. 4.
231 Submission 1, Committee for Perth, p. 8.
232 Submission 12, Infrastructure WA, p. 8.

Finding 44

WA's position as a resilient and prosperous mining and resources hub over the past three decades is thought to have dampened the impetus to invest in development markets and human capital for the future. Statistically WA lags behind most other states in terms of government and private investment in R&D.

The importance of innovation ecosystems (innovation has an address)

5.67 One way which the government could foster investment in innovation is through the establishment of innovation ecosystems which create a location for collaboration.

5.68 Collaboration within an ecosystem 'can lead to new knowledge and product development, increased workforce education and skill levels, diversified income sources and improved commercialisation outcomes. By global standards, though, Australia is relatively poor at embracing collaboration.'[233]

> ***To me, it is very simple. Bright people come up with bright ideas. How do you attract bright people? Give them an area that says, "Whoa! This is a really cool thing." There are people who are doing this sort of stuff.***
>
> *- Chief Scientist of Western Australia*

5.69 The Chief Scientist told the committee about the importance of innovation ecosystems that are 'vibrant.' In such an ecosystem, ideally, Intellectual Property (IP) is generated locally. Then the follow-on effect from this is that collaboration occurs and the IP continues to be developed and tested.[234]

5.70 An example here in WA is the Australian Marine Complex (AMC) with its common-user facilities and with BP as the anchor tenant, which has led to the AMC becoming 'a global-leading industrial ecosystem.'[235]

5.71 The Chief Scientist used the example of Silicon Valley to demonstrate how maybe in the future in WA there could be a 'Lithium Valley' where innovators and entrepreneurs collaborate and attract other interested parties to further develop the industry. [236]

5.72 The Committee for Perth recommends:

- establishing 'a national R&D hub here in Perth for the development of AI for agriculture, mining, fisheries, forestry, and environmental management'; and

233 Economics and Industry Standing Committee, *Growing WA through Innovation: The Western Australian Government's role in fostering innovation to expand and diversify the economy*, 30 June 2016, p. 37.
234 Professor Peter Klinken, Chief Scientist of Western Australia, *Transcript of Evidence*, 11 August 2021, p. 7.
235 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, *Transcript of Evidence*, 18 August 2021, p. 10.
236 Silicon Valley is a term used to describe the area between San Jose and Palo Alto in Santa Clara County, California, US, which is renowned for its computing and electronics industries. Professor Peter Klinken, Chief Scientist of WA, *Transcript of Evidence*, 11 August 2021, p. 6.

- developing 'collaborative 'Centres of Excellence' as hubs of R&D in sectors where WA has capacity to build a competitive advantage; such as health; education; environmental management; renewable energy; METS; space; and agri-tech.'[237]

Finding 45

Collaboration within an innovation ecosystem can lead to new knowledge and product development, increased workforce education and skill levels, diversified income sources and improved commercialisation outcomes.

237 Submission 1, Committee for Perth, p. 8.

Chapter 6

Inbound investment and the rise of ESG investing

6.1 Previous chapters have discussed the changing global economy, and global megatrends—decarbonisation, and the industrial revolution 4.0.

6.2 This chapter discusses business investment, which is spending by private businesses and not-for-profits on physical capital. Treasury describes business investment as 'private investment in projects like the Wheatstone or Gorgon projects, or iron ore, steel, gold, lithium, anything that produces.' Basically, 'if it is capital expenditure via private business, then that is business investment.'[238]

In short, investment is key to maintaining and improving the high standards of living Western Australians enjoy.

- Department of Jobs, Tourism, Science and Innovation

6.3 The investment environment is changing due to global megatrends. As JTSI submits, 'global investment decisions are shifting, largely driven by the digitisation and automation of production processes, rising environmental and social awareness, and changing geopolitical dynamics.'[239]

6.4 The rise of ESG investing means that economic, social and environmental factors will increasingly influence investment decisions, and maintaining competitive advantage will require demonstrating compliance with ESG benchmarks.

6.5 The rate of decarbonisation and investment in technology and innovation have been discussed in previous chapters. As noted, addressing these challenges successfully will position the state as an attractive place to invest in the future.

6.6 This chapter outlines some other factors which stakeholders submitting to the inquiry saw as being key to ensuring that the WA economy remains competitive in the changing global market. Both in terms of its current exports, and in diversifying into new markets and industries.

Foreign direct investment

6.7 For the economy to thrive capital expenditure via private business (business investment) is required. Some of this spending by private business is in the form of Foreign Direct Investment (FDI). Treasury advised that inbound investment comprises almost a quarter of total business investment nationally over the past decade.[240]

238 Mr David Christmas, Department of Treasury, *Transcript of Evidence*, 13 October 2021, p. 10.
239 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 24.
240 Mr Alistair Jones, Department of Treasury, *Transcript of Evidence*, 13 October 2021, p. 3.

6.8 FDI is a subset of foreign investment more generally. FDI is foreign investment in an enterprise or asset where the investor has control or a significant degree of influence over business decisions. It is usually considered 'direct' when the foreign investor has ten per cent or more of the voting power in the company. In a similar way, 'direct debt investment is debt between related parties.'[241] When a reference is made to foreign investment in this chapter, it refers to FDI.

6.9 Foreign investment has enabled more investments in capital in WA than would have been possible if economic expansion was financed through domestic savings.[242]

6.10 Modelling carried out by the Productivity Commission 'estimates that the cost of running a more restrictive foreign investment policy regime would be between $0.8 billion and $7.1 billion each year in forgone national income, due to a loss of $19–$182 billion of net foreign capital.'[243]

6.11 Foreign investment 'opens local businesses to global supply chains and new international markets, and provides key channels for learning and technology transfer.' [244]

6.12 And importantly for WA right now, it 'can also play a key role in diversifying local industry and securing trade in new sectors.' [245]

Finding 46

Foreign direct investment (where the foreign investor has control or a significant degree of influence over business decisions) has enabled more investments in capital in WA than would have been possible if economic expansion was financed through domestic savings.

Current investment environment

The resources sector and WA's competitive advantages

6.13 Foreign capital has played an important part of developing the WA resources industry. JTSI described how 'for many years, WA has enjoyed positive net investment into the local economy,' which has been 'dominated by mining.' It noted that 'more than $20 billion was invested into WA's mining and petroleum sectors in 2020 and mining accounted for 72% of WA's new capital expenditure in 2020.' And further, that WA's 'share of national mining and petroleum investment has recently increased to 54%.'[246]

6.14 WA didn't need to work too hard when it came to FDI in the resources sector, given its distinct competitive advantage due to 'it's highly prospective geology and strong natural minerals and petroleum endowment.'[247]

241 Productivity Commission 2020, *Foreign Investment in Australia*, Commission Research Paper, Canberra, 2020, pp. 25-26. Other types of foreign investment include portfolio investment where the investor has no control over the business.
242 ibid., p. 51.
243 ibid.
244 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 22.
245 ibid.
246 ibid. See also Submission 15, Department of Primary Industries and Regional Development, p. 10.
247 Submission 8, Department of Mines, Industry Regulation and Safety, p. 7.

6.15 The Chamber of Minerals and Energy (CME) noted that 'WA is recognised as a stable and attractive place to invest and operate compared to competing jurisdictions with similar mineral and energy wealth.' [248]

6.16 The WA resources sector has strong ESG credentials, and a 'well-established advantage of competing on cost.'[249] In particular, WA's largest iron ore producers are 'amongst the lowest cost producers in the world.'[250]

6.17 The state's competitive advantages include:

- stable government and institutions
- favourable policy settings and frameworks
- extensive geographic space
- highly liveable cities and towns
- being a world leader in resource extraction
- the development of high quality geoscience data, information and expertise
- hosting a skilled population base—especially those associated with the resources, marine and construction industries
- WA's proximity to key markets—it is geographically close to key export markets in southeast Asia and the Indo-Pacific region, with which it has established trade links.

6.18 Over the past decade these 'factors have contributed to business investing almost $555 billion in Western Australia, much of it supported by inbound investment' and, as noted above, this 'amounts to almost a quarter of total business investment nationally over that period.'[251]

6.19 WA has been fortunate to enjoy the prosperity delivered by our advantages in natural resources. However, many submitters to the inquiry warned against complacency. It is important to understand that there are 'other resource-rich jurisdictions around the world against which WA is competing for a finite amount of investment capital at any one time.'[252]

6.20 Furthermore, the investment environment is quickly changing as megatrends continue to impact upon the global landscape.

Finding 47

In the past WA has enjoyed positive net investment into the local economy, which has been dominated by mining. Foreign direct investment flowed into the resources sector due to its distinct competitive advantages.

248 Submission 16, Chamber of Minerals and Energy, p. 2.
249 ibid.
250 Mr Alistair Jones, Department of Treasury, *Transcript of Evidence*, 13 October 2021, p. 3.
251 ibid.
252 Submission 8, Department of Mines, Industry Regulation and Safety, p. 7.

The changing investment environment and the rise of ESG investing

6.21 The investment environment is changing, particularly since the emergence of the COVID-19 pandemic. The pandemic has acted 'as a supply, demand and policy shock', triggering a significant fall in the global flows of FDI in 2020.[253]

6.22 Globally, there is a trend towards more strategic investing, with a focus on 'considerations of risk, resilience and transparency' rather than those of 'competitiveness through marginal efficiency.' [254]

6.23 Supply chain resilience has been a focus, which JTSI advised 'could lead to pressures in some industries to reconfigure international production networks through reshoring, regionalisation or diversification.'[255] For example, as discussed in the previous chapter, the supply constraints affecting critical minerals means that countries are seeking to secure supply by making strategic investments in critical minerals projects. This will be an opportunity for WA, with its access to critical minerals deposits, if the attendant challenges are met.

6.24 Furthermore, ESG awareness is increasing with the ESG credentials of companies and regimes influencing investment decisions. Going forward, maintaining competitive advantage will necessarily include meeting ESG benchmarks.

6.25 The rise of ESG investing can be described as a global megatrend underpinned by other megatrends, most obviously, decarbonisation, but also technological advances such as automation.

6.26 The move towards ESG investing can be observed 'across all of WA's key markets, driven by regions with ambitious environmental targets, such as Europe. The United Nations Conference on Trade and Development estimates the value of sustainability-themed investment products has grown rapidly, increasing 80 per cent in one year to $3.2 trillion in 2020. These products include sustainable funds, green bonds, social bonds and mixed-sustainability bonds.'[256]

> ***Something like 85 per cent of the exports out of Western Australia at the moment are going to nations which have net zero ambitions by 2050. So, … as we accelerate that pathway towards zero carbon, I would certainly expect to see that people will look to those products that are produced ethically, responsibly, socially and with green power.***
>
> *- Rio Tinto*

253 UNCTAD, *World Investment Report 2021*, 21 June 2021, accessed 13 January 2022, <https://unctad.org/webflyer/world-investment-report-2021>. Cited in Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 23.
254 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 24.
255 ibid.
256 ibid.

6.27 Online investment publication *Stockhead* described 2021 as being 'the breakout year for ESG investing' noting 'a record US$650 billion going into ESG-focused funds globally, accounting for 10% of worldwide fund assets.'[257]

6.28 It goes on to say that 'companies that are rated highly for their sustainability efforts have delivered record gains, boosted by growing awareness in investments focused on ESG issues.' The sense amongst experts is that 'the ESG boom has just started, and will continue its rapid momentum well into 2022 and beyond.'[258] Trends in ESG investing predicted for 2022 include:

- increasing interest in ESG investments
- social issues becoming more prominent
- ramping up of scrutiny over 'greenwashing'
- bifurcation of the market – '2022 will see funds accelerate toward companies that genuinely engage in ESG issues, and out from those that are just window dressing'
- a growth in biotechs
- investment in biodiversity and food – 'Water tech, green metals, and agricultural companies are some of the stocks that could see investment inflow in 2022.'
- consolidation in the energy sector
- the explosion of green bonds.[259]

6.29 The way in which ESG investing is accelerating presents challenges and opportunities for WA. For example, the state's green production supply chains and proximity to markets are ESG credentials which can be marketed. This must be done proactively, particularly for key commodities and sectors where WA must maintain market share or grow new markets.[260]

6.30 The WA government has put considerable effort into promoting its ESG credentials in recent months. This includes 'a commitment toward renewables and net-zero emissions' which is 'reflected through key environmental regulatory policies and statements'; for instance, the *WA Climate Policy* and the net-zero by 2050 greenhouse gas emissions aspiration.[261]

257 Eddy Sunarto, 'The Ethical Investor: 8 trends in ESG investing in 2022, and expert comments from Pendal's Murray Ackman', *Stockhead* (web-based), 31 December 2021, accessed 4 January 2022, <https://stockhead.com.au/>.

258 ibid.

259 ibid.

260 Mr Adam Handley and Mr Kobus van der Wath, *Statement of Evidence*, 24 November 2021.

261 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 24. Other environmental initiatives include the *WA Energy Transformation Strategy*, which aims to enable 'the integration of more renewables and new technologies into the power supply chain'; the establishment of a *Clean Energy Future Fund*; and the introduction of carbon sequestration policies.' The government is supporting 'industry to progress further down the value chain into less emissions intensive activities such as battery manufacturing and recycling.'

6.31 The state government is also working to optimise 'health and wellbeing, education and equality outcomes,' including 'engaging with native title groups and Aboriginal communities to develop agreements that accelerate economic and community development.'[262]

Finding 48

The investment environment is changing due to global megatrends. Investment decisions are shifting, largely driven by the digitisation and automation of production processes, rising environmental and social awareness, and changing geopolitical dynamics.

Finding 49

The rise of Environmental, Social and Governance (ESG) investing means that economic, social and environmental factors will increasingly influence investment decisions, and maintaining competitive advantage will require demonstrating compliance with ESG benchmarks.

Securing inbound investment in the future

6.32 JTSI suggested a greater role for private investment in coming years, although companies and investors will be cautious:

> Following deficit spending by governments over the past few years, it is expected that public policy in the coming years will favour a greater focus on debt management over further stimulus. This suggests a greater role for private investment. However, early indicators on greenfield investment and international project finance – and the experience from past FDI downturns – suggest that even if companies and investors are gearing up for 'catch-up' capital expenditures, they will still be cautious with new overseas investments in productive assets and infrastructure.[263]

6.33 JTSI pointed out that 'foreign economies had a total of $4 trillion invested in Australia at the end of 2020, a 2.2% increase from 2019' which could mean 'that investors are taking confidence from Australia's strong management of the global pandemic.' [264]

6.34 In a similar vein, the Chamber of Commerce and Industry WA (CCIWA) argues that the opportunities facing WA are significant. It states that 'unlike many other places across the world, we have a rare chance to capitalise on our success in managing COVID-19 while supporting a strong economy.'[265]

6.35 JTSI submits that 'the most promising investment source in the short-term is likely to be from existing investors.'[266]

262 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 25.
263 ibid., p. 23.
264 ibid.
265 Submission 6, Chamber of Commerce and Industry WA, p. 3.
266 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 23.

6.36 Treasury outlined the key factors that will continue to be important for attracting inbound investment:

- WA's large and sparsely populated landmass
- WA's natural endowments—including solar and wind exposure which will play a role in the shift to renewable energy sources
- continued good governance and low sovereign risk
- high-quality infrastructure
- a highly skilled workforce
- WA's close proximity to Asia.[267]

6.37 Several submitters noted that in the past, procuring FDI outside the mining sector has not been a focus. However, If WA is to realise its potential in new supply chain opportunities, diversify its economy and remain competitive, attracting an ongoing and high level of FDI will be essential.

> ***Due to WA's export oriented economy, a focus on the traded sectors is … important, as is the need to support emerging industries to promote a more complex and diversified economy.***
>
> *- Infrastructure WA*

6.38 This will be important in maintaining market share in major iron ore export markets and also developing new markets and industries.

6.39 As discussed in earlier chapters, global demand for iron ore will continue to be an important part of WA's economy, but is unlikely to remain the key driver of growth. As for another of the state's key exports, LNG, according to Treasury, will likely 'be an important transition fuel as the world moves to net zero emissions.' We were told that 'current and planned iron ore and LNG investment is intended to maintain existing production levels rather than expand them.'[268]

6.40 Treasury advised that other commodities and sectors 'will need to step up to support growth.' It is fortunate that global 'megatrends are already stimulating investment in and demand for other commodities'; for example, battery minerals, hydrogen and renewable energy.[269]

6.41 Realising these new opportunities will require substantial investment from all interested parties. FDI will be important for investment in R&D, the importance of which was discussed in the previous chapter.

6.42 Capital will also be needed for the commercialisation of large scale projects and new ventures as WA moves to a more diversified economy. Capital used for the commercialisation of innovative technologies can be angel investment, venture capital or

267 Mr Alistair Jones, Department of Treasury, *Transcript of Evidence*, 13 October 2021, p. 3.
268 ibid., p. 2.
269 ibid.

private equity. Both money and mentoring are provided by venture capitalists to help grow businesses and ensure that the investments made are successful.[270]

Case Study 3

Downstream battery and critical minerals processing

Producing greener battery products will require 'significant, sustained investment at an industry level' to bring new technologies to commercialisation.[271] And a shift in mining activities towards advanced manufactured products such as battery chemicals will mean that capital investment in new mines will be needed.[272]

Access to capital has been identified as an impediment to diversifying downstream in battery and critical minerals projects. This is because 'capital expenditure required to establish new mines and production facilities is significantly higher in Australia compared to many of our peers, primarily due to high construction wages, but also higher material costs.'[273]

The WA government has committed $13.2 million through the WA Recovery Plan, 'to facilitate global investment in precursor cathode manufacturing.' JTSI advised that 'international interest has been strong in this incentive and delivery would add to the growing number of companies partaking in downstream battery/critical minerals processing activities in the state.'[274]

6.43 A 2016 Economics and Industry Standing Committee report on innovation found that WA 'investors generally understand investment in the resources sector, but need to be better informed as to how to invest in other sectors of the economy.'[275]

6.44 The report also identified that 'attracting capital for the commercialisation stage of innovation is particularly challenging, largely due to the speculative, generally unsecured nature of commercialisation investment.' It suggested that the state government could 'enhance the commercial potential of innovative local ideas' by ensuring 'that the business environment is attractive to private investors.' [276]

270 Economics and Industry Standing Committee, *Growing WA through Innovation: The Western Australian Government's role in fostering innovation to expand and diversify the economy*, June 2016, p. 59.
271 Submission 10, CSIRO, p. 6.
272 ibid.
273 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, Letter – additional information provided, 29 November 2021, pp. 3-4. Citing a recent report released by Accenture on behalf of the Future Battery Industries Cooperative Research Centre (FBI CRC).
274 ibid., p. 4.
275 Economics and Industry Standing Committee, *Growing WA through Innovation: The Western Australian Government's role in fostering innovation to expand and diversify the economy*, June 2016, p. 76.
276 ibid., p. iii.

6.45 There is no lack of investment opportunities in WA, particularly in the resources sector. Treasury told us that:

> Going forward, the latest Deloitte Access Economics Investment Monitor estimates that there are more than $110 billion worth of potential projects, with some large renewable energy and hydrogen projects uncosted, in Western Australia. This is the highest level of potential projects of all states and territories. Of these, more than 70 per cent are in mining and almost 15 per cent are in transport.[277]

6.46 According to JTSI, as at September 2021, in WA there were '$36.1 billion of major resource projects under construction or committed and $90.6 billion under consideration..'. [278] CME submits that there are '$140 billion of resource projects in the pipeline.'[279]

6.47 The resources sector is particularly capital intensive and sensitive to global disruptions, which means that long-term regulatory stability and efficiency is critical to securing investment in WA projects. Ensuring that the cost-base for projects remains sustainable and stable across the supply chain is crucial.[280]

As a predominately export-based economy that cannot set the price for its products, a critical determinant for attracting investment is the cost of doing business.

- Chamber of Minerals and Energy

6.48 Outside the resources sector, there is work to be done in ensuring competitive exports. For example, while WA's non-mining commodity exports produced by the state's primary industries enjoy many competitive advantages 'WA is a small supplier to large and growing markets with increasing competition.' It argues that 'without an ongoing and high level of investment' those industries and WA's regions are at risk of 'being left behind.'[281]

6.49 WA is not without its challenges—particularly around the cost of doing business. Infrastructure WA pointed out that manufacturing and production costs 'remain a significant factor affecting inbound investment into the future' as does the cost (and availability) of materials, energy and water.[282]

6.50 Overall, we observed that there are challenges which require immediate address if WA is to remain competitive in the global setting and work to diversify its exports. The main impediments identified throughout the inquiry are described in the following section. As it is incumbent upon the state government to provide clarity around how government and industry can work together to realise economic opportunities, and also to 'ensure

277 Mr Alistair Jones, Department of Treasury, *Transcript of Evidence*, 13 October 2021, p. 3.
278 Department of Jobs, Tourism, Science and Innovation, *WA Economic Profile - December 2021*, December 2021, accessed 27 January 2022, <https://www.wa.gov.au/government/publications/western-australias-economy-and-international-trade>.
279 Submission 16, Chamber of Minerals and Energy, p. 2.
280 Submission 4, Australian Petroleum Production and Exploration, p. 7; and Submission 16, Chamber of Minerals and Energy, p. 7.
281 Submission 15, Department of Primary Industries and Regional Development, p. 10
282 Submission 12, Infrastructure WA, p. 11.

infrastructure settings and investments support those opportunities', the role of government is the focus here.[283]

6.51 There are industries and sectors that have not been considered in compiling these themes; for example, service exports such as international education and tourism.

6.52 As noted in chapter 1, the state government is prioritising sectors that have mostly recovered from the impact of the COVID-19 pandemic for economic diversification. Efforts in sectors substantially impacted by the COVID-19 pandemic, such as international education and tourism, are focussed on returning activity to pre pandemic conditions when public health measures allow.[284]

6.53 We have focussed on those sectors identified by the state government in the Diversify WA strategy, in which reforms are being progressed with the aim of using existing competitive advantages to yield results in the short to medium term.

Finding 50

In the past, procuring FDI outside the mining sector has not been a focus. However, If WA is to realise its potential in new supply chain opportunities, diversify its economy and remain competitive, attracting an ongoing and high level of FDI will be essential. This will be important in maintaining market share in major iron ore export markets and also in developing new markets and industries.

Finding 51

Realising economic opportunities driven by global megatrends such as decarbonisation will require substantial investment. FDI will be important for investment in R&D, and capital will be needed for the commercialisation of large scale projects and new ventures as WA moves to a more diversified economy.

283 Submission 12, Infrastructure WA, p. 2.

284 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, Letter – additional information provided, 29 November 2021, 29 November 2021, p. 2.

Intergenerational challenges and opportunities – key themes

6.54 This section discusses several key themes that emerged in evidence to the inquiry. These can be categorised as intergenerational challenges, with inherent opportunities. Resolving these challenges will increase the attractiveness of WA to investors.

Legislative and policy frameworks which encourage inbound investment

Regulating and incentivising new industries

6.55 When investors look to new opportunities, they look for certainty. This includes having a legislative and policy framework in place which provides long-term guarantees on key elements, clearly sets out the respective responsibilities of industry and government, and, ideally, mitigates as far as possible any factors of structural disadvantage.

6.56 For the past 50 years the successful iron ore sector in WA has operated within legislative frameworks and state agreements which encouraged investment in infrastructure while also incentivising ongoing investment the industry (see Box 6.9).

Box 6.9: The role of state agreements in the WA resources sector

State agreements detail the rights, obligations, terms and conditions for the development of the specific project, and are administered by JTSI on behalf of the WA government.

WA's continued economic growth over many years has been made possible by substantial investments in the resources sector.

In many cases, proponents commit to these significant projects on the basis of an agreement specifying terms and conditions with the WA government for the development of the resource. These terms and conditions are contained within what is known as state agreements, which are ratified by acts of Parliament.

A state agreement is a legal agreement between the WA government and a proponent of a major project within the boundaries of WA. It is a highly visible sign of WA's and the proponent's support for and commitment to the project.

State agreements have been used to develop resource projects in WA for over 60 years with the first state agreement enacted in 1952 for the BP refinery, located at Kwinana.

In state agreements, significant responsibility is put on companies for infrastructure development, both industrial and social.

State agreements are not a 'one-size-fits-all' approach to resource development in WA. Although all agreements have similar provisions, they are negotiated on a case-by-case basis and as such have project-specific clauses.

Source: Department of Jobs, Tourism, Science and Innovation, *State Agreements*, 16 November 2020. https://www.wa.gov.au/organisation/department-of-jobs-tourism-science-and-innovation/state-agreements

6.57 New industries and sectors will be looking to the government to provide appropriate regulation, taxation and royalty regimes which encourage capital investment whilst enabling them to be competitive in the global market.

6.58 In relation to the current royalty regime, CME argues that while it has 'served the industry well and stood the test of time' it does 'not contemplate the downstream development of

critical battery minerals and other future-facing commodity supply chains' such as green steel.[285]

6.59 As outlined in chapter 3, due to the expected trend towards greener steel production, there is likely to be a market for magnetite derived feedstock in the medium to long term. We were told that while WA has significant reserves, to date, magnetite plants and operations have proved expensive to develop and run in WA.

6.60 The argument put forward by CME and other stakeholders is that the royalty regime as is, does not allow for capital intensity and processing complexity for downstream magnetite processing. They contend that the current royalty rate on magnetite concentrate does not recognise the high unit cost of production compared to other products attracting the same rate—such as beneficiated haematite.[286]

6.61 The CME position is that structural factors of comparative disadvantage impacting new industries will need to be addressed at a policy level. For example, high labour costs and small domestic markets are a distinct disadvantage to new industries such as value-adding processes in the mining and agricultural sectors. [287]

6.62 CME argues that these disadvantages can be heightened due to 'aggressive government support to nascent industries in competing jurisdictions, with industry subsidies and access to infrastructure paid for by their governments invariably higher than what can be found throughout Australia and its history.'[288]

6.63 This might well apply to the new hydrogen industry. As companies around the world move to decarbonise, stakeholders in the resources sector point to increasing policy support for hydrogen projects in competing jurisdictions.[289]

6.64 Given the competitive advantages the state holds in establishing hydrogen projects, the government has prioritised implementation of its *Renewable Hydrogen Strategy.*

6.65 Box 6.10 on the following page details the 'policy and regulatory complexity across multiple portfolio areas' which the state government is navigating to foster a competitive hydrogen industry. This includes consultation with other jurisdictions to ensure a consistent approach.[290]

6.66 For new sectors such as hydrogen, the challenge for the state will be determining appropriate legislative and policy frameworks (including taxation and royalties) and state-industry agreements. For example, considerations will include what infrastructure will be delivered as a part of state-industry agreements; and how the industry will be regulated to

285 Submission 16, Chamber of Minerals and Energy, p. 8.
286 ibid. Citing research from the report by Australian Venture Consultants, *A Case for a Fair and Reflective Royalty Regime tor the WA Magnetite Industry*, Chamber of Minerals and Energy of Western Australia and the Association of Mining and Exploration Companies, Western Australia, December 2020.
287 ibid., p. 3
288 ibid.
289 Submission 19, Woodside, p. 3; Submission 4, APPEA, p. 7.
290 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, Letter – additional information provided, 29 November 2021, p. 8.

incentivise investment while also delivering optimal outcomes for the use of the state's natural resources. [291]

Box 6.10: Implementing the Renewable Hydrogen Strategy

Acknowledging the policy and regulatory complexity across multiple portfolio areas, particularly in the areas of land tenure and energy policy, combined with the large number of renewable hydrogen project proposals in WA, responsiveness to industry and a concerted effort and coordination across government is required to effectively implement the Renewable Hydrogen Strategy.

Demand aggregation

Industry has advised that to kick off commercial-scale hydrogen production in WA, a foundation of sufficient domestic offtake is required. It is estimated this domestic demand could be in the order of around 100 MW initially, and scaling up as the industry grows locally.

To assist with stimulating domestic demand, the 2021-22 WA state budget included an announcement of $61.5 million for the renewable hydrogen industry in WA. This funding includes $50 million to help support domestic demand and market stimulation of hydrogen in WA.

The WA government is also seeking expressions of interest for commercial-scale hydrogen-fuelled transport projects, to drive aggregation of early domestic demand. In addition, JTSI is undertaking a hydrogen value chain model study to assist with identifying the potential domestic demand opportunities for aggregation.

Land tenure

Land tenure is a complex issue for the state, and a priority area of focus.

Vast tracts of land are required for wind turbines and solar photovoltaic panels to facilitate renewable hydrogen production. Some proposed projects are seeking land between 6,000 to 15,000 square kilometres.

Given the scale of proposed international investment, in some cases tens of billions of dollars, industry feedback has been that security of tenure is essential to ensure projects are able to progress to a Final Investment Decision. The WA government is working on a range of land tenure options to facilitate the development of renewable hydrogen projects.

Common/Multi-User Infrastructure

JTSI has commenced the early stages of analysis for common and multi user infrastructure requirements in the most prospective renewable hydrogen production regions. This analysis will include (but not exhaustively consider) future desalination, water management, port and energy infrastructure requirements, and how to best facilitate access to common infrastructure.

Regulation

JTSI has commenced consultation on regulations and standards impacted by hydrogen with the Australian government, and other states and jurisdictions, to determine the best approach for a regulatory reform agenda.

Source: Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, Letter – additional information provided, 29 November 2021, pp. 8-9.

Finding 52

When investors look to new opportunities, they look for certainty. This includes having a legislative and policy framework in place which provides long-term guarantees on key elements, clearly sets out the respective responsibilities of industry and government, and, ideally, mitigates as far as possible, any factors of structural disadvantage.

291 Mr Alistair Jones, Department of Treasury, *Transcript of Evidence*, 13 October 2021, p. 8; Ms Rowena Albones, Rio Tinto, *Transcript of Evidence*, 17 November 2021, p. 6.

Finding 53

New industries and sectors will be looking to the state government to provide appropriate regulation, taxation and royalty regimes which encourage capital investment and enable them to be competitive in the global market.

Finding 54

For new sectors such as hydrogen, the challenge for the state will be determining appropriate legislative and policy frameworks (including taxation and royalties) and state-industry agreements.

Streamlining regulation to make it easy to do business

6.67 Investors also look at how easy it is to do business in a jurisdiction. Once a policy framework is established for an industry, efficient online regulatory processes which reduce duplication and streamline the interface between business and government are important, according to industry stakeholders. Otherwise, 'the burden of regulation and compliance incrementally expands, making it unnecessarily complex and duplicative to obtain permits to construct and operate.'[292]

6.68 The state government's Streamline WA and Environment Online initiatives aim to improve regulation, in particular, mining environmental approvals. [293] CME says that the mining sector is looking to the government to deliver on these initiatives to 'shorten whole-of-project approval timeframes.' It also argues that 'given the reforms currently underway, a unique opportunity exists to clarify jurisdiction in state-based environmental and mining laws' and streamline regulatory processes across government.[294]

6.69 JTSI advised that a new case management unit is being created to work across agencies to strengthen support for complex proposals. This sits under the whole-of-government Regulatory Approvals Framework, as part of the Streamline WA reforms.[295]

Finding 55

Investors also look at how easy it is to do business in a jurisdiction. Within a policy framework regulating an industry, efficient online regulatory processes which reduce duplication and streamline the interface between business and government are important.

292 Submission 16, Chamber of Minerals and Energy, p. 7.

293 *Environment Online*, an online platform for water and environmental regulatory processes, aims to streamline processes. *Streamline WA* is a portal for industry, business and the community to inform government of regulatory or policy settings that would make it easier to do business in WA. Recently an additional $120 million of funding has been committed by the government to fund a red-tape reduction team of 150 frontline staff to speed up project approvals.

294 Submission 16, Chamber of Minerals and Energy, p. 7.

295 See Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, Letter – additional information, 29 November 2021, p. 4.

Project-ready industrial land

6.70 The provision of project ready industrial land is a complex undertaking, led by state government under the lead agency framework, and in consultation with industry and landholders.

6.71 Access to land 'is vital for a broad range of sectors—from Western Australia's mature resource and agribusiness industries to emerging sectors like renewable energy and automation technologies.' And 'in order to be attractive to industry, it is important that industrial land is located strategically and is integrated with infrastructure.'[296]

6.72 There are three main types of industrial land referred to in WA's *10-year Industrial Land Strategy*:[297]

- Strategic Industrial Areas (SIAs)
- General Industrial Areas (GIAs)[298]
- Technology Parks.[299]

6.73 SIAs, in particular, are important for the economy.[300] They support industrial activities of significant economic and strategic importance to the state. These are value-adding activities such as downstream resource processing which are parts of key industrial value chains.

6.74 SIAs require large tracts of land and are always on long term leases. They require major electricity and gas infrastructure networks, road access for heavy vehicles and direct port connection via road or rail. Sufficient port depth and size is integral to export activity. Access to substantial water and energy sources is important. In addition, corridors for roads, pipes and power lines must be taken into account.

6.75 There are 12 SIAs across WA. Demand for SIAs has increased significantly in the last five years, which 'has been driven by a range of global and local factors.' [301]

296 Industrial Land Steering Committee, *10-year Industrial Land Strategy*, Development WA, June 2021, p. 4.

297 ibid., pp. 8-9.

298 GIAs are estates with small to moderate sized industries house activities which are consumer and business orientated. They provide goods and services to regional, state and international markets and can include business parks, offices, local services, fabrication and manufacturing activities. They require access to key freight routes, as well as the freight rail network. They need potable and processing water, sewer/land for waste water disposal, electricity, and other energy. They are located on moderate to large, relatively flat sites – as any processing is land intensive.

299 Technology Parks are a specialised location for scientific and technological research and development activities. They may include production, manufacturing and assembly of products. They require proximity to: strategic and regional centres; population and trade centres; public transport; and research and scientific facilities (e.g. universities). They require all utilities including ICT networks

300 The combined gross output these with industrial operations in the 2018–19 financial year was $48.6 billion. This contributed $22 billion to GSP, representing approximately 8 per cent of WA's economy. The SIAs were responsible for the direct full time employment of 18,190 people. See Industrial Land Steering Committee, *10-year Industrial Land Strategy*, Development WA, Perth WA, June 2021, p. 10.

301 Industrial Land Steering Committee, *10-year Industrial Land Strategy*, Development WA, June 2021, p. 4.

6.76 One example of demand for SIAs arising from the combined effect of global megatrends is the rise in demand for lithium, which is used in electric vehicles and battery storage. This increase in demand is a result of global producers seeking downstream processing facilities in jurisdictions that meet ESG criteria. This has led to the construction of two new downstream processing facilities by producers—Tianqi Lithium (in Kwinana SIA) and Albemarle Lithium (in Kemerton SIA). A third lithium refinery facility is proposed by Covalent Lithium for the Kwinana SIA.

Finding 56

Access to land is vital for a broad range of sectors—from mature resource and agribusiness industries to emerging sectors like renewable energy and automation technologies. In order to be attractive to industry, it is important that industrial land is located strategically and is integrated with infrastructure.

Common-use and multi-use infrastructure

6.77 DPIRD outlined how 'a lack of 'turn-key' industrial estates' such as those 'offered to major project proponents in other competing jurisdictions' have, to date, been an impediment to new industrial projects in WA. [302] Often industrial areas 'require significant investment in headworks and other infrastructure - a situation that does not typically occur in 'turn-key' industrial estates in other jurisdictions globally.'[303]

6.78 Infrastructure WA described how supporting inbound investment requires having enabling infrastructure in place which supports emerging industries and growing export markets. It describes how 'the scale of opportunity is directly linked to the capacity of WA's utilities, transport network (ports, freight rail and road) and land supply to support planned growth.'[304]

6.79 Decisions around common user infrastructure are important. It will be vital that the state government makes the right types of investments in common user infrastructure, either wholly or in cooperation with industry partners. And 'this will need to be shaped by transparency of process, clear public value, and targeted investment based on regional strengths where there is evidence of market failure or an inability for industry to pre-fund necessary works.'[305]

6.80 Common-user facilities attract both the anchor tenants and Small and Medium-sized Enterprises (SMEs) to the location. Both of these are needed to create the healthy ecosystems described in the previous chapter. This is where the innovation and the technological advancement occurs. And it is the common-user facilities, which would be cost-prohibitive for one business, that makes the location initially attractive.[306]

302 'Turn Key' is a term used in real estate which denotes property or land that is 'move in ready' where everything works and is ready to go.
303 Submission 15, Department of Primary Industries and Regional Development, p. 13.
304 Submission 12, Infrastructure WA, p. 13.
305 ibid.
306 Mrs Linda Dawson, Department of Jobs, Tourism, Science, and Innovation, *Transcript of Evidence*, 18 August 2021, pp. 10-11.

6.81 Establishing, and deciding who pays for, 'critical infrastructure, including common-use infrastructure, to allow emerging markets and technologies to flourish' will be a key challenge for the state government. [307]

6.82 Ideally, common-use infrastructure is exactly that—for common use.[308] We were cautioned about investments and decisions that entrench monopolistic behaviour around access to infrastructure:

> There are a number of other examples of very important commodities where you could make the argument that we have allowed 30 to 40 years of entrenched monopolistic infrastructure control. I am sure the case can be made economically that that has benefited Western Australia in many respects, but in some of these new markets—I think hydrogen is one of them—having open access to ongoing infrastructure so that we do not have all of these different facilities being duplicated we think will be quite important.[309]

6.83 In relation to this, JTSI advised that when working with project proponents, if government is building particular infrastructure for a proponent to facilitate a project, then multi-user infrastructure is pursued. [310]

6.84 Furthermore, generally, government will not provide infrastructure that only services a particular mine, for example. But if a road or another aspect of infrastructure could be utilised by the local community, or a second proponent/project could also use that infrastructure, then that is an area that can be explored further in terms of government assistance.[311]

Finding 57

Supporting inbound investment requires having multi-use infrastructure in place which supports emerging industries and growing export markets. The scale of opportunity for the state is directly linked to the capacity of WA's utilities, transport network (ports, freight rail and road) and land supply to support planned growth.

Finding 58

De-risking investment in new industries and markets—hydrogen, for example—will largely depend on the ability to access to common and multi-infrastructure. Investments and decisions that entrench monopolistic behaviour around access to infrastructure will be counter-productive to attracting investment in new industries and accessing new markets.

307 Mr Adam Handley and Mr Kobus van der Wath, *Statement of Evidence*, 24 November 2021.
308 Dr Jeffrey Wilson, Perth USAsia Centre, *Transcript of Evidence*, 11 August 2021, p. 13.
309 Mr Adam Handley and Mr Kobus van der Wath, *Statement of Evidence*, 24 November 2021.
310 Mr Christopher Clark, Deputy Director General, Resources and Project Facilitation, Department of Jobs, Tourism, Science and Innovation, *Transcript of Evidence*, 18 August 2021, p. 10.
311 Mr Christopher Clark, Department of Jobs, Tourism, Science and Innovation, *Transcript of Evidence*, 18 August 2021, p. 10.

Multi-user port facilities co-located with SIAs

6.85 If WA is to become a global producer of domestic and export products such as green ammonia, hydrogen, iron, steel and other value added chemicals and concentrates, multi-user port facilities on the Mid-West and Pilbara coasts, co-located with project-ready industrial land, will be required. The location of projects adjacent to existing mines and infrastructure may also be optimal.

> ***There are some issues that we will have to deal with, especially on the export side and the availability of ports.***
>
> *- Department of Mines, Industry Regulation and Safety*

6.86 New industries may also require significant populations of skilled workers to reside in the Pilbara or other regions. Which brings attendant demand for residential land, housing stock and civic, health and education infrastructure.

6.87 In October 2021 the news that Fortescue Future Industries (FFI) would build the world's largest green energy hydrogen manufacturing facility at the Port of Gladstone in Queensland was seen by some as a loss for WA.

6.88 DMIRS advised in relation to this that the Queensland government was able to readily supply a port facility located in an industrial area (Gladstone). Although Oakajee SIA is being prepared for this type of use in the future, the export facility in the Gladstone port was not infrastructure that WA could currently offer to FFI in the timeframe sought.[312]

6.89 Looking forward, we were told that there is a sense of urgency within government to identify industrial land and ports, as well as skill sets and workforces, to allow the take-up of opportunities for new projects.[313]

Finding 59

There is a sense of urgency within government to identify industrial land and ports, as well as skill sets and workforces, to allow the take-up of opportunities for new projects.

The work of the Department of Jobs, Tourism, Science and Innovation in working to make project ready industrial land available

6.90 There has been considerable state government investment through the *WA Recovery Plan* and other initiatives in aligning the state government's asset investment program and infrastructure development in order to achieve project-ready industrial land.

6.91 The *Industrial Land Strategy* sets out ten recommendations to unlock industrial land in WA over ten years, as well as a list of recommended physical infrastructure projects and regulatory process improvements. This will guide allocation of a $50 million Industrial Lands Authority Land Development Fund which has been established to support the delivery of project-ready general and strategic industrial land.

312 Mr Jeffrey Haworth, Executive Director, Geological Survey and Resource Strategy Division, Department of Mines, Industry Regulation and Safety, *Transcript of Evidence*, 10 November 2021, p. 5.

313 Mr Richard Sellers, Director General, Department of Mines, Industry Regulation and Safety, *Transcript of Evidence*, 10 November 2021, p. 6.

6.92 The role of government is focused on maximising investment 'into the state in terms of capital works and ensuring that … service infrastructure—power, water and road networks—aligns with the industrial land to enable greater investment into particular areas.'[314] JTSI advised that it is currently carrying out gap analysis studies for the state's 12 SIAs.[315]

6.93 JTSI advised that the Western Trade Coast, and Kalgoorlie and Kemerton SIAs, are a current focus to leverage new industries into WA.[316] For example, JTSI is working with DevelopmentWA to ensure the Kalgoorlie and Kemerton SIAs become globally recognised industrial areas in battery materials projects.[317]

6.94 The Pilbara region has been identified by the Australian government as a priority area for the development of renewable hydrogen hubs. JTSI has commenced assessing the common and multi user infrastructure requirements in potential hub locations, both in the Pilbara and the Mid West. This analysis will include aspects such as 'water management, port and energy infrastructure requirements, and how to best facilitate access to common infrastructure.' [318]

Finding 60

There has been considerable state government investment through the *WA Recovery Plan* and other initiatives in aligning the state government's asset investment program and infrastructure development in order to achieve project-ready industrial land.

Land tenure reform to allow for competing land use

6.95 Ensuring project ready industrial land and the establishment of enabling infrastructure will, amongst other things, require the ongoing resolution of land tenure issues. This is a complex issue and identified by JTSI as one which is being resolved to allow the establishment of hydrogen projects (see Box 6.10 above).

Competing land uses

6.96 One of the issues raised during the inquiry was the importance of having the right land access arrangements and infrastructure in place to support existing industries and to facilitate the growth of new industries.

6.97 This has been highlighted by the development of the state's climate change policy and the strategies being developed in support of the aims under this policy, which have

314 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, *Transcript of Evidence*, 18 August 2021, p. 5.

315 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, Letter – additional information provided, 29 November 2021, p. 4.

316 The Western Trade Coast encompasses a range of industry and maritime freight and logistics activities. It is the premier industrial zone in WA and is adjacent to the preferred location for the state's primary container, bulk and general cargo port. See Saga Communications and Long Front Advisory Services, *Enabling the Western Trade Coast: Creating WA's World Class Industrial Destination - A Perspective from Industry*, Regional Development Australia Perth, September 2020, p. 10.

317 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, *Transcript of Evidence*, 18 August 2021, p. 10.

318 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, Letter – additional information provided, 29 November 2021, p. 9.

demonstrated that 'there is an increased requirement by several users for the same pieces of land.'[319]

6.98 Some of these emerging land uses are carbon farming, the hydrogen industry; the renewable energy industry, and the future battery industry. DMIRS advised:

> When you start looking at the requirements that will be needed to build the EVs and the renewable energy sources, there is a massive drain on a lot of our resources—nickel is one, lithium is another, and cobalt et cetera. It is a balancing act of making sure that all of these interests get what they need to be able to develop. With hydrogen, there is a lot of talk about how it is renewable energy, whether that is going to be solar panels, wind turbines or tidal, and giving them the area that they need. [320]

6.99 DMIRS pointed out that 'the legislative regime has to cater for mining, and pastoralists, and carbon farming, and hydrogen, and renewables.' DMIRS advised that it has been working with other agencies to devise 'a balanced and sensible approach' to the development of a legislative framework which accommodates all interests.[321]

Diversification of pastoral leases will enable greater synergies between agricultural and tourism development potential. The extent of capital investment is dependent on the "bankability" of land tenure. The ability to attract signature developments will only be realised if land tenure, access and assembly is attractive to third party investment.

- State Planning Strategy 2050

6.100 It is clear that a balance will need to be achieved between competing land uses and differing industry stakeholder requirements in terms of this use. This will involve satisfying diverse industries such as the pastoral, agricultural, and renewable energy industries so that economic opportunities are realised. It will also involve ensuring traditional owners are adequately considered.

Finding 61

Ensuring project ready industrial land and the establishment of enabling infrastructure will require the ongoing resolution of land tenure issues. A balance will need to be achieved between competing land uses and differing industry stakeholder requirements in terms of this use. This will involve satisfying diverse industries such as the pastoral, agricultural, and renewable energy industries so that economic opportunities are realised. It will also involve ensuring traditional owners are adequately considered.

319 Mr Jeffrey Haworth, Department of Mines, Industry Regulation and Safety, *Transcript of Evidence*, 10 November 2021, p. 4.

320 ibid.

321 ibid. These other agencies are JTSI, DPLH, DBCA (because it is the climate policy area), and DPIRD.

Land tenure – legislative reform

6.101 Currently, precursor work for new projects, such as renewable hydrogen hubs, can be carried out under section 91 of the *Land Administration Act*. This would include planning for establishing infrastructure in optimal locations.[322]

6.102 Beyond that, changes to legislation are required to move forward and give proponents of new projects certainty.

6.103 On 18 November 2021 the Minister for Lands, the Hon Tony Buti MLA, announced proposed changes to the *Land Administration Act* to introduce a new, more flexible form of land tenure for unallocated Crown land and pastoral land.[323]

6.104 The new legislation will allow for the creation of a diversification lease, 'which is a non-exclusive lease that will cover a raft of things, including hydrogen development, carbon farming on crown land, and other things that can be used, which currently cannot be done under the *Land Administration Act*.'[324]

6.105 The amending legislation is expected to be introduced in 2022.

Finding 62

Legislative changes to allow for the creation of a diversification lease under the *Land Administration Act* are being progressed in order to address land tenure issues, allowing for competing land use.

Wages and access to labour is an issue facing businesses across all sectors

6.106 WA is in a jobs growth phase, while at the same time the COVID-19 pandemic continues to hinder recruitment from interstate and overseas. According to the JTSI December 2021 market outlook, WA's employment figures rose to a record high in November 2021. Overall, during 2020–21, WA's annual average employment rose 1.8 per cent. This is expected to continue to rise, with the WA government Mid-year Financial Projections Statement 2021–22 forecasting annual average employment to rise 3.75 per cent in 2021–22 and 1.25 per cent in 2022–23.[325]

6.107 A 2021 report by the National Australia Bank found that of all Australian jurisdictions, businesses in WA were having the greatest difficulty finding staff. Labour shortages are seen as having the biggest impact on operations. The construction sector reported being hardest hit, while the mining, manufacturing, personal services, accommodation and hospitality

322 Mr Jeffrey Haworth, Department of Mines, Industry Regulation and Safety, *Transcript of Evidence*, 10 November 2021, pp. 4-5.

323 Hon Tony Buti MLA, Minister for Lands, *State Government to unlock land for renewable energy and economic diversification*, media release, 18 November 2021.

324 Mr Jeffrey Haworth, Department of Mines, Industry Regulation and Safety, *Transcript of Evidence*, 10 November 2021, p. 5.

325 Department of Jobs, Tourism, Science and Innovation, *WA Economic Profile - December 2021*, December 2021, accessed 27 January 2022, <https://www.wa.gov.au/government/publications/western-australias-economy-and-international-trade>.

sectors follow closely behind. The report concludes that, Australia-wide, labour shortages are expected to worsen in 2022.[326]

6.108 DPIRD described the particular issues for WA's regional and primary industry sectors, which 'report having more jobs than workers, with deficits both in low paid skilled jobs and in high paid skilled jobs. This lack of workforce has been a long-standing issue that has become more acute as a result of COVID-19.' [327]

6.109 Submissions from stakeholders in the resources sector describe the difficulty that the sector faces in sourcing 'transient workers from either interstate or highly skilled international specialist workers for … maintenance and project construction.'[328] Large resource projects rely on specialised workforces for short term contracts. These skillsets aren't available amongst WA residents and these workers tend to move from project to project.

6.110 Lack of access to skilled labour is also impacting emerging industries, for example, in diversifying downstream in battery and critical minerals projects. We heard that 'Australia's reliance on migration, skills shortages during mining booms, and a lack of specialist training have posed significant challenges to building the skilled workforce required to support these projects.'[329]

6.111 In order to provide some insight into the skills and training needed to support activities across the breadth of the battery and critical minerals value chains, the South Metropolitan TAFE has completed A National Vocational Skills Gap Assessment and Workforce Development Plan. In addition, 'the Department of Training and Workforce Development has developed a set of draft occupational profiles that detail skill requirements and educational pathways for battery and critical minerals occupations.' [330]

6.112 Labour shortages have resulted in higher wages in some sectors in WA—for example, mining and construction—and WA's agricultural workforce is the highest paid in the Organisation for Economic Co-operation and Development (OECD). While high wages are desirable for workers, the cost of wages is a significant cost of doing business in WA, which presents a challenge to the international competitiveness of exports.[331]

6.113 Another issue that arises when considering the cost and availability of labour, is lack of access to, and the high cost of, housing, particularly in the regions. Coupled with higher living costs in the regions this erodes any benefit gained through higher wages in the primary industry export sectors.[332] Infrastructure WA identified housing supply as a 'primary issue across the State' which is 'constraining economic growth.'[333]

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326 NAB Behavioural & Industry Economics, *NAB Business Survey Insight 2021*, Australia, December 2021.
327 Submission 15, Department of Primary Industries and Regional Development, pp. 13-14.
328 Submission 19, Woodside, p. 3.
329 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, Letter – additional information, 29 November 2021, pp. 3-4. Citing a recent report released by Accenture on behalf of the Future Battery Industries Cooperative Research Centre (FBI CRC).
330 ibid., p. 4.
331 Submission 15, Department of Primary Industries and Regional Development, p. 14.
332 ibid., pp. 12-13.
333 Submission 12, Infrastructure WA, p. 11.

6.114 Access to affordable housing and the cost of living in the regions is 'particularly challenging for low-income service workers in hospitality and childcare and for seasonal agriculture workers.' This means that 'most regions report major difficulties in attracting and retaining lower paid workers, with workers exiting regions or sector for those with high wages (mining) or lower costs (Perth).'[334]

6.115 Labour and skills shortages and access to housing are seen as the most pressing issues for the WA economy into the immediate future, according some of WA's business leaders interviewed by *The West Australian*. ACIL Allen executive director (WA and NT), John Nicolaou, described workforce shortages as 'the sleeping giant' and the biggest challenge for WA in the near-term, and one which could have a prolonged impact through 2022 and beyond.[335]

Finding 63

The cyclical nature of commodities markets creates fluctuations in the labour market and employment, and often creates the situation where one industry (for example, mining) attracts employees at the expense of other sectors.

Concluding remarks

6.116 WA 'plays a leading role in attracting international capital to Australia, given the size and scale of its resource sector.'[336] And, WA relies on international capital more than any other Australian jurisdiction.[337]

6.117 Competition for capital is likely to intensify as the world moves past the COVID-19 crisis.[338] It is important that securing inbound investment is a strategic focus for the WA government. As a state we have an opportunity to 'capitalise on our geographic advantages to build the awareness and attractiveness of WA as an innovative and diverse investment hub for foreign direct investment.'[339]

334 Submission 15, Department of Primary Industries and Regional Development, pp. 12-13.
335 Danielle Le Messurier, 'Labour shortages, climate change, inflation and China to shape WA's economy in 2022', *The West Australian* (web-based), 31 December 2021, accessed 26 January 2022, <https://thewest.com.au/>.
336 Submission 5, Perth USAsia Centre, p. 1.
337 Submission 6, Chamber of Commerce and Industry WA, p. 4.
338 ibid.
339 ibid., p. 10.

Chapter 7

Invest and Trade WA

Competing for foreign direct investment in a changing global economy

7.1 As WA pursues a more diversified economy, securing foreign direct investment will be increasingly important. As noted in the previous chapter, investment decisions are made based on balance, considering of a range of factors. These factors are rapidly shifting, and priorities being reconfigured as a result of global megatrends and the rise of ESG investing.

7.2 Prior to this however, getting investment opportunities even considered 'is often a product of persuasive marketing, informed dialogue, strong relationships and the compelling characteristics of the location.'[340] Recently, this has been complicated by measures enacted to manage the COVID-19 pandemic, limiting the traditional methods of engagement with overseas markets, necessitating agility and innovation in trade and investment promotion.[341]

7.3 We were told that now, more than ever before, WA needs to prosecute its own trade and investment policy, leveraging our unique brand. Targeted marketing of WA goods and services, along with building important trade partnerships in key markets, is going to be essential into the future.

7.4 The state government has an important role to play through WA's investment and trade ecosystem. Since 2017, this wider network has been spearheaded by JTSI which was established to create WA's current economic development portfolio.

7.5 Prior to 2017 the state's trade and investment function was, arguably, underutilised. There was no overall trade and investment strategy, most likely due to the fact that WA's wealth of natural resources and world-leading mining and METS sector meant that capital flowed into the state, requiring little active trade and investment promotion. In addition, the public sector was competing with a robust resources sector for talent in this area.[342]

7.6 Also, with little strategic direction from Perth, the overseas trade offices operated largely in isolation, with minimal coordination within a wider network and intelligence base.

7.7 Appendix one sets out a brief history and background to the current trade and investment ecosystem.

340 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 23.
341 ibid.
342 Department of Jobs, Tourism, Science and Innovation, *Western Australia's Overseas Trade and Investment Offices Review*, October 2019, p. 24. The first point was also noted by JTSI at the hearing on 18 August 2021.

Finding 64

Competition for capital is likely to intensify as the world moves past the COVID-19 crisis. As WA pursues a more diversified economy, securing foreign direct investment will be increasingly important.

WA's trade and investment ecosystem

Invest and Trade WA

7.8 The WA government launched Invest and Trade WA in 2019 to facilitate investment into WA and to assist local industries in accessing export markets. This function sits within JTSI. A website was launched in January 2021 to promote WA interstate and overseas. It profiles key industries and includes market outlooks for WA's key markets.

Box 7.11: Trade statements in Australian jurisdictions

Over recent years, Australian states and territories have produced trade and investment documents, variously termed strategies, statements, or plans.

The ACT first release one in 2016, followed by Victoria and Queensland. South Australia and the NT published theirs in 2018, and Tasmania the following year. 2021 has seen NSW, and most recently, WA, follow suit.

Some of these statements mark a point in time, while others cover a span of years (6, in the case of Tasmania). WA has the shortest time-span, covering a 14-month period.

Source: Compiled from jurisdictional trade statements, strategies and plans.

7.9 Invest and Trade WA coordinates the state's trade and investment function, including a range of initiatives and strategies, and compiles annual trade and investment plans which outline the government's strategies to achieve the state's investment and trade outcomes (see Box 7.11 above).

7.10 It plays a lead role in maintaining and developing trade relationships, facilitating events, hosting inbound delegations and managing international trade relations (sister-state relationships, agreements and memorandums of understanding). It has carriage of WA's *Asian Engagement Strategy 2019-2030*, which includes delivering capacity building workshops in doing business with Asia, partnering with organisations on market-based forums, and facilitating the WA-ASEAN Trade and Investment Dialogue.

7.11 Invest and Trade WA also has input into national trade and investment issues that impact upon WA; for example, negotiations around free trade agreements. It coordinates compliance with relevant federal legislation and provides input to the Foreign Investment Review Board.

7.12 Invest and Trade WA staff based in Perth, along with overseas office staff, meet regularly with Austrade and the Department of Foreign Affairs and Trade (DFAT) 'to discuss investment and trade opportunities and share market and industry insights and trends.'[343]

343 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, Letter – additional information provided, 14 January 2022, p. 2.

Finding 65

More than ever before, WA needs to prosecute its own trade and investment policy, leveraging a unique brand. Targeted marketing of WA goods and services, along with building important trade partnerships in key markets, is going to be essential into the future.

Finding 66

The state government plays a key role through WA's investment and trade ecosystem. Since 2017, this network has gone through a significant transition, the effectiveness of which is yet to be seen.

Overseas trade offices and trade commissioners

7.13 The trade and investment framework includes overseas trade offices and trade commissioners, which sit under the remit of JTSI. In September 2020 the Premier announced that these offices would move to a regional hub and spoke model. The hub and spoke 'model provides for greater flexibility and enables the government to be more responsive to emerging market and industry priorities, including the challenges associated with the COVID-19 pandemic.'[344]

7.14 There are eight international investment and trade offices across five regions. There are four trade commissioners and an Agent General in the London office. The hub locations are:

- ASEAN (Jakarta and Singapore)
- China (Shanghai)
- India-Gulf (Mumbai and Dubai)
- North East Asia (Tokyo and Seoul) – with a presence (or 'spoke') in Kobe with WA's sister-state Hyogo prefecture and another in north Vietnam
- United Kingdom/Europe (London)

Box 7.12: Agents General

The Australian states all employ an agent-general based in London, with the exception of Tasmania, where the post was discontinued in 1981. This person often has responsibility for representations to Europe, and, more recently, Israel. Some of these positions have existed since the mid-1800s; WA passed its own legislation establishing the role in 1895.

Sources: Department of State Growth, Tasmanian Trade Advocates https://www.stategrowth.tas.gov.au; Department of Jobs, Tourism, Science and Innovation, *Western Australia's Overseas Trade and Investment Offices Review*, Western Australian Government, Perth, October 2019, p. 58.

7.15 Trade commissioners and the Agent General are relatively new appointments, recruited under the new governance model. The Agent General is on location; however, the other trade commissioners (appointed from within the public sector on secondment) have been working in Perth due to COVID-19. Most offshore staff continue to work from home, as required by the circumstances within each jurisdiction.[345]

344 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 20.

345 Department of Jobs, Tourism, Science and Innovation, *Western Australian Investment and Trade Plan 2020-21 Review*, October 2021, p. 3.

7.16 There are 30 overseas staff, which is less than in the past. JTSI advised that they are in a 'rebuilding phase' and that, over the next 12 months, additional overseas positions and spokes (locations) will be identified. In doing this, the aim is to build a presence in places where the key market opportunities exist for WA. This might include a new standalone office in a market, a co-location with Austrade, or another 'more industry-specific presence with a locally engaged person.'[346] This process is being informed by:

- 'engagement with WA and overseas industry stakeholders;
- economic data, market intelligence and overseas government policy decisions regarding new and emerging industry opportunities, including the impact of COVID-19 on global supply chains;
- the need for the State to diversify its investment and trade markets and sectors in line with *Diversify WA*; and
- the ability for markets to contribute to the recovery of the State's international education and tourism sectors.'[347]

7.17 For markets where there is no WA overseas trade office, JTSI advised that the Perth office and/or relevant overseas office will work with Austrade and DFAT officials to service investment and trade enquiries.[348]

Finding 67

There are 30 overseas staff in trade offices located around the world, which is less than in the past. There has been a rebuilding phase following the 2019 review; over the next 12 months additional overseas positions and locations will be identified to build a presence in places where the key market opportunities exist for WA.

Education Business Development Managers and Tourism WA staff overseas

7.18 There are clear synergies between international education and tourism/aviation. As the employer of Tourism WA (TWA) staff, and tasked with a remit to promote international education offshore, JTSI undertakes trade and investment activities for both these sectors.[349]

7.19 JTSI's Education Business Development Managers (EBDMs) are situated in overseas offices to promote Perth's education services overseas. They support stakeholder engagement in location with key groups, including prospective international students, and facilitate strategic partnerships for WA's international education sector.[350]

346 Ms Simone Spencer, Deputy Director General, Strategy and International Engagement, Department of Jobs, Tourism, Science and Innovation, *Transcript of Evidence*, 18 August 2021, p. 12.
347 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, Letter – additional information provided, 14 January 2022, p. 2.
348 ibid.
349 TWA is a statutory authority which was brought under the management of JTSI as part of the machinery of government changes in July 2017. JTSI is the employer of all TWA staff, except for the Director General, who is also the Chief Executive Officer of TWA.
350 Department of Jobs, Tourism, Science and Innovation, *Western Australia's Overseas Trade and Investment Offices Review*, October 2019, p. 35.

7.20 TWA staff are also co-located in overseas offices. This is preferred over locating these staff with Tourism Australia overseas offices, for example, with one key benefit being the identification and promotion of the particular interests of WA distinct from the rest of Australia.[351]

7.21 To support collaboration between international education and tourism activities, EBDMs and TWA staff are co-located in the overseas trade offices in Jakarta, Shanghai and Mumbai. JTSI is also considering the co-location in Singapore and Tokyo. New EBDMs have been recruited in Malaysia, the Philippines and the United Kingdom/Europe.[352]

The wider trade and investment network in WA

7.22 The wider trade and investment network includes other WA departments working with Invest and Trade WA:

- DPIRD—supports agricultural and food opportunities and promote the state's aquatic resources. Also works directly with the commonwealth government to represent primary industries as the state's second largest traded sector.
- DMIRS—works to attract investment into WA's mining and resources industry, while promoting the state's export capabilities in the mining and mining equipment technology and services sectors.
- Department of Health.
- Department of Local Government, Sport and Cultural Industries (DLGSC).[353]

7.23 The network also collaborates with industry stakeholders, academia, and federal government agencies such as DFAT and Austrade, largely through Invest and Trade WA.

Finding 68

The wider trade and investment network includes other WA departments which collaborate with Invest and Trade WA. The network also collaborates with industry stakeholders, academia, and federal government agencies such as DFAT and Austrade.

351 Department of Jobs, Tourism, Science and Innovation, *Western Australia's Overseas Trade and Investment Offices Review*, October 2019, p. 40-41.

352 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, Letter – additional information provided, 14 January 2022, p. 4-5. Prior to the 2019 review of the overseas trade offices and the onset of the pandemic EBDMs were attached to the overseas offices in Shanghai, Tokyo, Mumbai, Jakarta and Hanoi.

353 Department of Jobs, Tourism, Science and Innovation, *Western Australian Investment and Trade Plan 2021-22*, October 2021, p. 4.

Marketing WA to grow and diversify the economy

7.24 The Invest and Trade WA Perth office, in partnership with the overseas offices, plays a key role in delivering the government's economic diversification agenda. It provides support to WA industry bodies looking to attract interstate or foreign investment, or wishing to access international markets. It connects businesses and investors in order to grow and diversify the economy.[354]

> ***Positioning WA and Greater Perth as open for business and building familiarity with the State and Greater Perth through positive marketing, will ... be important in order to generate service export growth and investment… .***
>
> *- Committee for Perth*

7.25 It is also leading a global campaign to promote WA and attract international students, visitors, skilled migrants and inbound investment as part of the *Reconnect WA* initiative. JTSI has established a cross-agency team to deliver *Reconnect WA*.[355]

7.26 Inquiry stakeholders emphasised the need for the marketing of WA to 'influence demand for WA products, particularly across Asia whilst also influencing inbound investment.'[356]

7.27 Some advocated for more strategic marketing in a world rapidly changing due to global megatrends and the COVID-19 pandemic. Without this focus, it is argued, opportunities will pass us by.'[357]

7.28 A few suggest that promoting sectors outside of mining warrants increased focus, with more overt promotion of investment in services, manufacturing and new sectors such as renewable energy, in line with the state's diversification agenda.[358]

7.29 The Committee for Perth advocates promoting Perth with an investment, engagement and attraction strategy along with an associated brand.[359] It submits that reputation has a direct impact on exports, particularly service sector exports such as tourism and education, and that reputation is enhanced when people are able to physically travel to WA. Research carried out by the Committee for Perth in 2019 demonstrated 'a significant uplift' in how the state is seen amongst those who have visited here; this then leads to growth in service exports, particularly inbound tourism.' In addition, the ability to attract inbound investment is increased.[360]

7.30 Clearly the ability of international visitors to come to WA is important. JTSI advised that 'the recovery of the tourism sector after the re-opening of borders will be contingent on WA's appeal as a holiday destination.' There a number of factors that will impact this, including

354 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 20.
355 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, Letter – additional information provided, 14 January 2022, p. 5.
356 Submission 11, Department of Local Government, Sport and Cultural Industries, p. 3.
357 Submission 6, Chamber of Commerce and Industry WA, pp. 8-10.
358 For example, see Submission 3, Unions WA, p. 13; Submission 6, Chamber of Commerce and Industry WA, pp. 8-9.
359 Submission 1, Committee for Perth, p. 10.
360 ibid., p. 7.

how well WA is marketed as a destination via targeted campaigns, the relative ease of travelling here, and then how easy it is to travel around the state once here.[361] As part of the *Reconnect WA* initiative, JTSI has been provided increased funding to support tourism activities in-market and connect WA tourism operators with key international markets.[362]

7.31 Similar factors will impact the attractiveness of WA as an international education destination. JTSI submitted that:

> How WA is perceived will be important, in terms of management of the virus, ease of entry and exit to the state, quarantine requirements and safety of students and ability for their families to visit.[363]

7.32 The DLGSC notes the importance of 'creating a more vibrant and active city centre [which] will support Perth market itself as a destination for international students, as well as events and conventions.' This then can help to encourage 'people to choose Perth as a destination to access services in sectors such as health.' Overall, 'increased levels of tourism will generate private sector investment in accommodation, hospitality, events, education and health services. Some of this investment will come from overseas sources.'[364]

7.33 The idea of developing WA's unique brand, which has been discussed over the years, needs renewed focus. One subject matter expert told us that WA is well on the way to developing this brand, with WA viewed increasingly favourably in relation to ESG, technology and innovation.[365]

7.34 However, were also told that it is important to get this branding right, because WA is moving into non-traditional markets as part of the *Diversify WA* strategy. Diversifying away from the traditional markets for which we are known, such as iron ore, oil and gas, requires a re-brand, and then strategic marketing of this brand. Concern was expressed about the lack of a comprehensive brand WA strategy which dovetails into the *Diversify WA* strategy.[366]

Finding 69

The idea of developing WA's unique brand, which has been discussed over the years, needs renewed focus. WA is moving into non-traditional markets as part of the *Diversify WA* strategy. Diversifying away from the traditional markets for which we are known, such as iron ore, oil and gas, requires a re-brand, and then strategic marketing of this brand.

361 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 12.
362 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, Letter – additional information provided, 14 January 2022, p. 5.
363 Submission 17, Department of Jobs, Tourism, Science and Innovation, p. 14.
364 Submission 11, Department of Local Government, Sport and Cultural Industries, p. 5.
365 Mr Kobus van der Wath, *Transcript of Evidence (closed)*, 24 November 2021, p. 12.
366 Mr Adam Handley, *Transcript of Evidence (closed)*, 24 November 2021, p. 12.

Managing our important trade relationships

7.35 The importance of strong relationships with trading partners was a key takeaway of this inquiry. These relationships will increasingly be with our Indo-Pacific neighbours.

7.36 The Regional Comprehensive Economic Partnership (RCEP), which came into force at the beginning of 2022, is said to create a new 'centre of gravity' for global trade. It includes 15 East Asian and Pacific nations, with Australia being one of these. Covering a third of the world's economy, and creating the largest trading bloc by economic size, the RCEP largely eliminates tariffs among its member states 'and is expected to boost intraregional exports by $42 billion.' It is mooted to become the largest trade agreement in the world as measured by the GDP of its members—almost one third of the world's GDP.[367]

7.37 The changing global economy and the shift towards Asia as the world's centre of economic activity is discussed earlier in chapter 4. With an understanding of how the Indo-Pacific region is being reshaped there is opportunity for us to build on existing relationships and forge new ones in the region. Other countries are certainly doing this.

7.38 Outperforming our competitors for business in the region can be achieved by leveraging our natural geographic advantage, and by building on our relative cultural intelligence. WA has a long history of dealing with these primarily Asian-based trade partners and through this is presented with an opportunity to strengthen ties and build cultural awareness.[368]

7.39 WA has a unique opportunity with its proximity to Asia, particularly now in the context of the global pandemic where shorter supply chains are an incredible competitive advantage.

7.40 Markets in the region will become more sophisticated, and there will be growing demand for services and technology where WA can build export capability—as noted in chapter 5.

7.41 We heard that while WA has a lot to offer and is competitive on many fronts, there needs to be a shift in mindset when it comes to engaging with trade partners, particularly those in the Indo-Pacific region. We were told that:

> …relationships are often so personal in Asia. If one can get going with a few initiatives that are potentially easy to get going—easier than one might think—the benefit and then that person might answer differently and pursue opportunity next time one asks him.[369]

7.42 WA's representation in the Indo-Pacific region could be characterised as somewhat superficial, according to one subject matter expert. Geographically we are part of the Indo-Pacific, but navigating the diverse cultures when doing business requires effort. This witness was of the view that cultural intelligence around building relationships with trade partners in

367 United Nations Conference on Trade and Development, *Asia-Pacific partnership creates new 'centre of gravity' for global trade*, 15 December 2021, accessed 25 February 2022, <https://unctad.org/news/asia-pacific-partnership-creates-new-centre-gravity-global-trade>.
368 Mr Adam Handley and Mr Kobus van der Wath, S*tatement of Evidence*, 24 November 2021.
369 Mr Kobus van der Wath, *Transcript of Evidence (closed)*, 24 November 2021, p. 12.

the Indo-Pacific is nascent. This has to change if WA is to engage fully with opportunities in our region.[370]

7.43 In moving beyond a transactional approach to a greater understanding of the cultural nuances and implications for building long-term trade relationships, WA as a trading partner will be able to weather the inevitable disputes and problems that arise from time to time.

7.44 This will be particularly important for WA's relationship with China, a key trading partner for iron ore and WA's primary industry sector. An expert witness in China-Australia relations suggested that currently Australia as a nation is missing out on a 'lot of low-hanging fruit' because it is not managing that bilateral relationship properly.[371]

7.45 This witness observed that 'Australia's dominant position in the iron ore supply chain to China is not a given for the future, despite what many commentators will say.' A deterioration in bilateral relations could lead to China escalating iron ore supply from non-Australian sources. This would have significant impact on our current and future market share and the pace at which displacement of Australian iron ore to China could occur.[372]

7.46 The bilateral relationship presents an acute challenge for WA. To a large extent it is the domain of the federal government; however, WA stands 'to lose the most from any material loss of market share of iron ore supplies to China and broader loss of any broader trade and investment with China.'[373]

7.47 The state will need to take an increasingly positive stance in relation to issues where our interests may not be entirely in step with the federal government's position. For example, in relation to Foreign Investment Review Board (FIRB) decisions; we heard that over the past two years a more formal built-in consultation process has been pursued by FIRB with the states. However, anecdotally, this consultation is not as robust as it could be; there needs to be greater consideration given to the state's interests under the national interest test. [374]

Finding 70

Geographically we are part of the Indo-Pacific, but navigating the diverse cultures when doing business requires further effort. Cultural intelligence around building relationships with trade partners in the Indo-Pacific needs to mature if WA is to engage fully with opportunities in our region.

Finding 71

WA's bilateral relationship with China must be nurtured in order to maintain this important trading partnership; any deterioration would have significant consequences for our economy.

370 Mr Adam Handley, *Transcript of Evidence (closed)*, 24 November 2021, p. 13.
371 ibid.
372 ibid.
373 Mr Adam Handley and Mr Kobus van der Wath, S*tatement of Evidence*, 24 November 2021.
374 Mr Adam Handley, *Transcript of Evidence (closed)*, 24 November 2021, p. 13.

Looking to the future and the role of the WA government

7.48 For WA businesses looking to move into international markets, success 'requires consistent effort and focus.' It requires working closely with in-market stakeholders and learning the business culture. Being aware of changing geopolitical conditions and scenarios that could affect trade, requires an adaptive and frequently revisited strategy.[375]

7.49 Invest and Trade WA, supported by other agencies which promote trade with their portfolio areas, has a role in facilitating the adaption of the state's economic framework in a rapidly changing global environment, so that businesses can grow and diversify their trade.

7.50 We were told that there is further opportunity for the state government to support WA industry sectors to increase cross-cultural business awareness. Engaging with our most important trading partners in own geographic region needs to be a priority. The state government needs to take a lead role in assisting WA businesses to move away from a transactional approach to business, recognising that our Indo-Pacific trade partners are all unique with diverse cultures and business approaches.[376]

7.51 The government, through Invest and Trade WA also has a role to play in attracting foreign direct investment, which will not be without its challenges going forward. It will need to adequately resource its advocacy role, particularly where the state's interests may not be heard at a federal level.

7.52 Resourcing of critical government trade and investment functions remains a challenge, in spite of considerable improvements made since 2017.[377]

7.53 Comparisons are sometimes made to other Australia jurisdictions, with Victoria and South Australia noted favourably. We received information from JTSI about resourcing of Invest and Trade WA.[378] However it fell outside the scope of this inquiry to make inter-jurisdictional comparisons with any degree of depth or analysis. Some detail about trade and investment approaches in other jurisdictions, including the commonwealth, is catalogued at appendix two.

7.54 Evidence suggests that while the Invest and Trade WA function has improved markedly in recent years, there is still room for improvement. It is an ongoing reform project for JTSI, as continues to build the overseas presence and network in line with the *Diversify WA* strategy.[379]

7.55 We recognise the ongoing work that JTSI and the government are doing in this area. The invest and trade promotion function will be a key part of securing market share and inbound

375 KPMG, *Accessing new opportunities: Opportunities to diversify and supplement Australia's trade and investment*, Australia, 2020, p. 16.
376 Mr Adam Handley, *Transcript of Evidence (closed)*, 24 November 2021, p. 12.
377 Mr Adam Handley and Mr Kobus van der Wath, *Statement of Evidence*, 24 November 2021.
378 Ms Rebecca Brown, Department of Jobs, Tourism, Science and Innovation, Letter – additional information provided, 14 January 2022, pp. 3-4.
379 Ms Simone Spencer, Department of Jobs, Tourism, Science and Innovation, *Transcript of Evidence*, 18 August 2021, p. 12.

investment in the future and will require ongoing critical analysis to ensure that it is achieving optimal outcomes for WA.

Finding 72

The invest and trade promotion function will be a key part of securing market share and inbound investment in the future and will require ongoing critical analysis to ensure that it is achieving optimal outcomes for WA.

HON P.C. TINLEY, MLA
CHAIR

Appendix One

Western Australia's investment and trade ecosystem – background to the current structure

In 2017, as part of machinery of government changes, the WA government created JTSI as a new economic development portfolio, with carriage of the state's investment attraction and trade promotion activities.

As a part of this amalgamation, the state's eight overseas trade and investment offices were brought under JTSI's remit, and into one network with the Perth-based staff, all working together on trade and investment promotion.

Previously, five overseas trade and investment offices sat under the remit of the former Department of State Development (DSD) and the other three (the Agent General in London, and the trade offices in Dubai and Tokyo) sat under Department of the Premier and Cabinet (DPC). The previous director general of DPC is on the public record as saying that the old structure was a 'historical quirk' and 'a symptom of the fragmentation of the public sector.'[380]

The previous structure of the overseas trade offices had evolved over time, and in a piecemeal way. There was little oversight of the work of the offices, nor was there coordination of those offices within a wider network and intelligence base. It has been suggested that the historical lack of attention to this function was largely due to two factors:[381]

- WA's wealth of natural resources and long boom meant that capital flowed into the state, with less dependence on active trade and investment promotion.
- The boom helped to erode the capability of the core public sector itself in this area, as the competition for talent played out in jobs and remuneration that the public sector could not match.

Once the trade offices were incorporated into a network with JTSI's Perth office in 2017, it became clear that there was a need to raise the effectiveness of trade and investment promotion.[382]

This coincided with a Corruption and Crime Commission (CCC) investigation and report into allegations of misconduct against the Japanese trade commissioner.[383] It was determined

380 Mr Darren Foster, Director General, Department of the Premier and Cabinet, *Transcript of Evidence [appearing before the JSCCCC in the 40th Parliament]*, 5 April 2019, p. 1.

381 Department of Jobs, Tourism, Science and Innovation, *Western Australia's Overseas Trade and Investment Offices Review*, October 2019, p. 24. The first point was also noted by JTSI at the hearing on 18 August 2021.

382 Department of Jobs, Tourism, Science and Innovation, *Western Australia's Overseas Trade and Investment Offices Review*, October 2019.

383 Corruption and Crime Commission, *Report on the WA Commissioner in Japan*, 12 March 2019.

that there would be advantage in reviewing governance arrangements and workforce culture more generally in the trade and investment network.

A review panel looking at the overseas trade and investment framework found that there were problems across the trade and investment attraction system. The alignment and co-operation between central office and overseas offices, and other relevant parties, needed a great deal of improvement. Operating arrangements across the offices varied widely, and ICT systems were largely inadequate. The central office seemed to lack clear processes to guide the operation and accountability of the system as a whole. Information flows and feedback in both directions were inadequate, impacting on the effectiveness of both the governance systems and the exchange of intelligence on trade and investment. The need to achieve a balance between devolved management and proper accountability was an issue that required address by the review panel.[384]

In carrying out its review and making recommendations, the panel was asked to take into account the state government's international trade and investment agenda, set out in the *Diversify WA* strategy and the *Asian Engagement Strategy*. In this respect, it became clear that the overseas offices structure and locations of the offices had not kept pace with the times – for example, Asian markets with identified future potential were not adequately connected into the network. It was recommended that detailed work should be undertaken to determine priority office locations and resourcing across the network.[385]

Overall, it was recognised that the success of the overseas trade offices is dependent on them being part of a wider effort and cooperation between the Perth office, the wider WA public sector and industry. Expertise from outside government around market research and planning is also imperative. Recommendations focused upon connection and collaboration between government agencies and the development of an intelligence base and planning capability within JTSI to enable in-depth analysis of market potential going forward.[386]

384 Department of Jobs, Tourism, Science and Innovation, *Western Australia's Overseas Trade and Investment Offices Review*, October 2019, p. 25.

385 Department of Jobs, Tourism, Science and Innovation, *Western Australia's Overseas Trade and Investment Offices Review*, October 2019, p. 30.

386 Department of Jobs, Tourism, Science and Innovation, *Western Australia's Overseas Trade and Investment Offices Review*, October 2019, p. 46.

Appendix Two

Comparison of Invest & Trade WA with other Australian jurisdictions

Commonwealth

At the federal level, the statutory agency Austrade leads Australia's trade and investment efforts, in partnership with DFAT. Austrade was created under legislation enacted in 1985 and is part of the Foreign Affairs and Trade portfolio. The CEO of Austrade reports to the Minister for Trade, Tourism and Investment.

While DFAT has over 100 overseas posts engaged in economic and commercial diplomacy, Austrade employs more than 60 trade and investment commissioners, as well as additional support staff, across 68 international offices. [387]

As well as leading whole-of-government negotiations, including in relation to free trade agreements, DFAT works with state, territory and local governments to support their international business functions across Australia wide offices, including in Perth. Austrade also assists smaller exporters through the TradeStart network with multiple offices in all states and territories. In WA the TradeStart offices are in Albany, Bunbury and Perth.

Austrade plays a coordinating role within Australia, convening meetings of relevant ministers, boards and structures relevant to trade, investment, international education and tourism.

Tourism Australia is the statutory agency promoting Australia as a travel destination. It targets 15 core markets through international hubs covering the Americas, Europe, Greater China, Japan and South Korea, New Zealand, and South and South East Asia.[388] Austrade retains responsibility for advising government on tourism policy.

Study Australia partners with every state and territory to promote Australian education and training institutions to international students.

Austrade does not explicitly identify priority sectors for trade, but highlights client outcomes in agribusiness, infrastructure, health, education, digitech, advanced manufacturing, and resources.[389] In 2019, Australia received most investment from the US, UK, Belgium, Japan and Hong Kong.[390] It's top earning exports in order were iron ore

387 Department of Foreign Affairs and Trade, *Australia's economic and commercial diplomacy*, accessed 6 December 2021, <https://www.dfat.gov.au>; Australian Trade and Investment Commission, *Austrade representatives*, accessed 6 December 2021, < https://www.austrade.gov.au/about/austrade-representatives>; Australian Trade and Investment Commission, *Australian Trade and Investment Commission Annual Report 2020-21*, Canberra, 2021, p. 45.

388 Tourism Australia, *Market Regions*, accessed 20 December 2021, <https://www.tourism.australia.com>.

389 Australian Trade and Investment Commission, *Australian Trade and Investment Commission Annual Report 2020-21*, Canberra, 2021.

390 Department of Foreign Affairs and Trade, *Trade and Investment at a glance 2020*, Canberra, 2021, p. 48.

and concentrates, coal, natural gas, education related travel and gold, followed by general tourism.[391] Minerals and fuels make up around half of Australia's export value.[392] In the 2020–21 financial year, agribusiness constituted around half of all trade outcomes.[393] Greater China continues to be the top export market for Austrade clients, followed by Japan, the US, Korea and the UK.[394]

Austrade states that it 'drives a 'Team Australia' approach with state and territory governments to amplify Australia's strong trade, tourism, investment and international education prospects in a competitive global marketplace.'[395]

While Austrade offers an arrangement whereby overseas engaged employees (OEE) undertake agreed state-funded trade and investment activities from its offices, these staff 'work under the joint branding of Brand Australia and that of the relevant State.'[396]

Operating Models

The 'Austrade State Specialist model' involves state officers being embedded in an overseas Austrade office. In this case, state-funded employees essentially work as part of the operation of the Austrade office. This is also known as the embedded model.

The review of WA's trade and investment offices cautioned that the effectiveness of the embedded model was entirely dependent on the flexibility and support of the particular Austrade officer assigned to the role of promoting state interests.

By contrast, the 'co-location' model describes a stand-alone state office which operates independently but in close proximity to an Austrade office in the same overseas location.

The review found that there are real advantages in a stand-alone office being located near an Austrade office wherever this is possible, because of the spill-over benefits that would be provided through information flow, networking, and formal and informal collaboration.

A third possibility is the 'stand-alone state office', where the state presence overseas is not near any other Australian trade office.

A key consideration is whether it is strategic in each case for the state to align or separate itself perceptually from the rest of Australia. For further breakdown of the advantages and disadvantages of each of the preferred models, see the review report.

Source: Department of Jobs, Tourism, Science and Innovation, *Western Australia's Overseas Trade and Investment Offices Review*, October 2019, pp. 54-57.

391 Department of Foreign Affairs and Trade, *Trade and Investment at a glance 2020*, Canberra, 2021, p. 21.
392 Department of Foreign Affairs and Trade, *Trade and Investment at a glance 2020*, Canberra, 2021, p. 20.
393 Australian Trade and Investment Commission, *Australian Trade and Investment Commission Annual Report 2020-21*, Canberra, 2021, p. 25.
394 Australian Trade and Investment Commission, *Australian Trade and Investment Commission Annual Report 2020-21*, accessed 6 December 2021, <https://www.transparency.gov.au>.
395 Australian Trade and Investment Commission, *Australian Trade and Investment Commission Annual Report 2020-21*, Canberra, 2021, p. 2.
396 Department of Jobs, Tourism, Science and Innovation, *Western Australia's Overseas Trade and Investment Offices Review*, October 2019, p. 54.

South Australia

In South Australia the Department for Trade and Investment (DTI) reports to the Minister for Trade and Investment. Following external review in 2019, the state adopted the embedded model for all overseas positions, with the exception of the Agent General. The review found that promoting South Australian trade and investment within the established Austrade network was likely to maximise the effectiveness of its limited resources.[397]

Accordingly, South Australia maintains global trade presence through 11 Austrade agents across the Americas, China, Hong Kong, the Middle East, India, North and South East Asia, in addition to the Agent General who works within the UK and Europe.[398] There appear to be additional South Australian trade representatives or contacts in China, France, Germany, the US and Singapore.[399]

As of 2019, the statutory South Australian Tourism Commission had 16 overseas staff, some of which were co-located with Tourism Australia.[400] The review recommended that tourism and trade staff overseas be co-located wherever possible to ensure a 'One South Australia' approach.[401]

South Australia attracts international students through StudyAdelaide, created under legislation in 1998. DTI offshore representatives cover all sectors, including international education.

DTI identifies the creative, tourism, hi-tech, space, defence, energy and mining, food, wine and agribusiness, health and medical industries as priority sectors under its current strategy.[402] South Australia has recently announced that the Australian Space Park will be based there.[403]

397 Steven Joyce, *Review of the South Australian Government's International and Interstate Engagement Bodies and Functions*, Joyce Advisory, 2019, p. 54.
398 Department for Trade and Investment, *Global offices*, accessed 8 December 2021, <https://dti.sa.gov.au>.
399 South Australian Government, *International offices*, accessed 20 December 2021, <https://trade.southaustralia.com>.
400 Steven Joyce, *Review of the South Australian Government's International and Interstate Engagement Bodies and Functions*, February 2019, p. 54.
401 Steven Joyce, *Review of the South Australian Government's International and Interstate Engagement Bodies and Functions*, February 2019, pp. 54-55.
402 Department for Trade and Investment, *About Us*, 2021, accessed 8 December 2021, <https://dti.sa.gov.au>.
403 Department for Trade and Investment, *Australian Space Park to be established in South Australia*, accessed 8 December 2021, <https://dti.sa.gov.au>.

Tasmania

The Department of State Growth (DSG) is responsible for attracting international trade partners, investors, students and tourists to Tasmania. It was created in 2014 during machinery of government changes, and has seven relevant ministers across 12 portfolios. The department also houses the office of the Coordinator General who works to secure investment to the state, facilitate major projects and reduce red tape.[404]

Tasmania has three independent trade advocates based in Japan, the US and Singapore, as well as a Hobart-based defence advocate. Their Chinese Business Development Manager is an Austrade State Specialist.[405] The state is currently assessing South Korea and Malaysia for future trade and investment missions.[406]

Tourism and events is the responsibility of the cultural and tourism development arm of the DSG—there is no separate tourism commission. Similarly, Study Tasmania sits within the DSG and uses virtual trade booths and promotional videos to promote Tasmania as an education destination to ASEAN and Southern American markets.

Tasmania is pursuing offshore investment in the agribusiness, technology, tourism, advanced manufacturing and renewable energy sectors, in addition to defence. [407] China continues to grow as the state's biggest export market.[408] Education and tourism are Tasmania's most lucrative service exports, in addition to manufactured, iron ore, processed metal and forest product goods.[409]

404 Department of State Growth, *Annual Report 2020–21*, Hobart, Government, October 2021, p. 7; Coordinator-General (Tasmania), Our Team, accessed 8 December 2021, <https://www.cg.tas.gov.au>.
405 Department of State Growth, *Tasmanian Trade Advocates*, accessed 8 December 2021, <https://www.stategrowth.tas.gov.au>; Department of State Growth, *Annual Report 2020–21*, Hobart, October 2021, p. 13.
406 Department of State Growth, *Tasmanian Trade Strategy Annual Action Plan 2021*, Hobart, February 2021, p. 5.
407 Tasmanian Government, *Invest in Tasmania*, accessed 8 December 2021, < https://tasmanian.com.au>; Department of State Growth, *Annual Report 2020–21*, Hobart, October 2021, p. 5; see also p. 46.
408 Tasmanian Government, *Tasmanian Trade Scorecard 2019–20*, October 2021, p. 7.
409 Tasmanian Government, *Tasmanian Trade Scorecard 2019–20*, October 2021, pp. 8-11.

Victoria

Victoria formed the Department of Jobs, Precincts and Regions (DJPR) in 2019. It houses Global Victoria and the Jobs, Innovation and Business Engagement group, which together are responsible for increasing the state's international trade opportunities. Global Victoria includes International Education.[410]

DPJR encompasses the Creative, Sport and Visitor Economy arm, which covers tourism, and Regional Development Victoria, which performs specialised invest and trade functions.[411]

In Victoria, foreign investment is led by Invest Victoria, which is part of the Department of Treasury and Finance.[412]

Both invest and trade functions rely on the same network of 23 international offices, so the above agencies work closely together.[413]

As well as six Melbourne offices, Victoria has trade offices in the Americas, China, India, Japan, Korea, Southeast Asia, the Middle East and Europe.[414] With the exception of the Agent-General, each office is headed by a commissioner or senior trade and investment director. The network has around 90 staff.[415]

Further representatives based in the UK and Washington advocate for Victoria's defence industry.[416] Victoria also runs a 'Virtual Trade Missions' program.[417]

Tourism and events are led by Visit Victoria, a company limited by guarantee in 2016.[418] They have eight international offices, some of which coincide with trade and investment offices, and employ public relations agencies in priority markets such as the US, UK and EU.[419] The Visit Victoria global team works alongside Tourism Australia.[420]

410 Department of Jobs, Precincts and Regions, *Annual Report 2020–2021*, Melbourne, October 2021, pp. 6-7.
411 Regional Development Victoria, *Contacts and Assistance*, accessed 15 December 2021, <https://www.rdv.vic.gov.au>.
412 Victorian Auditor-General's Office, *Global Victoria*, 2021, accessed 16 December 2021, <https://www.audit.vic.gov.au>.
413 Global Victoria, *What we do*, accessed 15 December 2021, https://global.vic.gov.au; Victorian Auditor-General's Office, *Global Victoria*, 2021, accessed 16 December 2021, <https://www.audit.vic.gov.au>.
414 Global Victoria, *All offices*, accessed 15 December 2021, <https://global.vic.gov.au>.
415 As at October 2019. Department of Jobs, Tourism, Science and Innovation*, Western Australia's Overseas Trade and Investment Offices Review*, October 2019, p. 28.
416 Victorian Government, *Victorian International Defence Industry Advocacy*, accessed 13 December 2021, <https://defence.vic.gov.au>.
417 Global Victoria, *Virtual Trade Missions*, accessed 15 December 2021, <https://global.vic.gov.au>.
418 Visit Victoria, *Reports*, accessed 15 December 2021, <https://corporate.visitvictoria.com/>.
419 Visit Victoria, *Annual Report 2020–21*, Melbourne, October 2021, p. 16 and p. 90.
420 Visit Victoria, *Annual Report 2020–21*, Melbourne, October 2021, p. 7.

International education is Victoria's largest services export industry, accounting for a third of all Australian international student enrolments.[421] In 2019 it was the state's largest export area, injecting $13.7 billion into the economy.[422] Study Melbourne maintains a global network of hubs in China, Vietnam and Malaysia, as well as a virtual hub in India.[423] These hubs are independent of Global Victoria offices; however, Global Victoria also has a global education network of 14 education service managers and consultants in offices across international markets.[424]

In addition to defence technologies, international education and the visitor economy, DJPR has prioritised construction, digital and space technologies, food and fibre and the creative industry.[425]

Victoria finds attracting trade and investment entirely independent of Austrade to be more effective in terms of both cost and flexibility. The state maintains the largest and best-resourced promotion network of any non-Federal jurisdiction.[426]

421 Global Victoria, *International education*, accessed 15 December 2021, https://global.vic.gov.au; Department of Jobs, Precincts and Regions, *International Education Short-Term Recovery Plan 2020/21*, Melbourne, December 2020, p. 3.

422 Department of Jobs, Precincts and Regions, *International Education Short-Term Recovery Plan 2020/21*, Melbourne, December 2020, p. 2.

423 Study Melbourne, *Study Melbourne Hubs*, accessed 20 December 2021, <https://studymelbourne.vic.gov.au>.

424 Study Melbourne, *Global Education Network*, accessed 20 December 2021, <https://global.vic.gov.au>.

425 Department of Jobs, Precincts and Regions, *Priority industries and sectors*, accessed 15 December 2021, <https://djpr.vic.gov.au>.

426 Department of Jobs, Tourism, Science and Innovation, *Western Australia's Overseas Trade and Investment Offices Review*, October 2019, p. 56.

New South Wales

Investment NSW is the lead agency for trade and domestic and foreign investment in New South Wales. Following a major review, it was established in March 2021 to centralise the state's economic development and attraction activities.[427] The agency incorporated former Premier and Cabinet groups including the Trade Group under the NSW Treasury and its international offices.[428]

The remit of Investment NSW is to promote the state for business, events, tourism and international study.[429] It reports to the Premier, the Minister for Jobs, Investment, Tourism and Western Sydney and the Minister for Trade and Investment through the Chief Investment Officer and CEO.

Destination NSW now falls within Investment NSW and promotes NSW as a tourism and events destination. It is a statutory authority established in 2011. As of November 2020, the agency had overseas offices across 9 countries, 5 of which are located in China and Hong Kong.[430]

In addition, Global NSW is a government-wide initiative which supports trade and promotes NSW for international investment and education. The latter falls under the banner of 'Study NSW'.[431] Prior to the COVID-19 pandemic, the international education sector accounted for $14.6 billion of the NSW economy per annum, making it the state's largest service export.[432]

NSW maintains a network of international offices in ten priority markets.[433] At present, NSW trade and investment commissioners or directors are spread across China, India, Japan, the United Arab Emirates, the US, Korea, Singapore and Vietnam; the last three of these representatives are Austrade embedded staff, while the remainder are independent.[434] NSW had 20 trade and investment employees overseas as of October 2019.[435]

427 Investment NSW, *A new website to drive investment in NSW*, accessed 22 December 2021, <https://invest.nsw.gov.au>.
428 Investment NSW, *Structure*, accessed 22 December 2021, < https://www.investment.nsw.gov.au>.
429 Investment NSW, *About Investment NSW*, accessed 22 December 2021, <https://www.investment.nsw.gov.au>.
430 Destination NSW, *Annual Report 2019–2020*, Sydney, November 2020.
431 NSW Government, *Global NSW – About Us*, accessed 22 December 2021, <https://www.global.nsw.gov.au>.
432 Investment NSW, *2020–2021 Annual Report*, Sydney, November 2021, p. 10; NSW Treasury, *Annual Report 2019–20*, Sydney, November 2020, pp. 21, 102.
433 Investment NSW, *International contacts*, accessed 22 December 2021, <https://invest.nsw.gov.au>. The annual report states a different figure (9): Investment NSW, *2020–2021 Annual Report*, Sydney, November 2021, p. 7
434 Investment NSW, *International contacts*, accessed 22 December 2021, <https://invest.nsw.gov.au>.
435 Department of Jobs, Tourism, Science and Innovation, *Western Australia's Overseas Trade and Investment Offices Review*, October 2019, p. 28.

In addition, the London-based position of NSW Agent General was recently reinstated after 20 years, with responsibilities for promoting the state for trade and investment across the UK, Europe and Israel.[436]

Currently NSW is prioritising the advanced manufacturing, defence, security, food and beverage, and digital, medical and space technologies industries.[437]

While NSW is still consolidating its new approach to trade and investment, it continues to use both stand-alone and Austrade State Specialist models for promoting the state internationally. It maintains there are 'advantages of working closely with Austrade, even where the embedded model was not being used'.[438]

436 Investment NSW, *NSW Agent General to boost business networks in UK, Europe and Israel*, media release, 1 October 2021.

437 NSW Government, *Global NSW – Priority Industries*, accessed 22 December 2021, <https://www.global.nsw.gov.au>.

438 Department of Jobs, Tourism, Science and Innovation, *Western Australia's Overseas Trade and Investment Offices Review*, October 2019, p. 56.

Queensland

Queensland's global business agency is Trade and Investment Queensland (TIQ). The corporate statutory body answers to the Minister for Trade and Investment. It has branches covering global investment and international operations, and an international education arm called Study Queensland.

Eleven trade and investment commissioners and an Agent-General represent Queensland's interests overseas. In total Queensland has 16 international offices, four of which are in China.[439] The Agent-General is co-located alongside Austrade in the Australia Centre, London, and Queensland also has five other offices positioned adjacent to Austrade. As of October 2019, Trade and Investment Queensland had a total of 66 offshore staff.[440]

Tourism and Events Queensland (TEQ) was established under legislation in 2012 to promote the state to visitors. It is guided by the Minister for Tourism Industry Development. Queensland uses some of its offshore TIQ locations to house TEQ global hubs, targeting 14 key markets.[441]

Queensland is currently promoting the aged care and senior living, education and training, food and agribusiness, knowledge and innovation, and mining, resources and energy export industries.[442] The state is targeting investment in education and training, new energy, resources, infrastructure, biofutures, health and biomedical technology, advanced manufacturing, aerospace and agriculture.[443]

While all of Queensland's global trade and investment offices are independent, some are hired from, or located close to, those of Austrade. Queensland told the WA review panel that it found Austrade's fee-for-service schedule resulted in higher overheads.[444]

439 Trade and Investment Queensland, *China*, accessed 22 December 2021, <https://www.tiq.qld.gov.au>.
440 Department of Jobs, Tourism, Science and Innovation, *Western Australia's Overseas Trade and Investment Offices Review*, October 2019, p. 28.
441 Tourism and Events Queensland, *Annual Report 2020–21*, Brisbane, p. 8; see also Department of Jobs, Tourism, Science and Innovation, *Western Australia's Overseas Trade and Investment Offices Review*, October 2019, p. 54, which details that Destination Gold Coast and Education Queensland International also have presences in TIQ offshore offices.
442 Trade and Investment Queensland, *Buy from Queensland*, accessed 22 December 2021, <https://www.tiq.qld.gov.au>.
443 Trade and Investment Queensland, *Industry investment opportunities*, accessed 22 December 2021, <https://www.tiq.qld.gov.au>.
444 Department of Jobs, Tourism, Science and Innovation, *Western Australia's Overseas Trade and Investment Offices Review*, October 2019, p. 57.

Northern Territory

Similar to Victoria and Tasmania, the Northern Territory (NT) government has recently created a new online presence called 'The Territory', which acts as a portal for international investors, trade partners, students and visitors.[445] These functions sit within the Department of Industry, Tourism and Trade (DITT), which was established in 2020 and answers to four different ministers.

Traditionally the NT relied on sharing Singapore-based Austrade staff, as well as its own independent staff promoting agribusiness and international education in Indonesia. Both of these presences have recently discontinued, and the territory is reviewing its offshore approach to trade and investment[446] in line with its international engagement strategy.[447]

Tourism NT is a commission created under legislation in 2012, sitting within DITT. It engages external marketing agencies to promote the NT as a travel destination in the Americas, Central Europe, the UK and Northern Europe, China, Taiwan and Hong Kong, Japan and Singapore.[448]

Study NT is governed by Tourism NT. It consists of a small Darwin-based team and has no independent offshore representatives. They rely on Austrade and Study Australia to promote the NT as an education destination internationally.[449]

The NT is foregrounding the renewable energy, oil and gas, mineral, health, education, agribusiness and aquaculture industries as key trade markets.[450] Its major exports are LNG, ores and metal scraps, and live animals.[451] Sectors seeking investment include the agribusiness, creative, defence, energy, space, tourism infrastructure, international education and training, tropical health and health research industries.[452]

445 Northern Territory Government, *The Territory: Boundless Possible*, accessed 23 December 2021, <https://theterritory.com.au>.
446 As advised by the DITT, 23 December 2021.
447 Department of Industry, Tourism and Trade, *Northern Territory International Engagement, Trade and Investment Strategic Plan 2018–2021*, Northern Territory, March 2018.
448 Tourism NT, *In Market Contact List*, Northern Territory, n.d.
449 As advised by Study NT staff, 23 December 2021; Tourism NT, *Tourism NT Annual Report 2020–21*, Northern Territory, October 2021, p. 85.
450 Tourism NT, *Northern Territory Business Events*, accessed 23 December 2021, <https://destination.ntbusinessevents.com.au>.
451 Northern Territory Government, *What we export and import*, accessed 23 December 2021, <https://theterritory.com.au>.
452 Northern Territory Government, *Investing in the Territory*, accessed 23 December 2021, <https://theterritory.com.au>.

Australian Capital Territory

Similar to the Northern Territory, the Australian Capital Territory (ACT) maintains an online portal, 'Canberra', to facilitate international study, business and tourism. These aspects are the responsibility of economic development arm within the Chief Minister, Treasury and Economic Development Directorate of the ACT government.[453] This branch administers the Study Canberra and Visit Canberra initiatives.

The ACT Government have one specialist Business Development Manager who they purchase through Austrade.[454] This position is based in Singapore and connects the ACT to Austrade's South East Asia network.[455]

The focus of ACT trade missions is on the renewable energy, agri-technology, space, health and sports science, defence, cyber security and tourism industries.[456] The ACT seeks international investment in most of these, with the addition of education and research, e-government, and space technologies.[457]

453 Chief Minister, Treasury and Economic Development Directorate, *Economic Development*, accessed 23 December 2021, <https://www.cmtedd.act.gov.au>.
454 As advised by the ACT Commissioner for International Engagement, 23 December 2021.
455 Chief Minister, Treasury and Economic Development Directorate, *Trade and Exports*, accessed 23 December 2021, <https://www.cmtedd.act.gov.au>.
456 ACT Government, *Trade Missions*, accessed 23 December 2021, <https://canberra.com.au/>
457 Chief Minister, Treasury and Economic Development Directorate, *Office of International Engagement*, accessed 23 December 2021, <https://www.cmtedd.act.gov.au>.

Branding and logos

Branding of Australian states and territories

In recent years, a number of Australian states and territories have created or updated their visual brand in order to present a consistent and recognisable image internationally. These master brands are distinct from - although sometimes aligned with - government logos.

Brand South Australia and Brand Canberra were created in 2013.[458] Brand Victoria was redesigned in 2015.[459] The Northern Territory launched a new overarching brand in 2018. Brand Tasmania was established under legislation in 2018, and launched its digital identity and branding in July 2021.[460] The state brands are linked to websites that act as portals into official investment, trade, travel and study opportunity information for overseas audiences.

Neither Queensland nor New South Wales have a State brand separate from that of government. Federally, Australia's Nation Brand Advisory Council launched a redesigned Australian nation brand based on the kangaroo in February.[461]

Western Australia's birthmark symbol was created under legislation in the 1970s.[462]

Made in Western Australia

Creating a global brand for Western Australia was a Labor election commitment in 2016.[463] The government recently stated that 'a state brand is critical to growing the recognition of WA's value proposition and supporting local industry to diversify investment and trade markets and create new jobs. Due to the COVID-19 pandemic, the launch of Brand WA has been postponed.[464]

458 Jessica Leo, 'How SA's new brand logo got the whole state in a buzz', *The Advertiser*, 7 March 2013, accessed 16 December 2021, <https://www.adelaidenow.com.au/>.
459 Jean Edwards, 'Brand Victoria: Andrews Government unveils $20 million new marketing strategy, logo for state', *ABC News*, accessed 13 December 2021, <https://www.abc.net.au/news>.
460 Adam Daunt, 'Brand Tasmania have launched a new innovation to showcase Tasmania', *The Examiner*, 21 July 2021, accessed 16 December 2021, <https://www.examiner.com.au>.
461 Hon. Dan Tehan, *New Nation Brand and tagline promotes Australia to the world*, media release, 18 February 2022.
462 Department of Mines, Industry Regulation and Safety, *Western Australia Products Symbol Act 1972*, accessed 16 December 2021, <https://www.commerce.wa.gov.au>.
463 Daniel Emerson, 'Labor wants 'global brand' for WA', *The West Australian*, 24 January 2016, accessed 8 December 2021, <https://thewest.com.au>.
464 Western Australian Government, *Turning to India: Investing in our future, Inquiry into Western Australia's economic relationship with the Republic of India – government response*, Department of Jobs, Tourism, Science and Innovation, Western Australian Government, September 2021, p. 4.

Appendix Three

Committee's functions and powers

7.59 The functions of the Committee are to review and report to the Assembly on: -

a) the outcomes and administration of the departments within the Committee's portfolio responsibilities;

b) annual reports of government departments laid on the Table of the House;

c) the adequacy of legislation and regulations within its jurisdiction; and

d) any matters referred to it by the Assembly including a bill, motion, petition, vote or expenditure, other financial matter, report or paper.

7.60 At the commencement of each Parliament and as often thereafter as the Speaker considers necessary, the Speaker will determine and table a schedule showing the portfolio responsibilities for each committee. Annual reports of government departments and authorities tabled in the Assembly will stand referred to the relevant committee for any inquiry the committee may make.

7.61 Whenever a committee receives or determines for itself fresh or amended terms of reference, the committee will forward them to each standing and select committee of the Assembly and Joint Committee of the Assembly and Council. The Speaker will announce them to the Assembly at the next opportunity and arrange for them to be placed on the notice boards of the Assembly.

Appendix Four

Submissions received

No.	Name	Position	Organisation
1	Ms Marion Fulker AM	Chief Executive Officer, Adjunct Senior Research Fellow UWA	Committee for Perth
2	Mr Roger Buckley	State Director Western Australia	Cement Concrete & Aggregates Australia
3	Mr Owen Whittle	Secretary	UnionsWA
4	Ms Claire Wilkinson	Director – Western Australia	Australian Petroleum Production and Exploration Association
5	Dr Jeffrey Wilson	Research Director	Perth USAsia Centre
6	Mr Chris Rodwell	Chief Executive Officer	Chamber of Commerce and Industry Western Australia Limited
7	Mr David Karr	Principal/Chief Executive Officer	Interspacial Systems
8	Mr Michael Barnes	Under Treasurer	Department of Treasury
9	Mr Richard Sellers	Director General	Department of Mines, Industry Regulation and Safety
10	Ms Kirsten Rose	Executive Director, CSIRO Future Industries	CSIRO
11	Ms Lanie Chopping	Director General	Department of Local Government, Sport and Cultural Industries
12	Mr Philip Helberg	Chief Executive Officer	Infrastructure WA
13	Mr Simon Trott	Chief Executive – Iron Ore	Rio Tinto
14	Mr Trevor Hart	Chairman of Partners WA, Global Mining Leader	KPMG
15	Mr Ralph Addis	Director General	Department of Primary Industries and Regional Development
16	Mr Paul Everingham	Chief Executive Officer	Chamber of Minerals and Energy of Western Australia
17	Ms Rebecca Brown	Director General	Department of Jobs, Tourism, Science and Innovation
19	Ms Meg O'Neill	Chief Executive Officer and Managing Director	Woodside

Appendix Five

Hearings and briefings

Date	Name	Position	Organisation
11 August 2021	Dr Jeffrey Wilson	Research Director	Perth USAsia Centre
11 August 2021	Professor Peter Klinken	Chief Scientist of WA	Office of the Chief Scientist
18 August 2021	Ms Rebecca Brown	Director General	Department of Jobs, Tourism, Science and Innovation
	Mrs Linda Dawson	Deputy Director General, Industry, Science and Innovation	
	Mr Christopher Clark	Deputy Director General, Resources and Project Facilitation	
	Ms Simone Spencer	Deputy Director General, Strategy and International Engagement	
13 October 2021	Mr Alistair Jones	Executive Director, Economic Business Unit	Department of Treasury
	Mr David Christmas	Director, Economic Business Unit	
10 November 2021	Mr Richard Sellars	Director General	Department of Mines, Industry Regulation and Safety
	Mr Richard Borozdin	General Manager, Resource Strategy Branch	
	Mr Jeffrey Haworth	Executive Director, Geological Survey and Resource Strategy Division	
	Ms Julie de Jong	Executive Director, Strategic Business Innovation	
17 November 2021	Ms Nicole Roocke	Chief Executive Officer	Minerals Research Institute of Western Australia
17 November 2021	Ms Rowena Albones	Chief Financial Officer	Rio Tinto
	Mr Simon Richmond	Vice President, Global Procurement	
	Mrs Laura Thomas	Acting Vice President, Human Resources	
24 November 2021	Mr Liam O'Connell	Acting Deputy Director General	

	Dr Alison Wilson	Executive Director, Strategy and Coordination	Department of Primary Industries and Regional Development
	Mr Robert Cossart	Chief Executive Officer, Wheatbelt Development Commission	
24 November 2021	Mr Adam Handley	National Vice President and Immediate Past President (WA branch)	Australia China Business Council
	Mr Kobus van der Wath	Chief Executive Officer	Axis Group International

Appendix Six

Glossary

Automation	Automation refers to the creation and application of technologies to produce and deliver goods and services with minimal human intervention.
Clean energy	Clean energy is generally understood as an energy that does not produce greenhouse gas emissions - although it is not necessarily renewable.
Confidential items	Confidential items of trade are commodities which, if disaggregated, may result in the data being identified to individual exporters, or export items of which the exporter has requested their values be kept confidential.
Critical minerals	Those minerals which are or existential importance for modern, technology-intensive societies. They are a special category of disproportionate importance, due to their economic importance coupled with heightened levels of supply risk.
Economic modelling and forecasting	Economic modelling is used in two ways - simulating (e.g. how changes in variables might affect the future) and forecasting (e.g. what the world might look like in 2041). Economic forecasting is the process of attempting to predict the future condition of the economy using a combination of widely followed indicators. Government officials and business managers use economic forecasts to determine fiscal and monetary policies and plan future operating activities, respectively.
Environment, Social and Governance (ESG) investing	Refers to investing in companies that score highly on environmental and societal responsibility scales as determined by third-party, independent companies and research groups.
Feedstock	Raw material that is used to produce something in an industrial process.
Foreign direct investment	Foreign direct investment is a category of cross-border investment in which an investor resident in one economy establishes a lasting interest in and a significant degree of influence over an enterprise resident in another economy.
Green energy	Green energy is a subset of renewable energy and refers to renewable energy resources and technologies that create no carbon emissions and have the lowest impacts on the environment.
Green hydrogen (also referred to as renewable hydrogen)	Green hydrogen refers to hydrogen made without fossil fuels. Green hydrogen is produced from electrolysis powered by renewable electricity.
Green steel	Green steel uses hydrogen, produced from renewable energy, to replace metallurgical coal to reduce iron ore to iron metal.
Human capital	Human capital can be understood as the stock of knowledge, skills and other personal characteristics embodied in people that helps them to be productive. Pursuing formal education but also informal and on-the-job learning and work experience all represent investment in human capital.

Intergenerational reporting	A long-range look at the impacts of population and government policy on the federal budget over the next 40 years. It is prepared by the government of the day and often lays the foundation for policy change or spending decisions in order to plan for the future. In Australia it has tended to be a modelling analysis that examines the fiscal impact on the Australian Government Budget position over the next 40 years.
Peak steel	Peak steel refers to a point in time where the maximum level of steel output and demand is reached.
Renewable energy	Renewable energy is produced using natural resources that are constantly replaced and never run out.
Supply chain	The sequence of processes involved in the production and distribution of a commodity. Put simply, it is the network between a company and its suppliers to produce and distribute a specific product to the final buyer. The supply chain also represents the steps it takes to get the product or service from its original state to the customer.
Value chain	The process or activities by which value is added to an article, including production, marketing, and the provision of after-sales service. The activities associated with after-sales service are that which provide services to enhance or maintain the value of the product after it has been sold and delivered. Examples: installation, repair, training, parts supply and product adjustment.

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