KPMG

Inquiry into Vulnerable Supply Chains

Productivity Commission

KPMG Australia

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Contents

Executive Summary

As a leading professional services firm, KPMG Australia (KPMG) is committed to meeting the requirements of all our stakeholders – not only the organisations we audit and advise, but also employees, governments, regulators and the wider community. We strive to contribute to the debate that is shaping the Australian economy and welcome the opportunity to provide a submission to the Productivity Commission's *Inquiry into Vulnerable Supply Chains* (the Inquiry).

Australia's supply chains proved generally resilient in response to the COVID-19 pandemic, but the experience with COVID-19, following the devastating 2019-20 bushfires has highlighted Australia's potential vulnerability to supply chain disruptions. Panic buying of some goods, notably personal protective equipment, and the imposition of export restrictions on these products by some countries added a degree of urgency to the unfolding situation.

As organisations look to recover from COVID-19, they must adjust their risk assessment approach in order to be better prepared for future business impacts and improve their business resilience. While there are many ways business can identify and manage its supply chain risks, KPMG has deep expertise in supply chain resilience and geopolitics. As these areas are topical and relevant to the inquiry, we have structured our submission to provide the Commission greater insights into how businesses across Australia best manage these risks. We also provide feedback on the Interim Report's framework to identify vulnerable supply chains and explain how policy makers may be able to leverage existing frameworks and dynamic assessment methods active in the private sector to help address geopolitical risk and other disruptive challenges facing supply chains.

KPMG understands that the Productivity Commission's final report will include additional data analysis to identify export markets that might be vulnerable to threats due to natural disasters, geopolitical reasons, or transport disruptions. KPMG looks at risk management practices in the export of higher education and the importance of having a long-term view when it comes to rare earths and critical minerals. In this context, we explore the potential for bilateral critical supply agreements as a measure for governments to secure the supply of critical goods and services in times of global supply disruption.

We would welcome meeting with the Productivity Commission at a future date to discuss our submission and look forward to continuing to contribute to the debate on this important issue.

Yours sincerely,

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ASPAC Head of Supply Chain

KPMG Australia

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Global Leader for Governance, Risk and Assurance Services

KPMG Australia

Background

KPMG is a global network of professional firms providing a full range of services to organisations across a wide range of industries, governments and not-for-profit sectors. We operate in 147 countries and territories and have more than 219,000 people working in member firms around the world. In Australia, KPMG has a long tradition of professionalism and integrity combined with our dynamic approach to advising clients in digital driven world.

Supply Chain & Operations

KPMG Australia's supply chain, strategy and value chain management professionals address crisis response planning, rapid diagnostic assessment for supply and demand risks across operations, scenario analysis and contingency planning. KPMG has expertise in all areas of supply chain operations from strategy and analytics, to supply chain risk, planning and execution, and logistics and distribution. We also have the capabilities to help the integration of tax planning into business operations to help with the potential of minimising expenses and risk, enhancing return on investment, and assisting in driving efficiencies across operations.

Australia Geopolitics Hub

KPMG's Australia Geopolitics Hub (AGH) assists clients and provides 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.

Section 1: KPMG recommendations

Recommendation 1: The framework to identify vulnerable supply chains outlined in the Interim Report is a valuable first step to managing Australia's supply chain risk, however it may benefit from further expert consultation and the inclusion of real time data sets to move it from static to dynamic.

Recommendation 2: The Australian Government could consider support for smaller businesses by introducing a voucher scheme for supply chain risk assessments. This would assist businesses of all sizes to build their resilience capability in order to reduce their vulnerability to supply chain disruptions.

Recommendation 3: The Australian Government consider the creation of frameworks that encourage collaboration so that industries work together and invest in measures to mitigate supply chain risk brought about by accelerated digitisation.

Recommendation 4: Businesses of all sizes should stress test their business continuity plans under all types of duress to better understand where, how and why the supply chain failed but most importantly, to learn from past events like COVID-19. From these learnings, they will define better supply chain strategies to shore up supply certainty and enhance customer fulfilment. Each alternative strategy then needs to be evaluated to ensure cost, customer service, financial impacts and risk factors are all balanced. They should also better understand what new capabilities will be required to protect them into the future.

Recommendation 5: The Australian Government should consider education programs and incentives for geopolitical risk management and country related diversification. By diversifying and managing the risk, Australian businesses will be less vulnerable to geopolitical shocks or disruptions.

Recommendation 6: The Productivity Commission analyse supply chain export risk on a sector basis to take into consideration the diverse nature of risks across Australia's key export sectors, while also considering export sectors such as rare earths that will be a major focus in the longer term.

Recommendation 7: As a key export that contributes to Australia's wellbeing, the higher education sector should focus on greater international student experiences for each target market to address supply chain risk and global competitiveness. The Australian Government could support this initiative by refreshing Australia's national 'Go to Market Strategy', originally published in 2016 under markedly different economic conditions.

Recommendation 8: The Australian Government consider updating Australia's Critical Minerals Strategy 2019 to take into consideration recent supply chain risk and account for opportunities that may be present in the circular economy.

Recommendation 9: The Australian Government consider the benefit of bilateral critical supply agreements as a way of reducing supply chain vulnerability in essential goods and services.

Section 2: KPMG Insights

1 Framework for identifying vulnerable supply chains

KPMG welcomes the Interim Report's framework to identify vulnerable supply chains as a valuable first step to assessing Australia's supply chain risk. KPMG notes the finding that combining imports and production data suggests that the supply of essential goods and services in Australia is not highly susceptible to a short-term disruption to the supply of imported goods. While we may agree to some extent, what the Interim Report does not fully consider are scenarios where several different risks overlay one another and cause a more prolonged disruption. For example, an international supply chain disruption coupled with a natural disaster event disrupting local production.

While the framework is very valuable when developing a snapshot or taking a 'static' audit of Australia's vulnerable supply chains, further value may be realised where data is inputted into a model and a dynamic framework is developed.

Dynamic frameworks allow governments and businesses to take stock of current risk but then leverage the use of big data to proactively predict supply chain risk and disruption and undertake mitigation strategies to avoid disruption and cost. For example, a dynamic tool may flag late deliveries from a certain geographic area and then notify supply chain managers before major disruptions occur. Big data can also dramatically reduce cost in the supply chain, potentially cutting out intermediary facilities if stock arrives packaged for its final destination.

KPMG currently assists clients to address risk and disruptive challenges facing supply chains through several frameworks and tools, including KPMG's Supply Chain Predictor and Dynamic Risk Assessment. An overview of these tools is outlined in the case studies below.

Case study: KPMG Supply Chain Predictor

Businesses are facing increased complexity to manage network, supply, and market risks, from global pandemics to geopolitical events. In order to identify supply chain vulnerabilities and respond sooner to future events, businesses need to look forward and predict disruptions, and enable cross functional rapid scenario planning capability for agile decision making.

KPMG's Supply Chain Predictor[1] helps address risk and disruptive challenges facing supply chains by using a real time digital platform that utilises advanced predictive analytics. The solution provides a digital-twin view of supply chain and operations and combines external and internal data to proactively manage events and risks, enhance/remodel network flows, and empower business planning processes.

[1] *https://home.kpmg/xx/en/home/services/advisory/management-consulting/optimize-your-sector-operations/kpmg-supply-chain-predictor.html*

Supply Chain Predictor functionality provides detailed insight into suppliers, raw materials and products to help understand the impact and risk of forecasted events:

— Ingest and integrate data from company's internal supply chain systems and external data sources showing real time events (Natural Disaster, News Feeds, Geopolitical, Financial, Regulatory, etc.)

— Enables real time predictive analysis of risk events and determines potential supply chain risk exposure

— Enables users to model and simulate cross functional supply chain scenarios to evaluate business impact for making trade-off decisions to avoid or minimize impact (revenue vs. cost vs. service levels)

— Recommends mitigation activities based on financial impact and risk avoidance scenarios through an AI-based logic

When companies anticipate future innovations, adapt to change, and seize valuable opportunities, they can help future proof not only their supply chain but the organisation as a whole. By adopting future proofing as a business-critical strategy, they can significantly improve their performance, enhance their competitive advantage, and contribute more fully to the Australian economy.

Case study: KPMG Dynamic Risk Assessment

Some organisations are adopting a dynamic risk assessment approach to understand the velocity of risks and their influence on each other, as there is an increasing recognition that the traditional approaches of risk management (looking at individual risks across likelihood and severity) are not sufficient to support risk resilience. In the real world, businesses are in the midst of managing a COVID-19 event, comprising of multiple interconnected risks, with significant speed of impacts and a myriad of consequences across corporate objectives.

By adopting a dynamic risk assessment approach business and government can understand the velocity of risks and their influence on each other, and challenge the process for the management of risk to ensure they encapsulate the consideration of risk in the four dimensions of impact, likelihood, connectivity, and velocity.

With so much uncertainty, organisations now more than ever are harnessing the use of technology to assist in the capture and aggregation of information, so that discussions are focused on the major issues or events

KPMG's Dynamic Risk Assessment (DRA)[2] investigates the structure of the whole risk system to understand the connections between risks and the speed at which risk impacts could occur.

[2] *https://home.kpmg/au/en/home/services/audit/dynamic-risk-assessment.html*

DRA provides a four-dimensional and dynamic view of risk to help make better-informed decisions by understanding what can happen when individual risks combine and interact. It also helps to identify the most effective intervention points to reduce the likelihood and severity of risk clusters.

In practice, it is KPMG's experience that no one manages individual risks, itemised on a page, when something goes wrong. Tools outlined in the case studies above seek to manage a series of connected risks that could be faced during an event at the same time. Assessing risk in a dynamic and connected way together with tools like the supply chain predictor supports identifying emerging environmental and organisational specific risks.

Recommendations:

1. The framework to identify vulnerable supply chains outlined in the Interim Report is a valuable first step to managing Australia's supply chain risk, however may benefit from further expert consultation and the inclusion of real time data sets to move it from a static to a dynamic risk assessment.

2 How Australian business can build supply chain resilience

The global COVID-19 challenges have highlighted the importance of a supply chain that can adapt to deal with uncertainty, complexity and fast and dynamic changes. The disruption to trade caught many organisations off guard and most have taken this unprecedented event as an opportunity to reduce uncertainty and performance gaps by designing future supply chains, enabled by digital capabilities – to help better respond and strengthen supply chain management approaches.

KPMG supports the Productivity Commission's finding that risks are best managed by those who have direct incentives to mitigate against them. Firms are primarily responsible for managing risks in their supply chain, and KPMG advises several clients on how to best manage risk given that each strategy has costs, and some will perform better under different types of disruptions.

KPMG's report *Supply Chain's New World Order*[3] explores the evolution of supply chains, and explains that most global supply chains for Australian companies were designed for a different time, around four key international paradigms:

1 Supply chains mirror an accepted belief in the benefits of trade liberalisation, as demonstrated by Australia's advocacy of free trade agreements and support of rules-based institutions such as the World Trade Organisation, and the Organisation of Economic Cooperation and Development.

[3] *https://assets.kpmg/content/dam/kpmg/au/pdf/2020/supply-chain-new-world-order.pdf*

2 These supply chains reflect long-standing labour and cost-of-doing-business differentials that encouraged the offshoring of Australian manufacturing and subsequent sourcing through lowest-cost third-party suppliers.

3 In Australia, off-shoring has allowed Australian manufacturers to leverage foreign tax incentives that can provide advantage and reduce the cost of goods imported into Australia.

4 There has been an assumption that inventory buffering can be used as a primary line of defence against supply risk, based upon historic consumption patterns and the ability to effectively manage long lead times.

From a public policy perspective, Australia's enthusiasm for free trade and the underpinning agreements it has entered into has not, and potentially never will, shield its supply chains through times of global crisis.

Regardless of industry, channel, maturity, or size, there are specific competencies that are critical to building resilient supply chain operating models[4]:

— Leveraging artificial intelligence and big data to establish a robust supply chain resiliency platform

— Incorporating tax optimisation into the footprint analysis

— Defining micro supply chains and applying true segmentation

— Embedding cost-to-serve as the foundational performance metric

— Getting the "make-versus-buy" mix right

— Driving purpose-fit inventory models: asset-light versus asset-heavy strategies

Case study: AgriFood Supply Chain Resilience

A recent report, *Mission Food For Life: AgriFood Supply Chain* Resilience[5], jointly developed by KPMG Australia and Food Agility CRC, seeks to identify and assess the underlying stresses within six significant Australian AgriFood supply chains (grains, horticulture, dairy, red meat, seafood and wine) and the amplified impact that these stresses have on supply chain resilience when shocks occur.

By understanding when, where and how stresses occur, mitigation strategies for industry investment can be identified with the goal of reducing the risks and vulnerabilities which arise in shock scenarios.

The report found that a key focus area for collaboration is the collection, analysis and use of data to inform real-time and predictive decision making across supply chains. Whether in business planning, supply chain forecasting or sustainability, the ability to adopt new systems and platforms to capture and use data effectively will be critical in the future resilience of supply chains. Moving to paperless systems, particularly in transport and distribution, will be essential in driving efficiencies and preparing supply chains for future shock events where access to physical assets is constrained.

[4] *https://assets.kpmg/content/dam/kpmg/au/pdf/2019/future-of-supply-chain-the-road-to-everywhere.pdf*

[5] *https://assets.kpmg/content/dam/kpmg/au/pdf/2020/agrifood-supply-chain-resilience.pdf*

The establishment of data standards and governance frameworks in addition to supporting awareness building will also help improve trust and promote a culture of collaboration where data sharing is encouraged and incentivised. Moving away from siloed technology implementations towards interoperable platforms will be critical in achieving objectives relating to traceability and sustainability in the sector.

Digital and data adoption will itself give rise to new cyber and privacy challenges, creating new vulnerabilities in supply chains. The industry would be prudent to work together and invest in measures to mitigate these risks and review these measures on an ongoing basis as the technology landscape evolves.

While many of Australia's larger businesses have the internal capability or the ability to bring in external expertise to ensure supply chain risk is managed across their business operations, many smaller businesses may not. In addition, the cost of managing risk often outweighs any benefit a smaller company may receive from employing tactics to manage supply chain disruption. One area that could be explored is assistance to small business in managing these risks, potentially through a voucher scheme, direct support to an industry association or CRC (as outlined in the case study above) or tax deductibility arrangement.

Recommendations:

2. The Australian Government could consider support for smaller businesses by introducing a voucher scheme for supply chain risk assessments. This would assist businesses of all sizes to build their resilience capability in order to reduce their vulnerability to supply chain disruptions.
3. The Australian Government consider the creation of frameworks that encourage collaboration so that industries work together and invest in measures to mitigate supply chain risk brought about by accelerated digitisation.
4. Businesses of all sizes should stress test their business continuity plans under all types of duress to better understand where, how and why the supply chain failed but most importantly, to learn from past events like COVID-19. From these learnings, they will define better supply chain strategies to shore up supply certainty and enhance customer fulfilment. Each alternative strategy then needs to be evaluated to ensure cost, customer service, financial impacts and risk factors are all balanced. They should also better understand what new capabilities will be required to protect them into the future.

3 Geopolitical considerations in supply chain resilience

Modern supply chains often rely on inputs from across the globe and can consist of thousands of firms. These economic interdependencies mean that a supply chain is potentially exposed to the many types of shocks that can affect every business, both in Australia and overseas whether they be geopolitical, environmental, economic, societal or infrastructure related. Firm level exposure to these risks depends on the characteristics of supply chains.

Geopolitical stressors can expose the weaknesses of supply chains with too much efficiency and not enough resilience. With the highly unpredictable landscape at present, we are seeing an increase in the speed and depth of these stressors. Pre-COVID-19, there were four main themes underpinning this geopolitical uncertainty.

1 Shifts in the international system's structure and institutions

2 Citizen dissatisfaction, unrest and a concomitant rise in populist politics

3 Rapid and dramatic tech transformation

4 Climate change has the potential to seriously disrupt global supply chains

COVID-19 has exacerbated and accelerated these existing flux trends, with real and tangible impacts to business supply chains.

Shifts in the international system and its institutions, the politicisation of international relations, and a tendency towards self-reliance

There are two high-level trends arising from the fracturing geopolitical landscape. The first is that bilateral and multilateral relations are becoming increasingly politicised and unpredictable. The second, and inextricably interconnected, is that domestic market dynamics may shift towards greater self-reliance. As part of the politicisation of international relations, and aggravated by COVID-19, we see a shift from liberalism to protectionist tendencies. Pre-existing trade tensions are intensifying, tariff and non-tariff barriers are being, or threatened to be, imposed. There is an increased interest in ensuring the stability and continuity of domestic industries in distress. It is now commonplace for governments to be talking in terms of strategic self-sufficiency, on-shore or near-shoring, and stockpiling.

We are also seeing heightened levels of anxiety and concerns around slowdown or shutdown of key suppliers and critical operations, delays in getting inbound and outbound raw materials to production sites and finished goods to market, and challenges around insolvency for upstream partners and key customers. As a result, there is a renewed focus on the adequacy of contingency plans and the long-term sustainability of current strategies.

Increasing domestic discontent is contributing to a rising trend of populism and a political rather than economic policy logic

Widespread disillusionment with globalisation is resulting in a growing mistrust of political and business elites. Populist leaders are taking advantage of discontent with an

anti-elite and anti-pluralist agenda, promoting an inwardly-focused nationalism rather than international engagement and cooperation. Democratic institutions, including free media and the independent judiciary, are often eroded as leaders move national policies towards the extreme left or right to demonstrate their appeal to their domestic power base.

This trend will likely drive more inward-focused policies, less impetus for international cooperation and more unpredictable social and economic policies. We are therefore seeing the potential for rapid changes to the conditions for doing business, with decisions about domestic markets likely to exhibit internal political logic more than global economic logic.

This trend is likely to intensify around many parts of the world, although not all, as a result of COVID-19. The uneven way in which the pandemic is affecting different communities among and within countries is further deepening inequality and poverty. Feelings of mistrust, disillusionment, and alienation from a system which is seen to have failed them will fuel populist leaders' ability to politicise public policy.

Technological transformation is advancing rapidly but not everyone is a winner

Digitisation offers businesses efficiencies and value-creating opportunities, including e-commerce, process automation, data collection and artificial intelligence, which are delivering new ways to engage customers. Technology advances can also strengthen customs controls and reduce compliance risk, enhancing the safety and security of global trade. But there is also great uncertainty over the impacts of technology on job security, national security and commercial governance.

Continued technology transformation will force businesses to consider:

— ways to further optimise each module of their supply chains – processes, communications and regulation – through digitisation (digitisation no longer appears optional and there will be pressure on businesses to innovate and adapt);

— the ability of existing digital infrastructure to cope with severe business disruptions, and ways to continue to uplift capability to meet demand (during COVID-19, remote working and massive service demand tested the limits of many businesses' and governments' ICT infrastructure); and

— how to ensure flexibility in digital infrastructure and investments, should it become increasingly necessary for businesses to adapt to, and bridge, technology divides.

Climate change has the potential to seriously disrupt global supply chains

Already we are experiencing the physical risks associated with extreme weather events like the 2020 bushfires. Resource scarcity, including insufficient potable water supply, already threatens many countries, including Australia. Associated socio-political risks such as mass migration, displacement, health crises, and unrest – including within and across borders – are likely to follow.

Businesses need to consider how climate change impacts the operation of, and changes to, supply chains:

— extreme weather events could shut down critical supply routes and increase the costs of transport and insurance (fires in South East Asia annually disrupt flights and commerce in Singapore and Malaysia, just as major storms in the South China Sea could seriously disrupt shipping);

— changing consumer preferences could drive greater demand for sustainable goods and corporate brands could suffer from failure to address climate responsibilities (the need to embrace more climate friendly products and services could see businesses face great pressure to adapt quickly or lose value); and

— the impact of carbon pricing schemes could drive increasing business costs (this could in turn drive businesses to pivot to greener and more efficient technologies).

Businesses need to develop the capabilities to be able to persist, adapt or transform in a crisis – to be resilient. If businesses can anticipate, prepare for and respond to global trends they will more effectively navigate this less predictable world, and be in a position to capitalise on opportunities. There are several ways business can manage geopolitical risk.

Business can consider conducting a geopolitical stress test to help evaluate the impact of various scenarios on its financial model, business model, and operating model. For example[6]: geopolitical tensions leading to large swings in global currencies, stock markets or commodities or loss of access to key geographic markets.

Business can look at forecasting and monitoring geopolitical risk to keep up with what is changing in the external environment and analyse accordingly. This could be done by deploying the power of big data to monitor public sentiment and policy updates to better anticipate the direction and speed of change[7].

Business can ensure information is getting to the right people: given the speed of change and limited time to react, geopolitical risks could hit multiple parts of a business simultaneously.

Under these conditions, appropriate governance frameworks and risk planning are essential. Geopolitics will manifest as a number of different business risks, which means the type of mitigation strategies a business can employ might sit in workforce planning, cybersecurity, compliance and tax.

Global interconnectedness means that a geographically distant or individually insignificant risk could have hidden systemic significance for businesses. Sometimes, and perhaps increasingly, these shocks will be unavoidable. Robust preparation, including risk profiling, scenario modelling and strategic adaptation strategies, and carefully considered 'plan Bs' (and Cs and Ds), as outlined above, will minimise the potential damage of geopolitical risks to businesses across Australia.

[6] *https://assets.kpmg/content/dam/kpmg/xx/pdf/2018/03/the-ceo-as-chief-geopolitical-officer.pdf*

[7] *https://assets.kpmg/content/dam/kpmg/xx/pdf/2021/02/top-risks-2021-the-bottom-line-for-business.pdf*

Recommendations:

5. The Australian Government should consider education programs and incentives for geopolitical risk management and country related diversification. By diversifying and managing the risk, Australian businesses will be less vulnerable to geopolitical shocks or disruptions.

4 Assessing vulnerable export supply chains

KPMG understands that the Productivity Commission's final report will further examine disruptions to supply chains that can affect exports. The Interim Report finds that there are two main sources of disruptions to exports: disruption to upstream supply chains and disruption to downstream supply chains. The final report will review risk management strategies to deal with these types of disruptions.

While KPMG agrees that export related supply chain disruption would not impact access to Australia's basic essential needs including water, health, communications, energy, logistics, finance, and government – exports generate a significant proportion of Australia's income and support the employment of tens of thousands of Australians. For example, KPMG recently found that the slowdown of new migrants coming into Australia due to COVID-19 border closures would mean that real GDP would be $117 billion lower in 2029-30 on an ongoing basis than it would have been had COVID-19 not triggered a slowdown in immigration[8]. In response, KPMG proposed that the Australian government seek to increase Net Overseas Migration (NOM) by attracting more higher education students given international students are younger than the Australian population as a whole and can be expected to be highly skilled as a result of their educational attainment before and after arriving here.

The impact international education has on other parts of the economy, like population levels, is an example of how fundamental some export industries are to broader living standards and economic growth. Exports of iron ore, coal, natural gas and education are some of the sectors most critical to the Australian economy and should be analysed separately in the final report given their diverse characteristics. For example, the impact of border restrictions on the supply of international students has a very different risk environment than the export of coal. The case study below examines some of the risk mitigation strategies higher education providers can implement to manage supply chain disruption in a post-COVID-19 environment.

Case study: Higher education geopolitical and supply chain risk

Higher education is Australia's third largest export, and the largest service-based export by some margin[9]. In 2019 international education contributed $37.6 billion to the Australian economy and supported over 240,000 jobs[10]. The growth in this sector has

[8] *https://home.kpmg/au/en/home/insights/2020/08/international-students-economic-recovery-growth.html*

[9] *https://assets.kpmg/content/dam/kpmg/xx/pdf/2020/10/future-of-higher-education.pdf*

[10] *https://ministers.dese.gov.au/tehan/international-education-makes-significant-economic-contribution*

been largely driven by favourable 'push' factors, such as a challenging domestic job market for Chinese and Indian students, and 'pull' factors, such as the strong reputation of Australia's education sector as well as other lifestyle factors. These drivers are increasingly subject to geopolitical uncertainty that, if unaddressed, has the potential to severely impact Australia's supply for foreign students.

KPMG's report *Geopolitics and the Australian Higher Education Sector*[11] finds that the so-called 'Golden Ages' of Australia's higher education sector are passing, due primarily to global geopolitical dynamics influencing student choices, and supply shocks such as COVID-19 impacting student movements. How the sector responds to this challenge is of critical importance to Australia's COVID-19 recovery. Universities Australia estimates that the sector's operating revenue fell by 4.9 percent in 2020, resulting in 17,000 job losses and predicts further falls of 5.5 percent in 2021[12]. This impacts the whole Australian economy. The report outlines several key trends currently affecting the supply of foreign students for governments and institutions to consider.

Many Australian universities have become highly dependent on income from international students. The disruption to international travel caused by COVID-19 has highlighted this overdependence with higher education enrolments down 5 percent in 2020[13]. In 2019, China and India represented 50 percent of all international student numbers (China with almost 171,000 students or 33 percent of the population and India with 87,000 students or 17 percent of the population) [14]. Australian higher education providers are highly leveraged and KPMG is encouraging institutions to extend partnerships and alliances to reach new markets and manage their geopolitical risk. Governments also have a role to play in supporting the sector's push for diversification.

The rise in nationalism is having a significant effect on student choices. Foreign students are acutely aware of the attitudes of leaders and populations in the countries where they intend to study, and the rise of nationalism is resulting in a less welcoming sentiment for foreign students. How Australia supports and welcomes its foreign student community is being increasingly scrutinised as other global players in the sector put their case forward as student-friendly destinations. KPMG is recommending higher education providers establish great international student experience (SX) for each target market to address this global competitiveness. Government can support this initiative by refreshing Australia's national 'Go to Market Strategy', originally published in 2016 under markedly different economic conditions[15].

Another area that the Productivity Commission may want to further assess in its final report is the long-term supply chain vulnerability of rare earths. A recent global report from KPMG and Eurasia Group, *Resourcing the Energy Transition: Making the World Go*

[11] *https://home.kpmg/au/en/home/insights/2021/04/geopolitics-and-the-australian-higher-education-sector.html*

[12] *https://www.universitiesaustralia.edu.au/mediaitem/17000-uni-jobs-lost-to-covid-19/*

[13] *https://www.austrade.gov.au/australian/education/education-data/current-data/summaries-and-news*

[14] *https://www.dese.gov.au/higher-education-statistics/resources/2019-section-7-overseas-students*

[15] *https://nsie.dese.gov.au/sites/default/files/docs/national_strategy_for_international_education_2025.pdf*

Round[16], looks at the impact of the energy transition on demand for raw materials in the Energy and Natural Resources sector, and how effective risk and supply chain management can ensure they are a part of a circular economy.

Mined materials are used to construct basic infrastructure to generate, transmit and store power. They enable the production of existing green technologies such as electric vehicles, solar panels, and wind turbines – and the development of new ones to address the urgency of climate change. Further, industries will deploy new technologies to reduce their own emissions making plant redundant sooner thus placing further demand on commodities. This transition highlights an underappreciated risk to the energy transition: the supply of clean energy depends on mined natural resources.

At the very beginning of the energy transition supply chain is the sourcing of metals, minerals and abiotic materials (resources). Therefore, it is necessary to ensure this doesn't turn out to be the weakest link. The key consideration is risk and supply management, since global known reserves are in fact likely enough to meet current projections of demand for many of these resources.

A circular solution to rare earths should be considered as a vital component of any government strategy to ensure ongoing supply of rare earth resources. The redesign of products alongside the reuse, recycling, and repurposing of these resources can relieve some pressure on commodity supplies to meet demand – aiding the rapid pace of the energy transition, transformation of related industries, and reduction in temperature rises globally.

According to the KPMG Report, future supply faces two key risks:

— Increasing Environmental, Social and Governance (ESG) scrutiny – whereby extraction and production will face increasing demands from downstream industries, investors and the public over ESG issues.
— Access issues – whereby access to these 'strategic resources' will be politicised in the name of national security given the centrality of their use to broader economic development and technological innovation, as well as the energy transition.

KPMG's *Resourcing the Energy Transition: Making the World Go Round* report focused on five metals that are expected to experience the greatest growth in demand from energy technologies by 2050: lithium, cobalt, vanadium, indium and graphite, and it is important to ensure that geographical and geopolitical constraints don't bottleneck supply chains. The KPMG report finds that China provides 98 percent of the EU's supply of rare earth elements (REE), Turkey provides 98 percent of the EU's supply of borate, and South Africa provides 71 percent of the EU's needs for platinum and an even higher share of the platinum group metals iridium, rhodium, and ruthenium. The EU relies on single EU companies for its supply of hafnium and strontium.

In recognition of the potential for resource-rich organisations and countries to take control of mineral supply chains, the US, UK, EU, Japan and Australia have all published lists of 'critical' raw materials that are considered "vital to… security and economic

[16] *https://assets.kpmg/content/dam/kpmg/xx/pdf/2021/03/resourcing-the-energy-transition.pdf*

prosperity". As part of a broader strategy to reduce reliance and minimise supply chain risks, these lists consider the centrality of these resources to continued economic development, technological innovation and the energy transition, balanced against potential reserves and reliance on imports.

In this context, Australia is increasingly considered as a politically stable country for the source of rare earths, especially Lithium. Though mined across six continents, the top four global producers are Australia, China, Argentina and Chile. Bolivia holds nearly a quarter of all identified lithium resources globally, however state control and limited mining infrastructure mean that production is largely untapped. Given the critical nature of Lithium production, the Productivity Commission should assess the international implications of a supply chain disruption to rare earth exports like Lithium.

The Australian Government's *Critical Minerals Strategy 2019* outlines the Government's policy framework for our critical minerals market. The strategy finds that much like the EU, Australia may face issues in the longer term accessing rare earths where supply predominately comes from a single country. The strategy also finds that Australia is a highly attractive destination for investment, with competitive advantages across the full spectrum of "technical, capital allocation, and risk considerations, including political and economic stability, technology, training, research and development, environmental and labour standards, and legal and regulatory certainty."[17] Given the heightened geopolitical risk and supply chain disruption that has occurred since the release of the *Critical Minerals Strategy 2019*, KPMG suggests that this report be updated to consider the export and import risks associated with rare earths.

Bilateral critical supply agreements

One area that could be explored further by the Australian Government is the potential for multi-product critical supply agreements. International agreements that reference supply of critical essential products are already commonplace. For example, in June 2020 the Australian and Indian Governments signed a MoU in relation to the supply of critical minerals[18]. The MoU details Australia's future ambition to be the top supplier of cobalt and zircon to India and supply many other critical minerals to India, including antimony, lithium, rare earth elements and tantalum. The bilateral agreement supports the "Make in India" program, and its goal of moving to full electric mobility by 2030. Another example is Australia's bilateral nuclear cooperation (safeguards) agreements, which ensure supply of Uranium for peaceful purposes[19]. Going forward these agreements could include bilateral supply considerations.

Another possibility is to negotiate amendments to existing bilateral Free Trade Agreements (FTAs) to include the supply of vital goods in emergencies. While the provisions would be difficult to enforce in times of global disruption, they could provide

[17] *https://www.industry.gov.au/sites/default/files/2019-03/australias-critical-minerals-strategy-2019.pdf*

[18] *https://www.minister.industry.gov.au/ministers/pitt/media-releases/australia-and-india-sign-critical-minerals-agreement*

[19] *https://www.dfat.gov.au/international-relations/security/non-proliferation-disarmament-arms-control/policies-agreements-treaties/nuclear-cooperation-agreements/Pages/australias-network-of-nuclear-cooperation-agreements*

a justification domestically and to their trading partners for preferential supply to the relevant FTA partner.

While the benefit of such agreements may not have been considered as required a few years ago, there may be greater scope to open these dialogues given the heightened geopolitical tensions, the supply disruptions that have occurred due to the COVID-19 pandemic and the increasing need for countries to access limited deposits of critical minerals.

Recommendations:

6. The Productivity Commission analyse supply chain export risk on a sector basis to take into consideration the diverse natural of risks across Australia's key export sectors, while also considering export sectors such as rare earths that will be a major focus in the longer term.
7. As a key export that contributes to Australia's wellbeing, the higher education sector should focus on greater international student experiences for each target market to address supply chain risk and global competitiveness. The Australian Government could support this initiative by refreshing Australia's national 'Go to Market Strategy', originally published in 2016 under markedly different economic conditions.
8. The Australian Government consider updating *Australia's Critical Minerals Strategy 2019* to take into consideration recent supply chain risk and account for opportunities that may be present in the circular economy.
9. The Australian Government consider the benefit of bilateral critical supply agreements as a way of reducing supply chain vulnerability in essential goods and services.

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