



# **PRE-BUDGET SUBMISSION 2009-10**

**(JANUARY 2009)**

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## **TABLE OF CONTENTS**

<b>THE AUSIMM</b>	<b>3</b>
<b>SUMMARY OF RECOMMENDATIONS</b>	<b>3</b>
<b>POLICY CONTEXT – GLOBAL ECONOMIC DOWNTURN</b>	<b>6</b>
<b>1. EXPLORATION</b>	<b>9</b>
1.1 Introduce Flow Through Share Scheme on 1 July 2009	9
<b>2. POLICY AND R&amp;D INFRASTRUCTURE</b>	<b>10</b>
2.1 Ensure changes to R&D Tax Concession support work undertaken by both SMEs and large mining companies	11
2.2 Continue Support for the Minerals Down Under Flagship Initiative	13
2.3 Support the Creation of a CRC for Deep Exploration Technologies	14
<b>3. INTELLECTUAL CAPITAL – OUR PEOPLE</b>	<b>15</b>
3.1 Provide adequate support for quality minerals-related higher education	15
3.2 Support a critical mass of researchers and postgraduates in minerals related disciplines	17
3.3 Increase equitable participation of women in mining through adequate child care support policies	19
<b>4. LOW EMISSIONS TECHNOLOGY DEVELOPMENT</b>	<b>20</b>
4.1 Support for demonstration and commercialisation of step change low emissions technologies	23
4.2 Provide certainty for industry on the future availability of low cost, low emissions base load power	24
4.3 Adequate special measures for Energy-Intensive Trade-Exposed Industries (EITEs)	24
4.4 A way forward with developing countries	26

## **THE AUSIMM**

The Australasian Institute of Mining and Metallurgy ('The AusIMM') is the leading organisation representing minerals sector professionals in the Australasian region, primarily in the disciplines of mining engineering, metallurgy and geoscience. We have more than 9,000 members who work across academia, operations, mining technology and services, and Government. Given their technical expertise and first hand practical experience of the sector, our members are uniquely placed to comment on the policy settings that are needed to sustain the industry during a challenging economic period, and over the longer term.

## **SUMMARY OF RECOMMENDATIONS**

### **1. EXPLORATION**

#### **1.1 Policy Goal: Increase Exploration Spending in Australia**

##### **Recommendation**

1.1.1 Implement a flow-through tax credit scheme on 1 July 2009

### **2. POLICY AND R&D INFRASTRUCTURE**

#### **2.1 Policy Goal: Ensure changes to R&D Tax Concession support work undertaken by both SMEs and large mining companies**

##### **Recommendations:**

- 2.1.1 Increase the eligibility threshold for refundable tax incentives for R&D to companies with a turnover of \$50 million, as recommended by the *National Innovation System Review*
- 2.1.2 Maintain a premium tax level incentive for sustained investment in R&D projects by large companies (i.e. ensure the incentive does not drop below current levels)
- 2.1.3 Ensure that any amendment definition of R&D remains industry neutral, and does not add additional uncertainty and complexity into the system

#### **2.2 Policy Goal: Continue Support for the Minerals Down Under Flagship Initiative**

##### **Recommendation:**

2.2.1 Ensure CSIRO Minerals Down Under Flagship is sufficiently resourced and focused to continue to produce world class minerals related research

#### **2.3 Policy Goal: Support the Creation of a CRC for Deep Exploration Technologies**

##### **Recommendation:**

2.3.1 Support an application for a CRC for Deep Exploration Technologies in the 11<sup>th</sup> Round of CRC Program Selection

### **3. INTELLECTUAL CAPITAL – OUR PEOPLE**

#### **3.1 Policy Goal: Provide adequate support for quality minerals-related higher education**

**Recommendations:**

- 3.1.1 Establish mission-based compacts with minerals higher education providers in the areas of mining engineering, metallurgy and geoscience, to be reviewed on a triennial basis
- 3.1.2 Review the funding formula established by the *Higher Education Funding Act 2003* (Cth), particularly its impact on small, capital intensive courses

**3.2 Policy Goal: Support a critical mass of researchers and postgraduates in minerals-related disciplines**

**Recommendations:**

- 3.2.1 Ensure that higher education institutions with records of research excellence in disciplines of national importance receive adequate funding to support PhD students
- 3.2.2 Investigate options for promoting the value of PhD graduates to employers in industry
- 3.2.3 Increase the annual stipend for PhD students to at least \$25,000 per annum

**3.3 Policy Goal: Increase equitable participation of women in mining through adequate child care support policies**

**Recommendations:**

- 3.3.1 Investigate options for returning a greater proportion of child care costs incurred by workers in regional Australia through the tax system
- 3.3.2 Extend fringe benefits tax exemption to all forms of employer-sponsored child care
- 3.3.2 Support the creation of child care centres in rural and regional Australia, with operating hours that reflect the actual needs of local employees.

**4. LOW EMISSIONS TECHNOLOGY DEVELOPMENT**

**4.1 Policy Goal: Support for demonstration and commercialisation of step change low emissions technologies**

**Recommendation:**

- 4.1.1 Put in place fiscal incentives to ameliorate risk associated with demonstration and commercial development of first-of-a-kind plant aimed at substantial emissions reduction

**4.2 Policy Goal: Provide certainty for industry on the future availability of low cost, low emissions base load power**

**Recommendations:**

- 4.2.1 Develop a National Energy Policy that outlines a matrix of electricity sources likely to be available over the next two decades.
- 4.2.2 Conduct a fully-informed, evidence-based debate on the viability of nuclear power in Australia in a carbon constrained context.

#### **4.3 Policy Goal: Adequate special measures for Energy-Intensive Trade-Exposed industries (EITEs)**

**Recommendations:**

- 4.3.1 Emissions intensity baseline for assessing eligibility and level of assistance for an industry to be based on emissions intensity of process, not output
- 4.3.2 Allocation of credits to EITEs to remain constant based on a threshold of emissions per unit of revenue, until such time as developing countries accept obligations, or sector specific agreements are concluded

#### **4.4 A way forward for developing countries**

**Recommendation:**

- 4.4.1 Australia to take a leadership role in negotiating staged inclusion of developing countries into the Kyoto Protocol, with requirements to impose a carbon price on exports in EITEs for least -developed countries in return for technology assistance.

## **Policy Context – Global Economic Downturn**

The AusIMM would like to thank the Treasurer for the opportunity to provide input into the 2009-10 Budget. Our members are bound by a Code of Ethics to put the interests of the community ahead of personal or sectional interests, and are strongly committed to ensuring the sustainability of the industry in which they work. The AusIMM is committed to recommending policy settings that will assist the minerals sector in Australia to weather the current economic downturn, and position the sector for future competitiveness in what is, and will continue to be, a minerals hungry world.

The minerals sector has been the major driver of Australian economic prosperity, no more so than in recent times. According to Chris Richardson of Access Economics, the “commodity boom” has contributed to increases in national income of between 10 and 14% over the last few years, and these increases are over and above income levels had prices stayed at 2002-03 levels.

As well as contributing directly to prosperity, the minerals boom has provided an unprecedented opportunity for Australia to build up significant capacity in mining technology and service industries. In a global knowledge economy, specialist companies with the ability to value-add through the provision of innovative products and services that increase efficiency of traditional industries are increasingly engines of economic growth in their own right. The export of specialist mining technology and services alone is worth more than \$2 billion per annum. Where once the industry was described as being comprised largely of junior, mid-tier and major companies, there is now an additional category of mining firm, as is evidenced by the following slide from a presentation by Rio Tinto CEO Tom Albanese at a recent presentation to the Melbourne Mining Club:

**RioTinto**

### The global future of mining

- Resource sector is increasingly diverse, competitive and global
- Four types of players in today's resource industry:
  - Global Leaders
  - Emerging Majors
  - Aspiring Players
  - Support Specialists
- Dynamic landscape of intense competition and collaboration

2 October 2008 Consolidation and Diversity - Resources in the 21st Century 13

**Figure 1 Slide from Melbourne Mining Club Presentation by Tom Albanese, Rio Tinto CEO**

Both of the trends described above – a thriving mining sector capable of delivering product to a growing world economy, and a platform for developing innovative services – must be sustained if Australia is to maintain its economic strength in the coming decades.

As has been documented in the media and on the stock exchange, the industry has felt the current downturn as a decline in commodity and share prices, and this has

translated into a scaling back of potential mining developments. This has impacted on mine employees, contractors and support industries. The constrained capital market has created an environment where junior explorers in particular are challenged to access finance. Only 24 IPOs raising \$796 million were completed in the eleven months to November 30, 2008, compared to 68 IPOs raising \$7.8 billion in the corresponding period in 2007. This is of particular concern as junior exploration companies make the new discoveries that are the lifeblood of the industry, finding and identifying deposits that become the basis for new projects.

As a professional association whose members have experienced a number of commodity cycles, The AusIMM urges the Government to take a long term view of the social, economic and environmental sustainability of the sector. For the long term, issues such as professional skills, innovation capability, technologies that reduce energy usage and sustained, successful exploration initiatives continue to be the key to maintaining Australia's competitiveness as a supplier of minerals commodities. The last issue – sustained, successful exploration – is the most important, as exploration is the lifeblood of the industry. Without significant economic deposits, all other issues relating to the industry are moot.

For this reason the implementation of a flow-through share scheme urgently on 1 July 2009 is our first Budget priority. The remainder of our Budget priority reflect ongoing priorities for a competitive minerals sector, constituting a long term strategy that is also responsive to current economic realities.

The surge in economic growth in China and India is not a short term phenomenon and is unlikely to be derailed by the current financial turmoil. Half the world is going through an industrial revolution comparable to that in the US in the 1890s and Japan in the immediate post-war period. China is projected by the World Bank to be the largest trading nation by 2020 and the largest economy by 2030. In 2030, the World Bank also projects that India's economy will be larger than the current US economy in purchasing parity terms. The major developing countries of Brazil, China, India, Russia and Indonesia are expected to continue to experience strong growth in real GDP for some time.<sup>1</sup>

Based on this information, policies should facilitate decision making that is geared more to the medium term demand/price outlook than to contemporary spot prices. Without forward-looking policies, Australia could lose its place as a competitive supplier of minerals commodities. This would have devastating effects on our ability to capitalise throughout this century on our generous natural endowments.

In designing a policy framework for a competitive industry, the Government must recognise that, more so than in any other industries, mining success is reliant on risk-taking, particularly in the areas of exploration and innovation. In the face of unforeseeable cyclical variations in commodity prices and unstable financial markets, companies need stable policy environments if they are to continue to make optimistic investment choices. Therefore, policy settings that smooth out additional variables (skills, low cost energy, and incentives for innovation) are of particular importance in reassuring global companies that Australia is the best place to do business.

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<sup>1</sup> Hooke, M., 'Re-Establishing Australia as a Global Supplier of Minerals, *The First International Future Mining Conference 2008* (19-21 November 2008, Sydney) at [http://www.minerals.org.au/\\_data/assets/pdf\\_file/0018/32760/MHH\\_Intl\\_Future\\_Mining\\_Conference\\_191108.pdf](http://www.minerals.org.au/_data/assets/pdf_file/0018/32760/MHH_Intl_Future_Mining_Conference_191108.pdf)

In order to focus on sustaining and increasing Australia's competitiveness as a minerals supplier, The AusIMM recommends policy priorities for the 2009-10 Budget that will strengthen capacity in the following areas:

- Exploration
- Innovation Policy and Research and Development (R&D) Infrastructure
- Intellectual Capital - People
- Low Emissions Technology Development

## 1. The importance of EXPLORATION

*The most recent data from the ABS has indicated that although levels of exploration expenditure in Australia are increasing, we are still outpaced in exploration expenditure by the rest of the world with regards to a number of key commodities. Moreover only 36% of exploration activity in 2006-07 was greenfields exploration – searching for new deposits.<sup>2</sup>*

*Most of the major deposits that are currently being mined were the result of exploration efforts more than 15 years ago. If we do not undertake the greenfields exploration to restock our minerals warehouse, our ability to continue to benefit from our rich natural endowments will be severely curtailed.*

### 1.1 Policy Goal: Increase Exploration Spending in Australia

On 5 November 2008, The AusIMM, in conjunction with other mining associations and the ASX and Australian Shareholders Association, made a submission to Resources Minister Martin Ferguson urging the implementation of a flow-through share scheme, to commence on 1 July 2009.

The full submission can be viewed at:

[http://www.ausimm.com.au/content/docs/joint\\_industry\\_subm\\_shares.pdf](http://www.ausimm.com.au/content/docs/joint_industry_subm_shares.pdf)

The major rationale for a flow-through share scheme is to rectify a current anomaly in taxation law that adversely affects junior explorers. Currently, the Income Tax Assessment Act (ITAA) provides for a tax deduction for exploration expenditure, presumably on the basis of it being a high-risk activity with recognised benefits to the common economic good. However, junior exploration companies (which make up more than 70% of companies engaged in mineral exploration within Australia) generally do not generate sufficient taxable income to be able to claim the deduction.

A flow-through share scheme would smooth out this anomaly by allowing companies which cannot use the deduction themselves to pass it through to shareholders, who are then able to use it to offset their own tax liabilities. Thus, a flow-through share scheme achieves twin objectives of rectifying a tax anomaly and increasing the attractiveness to investors of junior exploration companies (thereby providing those companies with the capital to maintain or increase their exploration activities).

A flow-through share policy is now essential to the survival of an important part of Australia's minerals sector, at a time when traditional sources of finance and investment have been strangled by fear on the financial markets. A flow-through share scheme will provide a buffer for junior exploration companies, which are the engine room of one of the mining industry, from the worst impacts of the economic crisis.

The industry has long advocated the introduction of a flow-through share scheme for Australia, not only because it would ensure that the tax deduction achieves its intended aim, but in order to increase Australia's competitiveness as a destination for exploration and mining investment in a global industry. It would also give Australia policy parity with Canada, which has had a successful flow-through share scheme in place since 2000. The effectiveness of the Canadian scheme can be seen by the fact

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<sup>2</sup> Huleatt, M. and Jaques, L. 'Australian mineral exploration at record levels', *AusGeo News*, (December 2007) Issue No. 88, at [http://www.ga.gov.au/image\\_cache/GA10851.pdf](http://www.ga.gov.au/image_cache/GA10851.pdf).

that, within a year of its introduction, Canada displaced Australia as the second-largest spender on exploration (by region).

The primary market has become a very difficult place for raising exploration capital, and the shortage of capital has potentially devastating implications for junior exploration companies. Many companies have shelved their listing intentions because of volatility and a lack of investor support. The quantifiable losses across the short term – jobs, exploration spending and new IPOs – are significant. However what the bare statistics fail to capture are the longer term economic impacts – loss of talent and of geoscientific knowledge about Australia's terrain, and loss of infrastructure. These losses will directly impact upon our ability to restock Australia's mineral inventory through exploration.

Without immediate rectification of advantages faced by the junior sector in capital markets, decisions that are made in the next 24 months could do irreversible damage to the long term competitiveness of the Australian minerals sector. Implementation of a flow-through share scheme is critical to ensuring that exploration capital – the lifeblood of the minerals industry – keeps flowing.

**Policy Recommendation:**

**1.1.1 Implement a flow-through tax credit scheme on 1 July 2009**

## **2. The importance of INNOVATION POLICY AND R&D INFRASTRUCTURE**

*A forward looking innovation policy and excellent R&D infrastructure are critical for maintaining Australia's position as a leading edge minerals innovator. Australia has a strong history of government-university-industry R&D collaboration that has resulted in stunning value added results for industry in the past. A particularly strong role has been played by AMIRA International, a consortium of companies which contracts out pre-competitive research to centres of excellence.*

*Due to consistent public and private investment in research infrastructure in Australia, we have a number of notable world class research facilities. These include Queensland University's Julius Kruttschnitt Mineral Research Centre, the University of Tasmania's Centre for Ore Deposit Studies, the Perth-based Parker Centre, the University of South Australia's Ian Wark Research Institute, the national researcher CSIRO and Cooperative Research Centres (CRCs).*

*The AusIMM congratulates the Rudd Governments' explicit recognition and action on the importance of mineral resources as a springboard for innovative industries, and a major innovator in its own right. In particularly*

- *The creation of the **CSIRO Minerals Down Under Flagship** to help transform the industry with revolutionary new technologies and ideas to solve a range of key technical challenges, with the aim of assisting the Australian minerals industry to exploit new resources with an in-situ value of A\$1 trillion by the year 2030, and more than double the size of the associated services and technology sector to A\$10 billion per year by 2015.*
- *The establishment of a \$14 million over four years, the **Mining Technology Innovation Centre** in Mackay to provide small and medium sized enterprises (SMEs) operating within the mining technology field advice to improve their business processes, test new products and find new markets.*

- *Explicit recognition throughout the Review of the National Innovation System of the critical role played by the mining industry as an engine of innovation*

*The AusIMM supports many of the recent findings of the Review of the National Innovation System, however there are some areas of concern enumerated below, as well as additional areas that require strengthening.*

*We submit that these areas are critical ensuring that innovation policy and research infrastructure is appropriately adapted to supporting investment in research that will 'make the difference' in terms of Australia's competitiveness as a destination for exploration and mining.*

## **2.1 Ensure changes to R&D Tax Concession supports work undertaken by both SMEs and large mining companies**

The Report on the National Innovation System made several recommendations regarding the R&D tax concession which cause our members some concern. Under Recommendation 8.3:

*"The existing R&D Tax Concession (the 125 percent R&D Tax Concession, the 175 percent Premium, the R&D Tax Offset and the International Premium) should be replaced with a Tax Credit in order to raise the level of business expenditure on research and development by providing a less complex and more predictable support mechanism. A 40 percent Tax Credit should be available to large firms with a refundable Tax Credit of 50 percent available to smaller firms with turnover under \$50 million."*

The AusIMM supports the broadening of eligibility for the refundable credit to medium size enterprises (turnover of \$50 million). We also recognise that in many cases the 50% credit represents an increase, as companies that previously would have used the 125% concession (or 7.5c in the dollar) will now receive 20c in the dollar if they have a turnover of under \$50 million.

However there is some concern about the effect of the change on large companies, with turnovers greater than A\$50m, and foreign-owned corporations. For these companies the proposed rate of credit at 40 per cent is only equivalent to a 10c in the dollar, or an R&D concession of 133 per cent. While this restores core program value to pre-1996 levels, there are two major problems with this rate. Firstly, it is considerably lower than the return they can generate under the current complex 175 per cent program, up to 22.5 cents per dollar invested, making it an unfair trade-off to ask large companies to make. Secondly, the rate nominated remains below the cost of capital and will only contribute marginally to project economics.

The justification for this reduction in the *National Innovation System Review Report* was that large companies are not influenced in their decision making by the tax concession; therefore the change would not affect the level of their research expenditure in Australia. However this is not consistent with the evidence that The AusIMM has received from members. AMIRA International has indicated that the deduction figures are an important consideration for its members, who conduct rigorous analysis of R&D proposals. Rio Tinto has indicated that the 150% R&D tax concession was instrumental in deciding to proceed with construction of its HIs melt plant, which constituted a step change technology for iron and steelmaking. Taking the HIs melt process successfully from concept to commercialisation cost between half a billion to a billion Australian dollars over a period of two decades. Had that

level of deduction not been available, the company would not have proceeded with the project.<sup>3</sup>

The Report further criticised access of the concession by the mining industry in an operational context and recommended measures to limit these:

*“In recent years several firms have been successful in the aggressive use of the R&D Tax Concession to make claims for a very large share of expenditure in large one-off projects like mines and civil engineering. These claims have demonstrated that some aspect of the project is new and technically risky. This having been done it has been possible, despite the efforts of the Australian Taxation Office, to claim as much as 80 percent or more of all investment expenditures in the project. The Panel appreciates that such ventures are both risky and innovative. At the same time it is clear that such ‘whole of mine’ claims are gaining for themselves a degree of assistance disproportionate to the benefits available to many other innovative projects.”*

This statement fails to recognise the often practical nature of mining innovations, as well as the considerable cost and risk involved in testing a hypothesis at the level of operations. That is, due to the large scale nature of mining, for which testing a new process may require adjustment of an entire complex integrated system which can result in millions of dollars of loss.<sup>4</sup> The incentive for companies to undertake these risks are the broader efficiency gains which may be capable of being applied across the broader industry, which in turn may result in significant productivity gains for the entire economy (the goal of the incentive). Thus any changes to R&D tax incentives must recognise the risk and value to the economy of R&D that occurs at the margins.

As well as continuing to recognise the importance of incremental innovation, the importance of step change technologies and the particularly high risks associated with these must continue to be recognised through Government support. Step change technologies are few and far between in the mining industry due to the high risk, the long payback periods and the high failure rate. However they are critical if the industry is to achieve order of magnitude efficiency improvements, and meet increasingly stringent environmental expectations. The risk inherent in such projects is evident in the number of projects abandoned before commercial operation. Recent examples include the A\$2 billion, hot briquetted iron project in the Pilbara, Western Australia and the Australian Magnesium Corporation smelter in Gladstone, Queensland.<sup>5</sup> The AusIMM submits that, a reduction in the premium tax incentive, or a winding back of eligibility of mining projects for concessions would be highly ill advised given the importance of these projects to both our economic competitiveness, and our ability to continue production in a water and carbon constrained world.

Finally, a function of the R&D tax concession that is not widely recognised is the imperative created for companies review, investigate and document an R&D project. That is, not only does the incentive create a push for innovation that might not have taken place otherwise, but it triggers a process of R&D engagement between the company and the Government. As a result of this engagement, the process of taking a hypothesis through to commercialisation is approached using more formalised research methodologies that would ordinarily occur, and is documented at a level

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<sup>3</sup> Rio Tinto, ‘Submission to Productivity Commission Inquiry into Science and Innovation,’ (28 July 2006), at [http://www.pc.gov.au/\\_data/assets/pdf\\_file/0009/37692/sub046.pdf](http://www.pc.gov.au/_data/assets/pdf_file/0009/37692/sub046.pdf), p 3

<sup>4</sup> Upstill, G., and Hall., P, ‘Innovation in the minerals industry: Australia in a global context’ *Resources Policy*, Volume 3, Issue 3 (September 2006) pp 137-145 .

<sup>5</sup> Ibid.

that makes that research more accessible to other users (cf. if it was a purely internal process).

**Recommendations:**

- 2.1.1 Increase the eligibility threshold for refundable tax incentives for R&D to companies with a turnover of \$50 million, as recommended by the *National Innovation System Review***
- 2.1.2 Maintain a premium tax level incentive for sustained investment in R&D projects by large companies (i.e. ensure the incentive does not drop below current levels)**
- 2.1.3 Ensure that any amendment definition of R&D remains industry neutral, and does not add additional uncertainty and complexity into the system**

## **2.2 Continue support for the CSIRO Minerals Down Under Flagship**

The AusIMM congratulates the Rudd Government on its support for CSIRO Minerals Down Under Flagship (CSIRO MDU). The support is evidence of a keen understanding by the Rudd Government of both of the importance of innovation to mining, and of mining as a driver of new innovation with application across industries. This understanding was evident in the words delivered by Senator Kim Carr at the Flagship Launch in May 2008:

*“Australia can build prosperity and innovation capacity by:*

- increasing the knowledge-intensity of their resource-based industries*
- using their resource endowment to leverage the development of other industries, such as manufacturing, ICT and financial services and*
- making the most of the knowledge infrastructure provided by universities and public research organisations to develop new ideas.”*

As described above the minerals sector has the capacity to deliver a range of benefits to the Australian economy across industries. However these benefits contingent upon sustaining a competitive sector here in Australia. That is, Australia’s mining sector must develop innovative ways of finding and extracting otherwise uneconomical ore resources to ensure the industry’s long-term viability.

In a consolidated global industry, Australia can no longer take our current minerals strength for granted. In a highly consolidated industry, where developing countries are taking major strides forward to reduce sovereign risk, we are now competing with underexplored regions for exploration and mining investment. In the last ten years Australia’s share of global mineral exploration has halved. The only way to reverse this trend is to increase our prospectivity. Prospectivity is a composite concept dependent on the state of science. In order to increase prospectivity we must find new and innovative ways to discover deposits, develop more efficient ways to process lower ore grades (thus broadening the definition of economic deposits), and increase the efficiency of mining methods to bring down the costs of mining. These challenges are currently being tackled head on by CSIRO MDU.

As stated by CSIRO, Australia has substantial hidden mineral assets that can be unlocked with new processes and technologies. The profitable recovery of impure iron ore, low-grade nickel and currently un-mineable mineral sands alone could add A\$750 billion to Australia’s economic resources. The long-term MDU project will help create the technology needed to access and process lower-grade ore bodies and keep Australia at the forefront of the minerals industry. On a social and

environmental level, it will deliver better resource utilisation and provide longer economic lives for the remote regions in which minerals wealth tends to occur.

Ensuring that the CSIRO MDU is sufficiently resourced and focused to continue to produce world class research, and engage global resource partners, is particularly important in the current climate of market uncertainty. It is in uncertain economic times such as these when companies may feel most reticent about investing in new research, or varying an established process. However these are also the times when innovations in process and technology are most critical, as the increase in the marginal profits they can deliver are critical for increased competitiveness, and even survival. A combination of public investment, strategic institutional vision, and private participation are needed to maintain the momentum of value adding mining research at the present time.

**Recommendation:**

**2.2.1 Ensure CSIRO Minerals Down Under Flagship is sufficiently resourced and focused to continue to produce world class research**

**2.3 Support the creation of a CRC for Deep Exploration Technologies**

As previously mentioned, a major challenge for Australia is increasing our discovery rate and this can only be achieved through the development of new innovative technologies through research. To a significant degree, relevant work is being done through the CSIRO Minerals Down Under Flagship and through various ARC Linkage Projects and Centres of Excellence.

Recently, two CRCs associated with improving the effectiveness of exploration were wound up, as they had achieved their goals. Industry now requires a more targeted exploration CRC that will focus on solving many end user challenges associated with deep exploration, both around existing operations and in greenfield environments. An industry led proposal is currently being developed through AMIRA International with support from CSIRO that aims to solve many of the challenges associated with deep exploration by addressing the following areas:

- Deep targeting
- Real time data fusion
- Better, safer, higher value drilling technologies

The AusIMM believes that the proposed CRC Deep Exploration Technologies is consistent with the new CRC Guidelines, having both broad relevance to end users and the capacity to be effectively deployed to achieve the objective of economic prosperity, as well as directly improving safety and environmental outcomes associated with exploration.

The CRC is particularly important as in the current conservative economic climate, few companies will have the capacity or the appetite for risk to undertake the kind of leading edge research in deep drilling themselves, yet developments in the area of Deep Targeting must occur for Australia to make discoveries in the coming decades.

An initiative the scale of a CRC is needed to marshall the extent of capability and the degree of institutional cooperation that are needed for significant developments in this area to occur. The CRC for Deep Exploration Technologies represents a key objective that is complementary to a flow through share scheme in Australia: companies need not only the money to drill, and the know-how to drill in the right

places, but also to make the correct inferences from resulting data. This is critical to improving both Greenfield and Brownfield discovery rates beneath our terrain. Therefore we urge the Government to support the application for a CRC for Deep Exploration Technologies in the 11<sup>th</sup> CRC Program Selection round later this year.

**Recommendation:**

**2.3.2 Support an application for a CRC for Deep Exploration Technologies in the 11<sup>th</sup> Round of CRC Program Selection**

### **3. The importance of INTELLECTUAL CAPITAL – OUR PEOPLE**

*Despite the short term decline in commodity prices, expectations of skills needs to meet demand over the medium term continue to be high, in line with expectations of sustained high levels of production. According to the latest ABARE listings, in October 2008 there were advanced minerals and energy projects to the value of \$67.3 billion. While total capital expenditure on advanced projects is 4 per cent down from April 2008, expenditure is still relatively high at 16 per cent above October 2007 levels.<sup>6</sup> Thus, the mining industry will continue to require additional numbers of highly skilled and innovative people to meet continuing strong demand for minerals and energy commodities in the medium term*

*Recent projections of skills needs undertaken by the Minerals Council of Australia into the next decade have indicated that at least 70,000 additional skilled workers and 7,500 additional professionals will be needed for the minerals sector in 2015.<sup>7</sup>*

*With significant numbers of skilled workers and professionals due to retire, sustaining investment in meeting the future skills needs of the minerals sector remains a priority.*

*Traditional sources of supply of labour such as South Africa, Brazil, China and India are now facing their own growth challenges/labour shortages, and can no longer necessarily be relied upon to 'fill the gaps' for the Australian minerals sector. We need to plan adequately to meet our own professional skills needs.*

*Finally, highly capable graduates and experienced professionals who have a high level of technical capability and sound training are the lynchpin of innovation. It is ultimately their assessments of opportunities and capability improvements that will lead the way to a more competitive industry. Without the ability to attract and retain people with a high level of technical knowledge and a deep operational understanding, the industry will not be able to make the critical innovations which are needed.*

#### **3.1 Provide adequate support for quality minerals-related higher education**

A recent study from Graduate Careers Australia indicated that Mining Engineering graduates were the most likely to be employed within four months of graduating, and were the only graduates to experience 100% employment rate.<sup>8</sup>

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<sup>6</sup> ABARE, 'Minerals and energy: major development projects – October 2008 listing' (November 2008)

<sup>7</sup> Chamber of Minerals And Energy Western Australia, 'Staffing the Supercycle: Labour Force Outlook in the Minerals Sector 2005-2015', (August 2006) at <http://www.cmewa.com.au/UserFiles/File/Publications%20-%20Human%20Resources/Staffing%20the%20Supercycle.pdf>

<sup>8</sup> Graduate Careers Australia, 'Annual Graduate Survey 2008', (December 2008)

Despite the obvious pressing demand for professionals for the mining industry, the number of mining engineering, metallurgy and geoscience departments in universities has been steadily declining. Since 2000, eight minerals departments have closed, three are marked for closure and four have been merged into other degrees.<sup>9</sup>

The steep decline in the number of minerals-related courses is largely due to the funding arrangements instituted under the *Higher Education Support Act 2003* (Cth). The Act provides funding for Universities on the basis of the number of students enrolled in a particular subject. The per student allocation is based on general assumptions about costs of teaching a subject within a 'cluster'; the formula took no account of the differences in course content requirements, infrastructure needs, location or any other course or institution-specific factor. Under this funding formula, small, capital intensive courses such as mining engineering and field and laboratory intensive courses such as geoscience were particularly disadvantaged and for many Universities it was simply not viable to run them.

An additional pressure for minerals-related courses is the year by year nature of the funding, which is calculated by reference to the number of students enrolled in that subject for the previous year. Minerals-related course enrolments have traditionally been cyclical, in line with the profitability of the industry itself. The variability of enrolments from year to year has made them an unattractive funding prospect for higher education providers.

The overall levels of funding to courses have also been affected by the trend for students in technical disciplines to take subjects from other faculties. That is, when students in Science and Engineering undertake a subject from a different faculty such as Arts and Commerce, the course loses funds, as students from Arts and Commerce rarely cross over into Science and Engineering.

Several years of inadequate funding has had a serious impact on minerals-related courses. A survey of minerals-related course Heads of Department conducted by The AusIMM in 2007 indicated that these courses were facing major salary pressures, decline in staff numbers, outdated infrastructure and, in some cases, uncertainty about survival.<sup>10</sup>

Meanwhile the outcomes of the 2007 Australian Geoscience Council Summit<sup>11</sup> and Survey confirmed that geoscience continues to lose status and visibility through merger of departments and reductions in staffing levels. Many of the sixteen 'geoscience departments' identified as having the capacity to teach geosciences are uneconomic for the universities on a teaching basis, with too few students per teaching academic at current funding levels. Furthermore, some universities have created 'geoscience degrees' by blending geography or environmental courses with traditional earth science subjects of relevance to the resources industry. Graduates from these degrees are poorly equipped to meet the requirements of the resources industry.

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<sup>9</sup> Galvin J. and Carter R., 'Strategic Review of Minerals Council of Australia Tertiary Education Initiatives,' *Minerals Tertiary Education Council of Australia* (May 2003) at [http://www.minerals.org.au/\\_data/assets/word\\_doc/4328/MTEC\\_Review\\_FINAL.doc](http://www.minerals.org.au/_data/assets/word_doc/4328/MTEC_Review_FINAL.doc)

<sup>10</sup> The AusIMM, 'The AusIMM Questionnaire Report – New Funding Arrangements for Universities' (July 2007)

<sup>11</sup> Australian Geoscience Council, 'The Australian Geoscience Council Tertiary Education Profile 2007', (January 2008)

The AusIMM submits that a federal funding compact or partnership of the kind recently announced in the areas of teaching, nursing and medicine is required for minerals-related disciplines in the area of mining, metallurgy and geoscience. Moreover, the triennial arrangements for such a compact flagged in Federal Labor's 2006 Higher Education White Paper would also remove the uncertainty caused by cyclical enrolments.

Over the past few years, many courses would have not been able to remain viable, but for the support of mining companies who committed to generous sponsorship arrangements. Now, as then, the current situation is unsustainable. Short term corporate sponsorship arrangements have led to an unpredictable funding environment, particularly now as many companies are looking to reduce additional overheads. As the economic constraints on companies tighten, corporate sponsorship can no longer be relied upon to underwrite Australia's future skills needs. The Federal Government can no longer afford to ignore the fundamental flaw in funding arrangements, not just for minerals related courses but all specialist science and engineering courses play an important role in meeting the skills needs of Australian industry.

**Policy Recommendations:**

**3.1.1 Establish mission-based compacts with minerals higher education providers in the areas of mining engineering, metallurgy and geoscience, to be reviewed on a triennial basis**

**3.1.2 Review the funding formula established by the *Higher Education Funding Act 2003 (Cth)***

**3.2 Support a critical mass of researchers and postgraduates in minerals-related disciplines**

A critical mass of capable researchers is a prerequisite for strong innovative capability. For example, AMIRA, a consortium of companies which contracts out pre-competitive research to public institutions, and is attributed with spearheading Australia's research excellence, reported that between 1990 and 2004, more than 261 PhD students and 65 post-doctoral researchers were involved in its university-based research projects.<sup>12</sup>

Meanwhile the contribution of an employee with advanced research qualifications within a company can be invaluable. In his input to our submission, an AusIMM member, who has been involved in both research and industry for over twenty-five years, reflected on the innovative capacity his advanced technical knowledge enabled him to bring to industry:

*"After two years at Berkeley I returned to Western Mining to do my doctoral research at the Kambalda nickel mines part time, whilst working as a senior geologist. The isolation from academe was a challenge, but I was compensated by the opportunity to apply my research outcomes at the mines. For example, I applied my results to important practical issues, such as guiding exploration for more ore, improving ore reserve calculations, mine planning and grade control, and to metallurgical processing. This experience convinced me of the power of integrative applied research. It also showed me the potency of effective bridges between industry and research institutions,*

<sup>12</sup> Whitman, D., 'A Mine of Innovation', in *Innovation Australia*, (2007) Palamedia, at <http://www.innovationaustralia.net/article/article.php?article=10.169>

*and the high practical and scientific value of applied research; insights that became part of my life.”*

Given the important role the PhD qualified professionals play both in research institutions, industry, and as a bridge between the two, maintaining a critical mass of such individuals should be viewed as a priority. Under current policies this has not been the case. According to the Minerals Tertiary Education Council, PhD enrolments for metallurgy, mining engineering and earth science between 2000 and 2004 declined 40%, 50% and 36% respectively.<sup>13</sup>

Attracting and funding PhD students is a complex problem. On the funding side, Universities need the facilities and staff to the support them. There is also some question of whether Australia needs to do more to attract students to conduct further study in their fields. It is unclear whether employers recognise the value of a PhD sufficiently. Finally there is little financial incentive for a talented student, even one who is committed and passionate about research, to undertake a PhD, with the current stipend rate barely adequate to support a reasonable standard of living.

The recent *National Innovation System Review Report* stated that the growth in the stipend rate in recent years has failed to keep pace with that of either the Consumer Price Index or full-time adult weekly ordinary time earnings. At its current rate in 2008 (approximately \$385 per week), the full-time Australian Postgraduate Award (APA) stipend is only marginally above the Henderson poverty line for the March quarter of 2008, which for a single person working is \$378.08 per week (equivalent to \$19,660.16 per annum). The AusIMM concurs with the Report that the stipend should be increased to at least \$25,000 per annum. Broader issues around funding for universities, promotion of the value of research capability to firms, and the adequacy of current scholarship arrangements all need to be looked at more closely.

It has been suggested that overseas students may be utilised to fill gaps in terms of both professionals and researchers. However as high-tech industries across both developed and emerging economies place increase demand on global supply of science and technology graduates, this will not be sustainable. Recent data shows an increasing competition between OECD countries for graduates from China and India, which produces a fifth of the world’s supply of PhD graduates in science and engineering. They may even be staying at home. Consequently an over-reliance on overseas graduates could easily place us on the losing side of a talent war. Investment in a sustainable, highly skilled professional workforce should be a national priority.

**Recommendations:**

- 3.2.1 Ensure that higher education institutions with records of research Excellence in disciplines of national importance receive adequate funding to support PhD students**
- 3.2.2 Investigate options for promoting the value of PhD graduates to employers in industry**
- 3.2.3 Increase the annual stipend for PhD students to at least \$25,000 per annum**

<sup>13</sup> Minerals Council of Australia, ‘University Enrolment Statistics’, (2007) at [http://www.minerals.org.au/mtec/what\\_we\\_do/mtec\\_research/statistics](http://www.minerals.org.au/mtec/what_we_do/mtec_research/statistics)

### 3.3 Increase equitable participation of women in mining through adequate child care support policies

The attraction and retention of women is increasingly viewed by mining organisations as a key strategy for addressing the skills shortage. Ensuring that women's participation in mining and indeed all industries is equitable is also an important Government objective. Currently women account for only 18% of the mining workforce, compared with 42% of the total Australian workforce. The numbers of women in technical or operational roles is particularly low, with women comprising only 3% of the site based workforce.<sup>14</sup>

A number of companies have targeted recruitment drives aimed at women. However, as women are more likely to be primary carers for children, the lack of suitable, affordable child care for women in mining remains a major barrier to their participation in the sector. The recent Minerals Council of Australia report *'Attracting and Retaining Women in the Australian Mining Industry'* found that starting a family was the most common reason women left mining, and that finding a carer was virtually impossible.<sup>15</sup>

Both male and female members of The AusIMM have indicated that there is a dire shortage of child care centres in rural and regional Australia. For example, a female mining engineer living in Moranbah, QLD, has indicated that there are only six places per day for children under two for the whole town (population ~10,000).

Not only are there inadequate numbers of child care centres, but those that do operate tend to operate only during 'traditional' working hours and are incompatible with mining rosters. Women who work in professional mining roles are therefore required to look for alternative and costly options such as nannies, or a customised family day care plan.

At roughly \$16 an hour, the costs of child care enabling full time work in the industry will exceed \$30,000 per year, and can account for half of a female professional's after tax salary. These costs are a major disincentive for women to enter into, or stay in mining. One example from our membership was of a mining engineer who paid \$35,000 per annum for full time care for her two children (this included three days per week child care centre and two days per week for a nanny). She has since decided to quit work as a mining engineer and leave the industry, partly because of the cost and partly because of the stress of juggling childcare arrangements.

The pressure felt by families working on mine sites was evident in the responses to *The 2008 AusIMM Remuneration and Employment Survey*, which is an annual Survey of all AusIMM members, who are professionals in the mining industry. Of the 506 respondents who identified themselves as carers for a child:<sup>16</sup>

- 12% indicated that costs of caring are a disincentive to continue working in their current role (25.0% of females; 10.6% of males); and
- 15.5% indicated that costs of caring are a disincentive to continue to work in the minerals sector (20.8% of female carers; 15.0% of male carers)

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<sup>14</sup> Minerals Council of Australia, 'Unearthing New Resources – Attracting and Retaining Women in the Australian Mining Industry,' (May 2007) at [http://www.minerals.org.au/\\_data/assets/pdf\\_file/0016/20275/MCA\\_Women\\_In\\_Mining\\_Web\\_Version.pdf](http://www.minerals.org.au/_data/assets/pdf_file/0016/20275/MCA_Women_In_Mining_Web_Version.pdf)

<sup>15</sup> Ibid.

<sup>16</sup> The AusIMM, *The AusIMM Remuneration and Employment Survey Report* (July 2008) at <http://www.ausimm.com.au/publications/epublication.aspx?ID=3420>

The significant impact of child care cost and availability on both general retention and the participation of women is not surprising. At present there is little support for parents in the mining industry. The Child Care Tax rebate is not available for most parents using In-Home care, and the rebate itself is capped at only \$7,500.

Mining companies which wish to pay for their employees' In Home child care costs (or another option) find that their hands are tied, as the Fringe Benefits Tax Exemption is available only for employers who run their own child care centres. The risks and liabilities of running a child care centre, along with limited place availability, make this an unattractive prospect for most mining companies.

It has long been advocated by industry groups that the Fringe Benefits Tax exemption should be available for *all* employer sponsored child care, including In Home care. The case for flexibility has been put forward by PriceWaterhouseCoopers, whose employees faces high costs of inner city child care outside working hours.<sup>17</sup> Organisations such as the WA Police and Department of Defence, which face similar challenges to those of the mining industry, have also indicated the need for a change in existing policy.<sup>18</sup>

An extension of the exemption would also constitute a more general recognition of the reality of the 24 hour global market place, in which an increasing number of roles require people to work non traditional working hours. These include professions such as nursing, that have always been subject to shift work, through to highly paid accounting positions, where career advancement is dependent on being available to meet client needs.

**Policy Recommendations:**

- 3.3.1 Investigate options for returning a greater proportion on child care costs incurred by workers in regional Australia through the tax system**
- 3.3.2 Extend fringe benefits tax exemption to all forms of employer sponsored child care**
- 3.3.2 Support the creation of child care centres in rural and regional Australia, with operating hours that reflect the actual needs of local employees**

#### **4. The importance of LOW EMISSIONS TECHNOLOGY DEVELOPMENT**

*The Government has committed to a minimum target of 5 percent greenhouse gas emissions reduction on 2000 levels by 2020, or 15 percent if all developed nations take on comparable reductions to those in Australia. Its main instrument for achieving this target is the planned Carbon Pollution Reduction Scheme – the outline for the scheme is contained in the Governments White Paper, released on 15 December 2008.*

*The AusIMM does not have a position on the causes or degree of anticipated climate change, however given the national objective of achieving global greenhouse gas reductions, our members - as experts in the minerals sector - have put forward a range of policy settings to maximise the contribution of the minerals sector to the global abatement task through technology based solutions. A technology based solution is the only means by which the global reductions of the kind envisaged can*

<sup>17</sup> Power, K. 'Parents Under Pressure,' *About the House* (November 2005), pp 23-25 at [http://www.apf.gov.au/house/house\\_news/magazine/ath25\\_Parents.pdf](http://www.apf.gov.au/house/house_news/magazine/ath25_Parents.pdf)

<sup>18</sup> Nicholson, J. 'Tug of War,' *About the House* (December 2006), pp 25-27 at [http://www.apf.gov.au/house/news/magazine/ath29\\_tug.pdf](http://www.apf.gov.au/house/news/magazine/ath29_tug.pdf) .

occur without a massive reduction in standards of living in many countries across the world, including Australia.

With global electricity production projected to treble by 2050, largely as a result of activities in emerging economies such as China and India,<sup>19</sup> it is clear that a raft of new technologies for producing key commodities will be needed to bring down global greenhouse gas emissions in the coming decades. Thus, the key objective for Australian GHG emissions policy must not be merely to reduce our national emissions, which account for 1.6% of the world's total, but to assist our neighbours and resources customer countries with the technologies and processes that will enable them to bring down their emissions.

The importance to the global abatement task of developing low emissions technologies for the production of key minerals, metals and energy resources currently consumed in developing countries is evident from the trends below. Figure 2 represents the increase in consumption in key commodities and energy in China over the last five years (all of which are major Australian export commodities). This level of consumption is projected to continue to increase over the coming decades.

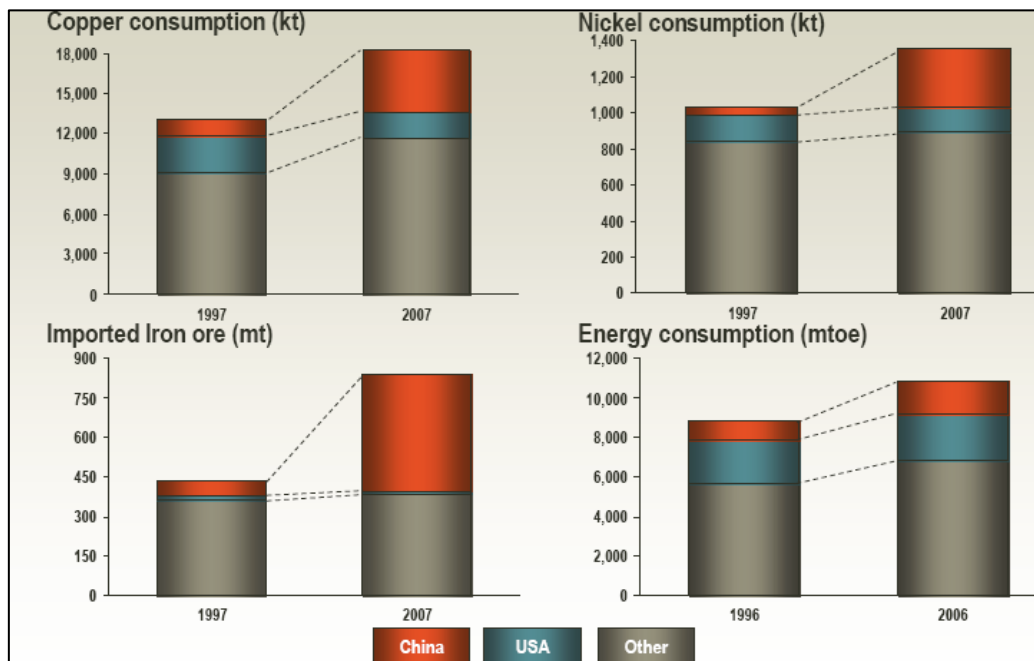


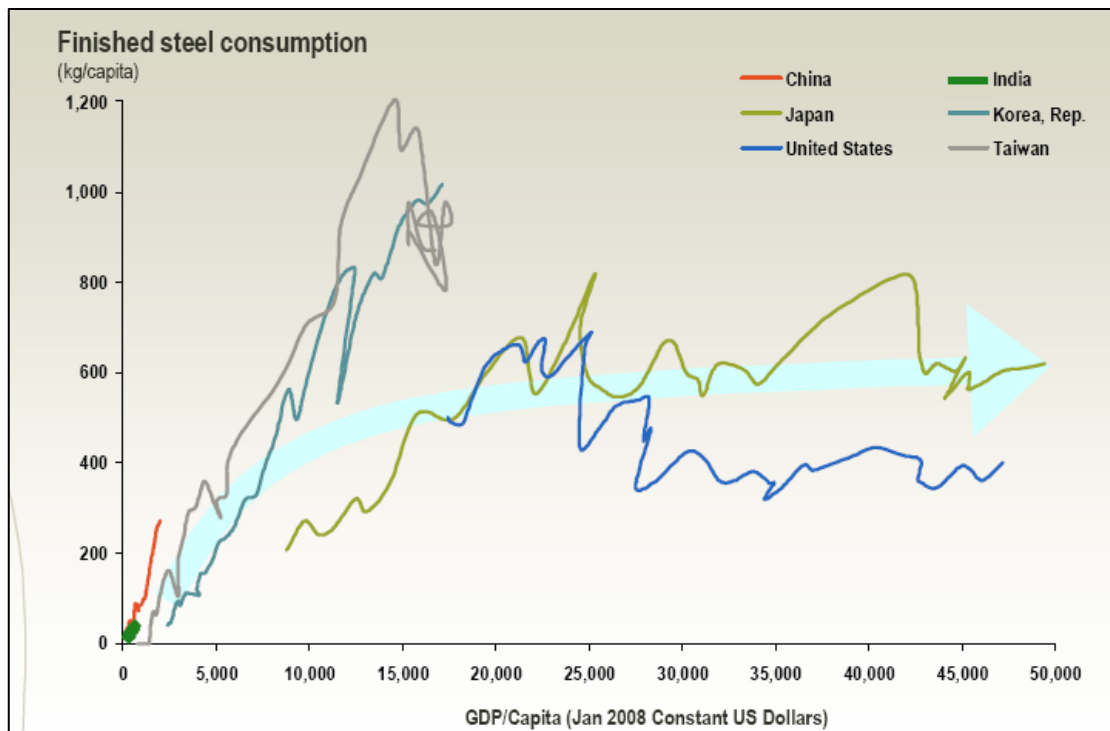
Figure 2. China's consumption of energy and mineral commodities other than steel<sup>20</sup>

Figure 3 shows the link between finished steel consumption and GDP. Based on the trends in developed nations, China and India can be expected to significantly increase their level of steel consumption as standards of living increase.

<sup>19</sup> International Energy Agency, 'Energy Technology Perspectives', OECD-IEA (2006)

<sup>20</sup> Kloppers, M. BHP Billiton CEO Address to Melbourne Mining Club (23 June 2008, Melbourne)

<http://www.bhpbilliton.com/bbContentRepository/docs/melbourneMiningClubLondon.pdf>



**Figure 3. Relationship between Finished Steel Consumption and GDP<sup>21</sup>**

*As a major producer of energy and energy intensive commodities, and with a highly developed research infrastructure, Australia can contribute to meaningful emissions reductions through technology development. These opportunities exist both in low carbon power generation, and in increasing energy efficiencies in mineral and metals production.*

*In the area of low carbon power, we have extensive expertise in clean coal research such as coal gasification and carbon capture technology (such as the Zerogen project) and also carbon storage options such as geosequestration. We are also significantly advanced in the development of renewable energy options such as geothermal electricity from hot rocks. As a major exporter of uranium and nuclear technologies, Australia has also played a major part in enhancing safety in the nuclear supply chain by improving practices at home and abroad.*

*Australia is also at the forefront of energy efficiency improvements in the production of key commodities – from exploration, mining and mineral processing through to metal extraction and refining. The contribution that can be made through energy efficiency contributions should not be underestimated. Recent studies have suggested that energy efficiency improvements have the potential to make the greatest single contribution to abatement leading up to 2050.<sup>22</sup> These efficiencies will be generated both incrementally (through the application of energy efficiency practices such as heat recovery and new efficient comminution operations) and also through a transformation in the industry that should occur as new processes such as dry granulation are introduced.*

<sup>21</sup> Ibid.

<sup>22</sup> ABARE, 'Technological Development and Economic Growth,' Research Report 06.1, (Canberra, January 2006), at [http://www.abareconomics.com/publications/2006/RR06\\_1\\_ClimateAsiaPacific.pdf](http://www.abareconomics.com/publications/2006/RR06_1_ClimateAsiaPacific.pdf) p 60.

*The development and deployment of relevant technologies will not take place in a vacuum. As we have previously indicated to government, a tightly focused, nationally coordinated strategy is needed, consisting of.*<sup>23</sup>

- *A comprehensive technology policy aimed to encourage development of low emissions technologies*
- *A national energy policy that provides certainty for industry over future availability of low emissions base load power*
- *Effective carbon emissions trading scheme with adequate support provisions for Energy-Intensive Trade-Exposed Sectors (EITEs)*

#### **4.1 Support for demonstration and commercialisation of step change low emissions technologies**

The AusIMM acknowledges that there are a number of programs and grants aimed at fostering low and zero emissions technology research. Whilst these initiatives are worthwhile, they are largely focused at the back end of the technology development process, namely, research and development (R&D).

The journey from concept to commercialisation includes each of the following steps: research, development, demonstration, commercialisation and deployment. It is the latter parts of the process that are often the most costly and involve the greatest risk to industry. A carbon price alone of the kind envisaged will not be enough to bring such projects over the line in terms of their profitability.

The inadequacy of current levels of support for the commercialisation and deployment phase was recently outlined in a letter from the developers of Zerogen, regarded the most advanced clean coal project in the country, and a world leader to Minister Martin Ferguson. In the letter the company stated that:<sup>24</sup>

*"Australia's 5 per cent carbon reduction target accompanied by a weak carbon price will be nowhere near sufficient to generate the scale of investment needed to make clean coal technologies economically viable...Low-emission technology deployments, along with many other first-of-a-kind technologies, have high risks involved...Along with the high costs that project proponents will face as early movers, they will be forced to pay for permits for emissions generated whilst acquiring these valuable learnings."*

The AusIMM concurs with the representatives of Zerogen that a carbon price is not sufficient to overcome the high costs of commercialisation of major plant – ironically our major industries are the ones that most need to change if global emissions are to be reduced. Consequently, appropriate fiscal incentives aimed at ameliorating the risks associated with demonstration and commercialisation of first-of-a-kind plant are required to encourage companies to take that critical next step - beyond the research centre. As there is no one silver-bullet technology that is going to meet the world's emissions reduction needs, these incentives should be available across industries. We need to go beyond just 'picking winners' at the front end of the R&D process if Australia is to truly transition to a low emissions economy.

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<sup>23</sup> See 'The AusIMM Submission to the CPRS Green Paper' (September 2008), at [http://www.ausimm.com.au/Content/docs/emissions\\_trading0908.pdf](http://www.ausimm.com.au/Content/docs/emissions_trading0908.pdf)

<sup>24</sup> Kerr, C. 'Clean Coal Dirtied by ETS Plan', *The Australian* (19 January 2009) at <http://www.theaustralian.news.com.au/story/0,24897,24929818-601,00.html>

**Recommendation:**

- 4.1.1 Put in place fiscal incentives to ameliorate risk associated with demonstration and commercial development of first-of-a-kind plant aimed at substantial emissions reduction

**4.2 Provide certainty for industry on the future availability of low cost, low emissions base load power**

The AusIMM indicated that a national energy policy is a critical issue for companies as they plan their strategy to remain competitive in a carbon constrained environment. Companies need to know the matrix of electricity sources that will be available to them in the medium term, in particular low cost, low carbon base load electricity options, in order to determine forward investment strategies.

The smelting industry constitutes one example where information regarding future electricity sources is critical to decisions regarding investment in new technologies. Without access to low carbon electricity, the emissions for any given metal are similar, regardless of processes; therefore there is no need for businesses to consider a shift in processes for new plant with lower direct emissions. However, if low carbon electricity sources are available, a shift in smelting technologies from carbothermic reduction processes to electrothermic processes can in most cases reduce carbon emissions to minor levels. This shift would effectively move carbon emission control from the smelting operations to power generation, where it could be most efficiently handled.

Thus the AusIMM recommend that the Federal Government develop, as a priority, a National Energy Policy that outlines a matrix of electricity sources to be available over the next two decades.

The AusIMM also said that a fully informed and evidence-based debate on the potential of nuclear power in Australia is needed. We do not directly advocate nuclear power, but believe that it would be politically irresponsible to dismiss nuclear power as an electricity source based on historical antipathy. Ultimately a matrix of energy sources (such as carbon with geosequestration, renewables, geothermal and possibly nuclear) will be needed and each must be considered on its merits.

**Recommendations:**

- 4.2.1 Develop a National Energy Policy that outlines a matrix of electricity sources likely to be available over the next two decades.
- 4.2.2 Conduct a fully-informed, evidence-based debate on the viability of nuclear power in Australia in a carbon constrained context.

**4.3 Adequate support provisions for Energy-Intensive, Trade-Exposed Sectors (EITEs)**

The AusIMM agrees that should an emissions trading scheme go forward, special measures will be required to put local EITEs on an equal footing with producers in countries that do not face a carbon constraint. Otherwise an emissions trading scheme will likely result in producers relocating to jurisdictions without a carbon price, often to countries with lower innovative capability and less stringent environmental constraints. The net effect would be a likely *increase* in net global greenhouse gases, whilst simultaneously damaging our national economy. Moreover, should such 'carbon leakage' occur, Australia's opportunity to apply our innovative capacity to contribute to a technology based solution would be lost.

The AusIMM strongly submits that, if the aim of ‘special measures’ is to avoid carbon leakage, then both the eligibility for assistance, and the level of assistance, must effectively place local producers on equal footing with producers who do not face carbon constraints.

Consequently, we strongly disagree with the White Paper proposal that eligibility for assistance should be determined with reference to a threshold of average emissions based on type of output. This is due to the fact that, in the minerals and energy sector, the emissions-intensity will depend on the mining method and processing technologies used, and will vary significantly between operations based on the method used. For example, because of the different processing methods, nickel-laterite operations are three to five times more carbon-intensive per unit of metal than nickel-sulphide mines. Similarly, SXEW copper is more carbon-intensive than copper produced via a normal concentrator-smelter-refinery route. Thus, a baseline calculated by reference to output will have an arbitrary impact on operations. This will not create an incentive for steady and measured reduction in emissions, but simply send shock waves through certain industries – resulting in windfall gains for some and complete loss of profitability for others. The baseline must be calculated by reference to process; the emissions credit should be incentive enough to ensure that those industries that can transition to a lower emissions process undertake to do so.

The AusIMM also disagrees with the Government’s preferred position that assistance rate to EITEs be reduced over time. We recognise the underlying arguments behind this position – namely that as new EITE plant and industries come online, the number of permit allocations will increase, which will reduce the number of credits in other sectors. Therefore a steady reduction is proposed. However the position does not take into account economic, scientific and environmental realities in the minerals sector.

That is, current economic drivers of minerals consumption are the rapidly emerging economies in the Asia-Pacific. As stated in the Green Paper:<sup>25</sup>

*“Australia’s economic growth has benefited from the rapidly expanding developing economies, particularly in the Asia–Pacific region, driving international demand for our abundant mineral resources, including coal, iron ore, bauxite, alumina, and uranium. Australia is a net energy exporter, with the sector growing by an average 5 per cent a year in real terms over the past two decades, to \$38 billion in 2006–07 representing 3.8 per cent of GDP. In 2005–06, coal accounted for 62 per cent of total energy export value, with liquefied natural gas contributing 11 per cent and uranium one per cent.”*

Increasing consumption of mineral resources has created significant economic opportunities for Australia. However the pressure to increase supply is not without its challenges. A recent report by Dr Gavin Mudd, entitled ‘*The Sustainability of Mining in Australia - Key Production Trends and Their Environmental Implications for the Future*’<sup>26</sup> outlined a number of trends that have emerged in the mining sector. These trends are:

- Production: gradually or exponentially increasing, which is likely to continue for some time;

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<sup>25</sup>Department of Climate Change. ‘Carbon Pollution Reduction Scheme *Green Paper*’, (2008), p 7.

<sup>26</sup> Mudd, G., ‘Sustainability of Mining in Australia’. Research Report 5, (October 2007) at <http://civil.eng.monash.edu.au/about/staff/muddpersonal/SustMining-Aust-aReport-Master.pdf>

- Ore Grades: gradually declining, unlikely to ever increase in the future with some metals likely to decrease by about half in the near future (eg. gold);
- Open Cut Mining: now widespread, likely to be sustained in the future though the long-term is hard to predict as new mineral deposits are likely to be deeper;
- Waste Rock / Overburden: increasing rapidly, likely to be sustained in the future and closely linked to open cut mining (especially for coal and base metals);
- Economic Resources: commonly increasing but some remain stable or gradually declining, future linked closely to exploration, technology and economics.

A number of research projects are underway to reverse the trends described above. Notwithstanding these developments, given the current level and projected levels of demand for minerals commodities, it is likely that the net emissions from EITEs will increase over time, even as the emissions intensity of the material being mined comes down. Consequently it would not be advisable to reduce the assistance rate for EITEs over time. As new producers come online as this would result in insufficient allowance for EITEs to ensure that local producers are on equal footing with competing suppliers in countries which do not face an emissions constraint. Local suppliers should not be punished for delay by our Government in negotiating an acceptable compromise with major supplier companies simply to get our numbers down, when there is no net reduction in global emissions.

**Recommendation:**

**4.3.1 Emissions intensity baseline for assessing eligibility and level of assistance for an industry to be based on emissions intensity of process**

**4.3.2 Allocation of credits to EITEs to remain constant based on a threshold of emissions per unit of revenue, until such time as developing countries accept obligations, or sector specific agreements are concluded**

#### **4.4 A way forward with developing countries**

Developing countries are expected to account for more than 80% of growth in emissions over the next two decades. Unless they accept binding obligations, any measures taken in developed countries to reduce emissions will have negligible impact on the overarching goal – the stabilisation of global greenhouse emissions.

In the past, developing countries have not accepted binding targets on the philosophical basis that as the current developed countries were able to grow their economies without emission limits, developing countries should be excluded from any obligation to curb emissions for some time.

This argument is too simple and calls for greater scrutiny. What developing countries are really interested in is *not* the right to emit per se, but the ability to develop their economies with equivalent access to low cost, base load energy and low cost industrial processes.

The challenge for developing economies, as for the rest of the world, is to de-couple increases in production of energy and key commodities from GHG emissions growth. The only way to do so is to commit to a comprehensive program of international technology development and transfer.

The AusIMM supports the proposal put forward in the *Draft Garnaut Report* that the international community encourage developing countries to adopt obligation in stages. To begin with, targets could be one-sided for developing countries, providing the option to sell permits internationally but no obligation to buy for compliance. Least developed countries would not be expected to take on targets immediately, but would be expected to implement agreed policies on the export of EITs, subjecting these exports to a carbon price. This would negate the need for 'special measures' for EITs in countries with binding targets such as Australia.

In return, high-income countries would commit to funding research, development and commercialisation of low-emissions technology in developing countries. The AusIMM supports the creation of the International Low Emissions Technology Commitment as outlined in Chapter 13 of the *Draft Garnaut Report* for this purpose.

The flagged 'package deal' approach described above would combine technology assistance with the obligation for developing countries to create a level playing field for all trade-exposed energy intensive industries. This is particularly important for minerals and energy producers.

**Recommendation:**

**4.4.1 Australia to take a leadership role in negotiating staged inclusion of developing countries into the Kyoto Protocol, with one-sided obligations for developing countries, and requirements to implement agreed policies in EITs for least-developed countries**