AUSTRALASIAN INSTITUTE OF MINING & METALLURGY

INQUIRY INTO THE STATE OF AUSTRALIA'S MANUFACTURED EXPORT AND IMPORT COMPETING BASE NOW AND BEYOND THE RESOURCES BOOM

Who are We?

The Australasian Institute of Mining and Metallurgy ('The AusIMM') is the preeminent organization representing professionals in the minerals sector in the Australasian region. As professionals, our members have an ethical commitment to applying their expert knowledge in the fields of mining engineering, metallurgy and geoscience towards the benefit of the industry and community. Consequently they have a strong commitment to the sustainability of the minerals sector in Australia and the resulting economic benefits for this region. As mining is a high tech industry, maximizing opportunities for synergies with other sectors that will lead to improved competitiveness and efficiency of the mining sector is a major priority.

Key Issues

The terms of reference for this inquiry rely on four implicit assumptions that The AusIMM believes should be reconsidered. These assumptions are as follows:

- the resources boom will not continue for a sustained period
- the demise of Australian minerals commodity exports is inevitable and beyond our control
- minerals and manufacturing are discrete sectors with limited bearing on each others' success
- Mining and manufacturing face entirely distinct challenges which should be considered separately

The world economy is rebalancing and The AusIMM believes that we have an opportunity to benefit from that. Over the next few years it is critical that we seek to increase our competitiveness across a number of sectors through maximizing our current comparative advantages. This will involve raising our game in traditional industries as well as exploring the potential to export value added niche markets; in all cases we must recognize that continual improvement in terms of efficiency and innovation are crucial.

Minerals and energy production and processing are now a relatively larger part of the Australian economy than at any time since Federation. Projected to bring in over $100 billion dollars in exports next financial year, the leverage of the resources investment boom on overall Australian economic growth is unprecedented.[1] A number of associated downstream and supporting services stand to benefit from this.

[1] ABARE, 'Record Commodity Earnings in Prospect,' (26 June 2006), at http://www.abareconomics.com/corporate/media/2006_releases/26june_06.html

Despite the current record amount of advanced project expenditure in Australia, our relative share of new, or greenfields, exploration is declining. As new exploration is the lifeblood of the industry, a failure to turn this trend around will lead to the eventual decline of the minerals sector in Australia. Addressing issues around human capital, infrastructure, red tape and innovation are critical if we are to continue to attract exploration and mining investment over the longer term. In a global industry we face increasing competition from higher risk but under explored locations.

Mining is a capital and knowledge intensive activity, and will require niche products such as explosives and software for example to maintain competitiveness, as well as extensive support services delivered locally to keep operations efficient and lean. We as a country need to recognise the opportunities presented by the resources boom and our natural endowment, and look at how we can tap in to them to optimise our comparative advantages. This requires both a plan for a sustainable industry minerals sector, and for maximising synergies between the minerals sector and local manufacturing and associated services industries. This will require carefully adapted policy settings that recognise the interdependence of the mining and manufacturing sectors and take a long term view of what is needed to maintain Australia's prosperity.

Proposition 1: That the resources boom will not continue for a sustained period

The total value of Australia's minerals and energy exports is forecast to be around $100.6 billion in 2006-07.[2] With a record $34 billion of advanced projects announced by the Australian Bureau of Agriculture and Resources Economics (ABARE) earlier this year, the potential rewards for mineral commodity exports for the short to medium term are significant.[3]

For the longer term, insofar as the boom is largely driven by high commodity prices, there is a large body of economic opinion that says we are entering a sustained period of demand. That is, the demand from emerging economies in China and India can be compared to, the boom generated by development in Japan and Germany from 1950 to the late 1970s.[4]

China in particular is entering a period of rapid growth, with rates of urbanisation, resource consumption and energy use accelerating. With a low per capita endowment of most economically valuable naturally resources, industry and the expanding middle class will need to look elsewhere to satisfy their appetite for commodities for some time to come.

A survey of leading CEO's in the minerals industry in April 2006 by investment firm PriceWaterhouseCoopers indicated that "the view from the top is that the industry is in great shape. Profits and cash flows are at record levels, demand is good, supply has its challenges, but the industry believes that the good times will continue."[5]

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[2] Ibid.
[3] ABARE, 'Minerals and Energy – Major Development Projects April 2006 Listing,' (May 2006) http://www.abareconomics.com/publications_html/minerals/minerals_06/ac06_mearticle.pdf .
[4] Garnaut R., 'The China Resources Boom,' (February 2006), Paper Presented a the Australian Agriculture and Resources Economics Conference, Sydney 8-10 February 2006, at http://www.aomevents.com/AARES2006/keynote/garnaut.pdf .
[5] PwC, 'Mine: Let the Good Times Roll - Review of global trends in the mining industry in 2005,' (June 2006) at

Opportunity
Insofar as the resources boom is the result of sustained demand and commodity prices, there is a strong likelihood that that this will continue over the longer term.

Proposition 2: the demise of Australian minerals commodity exports is inevitable and beyond our control

The greatest threat to the long term sustainability of the minerals sector in Australian is our declining share of greenfields exploration. In the last five years Australia has slipped from second to fifth most explored region, from 17.3% to 12.6% of the exploration investment pie.[6] In a recent survey of its members carried out by The AusIMM, 91% agreed that insufficient exploration investment could see a downturn in the Australian minerals industry.[7]

In an investment climate where the mega miners are looking to restock their inventories, Australia will have to work hard to maintain and improve its global competitiveness as a destination for exploration if we want to continue to reap the rewards of the boom. This will involve pursuing the objectives of the Minerals Exploration Action Agenda such as improving the provision of geoscientific data and assisting junior explorers to raise finance through tax incentives for exploration. An exploration investment tax credit scheme has proven enourmously successful in stimulating exploration activity in Canada, which has managed to retain its ranking as an attractive destination for exploration investment despite facing many of the same challenges as the Australian minerals sector (ie 'mature terrain').

The challenge of improving our competitiveness over the long term is not just a question of throwing more money at the problem, but also making a concerted effort to lower the risks associated with exploration in Australia by raising our prospectivity. Prospectivity is a composite term relative to the state of science. We can improve our prospectivity by coming up with new ideas and technologies for deep exploration and mining, developing new minerals processing techniques that allow previously uneconomic deposits to come online, and advancing mining methods to increase efficiencies and bring down costs.

The importance of innovation and efficiency improvements that 'make the difference,' cannot be underestimated. Australia has been a world leader in minerals research, with striking value added results for our sector and our economy. For example gold production has jumped six fold in the past 20 years to $5 billion, driven by a range of new exploration and processing technologies.[8] At a global level, technological innovation has typically proceeded more rapidly in the mining industry than for other

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http://www.pwcglobal.com/extweb/pwcpublications.nsf/docid/a6eaffd49277c9658525717a0015b15e .
June 2006

[6] Metals Economics Group, 'Worldwide Exploration Budgets Reach $5.1 Billion in 2005-Just Shy of 1997 Peak', (10 November 2005) at http://www.metalseconomics.com/frame_press_releases.html ; Metals Economics Group, 'Exploration Spending Nearing Bottom of Cycle,' (2 November 2000) at http://www.metalseconomics.com/frame_press_releases.html .

[7] Centre for Social Responsibility in Mining at the University of Queensland, '2005 Survey of Minerals Industry Professionals, Key Findings, for Macquarie Securities and Australasian Institute of Mining and Metallurgy (March 2006) at http://www.ausimm.com/2005survey_minerals_industry_professionals.pdf .

[8] Roberts, P., 'Mining Innovation Will Pay Handsome Dividends,' *Australian Financial Review* (21 March 2005), p 28.

industries, particularly during periods of high demand. This has allowed mineral prices to decline over recent decades despite increasing global resource consumption.

For Australia maintaining our leading edge in minerals research requires a commitment to the system of university, industry and government collaboration that has facilitated billion dollar innovations and transformative leaps of science in the past. We need to ensure that a sufficient number of talented students are attracted to the minerals sector, that there are enough high quality minerals related courses in existence to teach them, that universities maintain their linkages with industry, and that government policies facilitate the participation of more companies in the R&D process.

A further capacity constraint on the competitiveness of the minerals sector is shortage of professionals and skilled workers, with a number of mining companies citing lack of skilled personnel as the major cause of recent project delays.[9] A recent AusIMM survey showed that equipment shortages and excessive regulation were also major concerns.[10]

Opportunities
There are a number of factors other than commodity prices that will impact whether Australia is able to reap long term benefits from a period of sustained minerals demand. In particular we need to increase our competitiveness as a destination for greenfields exploration. Strategies to do so could include the following:

* Improve access to land
* Introduce tax and other fiscal incentives for exploration
* Continually improve quality of geoscientific data
* Increase funding for minerals related courses
* Increase opportunities for university-industry-government collaboration in R&D
* Address infrastructure constraints
* Streamline regulation

Proposition 3: mining and manufacturing are discrete sectors with limited bearing on each others' success

The relative successes of the minerals and manufacturing sectors should not be considered in discrete isolation, but need to be considered both as part of a continuum, as well as part of a feedback loop. The minerals boom creates significant opportunities for manufacturing and a number of downstream industries. Meanwhile leading edge services, local manufacturing and technology improve the competitiveness of the mining sector.

It has been estimated that mineral production taken in isolation amounts to only 4% of Australian output. However a more expansive view of the mining sector, which takes into account the transport of mining output, the power used in production and processing, the goods and services used in production, such as explosives and finance, take it up to something like 10%.[11] The current resources boom has also seen direct benefits to the metal products sector of manufacturing including alumina,

[9] ABARE, 'Minerals and Energy – Major Development Projects April 2006 Listing,' see above n 3.
[10] Centre for Social Responsibility in Mining at the University of Queensland , see above n 8.
[11] Shann, E., 'Mining boom's part is bigger than the hole,' *The Australian*, 23 June 2006), at http://www.theaustralian.news.com.au/printpage/0,5942,19557198,00.html .

aluminium and steel, which have all benefited from the boom and make another 1.3%.[12]

A striking success story flowing largely from the minerals boom is the rise of Australia's Mining Technology Services Sector. This has broadly been defined by ABARE as including exploration and other services, machinery and equipment manufacturing services, construction services and scientific research services, technical services, computer services and businesses and professional associations. Gross export sales revenue from the sector in 2003-04 was 1.1 billion dollars, with gross sales reaching $4.75 billion.[13] A number of these services have managed to carve out niche export markets in Australia and overseas, for example, 60% of the world's mines now use mining software developed in Australia. The excellence of these services has enabled the minerals sector to increase its competitiveness in turn.

Commentators such as Peter Kenyon, Professor of Economic Policy at Curtin University of Technology, have predicted that the strength of the mining sector will create a synergy between manufacturing and mining in the West, which will continue to lead to specialisation and niche market development. WA's manufacturing sector is already very export oriented meaning that it is well positioned to make the most of the China boom. Exports from WA account for about 28% of sales in that State, compared with 15.7% for all Australian exports, and manufacturing accounts for 15% of all WA exports.[14] WA manufacturing exports for key niche markets in particular have grown. Thus, although manufacturing's *share* of the WA economy is declining, its importance is not.

Ed Shann, the former director of Access Economics, has urged Easter States which lack the resource strengths of Queensland and WA, to position themselves to tap into the boom. Engineering, construction, service and manufacturing companies in the sunbelt are largely outsourcing many of their functions, leading to opportunities in the East Coast. Companies that have benefited from this trend include Melbourne based Orica produces explosives used in mining, whereas NSW produces most of the railway stock used to transport minerals. Shann has argued that we should be tapping into the mining boom by supplying goods and services in line with our comparative advantages.[15]

In the Australian Industry Group Report , 'Manufacturing Futures: Achieving Global Fitness,' a number of key strategies that manufacturers have adopted in order to remain competitive were identified.[16] These include developing niche markets with export potential, focusing on innovation, product development and skilled labour inputs to retain a competitive edge. Another strategy being adopted is to concentrate on delivering high quality support services focusing on customisation, timely delivery and after care services – staying close to their customers being a key to remaining competitive. Policies that allow manufacturing companies to follow these strategies

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[12] Ibid.
[13] ABARE, 'Mining Technology Services: A Review of the Sector in Australia,' (8 April 2005) at http://www.abareconomics.com/publications_html/minerals/minerals_05/er05_mining_tech.pdf .
[14] Kenyon, P., 'Manufacturing in the West,' *Webferret,* (1st June 2005) at http://www.ferret.com.au/articles/c4/0c02f2c4.asp .
[15] Shann, E., 'Victoria Should Tap into Mining Boom', *The West Australian* (24 June 2006), p 5.
[16] Australian Industry Group, 'Manufacturing: Achieving Global Fitness,' (April 2006) at http://www.aigroup.asn.au/aigroup/pdf/publications/reports/general_reports/Manufacturing_futures_full.pdf .

and develop products and services that complement our natural strengths are needed.

Opportunities
Mining and manufacturing sectors exist along a continuum. Developing synergies between the two creates benefits for each sector. The minerals sector has created significant opportunities for manufacturing companies and downstream services. Innovation in relevant manufacturing and other services can provide significant benefits to the competitiveness of the local mining industry.

Proposition 4: mining and manufacturing face entirely distinct challenges which should be considered separately

The importance of increasing our capacity to innovate whilst retaining our comparative advantage of low sovereign risk, is critical for both the mining and manufacturing sectors. Consequently, both sectors have a strong interest in improving the level of science and engineering education in Australia, removing barriers to university-business-government collaboration for R&D, and ensuring that competitiveness does not fall victim to excessive bureaucracy.

It is no secret that both the mining and manufacturing industries are faced with current skills shortages, which are projected to get worse if we do not invest in future professionals today. In the recent Australian Industry Group Report it was submitted that there is a looming skills shortage in science and engineering, and that Science and Engineering courses should be made areas of national priority. The Australasian Institute of Mining and Metallurgy has meanwhile argued that minerals related courses in Science and Engineering should be funded at the same level of Agriculture courses in cluster 10, for a much needed additional $4000 per student.[17]

These represent separate approaches to deal with the same problem, namely the declining number of science and engineering graduates in the current user pays funding environment, that does not favour small and specialised capital intensive courses. It is disturbing that in a global knowledge economy, Australia is below the OECD average when it comes to expenditure on educational institutions as a percentage of GDP.[18] The AusIMM is hopeful that there will be some positive policy outcomes flowing from the Science, Engineering and Technology Skills Audit to resolve the looming SET skills crisis.

Creating the right policy setting for university-industry-government collaboration in R&D is also critical. In many cases global players are making decisions regarding R&D investment decisions centrally according to strict qualitative criteria. Measures that better align university and industry research priorities, such as a balanced research quality framework and provision for third stream funding to effectively communicate with head offices of major investors must form part of any strategy that envisages the creation of world class research centres of excellence.

Although leveraging funding from global players is important, ensuring that local SMEs do not miss the chance to innovate and participate in the collaborative process is also important. The AusIMM has received submissions from its members which indicate that SMEs firms who wish to apply for competitive grants face a number of

[17] The AusIMM, 'The AusIMM Submission in Favour of Increasing Funding for Minerals Related Courses to Cluster 10 Level,' (4th December 2004) at http://www.ausimm.com/policy/sub_inc_funds0405.pdf .
[18] Australian Industry Group, above n 16, p 70.

obstacles, such as the prohibitive costs of putting together a tender applications. They have also reported exclusion from participating in some of the collaborative research institutions and CRCs, due to IP concerns and the small amount of capital that is available to contribute. In their submissions, our members have suggested that a streamlined grants process or some form of tax credit may help to overcome this hurdle. The AIG report for manufacturing likewise suggests that a streamlined grants process and making the R&D tax concessions more effective (for example, by allowing companies to credit their franking accounts by the amount of company tax saved as a result of the concession) would be of significant assistance.[19] Once again, there appears to be a common problem identified by industry groups, namely extreme difficulty faced by SMEs in gaining access to the R&D grants and collaborative programs which could be addressed by more effective policy measures.

Although mining and manufacturing sectors in Australia have the comparative advantage of having low political risks, they are subject to excessive prescriptive regulation in areas as diverse as finance, environment and project approvals. It is critical to both industries that all three levels of government work to reduce the regulatory burden, maximise the efficiency of new regulation, identify priority areas of regulatory reform, reduce regulation and overlap, and increase national consistency. Most in terms of implementation, a cooperative rather than an adversarial approach by administrative agencies is critical.

Opportunities
Globalisation has thrown up challenges to the sustainability of Australian mining and manufacturing sectors over the long term, with efficiency improvements and innovation an important part of the solution. Consequently, there are a number of policy measures that are critical for advancing the competitiveness and sustainability of both sectors. These measures include:
* Increased funding for small, specialist science and engineering courses to ensure we have the human intellectual capability to innovate
* Finding ways to bring universities and industries closer together, through policy measures that facilitate greater alignment of priorities and effective two-way communication.
* Looking more closely at policy measures designed to provide business access to R&D funding, and the opportunity to participate in public-private collaborative research groupings to ensure that they do not unduly prejudice SMEs.
* Reducing the red tape

Conclusion
It is the view of The AusIMM, that any inquiry into current and future economic growth that looks at the success of the mining and manufacturing sectors as a dichotomy is extremely limited. The changes to the structure of the Australian composition of the economy occurring as a result of globalisation and the change in marketplace dynamics are significant and long term. We may need to discard some of our previous assumptions about how these sectors operate and interact in order to determine a strategy that will lead to better outcomes for both sectors.

A more forward looking inquiry would ask: “How do we tap into the synergies between mining, manufacturing and downstream industries in order to maximise the benefits from the minerals boom for the medium to longer term, for the benefit of the Australian economy and our quality of life?” Granted, not all manufacturing firms stand to benefit from the minerals boom. However the extent to which these

[19] Australian Industry Group, above n 16.

opportunities are available needs to be more closely investigated if we are to make the most of our natural comparative advantages.

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