

GEOPOLITICS AND THE AUSTRALIAN MINERALS INDUSTRY

**Complex interplays,
real consequences**

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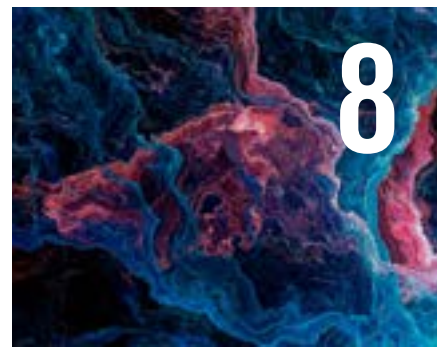
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EXECUTIVE SUMMARY

Geopolitics affects minerals markets, and minerals markets affect geopolitics.

The operating principles and assumptions of the 1990s and early 2000s no longer apply to the world in which the Australian minerals industry now operates. Rather than openness, multilateralism, globalisation and free trade, the geopolitical context is characterised by rising strategic competition, inequality, lack of trust, protectionism, nationalism, disruption, and, importantly, consumer awareness and expectations of business.

Changing geopolitical dynamics are causing dramatic shifts in the supply and demand of minerals. At the same time, the supply and demand of minerals have the very real potential to fundamentally redraw geopolitical power maps. It's a cycle of cause and effect that looks set to continue for the foreseeable future.

The four major geopolitical trends that drive risk to the Australian minerals sector, as this report will explore, are:

- 1) Structural shifts to the international system
- 2) Domestic discontent
- 3) Industrial revolution 4.0
- 4) The climate crisis

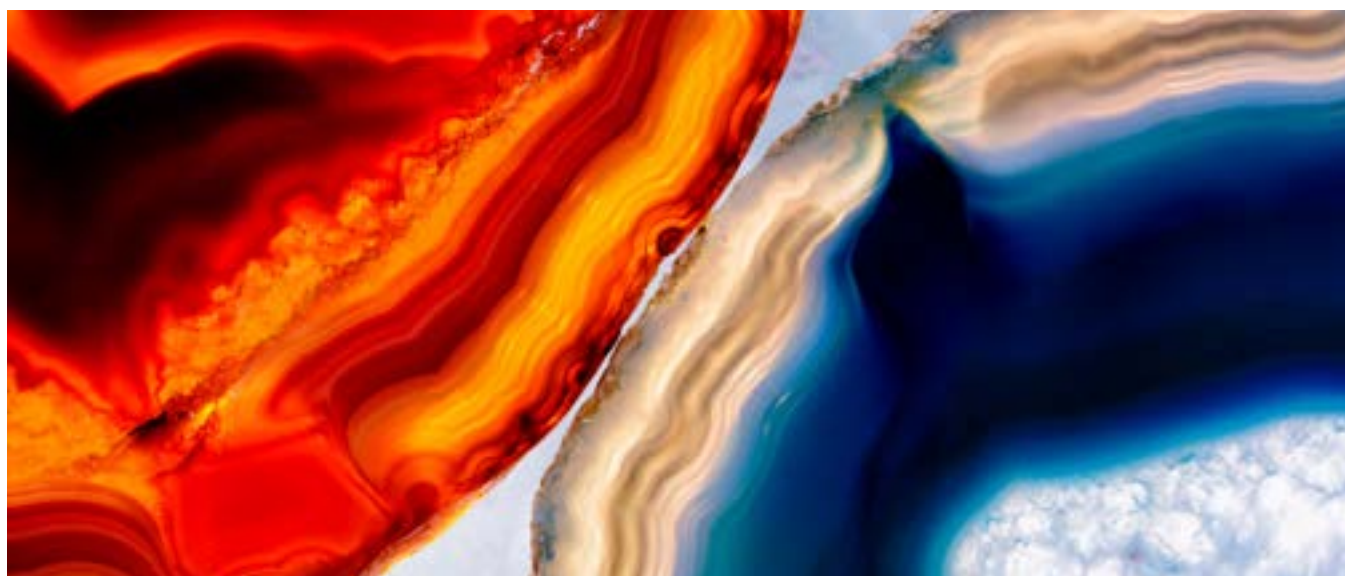
This report examines geopolitical developments and how they affect coal and iron ore, as Australia is the world's largest exporter in these minerals; and gold, where Australia is the world's second largest exporter. It also includes a section on the geopolitics of rare earth elements (REEs) and critical minerals.¹

Global geopolitical volatility presents risks, but for those on the front foot, it also presents significant opportunities. Key to success is increasing resilience and preparedness to effectively navigate geopolitical risk.²

Businesses in the Australian minerals sector need to ensure they understand these profound and ongoing changes and, more importantly, are prepared for them.

The increasingly unstable geopolitical environment has four key takeaways for the Australian mineral sector:

- 1) The demand for fossil fuels is decreasing, albeit unevenly;
- 2) The demand for rare earth elements (REEs) and critical minerals is increasing;
- 3) Reputation matters: consumer and shareholder focus on ESG and the social licence to operate is growing;
- 4) Security of supply from trusted partners is of increasing importance.



SECTION TWO

Snapshot of the Australian mineral industry

The minerals sector is critical for Australia’s economic wellbeing. In 2019-20, the mining industry (of which minerals is the major component) delivered 10.4 percent of the Australian economy, which equates to \$202 billion of Australia’s GDP, the most of any sector.³

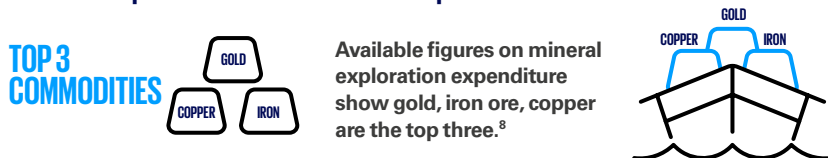
What have we got?

Australia has extensive resources of many mineral commodities, some of which are considered critical for modern and emerging technologies, and by trading partners. Australia is amongst the world’s top six producers of bauxite, coal, copper, gold, iron ore and industrial minerals.²

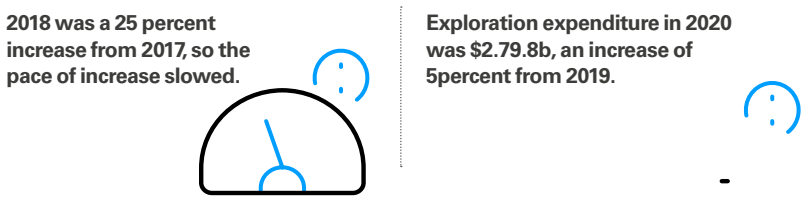
For two of the three minerals covered in this report, coal and iron ore, Australia has estimated reserves of 280 and 175 years respectively. Our gold resource life is closer to 50 years.⁴ However, these figures are at best good estimates. It is not possible to state with certainty how long Australia’s resources will last due to variations in production rates, the changing economic viability of deposits, and the rate of new resource delineation versus resource depletion.⁵

In terms of REEs and critical minerals, Australia has the opportunity to position itself as a global supplier. However, the extent of deposits is not yet clear, and gaps exist in the technology and capability to economically and safely extract critical minerals. Known critical minerals deposits in Australia include molybdenum and rhenium, scandium, antimony, hafnium, lithium, REEs, indium, tungsten and platinum-group elements. Some of these deposits are very modest in size compared to elsewhere in the world, and in other cases where large geological resources are present, they are not recoverable using existing extraction technology and based on current commodity prices.⁶

Exploration in Australia in 2019: gold, copper and iron ore are the top three commodities explored in Australia.⁷



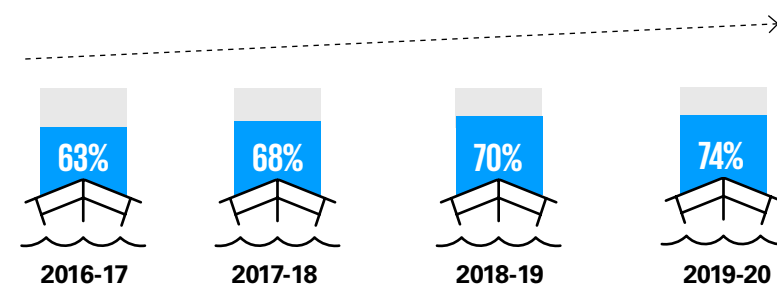
Exploration expenditure in 2019 was \$2.648b, an increase of 21percent from 2018.



COVID-19

The likely cause of this substantial drop in expenditure growth is the economic slowdown brought on by COVID-19.⁹

Q3: minerals as percentage of export merchandise.¹⁰



Where does it go?

Australia is the world's largest exporter of iron ore and coal, and the world's second-largest exporter of gold.¹¹

As critical materials for powering cities and manufacturing goods, Australian mineral resources are in high demand across the globe.

Table: Australia's Top 5 Minerals Exports 2019-20¹²

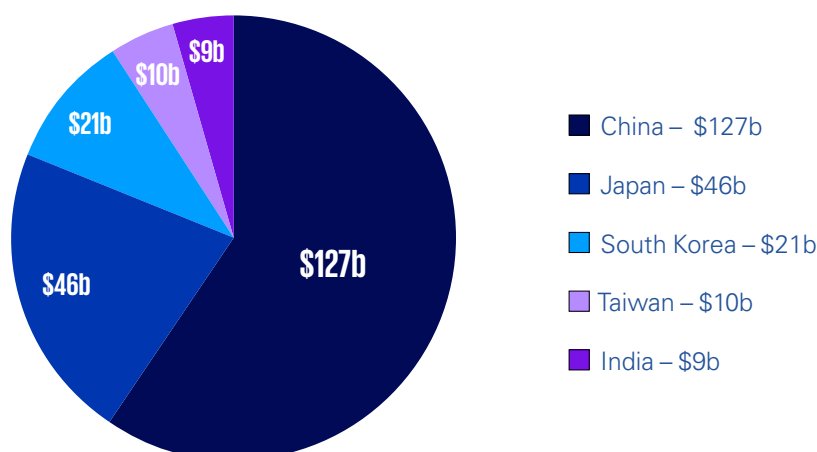
Australia's TOP 25 EXPORTS, GOODS & SERVICES ^(a) (A\$ million)							
RANK	COMMODITY	2017-18	2018-19	2019-20	% SHARE 2019-20	2018-19 to 2019-20	5 YEAR TREND
1	Iron ores & concentrates	61,392	77,520	102,864	21.6	32.7	14.1
2	Coal	60,379	69,595	54,620	11.5	-21.5	12.2
8	Aluminium ores & conc (incl alumina)	9,448	11,358	8,875	1.9	-21.9	8.6
10	Copper ores & concentrates	5,700	5,969	6,854	1.4	14.8	6.8
18	Other ore & concentrates	3,140	3,523	3,678	0.8	4.4	-3.2

a) Goods trade is on a recorded trade basis, Services trade is on a balance of payments basis. (b) Balance of payments (BOP) basis

Produced by: Statistics Section Trade and Investment Economics Branch Office of the Chief Economist

Source: <https://www.dfat.gov.au/sites/default/files/australias-goods-services-by-top-25-exports-2019-20.pdf>

Major markets (countries and jurisdictions) for Australia's resources, 2019-20



SECTION THREE

What's the story?

For Australia, the global demand for the raw minerals under Australian soil has been a crucial driver of our economic wellbeing for decades. Major markets for Australian minerals are concentrated in Asia, and the growing wealth of our Asian neighbours has underpinned demand for Australian minerals exports for many years. Despite the heavy challenges from COVID-19, growth in the region remains the picture for the foreseeable future. However, as this report outlines, several geopolitical trends mean patterns are shifting.

There's a lot of news and noise in the geopolitical realm. Here are four interconnected megatrends for cutting through the cacophony. Each of these trends existed before the COVID-19 pandemic, but COVID-19 has exacerbated and accelerated them. Each of these trends has real implications for the Australian minerals sector.



1. THE SYSTEM IS SHIFTING

Structural changes in the international system are creating shifts in power dynamics, as rising and status quo powers jostle for space and influence.

The rising economic power of actors who were not part of the formation of the post-Second World War international system is shifting the locus of power from the North Atlantic, where it has been based for the past seven decades. The desire of these emerging powers for more voice and agency is in some cases posing challenges to the existing norms and structures, and it is not yet clear how the system will be shaped in the future. How status quo powers respond to this shift also affects what happens next.

A key element to this shift is the rising power and role of China on the regional and global stage, and the ongoing strategic competition between China and the United States. At the same time, the European Union is positioning itself as a strong and values-based global actor, protecting stability, and at the forefront of climate action and human rights, not fully aligned with either China or the US. Nations in the Asia-Pacific region are carefully balancing their interests as they negotiate their relationships between the two major actors in the region. Russia is taking advantage of the moment of confusion, and building stronger ties with China, although it is far from an 'alliance'. A number of factors have led to the relationship between Australia and China being at its lowest point in decades, and the trajectory is not positive.



So what?

As the system shifts and re-forms, we will face geopolitical volatility as actors rethink what their interests are, and how best to achieve them. There are many ways in which this systemic shift and volatility matters to the Australian minerals industry. Our exports of iron ore provide a good example of how geopolitics could affect the minerals sector.

Much has been written in recent months about the important role iron ore plays in Australia's economy. As a reliable producer of high-grade ore, Australia is well positioned to be a key global supplier for several years to come; and as Australia's trading partners begin to recover and rebuild from COVID-19, the industry is set to benefit. Indeed, Australian iron ore earnings look set to hit an all-time high in the financial year 2020-21. After reaching the \$100 billion mark in 2019-20, a first for any commodity, in 2020-21, iron ore export earnings are forecast to rise again to \$149 billion, based on strong earnings in January and February.¹³ The high iron ore price is a product of supply and demand, and China is likely to further expand construction throughout 2021, generating continued strong demand for iron ore and maintaining higher prices.

While supply and demand are the key drivers of price on an open market, demand is not removed from geopolitics. Indeed, the volatile geopolitical context means that while Australia's iron ore exports to China are strong now and likely to hold into the immediate future, we should not become complacent about iron ore's role in Australian trade, or as a lynchpin of our relationship with China, over the longer-term.

For the time being, reduced competition from other major iron ore producing nations is working in Australia's favour. Australian iron ore looks to be in a strong position until 2026, where prices are forecast to come down to US\$72 (in real terms). Iron ore output from South America and Africa is expected to increase over this period. At the same time, China is actively investigating several possible alternative sources to diversify its supply.¹⁴

China currently sources 60 percent of its iron ore imports from Australia, however, China is looking to reduce this dependency.¹⁵ In May 2020, major Chinese steelmakers called on their government to increase domestic iron production and invest more into overseas exploration.

In early 2021, China's Ministry of Industry and Information Technology (MIIT) released a draft five-year plan for the steel industry which elevated resource security and reducing dependency on certain suppliers to one of the top six strategic priorities.¹⁶

The Chinese government aims to have China supplying at least 45 percent of its iron ore needs from sources it controls (now at about 30 percent), particularly through scrap steel recycling. China has made large investments in overseas mining projects to generate long-term opportunities for diversification in its supply. As Chinese state-affiliated newspaper, The GlobalTimes, put it in mid-2020:

"It would be a big mistake for anyone to think that despite its dependence on iron ore, China wouldn't cut Australian imports. China will not tolerate further behaviour that touches its bottom line, even if retaliation comes at the expense of its economic interests"

The GlobalTimes, June 2020



“As the bilateral relationship is tense, Australia is not regarded by China as a reliable trading partner. It is necessary for China to remove its reliance on Australian iron ore.”

**Yantai Media Group,
August 2020**

China is actively investigating possible iron ore mines in Africa, including large deposits in Madagascar and Gabon. The most notable prospect on the African continent is the proposed Simandou iron ore mine in Guinea, where deposits are large and of high quality, although the region is relatively remote and far from ports, and challenges exist around complex ownership arrangements. Roadworks and feasibility reviews of port connections and over 600 kilometres of railway are underway. While full output is not expected before 2027, the mine could produce close to 200 million tonnes per year, around 15-20 percent of what is produced in the Pilbara region.

Vale in Brazil is aiming to regain its title of world’s biggest producer, lost to Rio Tinto in the wake of the Brumadinho dam disaster in 2019, and China is investing in infrastructure to assist in shipments from the region. In July 2020, China approved four new deepwater ports on its east coast to host Vale’s supersize Valemax ships, bringing the total to 11. The Valemax vessels can carry up to 400,000 tonnes of iron ore in one shipment, roughly double what Australian ships can carry, and allow Vale to remain competitive with Australian competitors despite longer travel distances. In August 2020, Vale docked its first Valemax ship in Yantai Port. The ports will also be able to handle larger vessels from Africa. Analysts note that it could take 3-5 years before shipments from Brazil and Africa could challenge Australian iron ore exports to China.

For now, Australia is in a very strong position in global iron ore trade. Over the longer-term, however, Australia should not be complacent about its markets for, and competitive advantage in, iron ore production and export. Analyses range from arguing there is no end in sight for China’s need for iron ore,¹⁷ to China actively seeking other prospects as a result of trade tensions with Australia.¹⁸ Exports will remain sensitive to conditions in China, Australia’s primary export market, and any further disruptions due to extreme weather or other external factors, including political unrest, will pose risks to export volumes and iron ore prices.¹⁹

It is impossible to predict with certainty what the future of Australian iron ore will look like. The guiding principle, as with all minerals in this unstable geopolitical environment, should be that all assumptions will need to be constantly tested and updated.

2. DOMESTIC DISCONTENT

The second geopolitical megatrend is a rising sense of anger around the world at real and perceived inequality within countries.²⁰ There is a growing perception among the working and middle classes that the benefits of globalisation and free trade are not 'trickling down' as was promised.²¹ Rather, those in the middle to lower levels of the social and wealth triangle see that the elites at the top are increasing their wealth and privilege, while the average person sees no real improvement to her or his wellbeing. The COVID-19 pandemic is driving increasing levels of inequality. Between 18 March and 31 December 2020, billionaires increased their wealth by \$3.9 trillion, predominantly off the back of stock market returns. Their total wealth now stands at \$11.95 trillion, or the equivalent of what G20 governments have spent in response to the pandemic.²² A growing lack of trust that the status quo elites and ways of doing things will ever make things better is resulting in moves away from the political centre, to the extreme left, the extreme right, to identity politics based on religion or ethnicity, and predicated on an 'us' versus 'them' mindset.

Inequality is growing for more than 70 percent of the global population, exacerbating the risks of divisions and hampering economic and social development.

United Nations Department of Economic and Social Affairs²³

Inequality, or the perception of it, is fertile ground for populist leaders to emerge and thrive.²⁴ Populist leaders draw on sentiments of injustice and marginalisation, and deliberately provoke them further, identifying themselves with the 'us' and eschewing any connection with what they construct as being the untrustworthy and out of touch elite 'other'.²⁵

At the domestic level, being part of the 'us' provides populist leaders with a justification for dismantling democratic checks and balances to power – by definition, populism asserts, the populist leader is one of the people, so checks and balances to her or his power are tantamount to checks and balances on the people themselves. Rule of law, freedom of speech, free media, a strong and vibrant civil society, and freedom of information begin to be deliberately eroded. Populist leaders also tend to equate the rest of the world with 'the other' against which their group needs to be protected. Nationalist sentiments are stoked, and protectionist policies are implemented.

At the international level, populist leaders tend to be sceptical and suspicious of internationalism, multilateralism, openness and free trade.²⁶ Accordingly, populist leaders undermine, or at least do not actively engage in, the norms and institutions that promote engagement and cooperation for global governance, including in trade.

So what?

How do rising inequality, growing discontent, and changing politics matter to the minerals sector? The case of geopolitics and gold.

COVID-19 has had negative impacts on the development progress made over the past 20 years.²⁷ Recovery from COVID-19 is likely to be uneven and ‘k-shaped’, both across and within countries – including in Australia.²⁸ That is, those who were wealthy before the pandemic will become relatively more privileged, and those who were marginalised will become relatively more disadvantaged. Existing inequalities, and inequalities arising from other factors, are set to be intensified. As inequality increases, disillusioned populations turn away from the political centre and look for alternatives, often populist and authoritarian leaders with their associated tendencies for nationalism and protectionism.

Discontent in society extends to responses to the emerging ESG agenda, and how these policies exacerbate inequalities. There is a growing shareholder and consumer focus on environment, good governance, and transparency – lack of trust has increased scrutiny of corporates not just commercially but also grown demand for transparency into sustainability. Having a social license to operate is now a fundamental consideration for businesses, particularly in natural resource sectors, and community engagement has become an important channel for aligning to these agendas in society.

It might seem far away, but growing inequality, citizen anger, and changing politics matters to the Australian minerals industry.

Nationalisation and protectionism of mineral resources is nothing new – in 2011 in Venezuela, all gold mines were nationalised by then-President Hugo Chavez. In 2012, Argentinian President de Kirchner nationalised the privately owned oil company YPF. More recently and closer to home, the government of Papua New Guinea made a surprise announcement not to renew the mining lease of the Porgera gold mine which came as a shock to the mine’s operator, Barrick Gold, and their joint venture partner, Zijin Mining.²⁹ In Indonesia, the populist tendencies of President Joko Widodo (Jokowi) have pushed the country towards protectionism through non-tariff measures, including a ban on raw mineral exports, and the provision of greater authority for ministers to issue intervention and monitoring policies.³⁰

However, the operating assumption in much of Australia has been that the incidences of nationalisation and protectionism are relatively uncommon, and the general trend is towards more free and open trade. This assumption needs to be interrogated, as with growing real and perceived inequality, rising discontent, and more governments moving away from a broadly liberal centrist stance, the likelihood is that the trend will be more towards trade protectionism rather than openness. Again, COVID-19 has exacerbated this existing trend, not only by intensifying inequality, but also through the shock it dealt to long and complex supply chains. At least for the time being, being less reliant on others is looking very appealing. Mining companies have noted that it is not the policy changes as such, but the speed of change, that causes most disruption.³¹

Gold is one of Australia’s key mineral commodities and is highly vulnerable to geopolitical trends as the PNG and Venezuela examples demonstrate. Perhaps like no other mineral, gold has a special place in the Australian psyche. The ‘gold rush’ of the early 1850s was Australia’s first modern mining and economic boom, drawing in people from all over the world who dreamt of making their fortune. Today, gold remains an important element of the Australian economy, our third largest export commodity after iron ore and coal.

In medicine and healthcare, gold nanoparticles are found in Rapid Diagnostic Tests, making gold critical in disease diagnostics around the world. Gold-based drugs treat illnesses such as rheumatoid arthritis, and are being tested for cancer treatment. Implantable electronics to monitor patients' vital signs and warn of potential health problems use gold. In the environmental realm, gold nanoparticles are used in solar cells, and also breaking down contaminants in groundwater. Gold's reflective properties are used in space telescopes, and building insulation. Gold nanotechnology is also being used in touch sensitive screens, and advanced flash memory devices.³²

Around 75 percent of gold supply comes from mines, with recycling making up the difference, the majority of which comes from jewellery (around 90 percent).³³ Around four decades ago, most gold came from South Africa. Today, there are gold mining operations on every continent except Antarctica. The most recent available data shows that China was the largest producer in the world in 2018, with 383.2 tonnes, and accounting for 12 percent of global production. China's production is followed by the Russian Federation with 329.5 tonnes,³⁴ and then Australia, with 325.1 tonnes. Australia has the largest known gold deposits in the world and the industry supports more than 30,000 workers.³⁵

Another key geopolitical issue impacting gold supply is terrorism, particularly in West Africa. As part of the broader global geopolitical trend of citizen dissatisfaction and unrest over real and perceived inequality, corruption and lack of opportunity have exacerbated underlying political and ethnic tensions, undermined trust in government, and left countries in West Africa increasingly vulnerable to terrorist groups.³⁶ In 2019, terrorists attacked an Australian gold mining organisation in Burkina Faso, leaving dozens dead and many more injured.³⁷ The issues driving terrorist activity in that region of the world are not set to be resolved in the immediate future, particularly as COVID-19 exacerbates existing inequalities and undermines poverty reduction.



3. Industrial Revolution 4.0

The third trend is how the growing role of tech, data and cyber is changing not only our daily lives, but also the structures and systems that surround us. Described by some as 'Industrial revolution 4.0', these developments have the very real potential to revolutionise government structures, economies, businesses, and indeed, life as we know it.³⁸ While comparing it to another industrial revolution may seem dramatic, this shift is arguably comparable to the intensity of change brought by steam power, electricity, or computing.³⁹ This tech disruption is highly geopolitical, as technological developments are not only driven by geopolitical competition as the system shifts, but at the same time, our global geopolitics are increasingly being shaped by technological developments. For example, as we transition from fossil fuels to renewable energy, access to the minerals that make renewables run has the potential to reconfigure the map of global political power.

There are several key pressure points in the tech domain with the potential to create crisis. Particularly noteworthy are the increasing threat of cyberattack and the slow pace of cyber governance and regulation, the implications of Artificial Intelligence (AI) and machine learning on employment in already marginalised communities, and the strategic competition over technology between the US and China. All these triggers are set to further intensify as countries begin to emerge from COVID-19.



So what?

How does the combination of technological innovation and strategic competition between the US and China matter to the mineral sector?

The Industrial Revolution 4.0 and what it means for semiconductors and minerals⁴⁰

In the global race for technological pre-eminence, global actors are intensifying their efforts to ensure technological superiority on a global scale.⁴¹ Securing supply of semiconductors is seen as critically important. Many semiconductors either rely on or are in themselves minerals which Australia possesses. Metals such as arsenic, gallium, indium, and the rare earth elements cerium, europium, gadolinium, lanthanum, terbium, and yttrium are important mineral materials used in semiconductor technology. Most of the world's supply of these materials is produced as by-products from the production of aluminium, copper, lead, and zinc.⁴²

Since 2017, when former President Trump declared China a strategic competitor in his administration's first national security strategy, the US has been challenging China's pursuit of technological dominance. China launched its 'Made in China 2025' policy in 2019 aiming to catch up with and then surpass Western technological prowess. The US and other industrialised countries see this strategy not only as a challenge to international trade rules, but also a security risk.⁴³

US President Biden has described semiconductors as being key to the "competition to win the 21st century".⁴⁴ Semiconductors are the fundamental building blocks of our world. We use them in computer chips, which run our smartphones, computers, tablets, cars, washing machines, televisions, LED lights, and indeed, anything that's computerised. Over the past decade, semiconductor manufacturing capabilities have been concentrated among a handful of companies in just a few countries and jurisdictions, including Samsung in South Korea and TSMC in Taiwan. Intel in the US is currently in third place. The most heavily relied upon resource used to produce semiconductors is silicon, 64 percent of which is produced in China, with Russia the next highest producer at 9 percent. Japan produces 7 percent, and the USA, along with Norway, is at 5 percent.⁴⁵

This strong concentration of supply of critical components like silicon and manufacturing of semiconductors in places which the US considers as unreliable partners, if not strategic competitors, creates obvious risks and vulnerabilities to global technology supply chains, and, ultimately, national security interests. On 8 June 2021, the United States' Senate passed a bill with broad bipartisan support to invest USD250 billion into innovation and competition, including the domestic production of semiconductors. This investment has been described by the US Democrats as a response to the current market dominance of foreign competitors, including China, in the production and manufacture of these essential elements.⁴⁶

The developments in semiconductor production competition matter for the Australian economy and Australian industry.

Global demand for semiconductors is increasing. Australia, like anywhere in the world, needs a reliable supply of semiconductors both right now, and as it faces into the future, including in our transition to a net-zero economy. On the one hand, having the US strengthen its semiconductor manufacturing capabilities builds stability and security for us. However, at the same time, the potential for an increasingly decoupled and competitive technology and semiconductor landscape will create considerable uncertainty. In addition to the risk of disruption to global supply chains of products which rely on semiconductors, businesses need to consider what further tech decoupling and an increasingly competitive technological landscape will mean for how the world in which they do business looks and functions.

4. THE CLIMATE CRISIS

While it might not seem like a geopolitical issue at first glance, politics underpin the climate crisis we find ourselves in, and on the flipside, how the climate crisis plays out will certainly have an impact on geopolitics. As Sir David Attenborough noted in an address to G7 leaders in June 2021, the climate crisis is an issue of global security.



Sadly, we are quickly becoming all too familiar with the first order impacts of climate change, that is, the increasing regularity and severity of extreme weather events like droughts, heatwaves, cyclones, and floods. Additionally, climate change gives rise to physical disruptions of delivery of products in key markets. The climate crisis also has flow-on effects that are already powerfully reshaping societies and economies, and the way people live their lives. For example, the effects of climate change mean that many people reliant on farming and agriculture are having to find new livelihoods, leading to displacement and migration, both within and across borders. This is happening to coffee farmers in Guatemala who are seeking to migrate into the United States,⁴⁷ and agricultural workers in Vietnam – where 70 percent of the population relies on the increasingly drought-stricken Mekong River for their living.⁴⁸ This movement of people will only increase into the future, and has worrying implications for internal and cross border conflict, and political instability along the lines of what occurred in Europe with the refugee crisis in 2015.⁴⁹ As permafrost in Siberia and Russia melts and releases long-buried ancient disease-causing bacteria and viruses, pandemics like COVID-19 will become far more common than a one in a hundred years events.⁵⁰ As ice melts in the Arctic, geostrategic competition for control of sea lanes and underwater resources will intensify. Countries' and businesses' current commitments to minimising climate change are so far not nearly enough to prevent these events from occurring.

So what?

This report will examine how the climate crisis matters to the Australian minerals sector, and in particular, the coal industry.

At a business level, Paul Dillinger of Levi Strauss noted that climate change is just as much an issue for business as it is for the Pentagon, and that "anyone with a supply chain is going to be affected." Climate change, including shifts in temperature and rainfall, will have numerous complex impacts on the minerals industry. Climate change will affect infrastructure and equipment, practices around environmental protection and site closures, the health and safety of employees, and the stability and reliability of supply chains and transportation routes. Climate change will impact the supply and cost of critical inputs like energy and water, and will also create new challenges around obtaining and maintaining a social licence to operate.⁵¹ In addition to supply chain disruptions and vulnerabilities, the climate crisis is driving a rapidly accelerating shift away from fossil fuels, including coal. Given the historical importance of coal to the Australian economy, this trend has huge implications for the sector.

Overall, global demand for coal has been trending downwards for several years as part of moves towards renewable energy.⁵² This trend is set to continue. Non-government actors such as investors and companies have shown a strong commitment to acting on climate change.⁵³ For example, significant Australian venture funds have announced new standards for environmentally-conscious investing, which signal a strong move away from companies reliant on thermal coal as an input.⁵⁴ Social license to operate and sustainability initiatives are becoming more closely linked to the ability to access capital, and the financial outcomes of firms across the minerals sector.

As of mid-2021, 189 countries have signed the Paris Agreement to limit their CO₂ emissions. However, some jurisdictions are undertaking to cut carbon emissions faster than others. Numerous governments around the world have enacted climate-targeting policies which will impact the demand for coal over coming decades, including in Australia's biggest coal export markets.⁵⁵ Japan's Ministry of Economy, Trade and Industry has commenced formal regulatory discussions to phase out coal-fired power plants by 2030. This would see coal's share of Japan's energy mix reduce from 32 percent in 2018-19 to 26 percent in 2030-31.⁵⁶ South Korea, the third largest market for Australian

thermal coal,⁵⁷ is attempting to marry environmental energy policy with COVID-19 economic recovery through the 'Green New Deal'.⁵⁸ With a goal of net zero emissions by 2050, implementation of the policy will impact South Korea's coal demand through greater investment in renewable energy sources, phasing out of coal-fired operations and investment in coal resources, and a new carbon tax.⁵⁹ Consumers are increasingly demanding ambitious climate targets, and have high expectations of the mining sector to respond.

As government and societal scrutiny grows in this space, mining businesses must be on the front foot and look at responding with changes in operating models.

Other major global actors are also strongly committed to reducing emissions. The United States has made a dramatic about-face in its attitude to reducing carbon emissions under the Biden-Harris administration. Under the previous administration, the United States had not taken a strong leadership role around establishing net-zero strategies. The Biden-Harris government has pivoted the US' stance. The Leaders' Summit on Climate, hosted by President Biden in April 2021, included an announcement that the United States will reduce emissions by 50-52 percent by 2030 (compared to 2005 levels), transform energy systems and the transport sector, and advance innovation in clean technologies.⁶⁰

China's commitment to net-zero emissions by 2060 has profound implications for Australian coal exports. On the one hand, the International Energy Agency sees coal demand in China continuing to increase in the short term as the country recovers and rebuilds from COVID-19, and in 2021, coal use surpassing the previous 2014 peak to reach the highest ever levels for the country.⁶¹ Some analyses of China's most recent Five-Year Plan (FYP 2021-2025) note the targets outlined are in line with previous trends, and with non-fossil fuel energy targeted to make up 20 percent of China's energy mix, government policies leave considerable room for further expansion in the coal industry.⁶²

At the same time, China has committed to net-zero carbon emissions by 2060, and CO₂ emissions peaking no later than 2030, meaning that increases in energy demand will need to be covered by low-carbon sources. The 2021-2025 FYP signposts China's net-zero transition ambition through a range of binding and indicative development targets. Economic and environmental indicators include reductions in carbon dioxide emissions and energy consumption, as well as improvements to forest coverage and air quality. In addition, China's emissions trading scheme (ETS) could reduce coal's role in power generation to less than 50 percent by 2035 if it adopts more stringent allowance allocation benchmarks for coal-fired units than at present.⁶³

The political will to achieve these goals exists at the highest level. In May 2021, the first meeting of the newly-formed Leading Small Group (LSG) for Peak Carbon and Carbon Neutrality was held. LSGs are highly important mechanisms for ensuring policies are implemented, so

establishing an LSG on carbon is a very strong signal of intent. However, while there is broad agreement in the Chinese government on the goals, there is considerable debate on how to achieve them. For now, coal remains a critical element of the economy.

China traditionally tends to prefer to under-promise and over-achieve in its public targets, and to date, China has not missed any of its climate commitments.⁶⁴ Over the coming years various environmental lobbyists globally will be paying close attention to future policy, and China's progress towards attaining their targets.



Carbon Border Adjustment Mechanisms (CBAM)

While individual countries are committing to reducing emissions, concerns are growing about ‘carbon leakage’, or emissions being shifted to less ambitious jurisdictions, undermining the efforts of high ambition jurisdictions, and the global result overall. The EU is ambitious, aiming to cut emissions by 55 percent by 2030 in comparison with 1990 levels. In order to address its concerns around carbon leakage, the EU is proposing a Carbon Border Adjustment Mechanism (CBAM). An EU CBAM could take a number of forms, including taxes on imports, based on the EU Emissions Trading Scheme, or a new tax charged within the EU and on imports based on the average carbon intensity of certain products.

While the idea of a CBAM has been under discussion for many years, it seems that there is now genuine political will to implement. Aside from the EU, the US, Canada, Japan and the UK are also considering CBAMs.

For Australia, only around 5 percent of total exports are considered Emissions Intensive and Trade Exposed (EITE), but of those, primary metals account for a large majority – 88 percent in 2018-19. Some of these primary metal goods are mainly produced for the export market – 83 percent of alumina and 92 percent of aluminium produced in Australia are exported, worth around \$12 billion annually.

In 2020, 64 percent of aluminium was exported to jurisdictions where carbon prices are in place or under consideration. CBAM can be seen as a potential risk for some Australian exports – and an opportunity for those who decarbonise production methods.

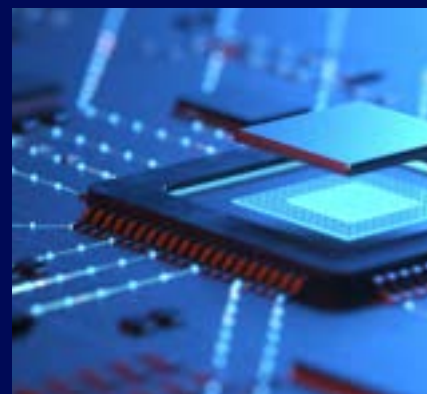
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While Australian coal exports are expected to grow modestly in the short-term, demand in the medium to long-term will be shaped by the rate of uptake of ‘green’ energy policies across the globe, and the pace of transition to these technologies.⁶⁵

Case study:**The geopolitics of rare earths and critical minerals**

Rare earth elements and critical minerals (REEs) provide an illuminating case study of where all these geopolitical trends come together with potentially huge implications not only for the Australian minerals sector, or even the Australian economy, but for the way the world and all its inhabitants live.

What are rare earths?

Rare earth elements are 17 elements which, despite their name, are not actually all that rare in the earth's crust. They are, however, rare in terms of accessibility, as in most places they are not found in sufficient concentrations to support commercial mining operations, meaning it is neither economically nor environmentally feasible to extract and process them. While there are deposits around the world, they are high-cost to develop, and have long lead times – usually around a decade. Additional challenges lie in, for example, the social licence to operate, and environmental, social and governance concerns. For example, protests around who benefits from the mining of rare earths can result in the introduction of high royalties or taxes. Changes in government attitudes to business and resource nationalism can dramatically affect the availability of rare earths.⁶⁶

What are rare earths used for?

Everyone uses rare earths, and demand is growing exponentially. REEs are used for everything from lighting, glass and magnets, to hybrid and electric vehicles, wind turbines, and defence systems. They are critical components of 'industrial revolution 4.0', as they are essential for the production of high-tech applications that underpin, for example, the deployment of 5G, and the development of artificial intelligence (AI). REEs are essential for the transition to carbon neutral economies.

Rapid technological advances, along with the trend towards the decarbonisation of the global economy and corresponding demand for renewable energy creation and storage, are driving a growing demand for REEs and critical minerals around the world. At the same time, substitution and replacements are not readily available.

Demand is also a function of political decisions.

Government policy decisions to subsidise, or alternatively, to not subsidise, industries such as electric vehicles (EVs) affects demand for their production, and for the materials required to build them.⁶⁷

What are critical minerals and what are they used for?

The definition of what counts as a 'critical' mineral is not fixed, and depends on context. Critical minerals are those which are economically and strategically important, crucial for human society, and irreplaceable inputs for technological and industrial development, including renewable energy, telecommunications, and defence technologies. At the same time as being essential, their supply may be at risk due to scarcity, geopolitical issues, trade policy, or other factors. Often appearing on 'critical minerals' lists are: antimony, barite, beryllium, bismuth, cesium, chromium, cobalt, germanium, indium, lithium, manganese, niobium, platinum-group elements (PGE), potash, rare earth elements (REE), rhenium, rubidium, scandium, strontium, tantalum, tellurium, rhenium, tungsten, and vanadium.⁶⁸

What's the geopolitics?

The security of supply chains for REEs and critical minerals has become a global strategic issue.⁶⁹ While REEs and critical minerals are increasingly essential for almost every aspect of daily life, as well as military applications, energy security and national security more broadly, no country is able to be fully self-sufficient. Indeed, at the moment, China's processing capabilities mean that it leads in production and supply. For example China controls around 80 percent of supply of cobalt. China has also invested heavily in rare earth production and supply capabilities outside of China, such that the only significant rare earth mine in which China has not yet invested is Lynas, in Australia.⁷⁰

The United States, among others, is uncomfortable with an over-reliance on their strategic competitor for these essential elements. They include REEs in their list of 'critical minerals', defined as having "a supply chain that is vulnerable to disruption, and that serve an essential function in the manufacture of a product, the absence of which would cause significant economic or security consequence".⁷¹

Recognising this trend, Australia has invested in exploration drilling expenditure through government initiatives such as the \$100 million 'Exploring for the future program'. Its 'economic demonstrated resources' (EDR) of REEs have increased significantly in the past several years. Australia is well positioned to supply not only rare earths, but also cobalt and lithium. It is estimated that Australia has the world's sixth-largest resource of REEs.⁷²

At the same time, Australia needs to be fully cognisant of the risks and challenges to accessing and processing REEs. Mining REEs is environmentally and economically challenging. For example, one of the few manufacturing and processing plants for rare earths outside China is based in Malaysia, where local residents are raising objections to the facility.⁷³ The Olympic Dam site in South Australia is said to hold around 53 million tonnes of rare earth elements, however the owners of the site are choosing not to pursue extraction as they consider it "uneconomic" as technology is not available to ensure the investment to develop would be matched by returns.⁷⁴

In November 2019, Australia and the US formalised a partnership to develop new sources of REEs and critical minerals. The agreement intends to close knowledge gaps, fast track innovation, and allow the development of 'mutual supply and demand arrangements'. Australia launched its Critical Minerals Strategy and opened a Critical Minerals Facilitation Office in January 2020 to help miners secure investment, financing, and market access for relevant projects.

Having high geographic concentrations of REEs, lithium and cobalt, essential for energy security and staying ahead in the technology revolution, concentrated in parts of the world that are not always considered as allies and partners will contribute to shaping the global geopolitical map in the years to come.



So what for the Australian minerals sector?

The story is clear. In this shifting geopolitical environment, the Australian minerals sector is facing dramatic changes. Global power relations will change, different actors with different interests will have more voice on the world stage, including pressing the ESG agenda. As inequality increases, disruption from anger and discontent will grow, and the populist and authoritarian political leaders will not move inexorably towards cooperation and policy convergence. Data will be the new oil, and data requires a whole new range of tech components, which rely on minerals. Automation and artificial intelligence will reconfigure employment, causing many of those who are already marginalised to be even worse off. The same applies for the renewable energy transition. Climate change will cause extreme weather events, and also disruptions and instability in populations, and consumer concern around this is driving demand for strong action from commercial organisations.

All of these shifts matter to the minerals sector. As noted in the introduction:

1. The demand for fossil fuels is decreasing, albeit unevenly;
2. The demand for rare earth elements (REEs) and critical minerals is increasing;
3. Reputation matters: consumer and shareholder focus on ESG and the social licence to operate is growing;
4. Security of supply from trusted partners is of increasing importance.



SECTION FOUR

Strategic steps for the Australian minerals industry to navigate geopolitical risk

The minerals industry has for decades underpinned Australia's prosperity. The growing wealth of our Asian neighbours has spurred demand. However, as this report outlines, several geopolitical trends mean those patterns are shifting. However, as geopolitics and public attitudes shift, the minerals sector must keep up, demonstrating that it has a 'social licence' to operate, that it is fairly distributing its gains, and that it is taking positive action, particularly regarding environmental and social impacts.⁷⁵

Australian minerals companies will be impacted by each of the trends discussed in this report, in different ways. Traditional business models and asset bases will need to be revised, in many cases, dramatically so.

Opportunities exist to improve the minerals sector's preparedness for geopolitical disruption.

It's critical that mining companies are responsive to geopolitical change and proactively pursue growth opportunities by following strategic steps, namely:

Translate the trends

Understand what the uncertain geopolitical environment means for your business. Turn the trends, news stories and insights into tangible, practical considerations that are relevant to your context and will help you to navigate uncertainty in a strategic and responsive way.

Know your exposure

Develop these insights into an assessment of how this will affect your top and bottom line. Model scenarios in your supply chains and gauge whether you can continue to service customers in the same ways as before. Analyse your entire value chain, including impacts to your suppliers and critical stakeholders – gaining a holistic and deep understanding of which parts of your business are most exposed and where you should focus response effort.

Develop your strategy

Form a targeted and proactive strategy that addresses key elements for your business. Factor in both best and worst case scenarios – considering how you will implement change to both your business and operating models. Answer the key questions – can you maintain business as usual? If not, what does your new normal look like? Consider how you can address challenges and uncover new opportunities.

Keep current

Recognise the dynamic nature of geopolitical events and resolve to continually update your strategy to remain responsive to new developments. Keep close to your network – engage with your stakeholders, openly discuss new events, and determine how to proceed in a proportional and considered manner.

KPMG's specialists can support you along this journey – please reach out to the key contacts in this report if you would like to discuss how this applies to your organisation.



SECTION FIVE

What can KPMG do for you?



KPMG is a global consulting, tax and audit business, with offices in over 150 countries worldwide, and coverage across every state in Australia.

Our Australian firm has a number of capabilities which can support you in navigating geopolitics and what this means for your business.



Australia Geopolitics Hub

The Australia Geopolitics Hub (AGH) provides solutions and thought leadership to track and effectively navigate geopolitical complexity and risk. The AGH draws on specialised capabilities across KPMG in Australia and globally to provide tailored and practical roadmaps for success in these uncertain geopolitical times.



Access Asia

Access Asia is KPMG's response to the increasing trade opportunities in the high growth Asian region. We utilise our teams of dedicated specialists to assess opportunities in international markets and build relevant strategies for accessing them.

Understanding and entering international markets is complex, and as such we will tailor our analysis and work to your needs. Our Australian team members have extensive experience of living and working in key Asian markets, enabling us to bring their first-hand knowledge to bear for you.

Endnotes

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