

FUTURE

CRITICAL

Meeting the minerals
investment challenge



Resourcing tomorrow
**Australian
Mining**



EXPOSED

Rising costs
Declining productivity
Stagnant investment
Uncompetitive taxation
Increased policy risks

Labour productivity and investment is in severe decline

Australia risks dealing itself out of trillion-dollar critical minerals markets unless it gets serious about addressing rising costs, declining productivity and increased policy risks.



1.1% ▼

Productivity growth

All-industry productivity has halved since the Hawke-Keating reforms of the 1990s.

Productivity Commission

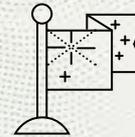


\$933 billion

Stagnant investment

Mining capital stock has plateaued at \$933 billion over the last five years.

ABS, *Australian System of National Accounts*, table 58



30%

Uncompetitive tax rate

Australia has the third highest company income tax rate among OECD countries.

Bazel and Mintz

Without action, Australia cannot rely on future wealth from mining

Australian mining has underpinned decades of high living standards and poured billions of dollars into the public purse for roads, schools, hospitals and welfare – but future national wealth from mining is not assured.



\$2.7 trillion

Export revenue

Resources export revenue from 2013-14 to 2022-23 – that's a 138 per cent increase.

ABS, *International Trade in Goods and Services*, table 3



\$252 billion

Mining wages

Wages paid across the resources industry from 2012-13 to 2021-22.

ABS, *Business Indicators*, table 17



\$295 billion

Taxes and royalties

Company taxes and royalties paid by the mining industry from 2012-13 to 2021-22.

EY, *Royalty and Company Tax Payments*, MCA report, May 2023

Lifting productivity is critical and the real gamechanger for Australia

A 1 per cent lift in productivity through a more competitive tax structure, better regulatory settings and productive workplace relations could boost rewards for workers by 2030. Centre for International Economics



\$290 billion

Economic boost

From a 1 per cent lift in productivity across all industries to 2030.

Centre for International Economics



9.4% ▲

Real wages increase

In workers' pay packets from a more productive economy to 2030.

Centre for International Economics



\$11,700

Families better off

All Australian families better off from a more productive economy to 2030.

Centre for International Economics

Minerals Council of Australia

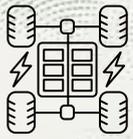
Ph. + 61 2 6233 0600
Email. info@minerals.org.au
Web. minerals.org.au

All rights reserved. Except as permitted by the *Copyright Act 1968*, no part of this publication may be reproduced without the written permission of the publisher.

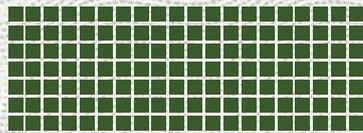
© Minerals Council of Australia, Sept 2023

The battery minerals shortfall demands hundreds of new mines

More than 260 new lithium, cobalt, nickel and copper mines will be needed by 2030 if the world is to meet global demand for minerals-intensive electric vehicles and energy storage batteries.

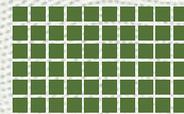


140 Copper mines



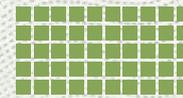
S&P Global

60 Nickel mines



IEA

50 Lithium mines



IEA

17 Cobalt mines



IEA

Global mining investment required to reach net zero is staggering

Australia has a once-in-a-century opportunity to generate sustained national prosperity and contribute in a substantial way to global clean energy supply chains, but only if its acts with urgency now.



2 times

Mining investment

Global investment will need to double by 2050 to meet demand for green tech.

S&P Global

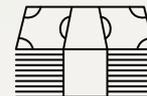


us\$4 trillion

Investment to 2030

Global mining, refining and smelting investment required to achieve net zero.

McKinsey & Company



us\$160 billion

Over next 25 years

Annual global mining investment required to reach net zero by 2050.

S&P Global

Australia has the minerals, but is being outpaced by competitors

Australia has enviable reserves of future critical minerals but risks falling behind other highly competitive resource-rich countries with a strong political focus on the energy transition.



No.1

Global resources...

of recoverable nickel, zircon (zirconium), rutile (titanium), uranium, gold and zinc.

Geoscience Australia



Top 5

Global resources...

of lithium, copper, bauxite, cobalt, tungsten, ilmenite, vanadium and manganese.

Geoscience Australia



80%

Under-explored

Opportunities for new mineral discoveries are vast with 80% of Australia under-explored.

Geoscience Australia

If Australia is to meet this critical opportunity, action is needed now.

Government and industry must work together to clear the roadblocks that threaten the next wave of global mining investment in Australia. This can be achieved by addressing five critical areas:



Reduce the regulatory burden to attract investment



Advance policies that support competitive project returns



Deliver efficient public infrastructure and services



Make support for mining a political imperative



Put business and productivity at the centre of fiscal policy

Australia must act urgently if it is to benefit from the next resources boom

Australia must get the policy settings right to attract investment in mining and the downstream processing and advanced manufacturing it enables. Without the right policy settings, the opportunity presented by increasing global demand for the minerals, metals and energy commodities needed for the world to get to net zero emissions will be lost.

After all, Australia does well when Australian minerals do well.

This report, *Future Critical: Meeting the minerals investment challenge*, highlights the importance of the Australian mining industry to the economy, the opportunity that lies ahead, and the critical role of policy settings to attracting new investment.

Australia's attractiveness as a place to do business is no longer assured. Rising costs, declining productivity and increasing policy risk are impacting investment decisions. Australia's vulnerability to competition from resource-rich economies is only growing as they seek to seize the opportunity to supply the minerals and metals needed to achieve global net zero emissions.

The world must undergo an extraordinary deployment of clean energy within the next two and a half decades, along with a potentially massive increase in global production of the material inputs required to manufacture the necessary technologies and infrastructure.

Australia is fortunate to have the mineral resources, stable political system, world-leading exploration geoscience, and the processing technologies and environmental management systems needed to help meet this growing demand.

The importance of having secure, resilient supply chains and transparent, well-functioning markets for minerals and metals has never been higher. Australia's comparative advantage in mining positions it well as a strategic partner in clean energy supply chains. However, mining investment cannot be taken for granted owing to strong competition from other resource-rich countries.

Inside

A critical industry

Mining is Australia's biggest economic contributor which makes its ability to attract investment critical.

PAGE 8

A critical opportunity

Australia has a once-in-a-century chance to lead global decarbonisation efforts, if it takes the necessary steps.

PAGE 26

A critical role for government

Urgent action is required to reduce the industry's exposure to increasing policy risks that dampen investment.

PAGE 42

Dramatic, short-term interventions by federal and state governments are resetting trader partner and investor perceptions of Australia's mining industry.

The Australian government has a clear role in providing policy settings that improve investment conditions for mining if capital is to flow to the strongest projects and provide the surest path to long-term industry growth, the jobs it creates and higher incomes it generates.

The last major expansion in mining demonstrates the massive contribution mining can make to Traditional Owners, communities, regions, the national economy, and government budgets. Harnessing the next opportunity to attract investment will enable these significant benefits to continue well into the future. As global demand for minerals and metals intensifies and other resource-rich countries are responding, time is running out for Australia to catch the next wave of mining investment.

It takes decades to discover and develop mineral resources and establish downstream industries, including processing and manufacturing. Accordingly, it is imperative the Australian government takes a long-term view to ensure policies enable Australian mining to grow and deliver for the future.

Australia's potential to expand its mining industry is only limited by its ambition, which must be supported by tangible and targeted policies to attract investment.

'As global demand for minerals and metals intensifies and other resource-rich countries are responding, time is running out for Australia...'



Tania Constable
Chief Executive Officer
Minerals Council of Australia



Recommendations

Five critical areas must be addressed to unlock the next wave of mining investment and activity.

PAGE 45

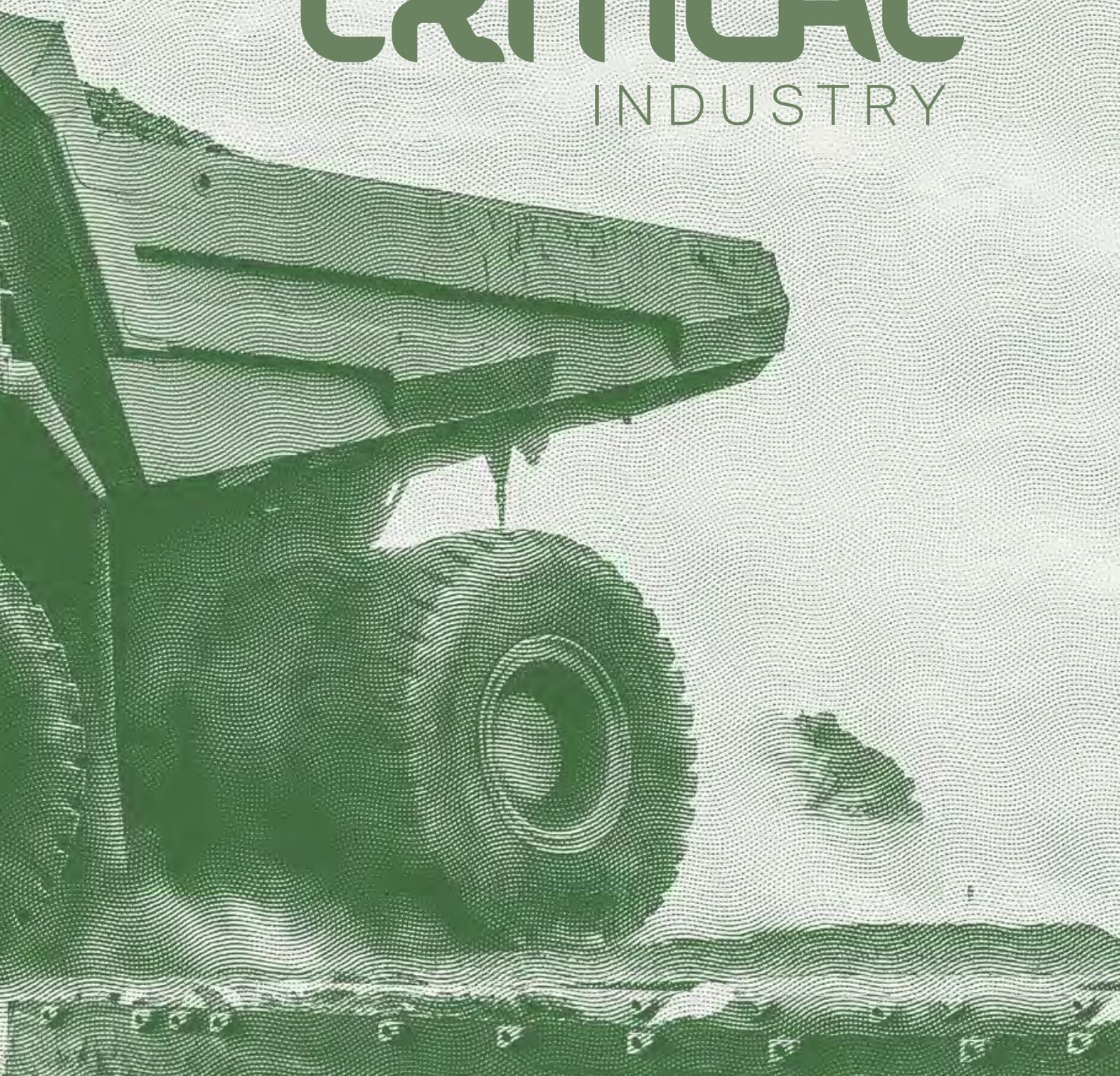
Conclusion

Australia's mining industry stands ready to lead global efforts to reach net zero by 2050, but can't do it alone.

PAGE 51



A
CRITICAL
INDUSTRY



A critical industry

Australia's mining industry is critical to the national economy

Australia's mining industry has been a strong contributor to the economy, mining regions and local communities over the last two decades. The major expansion in mining driven by Asia's economic growth transformed the economy. This has left Australia at the frontier of global mining and positioned the industry as a major driver of productivity growth.

The mining industry's strong linkages across the entire economy has resulted in benefits from its activities being widely distributed. Furthermore, company taxes and royalties paid by Australia's mining industry have underpinned Commonwealth and state budgets, and the broader economy has benefited through the industry's positive impact on the terms of trade (figure 1).

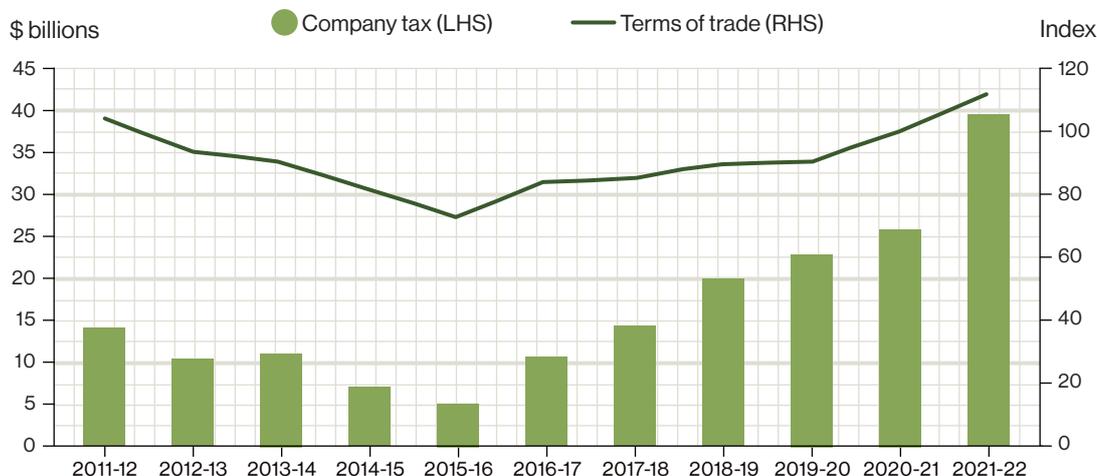
Australia's effective tax rates on mining investment are among the highest compared to other mining jurisdictions around the world. As a result, the industry's international competitiveness for investment is threatened by increases in taxes or royalties, such as Queensland's dramatic increase in coal royalties in 2022. Exploration and mining investment depends on companies' expectations of future financial returns, so any opportunistic increase in tax and royalty settings will deter future investment.

Mining is not only the largest industry with the most capital assets, it is also one of the most variable in terms of return on assets owing to volatile commodity prices. The large scale and long lead times of mining operations requires significant investment in capital which produces an average realised rate of return for the industry that is in the middle-of-the pack compared to other industries. Company tax and royalty payments vary over price cycles too, which makes government budget positions very sensitive to the size of the industry and commodity prices.

FIGURE 1

Australian mining industry company tax payments have doubled in a decade

Net company tax payments and terms of trade



Source: EY, *Royalty and Company Tax Payments*, report prepared for the MCA, May 2023; ABS, *Australian National Accounts*, table 34, released 7 June 2023.

Productivity growth is the key to raising living standards

The Australian economy faces challenging domestic conditions. Productivity growth is at risk of falling further. Economic growth is weak, the federal budget is forecast to be in structural deficit, and there is an enormous amount of government debt to repay.¹ Long-term economic growth is at risk of remaining in the doldrums for years to come unless there is a boost to productivity.

Economic reform aimed at lifting productivity is required to unlock the growth potential across industries. Policy settings must enable rather than restrain business investment. It is through higher productivity that the economy will achieve sustained long-term growth and deliver increased incomes and living standards to all Australians.

An important driver of productivity growth is business investment. That means increasing the amount of capital available per worker, investing in innovative technologies, and adopting more efficient processes.

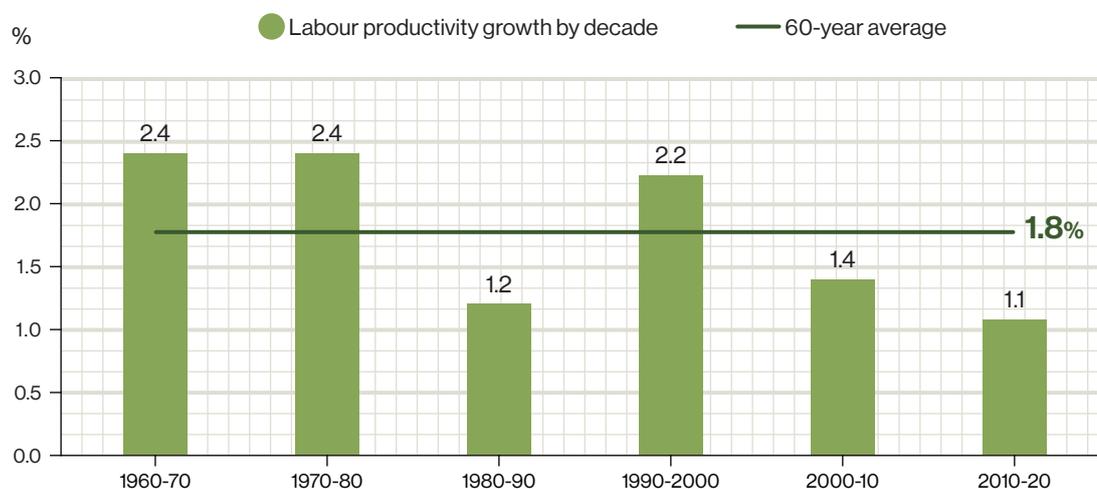
In Australia and other advanced economies there are calls for governments to act on implementing policies to increase productivity owing to slowing growth rates since about 2005. The microeconomic reforms in the 1980s and 1990s boosted Australia's productivity growth, but productivity growth has been in decline ever since (figure 2).

The slowdown in growth is attributed to both slower capital deepening (capital shallowing) and the failure of multifactor productivity to compensate.² Increasing business investment is critical for lifting Australia's productivity and the economic growth it generates.

FIGURE 2

Australia's labour productivity growth is weakening

Labour productivity growth by decade



Source: Productivity Commission, *Advancing Prosperity, Five-year Productivity Inquiry report*, 2023.

Australia's productivity growth is closely tied to capital investment

Australia has traditionally relied on foreign capital to fuel its growing economy. It is critical that Australia remain internationally competitive so that foreign investors see Australia as an attractive place to do business. If investment flows to projects in other countries, productivity will continue to stagnate.

Growing the nation's productive capital stock – the buildings and structures, equipment, machinery and technology – through increasing business investment is the key to lifting Australia's productivity and the economic growth it generates.

About one-third of Australia's long-term growth in income per person since the early 1900s has come from increases in the amount and efficiency of the capital available to each worker.³ A problem facing the Australian economy is that business investment as a share of the economy has steadily declined, and along with it, the contribution from capital to productivity growth has weakened.

Mining is a critical driver of Australia's productivity growth

The role of Australian mining in determining the economy's productivity performance cannot be overstated. Australia's mining industry is one of the most productive in the world and a major driver of the economy's overall productivity growth.⁴

The industry's productivity performance is due to the substantial amount of capital investment made since the early 2000s. It has also been a leading innovator and an early adopter of technologies, which are often linked to the foreign investment that Australian mining attracts. Fierce international competition for mining investment means that the industry has a strong incentive to attract foreign capital, deploy cutting edge exploration and extraction technologies, and overcome escalating input costs, labour shortages and productivity challenges facing major investment projects in Australia.⁵

The ramp up in mining investment driven by China's economic development in the early 2000s underpinned Australia's overall growth in business capital investment. However, following the peak in mining investment in 2012-13, both mining and non-mining investment growth have weakened. The economy's capital stock is now growing at its lowest rate in 60 years (figure 3). Consequently, Australia has gone from one of the best performing OECD countries for annual private sector capital investment to one of the poorest over the last decade.⁶

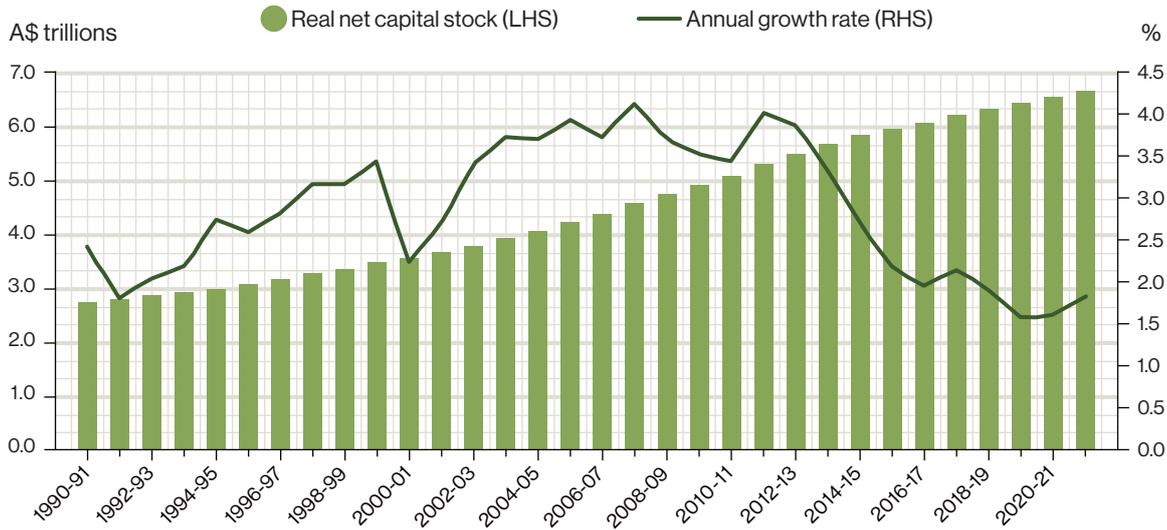
Growth in business investment would have been much worse over the last two decades and Australia's productivity performance much weaker without the significant contribution to capital investment from mining. A potential problem for Australia's productivity growth going forward is that despite the mining industry investing \$257 billion over the decade following the end of the mining boom, the resources sector's net capital stock (which also accounts for depreciation) has plateaued since about 2015-16 (figure 4). Over recent years, most capital expenditure was on plant and machinery, which includes spending on sustaining capital, compared to expenditure on new projects.

In the absence of another major expansion in mining, or some similar increase in investment activity in other sectors, Australia is at risk of experiencing continued weakness in business investment.

FIGURE 3

A slowdown in capital deepening is putting a handbrake on economic growth

Net capital stock, all industries

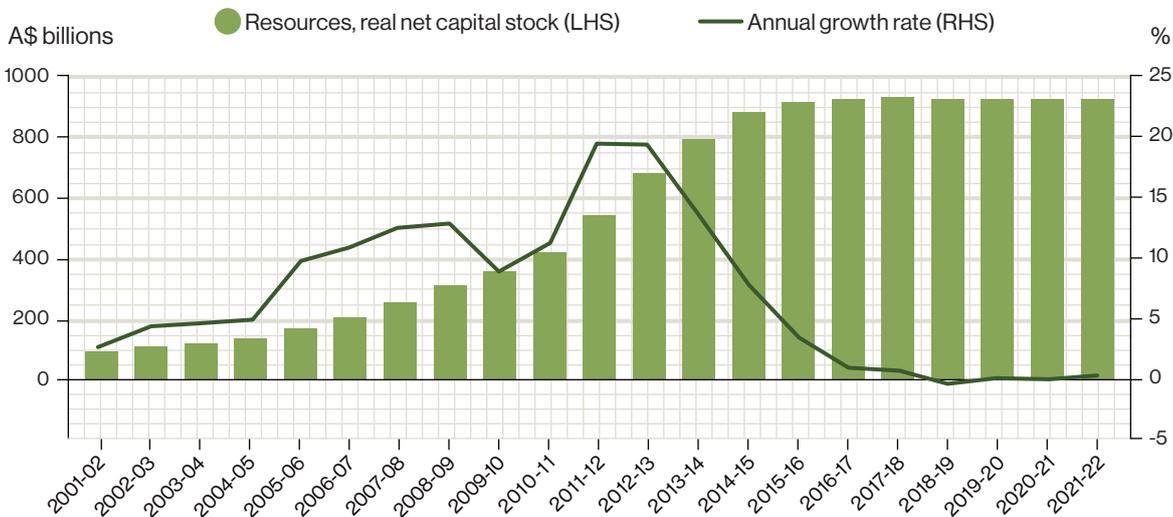


Source: ABS, Australian System of National Accounts, table 58, released 28 October 2022.

FIGURE 4

The mining industry's net capital stock is plateauing

Net capital stock



Source: ABS, Australian System of National Accounts, table 58, released 28 October 2022.

All aspects of our lives benefit from the minerals we mine

It is almost impossible to imagine what daily life would be like without the goods and services enabled by the minerals, metals and energy commodities the mining industry produces. These commodities are necessary for nearly all aspects of our paid and unpaid work, domestic activities, health and leisure, and are the foundation of improvements to our standard of living over time (figure 5).

Since the discovery of gold in the mid-1800s, mining has helped grow and shape the Australian economy and the regions and communities where it takes place. Australia has been fortunate that for almost two centuries and through many commodity price cycles the mining industry has continued to support the country's economic prosperity. Not all resource-rich countries have achieved the significant economic benefits that Australia has from its mineral resources.

The major expansion in mining that occurred earlier this century was in response to strong global demand for Australia's mineral and energy commodities. Analysis shows that without the expansion of mining, Australian households would have been \$14,800 worse off.⁷

FIGURE 5

A snapshot of minerals and metals critical to modern life

● Minerals on Australia's Critical Minerals List

● Other future critical minerals

Public infrastructure

Schools, hospitals, public transport, roads and bridges, water and gas

Fe Iron	C Carbon	Mn Manganese	V Vanadium
Mg Magnesium	Zn Zinc	Cu Copper	Al Aluminium

Advanced medicine

Advanced imaging, artificial organs, cancer diagnosis and treatment

Be Beryllium	Ta Tantalum	Ree Rare earths	Bi Bismuth
U Uranium	Ag Silver	Mo Molybdenum	Ti Titanium

Lifestyle technology

5G network, smartphones, laptops, semi-conductors, processors

Au Gold	Si Silicon	Cu Copper	Pd Palladium
Ree Rare earths	Al Aluminium	Mn Manganese	Sn Tin



Put another way, Australia's economic growth would have been 13 per cent lower in 2020 – the first year of the COVID-19 pandemic – had there not been a permanent increase in the size of the mining industry from 2005.

If a major expansion of mining similar to the last one was repeated and generated the same economic benefits, the outcome by 2030 would be almost equivalent to a 1 per cent annual increase in labour productivity.

Households could be \$11,700 better off, real wages 9.4 per cent higher, or \$130 a week higher per worker, the economy \$290 billion larger, and real GDP per person \$9,900 higher.⁸ Outcomes such as these provide an indication of what could occur if Australia catches another wave of global mining investment.

The last mining boom made Australian households significantly better off.



\$14,800

Families better off

Australian households \$14,800 better off in 2020 due to the expansion of the mining industry since 2005. Centre for International Economics

Aerospace

Space stations, rocketships, satellites, passenger planes, telescopes

Nb Niobium	Ta Tantalum	Sc Scandium	Zr Zirconium
Be Beryllium	Ti Titanium	W Tungsten	Ree Rare earths

Advanced manufacturing

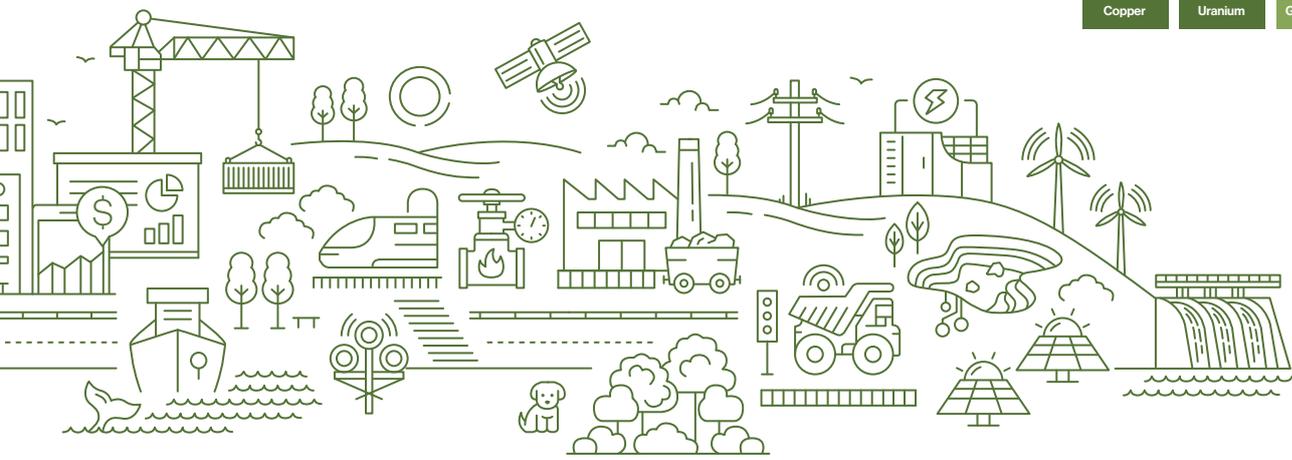
Defence applications, catalysts, permanent magnets, biomaterials

Sb Antimony	Ga Gallium	Bi Bismuth	Be Beryllium
Ce Cerium	Ge Germanium	Ree Rare earths	Te Tellurium

Energy transition

Solar panels, wind turbines, battery storage, hydrogen, CCUS, SMRs

Li Lithium	Ni Nickel	Co Cobalt	Ree Rare earths
Cu Copper	U Uranium	Ge Germanium	Mn Manganese



Australia does well when Australian minerals do well

Australia's mining industry is critical to the national economy and as the largest industry it has been a significant contributor to mining regions and local communities over the last two decades. Australia is the world's largest exporter of iron ore and metallurgical coal, the second largest exporter of thermal coal and gold, and the fourth largest exporter of copper.

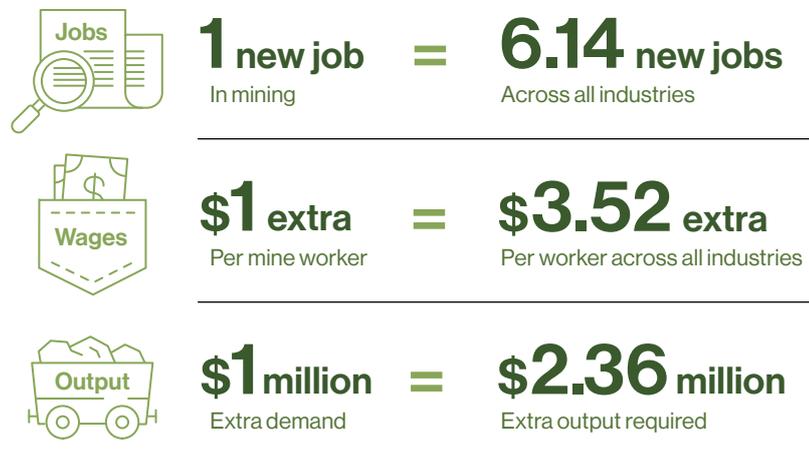
The distribution of benefits from mining activities extend widely to supplier industries and their workers, as well as the regions and communities where these businesses are located. Across industries, mining has been consistently at the forefront of productivity growth and a top contributor to the national economy.

In 2021-22 the mining industry accounted for almost 8.5 per cent of GDP, 69 per cent of all export earnings, and supported over 1.1 million jobs at hundreds of operating mine sites and in supply chains across the country.⁹ The industry is the biggest company taxpayer and investor in infrastructure and equipment and, owing to its leading productivity performance, pays the highest average wages – \$144,000 a year compared to \$95,000 across all industries.¹⁰

Spending on domestic goods and services by mining companies accounts for 5 per cent of the total intermediate use by all industries across the Australian economy.¹¹ Mining draws in domestically provided goods from a range of manufacturers in the chemical, metal and petroleum industries and makes large purchases from electricity suppliers, construction, railway freight and transport, and wholesale trade industries. Mining also extensively utilises the professional services of the finance and business industries. Because mining draws widely on other industries in the economy for goods and services, those industries also benefit when mining's activities expand. Input-output multipliers for jobs, wages and output highlight the impact of the industry's activity on the rest of the economy (figure 6).

FIGURE 6

The mining industry boosts activity across the economy¹²



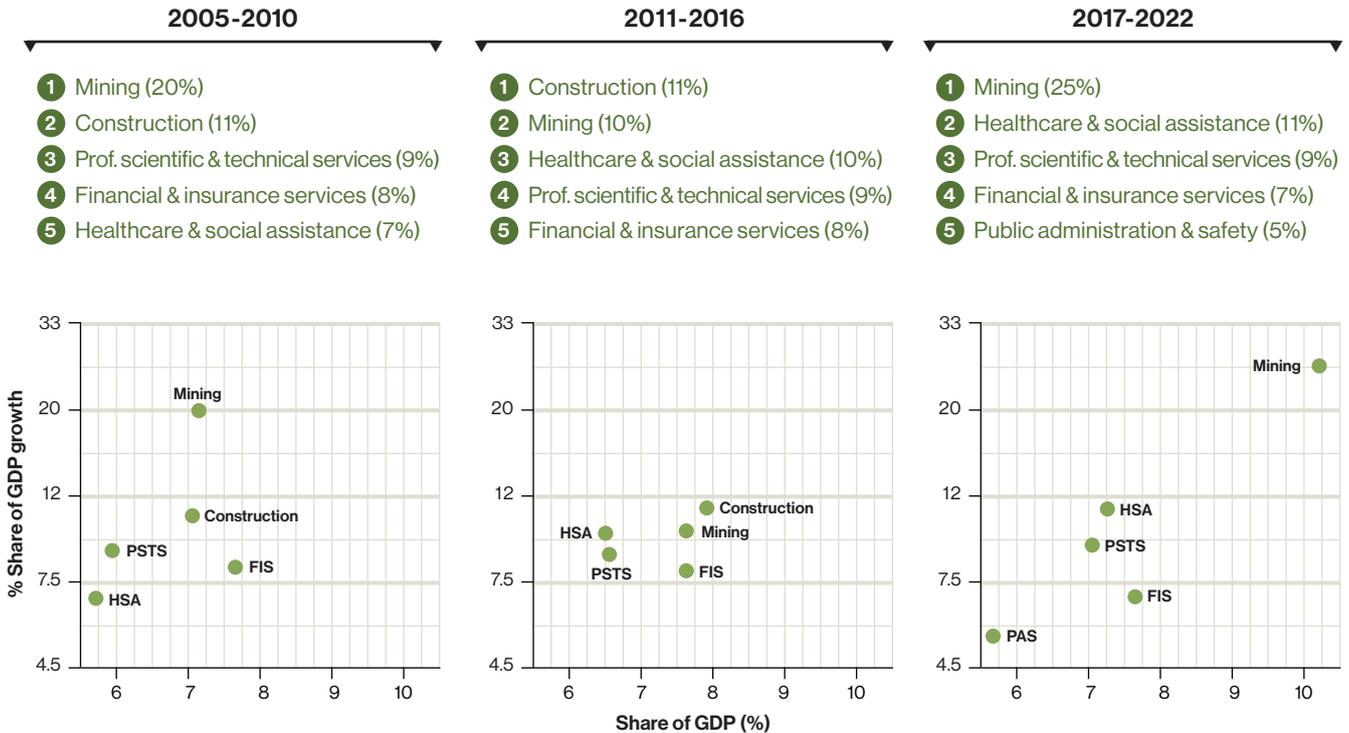
Note: MCA analysis of input-output multipliers.

Source: ABS, *Australian System of National Accounts: Input-Output Tables*, March 2023.

FIGURE 7

Mining is the largest contributor to Australia's economic growth

Percentage contribution to economic growth



Source: ABS, Australian System of National Accounts, table 5, released 28 October 2022.

Many of the goods and services supplied to mining are from local businesses close to operations. The requirements of mining operations provide scale to commercial ventures that themselves deliver benefits to their broader communities. Local communities in regions where mining operates are also better off relative to those in non-mining regions on a range of social indicators. Census data shows that in regions where mining employment is higher average incomes are higher, there is a lower prevalence of mental health issues and residents have lower housing stress.¹³

Over the last 20 years mining was either the first or second largest contributor to Australia's economic growth (figure 7). Even in the period 2011-2016 when construction was the strongest contributor to growth, its performance was partly in response to mining's demand for heavy and civil engineering construction and for machinery and equipment manufacturing goods and services.¹⁴

Mining's economic contribution over this period was the result of the industry being willing to commit to large, lumpy capital investments with high upfront costs and successfully manage their substantial risks.



\$144k

Highest wages

The average annual wage paid to mine workers in 2021-22 – compared to \$95,000 across all industries.

ABS, Average Weekly Earnings

Attracting investment depends on the right policy settings

Strong commodity price booms may cause a migration of an economy's resources toward the booming sector. When this happens, it can lead to skills and capital shortages in other parts of the economy. At various times in some resource-rich countries the gains of a booming sector have been outweighed by the costs, negatively impacting their economic growth – an outcome referred to as the 'resource curse'.¹⁵ But in Australia the evidence shows that commodity price booms have positively impacted the booming sector as well as the rest of the Australian economy in both the short and long run.

The transmission of the positive effect of mining booms to the entire Australian economy has been possible due to having the right government policy settings. Flexible labour market settings, openness of skilled migration policy, and access to competitive credit markets have assisted in smoothing consumption, investment and government expenditure.¹⁶

The willingness of companies to make the decision to invest in Australia rather than in other resource-rich countries has been due to several attributes. Australia is fortunate to have high quality mineral resources, a stable political system, world-leading exploration geoscience, and the processing technologies and environmental management systems needed to sustainably supply the world with minerals and metals.

These features, combined with the flexible markets and productivity gains from the microeconomic reforms of the 1990s, enabled the industry to:

- Draw in the skills and expertise of professionals from across Australia
- Boost business investment by sourcing additional mining plant, equipment and machinery, in addition to driving operational efficiencies
- Develop innovations in mining technologies and processes and make them available to mining industries in other countries and domestically.

It was through these activities and on the back of the large capital investments made since the early 2000s that the mining industry was able to make such a substantial contribution to wages, export earnings, company taxes and royalties. During the last mining boom the resources sector lifted its capital stock to \$933 billion – an almost four-fold increase. This investment ensured Australia had the mine production capacity, supporting infrastructure, services and skilled workers to enable the industry to meet the growing global demand for commodities.

The potential for the industry to remain a large contributor to the economy over the long-term will depend on it continuing to commit to, and successfully deliver, capital investments with extremely large upfront costs and uncertain returns. Over the last decade, the sector's economic contribution through commodity price cycles was exceptional (figure 8). This outcome has led to mining becoming one of Australia's largest company taxpayers (figure 9).



\$933 bn

Capital stock

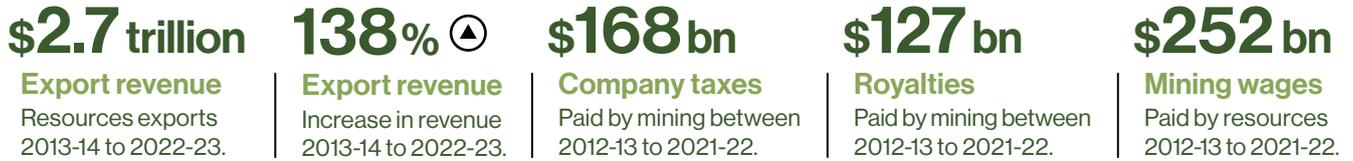
Total capital stock across the resources sector during the last mining boom – an almost four-fold increase.

ABS, Australian System of National Accounts



FIGURE 8

Five decadal contributions by Australian mining

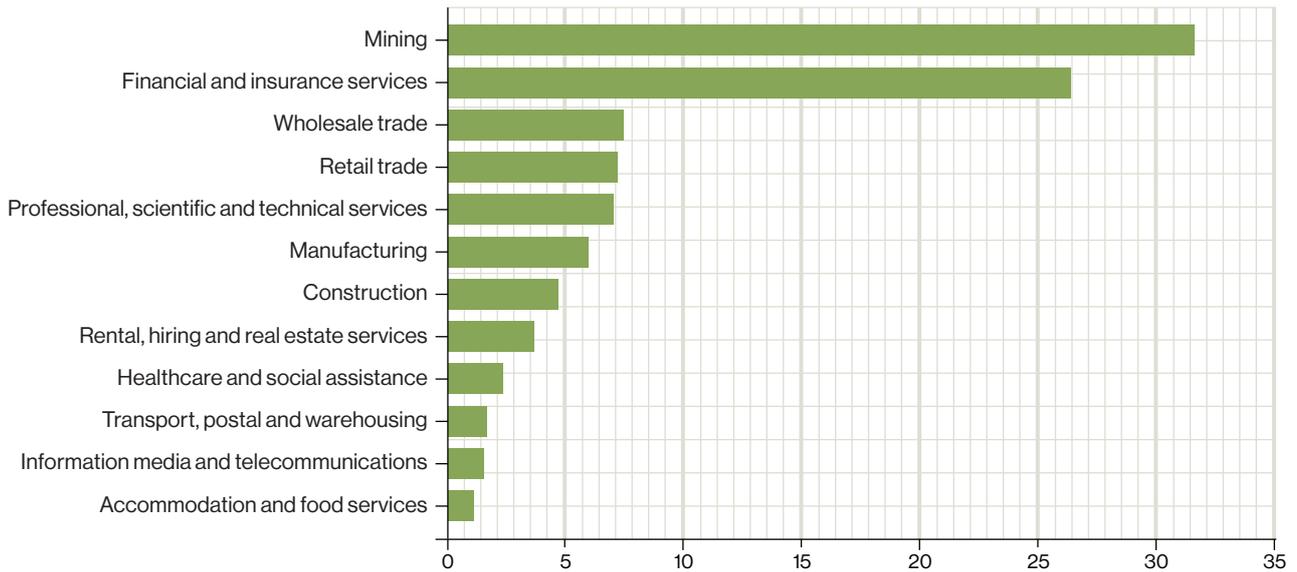


Sources: ABS; company taxes and royalties calculated by EY, *Royalty and Company Tax Payments*, report for MCA, May 2023.

FIGURE 9

Mining is the largest contributor to Australia's company tax

Net company tax, 2020-21, \$ billions



Source: Australian Tax Office, *2020-21 Taxation Statistics*, table C4.



Mining underpins the government's budget performance

Mining is consistently one of the biggest contributors to government revenues. Revenue from company taxes and royalties paid by Australia's mining industry have underpinned Commonwealth and state budgets over the last decade. In 2021-22, the industry made record company tax and royalty payments, contributing a total \$63 billion to federal, state and territory governments – an increase of \$21 billion on the previous year. That total contribution is the equivalent of paying for the entire Medicare scheme or the childcare subsidy for two years.

Not only is mining one of the largest contributors to Australia's company tax (\$39.5 billion in 2021-22), it provides significant revenues to state and territory governments through royalty payments (\$23.8 billion in 2021-22) (figure 10). This has enabled governments to invest in the things important to all Australians: families, communities and vital services like hospitals, schools, childcare, aged care and infrastructure. The mining industry's assistance from government is extremely small compared to the value it generates.¹⁷

Company tax and royalty payments climbed throughout the last decade, with iron ore and coal revenues experiencing significant growth in the last couple of years on the back of investments made ten years or more ago. This highlights that opportunistic increases in taxes and royalties, such as Queensland's dramatic increase in coal royalties last year, have long-term implications by putting at risk the new investment that generates the flow of future revenue payments to government.

The low chances of investment in an exploration project becoming a producing mine, long unproductive lead times, large upfront costs and the long life of many projects exposes investors to relatively more risk than most other industries (figure 11). This is why delays in environmental approvals of projects that are in the pipeline can accumulate to produce large economy-wide losses.

FIGURE 10

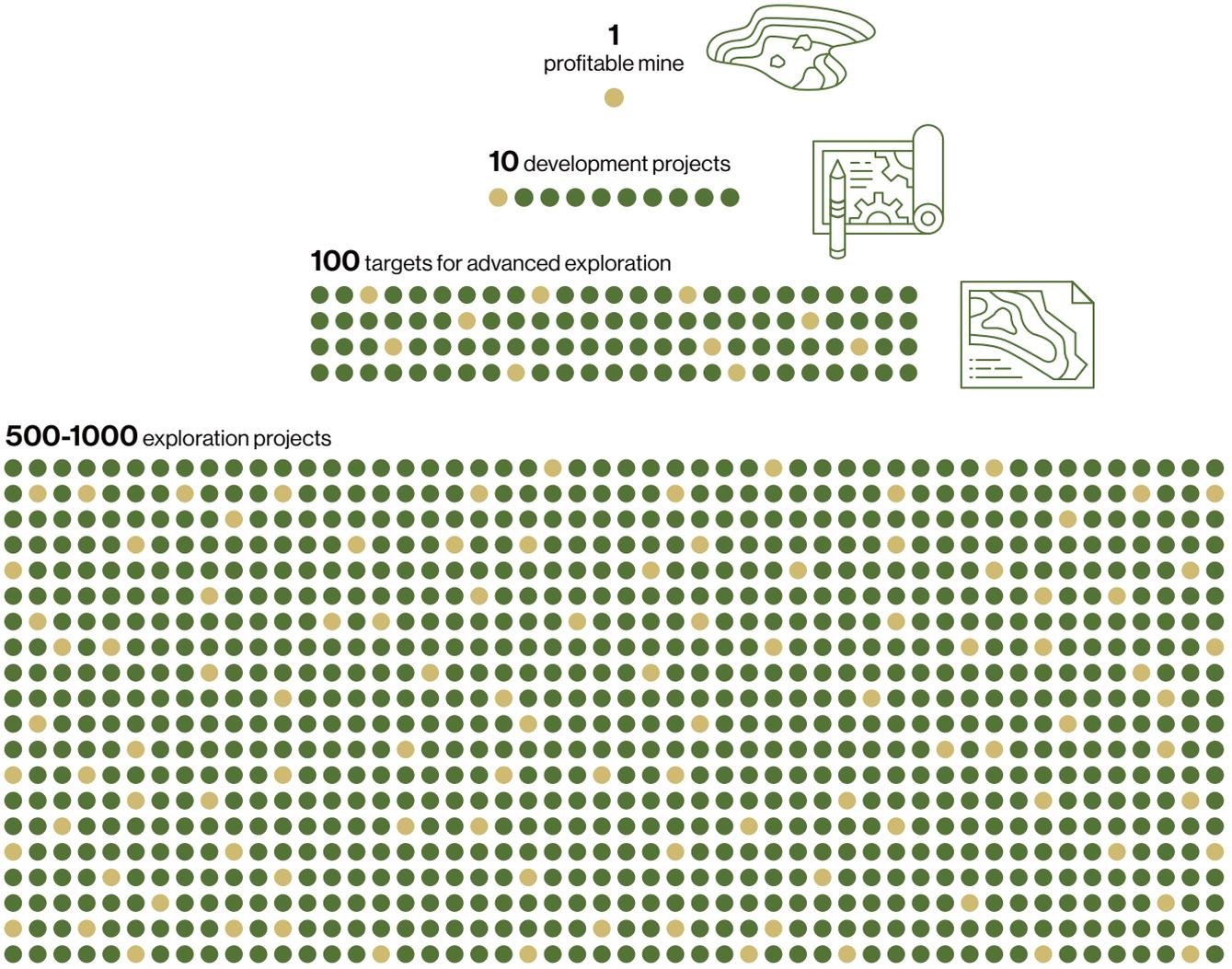
Royalty payments to the states and territories 2012-13 to 2021-22



Source: EY, *Royalty and Company Tax Payments*, report prepared for the MCA, May 2023.

FIGURE 11

Nothing carries more investment risk than setting out to build a mine



Source: Professor Roderick G. Eggert, *Mineral exploration and development: Risk and reward*, Colorado School of Mines, 2010.

Uncertainty and delays in environmental approvals cost the economy billions.

16 years

New mine timeline
End-to-end approval timeframe for a new mine to go from exploration to discovery to production.

Based on Centre for International Economics modelling

\$51 billion

Cost to the economy
Up to \$51 billion cumulative GDP loss from a 12-month delay in environmental approvals, based on 16-year timeframe.

Taxes and royalty payments from mining depend on returns from investments

The Australian mining industry's share of private sector capital stock (14 per cent) is substantially larger than that of any other industry owing to the capital intensity of its operations (figure 12). Mining is also exposed to the largest variation in profits compared to all other industries (figure 13). This is partly because compared to other industries, mining has the greatest amount of assets at risk.

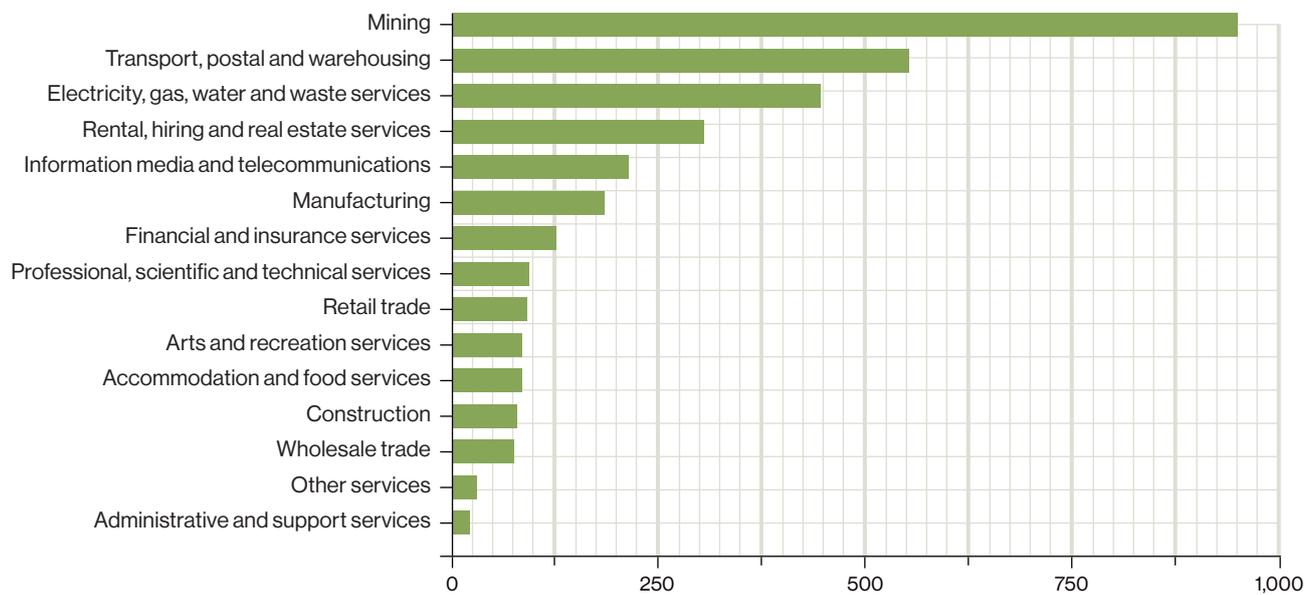
In addition to the relatively higher exposure to variations in cashflows, investments made in mining projects are also mostly irreversible – they are chiefly location specific and have little productive use outside of the industry. This raises the required rate of return that investors need in order to commit such large amounts of capital to projects.

Mining is by its very nature a risky business. The characteristics of commodity markets along with capital intensity of projects expose the industry's investors to significantly more variation in the returns on assets compared to those in other industries. When the mining industry's profits are compared to the size of its capital investment, the industry's return on assets has averaged 9 per cent over the last ten years (figure 14). This compares to a 12 per cent average return on assets across all other industries.

FIGURE 12

Mining's capital stock surpasses all other sectors

\$ billions

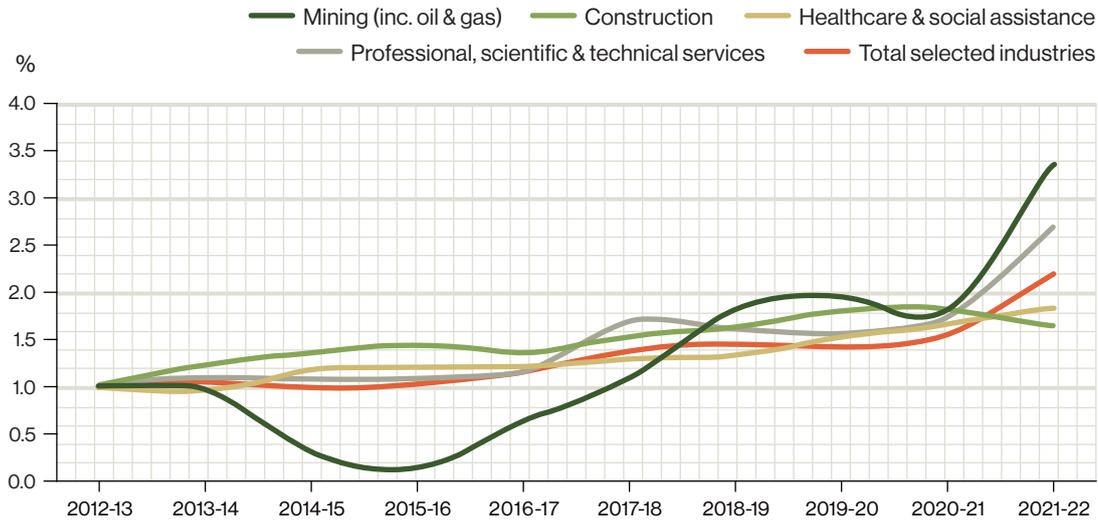


Source: ABS, Australian System of National Accounts, table 68, released 28 October 2022.

FIGURE 13

Mining profits are more variable compared to those in other sectors

Operating profit before tax (index 2012-13=1)

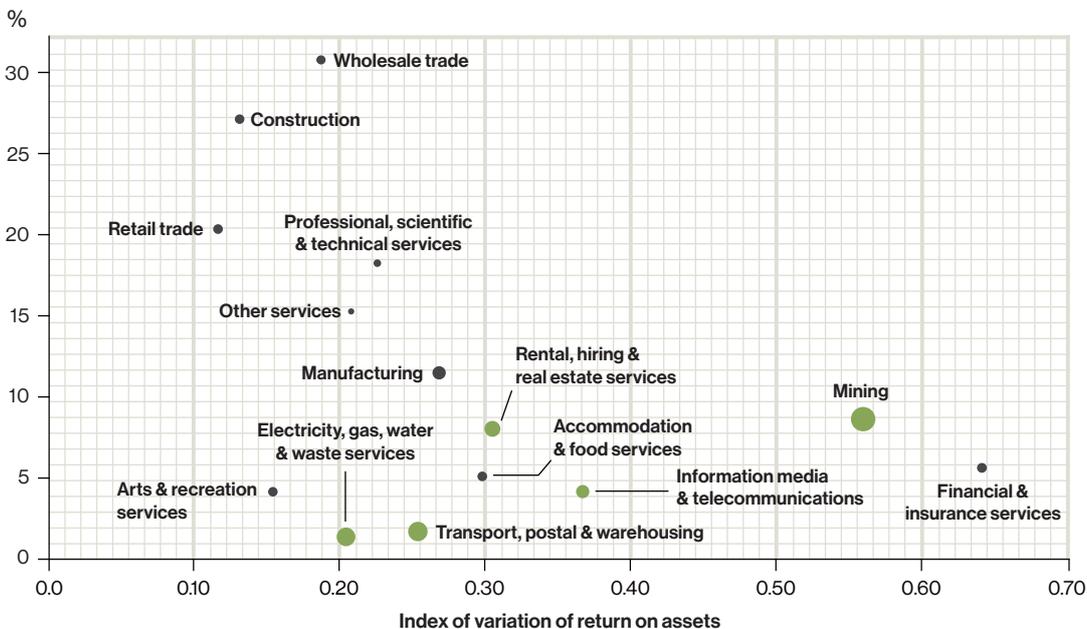


Source: ABS, *Australian Industry*, 2021-22, table 1, released 26 May 2023.

FIGURE 14

Mining is among the riskiest of all sectors for return on assets

Return on assets and risk (size = relative industry share of net capital stock)



Source: ABS, *Business Indicators*, table 9, released 5 June 2023; and ABS, *Australian System of National Accounts*, table 58, released 28 Oct 2023.

Mining is exposed to the largest variation in returns than any other industry

While all Australians benefit either directly or indirectly from the activities of mining through wages, superannuation, dividends, and tax and royalty payments, it is mining companies that effectively manage the risks in delivering these outcomes.

The Australian government's budget position is strongly linked to the industry's financial performance (figure 15). Variation in mining company profits leads to variations in company tax and royalty payments, which along with the relatively large size of the industry exposes the government's fiscal position to the profitability of mining.

This means that the sustainability of the federal government's fiscal position depends on the mining industry's profitability.

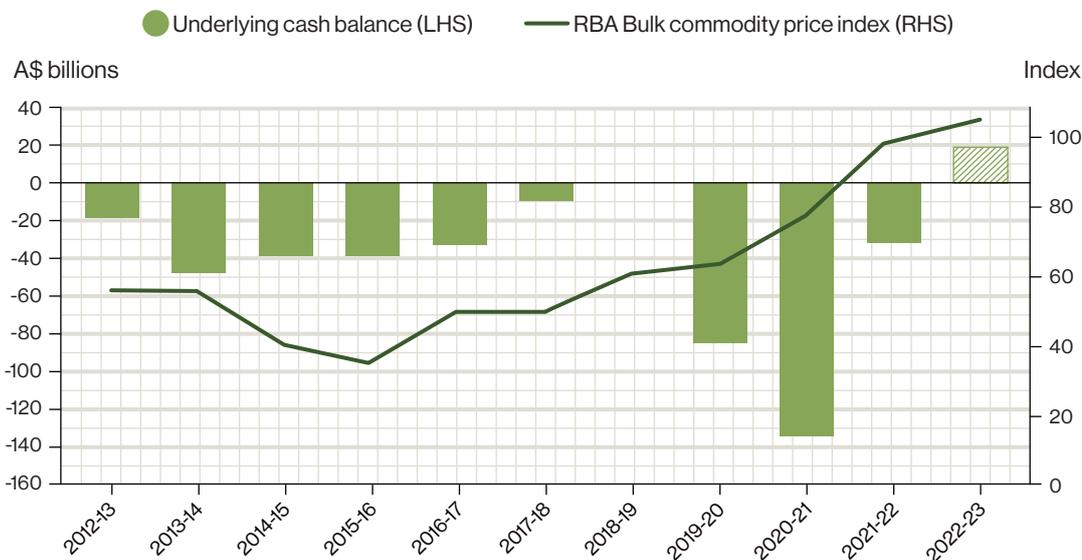
The company tax paid by the mining industry provides the Australian government with greater choice in the amount and type of public goods and services it provides. For example, the extra billions of dollars in company tax payments from mining during the pandemic reduced the budget deficit, thereby enabling the government to avoid much more difficult spending decisions.

Mining's contribution to federal government revenue also reduces the accumulation of national debt when the budget is in deficit. To illustrate this point simply, without mining's company tax payments the level of the government's net debt that is forecast for 2026-27 would have been reached last year in 2021-22 (figure 16).

FIGURE 15

The federal government's fiscal position is linked to the mining sector's performance

Underlying cash balance and bulk commodity price index (2021-22 = 100)



Source: Commonwealth of Australia, Budget Paper 1, Statement 11, Budget 2023-24; RBA Index of Commodity Prices, accessed July 2023

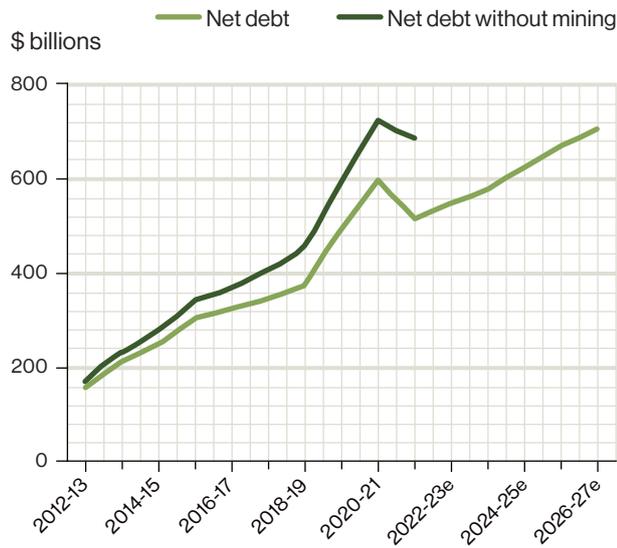
Mining's contribution to the economy relies on the willingness of industry to invest

The characteristics of mining investment – irreversibility, uncertain future pay-offs, and the ability to delay decisions until there is better information about future conditions – distinguishes the industry from capital investment in most other industries.

For the mining industry to sustain its large contribution to the economy, including to government revenues, companies must be willing to keep taking risks on investment in exploration, new projects, and the operation and extension of existing mines. Expectations of the future financial return from investment are critical to these investment decisions.

FIGURE 16

Accumulation of net debt without mining



Source: Commonwealth of Australia, Budget Paper 1, Statement 11, Budget 2023-24; EY, *Royalty and Company Tax Payments*, report prepared for the MCA, May 2023.



A
CRITICAL
OPPORTUNITY

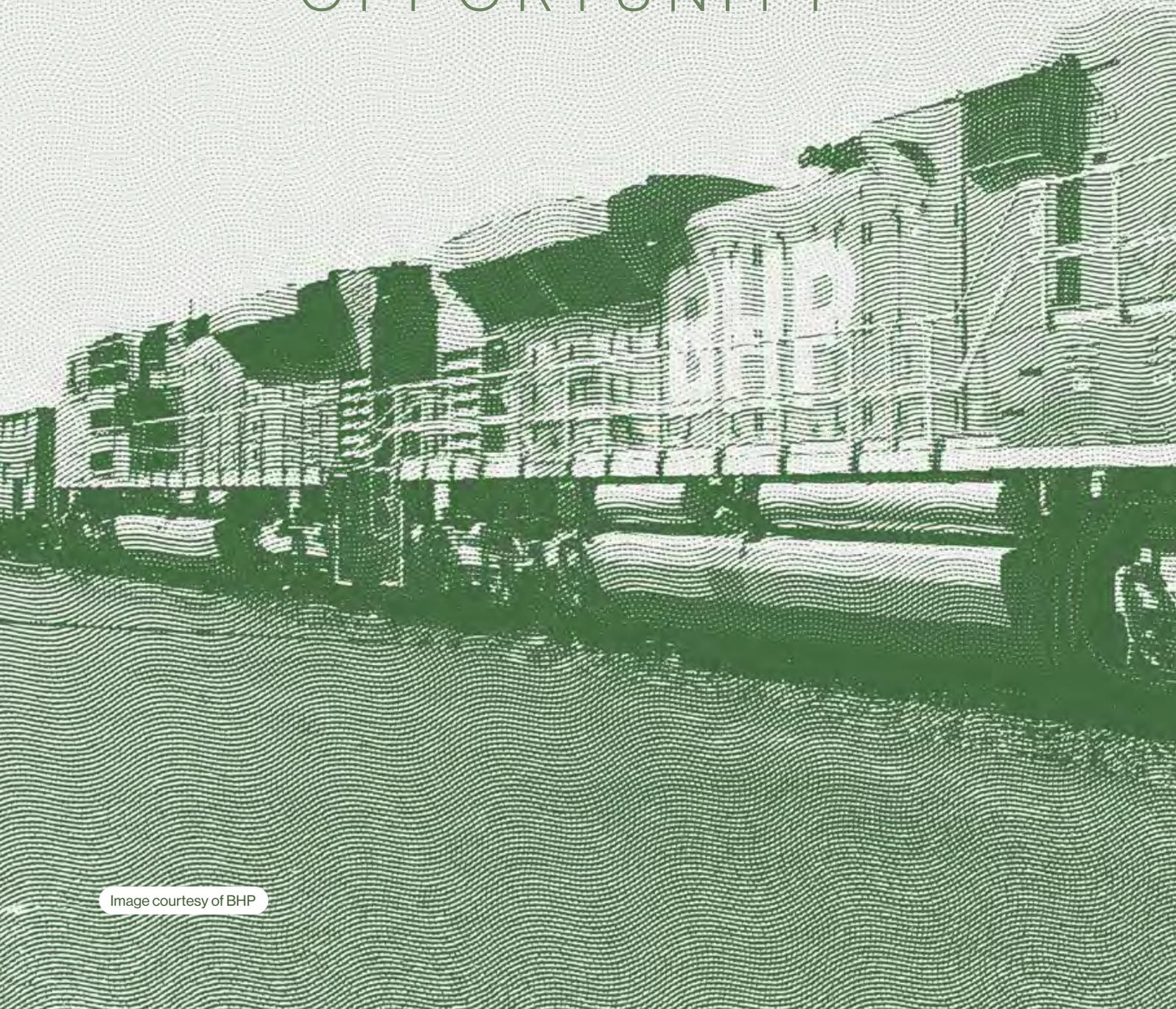


Image courtesy of BHP



A critical opportunity

Australia must act urgently to seize this once-in-a-century opportunity

Australia's world class mining industry is ideally placed to lead global efforts to decarbonise and achieve the goal of net zero emissions by 2050. Astronomical volumes of minerals and metals will be required to achieve this goal. By 2030 alone, 50 new lithium mines, 60 new nickel mines and 17 new cobalt mines will be needed to supply the materials required to meet demand for battery storage.¹⁸ This makes the minerals and raw materials produced by resource-rich countries increasingly critical over coming decades to address the major challenges reshaping the world.

The potential is strong for a global mining boom to supply the minerals and metals for the world's transition to net zero emissions. Many countries are choosing a materials-intensive pathway to reduce emissions. Significant investment will be required for clean energy technologies and systems, as well as mining, downstream processing, and advanced manufacturing.

Australia has a once-in-a-century opportunity if it has the right business and regulatory environment to attract the estimated US\$160 billion of global mining investment needed each year to achieve net zero emissions by 2050.

Given the potential scale of mining required, the opportunity for Australia could be significant and build on our last major expansion of mining. In contrast to bulk commodities, such as iron ore and coal, mines for battery and magnet minerals and metals are smaller operations, have different cost profiles and require access to common infrastructure. Expanding production of minerals critical to clean energy technologies will require significant expansion in exploration (figure 17).

Global growth in demand for materials could be strong or weak. The future for materials demand is very uncertain and largely dependent on the nature of the global commitment to the transition to net zero emissions. Australia is well positioned to play an important role in supplying the materials the world needs under either scenario for materials demand.

However, investment in exploration, new project development and expansion of existing production require attractive risk-adjusted returns. Strong trade and investment relationships with other countries are also needed to secure supply chains along with improving investment flows and technology transfers.

Achieving net zero emissions will require up to US\$4 trillion in mining, refining and smelting by 2030.

McKinsey & Company¹⁹

us\$160 billion

Investment must double

Annual mining investment to produce the minerals required to reach net zero by 2050.

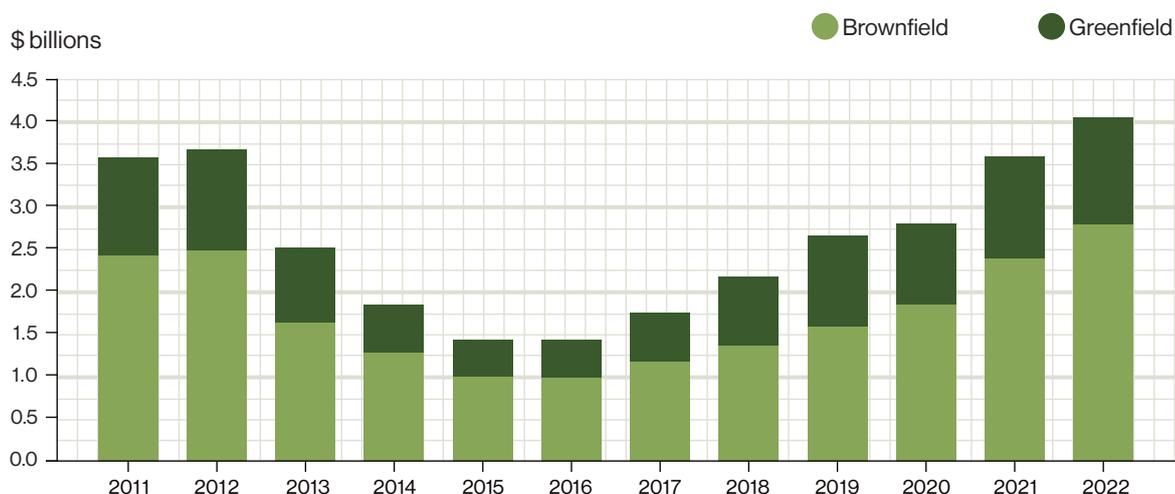
S&P Global²⁰



FIGURE 17

Only one-third of exploration expenditure is on greenfield

Brownfield and greenfield mineral exploration



Source: ABS, *Mineral and Petroleum Exploration*, tables 2 & 5, released 5 June 2023.

The world is changing rapidly

Economies are facing increasing uncertainty and disruption. Changing demographics, growing natural resource scarcity, shifting geopolitics, rapid technological advancements and deteriorating environmental conditions are creating new risks and opportunities for businesses, households and governments around the world.

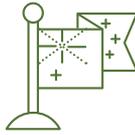
In addition to these megatrends, the increased flow of trade, capital, information and mobility of people that delivered higher living standards to a large share of the world's population over many decades are no longer assured. How global megatrends shape the world is uncertain but they will determine our future prosperity and the demand for minerals and metals for decades to come.

These global changes are occurring at a time when mining is being affected by its own major trends (figure 18).

FIGURE 18

From global megatrends to the macro trends affecting mining

Resource nationalism



Increasing resource nationalism and challenging geopolitics is producing greater strategic competition between nations and protectionism and thereby stronger headwinds to globalisation as countries pivot to onshoring, renationalisation and regionalisation. These factors increase project investment risk through trade distortions and the likelihood of more frequent and larger commodity price volatility.

Changing demand



Increasing demand for a greater range of mineral commodities is being driven by the transformation of economies in response to population growth, increasing urbanisation, rapid development of emerging economies, decarbonisation and digitalisation. Climate change and the heightened need to reduce greenhouse gas emissions requires new technologies, energy sources and infrastructure.

Declining ore grades



Declining high quality, accessible ores is adding to cost pressures, structural supply deficits and driving greater competition among resource-rich nations for new investment. There is greater incentive to using new technologies that better target and efficiently extract and process deposits, including recycling mine waste and integrating the circular economy into value chains. High quality geoscience data is critical to narrowing the search space for commercial exploration programs.

Advances in technology



Greater technological innovation is enabling the adoption of automation, digital technologies and data analytics to improve productivity, safety and environmental outcomes. These innovations give rise to new business models and work environments, greater competition for skilled workers and new training opportunities for existing workers, and lead to more diverse workforces.

Focus on ESG



Growing importance of environment, social and governance (ESG) is generating increased regulation, new financing and production models, and thereby the need to strengthen stakeholder engagement to sustain support for existing and new projects. This includes improving the economic aspirations of partners such as Traditional Owners, and lifting the living standards of communities.

Australia's high quality metallurgical coal is critical to the clean energy transition.

400 tonnes

Metallurgical coal
Metallurgical coal required to produce the steel in a 5MW wind turbine.

IEA

The pathway to delivering net zero emissions is uncertain

Climate change and the need to reduce global greenhouse gas emissions is a major global challenge. Many countries are taking actions to reduce their greenhouse gas emissions to net zero by around mid-century mostly through increased electrification of the economy and the transition to low and zero emissions 'clean energy' technologies.

Each country's energy mix during the transition will depend on the role of fossil fuels, renewables (such as wind, solar, hydro power and biomass), nuclear energy, and energy efficiency in delivering the desired emission reductions along with the required energy security and cost to consumers.

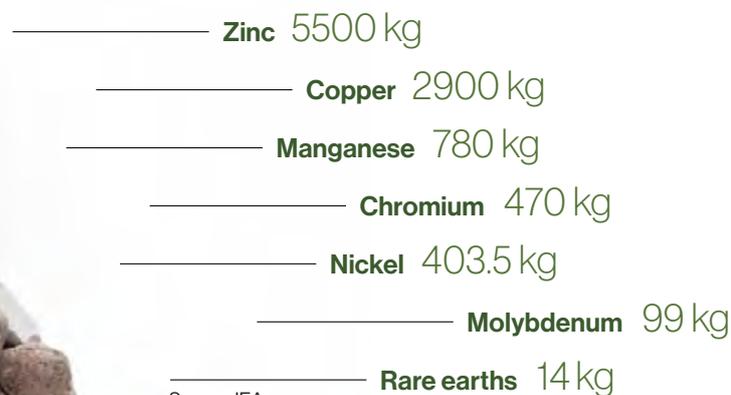
The additional growth in the quantity of materials needed to manufacture the technologies and infrastructure for achieving global net zero emissions will require an increase in the supply of minerals and metals. The transformation of energy and transportation systems require a massive up-scaling and rapid deployment of clean energy technologies and supporting infrastructure, including:

- Renewable and nuclear energy
- Battery and pumped hydro storage
- Carbon capture, utilisation and storage (CCUS)
- Electric vehicles and charging infrastructure
- Hydrogen production, transport and storage
- Electricity transmission and distribution networks.

FIGURE 19

Minerals intensity of an onshore wind turbine

Kg per MW



Source: IEA

Clean energy technologies are minerals-intensive

The world is on track to consume more minerals and metals over the next three decades than the total consumed over the last 70,000 years.²¹ The scale of the technology-led transformation required cannot occur without the minerals and raw materials provided by the mining industry. Renewable energy systems based on wind and solar, and electric vehicles are more materials-intensive compared to those relying on other energy sources, such as fossil fuels and nuclear (figure 20).

By 2050 the amount of minerals and metals required globally each year to decarbonise the electricity sector through renewable energy could be two to nine times the amount produced in 2015, and three-and-a-half to seven times for the transport sector, depending on the speed of emissions reductions.²² Over a period of 35 years the total amount of materials needed by these sectors each year could rise by a factor of seven.²³

A transformation of electricity and transport systems based on solar, wind and battery technologies require an extensive range of minerals and metals including copper, nickel, bauxite (for aluminum), iron ore and coal (for steel), cobalt, lithium, manganese, graphite, and rare earth elements. Although coal consumption is expected to decline by 2050, it will still be in demand for electricity generation in many countries.

Global megatrends will determine the growth in materials demand, as well as the materials intensity of renewable energy and electric vehicles. Demand for some raw materials, such as rare earth elements used for permanent magnets in wind turbine generators and EV motors, are forecast to increase by up to several times current production (figure 21).

Global demand for electricity is projected to triple by 2050 as sectors electrify and there is increased availability of hydrogen and hydrogen-based fuels. Wind and solar generation require four times the amount of metals compared to a coal or gas-fired power station to generate the same amount of electricity.²⁴

The scale of investment in technologies and infrastructure to achieve net zero emissions by 2050 is also huge, requiring global investment in clean energy to more than triple to around US\$4 trillion a year by 2030.²⁵

An EV produces 60 per cent less CO₂ emissions per km than a conventional car, but...

McKinsey & Company

6 times

Minerals required

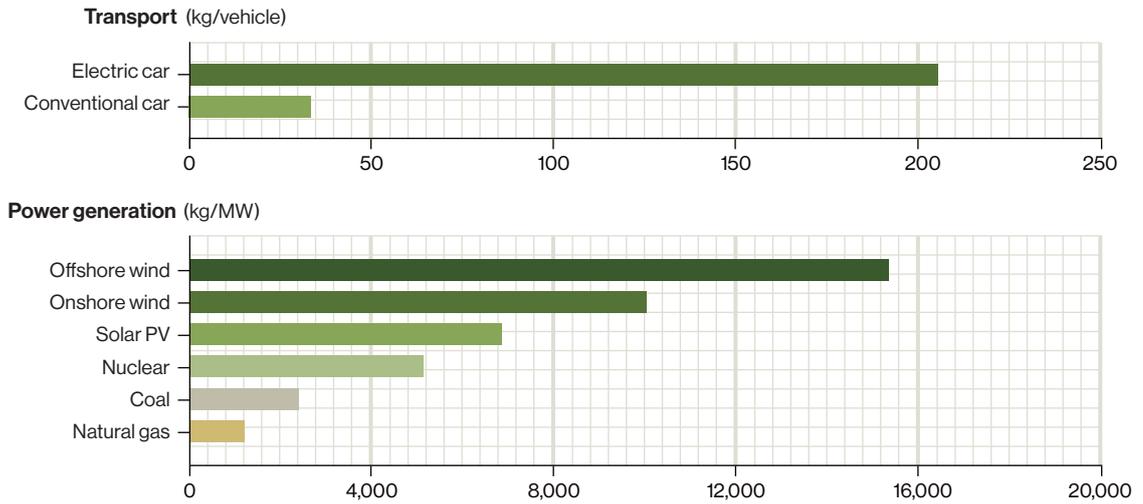
An EV uses six times more minerals than a conventional vehicle (not including steel and aluminium).



FIGURE 21

Future energy systems are much more minerals-intensive

Minerals used in select energy technologies



Source: IEA, *The role of critical minerals in the clean energy transition*, May 2021.

FIGURE 20

Minerals intensity: EVs compared to conventional vehicles

Kg per MW



	Electric vehicle	Conventional vehicle
Graphite	66.3	0.0 kg
Copper	53.2	22.3 kg
Nickel	39.9	0.0 kg
Manganese	24.5	11.2 kg
Lithium	8.9	0.0 kg
Cobalt	13.3	0.0 kg
Rare earths	0.5	0.0 kg
Zinc	0.1	0.1 kg

Source: IEA

Global demand remains uncertain

There are two plausible scenarios that capture extreme outcomes for demand over the next ten years – strong growth, which requires a massive scaling up of production, or weak growth.



Strong global demand for materials

- Countries prioritise economic growth based on robust trading relationships to capture the benefits of international trade, even though some areas of international relations remain contested between major economies and world powers.
- Materials use is driven by greater cooperation among nations in addressing global problems, rapid technological advancements, along with rising incomes and improved material living standards in most countries.
- Coordinated international action on achieving global net zero emissions by 2050 and adapting to the impacts of climate change significantly boost investment in renewable energy, infrastructure, new abatement technologies, and the integration of circular economy into value chains.
- Accelerated adoption of artificial intelligence, robotics, machine learning and big data positively impact productivity growth and digital transformation globally.



Weak global demand for materials

- International relations are increasingly complex and fragmented owing to a more chaotic and volatile international system, which is characterised by more frequent conflict between nations, strategic competition, disrupted trade and the diminished relevance of international rules and institutions.
- A retreat from globalisation and a move to greater protectionism is driven by countries pivoting to onshoring, re-nationalisation, regionalisation, and mutually beneficial alliances, which results in lower growth in materials demand from stagnating or falling living standards in most advanced economies and little action taken on urgently addressing global challenges.
- Lack of international cooperation on reaching net zero emissions by 2050 and the failure of major emitting countries to significantly lower their emissions delays global investment in renewables and reduces the growth in transition materials.
- Major technological advancements remain unstoppable but are mostly captured by advanced economies.

Achieving net zero by 2050 requires a much more minerals-intensive energy system.

IEA

9 times

Wind energy generation

An onshore wind plant uses nine times more minerals and metals than a similarly sized gas-fired plant.

2 times

Solar energy generation

Solar power plants require more than twice the amount of copper used in coal-fired power plants.

The transition to net zero provides a massive opportunity for Australia

Notwithstanding how the future unfolds, the economic opportunity this presents for a resource-rich country such as Australia depends on the share of global mining investment it can attract.

Under the emission reduction policy settings being adopted by many countries, huge investment in mining is needed to supply the necessary minerals and metals. This includes exploration, the expansion of existing mines, opening new mines, and developing downstream minerals processing and advanced manufacturing to deliver the clean energy systems and EVs by 2050.

The world needs up to US\$4 trillion of investment in mining, refining and smelting by 2030.²⁶ Achieving this requires global investment in mining to increase to US\$160 billion a year – more than double current levels.²⁷ The opportunity this presents for Australia will depend on its share of global mining investment.

Australia's mining industry possesses many of the attributes necessary to be a major, secure, responsible supplier of a broad spectrum of minerals and metals (figure 22).

FIGURE 22

Australia has the attributes of a leading global supplier of future critical minerals



Rich endowment

Australia boasts a rich endowment of minerals and metals needed for the clean energy transition.



Leading geoscience

World-leading minerals exploration geoscience and precompetitive data fit for industry.



Global reputation

For extracting minerals safely, sustainably and with robust ESG standards and labour protections.



Advanced METS

An advanced METS sector directly serving the mining industry, supported by world-leading tech vendors.



Skilled workforce

A highly skilled workforce with diverse and complex skills required to operate new technologies.



World-class R&D

Leading R&D and technical services provided through institutions such as the CSIRO and universities.



Strategic partnerships

Long-standing alliances and trading partners that facilitate access to capital, skills and technology.



Stable political system

A stable political system and low country risk for foreign investment cultivated over many years.

Competition for investment in clean energy technologies is intensifying

There is growing competition between countries for investment in clean energy technologies. Major economies are implementing comprehensive industrial policies and putting in place strategic alliances and trade agreement to secure critical mineral and materials supply chains and promote domestic production. China, the United States, Europe, Japan, Canada, the United Kingdom and the Republic of Korea have each adopted an array of incentives for investment to decarbonise their energy and transport systems, and industrial policies aimed at providing a competitive edge in supplying clean energy materials and technologies to the world. The measures in the US Inflation Reduction Act are the most significant example.

The international linkages between mineral extraction, early stage processing and manufacturing are strategically important for Australia. Recent geopolitical events have increased awareness by governments and industry of the need for access to reliable, secure global supply chains. Those linkages meant that until recently Australia had a reputation for being a reliable and safe destination for capital investment and a trusted and secure part of international supply chains for mineral, metal and energy commodities. This reputation was built over decades through deep domestic and international relationships.

Australia's reputation as a top tier mining jurisdiction cannot be taken for granted

Australia is currently ranked one of the most attractive regions in the world for mining investment in terms of investor perceptions of the policy settings and mineral potential.²⁸ However, maintaining this ranking and converting perception and mineral potential into actual investment ultimately depends on projects having favourable risk-adjusted returns compared to opportunities in other countries.

Australia's reputation as an attractive destination for mining investment can no longer be taken for granted. Competition for investment is increasing from established and emerging resource-rich countries taking action to strengthen and grow their minerals sector. New jurisdictions are opening up in Africa, broader South America, Southeast Asia, India and the Middle East.

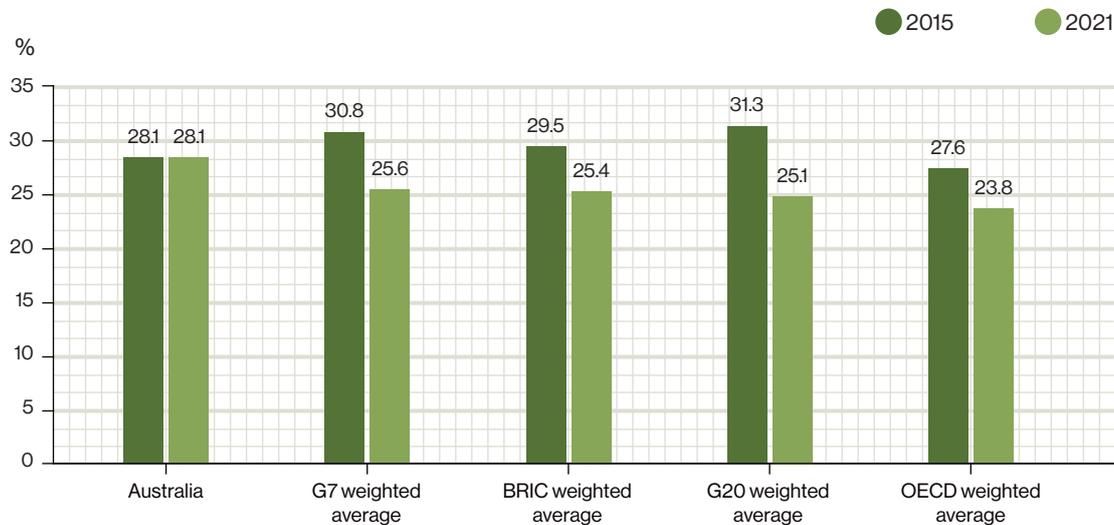
Competition will only increase into the future as more countries seek to maximise the economic contribution from their mineral resources. For example, Saudi Arabia is looking to mining as the third pillar of its industrial growth. Under the Saudi Vision 2030 plan it is undertaking a substantial geological survey to confirm potentially significant mineral reserves consisting of deposits of coal, copper, zinc, phosphates, uranium and gold.²⁹

Australia is a high cost place to do business. Rising costs, declining productivity and increasing political and policy risk are affecting investment decisions. In addition, Australia's tax settings are not internationally competitive. The country faces strong competition from other mining jurisdictions in providing attractive tax and royalty rates on mining investment.³⁰ Australia's effective tax rates on mining are now among the highest compared to other mining jurisdictions around the world.

FIGURE 23

Australia's marginal effective tax rate is among the world's highest

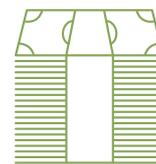
Australia, OECD, BRIC, G7 and G20



Source: P Bazel and J Mintz, *Corporate tax reform to help address Australia's weak investment performance*, School of Public Policy, University of Calgary, report prepared for the MCA, 2022.

Australia now has the highest marginal effective tax rates than the GDP-weighted averages of the G7, G20 and BRIC (Brazil, Russia, India and China) economies (figure 23).³¹ Australia has high effective company income taxes and stamp duties, especially on real estate transfers. This results in mining companies typically paying more tax and mining levies on their gross profits compared to Canadian companies and, in the case of copper, gold and iron ore, the United States. Leaving aside Brazil, China, India and Russia, Australia's fiscal system is less competitive than most countries for copper, gold and iron ore.³²

Government must ensure policy settings do not destroy shareholder value or certainty of supply for customers if Australia is to secure large commitments of capital for projects. Arbitrary policy interventions by governments that impose unexpected costs and taxes on the industry put at risk capital investment by increasing policy uncertainty and adversely changing perceptions of country risk for international investors and customers.



30%

Company tax rate

At 30 per cent, Australia has the third highest statutory company tax rate among OECD countries.

Australian Taxation Office

Australia's vulnerability to competition for investment is growing

International competition for minerals investment applies both between and within companies. When an Australian division of a global company makes the case to its board for progressing a local mining project, predictable and competitive policy settings are crucial to assessing the financial risk of that project favourably against other investment opportunities in the company's international portfolio.

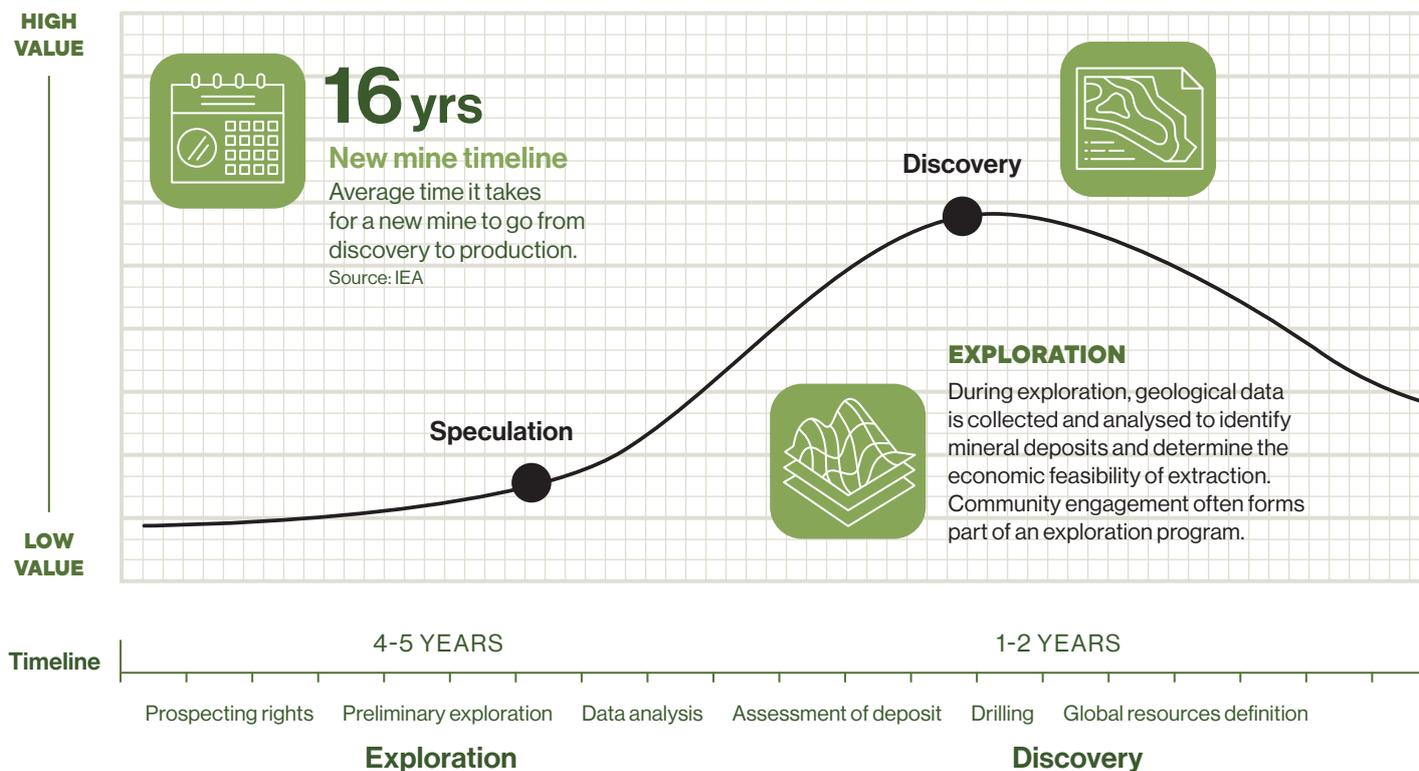
Mineral provinces in other countries that offer high-grade deposits or lower construction costs, energy costs and taxes on projects are providing superior capital returns for investors. For example, building a lithium hydroxide processing plant in Australia costs between 25 per cent and 50 per cent more than in South America, and 100 per cent to 200 per cent more than in China.³³

Australia's vulnerability to competition from resource-rich economies for mining investment is growing as they seek to seize the opportunity to supply the minerals and metals needed to achieve global net zero emissions.

FIGURE 24

From speculation to production: Bringing a new mine online

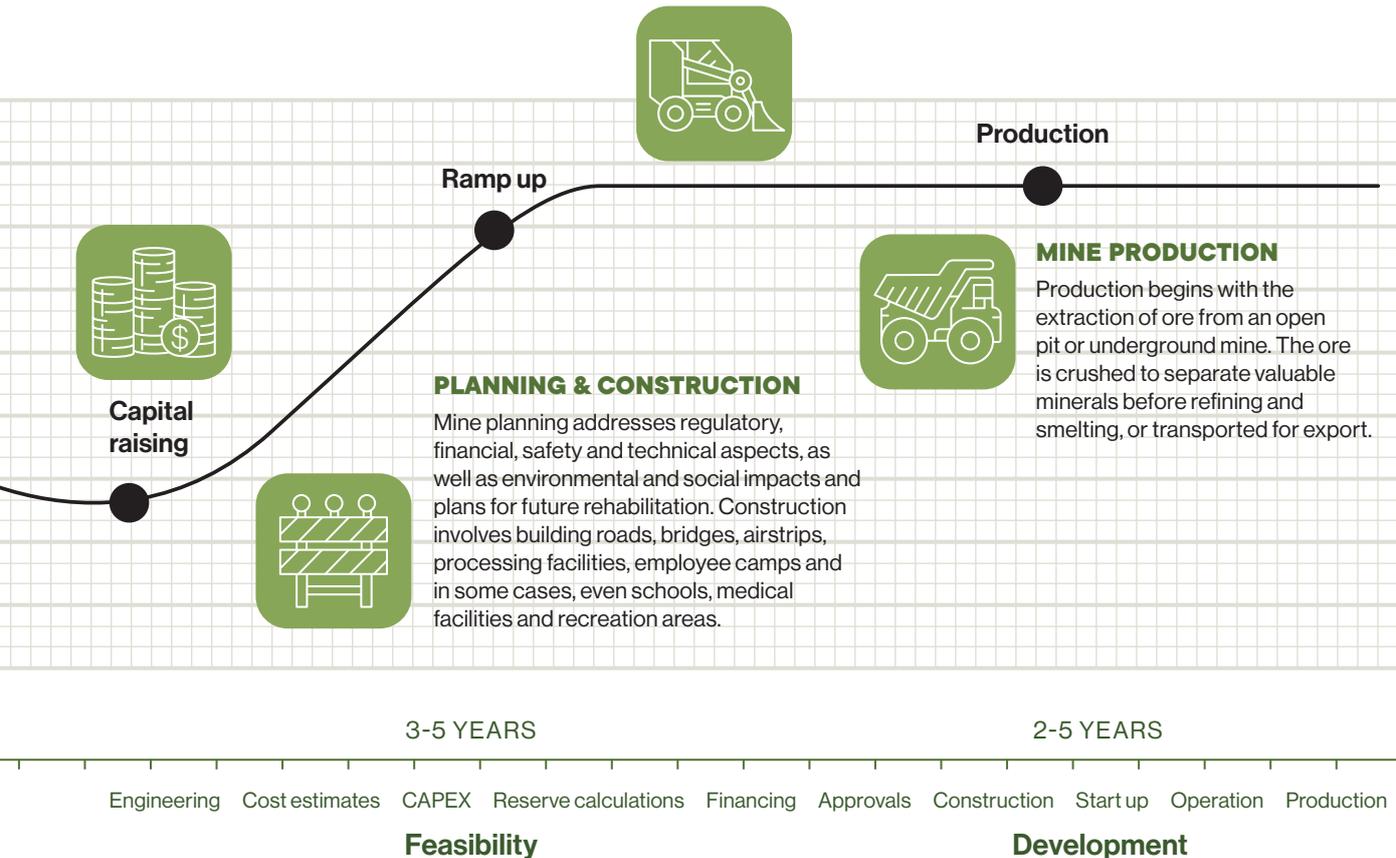
Source: Based on the traditional mineral discovery lifecycle known as the 'Lassonde Curve'



The sooner mining investment takes place the sooner the economy benefits

It takes years for the full benefits from mining investment to flow to the economy. The mining industry's substantial contribution to the Australian economy over the last decade is the result of \$246 billion of investment in exploration, mining projects and sustaining capital that was made since the early 2000s.

In addition to the time required to discover a deposit, the time it takes for the economy to significantly benefit from the capital investment in projects reflects their scale, complexity and uncertainty. For a project to move from deposit discovery to securing finance, obtaining approvals, completing construction, and then gradually ramping up to full-scale production can take many years (figure 24). Globally on average it takes about 16 years for a mine to be developed through to the point of first production – 12 years for exploration and feasibility studies and about four years for construction and start up.³⁴ From discovery to production a nickel mine takes on average 12 to almost 20 years depending on whether it is sulfide or laterite, respectively, and a copper mine takes about 17 years.³⁵



Government policies that impose high costs on industry threaten capital investment

Given the distinct characteristics of mining investment, the mining industry's economic contribution cannot be taken for granted. Government must fully consider the consequences of its policies on the industry to ensure its economic contribution remains strong.

New policies that impose unexpected and/or high costs and taxes on mining threaten capital investment. Poorly designed policies will destroy productivity if they introduce distortions through inefficient changes to settings, create rigidities that reduce the ability of businesses and their employees to respond to changing circumstances, or increase the regulatory burden on the industry.

The outcome of such policy settings is not only a reduction in the mining industry's productivity, but also its international competitiveness and the resulting potentially large adverse impacts on the economy.

FIGURE 25

Future scenarios for the mining industry

Source: MCA analysis



Four scenarios that could shape mining's international competitiveness

The strength of mining investment will be determined by the outlook for growth in global demand for minerals and metals and the effect of domestic policy settings on lifting its international competitiveness by improving investment conditions through productivity growth. Given the multitude of drivers and uncertainty confronting the outlook for the industry, there are four scenarios that capture its international competitiveness over the next 10 years (figure 25).

A booming global demand for materials combined with a productivity-enabling policy agenda will present an opportunity for Australia to play a leading role in the global transition to net zero. In contrast, weak global growth in demand for materials combined with productivity destroying policy agenda would reduce the international competitiveness of the Australian mining industry and reduce living standards.

Withering on the vine

Strong global demand and high quality ESG presents an opportunity for Australian mining to lead global decarbonisation. But unfavorable policies raise costs without benefits, so that existing mining operations become uncompetitive with global rivals, and new investment is deterred. Australian mining survives on the strength of existing projects and limited brownfield expansions. Over time, the industry loses ground to other mining jurisdictions.

'The coming decades are likely to be more capital intensive than the preceding decades.'³⁶

Viktor Shvets
Macquarie Capital

A lost cause

Weak global materials demand, combined with a productivity-destroying policy agenda would deal Australians out of any significant role in global decarbonisation efforts. Governments neglect markets over increased intervention. Australia's minerals industry faces shortages of mining skills and expertise and an economy-wide slump in business investment sees Australian productivity falter, entrenching high risk, high cost and low productivity projects.

Leading the next boom

Strong global demand for materials combined with a productivity reform agenda enables Australian mining to lead the net zero transition. Benefits of Australian leadership are channelled through mining regions, invigorating local businesses, contributing to government budgets, and enhancing community resilience. Growth in mining strains logistics, puts pressure on communities to adapt to greater mining presence, and tests governments' commitment to productivity-enhancing reforms.

Remaining on the competitive fringe

Weak global materials growth, combined with productivity-enhancing policy reforms which reduce costs for mining activities, allows profitable segments of the industry to remain internationally competitive. Investors have confidence that if global conditions pick up, risks taken now will pay off without additional costs. In the meantime, transition of the workforce away from the mining industry erodes expertise necessary for the future.



Image courtesy of New Hope Group

The background of the entire page is a green-tinted halftone image. On the left side, there is a large dam structure with a walkway on top. A long, narrow spillway or channel extends from the dam down towards the water. The right side of the image shows a wide expanse of water with ripples. The overall texture is composed of fine dots and lines, creating a grainy, high-contrast effect.

A
CRITICAL
ROLE FOR GOVERNMENT

A critical role for government

Policy settings must support economic growth by lifting productivity

Improving Australia's productivity performance will not just happen. It will require federal and state governments implementing reforms that ensure policy settings reduce distortions and disincentives that are limiting the economy's international competitiveness in attracting investment and the ability of businesses to lift productivity to drive economic growth.

Government exerts substantial influence over productivity and an industry's international competitiveness through all the different policy settings that affect investment conditions. For example, the impact of policy settings that reduce the mining industry's productivity may result in potentially large impacts on economic growth, household consumption and real wages (figure 26).

The challenge confronting the Australian government is how to reduce the budget deficit and pay down debt without impairing the economy's performance. Drastically cutting expenditure or increasing the burden of taxation on individuals and businesses makes little sense when the result is slower economic growth and lower living standards.

There is no single lever for improving productivity and international competitiveness. Policy must aim to continually improve investment conditions. This includes delivering internationally competitive tax settings, expanded trade and investment opportunities, efficient and effective regulatory settings, productive workplace arrangements, an efficient transformation to net zero emissions and industry focused skills and training.

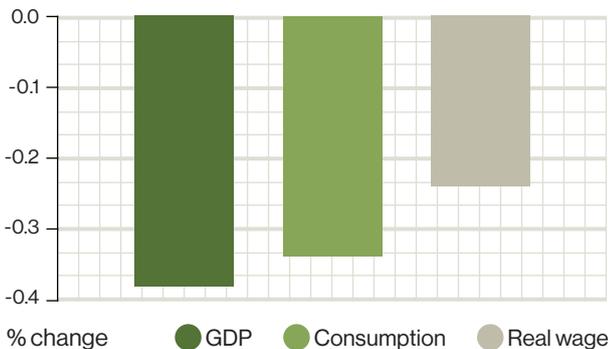
FIGURE 26

Economy-wide effect of policies that reduce the mining industry's productivity³⁷

Source: Modelling undertaken by CIE

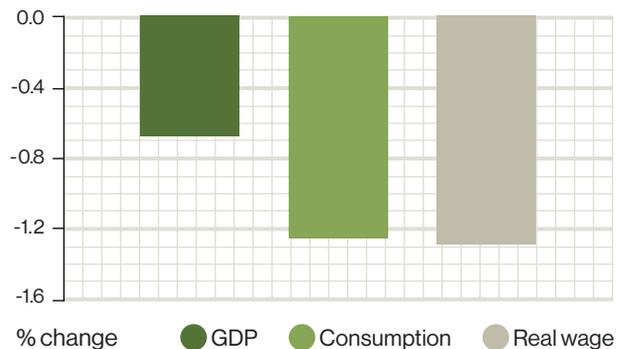
Labour productivity

- ▶ Workplace relations legislation that reduces workers' incentives and effort, or business workforce flexibility, cause large reductions in labour productivity.



Fuel tax credits

- ▶ Abolishing the fuel tax credit will lead to increases in the effective tax rate owing to limited options for substitution away from diesel.



Internationally competitive, stable and aligned policy is critical

It is through achieving these outcomes that policies support and enable businesses to innovate, invest and acquire the workforce capabilities and flexibilities that they need to successfully compete and grow.

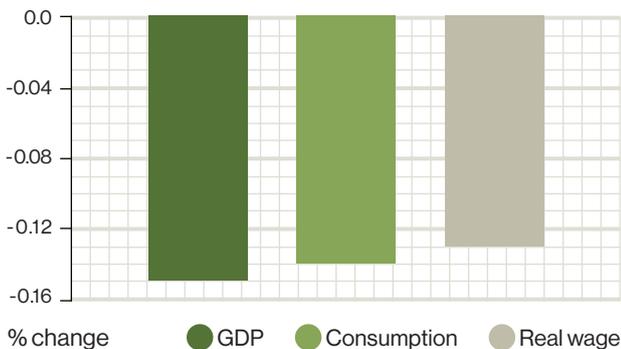
Policies that are stable, aligned and internationally competitive at attracting investment are needed to alleviate impediments that are currently constraining the mining industry from making an even stronger contribution to communities, regions and the national economy more broadly.

The government can stack the odds in favour of the Australian mining industry catching the next wave of global investment with the right policy settings. If it does, the benefits will be widespread and durable. If it does not, there are considerable downside risks to the economy. So alleviating key policy impediments to mining activity are critical to retaining Australia's comparative advantage in mining and minerals exports and expanding activity in minerals processing and mining-related manufacturing.

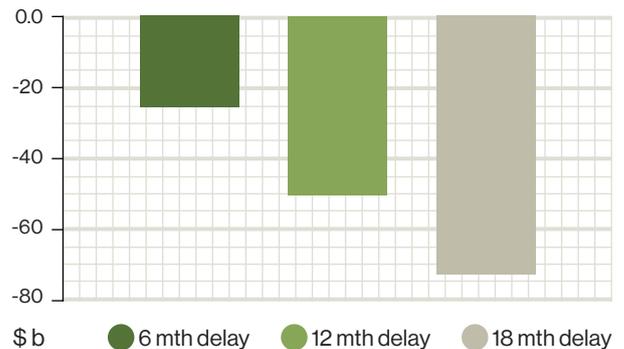
Australia's mining industry operates in overlapping jurisdictions, has broad linkages to other industries across the economy, and is subject to high risks with large amounts of capital at stake. The sheer scale and scope of the industry means that any mining activity is simultaneously subject to Commonwealth, state and territory, and local government policies which are not always aligned. Also, the vast amounts of investment in capital, skills development and technological assets specifically required for mining operations expose investors to significant risk from policy uncertainty.

Environmental approvals

- Higher compliance and administration costs reduce productivity. Taking into account a 16-year end-to-end approval timeframe, the cumulative GDP loss from an additional 12-month delay in environmental approvals could be up to \$51 billion to the economy.



Cumulative loss of GDP caused by delays



Clearing impediments to mining is critical to achieving net zero emissions globally

Policy should be targeted at alleviating the impediments to mining activity required for the global transition to net zero emissions. The opportunity presented by the clean energy transition offers a critical, if still uncertain, opportunity for the Australian mining industry and the broader economy. How countries around the world resolve the complexity of achieving global net zero emissions, as well as the magnitude of the material requirement, will determine the size of the opportunity for mining and in turn the benefits flowing to the Australian economy.

If the world embarks on a concerted, strong effort to achieving net zero emissions by 2050, the potential for a global mining boom is large. The materials-intensive pathway to reducing emissions that many countries are adopting foreshadows a surge in demand for minerals and metals. In the urgency to bring materials to market, existing impediments to mining activity will be exacerbated and new impediments will emerge. Australia's role in supplying the minerals and metals required for the global transition to net zero emissions will depend on how well domestic policies alleviate these impediments.

Lifting mining productivity starts with addressing five key impediments

Australia's mining industry is continually improving processes and adopting innovations on a range of fronts. Actions include investing in specialist mining skills and developing flexible workforces, sourcing higher quality capital inputs, and developing and deploying new exploration, mining and environmental management technologies and systems. But in many cases the efforts of the industry to improve its productivity and competitiveness are impeded by government policies that directly deter investment by reducing profits, or broader policy settings that constrain activity rather than incentivise growth.

The policy impediments to mining activity in Australia, both current and emerging, fall into five broad categories:

- 1. Excessive regulatory burdens without additional benefits**
Regulations that seek to address environmental, heritage, culture or safety issues but create excess regulatory burden without benefits
- 2. Restrictive policies that impact project returns**
Impediments that affect decisions about whether to explore for new reserves, change production plans, and expand or develop new mines
- 3. Inefficient provision of public infrastructure and services**
Under-provision of public goods such as transport infrastructure, national security and cyber security that impair the mining industry's ability to operate
- 4. Political imperatives that delay or prevent projects**
Political factors that present difficulties in gaining community support for projects, as well as the political process delaying or preventing investment
- 5. Fiscal policy that raises the cost of capital to projects**
Constraints in availability of project capital, increases in the cost of capital, and domestic monetary and fiscal policy settings.

Recommendations

1. Reduce the regulatory burden to attract investment

Poor regulatory settings delay mining projects, raise costs and deter investment.

Australian mining is recognised as a highly innovative sector. However, project delays, increasing costs and uncertainty from duplicative and overly complex regulatory processes are worsening investment conditions. The mining industry is committed to risk-based approaches to protect the country's environment, such as Towards Sustainable Mining and Enduring Value. It is also a world-leader in developing and adapting transformative technologies to improve mine safety, increase productivity and help the industry decarbonise.

Government has a major role in ensuring regulatory settings for the mining industry and downstream processing projects are timely, efficient and fully integrated with state and territory processes. Regulation must involve full consultation with affected parties, and regulatory functions must be sufficiently resourced, without burdening project proponents with onerous cost recovery.

Investment impediments

- Costly assessment and approvals
- Regulatory cost-shifting to industry
- Disincentive to investment and new technology
- Regulatory bottlenecks
- Lack of evidence-based policy
- Cultural heritage barriers

Recommendation 1	Government establish a single door approach for project facilitation and implement agreements and accreditation of state and territory processes.
-------------------------	--

Outcomes-focused regulation is crucial for the mining and downstream processing of minerals. Unnecessarily complex, uncertain or disproportionate requirements impose delays and costs on minerals projects, impede job creation and increase costs to operations along the value chain without delivering environmental gains. High regulatory costs, including onerous processes, risk undermining the feasibility or adversely affecting the timing of proposed investments.

Recommendation 2	Government work with industry to co-design an innovation blueprint to establish sandboxes that accelerate the testing, prototyping and commercialisation of technologies.
-------------------------	--

Technology is driving change across the mining industry enabling it to become more environmentally sustainable, energy efficient and productive. Digital transformation is also making previously uneconomic mineral deposits commercially viable. It is essential that government enhance the industry's capacity for innovation. Regulation must keep pace with emerging technologies and be coordinated within governments to enable their adoption by industry.

Recommendations

Recommendation 3 **Government ensure risk-based safety policies that are appropriate, effective and efficient, and are developed in consultation with industry.**

All safety regulations must have clear problem definitions and be informed by robust evidence so that they can be implemented safely and efficiently. Fast-tracking safety regulations, such as the silica workplace exposure standards, without considering the problem and evidence, risks compromising the health and safety of workers as well as raising project costs. A commitment to evidence-based regulation and detailed workforce planning will allow businesses to manage changes appropriately.

Recommendation 4 **Government modernise cultural heritage regulation by supporting robust consultation between Traditional Owners, jurisdictions and land users.**

Australia's cultural heritage framework is not fit for purpose. Some cultural heritage legislation has not maintained currency with other regulatory reforms. Involvement of Traditional Owners and land users in co-designing improvements in the identification and protection of cultural heritage will be critical to ensure practicality, predictability and robustness in regulatory regimes. The outcome of any modernisation project must be to ensure cultural heritage is available for future generations to understand their history, their songlines and their connection to Country.

2. Advance policies that support competitive project returns

Policy impediments to investment erode mining's international competitiveness.

Project returns are directly dependent on taxes and royalties, and input costs, and determine if, when and where mining investment will occur. Because of the declining international competitiveness of Australia's tax settings and increasing costs on business operations, the industry makes significant efforts to maintain investment returns by continually striving for greater efficiencies in project management and operations. Companies develop highly skilled, secure and flexible workforces, and deploy cutting-edge technologies to improve their productivity.

Having the right policy settings is essential to enabling companies to improve their returns on investment. Internationally competitive and stable tax settings, modern workplace rules, access to high quality precompetitive geoscience data, and national workforce planning are all necessary to ensure Australian mining can improve its productivity and international competitiveness.

Investment impediments

- Internationally uncompetitive tax settings
- Poor economy-wide labour productivity
- Lack of access to quality geoscience data
- Bottlenecks to mining inputs
- Workforce transition from mining
- Limited commercial opportunities

3. Deliver efficient public infrastructure and services

Failure to provide public goods adds to industry costs and increases investment uncertainty.

Australia's mining industry has led from the front on global mining productivity which has enabled it to develop and deploy cutting-edge technologies. Infrastructure needs have traditionally been met by individual mines investing in railways, roads, port facilities and utility services. In line with its ambition to reduce emissions to net zero, the mining industry is also heavily investing in clean energy transport and energy systems as they become commercially available.

Federal and state governments must be prepared to assist in providing the necessary public infrastructure and goods and services that support the mining industry to supply the growing global demand for critical minerals amid the increasing need for emissions reductions. Where governments traditionally provide the policy architecture to coordinate some of the outcomes that markets may not be able to provide, it is important that it is done as efficiently and effectively as possible.

Investment impediments

- Poor policy coordination
- Inadequate enabling infrastructure
- Weak innovation policy
- Poor access to public infrastructure
- Costly and unreliable electricity supply
- Exposure to high supply chain risk

Recommendation 9

Government extend Australia's international clean energy partnerships to explore all options for zero emission technologies.

Access to affordable, low emission and reliable electricity is of critical importance to the mining industry's ability to meet Australia's 2030 and 2050 emission targets and remain internationally competitive. All fuels and technologies, including carbon capture, utilisation and storage and currently prohibited advanced nuclear technologies, can play a part in maximising opportunities for Australia by facilitating an effective transformation to reliable, competitive, zero emissions energy.

Recommendation 10

Government establish a National Cabinet mechanism for critical minerals strategic planning and investment in common user infrastructure.

Governments can boost investment in mining and unlock value further along the critical minerals supply chain by facilitating the delivery of productive shared infrastructure. Critical minerals processing requires access to reliable energy supplies and high-purity water, and conversion of mineral concentrates into value-added chemical products generates large volumes of waste and by-products. Government can assist through better coordination, faster planning and approvals and exploring cost-sharing arrangements to reduce project costs and providing access to critical infrastructure and utilities where feasible.

4. Make support for mining a political imperative

Support from government and the public for mining is critical to attract investment.

Australia's mining industry is required to deal with multiple layers of government, each with an expanding remit, on issues often subject to divisive political narratives. Strong support from government, civil society and the public for mining's role and importance in addressing the many global and national challenges is essential to solving them. The industry is doing its part to ensure its contribution to the economy and its role in overcoming global challenges is widely understood.

Governments must also do more to support mining investment through targeted initiatives that promote the industry domestically and internationally to facilitate the flow of investment capital. Australia's foreign investment regime manages national security risks while allowing the economy to benefit from global capital. Foreign investment to fund exploration, develop and sustain job-creating projects and gain access to new technologies, skills and capabilities has helped mining become Australia's most successful global industry.

Investment impediments

- Overlapping governments
- Increased regulatory reach
- Government failure to support mining
- Domestic political fracturing
- Politics of supply chain security
- Prospect of opportunistic tax grabs

Recommendation 11

Government partner with industry to promote mining's strong global ESG performance, including Towards Sustainable Mining.

The mining industry is improving people's understanding of the link between raw materials and almost everything they use and raising awareness of its contribution to the economies and communities where activity is located. Government can support these efforts by expanding opportunities for trade and investment through actively promoting Australian mining's ESG performance and standards in trade discussions and publicly promoting investment in mining projects.

Recommendation 12

Government streamline foreign investment screening of critical minerals proposals to improve supply chain security between strategic partners.

Geopolitical uncertainty, supply chain vulnerabilities and the global imperative to achieve net zero emissions by 2050 have refocused Australian efforts to expand along the critical minerals supply chain. Streamlining processes will provide industry greater access to financial capital for upstream expansion, as well as benefit from other countries' technology, intellectual property and R&D. Government has an important role in supporting foreign investment into critical minerals projects by actively promoting opportunities and ensuring regulatory processes are not onerous, complex and costly.

5. Put business and productivity at the centre of fiscal policy

Fiscal policy that hampers business investment limits the contribution of the mining industry.

Government's fiscal policy settings, along with monetary policy, affect the mining industry's ability to bring new projects to final investment decision through their impact on the cost of capital. The industry's ability to raise funds for its various activities – exploration, project development and operation, R&D and technology deployment – depends on unfettered access to capital at the required cost.

Increasingly, the mining industry's access to capital is dependent on strong ESG credentials. While Australia's mining industry has gained a solid reputation for ESG performance, impediments to investment are emerging in the form of risk perceptions, competition among mining countries for investment funds, and poor industry policy knowledge. Government must ensure the fiscal sustainability of public finances by reducing and removing impediments to productivity growth and adopt best practice public policy processes which will improve investment conditions for mining.

Investment impediments

- Global financial instabilities
- Poorly aligned fiscal and monetary policy
- Policy uncertainty
- Cyber security and cyber fraud
- Competing global climate policies
- Lack of mining sector policy expertise

Recommendation 13

Government commit to Australian Public Service reforms that put business at the centre of policy decision making.

Policy that is uncertain or lacks credibility increases the incentive for a company to wait and see what policy settings will eventually be adopted before committing to an investment. Given the characteristics of mining investment, the required return can be high. Policy design and implementation that is transparent, based on genuine engagement with affected parties, and independent of the political process will reduce the risk of impairing mining investment.

Recommendation 14

Government commit to a formal process for assessing and implementing recommendations in the Productivity Commission's five-year reviews.

Geopolitical and global macroeconomic uncertainties are dominating the global economy. These conditions also affect the Australian economy through high inflation and increased interest rates. To take pressure off monetary policy, Government must bring the federal budget back into balance over the long-term and reduce debt without impairing the economy's performance or increasing the tax burden on business. This is best achieved by providing the incentives and reducing the barriers needed to lift productivity and grow the economy.

Conclusion

Government action is critical to meeting Australia's minerals investment challenge

The Australian minerals industry has been a strong contributor to the national economy and the mining regions and local communities in which it operates. Revenues from company taxes and royalties paid by Australian mining have underpinned Commonwealth and State budgets, respectively, and benefited the broader economy through the industry's positive impact on the terms of trade. Mining is not only Australia's largest industry with the most capital assets, but also one of the most variable in terms of return on assets.

The minerals and raw materials produced by resource-rich countries are critical to addressing major challenges arising from the megatrends shaping the world over coming decades. The scale of supply of minerals and metals needed will depend largely on how the global transition to net zero emissions unfolds. The international competitiveness of the Australian mining industry will determine the nation's success in capturing to the fullest extent possible the benefits from growing material demand.

The right policy settings from government are critical to Australian mining being able to catch the next wave of global mining investment. With the right policy settings, the industry can capture a significant share and the benefits to Australians will be widespread and durable. But the strength of growth in material demand is uncertain. Principled policy targeted at alleviating key impediments to mining activity will be critical to enabling Australia retain its comparative advantage in mining and minerals exports.

Maintaining Australia's competitive edge in mining will require immediate and coordinated longer-term action by government. The policy recommendations in this report provide the starting point for improving the productivity and international competitiveness of the mining industry. While many of the policy recommendations are not new, they are critical to ensuring a prosperous future for all Australians.

Endnotes

- ¹ Commonwealth of Australia, *Budget Strategy and Outlook*, Budget paper no. 1, Budget 2023-24, Canberra, 9 May 2023.
- ² Productivity Commission, *PC Productivity Insights: Recent developments*, June 2021, p. 46.
- ³ Productivity Commission, *PC Productivity Insights: Australia's long-term productivity experience*, No. 3/2020, 2020, p. 35.
- ⁴ Productivity Commission, *Five-year Productivity Inquiry: Advancing prosperity*, vol. 1, Inquiry report no. 100, 2023, p. 7.
- ⁵ Infrastructure Australia, *2022 Infrastructure market capacity report*, Canberra, 14 December 2022, p. 8.
- ⁶ P. Bazel and J. Mintz, *Corporate tax reform to help address Australia's weak investment performance*, School of Public Policy, University of Calgary, prepared for the MCA, 2022.
- ⁷ Centre for International Economics, *Estimating the economic benefits of mining expansion and further productivity reforms*, report prepared for the MCA, Canberra, 31 May 2021.
- ⁸ Ibid, p. 19.
- ⁹ ABS, *Australian System of National Accounts*, Table 5, released October 2022.
- ¹⁰ ABS, *Average Weekly Earnings*, Table 10H, released February 2023.
- ¹¹ ABS, *Australian National Accounts: Input-Output Tables, 2020-21*, Table 5, released March 2023.
- ¹² Calculated from ABS, *Australian National Accounts: Input-Output Tables, 2020-21*. Mining industry includes ABS industry categories coal mining, iron ore mining, non-ferrous metal ore mining, non-metallic mineral mining, exploration and mining support services, and excludes oil and gas extraction. Reported multipliers are Type 2A.
- ¹³ MCA analysis of ABS, *Data by Region*, released May 2023.
- ¹⁴ V Raynor and J Bishop, *Industry dimensions of the resource boom: An input-output analysis*, Research discussion paper, RDP 2013-02, Reserve Bank of Australia, 2013, pg. 9.
- ¹⁵ S. Battacharyya, 'Commodity boom-bust cycles and the resource curse in Australia: 1900 to 2007', *Australian Economic History Review*, vol. 61, 2021, pp. 186-203.
- ¹⁶ Ibid, pg. 199.
- ¹⁷ Productivity Commission, *Trade and Assistance Review 2021-22*, annual report, Canberra, July 2023.
- ¹⁸ IEA, *The role of critical minerals in clean energy transitions*, Paris, 2021.
- ¹⁹ McKinsey & Company, *The net-zero materials transition: Implications for global supply chains*, July 2023.
- ²⁰ S&P Global, 'Metal producers will need to double capex to meet net zero by 2050: BofA', 30 November 2021.
- ²¹ G. Pitron, *The Rare Metals War: the dark side of clean energy and digital technologies*, Scribe Publications, 2020.
- ²² T. Watari et al., 'Total material requirement for the global energy transition to 2050: A focus on transport and electricity', *Resources, Conservation & Recycling*, 2019, vol. 148, pp. 91-103.
- ²³ T Watari, et al., 'Sustainable energy transitions require enhanced resource governance', *Journal of Cleaner Production*, vol. 312, 2021, www.elsevier.com/locate/jclepro.
- ²⁴ McKinsey & Company, *Global Energy Perspective*, 26 April 2022.
- ²⁵ IEA, *World Energy Outlook 2022*, Paris, October 2022.
- ²⁶ McKinsey & Company, *The net zero materials transition: Implications for global supply chains*, July 2023.
- ²⁷ S&P Global, *Metal producers will need to double capex to meet net zero by 2050: BofA*, 30 November 2020, viewed 29 September 2022.
- ²⁸ J. Yunis and E. Aliakbari, *Fraser Institute Annual Survey of Mining Companies*, 2021.
- ²⁹ J. Hammond, 'Saudi Arabia looks to mining as way to diversify its economy', *Forbes*, 3 January 2023.
- ³⁰ P. Bazel and J. Mintz, *Corporate tax reform to help address Australia's weak investment performance*, School of Public Policy, University of Calgary, prepared for the MCA, 2022.
- ³¹ Ibid, p. 12.
- ³² Ibid, pp. 18-22.
- ³³ P. Kerr and B. Thompson, 'PM's battery dream 'admirable' but unlikely: CEOs', *Australian Financial Review*, 2 March 2023.
- ³⁴ S&P Global Intelligence, 'Discovery to production averages 15.7 years for 127 mines', 2023.
- ³⁵ IEA, *The role of critical minerals in clean energy transitions*, Paris, 2021.
- ³⁶ Macquarie Capital, 'A new type of autocorrect: technology is rewriting the global economic rulebook', viewed July 2023.
- ³⁷ Economy wide modelling undertaken by the Centre for International Economics using CIE Regions model of the Australian economy based on ABS' *National Accounts: Input-Output Tables, 2020-21*. Charts show the economy wide impacts of abolishing the fuel tax credit for all industries; a 5 per cent productivity shock to labour in the mining industry (excluding oil and gas); and delays in environmental approvals at a discount rate of 15 per cent.

Figures

- FIGURE 1 Australian mining industry company tax payments have doubled in a decade
- FIGURE 2 Australia's labour productivity growth is weakening
- FIGURE 3 A slowdown in capital deepening is putting a handbrake on economic growth
- FIGURE 4 The mining industry's net capital stock is plateauing
- FIGURE 5 A snapshot of minerals and metals critical to modern life
- FIGURE 6 The mining industry boosts activity across the economy
- FIGURE 7 Mining is the largest contributor to Australia's economic growth
- FIGURE 8 Five decadal contributions by Australian mining
- FIGURE 9 Mining is the largest contributor to Australia's company tax
- FIGURE 10 Royalty payments to the states and territories
- FIGURE 11 Nothing carries more investment risk than setting out to build a mine
- FIGURE 12 Mining's capital stock surpasses all other sectors
- FIGURE 13 Mining profits are more variable compared to those in other sectors
- FIGURE 14 Mining is among the riskiest of all sectors for return on assets
- FIGURE 15 The federal government's fiscal position is linked to the mining sector's performance
- FIGURE 16 Accumulation of net debt without mining
- FIGURE 17 Only one-third of exploration expenditure is on greenfield
- FIGURE 18 From global megatrends to the macrotrends affecting mining
- FIGURE 19 Minerals intensity of an onshore wind turbine
- FIGURE 20 Minerals intensity: EVs compared to conventional vehicles
- FIGURE 21 Future energy systems are much more minerals-intensive
- FIGURE 22 Australia has the attributes of a leading global supplier of future critical minerals
- FIGURE 23 Australia's marginal effective tax rate is among the world's highest
- FIGURE 24 From speculation to production: Bringing a new mine online
- FIGURE 25 Future scenarios for the mining industry
- FIGURE 26 Economy-wide effect of policies that reduce the mining industry's productivity



FUTURE

CRITICAL

Minerals Council of Australia

Phone. +612 6233 0600

Email. info@minerals.org.au

minerals.org.au

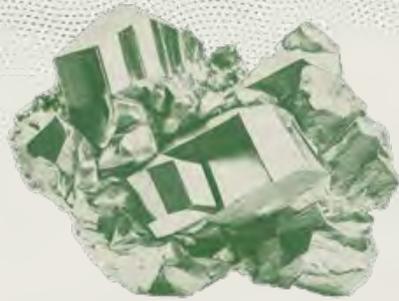
© Minerals Council of Australia

All rights reserved apart from any use permitted under the *Copyright Act 1968* and subsequent amendments, no part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of the publisher and copyright holders.

September 2023



Resourcing tomorrow
**Australian
Mining**



FUTURE
CRITICAL