Australian Mining

New frontiers South and East Asia

21

TRADE AGENDA

Minerals Council of Australia

A guide for Australian trade negotiators and mining and METS businesses to leverage trade and investment opportunities in emerging markets across Asia

ABOUT NEW FRONTIERS

New frontiers: South and East Asia is a research study by Mike Adams, Nicolas Brown and Ron Wickes, the partners of Trading Nation Consulting, for the Minerals Council of Australia.

The New Frontiers study will produce a series of reports identifying opportunities and setting out an agenda for Australian trade negotiators and mining and METS businesses to expand trade and investment links with emerging Asian economies.

The Trading Nation Consulting partners are former senior officials of the Department of Foreign Affairs and Trade and the authors of *Trading Nation: Advancing Australia's interests in world markets*, UNSW Press, 2013.

New frontiers

SOUTH AND EAST ASIA

CONTENTS

05	Foreword
07	Executive summary
19	India and ASEAN: An introduction
21	The New Frontiers research project
25	Trade and investment links with Australia
32	Opportunities for future growth and development
41	Generic challenges to doing business
45	Resources nationalism in South-East Asia
47	Measures directly affecting market access for goods
50	Measures directly affecting access for services and investment
54	Priorities for the minerals and METS sectors
60	Recommendations
69	Technical annex
81	Endnotes, references and glossary

Emerging markets across South and East Asia are the new frontiers for Australia's mining and METS sectors.

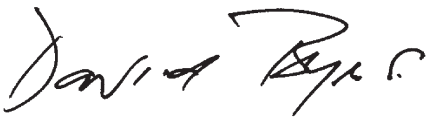
Australia's mining industry has contributed enormously to the nation's prosperity through its export success and international engagement. Asia has been a large part of this story, from the opening up of trade with Japan in the post-war period, which built Australia's export coal industry, to the China resources boom, which kept Australia growing through the Global Financial Crisis. Resources now account for over half of Australia's total exports – and the vast bulk of these are to the countries of Asia.

This story still has a long way to play out. As Asia's economies continue to develop, there will be significant new opportunities for Australian mining. The opportunities lie not only in exporting minerals commodities to new markets but in leveraging the skills, technology and expertise of Australia's world-leading mining industry. There will be scope for Australian mining companies to invest and work with local partners in developing these economies' own resources. And there will be export opportunities for Australia's mining equipment, technology and services (METS) sector.

Realising these benefits will require cooperation and engagement by business and government in Australia and in the region. While the region's economies are committed to open markets, there remains an array of impediments to mining and mining services trade.

Trade agreements have been an important avenue for tackling such barriers from the 1957 Australia-Japan Agreement on Commerce to the 2014 China-Australia Free Trade Agreement. Australia is now engaged in several bilateral and regional trade negotiations. That is why the Minerals Council of Australia has commissioned New Frontiers, a series of research reports by Trading Nation Consulting.

The New Frontiers series will examine the opportunities, identify the impediments and set out a policy agenda for mining and mining services. This first report provides an overview of the extraordinarily dynamic economies of India and South-East Asia. It will be followed by individual country reports conducting stocktakes of trade and other regulatory barriers and making recommendations for Australia's trade negotiators. Reducing and, where possible, eliminating these barriers will help boost Australia's mining and mining services trade and investment with these economies, delivering broad-based economic and social benefits.



David Byers
Interim Chief Executive
Minerals Council of Australia

India and ASEAN are very bright prospects for mining and METS

The New Frontiers research project examines Australia's trade with, and mining-related investment in, India and the member states of the Association of Southeast Asian Nations (ASEAN). These countries are important to Australia's trading and investment future across the mining supply chain. India is one of the brightest prospects for world mining as China's economy matures and slows. And ASEAN is one of the hubs of Asia's economic dynamism and a key market for Australia's resources and mining equipment, technology and services (METS).

India and ASEAN member states are engaged in a range of trade negotiations with Australia. If Australia is to take maximum advantage of new frontiers of opportunity in mining, trade and investment barriers must be reduced and eliminated where possible. An essential first step is for Australian trade negotiators to be fully informed on the most troublesome barriers to extractive mining and METS.

...particularly if trade and investment barriers can be reduced or eliminated.

Trade links with ASEAN and India

India and ASEAN are substantial markets for Australian minerals and basic metal manufactures. Exports to India exceeded $8 billion in 2016, dominated by coal. Copper ores and concentrates, alumina, gold and unwrought lead are also substantial. Trade in minerals has grown appreciably over the past 15 years.

Individual ASEAN markets for minerals and basic metals are much smaller than India's, with the biggest – Malaysia – worth about $2.7 billion in 2016. Coal is an important export to Malaysia, Vietnam and Indonesia. Other minerals and metals are also significant.

Industry survey data point to Indonesia as either the top or second top market for Australian METS firms: at least 140 METS firms export to this market, ranging from big contract miners such as Thiess to providers of specialised equipment and services. Other ASEAN economies also play an important role in METS trade, with Singapore acting as a mining and marketing hub. India presents huge opportunities for METS firms, but difficulties in this market currently limit trade.

India's FDI is burgeoning, but not with Australia

...and Australia's FDI with ASEAN is underweight in mining

Medium to rapid growth in India and ASEAN should lead to soaring demand for Australia's energy, metals and METS

Investment links with ASEAN and India

Burgeoning foreign direct investment (FDI) – both inward and outward – has been integral to India's re-integration with the global economy. The Australia-India direct investment relationship, however, is still very under-developed. India currently accounts for just 0.1 per cent of Australia's cumulative inward FDI and 0.3 per cent of outward FDI, some of which is in mining and METS.

ASEAN accounted for 7 per cent of global inward FDI stocks and 4 per cent of outward FDI in 2016. Most of it – over 60 per cent – involved Singapore, reflecting its role as a major financial hub. Australia accounted for 1.5 per cent of FDI in ASEAN economies in 2016. Inward FDI into Australia from ASEAN ($43.9 billion in 2016) is almost entirely from Singapore and Malaysia.

Australia is underweight in inward and outward ASEAN FDI in mining relative to investment in non-mining sectors and investment in other economies.

Opportunities for growth and development

Medium to rapid growth in the Indian and ASEAN economies will be driven by factors such as population growth, urbanisation, productivity gains, capital accumulation, infrastructure spending and FDI inflows. This will have major implications for mining and METS:

- Demand for energy should soar. Coal will provide about 40-60 per cent of India's energy until 2030 and beyond because it is the cheapest fuel available. ASEAN coal imports also should grow strongly into the 2020s.
- Demand for steel and other metals should surge. As economic development leads to higher incomes, regional demand for metals will increase substantially.
- Effective exploitation of resources promotes long-term development by providing income and jobs and stimulating other areas of the economy. To achieve this, mining operations across India and South-East Asia will need to rely more on advanced mining technologies and services and on international partnerships to improve mining regulation and governance.

India and most ASEAN economies are difficult markets, but the challenges are not insurmountable

Challenges to doing business

Meeting this demand for mining products and METS will not be plain sailing. India and most ASEAN economies are difficult markets. With the exception of Singapore and, to a lesser extent Malaysia and Thailand, these economies present serious challenges for foreign companies wanting to access goods, services and investment markets. They include: opaque regulatory environments, red tape, unpredictable taxation demands, precarious protection of intellectual property, corruption, inadequate infrastructure, low education levels, labour market rigidities, and problems in trading across borders or within a sprawling archipelago such as Indonesia or a massive country such as India.

Resources nationalism is among the barriers mining and METS operators face, especially in South-East Asia

Resources nationalism in South-East Asia

Foreign investment in mining is a vexed policy issue in most countries in South-East Asia. Governments invariably talk about openness to trade and investment and their support for engaging with the globalising world, but there are strong vested interests, particularly in mining, that act as lead weights against reform. Nationalism, protectionism, anti-mining sentiment and environmental activism all come into play. The Philippines is one of the most visible and vocal examples of resources nationalism but Indonesia is not far behind.

Governments invariably talk about openness to trade and investment, but there are strong vested interests that act as lead weights against reform.

ASEAN tariffs are not a major impediment for mining but are a concern for some METS products

Indian tariffs, border fees and charges are a major impediment for mining and METS

Market access barriers for goods: tariffs

Market access for goods into India and ASEAN economies has improved substantially over recent decades. Tariffs have come down dramatically in ASEAN economies, and are now at low levels, particularly for minerals and energy. Indeed, in the case of Australia, ASEAN tariffs have been mostly eliminated on mining commodities (though not on some METS products) under the ASEAN-Australia-New Zealand Free Trade Agreement (AANZFTA) and various bilateral agreements. Exceptions to tariff free treatment vary across countries but include copper cathodes, semi-finished iron and steel products, explosives and detonators, trucks, and various items of electrical machinery and mechanical appliances.

Tariffs also have fallen in India but are still high and provide most – perhaps two-thirds – of the border protection to domestic industry. Tariffs on ores and concentrates are relatively low, but are bound at substantially higher rates (and are unbound for some minerals), meaning in both cases that tariffs can be increased easily. Tariffs on products like coke, unwrought silver and gold, pig iron and ferrous products are in the 5-10 per cent range. And tariffs on products of interest to the METS sector also can be significant.

In addition, a battery of border fees and charges apply cumulatively on top of the basic tariff. These charges typically add over 25 per cent to the landed cost of minerals and around 34 per cent to some METS products. Adding to the complexity is an overall lack of transparency in administrative arrangements.

Tarrifs have fallen in India but are still high and provide most – perhaps two-thirds – of the border protection to domestic industry.

Non-tariff measures have grown as tariffs have fallen. Many are now substantial barriers, especially in ASEAN economies

Non-tariff market access barriers for goods

As tariffs have fallen, non-tariff measures (NTMs) have grown in India and the ASEAN economies to the point, in some cases, of muting the effects of tariff reductions. NTMs become non-tariff barriers (NTBs) if they discriminate against foreign suppliers by increasing the price of imports or otherwise restricting trade. This may happen by design to achieve a protectionist end or because disciplines on transparency and accountability are weak, allowing poorly designed measures to complicate business unnecessarily.

NTBs are especially a problem in ASEAN economies, where they provide the bulk of border protection. Examples include technical barriers (such as product standards), import licensing requirements, export related measures (such as taxes and prohibitions), customs and other regulations and charges, measures related to state trading enterprises, and discriminatory government procurement policies.

Restrictions on trade in services and investment are higher than for goods

Measures affecting access for services and investment

Services restrictions are on average much higher than on goods, and services and investment restrictions in India are generally higher than in most ASEAN economies. India has one of the most restrictive services regimes in the world, including for services that commonly support mining and METS such as engineering, construction, accounting, legal, and computing services.

Restrictions in India are generally higher than in most ASEAN economies

Australian access to services and investment markets in ASEAN economies is generally easier than for Indian markets in part because of some liberalisation under AANZFTA and bilateral trade agreements. But there is still a very long way to go in addressing barriers relevant to mining and METS. The type and severity of restrictions vary from country to country, but often include limits on equity participation, commercial presence to provide cross border services, recognition of professional and vocational qualifications, and movement of people.

RCEP could be central to advancing the trade agenda with India

Strengthening government to business cooperation on mining and energy issues will be key

Minerals and METS sector priorities: India

Australia-India negotiations should target India's tariffs on minerals, metals and METS products; lack of transparency on border fees and charges; growing ingenuity in use of NTBs; high barriers to services trade; and restrictions on movement of personnel. Having flexibility to deploy senior executives and specialised technical and professional personnel to assist in delivering mining projects, investments and services is a high business priority.

Making progress on this agenda may well depend on progress in the negotiations for the Regional Comprehensive Economic Partnership (RCEP). Big FTAs address big structural issues and can move smaller agreements along in their wake. RCEP could form a baseline for progress in Australia-India Comprehensive Economic Cooperation Agreement (AI-CECA) negotiations with no RCEP minus commitments and some RCEP plus commitments. Negotiations to date also should inform the Australian Government's India Economic Strategy.

From an Australian industry perspective, it is critically important that AI-CECA and the India Economic Strategy build on common interests in mining and METS, public sector reform in the resources cluster of industries and related education and upskilling. Strengthening government-to-business cooperation on mining and energy issues, such as high efficiency, low emissions (HELE) coal-fired power stations, could well turn out to be path breaking and a key point of intersection in an enduring and growing Australia-India relationship.

Addressing the imaginative use of NTBs and barriers to services and investment must be a top priority for Australia.

Addressing non-tariff barriers and barriers to services and investment must be a top prioity in negotiations with ASEAN economies

More high level action is needed to address resources nationalism in South-East Asia

Minerals and METS sector priorities: ASEAN

Accelerating the removal of remaining tariffs, especially on goods embodying advanced mining technology, would assist Australian mining and METS companies.

Addressing the imaginative use of NTBs and barriers to services and investment must be a top priority for Australia, especially in Indonesia – a METS high priority market. This should include helping to build institutional and human capacities in the ASEAN minerals sector.

As in India, there is scope for cooperation on HELE coal-fired power technology. There are potentially big opportunities to increase cooperation on policy development in mining, including in promoting trade and investment in resources and energy, and strengthening public private partnerships (including in financing mining and energy projects and infrastructure projects more broadly). And there is a pressing need for building technical and vocational skills in mining. Encouraging technical training in mining and METS should be a priority for RCEP and the AANZFTA Review.

Complementing more cooperation around mining and energy, further high-level policy action by Australia is needed in two key areas. The first is to address resources nationalism in South-East Asia. This will not be easy, but one approach might be for ministers and senior officials to increase emphasis on the health, safety, environmental, efficiency, and broader development benefits of enhanced cooperation in sustainable mining. Another is more carefully targeted public advocacy to convey the message that sustainable mining is a key part of development and that Australia has world-leading skills across the mining value chain.

Recommendations

The following recommendations are put forward to address barriers to extractive mining and METS:

Actively pursue further trade liberalisation and facilitation

- Actively pursue further trade liberalisation and facilitation. Australia has strong interests in maintaining an open rules-based global trading system to achieve further access to export markets and reduce the costs of moving goods and services across international borders. Options should be explored for securing market access gains achieved in Trans Pacific Partnership (TPP) negotiations, notwithstanding the decision by the US Administration to withdraw from this agreement. And RCEP is potentially one of the keys to securing good outcomes in bilateral negotiations and the AANZFTA Review.

Strengthen the analytical foundations for trade negotiations

- Strengthen the analytical foundations of trade negotiations. More analytical work is required to understand why NTMs are proliferating, why many of them become barriers to trade and what can be done to roll them back. Answering some of these questions should help to place NTMs more firmly at the centre of negotiations on merchandise trade. Another pressing analytical challenge is to come to grips with overseas affiliates trade, especially for services. Current ABS statistics on Australia's trade do not adequately capture how businesses operate overseas to deliver services.

Strengthen the narrative on trade reform

- Strengthen the narrative on trade reform. Public attitudes towards international trade and investment are rapidly becoming more negative and suspicious as populist and anti-globalisation sentiment takes a firmer hold on public debate. The debate needs to be rebalanced. This requires both government and business putting a top priority on explaining plainly and simply – and with real world examples – why trade and investment promote growth, jobs and rising living standards.

Make a strong resources sector a sustained trade policy priority

- Make a strong resources sector a sustained trade policy priority. Australia is a mining, energy and mining technology superpower, but this prominence is not reflected in sustained government policies and programs in a comparable way, say, to education and financial services or agriculture and processed foods.

Australia's interests in a strong resources sector could be advanced by: (i) building resources, energy and METS partnerships with India and the countries of South-East Asia; (ii) promoting sustainable production of minerals and metals through APEC (and APEC-linked organisations); and (iii) reinforcing public messaging on the development benefits of sustainable mining.

Assist in building instititional and human capabilities in Asia's mining sectors

- Help to build institutional and human capacities in Asia's mining sector. FTAs contribute to institution building and reform at various levels. RCEP, the AANZFTA Review and Australia's bilateral trade negotiations are an opportunity to contribute to institution building and reform, particularly through provisions on good regulatory practice and economic cooperation.

  Enhanced cooperation in resources and METS is strongly in the interests of Australia, ASEAN and India. Australia has acknowledged skills across the mining value chain and ASEAN and India need to transform their mining and energy sectors to achieve some of their development objectives.

Engage with China's Belt and Road Initiative

- Engage with China's Belt and Road Initiative (BRI). BRI has the potential to shape the Indo-Pacific regional economy and provide further opportunities for Australian engagement in regional infrastructure investment. Australia should build on its Asian Infrastructure Investment Bank membership and leverage commercial skills and capabilities by seeking to participate in BRI projects. Federal and State Governments should work with the Australian infrastructure sector to develop strategies for engaging with Chinese counterparts around BRI.

Explore an Asian Clean Energy Initiative

- Explore an Asian Clean Energy Initiative. Australia should promote and support the creation of an Asian Clean Energy Initiative, either in a building block approach that initially brings together a small number of key regional countries, or on a wider pan-Asian basis.

Australian mining

ECONOMIC CONTRIBUTION

$236.8b

Economic contribution
The value added by the mining and METS sectors to the Australian economy

≃15%

GDP contribution
Mining and METS approximate contribution to Australia's Gross Domestic Product

1.1m

Employment
Around 1 in 10 Australian jobs rely on the mining and METS sectors

Economic contribution by major mining region

KEY
- Economic contribution
- % of regional economic activity
- Full time equivalent

Pilbara	Bowen-Surat	Hunter
$38 billion	$19 billion	$15 billion
88 per cent	63 per cent	34 per cent
93,800 jobs	99,700 jobs	93,600 jobs

Minerals industry royalties and taxes
(A$)

$7.9b

Royalties 2015-16
Up from $2.1 billion in 2004-05

$177b

Taxes and royalties
Paid between 2006-07 and 2015-16

Resources exports: Now and then
(A$ and share of total exports)

$1.5b

In 1971-72
Resources were 26% of total exports

$198b

In 2016-17
Resources were 53% of total exports

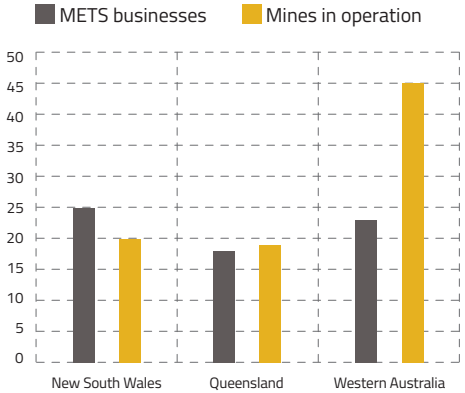
Major METS industries

- Mining support services
- Chemical manufacturing
- Communication services
- Computer systems design
- Equipment manufacturing
- Transportation services

Sources: Deloitte Access Economics, *Mining and METS: Engines of economic growth and prosperity for Australians*, 2017.

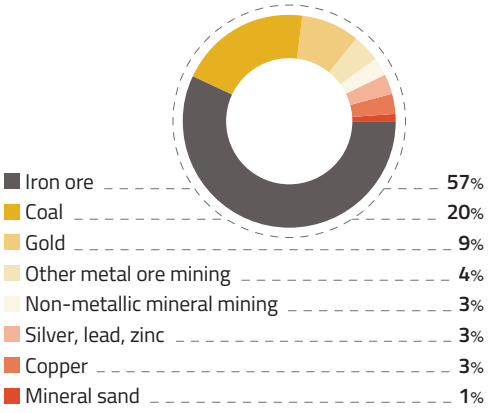
Share of mines and METS businesses

(% share, select states)



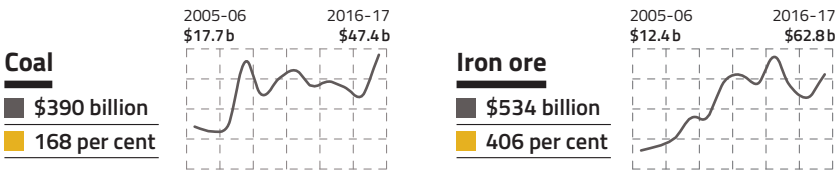
Value added by industry composition

(%, 2014-15)

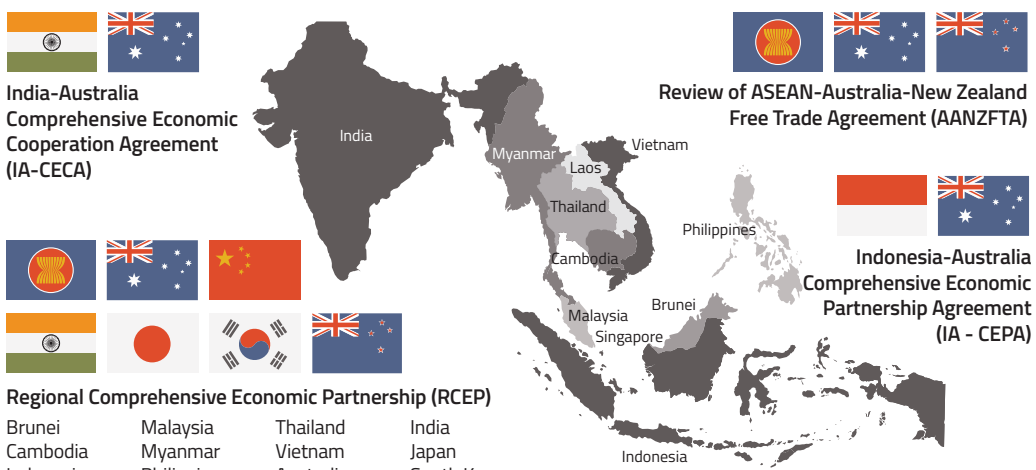


Australian coal and iron ore exports to South and East Asia, 2005-06 to 2016-17

($A)



Trade negotiations underway in South and East Asia



Regional Comprehensive Economic Partnership (RCEP)

Brunei	Malaysia	Thailand	India
Cambodia	Myanmar	Vietnam	Japan
Indonesia	Philippines	Australia	South Korea
Laos	Singapore	China	New Zealand

Sources: Department of Foreign Affairs and Trade; World Bank; Australian Bureau of Statistics; IMF.

India & ASEAN

The Australian minerals industry is, by almost any metric, hugely significant for the Australian economy. The industry contributes about 8 per cent of gross value added by all industries – larger than the share contributed by manufacturing.[1]

It contributes substantially to employment: approximately 230,000 jobs directly in May 2017 and many more indirectly.[2] Employment created in other sectors is appreciably larger than in the mining sector itself because the mining sector is capital intensive. Other sectors supplying it typically require more labour for each dollar of value-added.[3] And it also contributes substantially to tax revenue: the two biggest companies – BHP and Rio Tinto – paid a combined total of around $7 billion to the Commonwealth, State, Territory and local governments in their 2016 reporting periods.[4]

Most mining industry output is exported – almost 90 per cent in the case of the Australian iron ore industry and more than 80 per cent for the coal industry. Defined to include extractive minerals and basic metal manufactures such as iron and steel ingots and unwrought aluminium, copper, lead and zinc, as in this report, mining commodities contribute more than 55 per cent of Australia's merchandise exports. If liquefied natural gas (LNG), crude oil and related products are added, the share rises to more than 65 per cent.

The contribution to Australia of the vast industry that provides mining equipment, technology and services (METS) is not generally as well known as that of mining, even though its contribution is significant. The mining equipment component of the METS sector ranges from explosives and pumps to safety headgear and tyres. The services component can consist of professions and activities as diverse as engineering, law, accounting and education and training. The sector is highly internationalised and operates to a significant extent through commercial presence abroad. Some firms are 'born global', making their way in the global market place from the outset.

Australia's mining and METS sectors make a major contribution to the region and world economy. Cumulative Australian outward foreign direct investment (FDI) to the mining sector was around $92 billion at the end of 2016. Imports of mining goods and METS goods and services from Australia make up a relatively small share of total imports by key economies in the Asia Pacific region, but their contribution is much more significant than raw numbers suggest. In the case of China, for example, the Australian mining and quarrying industry provides about US$11.6 billion in value added to China's

exports. For Japan, the corresponding figure is US$4.7 billion and for Korea, US$7.6 billion.[5] There is a real sense in which the Australian mining and METS sectors have helped to underpin the export-oriented industrialisation of East Asian economies and have played a key role in one of the most profound transformations in economic history.

Growth in some major East Asian minerals markets such as China and Japan has slowed, but the story of Asia's economic development – and of associated growth in demand for minerals, basic metal manufactures and METS – is far from over. India is currently the world's fastest growing major economy and is expected to drive demand for many minerals as it enters its own phase of peak industrialisation. Despite its own substantial resource endowments, Indonesia should become a more important source of demand for minerals as diverse as iron ore, high-quality coal and non-ferrous metals and for mining services. And China's Belt and Road Initiative (BRI) has the potential to add significantly to infrastructure spending in the region and thus to demand for steel, aluminium and the like.

Australia will always, of course, face intense competition for this business from other mining exporters, putting a premium on effective policies by Australian governments at all levels to enable the industry to compete successfully. This includes policies that impact directly on competitiveness, for example taxation and energy costs, and approaches and strategies to improve access to markets for goods, services, investment and skilled workers.

Australia will always face intense competition from other mining exporters, putting a premium on effective policies by Australian governments at all levels to enable the industry to compete successfully.

The New Frontiers research project

This overview report, and the country specific reports that follow in the New Frontiers research project, examine Australia's trade with, and mining-related investment in, India and the member states of the Association of Southeast Asian Nations (ASEAN): Brunei Darussalam, Cambodia, Laos, Indonesia, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam.

These countries have been chosen for this research project because they are important to Australia's trading and investment future across the mining supply chain and beyond:

- After China, India's transformation is the most important economic story in the most recent phase of globalisation. India has the potential to grow sustainably at 5-6 per cent per year for an extended period, making it one of the world's biggest economies by the 2030s. It could well become one of the brightest prospects, perhaps even the brightest prospect, for world mining as China's economy matures and slows – a prospect that could plausibly flow on to METS companies supplying technologies, products and services to assist in modernising India's mining and related sectors.
- And ASEAN – a collaboration between vividly diverse countries in their geographies, levels of development, populations, growth prospects and systems of economic, political and social organisation – is one of the hubs of Asia's economic dynamism and a key market for Australia's resources and METS products and services. Minerals and energy make up well over half of Australia's top 10 merchandise exports to ASEAN, and ASEAN member states are among Australia's principal export markets for minerals.[6] Industry surveys identify Indonesia as the top or second top export market for Australian METS companies and South-East Asia more broadly as a key market along with North and South America.[7]

Continuing growth in India and ASEAN economies should fuel demand for minerals resources, which Australia is well positioned to meet. And continuing structural changes in their economies should fuel demand for expertise, technology, equipment and direct investment as governments and business seek to develop their own environmentally and socially sustainable mining sectors. This has the potential to create new frontiers of opportunity for Australian mining exports and contribute significantly to Australia's economic growth and prosperity.

India and ASEAN member states also have been chosen for this project because they are engaged in trade negotiations with Australia. All participate in negotiations for a Regional Comprehensive Economic Partnership (RCEP), which may feasibly conclude by the end of 2018. Australia and Indonesia are negotiating for an Indonesia-Australia Comprehensive Economic Partnership Agreement (IA-CEPA), which policy makers in both countries expect, ambitiously, to conclude by the end of 2017. And Australia and India are negotiating a Comprehensive Economic Cooperation Agreement (AI-CECA) that is likely to proceed on a slower timetable but is no less important.

If Australia is to take advantage of new frontiers of opportunity in mining, it is essential to tackle trade barriers and other impediments, especially in areas such as services and investment where significant barriers remain. To do this, Australian policy makers and trade negotiators must fully understand the mining sector's strong interest in building comparative advantage in both extractive mining, where Australia's competitiveness is well known, and in METS, where our competitiveness is less widely known. They also arguably need guidance on the most troublesome barriers from an industry perspective.

This report, and the country reports to follow, provide a comprehensive stocktake of trade and investment barriers and restrictions to extractive mining, trade in commodities and trade in mining technology and services. These reports aim to identify the most onerous impediments to trade and investment to enable business to provide specific advice to Australian trade negotiators on impediments and restrictions that are important for mining and METS and, hopefully, have this advice reflected in Australia's negotiating priorities.

Barriers and restrictions

At one level barriers and restrictions associated with the general business environment of particular countries weigh heavily on mining and METS companies. Examples are lack of transparency in dealing with state owned enterprises that dominate resources and essential transport systems, inconsistent tax treatment and overly bureaucratised processes on land use and approvals for mining and setting up businesses.

By and large such impediments are not subject to negotiation in trade agreements, but agreements can contribute to institution building and reform, particularly through provisions on good regulatory practice and through work programs associated with chapters on economic cooperation.

There is nothing prescriptive on the content of economic cooperation provisions: it depends on the ambition and priorities of negotiating parties. But it might cover issues such as how to promote more competitive economies; public-private-academic partnerships; and information flows on minerals exploration, development and value added activities. It also might cover cooperation on sustainable minerals development, new technologies, technology transfer and the health, environment and social benefits of mining, as well as training for mine managers, engineers and project coordinators. The imaginative development of trade agreements that encourage closer institutional ties between Australia and regional partners, broad economic reform and good regulatory practice – including best practice mining regulation – is strongly in Australia's interests.

At another level, there is a range of barriers and restrictions that vary from country to country that can be negotiated directly in trade agreements. In India, for example, tariffs are still a significant problem, especially when they are augmented (as they are) by a series of domestic charges and taxes that may or may not be in line with those borne by domestic companies. In other markets such as Indonesia and Thailand, a mixture of unilateral liberalisation

and the contribution of market-opening through free trade agreements have largely swept away tariffs as barriers to the mining and METS sectors. But, in the well-known analogy to peeling an onion, stripping away some barriers leaves others in their place. In this vein, non-tariff barriers (NTBs) to merchandise trade have become more significant over time.

NTBs are a subset of a wider group of non-tariff measures (NTMs) – any measures apart from tariffs that affect trade in goods. Examples of NTMs are technical requirements that imported products must have certain characteristics or meet certain standards, anti-dumping and safeguard action. While NTMs are often legitimate and can promote trade (as when labelling requirements or standards add to buyer confidence in a product), NTBs can be introduced with the intent of adding to industry protection and can have a chilling effect on trade flows.[8] Econometric evidence using gravity models suggests that their tariff equivalents can be quite significant, though the results vary a good deal from one country to another.[9] NTMs are used widely in India and ASEAN, but the extent to which they become NTBs is often difficult to ascertain.

Barriers to services trade, such as the services provided by the METS sector, are also examined. These barriers are again widespread. Examples relevant to the mining and METS sectors include imposing additional professional standards (for example, for engineers); effectively limiting the practice of certain occupations (such as lawyers and accountants) to local residents; placing restrictions on services provided by

The imaginative development of trade agreements that encourage closer institutional ties between Australia and regional partners, broad economic reform and good regulatory practice is strongly in Australia's interests.

commercial presence in the host economy; and limiting the movement of executives and specialists into the host economy or their period of stay. In schedules of services commitments, commitments for many sectors are often absent or left unbound (meaning that any measures can be introduced to limit market access or national treatment).

Singapore aside, the investment climate in the countries examined in this report is at best challenging and at worst fraught. Barriers to FDI have been bolstered over the past decade by economic nationalism, as well as (to a much lesser extent) by environmental activism. Restrictions can take the form of limits on foreign equity or requirements to achieve majority local ownership over time; obligations to undertake processing and refining of minerals before they are exported; restrictions on foreign ownership of land; and limits on the movement and stay of senior business persons or experts.

There are also impediments to trade and investment that arise from inadequate infrastructure. The physical infrastructure deficit in the region can take various forms – overcrowded ports, roads that cannot bear the passenger and goods traffic using them, the absence of rail links between mines and ports and inadequate telecommunications. The deficit is evident, for example, in Indonesia's sprawling island chain, where about two thirds of Indonesia's trade is carried out through Tanjung Priok Port, which has only recently undergone major extensions, and in India, where shipping coal from Australia can be cheaper than domestic transportation.[10] The inadequacy of regional infrastructure is indicated by the relatively low ranking of many economies on international lists covering key infrastructure performance.

The report only examines direct barriers to minerals and METS trade and investment in each market. Indirect barriers could well turn out to be very significant if the Trump Administration in the United States were to adopt policies along the lines suggested in the 2016 US presidential campaign. For example, steep barriers on Chinese steel and other manufactures could have adverse knock on effects in the short term on a number of regional countries given the importance of the Chinese market to them.

In these circumstances, RCEP would become more important by providing more open regional markets for economies which would otherwise be seriously affected.[11] The Trans-Pacific Partnership (TPP) less the United States could also be important in this context.

Structure of report

This overview report is organised as follows. It examines trade and investment links between Australia, India and ASEAN, and considers opportunities for further growth based on factors such as population growth, urbanisation and economic openness. This is followed by a review of the climate for doing business in the region – specifically the challenges arising from an often unpredictable regulatory environment.

Measures directly affecting market access for goods are examined next. This takes in tariffs on minerals, basic metal manufactures and mining equipment, and non-tariff barriers. Measures directly affecting access for services and investment are reviewed drawing on restrictiveness indexes compiled by the Organisation for Economic Cooperation and Development (OECD) and the World Bank, and on the services, investment and movement of natural persons schedules agreed in the ASEAN-Australia-New Zealand Free Trade Agreement (AANZFTA) and Australia's bilateral agreements with regional countries.

This is followed by a review of priorities for the mining and METS sectors in addressing border and behind-the-border impediments to trade and investment, and later by specific recommendations for addressing these impediments. An annex to the overview report takes up the technical, but important, issue of defining these sectors.[12]

Trade and investment links with Australia

ASEAN and India are sizeable markets for Australia's mining products (Chart 1). India is the larger export market for mining products – considerably larger than any individual market among ASEAN economies. Coal dominates exports to India and is a significant export to a number of ASEAN economies, including Indonesia, despite its own extensive reserves.

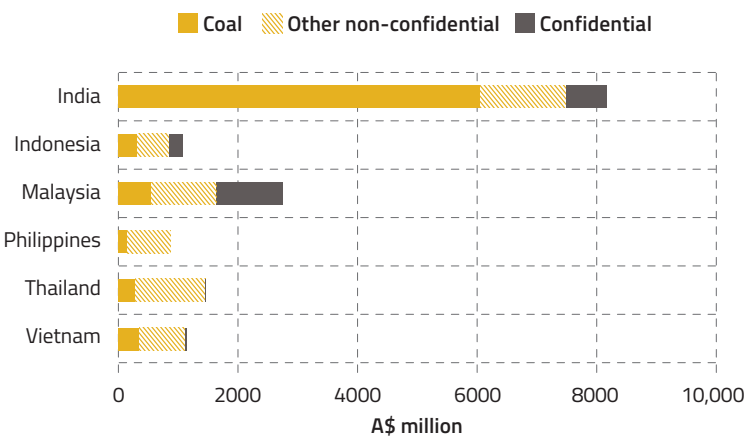
Australia's mining exports both to India and ASEAN are larger than normally thought because of the presence of commodities where the Australian Bureau of Statistics (ABS) restricts the release of trade data (known as confidential items). As indicated in the chart, which includes total confidential mining exports for India and five ASEAN economies estimated from import country data, this is particularly evident for Malaysia, where nickel and nickel alloys and alumina are big items in the trade. Confidential items also were important for Indonesia, where alumina and salt (other than table salt) were significant exports in 2016 and in India, where alumina is an important Australian export.

Minerals (HS 25, 26 and coal as defined in Chart 2) make up most of Australia's mining exports to India and ASEAN. Charts 2 and 3 show export trends since 2000. Coal has dominated exports to India over the past 15 years. Its value has declined appreciably since 2011 in US$ terms, but this reflects changes in unit values, not volume. The tonnage shipped to India in 2016 was a record – almost 60 per cent up on the 2011 volume.

Chart 1

Australian mining exports to India and selected ASEAN countries (2016)

Source: UN Comtrade Database

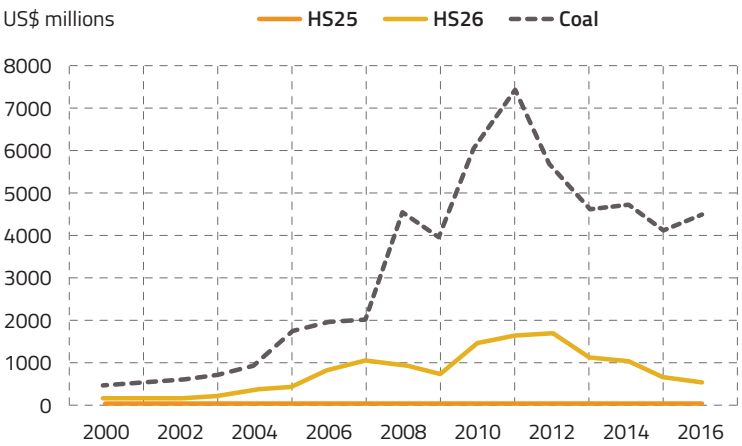


Note: Coal is defined in this chart as Heading 27.01 in the Harmonized System (henceforth HS 27.01) and the total for mining exports is the total as defined in the Technical Annex to this report: it thus covers both minerals and basic metal manufactures. Confidential exports are estimated from the import data of Australia's partner economies, after allowing for freight and insurance costs.

Chart 2

Australian exports of minerals to India

Source: UN Comtrade Database



Note: HS 25 refers to salt; sulphur; earths and stone; plastering materials, lime and cement, while HS 26 consists of mineral ores, slag and ash. Coal is here defined as HS 27.01 and excludes lignite, peat and coke. Confidentiality in ABS statistics affect the totals for HS 26 and HS 25 and this may affect comparisons over time. Comparisons over time should also be undertaken with caution because the HS classification is revised at approximately five-yearly intervals.

In the case of ASEAN, both coal and mineral ores have grown strongly since 2000. Growth in coal exports reflects a number of different trends in member economies, including strong growth over a long period in exports to Malaysia, which is the biggest export market in ASEAN for Australian coal (though the US$ value in 2016 was down on that in 2014); the emergence of Indonesia as a significant market in recent years – virtually no Australian coal went there as late as 2012, but by 2016 Australian exports were valued at US$218 million; and the emergence of Vietnam as a significant market. Vietnam became the second biggest market for Australian coal in ASEAN in 2016.

Growth in US$ values of coal exports in some markets is all the more impressive over recent years because it has occurred along with an appreciable fall in unit values for coal.

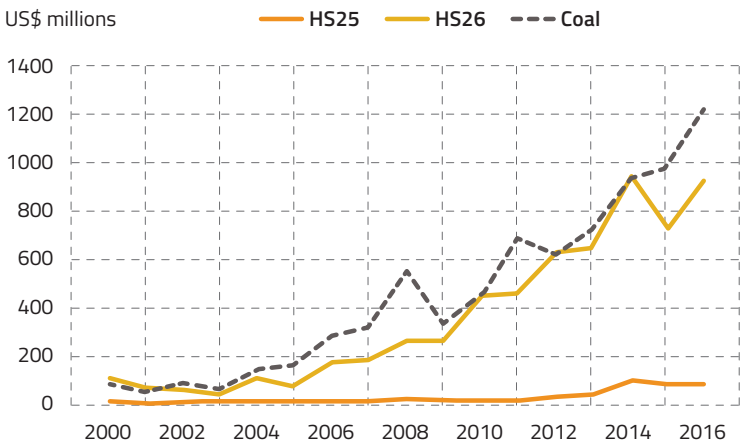
Growth in HS 26 exports (mainly metal ores) to ASEAN economies is a response to four factors:

- Growth over many years (albeit with big annual fluctuations) in Australian exports to the Philippines, which is the biggest Australian market in ASEAN for HS 26 products. This is largely a story about two products – copper ores and concentrates, and precious metal (other than silver) ores, with the latter becoming prominent after 2010.
- The emergence of Indonesia as a big market, with the value of HS 26 exports more than doubling between 2012 and 2016: before 2012, exports were quite limited. This is largely a story about iron ore, where Indonesia's total import market has grown, but where in addition – and more importantly –

Chart 3

Australian exports of minerals to ASEAN 6

Source: UN Comtrade Database



Note: The ASEAN 6 refer to Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam. HS 25 and HS 26 are defined as for the chart on India. Coal is again defined as HS 27.01 and excludes lignite, peat and coke. The qualifications on comparing export levels over time are as for Chart 2.

Australia has gained market share at the expense of Brazil. Between 2012 and 2016, Australia's share of Indonesia's iron ore import market went from under 1 per cent to 68 per cent, while Brazil's declined from 65 per cent to 25 per cent.

- Growth in Malaysia's market, though exports of HS 26 products have fluctuated in recent years and were down on 2011 levels in 2016 in US$ terms.
- Some growth in exports to Singapore and Vietnam.

Metals also are significant in Australia's exports to both India and ASEAN. In the case of exports to ASEAN, basic iron and steel manufactures are modest and dominated by metal waste and scrap, but a range of other metals are significant. Chart 4 looks at two examples: unwrought aluminium and unwrought copper.[13]

Exports grew quite rapidly in US$ terms in the period to 2008 in the case of aluminium, and 2012 in the case of copper. The reasons for growth in the market are not difficult to understand since both are widely used metals in emerging and industrialised economies. Less clear is why there was a significant decline in each export market after the peak was reached.

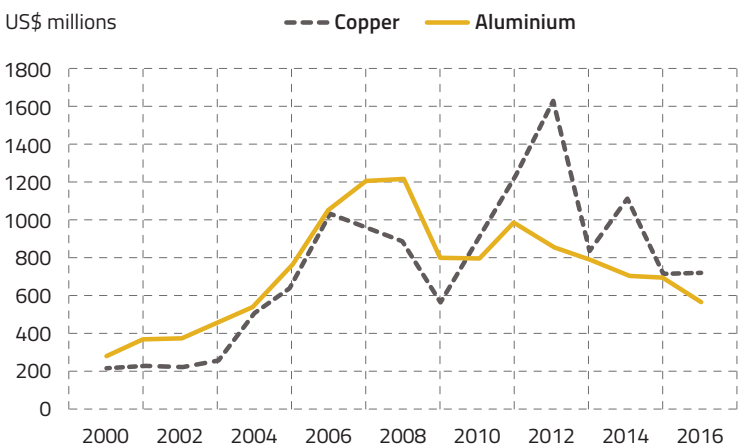
Three factors shaped these outcomes: the overall trend in the volume of metal imports, changes in unit values and changes in Australia's market share.

The examples of Malaysia and Indonesia for copper illustrate these variables at work. Australian copper exports peaked in 2014 for Malaysia and 2012 for Indonesia. The total volumes of metal imported by Malaysia and Indonesia were either about the same or higher in 2016 than they were in the peak

Chart 4

Australian exports of unwrought copper and aluminium to ASEAN 6

Source: UN Comtrade Database



Note: Unwrought aluminium is defined as HS 76.01, while refined copper and copper alloys, unwrought is defined as HS 74.03. ASEAN 6 is as defined previously.

years, but unit values fell along with the US$ value for total imports. Australia's market share also fell quite sharply. In Indonesia, Australia's market share for unwrought copper slumped from 31 per cent in 2012 to less than 8 per cent in 2016. In Malaysia, it fell from 35 per cent in 2014 to 24 per cent in 2016.

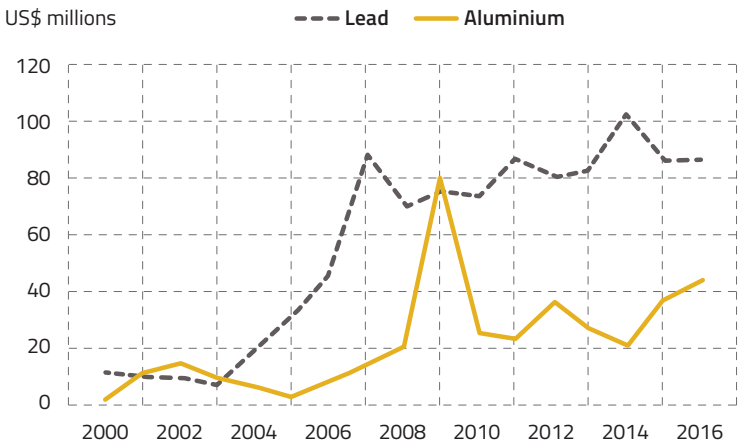
For India, Chart 5 shows trends in two metal exports: unwrought lead and unwrought aluminium. Exports of unwrought lead have been basically flat since 2007 and exports of unwrought aluminium have trended slowly upwards. Australia's exports of unwrought aluminium are only a fraction of those sold to ASEAN and our share of India's import market is very low – about 2 per cent in 2016. In contrast, Australia held about 19 per cent of the Indian market for unwrought lead in that year.

Australia's exports of coal and mineral ores to ASEAN have grown strongly since 2000. Vietnam became the second biggest market for Australian coal in ASEAN in 2016.

Chart 5

Australian exports of unwrought lead and aluminium to India

Source: UN Comtrade Database



Note: Unwrought lead is defined as HS 78.01, while unwrought aluminium is defined as HS 76.01.

Mining equipment, technology and services (METS)

There are no reliable official statistics for METS on the trade and investment relationship with ASEAN economies and India. Australian industry survey data identify Indonesia as the biggest or second biggest export market for Australian METS companies.[14] It is estimated that at least 140 METS firms export equipment, products, services or technology to this market ranging from big contract miners to providers of specialist services. Examples include Thiess and MacMahon Holdings (comprehensive mine-services for large projects), Banlaw (fuel management) and Techenomics (analysis of lubricants for mining machinery). Survey data also suggest that South-East Asia more broadly is a key market for METS along with North and South America.[15]

Over half of METS exporters have affiliates in overseas markets, with Singapore, Malaysia and Thailand identified as the most popular.[16] For example, METS companies take advantage of Singapore's role as a financing and marketing hub for mining companies.[17] Reflecting this, exports of goods to Singapore that could include mining equipment might have exceeded exports to any other ASEAN member state in 2016, including Indonesia, though this depends strongly on definitions.[18] Vietnam is an emerging market for Australian METS companies.[19]

India is a significant METS market, and presents huge opportunities in areas such as training and safety, but problems with tariffs, state owned enterprises and general lack of transparency limit trade.

Direct investment in mining and METS: Australia-India

India was one of the world's top 10 host economies for FDI inflows in 2015 and 2016 and a major source of FDI. [20] Its FDI inward stock has risen from US$16.3 billion in 2000 to US$206 billion 2010 and US$319 billion in 2016 and its outward stock from US$1.8 billion in 2000 to US$97 billion in 2010 and US$144 billion in 2016. India has progressed from having less inward and outward FDI stock in 2000 than Indonesia, Malaysia, Singapore and Thailand to having more in 2016 than any ASEAN member state except Singapore.[21]

These movements provide tangible evidence of India's big strides in re-integrating with the global economy over the last decade or so.[22] The Australia-India direct investment relationship, however, is still very under-developed (Table 1). India is a small market for Australian direct investment, though the amount invested has risen from $0.3 billion in 2009 to $1.3 billion in 2012 and $1.8 billion in 2016. Industries attracting investment include financial services, coal, oil and gas, and metals.[23] India also appears to be an emerging destination for Australian investment in METS, albeit from a very small base.[24]

India's direct investment in Australia also is modest, just $0.9 billion in 2016. This was down from $1.3 billion in 2012 but is a significant improvement on negligible (and not published) levels a decade ago. Investment is noticeable in coal, oil and gas, renewable energy and information technology services.[25]

Table 1

Australia's FDI with India and ASEAN (2016)

Source: DFAT, *International investment Australia 2016*, October 2017

	Inward		Outward	
Country	**$ million**	**% of world**	**$ million**	**% of world**
India	886	0.1	1759	0.3
Indonesia	np	–	6221	1.1
Malaysia	11,407	1.4	5596	1.0
Singapore	31,242	3.9	19,772	3.6
Philippines	5	0.0	973	0.2
Thailand	np	–	1644	0.3
Vietnam	np	–	1550	0.3
ASEAN other (incl. confidential)	1238	–	1994	–
Total ASEAN	**43,892**	**5.5**	**37,750**	**7.4**
World	**796,072**		**554,874**	

Note: 'Per cent of World' refers to percentage of total FDI into Australia from all sources and of Australia's global outward FDI. FDI data on Cambodia, Laos and Myanmar are either not published (np) or not available.[26]

Direct investment in mining and METS: Australia-ASEAN

Seven per cent (US$1.9 trillion) of the global inward FDI stock was invested in ASEAN economies in 2016, most (59 per cent) in Singapore, reflecting its role as a major global and regional financial hub. The European Union, Japan, the United States, China and Hong Kong were the main non-ASEAN sources.[27] Outward FDI stocks from ASEAN were US$1.0 trillion – 4 per cent of the global total. Of this, 68 per cent was sourced from Singapore.[28] ASEAN's shares of both inward and outward stocks of world FDI have risen significantly since 2000.

Australian direct investment in ASEAN is modest. Australia accounted for 1.5 per cent of FDI in ASEAN economies in 2016, equivalent to 7.4 per cent of Australia's total outward FDI. Most (52 per cent) was invested in Singapore followed by Indonesia and Malaysia. The direct investment relationship is significant, however, from the perspective of some ASEAN economies' investment in Australia. Inward FDI into Australia from ASEAN (A$43.9 billion in 2016) is almost entirely from Singapore (71 per cent in 2016) and Malaysia (26 per cent) (Table 1). Australia in fact is one of the leading country destinations for Singaporean and Malaysian outward FDI.

Available evidence on inward and outward ASEAN FDI in mining is sparse but there is enough to show that Australia is underweight relative to investment in non-mining sectors and investment in other economies. Net inflows to mining in ASEAN economies from all sources were US$34 billion from 2012 to 2016 or about 6 per cent of total inflows. Australia's contribution was US$0.3 billion, well behind the European Union (US$6.6 billion), Japan (US$2.5 billion), China (US$2.3 billion), and Singapore (US$1.0 billion). There is little information about investment in METS in ASEAN but it would, most likely, be only a small part of FDI inflows to manufacturing (US$103 billion) and professional services (US$7.6 billion). ASEAN statistics show very small net inflows from Australia in professional services: net inflows were negative for manufacturing.[29]

Australia is underweight relative to investment in non-mining sectors and investment in other economies when it comes to ASEAN foreign direct investment in mining.

ASEAN industry-by-industry data on investment in Australia are also sparse. One indicator –reflecting investors' intentions but not acquisitions – is investment approvals published by the Foreign Investment Review Board (FIRB). Data from 2011-12 to 2015-16 show greatest ASEAN interest in real estate and services. Manufacturing, and especially mining, lagged behind. There was in fact less ASEAN interest in Australian mining projects than from the rest of the world. The value of aggregate approvals for mining investments (including oil and gas) from Singapore and Malaysia was around 3 per cent of their total FIRB approvals, compared with 19 per cent of total approvals for all countries.[30]

Opportunities for future growth and development

As in the past, Australia's prospects in the region will depend on economic growth in key countries and changes in their business environments, and on very specific factors such as changes in per capita consumption of metals and the extent to which sustainable mining practices become more embedded in regional approaches to development. There are potentially big opportunities for Australia to strengthen mining and METS relationships with India and ASEAN economies.

Recent performance

India and the ASEAN economies have, for the most part, undergone a massive economic and social transformation in the last generation or so.

India, with its turbulent democracy, competition between state governments over who can be the most populist, ingrained protectionist instincts and heavily blurred lines between government and the market is now, perhaps incredibly, the fastest growing large economy in the world. Incremental reform has started that should, over time, ease some of the difficulties of doing business in a country notorious for its Byzantine bureaucracy.

The introduction of a national goods and services tax is a major achievement that helps to knit together a genuinely national economy for the first time since Independence. Recent reforms have been significant in strengthening governance, increasing openness to foreign investment and increasing the transparency of the financial system. Collectively they underpin India's rise in global competitiveness over recent years.[31]

It has been similar in ASEAN, although there are vast differences in member economies and societies. ASEAN economies fit into four broad groups from the perspective of openness and economic efficiency. Singapore sits at the top: it is English speaking, market compliance and risks are reasonably transparent and ease of doing business is rated the same as, or better than, Australia.[32] Miners and METS companies are attracted there because it is the obvious regional centre for consolidating previously scattered sales, procurement and distribution activities.[33]

There are potentially big opportunities for Australia to strengthen mining and METS relationships with India and ASEAN economies.

Then come Malaysia and Thailand, both top 10 markets for Australia and, in Malaysia's case, a significant destination for outward direct investment. Then come the difficult markets of Indonesia, the Philippines and Vietnam, which are also major trading partners and have the potential to become more important partners, particularly in the case of Indonesia and Vietnam. And finally there are the difficult and under-developed markets of Cambodia, Laos and Myanmar.[34] In almost all of these economies, growth has been solid to rapid, though India has grown significantly faster than ASEAN as a whole in the period since 2000 (Table 2).

Table 2

ASEAN and India: Growth rates in GDP (2000-16)

Source: IMF, World Economic Outlook Database, October 2017

	2000-07	2007-14	2015	2016
Brunei Darussalam	21	-0.2	-0.4	-2.5
Cambodia	9.7	5.9	7.2	7.0
Indonesia	5.1	5.9	4.9	5.0
Lao P.D.R.	6.9	7.8	7.3	7.0
Malaysia	5.0	4.6	5.0	4.2
Myanmar	12.8	6.2	7.0	6.1
Philippines	5.0	5.2	6.1	6.9
Singapore	6.0	4.9	1.9	2.0
Thailand	5.4	2.9	2.9	3.2
Vietnam	7.3	5.8	6.7	6.2
ASEAN 5	5.3	5.0	4.9	4.9
India	7.5	6.9	8.0	7.1

Note: Data are compound annual growth rates. ASEAN 5 here refers to Indonesia, Malaysia, the Philippines, Thailand and Vietnam. The growth rates for ASEAN 5 reflect weightings by GDP at purchasing power parity.

Growth prospects

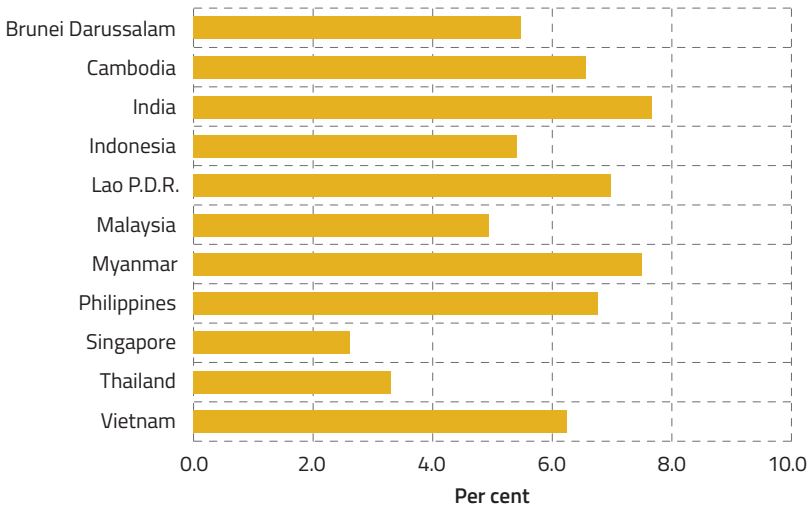
Prospects for continuing moderate-to-strong economic growth appear to be excellent for India and ASEAN economies in the medium term. ASEAN's economies are forecast to grow at a weighted average of around 5 per cent per year in the period to the early 2020s: faster growth is expected in the less developed economies of Cambodia, Laos, Myanmar and Vietnam with their strong catch up potential; moderate growth is expected in Thailand; and the slowest growth – between 2 and 4 per cent – in Singapore.[35] Beyond that, there are expectations that the ASEAN region will continue to grow briskly. The ASEAN Master Plan on ASEAN connectivity projects that the regional economy could possibly triple in size between 2015 and 2040.[36]

As in the recent past, India's economy is expected to grow faster than even the fastest growing less developed members of ASEAN over the next few years (Chart 6). And beyond this there is potential for India to become a top three economy based on GDP at purchasing power parity by 2030 and even a top two economy behind China by 2050.[37] India has substantial room for catch-up growth as resources shift from

Chart 6

ASEAN and India: Growth outlook to 2022

Source: IMF, World Economic Outlook Database, October 2017



Note: Data are compound annual GDP growth rates for 2016-22. 2016 data for Brunei Darussalam and Cambodia are estimated.

low productivity sectors such as agriculture into manufacturing and services and as opportunities are diffused via more open markets for goods, services and investment. But as in the case of ASEAN, realising these opportunities will continue to depend in large measure on maintaining good macroeconomic fundamentals, reforming product and labour markets, replenishing manifestly inadequate hard infrastructure and lifting investment in education and skills to benefit from the youth dividend. To some extent, it will depend on changes in investment sentiment linked to changes in international financial conditions and the degree of openness in major international markets: both India and ASEAN economies are major recipients of FDI (Table 3). And it certainly will depend on avoiding prolonged political and economic instability in a region that is heavily contested by the great powers and riven by deep seated animosities between regional parties.

Without being tied to specific forecasts, moderate-to-rapid growth in the Indian and ASEAN economies over the medium-to-long term will be driven by the following factors:

- Population, on the whole, is expected to increase strongly.[38] This will keep the workforce relatively young while upskilling will increase its quality. Equipping some of the world's largest workforces with relevant skills will be challenging – currently the bulk of ASEAN and India's population has barely primary level

Table 3

Stock of inward FDI into ASEAN and India

UNCTAD, *World Investment Report 2017: Investment and the Digital Economy*, United Nations, Geneva, 2017, pp. 226-229

	Value, US$ millions			Share, %		
	2000	**2010**	**2016**	**2000**	**2010**	**2016**
Brunei Darussalam	3868	4140	5739	0.05	0.02	0.02
Cambodia	1580	6162	16,656	0.02	0.03	0.06
Indonesia	25,060	160,735	234,961	0.33	0.79	0.88
Lao P.D.R.	588	1888	5639	0.01	0.01	0.02
Malaysia	52,747	101,620	121,621	0.70	0.50	0.46
Myanmar	3752	14,507	22,666	0.05	0.07	0.08
Philippines	13,762	25,896	64,249	0.18	0.13	0.24
Singapore	110,570	632,760	1,096,320	1.48	3.13	4.10
Thailand	30,944	139,286	188,651	0.41	0.69	0.71
Vietnam	14,730	57,004	115,391	0.20	0.28	0.43
ASEAN	257,601	1,143,998	1,871,893	3.44	5.65	7.00
India	16,339	205,580	318,502	0.22	1.02	1.19
World	7,489,631	20,244,875	26,728,256	100.00	100.00	100.00

Note: A number of entries for value are UNCTAD Secretariat estimates.

education and a significant minority has none – but the dividends from managing this effectively would be massive.

- Urbanisation is occurring quickly from a relatively low base compared with other developing regions such as Latin America. In India, the urban population is estimated to increase by around 400 million in the period to 2050.[39] In ASEAN member states, an additional 90 million people are forecast to move into cities and large towns by 2030.[40] In the normal course of events, these transformations are linked to the growth of the middle class defined in broad terms as those with significant disposable income. Urbanisation in turn will be linked to growth of services, which are important in their own right and central to facilitating global and regional value chains and enhancing participation of micro-, small- and medium-sized enterprises in those chains.
- In at least some of the economies being reviewed, growth will be driven by high rates of investment underpinned by strong national savings. India is expected by IMF Staff to invest about 30 per cent of its GDP out to 2022 and Indonesia around 34 per cent.[41]
- Government spending on infrastructure is increasing to address major historical

deficiencies, support urbanisation and industrialisation and create the energy, transport and communications capabilities required by a growing, more integrated regional economy.[42]

- Large inflows of foreign direct investment into manufacturing, finance, infrastructure and other services will continue to support growth. Recent flows into India have been especially strong. High per capita income Singapore provides opportunities in finance, high technology services and regional headquarters: about 60 per cent of large-scale ASEAN infrastructure financing is done via Singaporean companies using their business networks and platforms throughout South-East Asia and capacity to provide high-level services at each stage of the value chain.[43] Middle income countries such as Malaysia and Thailand provide access to the expanding middle class market and big infrastructure contracts, while low income countries provide opportunities in infrastructure, supply chain trade and resources.[44]
- Mega-regional trade and investment initiatives such as the ASEAN Economic Community (launched at the end of 2015), the Trans Pacific Partnership Agreement (if revived), Regional Comprehensive Economic Partnership negotiations (expected to be concluded by late 2018), and the Belt and Road Initiative (BRI) should have a stimulatory effect on regional economic growth.[45] These initiatives are complementary, combining rules for trade and investment, opportunities to deepen infrastructure and preferential access to key markets around the Asia-Pacific region.[46] They should increase exposure to trade and reinforce links between proximate economies and links more generally across the Asia-Pacific region.

Implications for mining and METS

So what, in broad terms, are the implications of expected significant, sustained economic growth in India and the ASEAN economies for minerals and energy and METS? Three things stand out.

The first is soaring demand for energy. According to the International Energy Agency, energy demand in India could more than double in the period to 2040, propelled by an economy that will be substantially larger and by demographic expansion that will soon make India the world's most populous country.[47] Coal supplies more than half of all Indian power stations. Under any plausible scenario, coal will provide about 40-60 per cent of India's energy until 2030 and beyond because it is the cheapest fuel available.[48]

India has the world's third largest coal reserves but has become a net importer of coal. The Indian government wants to boost domestic production but faces intractable problems in acquiring land and streamlining approvals processes, and arguably forging partnerships with global resources companies to access advanced technology and skills. Furthermore, India's railway system is inadequate for hauling domestically produced coal over long distances from mines to power stations. Imports of coal are likely to be boosted further by India's shift towards high efficiency, low emissions (HELE) coal-fired power stations. This should boost demand for high quality coal, which is in short supply in India.[49]

In addition to coal, India is a potentially important market for uranium. India's installed nuclear power generation is likely to increase at the second fastest rate in the world behind China in the decades to 2040.[50] With limited, low grade and geographically remote domestic sources of uranium, India will need to increase its reliance on imports.

Demand for energy also is soaring in ASEAN member economies. Over recent years, regional demand for power has driven demand for coal, even in gas producing countries such as Thailand and Malaysia. Power availability has increased massively, yet still over 100 million people in ASEAN, or roughly one sixth of the population, are without electricity and many more have low usage, particularly in Indonesia, the Philippines, Laos, Cambodia and Myanmar. Additional new coal-fired capacity is under construction on a massive scale – with Indonesia and Vietnam taking the lead – and this should underpin strong growth in regional coal imports: imports could surge from around 75Mt in 2015 to possibly 140Mt by 2020.[51]

Strong import growth among ASEAN member economies could continue through the 2020s, though this assessment is sensitive to any changes in planned energy mixes in the light of Paris climate change commitments, as well as to possible changes in domestic and export priorities for Indonesian thermal coal. A plausible scenario for coal imports is that they increase in the 2020s but at a slower pace than in the previous decade:

> Despite the scale back, coal still dominates the targeted additional capacity, followed by natural gas, hydropower, and other renewables. The planned large increase in renewables (including hydro), together with the adoption of clean coal technologies, allow South-East Asian nations to reconcile a growing coal consumption with national commitments to reduce their carbon intensity compared with business-as-usual.[52]

Another plausible scenario is that newly developed coal technology will be deployed increasingly across South-East Asia to improve air quality in major cities and engineer deep cuts in emissions. If correct, this suggests substantially more investment in super critical and ultra-supercritical power plants, which operate at higher temperatures and air pressure than subcritical plants to more rapidly convert water to steam, significantly improving efficiency and reducing emissions per unit of electricity generated.[53] Malaysia was the first regional country to commission an ultra-super-critical plant in 2015. It will also provide impetus for carbon capture and storage technology (CCS), though its deployment will depend on affordability – and therefore on international progress in developing the technology – and possibly on aid-related transfers. Australian business would have an obvious interest in participating in these initiatives, as well as in planned regional energy infrastructure projects such as the ASEAN Power Grid, the Trans-ASEAN Gas Pipeline and initiatives to reduce energy intensity and increase the share of renewables in ASEAN's energy mix.

A second set of implications for minerals and METS from sustained economic growth in India and ASEAN member states relate to demand for steel and other metals.

Demand should surge. The relationship between rising per capita incomes and per capita consumption of metals is well known. Demand increases dramatically as economies reach per capita incomes of US$5,000-10,000: this is commonly linked to rapid urbanisation and the take-off of heavy industrial development.[54] Thailand is within this income band and countries such as India, Indonesia, the Philippines and Vietnam have the potential to move into it in the next few years. It will take longer in Cambodia, Laos and Myanmar. Metals utilisation is low in India and in several ASEAN economies. This is illustrated for steel in Table 4, but it also applies to other metals such as copper and to late development commodity-cycle metals

Table 4

True steel use per capita: India, ASEAN and selected countries/regions (2015)

Source: World Steel Association, *Steel Statistical YearBook 2016*

Country/grouping	Crude steel (kg)
India	58.0
Indonesia	62.2
Malaysia	354.5
Philippines	74.3
Singapore	757.5
Thailand	229.2
Vietnam	164.5
Africa	60.1
China	478.8
European Union	271.0

Note: True steel use is obtained by adjusting apparent steel use for net steel exports.

such as nickel. As economic development leads to higher incomes, it seems likely that regional demand for metals will increase substantially over the medium-to-long term.

Managing India's increasing urban population successfully will require massive investment, and huge amounts of steel to construct housing, infrastructure and factories, and to upgrade the antiquated railway system.[55] Indian steel production is projected to increase by as much as threefold by the early 2030s. This will add further to India's standing as a major import market for metallurgical coal: India ranks alongside China and Japan as a market for Australian metallurgical coal and is well ahead of markets such as South Korea and Taiwan. An uncertain outlook for domestic iron ore production in India – there are problems with access to land, access to rail transport and political pressures in some quarters to cap the domestic price of iron ore – could also result in India emerging as a significant import market for iron ore. Urbanisation and modernisation is also set to flow through to increased demand for other key commodities such as copper.

In the case of the ASEAN economies, much of the rising demand for metals will be met from increased domestic metal production using locally mined ores – a feasible option for some economies given the region's rich resource base – though, depending on relative costs and policy constraints, part should be met from increased imports.[56] Brazil currently supplies significant volumes of iron ore to countries such as Malaysia and the Philippines. If their steel industries

grow, it would seem compelling for Australian companies to become more active in marketing iron ore and metallurgical coal through South-East Asia. And it would seem feasible, given ASEAN's 'generally underdeveloped and fragmented' steel industry, that some South-East Asian countries will continue to rely on Japan and Korea to supply their requirements for premium steels used in manufacturing products such as autos and white goods. As neither country has significant domestic supplies of metallurgical coal or iron ore, Australian companies could have additional export opportunities in these North-East Asian markets.[57]

And third, the fundamental importance of secure supplies of minerals and energy for sustained development requires regional countries to focus on how mining and METS fits into their overall development strategies.

The importance of mining varies considerably across India and ASEAN members: it is strongest in India, Myanmar, the Philippines, Laos, and Indonesia, and weakest in Singapore, Brunei Darussalam and Cambodia (Table 5). But even where there is least mining, industry players are active: Singapore, as previously mentioned, plays a major regional role in facilitating and channelling investment flows into mining projects. It also is a marketing and servicing hub for miners and many METS companies.

Effective exploitation of resources can promote long-term development by providing income and jobs, stimulating other areas of the economy though multiplier effects on non-mining income and effective demand, introducing new skills and training possibilities, and generating government revenue that can be used for wider social and economic purposes. To achieve these positive outcomes, mining operations across India and South-East Asia will need to rely more on advanced mining technologies and services. Core requirements may well be similar in both sets of countries.

In India, for example, import demand for METS could rise strongly, though with significant downside risks relating to India's difficult business environment. India has both rich mineral resources and a reputation for missed production targets that exacerbate problems in the power sector, industries such as steel and even industries such as electronics that would benefit from efficient development of India's significant rare earth deposits: global demand for rare earths should increase strongly over coming decades with growing use of clean energy technologies.[58] The Indian Government realises that it must modernise the mining sector to produce the resources and energy required to sustain economic growth, reduce poverty and create jobs, as well as to lift safety standards and improve environmental outcomes. To do this, India needs advanced technology and services – specialised mining equipment, engineering services, training at a high level, partnerships in research and development, partnerships in using and developing mining-related information technology, and mining-related consulting, management, legal and accounting services.

Another element could be the need for effective mining regulation and governance.[59] In the case of ASEAN, for example, governments have agreed in broad terms to promote environmentally

Table 5

Mining Contribution Index (MCI): India and ASEAN member states (2016)

Source: International Council on Mining and Minerals, *The role of mining in national economies: mining contribution index,* 3rd ed., supplement

Country	2016 MCI Rank (out of 183)	Metallic mineral, metals & coal export contribution (% of exports)	Metallic mineral & coal production value 2014 (% of GDP)	Mineral rent 2014 (% of GDP)
India	68	11.7	2.2	0.65
Myanmar	25	19.7	1.9	0.30
Philippines	26	7.7	2.8	1.92
Lao P.D.R.	42	29.7	12.0	8.96
Indonesia	58	17.5	3.1	0.83
Malaysia	72	3.1	0.3	0.27
Vietnam	96	1.8	3.1	0.35
Thailand	113	3.8	0.1	0.05
Singapore	164	0.5	–	0.00
Brunei Darussalam	167	0.5	–	0.00
Cambodia	182	2.1	0.0	0.00

Note: The MCI provides an indication of the relative importance of mining in the economic life of a given country. Ranking is out of 183 economies. Metallic mineral and coal production value is based on a dataset that includes metals, coal, feldspar, phosphate rock, salt, and sulphur. Mineral rent as percentage of GDP represents loosely aggregated potential tax and profit flows from mining.

and socially sustainable mining and work to strengthen institutional and human capacities in the minerals sector across exploration, extraction, processing and rehabilitation, and across policy development covering policy formulation and institutional and regulatory frameworks for mining.

ASEAN governments also have agreed that securing good outcomes will depend on building partnerships with the private sector and research communities and have singled out the importance of international partnerships in scientific and technological research in minerals, geosciences and geological mapping.[60]

What this might mean in practice needs careful testing, but it is significant that countries such as Vietnam are moving to map available resources more comprehensively and access and build expertise to develop them (including safety and sustainability aspects). All things being equal, these sorts of strategies should increase demand for mining-related products and services and provide scope for broad-based international engagement.

Generic challenges to doing business

India and most ASEAN economies are difficult markets in which to do business, whether for local or international firms. With the exception of Singapore and, to a lesser extent Malaysia and Thailand, all of these economies present serious and, in the main, similar challenges for foreign companies wanting to access goods, services and investment markets. Frequently cited concerns include opaque and unpredictable regulatory environments, strangling red tape, unpredictable taxation demands, precarious protection of intellectual property, corruption, inadequate infrastructure, low education levels and poor workforce standards, labour market rigidities, and problems in trading across borders or within a sprawling archipelago such as Indonesia or massive country such as India.

In the case of Indonesia, the three biggest problems raised by its business executives surveyed by the World Economic Forum were corruption, inefficient government bureaucracy and inadequate infrastructure.[61] Problems with economic nationalism and resources security also are becoming pressing (see pp. 45-47).

In the case of India, the business environment is becoming more challenging in the resources sector where most assets are owned or controlled by inefficient, subsidised and highly protected state owned enterprises (SOEs), or by Indian companies favoured by government entities. Security of minerals leases is not guaranteed, especially following successful minerals exploration. Agreed contracts are often re-interpreted, leading to delays in payment or in granting licenses.[62]

With the exception of Singapore and, to a lesser extent Malaysia and Thailand, ASEAN economies present serious and, in the main, similar challenges for foreign companies wanting to access goods, services and investment markets.

Table 6

Governance indicators, India and ASEAN member states (2016)

Source: World Bank, Worldwide Governance Indicators Database 2017

	Governnment effectiveness		Regulatory quality	
Country	**Estimate**	**Rank**	**Estimate**	**Rank**
India	0.1	57.2	-0.3	41.3
Brunei Darussalam	1.1	81.3	0.6	71.2
Cambodia	-0.7	24.5	-0.5	34.1
Indonesia	0.0	53.4	-0.1	50.0
Lao P.D.R.	-0.4	39.4	-0.7	24.5
Malaysia	0.9	76.0	0.7	75.5
Myanmar	-0.1	16.3	-0.9	18.8
Singapore	2.2	100.0	2.2	100.0
Thailand	0.3	66.3	0.2	60.1
Vietnam	0.0	52.9	-0.5	35.1

Note: Estimates of governance performance range from weak (-2.5) to strong (2.5). Rank refers to percentile rank out of 229 economies, ranging from 0 (lowest regulatory quality) to 100 (highest regulatory quality).

Government procurement discriminates against foreign suppliers and intellectual property rights are insecure.[63] Land reforms in India are an especially thorny issue. They are seen as anti-poor, anti-farmer and a throw-back to dispossession under the Raj. It is India's most explosive political minefield.[64]

The sorts of challenges raised in relation to Indonesia and India are summarised and generalised across the region in Tables 6 and 7 and Chart 7. Table 6 provides an overview of government effectiveness and regulatory quality indicators. The capacity of governments to formulate, implement and review sound policy is important in itself, but is especially important because it is linked to growth and development potential. As a general principle, there is a causal relationship between better governance, less corruption, greater regulatory predictability and better development outcomes.

Government effectiveness and regulatory quality are at, or close to, best practice in Singapore, which goes part of the way to explaining its transformation over the last few decades and high per capita real income. Effectiveness and quality then fall steeply. As both measures dip, concerns rise

Table 7

Ease of doing business: India and ASEAN member states, selected measures (2016)

Source: World Bank, *Doing business 2017: Equal opportunities for all*, Washington D.C., 2017

	Ease of doing business rank (1-190)	Starting business rank (1-190)	Dealing with construct. permits (1-190)	Getting electricity rank (1-190)	Regist. property rank (1-190)	Getting credit rank (1-189)	Paying taxes rank (1-190)	Trading across borders (1-190)	Enforcing contracts (1-190)
India	130	155	185	26	138	44	143	172	136
Brunei Darussalam	72	84	37	21	134	62	89	142	93
Cambodia	131	180	183	136	120	7	124	102	178
Indonesia	91	151	116	49	118	62	104	108	165
Lao P.D.R.	139	160	47	155	65	75	146	120	88
Malaysia	23	112	13	8	40	20	61	60	42
Myanmar	170	146	66	149	143	175	119	159	188
Philippines	99	171	85	22	112	118	115	95	136
Singapore	2	6	10	10	19	20	8	41	2
Thailand	46	78	42	37	68	82	109	56	51
Vietnam	82	121	24	96	59	32	167	93	69

among traders and investors wanting, but probably failing, to understand fully market compliance obligations, customs and border processes, business taxation and issues such as protection of intellectual property.

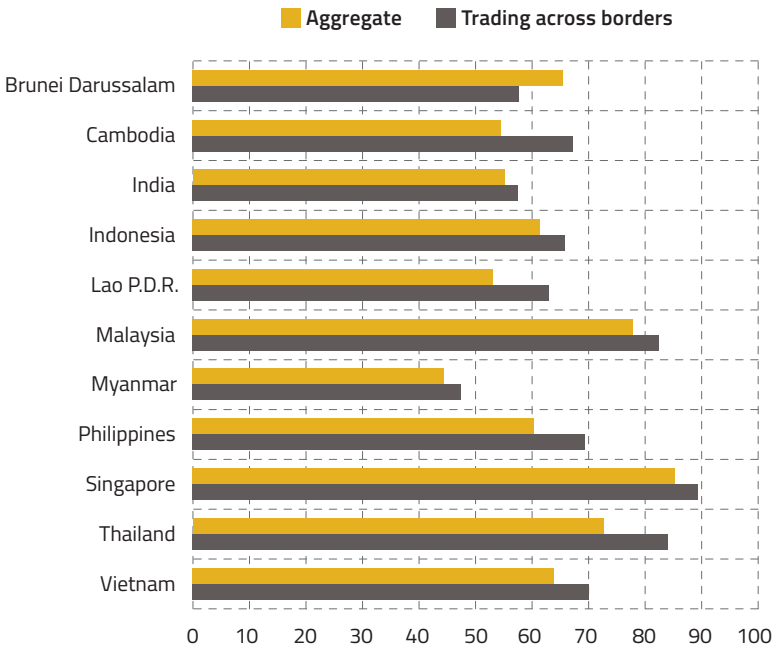
This story is repeated in broad terms in the World Bank's ease of doing business index. It shows wide variations between countries in areas such as starting a business, registering property, accessing credit, and enforcing contracts that align with development levels. It also shows, however, that several ASEAN economies have been more effective in developing enabling environments for business than India, and that low- and low-middle income ASEAN member states are making progress. Vietnam for example is a difficult market in which to start a business, but has made massive progress in areas such as dealing with construction permits, getting business credit and registering property (Table 7).

How supportive business environments are relative to best practice is shown simply in Chart 7, which maps just two variables from the World Bank's Ease of Doing Business report: their distances from a 'frontier' representing international best practice on

Chart 7

Towards Best Practice (2017)

Source: World Bank Ease of Doing Business 2017



Note: The index is the Bank's Distance to Frontier index and measures the distance countries have gone to the 'frontier' represented by the best performance on each of the indicators which go to make up the index. It ranges from 0 to 100, where 100 represents the best performance. The aggregate measure covers a range of indicators relevant to business: starting a business, dealing with construction permits, getting electricity, registering property, protecting minority investors, paying taxes, trading across borders, enforcing contracts and resolving insolvency.

a broad range of measures relevant to doing business (including those in Table 7) and trading across international borders.

As might be expected, the chart shows that some countries in the broad region are well away from the 'frontier' in the case of the aggregate measure: Singapore achieves a high distinction and Malaysia and Thailand a credit, but India and Indonesia just pass and Myanmar fails. Less predictably, the chart also shows that, with the sole exception of Brunei Darussalam, every economy was closer to the 'frontier' on trading across borders than on the aggregate measure. This augurs well for firms seeking to trade with them.

Government effectiveness and regulatory quality are at, or close to, best practice in Singapore, which goes part of the way to explaining its transformation over the last few decades.

Resources nationalism in South-East Asia

Foreign investment in mining is a vexed policy issue in most countries in South-East Asia. Governments invariably talk about openness to trade and investment and their support for engaging with the globalising world, but there are strong vested interests, particularly in mining, that act as lead weights against reform. Nationalism, protectionism, anti-mining sentiment and environmental activism all come into play.

The Fraser Institute's annual survey of mining companies provides specific insight into how investment decisions can be impacted by uncertainty in administrative, interpretive and enforcement aspects of existing regulations; future regulations; and legal and taxation matters; and by factors such as regulatory duplication and disputed land claims. Table 8 shows this spectacularly for the Philippines, where investment attractiveness of one of the world's most mineralised regions is being undermined to a significant degree by perceptions of inconsistent and, at times, strongly negative, mining policies.

Closing down mines and threats to 'tax miners to death' in presidential addresses have sent shockwaves among mining companies based in the Philippines, domestic and foreign.[65] In 2016, mining contributed just 0.6 per cent of

Table 8

Attractiveness of minerals exploration investment: India and selected ASEAN states (2016)

Source T Jackson & K Green, *Fraser Institute Annual Survey of Mining Companies 2016*, Fraser Institute, February 2017

Country	Policy Perceptions Rank (out of 104)	Overall Investment Attractiveness Rank (out of 104)	Best Practices Minerals Potential Rank (out of 104)
India	88	97	94
Philippines	100	66	10
Indonesia	99	78	51
Myanmar	94	91	81
Malaysia	55	93	102

Note: The Fraser Institute annual survey of investment attractiveness is based on the views of mining managers and executives with extensive knowledge of particular jurisdictions. It combines best practice mineral potential – geological attractiveness – and perceptions of government policies and regulations that affect exploration investment.

Note also: The 2016 survey covers 104 jurisdictions that include countries and regions within countries. A ranking of 1/104 denotes most attractive for investment; 104/104 denotes least attractive. Among ASEAN members, only the Philippines, Indonesia, Myanmar and Malaysia were included in the survey.

GDP and around 4 per cent of merchandise exports, and accounted for less than 5 per cent of FDI inflows.

The Philippines presents one of the most visible and vocal examples of resources nationalism but Indonesia is not far behind. It is quietly, but systematically, empowering its state owned enterprises to build a domestically owned and value-added resources sector by moving to divest foreign owned mining assets and either banning or taxing exports of unrefined mining products.

In part, Indonesia's shift towards local ownership in mining and to greater minerals processing reflects strong beliefs in:

- The need to control domestic resources
- The central role of the state in promoting industrialisation
- The primary role of manufacturing as a driver of jobs and growth
- The centrality of domestic-focused growth based on Indonesia's large population (around 259 million) – a belief that overlooks the benefits that flow from increased openness to foreign investment and trade, along with greater involvement in global supply chains.

The shift to local ownership in mining also, and perhaps increasingly, reflects economic nationalism. Nationalism has deep well-springs in Indonesia, but is being re-packaged by populist politicians as they attempt to outbid their rivals in delivering supposed public benefits. Nationalism links local business elites, politicians and officials. It also is sufficiently ambiguous so that governments can talk simultaneously of open economies and societies while erecting barriers to outsiders. Protectionism and calls for self-sufficiency may well resonate widely enough through Indonesia to maintain the political status quo.[66] Beyond the Philippines and Indonesia, the operating environment for mining is becoming more difficult across most of South-East Asia.[67]

Nationalism has deep well-springs in Indonesia, but is being re-packaged by populist politicians as they attempt to outbid their rivals in delivering supposed public benefits.

Malaysia imposes fluctuating export taxes on some mining products. Vietnam requires downstream processing in companies' mining applications and is increasing export taxes and royalties. Myanmar is placing more restrictions on exports of gemstones and other mining products.[68] And even Laos, for some time the exception with its small population, rich resource base and need for foreign investment in mining, has imposed a moratorium on mining exploration and approvals for new mines until a new legislative framework is in place.

Rightly or wrongly, there is an impression that, step by step, the region is becoming a hotbed of populist, anti-mining investment and anti-foreigner sentiment that makes it very difficult for foreign mining companies, with their long time horizons, to invest with much confidence. The reasons for these negative sentiments are not clear cut: negativity exists in both democratic and

authoritarian countries but is not across the board with distinctions made between METS companies and extractive mining companies and between companies engaged in on-shore and off-shore investment. By and large, however, anti-mining sentiment seems to be bound up with powerful national and local vested interests, elites interested in building businesses in downstream minerals processing, environmental activism, and political emotion over land use.

Mining and mining-related investment is a large part of Australia's outward direct investment. The difficult operating environment for on-shore investment in South-East Asia goes some way in explaining why total Australian direct investment there is relatively low and why, in the case of Australian mining companies, it appears to be faltering. Simply put, foreign investment in mining is now, more often than not, caught up in a maze of regulations, vested interests and political activism.

Measures directly affecting market access for goods

Market access for goods into India and ASEAN economies has improved substantially over recent decades. External trade – imports and exports as a proportion of gross domestic product – is high for most South-East Asian countries and is high by historical standards in India.[69] Tariffs have tumbled but non-tariff measures (NTMs) have increased. Two issues stand out: tariffs are a much bigger problem for the minerals and METS sector in India than in ASEAN, and NTMs, while a growing problem in both India and ASEAN, are becoming especially onerous in ASEAN economies.

Tariffs

Tariffs in ASEAN economies are now at low levels, particularly for minerals and energy (Table 9). Indeed, in the case of Australia, ASEAN tariffs have been mostly eliminated for mining commodities (though not for some METS products) under preferences provided through the ASEAN-Australia-New Zealand Free Trade Agreement (AANZFTA) and various bilateral agreements.

Exceptions to tariff free treatment vary across countries but include, for example, copper cathodes, semi-finished iron and steel products, explosives and detonators, trucks, and various items of electrical machinery and mechanical appliances.

Tariffs also have tumbled in India during its transition from being one of the world's most inward looking countries in the 1970s and 1980s to wanting to reap the benefits from reintegrating with the global economy. Tariffs nevertheless are still high and provide most – perhaps two-thirds – of the border protection to domestic industry.[70]

Tariffs on ores and concentrates are relatively low, generally 2.5 per cent, but are bound at substantially higher rates (and are unbound for some minerals such as lead and zinc ores and concentrates), meaning in both cases that tariffs can be increased easily. Tariffs on products such as coke, unwrought silver and gold, pig iron and ferrous products are in the 5-10 per cent range. And tariffs on products of interest to the METS sector also can be significant: for example, 7.5 per cent for self-propelled coal or rock cutters and tunnelling machinery and 10 per cent for prepared explosives, safety fuses and detonators, and rock drilling and earth boring equipment.[71]

Table 9

Tariffs on minerals and metals: India and ASEAN member states

Source: WTO, ITC and UNCTAD, *World Tariff Profiles 2016*, Geneva, 2017

	Bound AVE rate	Binding in %	Applied MFN AVE rate	Duty free in %	Max MFN
India	38.3	61.3	7.9	0.3	15
Brunei Darussalam	20.3	98.2	0.3	96.2	20
Cambodia	20.4	100	7.4	30.6	35
Indonesia	38.8	97.7	6.4	17.6	30
Lao P.D.R.	15.5	100	5.8	0	20
Malaysia	17.6	65.2	7.6	50.7	60
Myanmar	23.8	8.5	3.4	5.7	30
Philippines	24.5	35.3	4.6	5.7	20
Singapore	5.7	45.2	0.0	100	0
Thailand	24.4	51.0	5.6	45.0	30
Vietnam	11.2	100	8.1	39.2	45

Note: Bound average rate: simple average of final bound duties excluding unbound tariff lines. Binding in %: share of HS six-digit sub-headings containing at least one bound tariff line. Applied MFN average rate: simple average of MFN applied duties. Duty free in %: share of duty free HS six-digit sub-headings in the product group. Max MFN: highest ad valorem duty.

Note also: The data relate to 2014 in the cases of Brunei Darussalam, Cambodia, Indonesia, and Malaysia. In all other cases, they relate to 2015.

In addition, a battery of border fees and charges apply cumulatively on top of the basic tariff. They include landing fees, countervailing duties that correspond to excise duties imposed on similar domestic products (though whether they do or not is subject to debate) and various education-related charges. These charges typically add over 25 per cent to the landed cost of minerals and around 34 per cent to some METS products.

Adding to this complexity is an overall lack of transparency in administrative arrangements. India publishes applied tariff and other customs duty rates, but no single official publication is available covering tariffs, fees and tax rates on import. And there is considerable scope to adjust tariffs throughout the year. Rates are announced by the Indian Government in the annual budget but can be adjusted at any time in response to changing international prices

or domestic pressures. Notifications in the Gazette of India contain numerous exemptions that vary according to the product and user, adding to the complexity of administration and providing scope for administrative discretion.[72] The wide gap between bound rates and most favoured nation (MFN) applied rates charged at the border for ores and concentrates and basic metals provides ample room for manoeuver. So too does the similar gap between applied MFN rates and bound rates for METS products. Data for 2016 from the WTO online tariff database show that the bound rate for METS products is typically 25 or 40 per cent, with many items unbound.

Non-tariff measures

As tariffs have fallen, the importance of NTMs has burgeoned in India and the ASEAN economies, much as it has in other parts of the world. NTMs become non-tariff barriers (NTBs) if they discriminate against foreign suppliers by increasing the price of imports or otherwise restricting trade. This may happen by design to achieve a protectionist end or because national and regional disciplines on transparency and accountability are often weak, allowing poorly designed measures to complicate business unnecessarily.[73]

These barriers can arise on a large scale. For example, the 2015 WTO Trade Policy Review of India drew attention to:

- Import licensing on about 17-18 per cent of mineral products
- Import quotas on goods such as marble and similar stones
- Active use of anti-dumping measures – India is one of the world's most active users of these measures in sectors such as chemicals and, to a lesser extent, different types of machinery and base metals
- Standards and technical requirements, for example in relation to coal and coal products
- Export taxes on some minerals and metals, for example on bauxite, ilmenite, iron ore pellets, and ferrous waste and scrap
- Export surcharges on manganese ore, chrome ore, mica products and iron ore
- State owned enterprises in some cases having the exclusive right to export a commodity or to authorise another entity to export it (for example iron ore).[74]

In the case of ASEAN, the percentage of imports covered by one measure or another is high for all ASEAN members. NTMs cover 100 per cent of national tariff lines in the case of Cambodia, Laos, the Philippines, Singapore, Thailand, and Vietnam, and between 42 per cent of lines in the case of Myanmar and almost two thirds in Indonesia. Their proliferation, along with barriers to trade in services, are seen as root causes of limited economic integration across ASEAN economies.

Generally speaking, minerals products as a group are not among the most heavily regulated products in ASEAN, but products used by the mining sector are impacted such as chemicals, metals, machinery, and transport equipment.[75] Examples of NTMs at the economy level include:

INDONESIA 110 mineral tariff lines are affected by three or more NTMs. Across all occurrences of NTMs, technical barriers to trade are the most frequently applied measures. Import licensing and export-related measures are prominent, the latter particularly important for the minerals sector.

LAOS Over three quarters of mining-related products are subject to three or more NTMs. About half are export taxes and prohibitions. Others include price controls on imports, import licensing requirements and restrictions on payments for imports.[76]

MALAYSIA Mineral producers are impacted by export taxes on mineral ores. The sector more broadly is impacted by import licensing for potential mining equipment and by preferences to Bumiputera (ethnic Malays and other indigenous ethnicities in Malaysia) in contracts with the government and government-linked enterprises.[77]

PHILIPPINES Minerals products and mining equipment imports are affected by a range of technical barriers, import licensing requirements, export-related measures, customs and other regulations and charges, and measures related to state trading enterprises.

THAILAND All minerals, metals and machinery lines are affected by at least one NTM, and most mineral products by three or more.[78] Import licenses are required for many raw materials, though this was not emphasised in the WTO's 2015 Trade Policy Review of Thailand.[79]

VIETNAM No imported product is free of at least one NTM. They include product standards, export-related measures, tax incentives for domestic manufacturing, and discriminatory government procurement policies.[80]

Measures directly affecting access for services and investment

Barriers to trade in services result from domestic laws and practices that restrict access for foreign suppliers relative to domestic ones, or which limit both domestic and foreign supply.

ASEAN economies and India have made big strides over recent years to liberalise border and behind-the-border restrictions in services and associated investment. This has happened mostly on a unilateral basis as successive governments have recognised the benefits of expanding and modernising services and boosting FDI. Bilateral and regional trade agreements have also helped in the case of ASEAN economies by mostly binding current levels of openness and, in some cases, liberalising them. To date, trade agreements have not played much of a role, if any, in reducing India's services and investment restrictiveness: India has negotiated several shallow trade agreements with developing countries, mostly bilaterally, and has taken a very cautious approach to agreeing binding international commitments.

Services restrictions, including on services delivered through commercial presence, are on average much higher than for goods. This is not unique to India and ASEAN. It applies globally. But it points both to the challenges facing governments in making these reforms (and the accompanying behind-the-border structural reforms that are needed to enhance competition, innovation and productivity) and the potential rewards in terms of increasing trade, growth and wealth creation if these reforms are managed effectively.

Table 10

Services Trade Restrictiveness Index, selected services (2016)

Source: OECD Services Trade Restrictiveness Index

Country	Accounting	Engineering	Legal	Computer	Construction
India	0.880	0.272	0.906	0.335	0.309
Brazil	0.271	0.232	0.299	0.292	0.230
China	0.423	0.245	0.472	0.309	0.313
Indonesia	0.424	0.286	0.879	0.291	0.386
Russian Federation	0.295	0.287	0.318	0.331	0.352
South Africa	0.216	0.181	0.247	0.160	0.180

Note: OECD STRI composite indices quantify identified restrictions across five policy categories: restrictions on foreign entry (e.g. information on foreign equity limitations, requirements that management or boards of directors must be nationals or residents, foreign investment screening); restrictions on movement of people; other discriminatory measures (e.g. in relation to taxation, subsidies and government procurement where national and international standards differ); barriers to competition; and regulatory transparency. Restrictions are evaluated on a 0 (complete openness to trade and investment) to 1 (closed) scale.

Note also: Notwithstanding the apparent precision of these data, they are based on broad judgements and coding principles and should be seen as providing a general indication of regulatory restrictiveness.

Services and investment restrictions in India are generally higher than in most ASEAN economies. India in fact has one of the most restrictive services regimes in the world,[81] though it still attracts substantial inflows of FDI. Approximately 40 per cent of global inflows into India went into services in recent years, predominantly into telecommunications, financial services, insurance, outsourcing businesses, wholesale and retail distribution, and construction.[82]

Table 10 provides some evidence of the extent of restrictiveness in services that commonly support mining and METS. Compared to other major emerging economies, India has the highest level of restrictiveness in accounting, legal and computing services, and among the highest in engineering and construction services. Restrictions include limits on equity participation, land purchase and use, cross border mergers, commercial presence to provide cross border services, recognition of professional and vocational qualifications, and movement of people – foreign natural persons providing services as intra-corporate transferees, contractual services suppliers or independent service suppliers.[83]

Australian access to services and investment markets in ASEAN economies is generally easier than for Indian markets, though there is a long way to go. Access varies considerably from country to country.

For example:

INDONESIA AANZFTA has made only limited progress in addressing services barriers relevant to mining and METS. For construction services, Indonesia is rated by the OECD as the second most restrictive among 44 countries. Indonesia's AANZFTA schedule specifies that firms providing these services must form a joint venture with not more than 55 per cent owned by foreign partners (the equity limit has, in practice, been relaxed to 67 per cent on an MFN basis for work on large projects). The schedule permits very significant limits on services provided by executives, managers and technical experts including, for example, an economic needs test for managers and technical experts.

For engineering services, the AANZFTA schedule stipulates that commercial presence can involve either a joint operation representative office or a joint venture no more than 49 per cent foreign owned, while consulting and design services delivered by commercial presence must be provided through a representative office with a local partner. Legal services are almost completely closed to outsiders, with Indonesia rated by the OECD as the second most restrictive country in Asia (after India). In Indonesia's AANZFTA schedule, commercial presence for legal services is unbound.

LAOS Under AANZFTA, foreign enterprises can establish a commercial presence in Laos with up to 100 per cent ownership, though in practice, the government must have 10 per cent ownership of mining ventures. Preferences to local businesses (i.e. limits on national treatment) are extensive and cover taxation, subsidies, investment incentives and other support measures.

MALAYSIA Services providers, including providers of mining-related services, have been given improved access to the Malaysian market through AANZFTA and the Malaysia-Australia Free Trade Agreement (MAFTA), including easing of restrictions on company personnel and opportunities for majority ownership in companies in Malaysia.

Restrictions on foreign investment mostly affect equity holdings in services sectors. The Malaysian Government has moved to free up restrictions, including in mining, and government assistance is available to foreign investors, including tax incentives. Foreign equity of up to 100 per cent is allowed in the extraction and processing of minerals, though in practice foreign investments typically involve joint venture arrangements with local partners, especially Bumiputera who are accorded preferential treatment, including in aspects of foreign investments.

PHILIPPINES Services exporters to the Philippines face formidable barriers, though some liberalising commitments were made in AANZFTA, including in relation to mining and related services. Foreign equity restrictions were loosened, among others, for large-scale mining construction projects, construction of power plants, energy distribution services and coal exploration and development. More liberal arrangements also were introduced for Australians working in the Philippines and for business visitors.

Serious impediments nonetheless remain. The 2016 OECD FDI Regulatory Restrictiveness Index rates the Philippines as the most restrictive among ASEAN economies for investments in primary industries (including mining), business

services and transport.[84] On this measure it also is more restrictive than India. Moves to close mines or suspend mining operations, ban new open-cut mines and raise mining taxes to punitive levels indicate that much remains to be done to attract international investors.[85]

SINGAPORE Like Australia, Singapore has preferences over competitors in mining-related services in both the Singapore-Australia Free Trade Agreement (SAFTA) and AANZFTA. The SAFTA Review, completed in 2017, eased restrictions on mobility and length of stay of business personnel and their families: temporary entry commitments in SAFTA are now less restrictive than in any of Singapore's other FTAs. The Review also removed restrictions on e-commerce (for example on free flow of data) and increased access for providers of engineering, accounting and legal services.

THAILAND Australia's services access to Thailand is subject to both the Thailand-Australia Free Trade Agreement (TAFTA) and AANZFTA. AANZFTA is a more modern agreement with a much wider range of services commitments than TAFTA, but the latter includes more favourable conditions in some areas. Construction services are one example, with TAFTA permitting Australian equity up to 100 per cent for services delivered by commercial presence.

Australia has received commitments under both TAFTA and AANZFTA on movement of business persons to Thailand. TAFTA provides good outcomes in this area with up to five year stays for intra-corporate transferees and three years for contractual service suppliers. Unusually, TAFTA commitments apply to all sectors, irrespective of whether specific commitments have been made, although 39 professions (including civil engineers and lawyers) are excluded. AANZFTA has specific provisions for business persons seeking entry to establish commercial presence.

Thailand imposes equity limits on a large number of activities, including mining. In sectors where Thailand is not yet believed to be competitive, including many services, government approvals and permits are required. That said, extensive investment incentives are available to foreign companies including in relation to corporate tax, duty free imports and utilities, infrastructure and construction costs.

VIETNAM Vietnam's WTO accession negotiations brought about significant liberalisation across the board. Further services commitments were made for AANZFTA, including in construction, mining and energy-related services. Vietnam compares favourably with some other ASEAN economies on services, including professional services, but onerous barriers to services trade remain.[86]

Vietnam is seen as a generally desirable destination for greenfield FDI investment, but not in mining, despite the government's stated policy to attract international capital and expertise in mining. This is largely because the mining sector is dominated by a handful of state owned and linked enterprises that control the playing field. A restrictive and constantly changing taxation and regulatory environment also discourages direct investment.[87]

Priorities for the minerals and METS Sectors

India

India is potentially one of the brightest prospects in the world for Australian mining and mining technology and services companies over the medium-to-long term, but it remains a difficult market to sell into and especially to set up a business.

From a mining and METS standpoint, the following impediments should be targeted in Australia-India negotiations and discussions:

- India's applied MFN tariff on minerals and metals is 7.9 per cent, and approximately 5 per cent for resources – one of the lowest tariff categories across the entire Indian tariff schedule. Removing the tariff (and binding it at zero) would be valuable to industry and put Australia on the same footing as ASEAN economies and countries such as Chile.
- India's customs tariff and fee system is complex. The cumulative nature of fees and duties raises the level of border protection considerably. Additional fees and duties are intended to correspond to excise duties imposed on similar domestically produced goods. Lack of transparency, however, raises concerns that traders are subject to higher fees and charges than the required rate of duty on the real value of their products. Increasing transparency in fee charging arrangements would benefit business significantly.
- Tariffs tend to rise steeply with the level of processing. Combined with cumulative fees and charges, METS companies face major barriers at the border. India has the potential to become a key market for METS. Eliminating tariffs on METS products and then binding duty free outcomes would be a major step forward.
- Indian trade costs tend to be high reflecting significant policy barriers (such as tariffs and non-tariff measures, frequent delays in customs clearances, issues with customs online documentation etc.), as well as elevated costs linked to transport and distribution (freight and time) and communications (such as provision of information on legal and regulatory processes). Reducing these costs would increase trade, boost growth and potentially increase employment in Australia and India. Non-tariff measures should be a focal point of work on merchandise trade in RCEP and AI-CECA, and be a major element of long-term work on Australia-India trade in the India Economic Strategy.
- India's business environment is improving but is especially difficult in the resources sector. Most assets are owned or controlled by state owned enterprises or by Indian companies favoured by government entities. The writ of bureaucratic involvement also runs deep, particularly in relation to land-use and approval processes for most aspects of mining.

  India has one of the most open regimes among emerging economies to FDI in mining and metals and machinery, but does not attract FDI commensurate with its importance as a producer of minerals and energy or its potential to increase output substantially. This paradox is explained by

the unpredictability of business conditions in the sector. Without more clarity and predictability, the easiest option for perhaps the majority of foreign mining and METS companies is to trade with India and stay away from the bureaucratic complexity of operating businesses there.

A high priority for business is for RCEP to contribute to institution building and reform, particularly through provisions on good regulatory practice. This also should be taken up in AI-CECA negotiations and could usefully be explored in detail in the India Economic Strategy.

- Restrictions on movement of people – foreign natural persons providing services as intra-corporate transferees, contractual services suppliers or independent service suppliers – are a major impediment to supplying mining and METS-related services. A major priority is increasing the flexibility of Australian mining and METS companies to deploy senior executives and people with advanced or specialised technical skills to assist in delivering mining projects, investments and services.

Making progress on this agenda may well depend on progress achieved in RCEP negotiations. RCEP has a high profile in India. Big FTAs address big structural issues and can move smaller agreements along in their wake, just as breakthroughs in AANZFTA, for example, underpinned progress in the Malaysia-Australia Free Trade Agreement (MAFTA). RCEP could form a baseline for progress in AI-CECA negotiations with no RCEP minus commitments and some RCEP plus commitments. More gradual progress on AI-CECA negotiations also would be a good thing if it provides time, not only to take advantage of potential progress in RCEP, but to consider how the India Economic Strategy can contribute to 'cementing India as a priority economic partner.'[88]

India is potentially one of the brightest prospects in the world for Australian mining and mining technology and services companies over the medium-to-long term.

Medium-to-long term cooperation in resources and METS is strongly in the interests of both Australia and India. It is important in its own right, and could be a catalyst for narrowing positions in other areas of the economic relationship. From an Australian perspective, it is critically important that AI-CECA and the India Economic Strategy build on common interests in mining and METS, public sector reform in the resources cluster of industries and related education and upskilling. Strengthening government-to-business cooperation is also important. Strengthening regional cooperation across government and business on mining and energy issues, such as high efficiency, low emissions (HELE) coal-fired power stations, could well turn out to be path breaking and a key point of intersection in an enduring and growing Australia-India relationship.

ASEAN

A combination of unilateral reform and regional and bilateral preferential trade agreements with Australia has largely completed the task of removing tariff barriers to minerals, basic metals and mining equipment, at least among the more developed members of ASEAN. Accelerating removal of remaining tariffs, especially on goods embodying advanced mining technology, would help Australian mining and METS companies. There are a number of items where ASEAN tariffs will remain – sometimes at high levels – out to 2020 and beyond, which could affect exports of mining equipment in particular. In some cases, tariffs will remain at only nuisance levels and could be abolished more easily.

Addressing the imaginative use of NTBs and barriers to services and investment must be a top priority for Australia, especially in Indonesia, a METS high priority market. Restrictions in ASEAN have proliferated over recent years to the point of muting some of the effects of tariff reductions and other steps towards liberalisation. Liberalisation is needed in key areas such as import licensing, government procurement (including by public enterprises), and services incidental to mining, engineering and construction, as well as services such as law, computing and software where commitments in bilateral agreements such as TAFTA and regional agreements such as AANZFTA are limited.

To the extent possible, Australia's mining and METS sectors would benefit greatly from including some of the TPP outcomes on resources and energy in RCEP and AANZFTA. Areas where progress would be especially valuable include: locking in current regulatory arrangements and access for mining and energy exploration (against the background of stirring resources nationalism); increasing regulatory transparency for investors in mining and suppliers of mining technologies and services; and imposing disciplines on the imposition of export taxes.

To the extent possible, Australia's mining and METS sectors would benefit greatly from including some of the TPP outcomes on resources and energy in RCEP and AANZFTA.

Currently, ASEAN members do not have effective processes to address concerns about NTMs or machinery to promote cohesive cooperation between national trade and competition authorities (where the latter exist).[89] Responding to this weakness, the ASEAN Economic Community Blueprint for 2025 emphasises the necessity of good governance and regulatory practice across trade, investment, competition, and skilled labour mobility to underpin future economic growth and advance regional economic integration.[90] It also observes that 'concerted regulatory and institutional improvement' across ASEAN member states will be assisted through strengthened cooperation with Dialogue Partners such as Australia.[91] RCEP, the AANZFTA Review and Australia's

bilateral trade negotiations with Indonesia represent timely opportunities for stepping up cooperation with ASEAN on ways to tackle border and behind the border barriers (Box 1).

From the perspective of the mining and METS sector, intensifying cooperation on reducing NTBs and barriers to services and investment should include helping to build institutional and human capacities in the ASEAN minerals sector – one of the stated aims of the ASEAN Economic Community Blueprint for 2025. There are strong points of interconnection between Australian competitive strengths and ASEAN requirements in this area. Specifically, the Blueprint highlights clean coal technology, initiatives to reduce energy intensity in ASEAN by 20 per cent by 2020 and 30 per cent by 2025 compared with 2005, and increasing the share of renewables in the energy mix. The ASEAN Minerals Cooperation Action Plan 2016-2025 takes this further by emphasising the need for:

- Stronger public-private-academic partnerships in mining
- Better information flows on minerals exploration, development, consumption, and value added activities, including minerals laws and regulations
- Stronger cooperation on sustainable minerals development, new technologies, technology transfer, and the health, environmental and social benefits of mining
- Better training for mine managers, engineers and project coordinators in a wide range of disciplines such as conducting geological surveys, minerals exploration, minerals economics, environmental management, and use of geophysics technology in on-shore and off-shore minerals exploration. [92]

Some of this cooperation could be done on a commercial basis, but some could be through carefully targeted aid for trade. The Australian Government has a funding target of using up to 20 per cent of Official Development Assistance (ODA) for aid-for-trade: in the case of eligible ASEAN countries, this would amount to almost $150 million in 2017-18 – a significant down payment in boosting specific skills and institutional capacity in a region of prime importance to Australia.[93]

The scope for cooperation on HELE coal-fired power technology is significant. There are potentially big opportunities to increase cooperation on policy development in mining, including in promoting trade and investment in resources and energy, and strengthening public-private partnerships (including in financing mining and energy projects and infrastructure projects more broadly). And there is a pressing need for building technical and vocational skills in mining.[94] Education is a big services issue in all of Australia's recent FTAs. Encouraging technical training in mining and METS should be a priority for RCEP and the AANZFTA Review.

One possible model for fostering more cooperation around the mining, energy and METS cluster of industries is the one funded by the AANZFTA Economic Cooperation Support Program and developed by the Australian Competition and Consumer Commission (ACCC) and other international experts in relation to competition policy. The Competition Law Implementation Program (CLIP) delivers tailored training and mentoring to ASEAN member states to implement national laws and policies to meet

BOX 1

Trade negotiations

RCEP and the AANZFTA Review are linked in timing and substance. If RCEP concludes successfully, it should provide an elevated floor for negotiating more ambitious outcomes in the Review: this would mean basically no RCEP minus commitments and some RCEP plus commitments. Similarly, if RCEP loses momentum, which is conceivable given the different interests and priorities of a very diverse group of negotiating parties, the Review would probably be brought forward and assume greater significance in adding value to existing AANZFTA commitments.

It is too early to predict the likely ambition of either RCEP or the Review. Good outcomes will depend on the quality of government-to-government cooperation and on the persuasiveness of business in Australia and elsewhere in defining desired negotiating objectives and setting up processes to achieve them. The ASEAN-Australia Summit in March 2018 is an obvious opportunity for targeted influence: a business summit will be held in parallel with the Leaders' Summit, with outcomes informing AANZFTA Review recommendations to Ministers in August 2018.

commitments under the ASEAN Economic Community Blueprint, AANZFTA and ASEAN's post-2015 vision for competition.[95] This in turn benefits Australia through potentially more trade, more high- level contact and closer institutional ties.

CLIP demonstrates the importance of:

- Good initial work to build relationships and confidence with counterpart organisations in ASEAN member states to identify shared interests and opportunities for cooperation
- Developing medium-to-long term strategies for sustainable cooperation and institution-building that have buy-in from relevant agencies and other interested players
- Being able to mount a strong case for government funding for cooperation.

Developing a clear national objective around mining and energy would depend on strong interest within the Australian Government in ASEAN's mining and energy reforms, having an agency or group of agencies in Australia with the vision to see the benefits of collaboration for the region and Australia, buy-in from relevant agencies in the region, and enlightened self-interest within the Australian Government to make funding available.

Complementing more cooperation around mining and energy, further high-level policy action by Australia is needed in two key areas. The first is to address resources nationalism in South-East Asia. One approach might be for ministers and senior officials to increase emphasis on the health, safety, environmental, efficiency and broader development benefits of enhanced cooperation in sustainable mining. Another might be more carefully targeted advocacy to convey the message that sustainable mining is a key part of development and that Australia has skills across the mining value chain.

Making progress would no doubt be a long uphill slog: resources nationalism and political emotion over land and environmental issues are not particularly susceptible to good economic arguments. Nonetheless, further liberalisation elsewhere in ASEAN economies, including in related manufacturing and services sectors, may eventually help to build support for more liberal approaches to mining.

The mining sector also would welcome more high-level policy action by Australia to seize opportunities linked to China's Belt and Road Initiative (BRI), as well as to clarify potential risks. At a general level, Chinese rhetoric on BRI may well be running ahead of reality, but reality will probably catch up soon enough, and already has caught up in the countries of the Greater Mekong Region – Cambodia, Laos, Myanmar, and Thailand. BRI is big there, is getting bigger very quickly, and puts China at the centre of their economic dynamism.

BRI may well provide opportunities for Australian engagement in regional infrastructure investment, some involving resources and energy, mining technology, and related construction, engineering and scientific services.

Developing a clear national objective around mining and energy would depend on strong interest within the Australian Government in ASEAN's mining and energy reforms, having an agency or group of agencies in Australia with the vision to see the benefits of collaboration for the region and Australia, buy-in from relevant agencies in the region, and enlightened self-interest within the Australian Government to make funding available.

Recommendations

Neither India nor South-East Asia are 'easy' markets for Australian mining and METS, but prospects seem good given strong expectations of solid-to-rapid economic growth, the implications for resources and METS of large scale investment in hard infrastructure over the next several decades, the quality of the minerals base, and the need to develop it using modern technologies and approaches.

Tariffs are still a major barrier to accessing India's market, unlike ASEAN where applied tariffs relevant to Australia have been largely eliminated on minerals, basic metals and most mining equipment through a combination of unilateral reform and regional and bilateral preferential trade agreements. In most other respects, border and behind-the-border barriers to goods, services and investment in India and much of ASEAN are reasonably similar. Non-tariff barriers to goods have proliferated as tariffs have fallen or been eliminated. Barriers to trade in services are well entrenched including, to varying degrees, on movement of specialised personnel. Restrictions on direct investment in mining have played havoc with mining and METS in countries such as Indonesia and the Philippines. But, for the most part, minimal levels of FDI in the mining sector, at least compared to manufacturing, finance and real estate, reflect challenging business environments rather than specific regulatory impediments – challenges such as assets owned or controlled by state owned enterprises and unpredictable and excessive bureaucracy. In these circumstances, many Australian mining and METS companies have found it easier to trade rather than invest.

The following recommendations are put forward for consideration to address border and behind-the-border barriers to extractive mining and METS either directly through trade negotiations or indirectly through establishing closer institutional ties between countries in the Asia-Pacific region, building strategic partnerships in mining and energy, and developing policy narratives that might connect with those left behind by regionalisation and globalisation.[96]

1. Actively pursue further trade liberalisation and facilitation

As a middle-sized advanced economy in proximity to growing and maturing regional markets, Australia has strong interests in maintaining an open, rules-based global trading system, in achieving further access to export markets and in reducing the costs of moving goods and services across international borders. This requires resisting protectionist tendencies and actively pursuing trade liberalisation across a range of fronts.

On the multilateral front, the WTO's Trade Facilitation Agreement (TFA), which entered into force in February 2017, has considerable scope to reduce trade costs by streamlining customs and border regulations and administration which, in many developing countries, can impose trade costs higher than those imposed by tariff barriers. Even fairly basic trade facilitation measures – such as improving trade-related information, harmonising and simplifying documents and automating processes and risk management – could reduce overall trade costs by around 10 per cent and considerably more for low-

and low-middle income economies.[97] In 2015, the WTO Secretariat estimated that full implementation of the TFA could reduce member economies' trade costs by about 14 per cent on average, with reductions ranging from 9-10 per cent for developed economies to over 20 per cent for least developed economies.[98]

If achieved, such reductions would boost economic output and jobs, and increase trade. This would deliver all-round benefits, particularly at a time when growth in world trade is barely, if at all, keeping pace with growth in the global economy. But achieving timely outcomes on trade facilitation will require developed countries such as Australia to build on previous international work to improve customs services and border management and actively assist developing countries to implement their TFA commitments. Supporting effective implementation of the TFA should be regarded as part of a broader commitment to advancing liberalisation across goods, services and investment, and building pathways to greater global and regional economic and trade integration.

Bilateral free trade negotiations with India and Indonesia should be given priority. India is an important trading partner and one of the major emerging markets that is reshaping the global economy. Indonesia is the largest economy in ASEAN. As Australia's fourth largest trading partner in ASEAN there is considerable scope to boost the bilateral trade and investment relationship.

A high priority should continue to be placed on pursuing a range of regional trade initiatives. Options should be explored for securing the gains in market access achieved in TPP negotiations, notwithstanding the decision by the US Administration to withdraw from the agreement. This requires building on the agreed core elements of the re-named Comprehensive and Progressive Trans-Pacific Partnership (CPTPP), specifically moving quickly to resolve outstanding issues in areas like state owned enterprises and aspects of services and investment. Subject to the changing currents of economic nationalism, leaders should ideally be in a position to sign the CPTPP in the first quarter of 2018, with the Agreement entering into force by the end of that year after domestic ratification processes have been completed by at least six parties.

Beyond seeking to retain the gains from TPP on rules and market access improvements, Australia should seek to accelerate negotiations for RCEP while being mindful of the potential trade-off between (i) the desirability of finalising an agreement that includes most of the region's significant economies and (ii) the importance of emerging regional trade architecture containing modern trade disciplines in areas such as services, investment, competition, and behind-the border-regulation. Specific priorities for the mining sector in RCEP negotiations and the AANZFTA Review include: application of national treatment principles for government procurement; phasing out, or at least restricting, export taxes on minerals and energy; reducing barriers across mining services, engineering and construction, as well as services used intensely by mining and METS companies such as legal, financial and software services; and improving regulatory transparency for investors.

2. Strengthen the analytical foundations for trade negotiations

Australia prepares very thoroughly for trade negotiations and its trade negotiating teams are among the best in the world. But there are some areas where the analytical foundations of negotiations could be strengthened. This report has drawn attention to the problem of defining METS – a problem that has not been resolved even in plurilateral negotiations for the Trade in Services Agreement and that reflects the fact that so many products, technologies and services have multiple uses.

A pressing challenge is to get a clearer insight into the relationship between non-tariff measures (NTMs) and non-tariff barriers (NTBs). There is certainly a need for NTMs, for instance on standards: global demand for them is growing, driven by demand for quality products, the increasing pace of technological change, the fragmentation of supply chains, and increasing concern for social and environmental impacts. NTMs may or may not have non-trade objectives, but at what point can they start to distort trade?

Silo mentalities often exist within government systems, extending across departments and even within them. They enable new regulations to be introduced without taking into account existing ones or without formal, multi-agency consideration of possible flow-on consequences for the wider economy, including for trade. Examples are:

- Export taxes and prohibitions on minerals that are intended to encourage more domestic processing but have the effect of discouraging foreign investment and trade
- Price controls on imports that are intended to support domestic prices but restrict trade
- Border processes that are intended to streamline trade but end up adding unnecessary time and cost for traders through inconsistent customs valuations, frequent delays in customs clearances and issues with customs online documentation.

More analytical work is required to understand why NTMs are proliferating, why many of them become barriers to trade and what can be done to roll them back. International evidence suggests that NTMs probably double the level of trade restrictiveness imposed by tariffs and that their overall contribution to trade restrictiveness is increasing as tariff levels on average continue to decline.[99] Answering some of these questions would be a useful addition to the armoury of trade negotiators preparing for big negotiations. It should help to place NTMs more firmly at the centre of negotiations on merchandise trade. In a mining context, it also might provide useful guidance for bilateral and regional negotiators on issues such as: should trade agreements include separate mining/METS chapters, and what priority should be attached to building institutional infrastructure around good regulatory practice in mining and METS?

Another pressing analytical challenges is to come to grips with overseas affiliates trade, especially for services. Current official statistics on Australia's trade from the Australian Bureau of Statistics (ABS) do not

capture how businesses operate overseas to deliver services. They capture only a slice of it without providing a context for assessing whether the missing part is large or small.

The last partial ABS survey of trade by overseas affiliates of Australian companies – the 2009-10 survey of finance and insurance services – demonstrated that over 95 per cent of trade was through overseas affiliates (and was therefore not directly recorded in Australia's balance of payments data). This high figure cannot be extrapolated to other service trades. Each industry is different; the regulatory environment in the host country varies from industry to industry; and different technologies come into play to influence what can be traded across borders and what is best supplied by foreign affiliates.[100]

The United States and European Union conduct regular outward foreign affiliates trade surveys. New Zealand and Canada do ad hoc surveys, but it is about 15 years since the ABS published comprehensive data on the contribution made by foreign-owned businesses. Highest priority should be given to filling this sizeable gap in ABS data on Australian services trade and foreign investment. Regular outward surveys would be very useful in understanding better how Australian interests are being advanced in overseas markets. And importantly they would be valuable in monitoring FTA performance and in preparing for new trade negotiations. Improving access for Australian service providers and easing restrictions on establishing commercial presence are, after all, fundamental to modern FTAs and core trade interests for Australia.

3. Strengthen the narrative on trade reform

The international pendulum is always swinging between relatively open public attitudes to trade and investment and relatively restricted or suspicious ones. Right now, it is swinging with surprising speed towards restricted or suspicious ones as populist and anti-globalisation sentiment takes a firmer hold on public debate.

That debate needs to be rebalanced. In part, the narrative on the benefits of trade – essentially why it matters to people, industries and communities – must continue to be based on rigorous economic analysis on the role of trade and trade policy in modern economies. But if the debate is to be rebalanced, it must resonate with those directly affected by slow or negative growth, stagnant wages and disruptive technological shifts, and cut through to policy makers flirting with protectionist or mercantilist approaches to trade. That will require more than good analysis.

It will require both government and business putting a top priority on explaining plainly and simply and providing real world examples of why trade and investment promote growth, jobs and rising living standards. And it then requires, in the case of government, backing this up with inclusive policies that target re-training and re-skilling, facilitate worker mobility across regions and between firms, and improve access to healthcare and education.

4. Make a strong resources sector a sustained trade policy priority

Australia is a mining, mining technology and energy superpower. As we have noted previously: 'Exchanging commodities for manufactures will continue to account for the bulk of Australia's trade for years to come. It is the natural consequence of our comparative advantages.'[101] But is this reflected in the trade policies of Australian governments? The answer is that resources issues have been prominent from time to time – developing trade in liquefied natural gas to East Asia has been a very high priority – but that prominence has not been sustained in government policies and programs in a comparable way, say, to education and financial services or agriculture and processed foods. In that sense, Australia is different from countries such as the United States, Russia and Canada that assiduously push their mining and energy interests.

There are no clear reasons for this apparent difference in priorities. It might be that the synergies between minerals, energy and METS are not sufficiently understood by Australia's political leaders and senior officials, whether in terms of direct contributions to the economy, jobs, exports and tax revenue or in terms of their larger 'multiplier' impacts on other sectors. It might reflect misinformed value judgements that these sectors are 'old economy' – glib perceptions that brush over the high-level and innovative technologies and practices that now characterise Australia's mining and METS sectors, and the sheer scale of their contributions to Australia's trade performance and international economic engagement. It also might reflect an insufficient understanding of the potential of mining and METS to become a much larger element in Australia's partnership with East and South Asia.

Against this background, establishing METS Ignited – an industry-led, government funded growth centre for METS – is a positive development in strengthening collaboration across mining, METS companies, research institutions and government. As well as identifying (and commercialising) future opportunities for the sector in a competitive regional and global environment, METS Ignited could become one of the keys to building an informed understanding of the modern Australian mining sector in the general community.

Beyond funding collaborative organisations like METS Ignited, the Australian Government could demonstrate its commitment to advancing Australia's interests in a strong resources sector in several ways. Three deserve serious consideration.

The first is to build resources, energy and METS partnerships with India and the countries of South-East Asia. They could be modelled on the Australian Competition and Consumer Commission's approach to promoting competition policy in ASEAN under AANZFTA's Economic Cooperation Support Program. (See also Recommendation 5.)

Second, APEC (and APEC-linked organisations) have the potential to play a more valuable regional role in promoting sustainable production of minerals and metals; building understanding of modern mining's contribution to development and employment creation both directly and indirectly through impacts on other sectors; and encouraging more open markets for commodities and investment. Greater regular interaction between officials and business representatives

from member economies on the nuts and bolts of mining regulations, policies and practices and on developments in each economy's minerals and metals sector would help to build trust and confidence across the sector. It also would help in addressing – and potentially making effective progress on – practical matters such as how business and governments can spread the social and economic benefits from sustainable mining, the legal frameworks that might encourage more sustainable mining investment across the Asia-Pacific region, and the sorts of government-business partnerships that boost mining sector competitiveness.[102]

The Australian Government, and Australia more broadly, has a big stake in APEC. The APEC region has long been at the core of Australia's economic, trade and wider interests. And mining and mining-related activities are easily Australia's leading export sector and are overwhelmingly focused on the region. Securing adequate funding for this important area of APEC's work agenda should continue to be an important Australian priority.

Third, public diplomacy should reinforce the messages that mining can be a highly effective element for development, and that regional countries and Australia have complementary interests. The region needs commodities, technologies, advanced services, and improved health, safety and environmental outcomes in mining. Australia has global-level excellence across the mining chain. And these synergies should be promoted in the general community, with advocacy targeted at the Australian business community, civil society groups, and opinion leaders and stakeholders in Asia. There are plenty of misconceptions about the impact of mining on development. It is more than time to correct them with analytically sound, well-targeted information.

5. Build institutional and human capacities in Asia's mining sector

Good trade agreements are like an anchor: legally binding commitments on market access might be modest but they provide a context or basis for good quality regulatory reform. A key and under-appreciated aspect of FTAs is their contribution to institution building and reform at various levels. FTAs can provide a broad sense of direction for domestic economic reform and bring together domestic agencies to focus on the national interest – how good regulatory practice should work, how coordination within government and between governments can be improved, and how business engagement with government can be strengthened.

Silo mentalities in government need to be broken to reduce duplication of processes and associated costs for business. It is necessary also to test how particular regulations fit, or do not fit, with broad government policy objectives. For example, customs administration should be about trade facilitation and preventing illegal imports and people movement, but frequently trade facilitation takes a backseat to an overly zealous focus on bureaucratic processes and controls. Business then pays the price through unnecessarily high fees and charges and unnecessarily long delays in clearing imports.

RCEP, the AANZFTA Review and Australia's bilateral trade negotiations are an opportunity to contribute to institution building and reform, particularly through provisions on good regulatory practice and stronger economic cooperation – a key feature now of trade agreements between advanced, emerging and developing countries. Enhanced cooperation in resources

and METS, spanning sustainable mining, infrastructure, public sector reform, mining-related research and development, and high level scientific and vocational education, is strongly in the interests of Australia, ASEAN and India. Australia has acknowledged skills across the mining value chain. And ASEAN and India need to transform their mining and energy sectors if they are to achieve their development objectives.

Carefully targeted aid for trade Australian Official Development Assistance (ODA), amounting to around $150 million per year in the case of ASEAN, could go some way in supporting enhanced cooperation, though this must, in a practical sense, be based on mutual commercial benefit. One possibility might be to strengthen information sharing and provision of technical information in areas such as best practice mining regulation, including information on Australia's environmental regulation; mining project approval processes; the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the 'JORC Code'); and voluntary industry guidelines on sustainable mining practices. Another possibility might be to strengthen cooperation between Geoscience Australia and its regional counterparts. Geoscience Australia is acknowledged as a leading agency internationally in its field. Australian mining companies and minerals exploration ventures benefit from its acquisition, interpretation and provision of pre-competitive geological data and its analysis of resources potential. This body of geoscientific data represents a critical public good for a country with significant minerals and energy resources. Australia's regional trading partners could be assisted in their efforts to attract investment and develop their resources sectors through sharing information and technical knowledge with Geoscience Australia and, indeed, with the wider Australian academic and private sector geoscientific community.

6. Engage with China's Belt and Road Initiative

Developing economies in Asia have massive infrastructure investment needs, particularly in transport, energy and communications. Improving the efficiency, reliability and extent of transport, energy and communications networks will support regional growth and development by reducing trade costs and delivering long-term productivity and welfare gains for regional economies.

There is considerable scope for Australian involvement in Asian infrastructure projects given our skills in engineering, construction and infrastructure development and financing. The Australian Government should continue to support infrastructure investment in Asian economies through the multilateral development institutions, including the new Asian Infrastructure Investment Bank.

China's Belt and Road Initiative (BRI) has the potential to shape the Indo-Pacific regional economy and provide further opportunities for Australian engagement in regional infrastructure investment. Australia should build on its Asian Infrastructure Investment Bank membership and leverage commercial skills and capabilities by seeking to participate in BRI projects. Federal and State Governments should work with the Australian infrastructure sector to develop strategies for engaging with Chinese counterparts

around BRI. This should include analysis of the implications of the initiative for regional economic development, and the commercial as well as diplomatic opportunities for Australian collaboration with China and other regional economies. Australia's engagement also needs to be informed by clear-eyed analysis of the potential for BRI to become some form of servicing arrangement for the metropolitan power or a vehicle for managing Chinese excess capacity in commodities such as steel and cement.

China and Japan and, to a much lesser extent, India, are engaged in an infrastructure 'war', and South-East Asia is in the middle of it. From an Australian business perspective, a high priority is placed on Australia continuing to push hard to sustain the rules-based international economic order – rules must apply to all, including the behemoths; partnering with all parties in delivering worthwhile infrastructure projects; and stepping up research and analysis on the geo-economic challenges facing the wider region.

7. Explore an Asian Clean Energy initiative

A regional clean energy initiative could enhance energy security and economic development in Asia while achieving substantial reductions in greenhouse gas emissions. High efficiency, low emissions (HELE) coal-fired power plants produce more electricity using less coal by operating at higher temperatures and pressures to more rapidly convert water to steam. Electricity generating plants using HELE technology, such as ultra-supercritical and advanced ultra-supercritical plants, can virtually eliminate particulate pollution and reduce carbon dioxide emissions by as much as 50 per cent.[103] Adoption of Carbon Capture and Storage (CCS) technologies would increase emissions savings to 90 per cent.

Asia's energy consumption has grown strongly in recent decades, but still has substantial growth to come. Coal will play a central role in meeting these energy needs over coming decades. And Australia and neighbouring Asian nations have a direct economic and environmental interest in ensuring that proposed coal-fired plants employ the latest available HELE technology. There is a strong coincidence of interest amongst the suppliers of high energy, high quality coal best suited to these plants (Australia), the providers of new super-efficient generation technologies (Japan and China), and energy hungry developing nations such as India and Indonesia.

Moreover, under the Paris Agreement on climate change, as a developed country Australia has committed to providing financial resources and cooperation on technology transfer to assist developing countries with their climate change mitigation and emissions reduction efforts (Paris Agreement, Articles 9, 10). An Asian Clean Energy Initiative promoting the take-up of HELE technologies would be consistent with these undertakings and would contribute to the economic and environmental needs of developing economies.

Australia should promote and support the creation of an Asian Clean Energy Initiative either in a building block approach that initially brings together a small number of key regional countries, or on a wider pan-Asian basis.

Defining the mining industry and the METS sector

In examining tariff and other barriers to the mining and METS sectors, it is necessary to define these sectors as precisely as possible. For goods trade, the definition needs to be cast in terms of the Harmonized Commodity Description and Coding System (HS), which usually constitutes the basis for databases on tariffs and which is also widely used to identify trade flows. For services trade, a relatively standard classification used in the World Trade Organization (WTO) and in free trade agreements is the most appropriate way to proceed.

For the mining sector (referred to ocasionally as the minerals and basic metals sector), the starting point for the definition used here was a 2017 Deloitte Access Economics study for the Minerals Council of Australia. Deloitte defines the mining sector as including 'minerals extraction industries (i.e. excludes oil and gas), exploration activities and metal processing to a primary product (i.e. in refined metal form).' More specifically, Deloitte uses the Input-Output Industry Groups (IOIGs) of Australian Input-Output Tables to define the sector as consisting of the elements in Table A.1.

Table A.1

Deloitte definition of industries in the 'mining sector'

Source: Deloitte Access Economics, *Mining and METS: engines of economic growth and prosperity for Australians*, 2017

Code	Input-output industry group	Inclusions
601	Coal mining	All
801	Iron ore mining	All
802	Non-ferrous metal ore mining	All
901	Non-metallic mineral mining	All
1001	Exploration and mining support services	Exploration only
2101	Iron and steel manufacturing	Iron smelting and steel manufacturing only
2102	Basic non-ferrous metal manufacturing	Alumina production; aluminium smelting; copper, silver, lead and zinc smelting and refining; other basic non-ferrous metal manufacturing only

To translate this definition into the HS Nomenclature, a concordance between the IOIG codes and the HS Nomenclature was used. The resulting classification was then adjusted where appropriate on the basis of judgment to give the result for mining goods in Table A.3 at the end of this Annex.

Defining the METS sector is a good deal more difficult for two reasons. First in the case of goods in the METS sector, much or perhaps most of mining equipment defined in terms of HS codes (even at the six-digit level of disaggregation) can have multiple uses, with some in the mining sector and some outside it. Explosives, for example, can be used for mining, but also for more general construction work or for military purposes. Safety headgear can include motorcycle helmets as well as those used in the mining sector. Secondly, for both goods and services, the range of products and activities which contribute to the mining sector is extraordinarily broad.

The starting point in defining METS was again the study by Deloitte Access Economics, which identifies the industries that support the METS sector as those set out in Table A.2. A concordance between the IOIG codes and the HS Nomenclature was again used to provide a definition of mining equipment, which was then adjusted on the basis of judgment to give the results in Table A.4. Because much of the equipment identified in this way has uses (and often more significant uses) outside the mining sector, we have referred to these items as those that could include mining equipment. At the same time, not all items of mining equipment may be included. Even given these qualifications, the list is of value, providing a guide on what tariffs might apply to mining equipment.

The breadth of the definition used for the METS sector is consistent with the results of a 2015 survey of more than 430 firms carried out by Austmine. Chart A.1 shows the top 25 goods and services supplied by these firms according to their responses. The full list is broader still and extends to such services as blasting and drilling, education and training, and mine closure. In the case of METS services, this report has not sought to identify the full list, but has referred to a short illustrative list, covering, in the framework used in the WTO and in FTA schedules:

- Services incidental to mining
- Engineering services
- Construction services
- Legal services
- Computer services
- Accounting services
- Energy services (for Indonesia, which uses a slightly modified version of the standard classification).

The fact that METS goods and services cover such a wide range of highly specialised items means that generalisations in this report on such things as the incidence of tariffs on mining equipment and the significance of barriers to METS services need to be interpreted with caution.

Table A.2

Deloitte list of industries partly in the METS sector

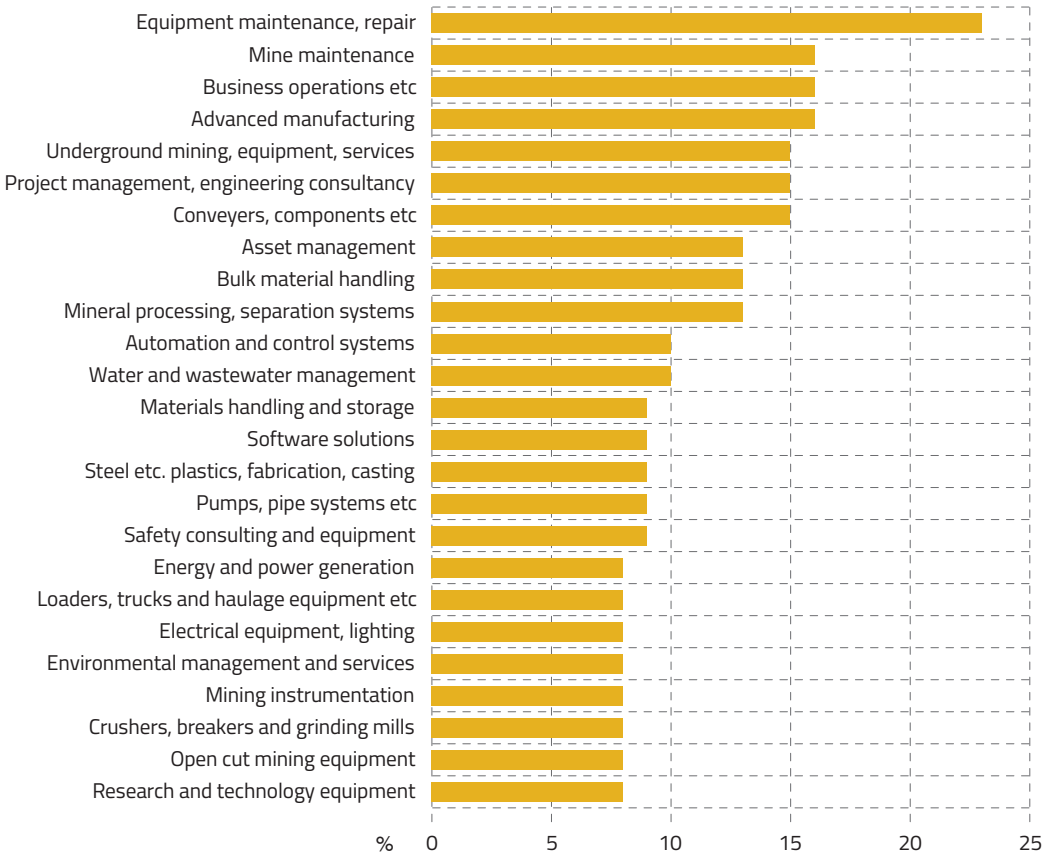
Source: Deloitte Access Economics, *Mining and METS: engines of economic growth and prosperity for Australians*, 2017

Code	Input-output industry group
1001	Exploration and mining support services (mining support services component only)
1803	Basic chemical manufacturing
1902	Natural rubber product manufacturing
2303	Railway rolling stock manufacturing
2401	Professional, scientific, computer and electronic equipment manufacturing
2403	Electrical equipment manufacturing
2405	Specialised and other machinery and equipment manufacturing
2801	Water supply, sewerage and drainage services
2901	Waste collection, treatment and disposal services
3101	Heavy and civil engineering construction
4601	Road transport
4701	Rail transport
4801	Water, pipeline and other transport
4901	Air and space transport
5201	Transport support services and storage
5701	Internet service providers, internet publishing and broadcasting, websearch portals and data processing
5801	Telecommunication services
6001	Library and other information services
6601	Rental and hiring services (except real estate)
6901	Professional, scientific and technical services
7001	Computer systems design and related services
8110	Technical, vocational and tertiary education services (including undergraduate and postgraduate)
9401	Automotive repair and maintenance
9402	Other repair and maintenance

Chart A.1

Austmine Survey: Top 25 goods and services supplied

Source: Austmine, 'New realities, bigger horizons, Australian Mining Equipment, Technology and Services (METS) National Survey', June 2015



Note: Data give the percentage of the firms out of the 432 surveyed which supplied the goods and services indicated. Some firms supplied more than one good or service.

Table A.3

Definition of mining in the HS (2012) nomenclature

Source: Deloitte Access Economics, *Mining and METS: engines of economic growth and prosperity for Australians*, 2017

HS chapter, heading or code (2012)	HS descriptor (sometimes abbreviated)
Coal and coke	
27.01	Coal; briquettes, ovoids and similar solid fuels manufactured from coal
27.02	Lignite, whether or not agglomerated, excluding jet
27.03	Peat (including peat litter), whether or not agglomerated
27.04	Coke and semi-coke of coal, of lignite or of peat, whether or not agglomerated; retort carbon
Iron ore	
26.01	Iron ores and concentrates, including roasted iron pyrites
Non-ferrous metal ores	
Chapter 26 (excluding 26.01; 26.18; 26.19)	Ores, slag and ash (excluding iron ore, and slag and by-products from iron and steel manufacture)
Non-metallic and other minerals	
Chapter 25	Salt; sulphur; earths and stone; plastering materials, lime and cement
71.02	Diamonds, whether or not worked, but not mounted or set
71.03	Precious stones (other than diamonds) and semi-precious stones, whether or not worked or graded but not strung, mounted or set; ungraded precious stones (other than diamonds) and semi-precious stones, temporarily strung
Basic iron and steel manufacturing	
26.18	Granulated slag from the manufacture of iron or steel
26.19	Slag, dross, scaling and other waste from the manufacture of iron or steel
72.01	Pig iron and spiegeleisen in pigs, blocks or other primary forms
72.02	Ferro-alloys
72.03	Ferrous products obtained by direct reduction of iron ore
72.04	Ferrous waste and scrap; remelting scrap ingots of iron or steel
72.05	Granules and powders, of pig iron, spiegeleisen, iron or steel
72.06	Iron and non-alloy steel in ingots or other primary forms (excluding 72.03)
72.07	Semi-finished products of iron or non-alloy steel
72.18	Stainless steel in ingots or other primary forms; semi-finished products of stainless steel
72.24	Other alloy steel in ingots or other primary forms; semi-finished products of other alloy steel

Basic non-ferrous metal manufacturing

2805.30	Rare-earth metals, scandium and yttrium, whether or not intermixed or interalloyed
2818.20	Aluminium oxide other than artificial corundum
71.06	Silver (including silver plated with gold or platinum), unwrought or in semi-manufactured forms, or in powder form
71.07	Base metals clad with silver, not further worked than semi-manufactured
71.08	Gold (including gold plated with platinum), unwrought or in semi-manufactured form, or in powder form
71.09	Base metals or silver, clad with gold, not further worked than semi-manufactured
71.10	Platinum, unwrought or in semi-manufactured forms, or in powder form
71.11	Base metals, silver or gold, clad with platinum, not further worked than semi-manufactured
71.12	Waste and scrap of precious metal; other waste and scrap containing precious metal or compounds principally for the recovery of precious metal
74.01	Copper mattes; cement copper (precipitated copper)
74.02	Unrefined copper; copper anodes for electrolytic refining
74.03	Refined copper and copper alloys, unwrought
74.04	Copper waste and scrap
74.05	Master alloys of copper
74.06	Copper powders and flakes
75.01	Nickel mattes, nickel oxide sinters and other intermediate products of nickel metallurgy
75.02	Unwrought nickel
75.03	Nickel waste and scrap
75.04	Nickel powders and flakes
76.01	Unwrought aluminium
76.02	Aluminium waste and scrap
76.03	Aluminium powders and flakes
78.01	Unwrought lead
78.02	Lead waste and scrap
7804.20	Lead powders and flakes
79.01	Unwrought zinc
79.02	Zinc waste and scrap
79.03	Zinc dust, powders and flakes
80.01	Unwrought tin
80.02	Tin waste and scrap
8101.10	Tungsten powders
8101.94	Unwrought tungsten, including bars and rods obtained simply by sintering
8101.97	Tungsten waste and scrap
8102.10	Molybdenum powders

8102.94	Unwrought molybdenum, including bars and rods obtained simply by sintering
8102.97	Molybdenum waste and scrap
8103.20	Unwrought tantalum, including bars and rods obtained simply by sintering; powders
8103.30	Tantalum waste and scrap
8104.11	Unwrought magnesium at least 99.8 per cent by weight magnesium
8104.19	Other unwrought magnesium
8104.20	Magnesium waste and scrap
8104.30	Magnesium raspings, turnings and granules, graded according to size; powders
8105.20	Cobalt mattes and other intermediate products of cobalt metallurgy; powders
8105.30	Cobalt waste and scrap
8106	Bismuth and articles thereof, including waste and scrap
8107.20	Unwrought cadmium; powders
8107.30	Cadmium waste and scrap
8108.20	Unwrought titanium; powders
8108.30	Titanium waste and scrap
8109.20	Unwrought zirconium; powders
8109.30	Zirconium waste and scrap
8110.10	Unwrought antinomy; powders
8110.20	Antinomy waste and scrap
8111.00	Manganese and articles thereof, including waste and scrap
8112.12	Unwrought beryllium, powders
8112.13	Beryllium waste and scrap
8112.21	Unwrought chromium; powders
8112.22	Chromium waste and scrap
8112.51	Unwrought thallium; powders
8112.52	Thallium waste and scrap
8112.92	Other metals (vanadium, gallium, hafnium, etc.) unwrought; waste and scrap; powders

Table A.4

Products that could include mining equipment, HS (2012) nomenclature

HS (2012)	Commodity descriptor (sometimes abbreviated)
	Basic chemical manufacturing
36.02	Prepared explosives, other than propellant powers
36.03	Safety fuses; detonating fuses; percussions or detonating caps; igniters; electric detonators
2837.11	Sodium cyanide
	Rubber product manufacturing and headgear
40.10	Conveyer or transmission belts or belting, of vulcanised rubber
4011.20	New pneumatic tyres of rubber of a kind used on buses or lorries
4011.62	New pneumatic tyres of rubber having a "herring bone" or similar tread of a kind used on construction handling vehicles and machines and having a rim size not exceeding 61cm
4011.63	Above of a kind having a rim size exceeding 61cm
4012.12	Re-treaded tyres of rubber of a kind used on buses or lorries
6506.10	Safety headgear
	Railway manufacturing
73.02	Railway or tramway track construction material of iron or steel, including the following: rails, check-rails and rack rails, switch blades, crossing frogs, point rods and other crossing pieces, sleepers, fish-plates, chairs, chair wedges, sole plates (base plates), rail clips, bedplates, ties and other material specialized for jointing or fixing rails
85.30	Electric signalling, safety or traffic control equipment for railways, tramways, roads, inland waterways, parking facilities, port installations or airfields (other than those in heading 86.08 below)
86.01	Rail locomotives powered from an external source of electricity or by electric accumulators
86.02	Other rail locomotives; locomotive tenders
86.03	Self-propelled railway or tramway coaches, vans and trucks, other than those under 86.04
86.04	Railway or tramway maintenance or service vehicles
86.06	Railway or tramway goods, vans and wagons, not self-propelled
86.07	Parts of railway or tramway locomotives or rolling stock
86.08	Railway or tramway track fixtures and fittings; mechanical signalling, safety or traffic control equipment for railways, tramways, roads, inland waterways, parking facilities, port facilities, port installations or airfields; parts of the foregoing
86.09	Containers specifically designed and equipped for carriage by one or more modes of transport
	Professional, scientific, computer and electronic equipment manufacturing
84.71	Automatic data processing machines and units thereof; magnetic or optical readers; machines for transcribing data onto data media in coded form and machines for processing such data, not elsewhere specified or included
8473.30	Parts and accessories of the machines of heading 84.71 above
90.15	Surveying (including photogrammetrical surveying), hydrographic, oceanographic, hydrological, meteorological or geophysical instruments and appliances, excluding compasses; rangefinders

90.24	Machines and appliances for testing the hardness, strength, compressibility, elasticity or other mechanical properties of materials (for example, metals, wood, textiles, paper, plastics)
90.26	Instruments and apparatus for measuring or checking the flow, level, pressure or other variables of liquids or gases
90.27	Instruments and apparatus for physical and chemical analysis (for example, polarimeters, refractometers, spectrometers, gas or smoke analysis apparatus); instruments and apparatus for measuring and checking viscosity, porosity, expansion, surface tension and the like; instruments and apparatus for measuring or checking quantities of heat, sound or light (including exposure meters); microtomes
90.32	Automatic regulating or controlling instruments and apparatus
90.33	Parts and accessories of items not included elsewhere for machines and apparatus of Chapter 90 of the HS
	Electrical equipment manufacturing
85.01	Electric motors and generators (excluding generating sets)
85.02	Electric generating sets and rotary converters
85.03	Parts suitable for use solely or principally with the machines of heading 85.01 or 85.02
85.14	Industrial or laboratory electric furnaces and ovens (including those functioning by induction or dielectric loss); other industrial or laboratory equipment for the heat treatment of materials by induction or dielectric loss
8526.92	Radio remote control apparatus
8545.11	Carbon electrodes of a kind used for furnaces
	Specialised and other machinery and equipment manufacturing
	Articles of Iron and Steel
7304.11	Line pipe of a kind used for oil or gas pipelines: of stainless steel
7304.19	Line pipe of a kind used for oil or gas pipelines: other
7304.22	Casing, tubing and drill pipe, of a kind used in drilling for oil or gas: drill pipe of stainless steel
7304.23	Casing, tubing and drill pipe, of a kind used in drilling for oil or gas: other drill pipe
7304.24	Casing, tubing and drill pipe, of a kind used in drilling for oil or gas: other, of stainless steel
7304.29	Casing, tubing and drill pipe, of a kind used in drilling for oil or gas: other
7305.11	Other tubes and pipes having circular cross-sections, the external diameter of which exceeds 406.4 mm: line pipe of a kind used for oil or gas pipelines: longitudinally submerged arc welded
7305.12	Other tubes and pipes having circular cross-sections, the external diameter of which exceeds 406.4 mm: line pipe of a kind used for oil or gas pipelines: other, longitudinally welded
7305.19	Other tubes and pipes having circular cross-sections, the external diameter of which exceeds 406.4 mm: line pipe of a kind used for oil or gas pipelines: other
7305.20	Other tubes and pipes having circular cross-sections, the external diameter of which exceeds 406.4 mm: casing of a kind used in drilling for oil or gas
7306.11	Other tubes, pipes and hollow profiles: line pipe of a kind used for oil or gas pipelines: welded, of stainless steel
7306.19	Other tubes, pipes and hollow profiles: Line pipe of a kind used for oil or gas pipelines: other

7306.21	Other tubes, pipes and hollow profiles: Casing and tubing of a kind used in drilling for oil or gas: welded, of stainless steel
7306.29	Other tubes, pipes and hollow profiles: Casing and tubing of a kind used in drilling for oil or gas: other
	Machinery and mechanical appliances and parts
8207.13	Rock drilling or earth boring tools, with working parts of cermets
8207.19	Rock drilling or earth boring tools, other, including parts
8413.50	Pumps for liquids, whether or not fitted with a measuring device; liquid elevators: other reciprocating positive displacement pumps
8413.60	Pumps for liquids, whether or not fitted with a measuring device; liquid elevators: other rotary positive displacement pumps
8413.70	Pumps for liquids, whether or not fitted with a measuring device: other centrifugal pumps
8413.81	Other pumps for liquids, whether or not fitted with a measuring device
8413.82	Liquid elevators
8413.91	Pumps for liquids, whether or not fitted with a measuring device: parts
8413.92	Parts of liquid elevators
84.16	Furnace burners for liquid fuel, for pulverised solid fuel or for gas; mechanical stokers, including their mechanical grates, mechanical ash dischargers and similar appliances
8417.10	Furnaces and ovens for the roasting, melting or other heat-treatment of ores, pyrites or of metals
8421.29	Filtering or purifying machinery and apparatus for liquids: other
8421.39	Filtering or purifying machinery and apparatus for gases: other
84.26	Ships' derricks; cranes, including crane cables; mobile lifting frames; straddle carriers and works trucks fitted with a crane
84.27	Fork-lift trucks; other works trucks fitted with lifting or handling equipment
8428.10	Other lifting, handling, loading or unloading machinery: lifts and skip hoists
8428.20	Pneumatic elevators and conveyors
8428.31	Other continuous-action elevators and conveyors, for goods or materials: specially designed for underground use
8428.32	Other continuous-action elevators and conveyors, for goods or materials: other, bucket type
8428.33	Other continuous-action elevators and conveyors, for goods or materials: other, belt type
8428.39	Other continuous-action elevators and conveyors, for goods or materials: other
84.29	Self-propelled bulldozers, angledozers, graders, levellers, scrapers, mechanical shovels, excavators, shovel loaders, tamping machines and road rollers
8430.10	Other moving, grading, levelling, scraping, excavating, tamping, compacting, extracting or boring machinery, for earth, minerals or ores: pile-drivers and pile-extractors
8430.31	Coal or rock cutters and tunnelling machinery: self-propelled
8430.39	Coal or rock cutters and tunnelling machinery: other
8430.41	Other boring or sinking machinery: self-propelled
8430.49	Other boring or sinking machinery: other
8430.50	Other moving, grading, levelling, scraping, excavating, tamping, compacting, extracting or boring machinery, for earth, minerals or ores; pile-drivers and pile-extractors; snow-ploughs and snow-blowers: other machinery, self-propelled

8430.61	Other machinery for moving, grading, etc. earth, minerals or ores: not self-propelled: tamping or compacting machinery
8430.69	Other machinery for moving, grading, etc. earth, minerals or ores: not self-propelled: other
8431.20	Parts of machinery of heading 84.27
8431.31	Parts of machinery of heading 84.28: of lifts, skip hoists or escalators
8431.39	Parts of machinery of heading 84.28: other
8431.41	Parts of machinery of heading 84.26, 84.29 or 84.30: buckets, shovels, grabs and grips
8431.42	Parts of machinery of heading 84.26, 84.29 or 84.30: bulldozer or angledozer blades
8431.43	Parts for boring or sinking machinery of subheading 8430.41 or 8430.49
8431.49	Parts of machinery of heading 84.26, 84.29 or 84.30: other
84.54	Converters, ladles, ingot moulds and casting machines, of a kind used in metallurgy or in metal foundries
84.55	Metal-rolling mills and rolls therefor
84.64	Machine-tools for working stone, ceramics, concrete, asbestos-cement or like mineral materials or for cold working glass
8466.91	Parts for machines of heading 84.64
84.74	Machinery for sorting, screening, separating, washing, crushing, grinding, mixing or kneading earth, stone, ores or other mineral substances, in solid (including powder or paste) form; machinery for agglomerating, shaping or moulding solid mineral fuels, ceramic paste, unhardened cements, plastering materials or other mineral products in powder or paste form; machines for forming foundry moulds of sand
8479.50	Industrial robots, not elsewhere specified or included
8479.81	Other machines and mechanical appliances for treating metal, including electric wire coil-winders
8479.82	Other machines and mechanical appliances for mixing, kneading, crushing, grinding, screening, sifting, homogenising, emulsifying or stirring machines
8480.10	Moulding boxes for metal foundry
8480.20	Mould bases
8480.30	Moulding patterns
8480.41	Moulds for metal or metal carbides: injection or compression types
8480.49	Moulds for metal or metal carbides: other
8480.60	Moulds for mineral materials
	Vehicles other than railway or tramway rolling stock; parts and accessories
87.04	Motor vehicles for the transport of goods
8705.10	Crane lorries
8705.20	Mobile drilling derricks
8705.90	Other special purpose motor vehicles, but not crane lorries or fire fighting vehicles
87.09	Works trucks, self-propelled, not fitted with lifting or handling equipment, of the type used in factories, warehouses, dock areas or airports for short distance transport of goods; tractors of the type used on railway station platforms; parts of the foregoing vehicles

Endnotes

1 Data are at basic prices and are from Australian Bureau of Statistics (ABS), *Australian System of National Accounts,* 2016-17, Catalogue 5204.0, released 27 October 2017. Mining here includes oil and gas extraction and mining exploration and other mining support services.

2 Datum is from ABS, *Labour Force, Australia, Detailed, Quarterly, May 2017*, Catalogue 6291.0.55.003, released 22 June 2017.

3 Using input-output analysis and labour productivity data, it is possible to identify the level of employment inside and outside the mining sector associated with its net exports. Take the number of jobs associated with $1 billion of exports of iron ore and coal. Recent analysis suggests that exports of iron ore of this order would be associated with about 1800 or 1900 jobs: approximately 400 in iron ore mining and another 1500 in other sectors. For coal, $1 billion of exports would be associated with about 4800 or 4900 jobs: 1000 in the coal industry and 3900 or so in other sectors. This analysis is indicative only and does not mean that a *change* in exports would necessarily lead to *changes* in employment of this magnitude. Input-output analysis is based on highly restrictive assumptions. But even with this qualification, there is a clear implication that mining generates jobs both within the sector and especially in sectors supplying inputs: Minerals Council of Australia (MCA), Submission to the Foreign Policy White Paper: *The turning tide of globalisation: International priorities for Australia's resources sector*, Canberra, March 2017, p. 13.

4 See BHP Billiton 'Economic Contribution & Payments to Governments Report 2016', September 2016, viewed 26 August 2017, http://www.bhp.com/-/media/bhp/documents/investors/annual-reports/2016-billitoneconomiccontributionandpaymentstogovernments2016.pdf?la=en. This covers the year ended 30 June 2016. For Rio's contribution covering the calendar year, see Rio Tinto, 'Taxes Paid in 2016', April 2017, viewed 26 August 2017, http://www.riotinto.com/documents/RT_taxes_paid_in_2016.pdf. Reflecting lower commodity prices, the amount paid by both miners was lower than in immediately preceding years. In 2013, Rio alone paid $5.7 billion. See Rio Tinto, 'Taxes Paid in 2013', March 2014, viewed 27 August 2017, http://www.riotinto.com/documents/RT_taxes_paid_in_2013.pdf

5 MCA, Submission to the Foreign Policy White Paper, *The turning tide of globalisation: International priorities for Australia's resources sector*, Canberra, March 2017, p. 20.

6 Department of Foreign Affairs and Trade (DFAT), *Composition of Trade: Australia 2016*, Canberra, June 2017, p. 118.

7 Austmine, 'National METS (Mining Equipment, Technology and Services) Survey 2015' (complete study), June 2015.

8 For this distinction and the observation that NTMs can sometimes promote trade, see M Ghodsi, J Gruebler and R Stehrer, 'Estimating Importer-Specific Ad Valorem Equivalents of Non-Tariff Measures', Vienna Institute for International Economic Studies, Working Paper 129, September 2016, p. 1.

9 The above study suggests that the simple average tariff equivalent for technical barriers to trade across the majority of the countries considered in this report was around 5 per cent. The countries covered are India and all ASEAN member states except Cambodia, Laos, Brunei Darussalam and Myanmar. However, the estimates for

individual countries vary massively and the results should therefore be interpreted with considerable caution. See ibid., pp. 32-33, 39.

[10] On Tanjung Priok Port, see E Ginting, A Yusuf, P Aji and M Horridge, 'Economy-wide Impact of a More Efficient Tanjung Priok Port', Asian Development Bank Papers on Indonesia, No, 3, October 2015. The port's capacity is currently being expanded.

[11] Australia's Productivity Commission recently modelled a number of scenarios for a trade war, finding that, in the event of a global 15 percentage point rise in tariff barriers, liberalisation by RCEP of tariffs, NTBs and barriers to services trade would more than offset the negative impact on Australia. See Productivity Commission, *Modelling protectionist trade policies: Rising Protectionism: Technical Supplement to the Research Paper*, Productivity Commission, July 2017, Appendix 3.

[12] Both the equipment and services components of METS are difficult to define precisely partly because many of the goods and services have multiple uses. The enormous range of goods and services involved also makes it difficult to identify them with any precision. The classifications proposed in the Technical Annex seek to identify the activities considered to be tied most closely to mining and are used in this report as indications of items that could include mining equipment and services.

[13] Other examples of prominent metals exports to ASEAN are gold (to Singapore and Thailand) and nickel (to Malaysia and Singapore). Nickel exports can be estimated from partner country statistics. They are mostly confidential in Australian statistics.

[14] Austmine, 'Australia's New Driver of Growth: Mining Equipment, Technology and Services', 2013, viewed 29 June 2017, http://www.austmine.com.au/Portals/25/Content/Documents/Austmine%20Survey%20Highlights.pdf; Austmine, 'National METS Survey 2015 Results: New Realities, Bigger Horizons' (online summary), viewed 28 June 2017, www.austmine.com.au; Austmine, 'New Realities, Bigger Horizons, Australian Mining Equipment, Technology and Services (METS) National Survey', (complete study), June 2015.

[15] Austmine, 'National METS (Mining, Equipment and Services) Survey 2015' (complete study), June 2015.

[16] See Austrade, 'Overseas Investment of Australian Companies', *Trade and Investment Note*, April 2015, p. 11. The nature of the activities of mining affiliates was not specified by Austrade. Presumably, companies in Singapore were marketing, distribution and financing arms of Australian miners and those in the Philippines and Indonesia were miners and explorers. Austrade's primary source for its note was the IBISWorld company database.

[17] Data on specific METS companies are hard to get. One example in Singapore is AMC Consultants, which set up an office in 2015. See: http://www.amcconsultants.com/announcements/new-office-singapore

[18] This estimate is based on the classification in the Technical Annex, which seeks to identify items that could include mining equipment and is derived from ABS statistics. Exports of these items to Indonesia in 2016 were less than $200 million, and to Malaysia less than $100 million. They may potentially have been around $300 million in the case of Singapore, but precision is virtually impossible given the multiple use nature of many products and technologies.

[19] The 2015 Austmine Survey of METS companies identified Vietnam as a significant market for METS exporters, with 21 per cent of exporters having a presence there. However, Vietnam did not rate very highly

when respondents were asked about the markets most important to them. The 2016 Australian International Business Survey (AIIB) also found that Vietnam was not expected to become a major new market for METS: University of Sydney for the Export Council of Australia and partner institutions, *Australia's International Business Survey: 2016 Report*, Export Council of Australia/University of Sydney, 2016.

20 United Nations Conference on Trade and Development (UNCTAD), *World Investment Report 2017*, Geneva, 2017, p. 12.

21 ibid. pp. 226-227.

22 ibid. p. 12.

23 See M Thirwell, *Australia-India economic ties: Room to grow*, Austrade, 15 April 2016, https://www.austrade.gov.au/news/economic-analysis/australia-india-economic-ties-room-to-grow, viewed 14 October 2017.

24 The 2015 Austmine Survey of Australian METS companies reported India as among the top 10 country locations for overseas operations and offices.

25 M Thirwell, *Australia-India economic ties: Room to grow*, 2016.

26 DFAT data for Table 1 is sourced from ABS, *International Investment Position, Australia: Supplementary Statistics, 2016,* Catalogue 5352.0, 10 May 2017.

27 The European Union accounted for 18 per cent of net FDI inflows into ASEAN member states from 2012 to 2016, Japan for 14 per cent, the United States 13 per cent, China 6.2 per cent, and Hong Kong 5.9 per cent. Intra-ASEAN flows accounted for 18 per cent of net inflows. Singapore accounted for 60 per cent of these: ASEAN Secretariat FDI Database as of 30 June 2017.

28 Data for total FDI for ASEAN are from UNCTAD, op.cit, pp. 227-228. After Singapore, Malaysia (13 per cent), Thailand (9 per cent) and the Philippines (5 per cent) account for the bulk of remaining outward FDI.

29 The discussion on inward FDI in mining in ASEAN is based on accumulated flows (and therefore building up of stocks) over five years rather than stocks at a given date. This is because of lack of information on FDI stocks by industry and country. The data source is the ASEAN Secretariat FDI Database as of 30 June 2017.

30 Data are from the Foreign Investment Review Board's (FIRB's) Annual Reports 2011-12 to 2015-16. FIRB approvals data must be interpreted cautiously and used for indicative assessments of investors' intentions. See FIRB, *Annual Report 2016*, pp. 47-50.

31 World Economic Forum, *The Global Competitiveness Report 2016-2017,* World Economic Forum, Geneva, 2017, p. 201. A more pessimistic view is developed in a lead article by The Economist, 'India's prime minister is not as much of a reformer as he seems', print edn, 24 June 2017. The Economist suggests Prime Minister Modi is more of an administrator than a reformer and is squandering a golden opportunity to reform India's economy.

32 University of Sydney for the Export Council of Australia and partner institutions, *Australia's International Business Survey: 2016 Report*, Export Council of Australia/University of Sydney, 2016, p. 9.

33 BHP bases its primary marketing and supply activities in Singapore and notes that '77 per cent of our sales and suppliers are in Asia'. See *BHP Annual Report 2017*, 20 September 2017, p. 67.

34 Brunei Darussalam is difficult to categorise and sits outside this analysis given that it is basically an oil and gas economy.

35 OECD, *Economic Outlook for South-East Asia, China and India 2017: Addressing Energy*

Challenges, OECD Publishing, Paris, 2017, p. 17.

[36] ASEAN Secretariat, *Master Plan on ASEAN Connectivity 2025*, Jakarta, August 2016, p. 33.

[37] The growing weight of key emerging economies (most notably in Asia) in world economic rankings is now commonly accepted. Besides China and India, Indonesia could rank among the world's top five economies by purchasing power parity by the end of the 2020s. However, the ranking of some ASEAN countries (such as Thailand) may actually decline: PwC, *The Long View: How will the global economic order change by 2050?* February 2017, p. 23.

[38] Thailand is an exception to expected strong population growth. Its population is ageing rapidly and the working-age population is expected to decline over the next decade.

[39] United Nations (UN) Department of Economic and Social Affairs, *World Urbanization Prospects*, UN, New York, 2014.

[40] ibid. p. 29.

[41] International Monetary Fund (IMF), World Economic Outlook Database, October 2017.

[42] The gaps in infrastructure are vast and are at a level, even with increased government spending, where they are dampening growth: M Peel & T Mitchell, 'Asia's $26 tn infrastructure gap threatens growth, ADB warns', *Financial Times*, 28 February 2017; and M Peel & J Vasagar, 'ASEAN has invested less than half of what it will need', *Financial Times*, 4 May 2017.

[43] EM Squared, 'China's stop-start One Belt, One Road progress in ASEAN', *Financial Times,* 2 December 2016.

[44] ASEAN Secretariat & UNCTAD, *ASEAN Investment Report 2016: Foreign Direct Investment and MSME Linkage,* Jakarta, September 2016, pp. 63, 68.

[45] The Belt and Road Initiative (BRI), also known as 'One Belt, One Road', is China's signature policy for building key infrastructure across Eurasia and South-East and South Asia. Surveys conducted by the Hong Kong Trade Development Council suggest that very large numbers of private Chinese businesses are considering investing in BRI markets as part of their business strategy. ASEAN may well be the top target: EM Squared, 'China's stop-start One Belt, One Road progress in ASEAN', *Financial Times*, 2 December 2016.

[46] The Economist, *ASEAN Connections: How mega-regional trade and investment initiatives in Asia will shape business strategy in ASEAN and beyond,* The Economist Corporate Network, 2016, pp. 4, 6.

[47] International Energy Agency (IEA), *India's Energy Outlook: World Energy Outlook Special Report*, OECD/IEA, Paris, 2015, p. 11.

[48] Under the IEA's central scenario, coal increases its share of India's primary energy mix from 44 per cent in 2013 to 49 per cent by 2040, and coal-fired power generation accounts for around half of the increase: IEA, op. cit., pp. 13, 57. In more general terms, India needs multiple sources of energy to meet its rapidly expanding energy requirements. It cannot afford to neglect low-cost energy sources such as coal: IEA, *World Energy Outlook 2016*, OECD/IEA, Paris, 2016, p. 7. This also is the view of Arvind Subramanian, Chief Economic Advisor to the Indian Government. See for example: A Subramanian, 'India is right to resist the West's carbon imperialism', *Financial Times*, 27 November 2015.

[49] Department of Industry and Science (Office of the Chief Economist), *Coal in India,* Commonwealth of Australia, 2015, p. 12.

[50] IEA, *India's Energy Outlook: World Energy Outlook Special Report*, OECD/IEA, Paris, 2015, p. 136.

[51] S Carnot-Gandolphe, *The role of coal in South-East Asia's power sector and implications for*

global and regional trade, Oxford Institute for Energy Studies, OIES Paper CL4, December 2016, p. 1.

[52] ibid.

[53] Supercritical and ultra-supercritical are engineering terms relating to boiler temperature and pressure conditions. While there are no precise definitions, supercritical plants operate with steam temperatures of approximately 550°C to 600°C; ultra-supercritical plants at 600°C and above; and advanced ultra-supercritical plants at 700°C and above. See IEA, *Technology Roadmap: High-Efficiency, Low-Emissions Coal-Fired Power Generation*, OECD/IEA, Paris, 2012, p. 14; IEA Coal Industry Advisory Board, *Power Generation From Coal: Measuring and Reporting Efficiency Performance and CO_2 Emissions*, OECD/IEA, Paris, 2010, pp. 22, 75-84.

[54] International Council on Mining and Metals, *The Role of Mining in National Economies: mining contribution index,* 3rd ed. supplement (n.d.), p.12.

[55] In the period to 2050, India's urban population is estimated to increase by around 400 million: United Nations (UN) Department of Economic and Social Affairs, *World Urbanization Prospects*, UN, New York, 2014.

[56] In the case of countries such as Thailand, a significant part of steel production comes from scrap. It is worth noting that Thailand's uneven endowment of minerals, its low production of iron ore and coal and its role as a major manufacturing hub make it a potentially important market for minerals and base metals. This assumes, however, that slow growth in productivity and the working age population, along with political instability, do not continue to hold back economic growth.

[57] Department of Industry, Innovation and Science (Office of the Chief Economist), *Resources and Energy Quarterly*, March 2017, p. 43.

[58] Rare earths are used widely in clean energy technologies. Deposits are found in many countries, including India, but mining, production and processing are concentrated overwhelmingly in China. As demand for renewable energy increases over the next few decades, global demand for rare earths should increase strongly: see M O'Sullivan, I Overland & D Sandalow, *The Geopolitics of Renewable Energy,* Working Paper, Center on Global Energy Policy, Columbia University/ Belfer Center for Science and International Affairs, Harvard Kennedy School, June 2017.

[59] International Council on Mining and Metals, op. cit., pp. 2, 45-46.

[60] ASEAN Minerals Cooperation Action Plan 2016-2025 (AMCAP-III), pp. 2-3, 8-11.

[61] World Economic Forum, *Global Competitiveness Report 2016-2017*, Geneva, 2017, last viewed 21 September 2017, https://www.weforum.org/reports/the-global-competitiveness-report-2016-2017-1 , pp. 204-205.

[62] Australia-India Business Council, Submission to the Department of Foreign Affairs and Trade: Australia-India Comprehensive Economic Cooperation Agreement Negotiations, March 2015.

[63] Office of the United States Trade Representative, *National Trade Estimate Report on Foreign Trade Barriers,* Washington D.C., 2016, pp. 205, 207.

[64] V Mallet, 'Reformist Modi tries to shake-off "anti-poor" label', *Financial Times*, 29 March 2015.

[65] L Murdoch, 'Duterte mining crackdown could hit Australian companies', *Sydney Morning Herald*, 25 July 2017.

[66] E Warburton, *Resource Nationalism in post-boom Indonesia: the new normal?*, Lowy Institute for International Policy, April 2017, pp. 15-16.

[67] The off-shore mining environment is better than the on-shore environment. Pressure from local interests falls off dramatically; national SOEs in the oil and gas industry tend to be the most internationalised and capable across the region; and company tax levels, while high, tend to be more stable than for on-shore mining.

[68] WTO, 'Trade Policy Review: Myanmar', Report by the Secretariat, WT/TPR/S/293/Rev.1, Geneva, 12 May 2014, pp. 56-59.

[69] According to World Bank data, total trade (goods and services) as a proportion of GDP was in the 50-70 per cent range in 2015/16 for Brunei Darussalam, Indonesia, Laos, and the Philippines; around 120-130 per cent for Cambodia, Malaysia and Thailand; close to 200 per cent for Vietnam; and over 300 per cent for Singapore. For India in 2016, it was nearly 40 per cent.

[70] Productivity Commission, *Rising Protectionism: challenges, threats and opportunities for Australia*, Productivity Commission Research Paper, Commonwealth of Australia, July 2017, p. 75.

[71] India Import-Export Customs Data Base; WTO Tariff Download Facility Database.

[72] United States Trade Representative, op. cit., p. 203.

[73] Average applied tariffs in ASEAN fell from 8.9 per cent in 2000 to 4.5 per cent in 2015. Over the same period, the number of non-tariff measures on goods soared from 1634 to 5975: L Ing, S de Cordoba & O Cadot (eds), *Non-Tariff Measures in ASEAN*, Economic Research Institute for ASEAN and East Asia and UNCTAD, 2016, pp. xii-xiii, 30-31.

[74] WTO, 'Trade Policy Review: India', Report by the Secretariat, WT/TPR/S/313, 14 September 2015, pp. 49-68.

[75] ibid. pp. 21, 27-28. For a discussion on the relationship between falling tariffs and increasing NTBs, see OECD, *Economic Outlook for South-East Asia, China and India 2017: Addressing Energy Challenges,* OECD Publishing, Paris, 2017, pp. 22-27.

[76] A Sayasenh, 'Non-tariff Measures in the Lao People's Democratic Republic', in L Ing, S de Cordoba & O Cadot (eds), op. cit., pp. 77-78; H Ahamat, 'Reducing non-tariff barriers in a more integrated ASEAN: will the ASEAN Economic Community be the best option?', paper presented to the ASEAN Economic Integration Forum, Kuala Lumpur, January 2016.

[77] These assessments of the impact of NTMs are based on an examination of the Economic Research Institute for ASEAN and East Asia (ERIA)-UNCTAD NTM database. See http://asean.i-tip.org/. The website of Malaysia's Ministry of International Trade and Industry, http://www.miti.gov.my , was also consulted (viewed 15 August 2017). For a summary of government procurement in Malaysia, see WTO, 'Trade Policy Review, Malaysia, Report by the Secretariat', WT/TPR/S/292, 27 January 2014, pp. 54-57.

[78] See C Intaravitak, 'Non-tariff Measures in Thailand', in L Ing, S de Cordoba and O Cadot (eds.), op. cit., Chapter 11. The UNCTAD TRAINS database also suggests that non-tariff measures are widespread for minerals and metals, including import licensing and technical barriers to trade.

[79] See WTO, 'Trade Policy Review: Thailand, Minutes of the Meeting on 24 and 26 November 2015', WT/TPR/M/326, 3 February 2016; and written questions and answers in WT/TPR/M/326/Add.1/Rev.1, 8 April 2016.

[80] V Thanh, N Duong & T Minh, 'Non-tariff Measures in Viet Nam', in L Ing, S de Cordoba & O Cadot (eds), op. cit., pp. 155-163; WTO, 'Trade Policy Review: Vietnam', Report by the Secretariat, WT/TPR/S/287/Rev.14, November 2013, pp.12, 71.

[81] India has an OECD Services Trade Restrictive

Index score above the average in all services sectors across the 44 countries in the index: OECD Services Trade Restrictiveness Index: country note: India.

82 S Benz, A Khanna & H Nordås, 'Services and Performance of the Indian Economy: Analysis and Policy Options', *OECD Trade Policy Papers*, No. 196, OECD Publishing, Paris, 2017, p. 13.

83 Source: OECD Regulatory Database for Services Trade Restrictiveness.

84 See the OECD FDI Regulatory Restrictiveness Index, viewed 22 August 2017, http://stats.oecd.org/Index.aspx?datasetcode=FDIINDEX# .

85 Philippines Environment Secretary Roy Cimatu said in May 2017 that he would not revoke the ban on new open cut mines and was not rushing a decision on suspended and closed mines. See, for instance http://www.gulf-times.com/story/558502/Philippines-environment-minister-says-ban-on-open- 31 July 2017 and https://www.australianmining.com.au/news/philippine-leader-make-miners-pay-neglecting-environment/ 25 July 2017 (viewed 22 August 2017). Australian miners have been affected. They include OceanaGold, which operates the Dipidio gold-copper mine in North Luzon, and Red 5, which operates the Siana gold project.

86 World Bank, Services Trade Restrictions Database.

87 This point was made by the WTO Secretariat in relation to large SOEs as a group: WTO, 'Trade Policy Review: Vietnam', Report by the Secretariat, WT/TPR/S/287/Rev.14, November 2013, pp. 40, 82-83.

88 M Turnbull, 'Address to the India-Australia Business Dinner', Mumbai, 11 April 2017.

89 OECD 2017, *Economic Outlook for South-East Asia, China and India 2017: Addressing Energy Challenges,* OECD Publishing, Paris, p. 76.

90 ASEAN Secretariat, *ASEAN Economic Community Blueprint 2025,* Jakarta, November 2015; ASEAN Secretariat, *Master Plan on ASEAN Connectivity 2025*, Jakarta, August 2016.

91 ASEAN Secretariat, *ASEAN Economic Community Blueprint 2025,* p. 6.

92 ASEAN Minerals Cooperation Action Plan 2016-2025, pp. 1-3; 8-11.

93 DFAT, *Aid Budget Summary 2016-17,* Commonwealth of Australia, Canberra, May 2016; DFAT, *Aid Budget Summary 2017-18,* Commonwealth of Australia, Canberra, May 2017. Eligible countries are: Cambodia, Indonesia, Laos, Myanmar, the Philippines, and Vietnam.

94 The need for technical and vocational training, and education more broadly, goes well beyond the requirements of ASEAN members' resources and energy sectors. Based on current trends, more than half of all high skilled jobs in 2025 will be filled by people without the relevant qualifications in Cambodia, Indonesia, Laos, the Philippines, Thailand, and Vietnam: ASEAN Secretariat, *Master Plan on ASEAN Connectivity 2025*, p. 34.

95 'AANZFTA Economic Cooperation Support Program: supporting competition in ASEAN Member States through the Competition Law Implementation Program', Factsheet, August 2015: https://www.accc.gov.au/system/files/AECSP_Fact_Sheet_CLIP_Aug2015.pdf

96 These recommendations draw on Minerals Council of Australia, Submission to the Foreign Policy White Paper, op. cit., pp. 37-40.

97 E Moïsé, T Orliac & P Minor, 'Trade Facilitation Indicators: The Impact on Trade Costs', *OECD Trade Policy Working Papers*, No. 118, OECD Publishing, 2011; E Moïsé & S Sorescu, 'Trade Facilitation Indicators: The Potential Impact of Trade Facilitation on Developing Countries' Trade', *OECD Trade Policy Papers*, No. 144, OECD Publishing, 2013.

[98] WTO, *World Trade Report 2015: speeding up trade: benefits and challenges of implementing the WTO Trade Facilitation Agreement*, Geneva, 2017, p. 7.

[99] WTO, *World Trade Report 2012: trade and public policies: a closer look at non-tariff measures in the 21st century*, Geneva, 2012, p. 9. The pace at which non-tariff measures is rising may now be slowing: WTO, *Report to the Trade Policy Review Board from the Director General on Trade Related Developments (mid-October 2016 to mid-May 2017)*, Geneva, 2017.

[100] A one-off survey by the ABS in 2002-03 found that foreign affiliates trade in services (FATS) was significant for Australia with nearly two-thirds of Australian services to the world sourced from an Australian commercial presence abroad. Later studies showed that the level of FATS activity with the world varies substantially across services sectors. For example, the Law Council of Australia found that only 17.9 per cent of Australia's legal services in 2010-11 were provided via foreign affiliates (i.e. commercial presence). On the other hand, the ABS found in a FATS survey of finance and insurance services in 2009-10 that over 96 per cent of Australia's total sales overseas were via foreign affiliates: F Bingham, 'Australia's foreign affiliates trade in services', Department of Foreign Affairs and Trade, September 2015.

[101] M Adams, N Brown & R Wickes, *Trading Nation: advancing Australia's interests in world markets,* University of New South Wales Press, Sydney, 2013, p. 85.

[102] APEC CEO Summit Peru 2016, 'Promoting the growth of a healthy and sustainable mining sector in the Asia Pacific: Key findings from the APEC Executive Dialogue Meeting, Arequipa, Peru, 10 May 2016 www.pwc.com/apec

[103] IEA, *Technology Roadmap: High-Efficiency, Low-Emissions Coal-Fired Power Generation*, OECD/IEA, Paris, 2012.

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Glossary

AANZFTA	ASEAN-Australia-New Zealand Free Trade Agreement
ABS	Australian Bureau of Statistics
AIBS	Australian International Business Survey
AI-CECA	Australia-India Comprehensive Economic Cooperation Agreement
APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
BRI	China's Belt and Road Initiative
CLIP	Competition Law Implementation Program
DFAT	Department of Foreign Affairs and Trade
FATS	foriegn affiliates trade in services
FDI	foreign direct investment
FIRB	Foreign Investment Review Board
FTA	free trade agreement
GDP	gross domestic product
HELE	high efficiency, low emissions [coal-fired power station]
HS	Harmonized Commodity Description and Coding System
IA-CEPA	Indonesia-Australia Comprehensive Economic Partnership Agreement
IOIG	Input-Output Industry Group
IMF	International Monetary Fund
ISDS	Investor-State Dispute Settlement
MAFTA	Malaysia-Australia Free Trade Agreement
METS	Mining Equipment, Technology and Services
MFN	most-favoured-nation
NTBs	non-tariff barriers
NTMs	non-tariff measures
ODA	Australia's Official Development Assistance
OECD	Organisation for Economic Cooperation and Development
PwC	PricewaterhouseCoopers
RCEP	Regional Comprehensive Economic Partnership
SAFTA	Singapore-Australia Free Trade Agreement
SOE	state owned enterprise
STRI	OECD Services Trade Restrictiveness Index
TAFTA	Thailand-Australia Free Trade Agreement
TFA	WTO Trade Facilitation Agreement
TPP	Trans-Pacific Partnership Agreement
WTO	World Trade Organization

Mike Adams

Mike Adams is a former Department of Foreign Affairs and Trade (DFAT) economist with extensive experience in trade-related aspects of e-commerce, free trade agreements, climate change and agricultural protectionism.

Mike was Australia's economic counsellor in Beijing from 2000 to 2004 and commercial counsellor in Wellington from 1989 to 1992. He holds a PhD in economic history from the University of Hull.

Nicolas Brown

Nicolas Brown headed DFAT's branch responsible for analysis and strategic advice about trade and economic issues for five years to 2008. He also headed the Canada and Latin America Branch over 2009 and 2010 and was Australia's Deputy High Commissioner to Malaysia from 2000 to 2003.

Nic joined DFAT in 1996 from the Department of Prime Minister and Cabinet and worked in the Australian Bureau of Statistics in the early part of his career. He holds a Masters degree from the London School of Economics.

Ron Wickes

Ron Wickes was Director of the Trade Analysis Section of DFAT from 1999 until 2008. Before that, he worked in the Asia-Pacific Economic Cooperation (APEC) Branch and in the East Asia Analytical Unit.

Ron has a PhD in International Relations from the Australian National University and a graduate qualification in econometrics from the University of New England. In 2005 he was awarded a Public Service Medal for contributions to trade policy.

New frontiers

SOUTH AND EAST ASIA

The Minerals Council of Australia is the peak national body representing Australia's exploration, mining and minerals processing industry, nationally and internationally, in its contribution to sustainable economic and social development. This publication is part of the overall program of the MCA, as endorsed by its Board of Directors, but does not necessarily reflect the views of individual members of the Board.

Minerals Council of Australia
44 Sydney Avenue, Forrest ACT 2603
P. + 61 2 6233 0600
E. info@minerals.org.au
www.minerals.org.au

ISBN 978-0-9946078-2-9

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