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aluminium  
SINCE 1963



**Alcoa World Alumina Australia** is the global leader in alumina production and Australia's sixth largest resources sector exporter. Alcoa is an integrated business comprised of bauxite mining, alumina refining, aluminium smelting, rolling and canned sheet products, with operations in Victoria, Western Australia and New South Wales.

## **GARNAUT REVIEW: EMISSIONS TRADING SCHEME DISCUSSION PAPER**

**Submission by Alcoa of Australia on the discussion  
paper released by the Garnaut Review in March 2008**

**April 2008**

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## 1. OVERVIEW

Alcoa has been a major Australian exporter and employer for over 40 years. Alcoa's operations in Victoria, Western Australia and New South Wales form an integrated aluminium industry which produces about 47% of Australia's alumina and 30% of the national aluminium output. These operations include bauxite mines, refineries, smelters, rolling mills and aluminium recycling facilities adding value to Australian resources throughout the manufacturing process.

Alcoa of Australia Limited is 60% owned by Alcoa Inc and 40% by Alumina Limited. Alumina Limited was established in 2002, following the de-merger of WMC Limited which partnered with Alcoa in the 1950s to build Australia's aluminium industry.

Alcoa directly employs over 6,000 people in Australia with thousands more employed as contractors across Alcoa's operations. It is conservatively estimated that Alcoa's Australian operations provide employment, through direct and indirect means for over 20,000 people – most in regional areas of Victoria and Western Australia.

Alcoa produces one third of Australia's aluminium, about half of its alumina and is the country's largest recycler of aluminium. Alcoa exports around \$3.5B of product each year with approximately 80 cents in every export dollar earned by Alcoa Australia staying in Australia. Alcoa is Victoria's largest exporter.

Both the refining of bauxite into alumina and its subsequent conversion, through smelting, to aluminium are energy intensive. On average in Australia the direct cost of energy represents over 20% of the total cost of both alumina refining and aluminium smelting, with some sites experiencing energy costs well above this average.

Alcoa's Australian operations fall into the category of a Emission Intensive Trade Exposed Industry (EITEI).

Although it is energy intensive to produce, aluminium provides significant climate change management opportunities. For example, the use of light weight aluminium in the transport sector greatly reduces greenhouse gas emissions in comparison to heavier metals – each kilogram of aluminium used in motor vehicle manufacture, instead of steel, saves around 20kg of greenhouse gas emissions over the life of the vehicle.

Aluminium is almost endlessly recyclable and recycling saves 95 per cent of the energy it would take to make new metal. Two thirds of aluminium produced since 1886 is still in use today.

Alcoa is the largest recycler of aluminium in Australia and recycles 70,000 tonnes of aluminium at its remelting facility at Yennora, New South Wales. Globally, Alcoa utilises about 20 percent of recycled metal for fabricated products and is working to increase this to 50 per cent.

Climate Change is one of the key issues of our time. As Alcoa recognised over a decade ago, the public debate has moved from whether climate change is occurring to what can we do to address it.

Alcoa in Australia has, over the past decade, significantly reduced its greenhouse emissions. For example, Alcoa's Victorian smelters have reduced greenhouse gas emissions per tonne of aluminium by 20 per cent since 1990. At Alcoa's alumina refineries in Western Australia, emissions intensities have been reduced by 6 per cent from an already very efficient base.

More broadly Alcoa took a voluntary global leadership position in addressing climate change and reducing greenhouse gas emissions. It set an ambitious target to reduce its 1990 global direct greenhouse gas emissions by 25 per cent by 2010. This was achieved in 2003. Alcoa is now working to maintain that reduction as the company grows.

Alcoa supports the introduction of an Australian Emissions Trading Scheme (ETS) and welcomes the release of an ETS discussion paper by the Garnaut Review.

Alcoa supports the intention of the Australian Government to implement a scheme that:

- properly responds to the environmental challenges of climate change;
- also recognises the social and economic dimensions of climate change;
- provides leadership and helps facilitate appropriate international linkages;
- achieves as broad a coverage as practical;
- recognises the role of technology;
- encourages efficiency improvements across business and community;
- fosters the long-term sustainability of Emission Intensive Trade Exposed industries in Australia.

## **2. BACKGROUND**

### 2.1 Alcoa in Australia

Alcoa has driven the development of Australia's aluminium industry for over 40 years. In Australia, Alcoa operates:

- bauxite mines and alumina refineries in Western Australia
- aluminium smelters in Victoria
- aluminium rolling mills and recycling plants in Victoria and NSW
- dedicated port facilities in WA and Victoria; and
- the Anglesea power station in Victoria

These operations produce over 21 million tonnes of bauxite, 8 million tonnes of alumina (13 per cent of world demand) 540,000 tonnes of aluminium and 180,000 tonnes of aluminium rolled product.

Alcoa is a leading exporter with around \$3.5 billion of product exported each year. It is Victoria's largest exporter and also accounts for 8 per cent of Western Australia's exports. Alcoa Australia exports to the world's fastest growing economies including Asia.

The aluminium industry makes a significant contribution to local communities. Around 80 cents in every export dollar earned by Alcoa Australia stays in Australia, including through wages, spending on local suppliers, community sponsorships, royalties, taxes and dividends.

Alcoa is a major employer and provides jobs for 6000 employees and contractors, predominantly in regional Australia. Alcoa also supports local businesses and employment through local spending.

Alcoa is investing to expand its operations in Australia. It has completed a major upgrade of its Pinjarra refinery and has received environmental approval by the WA Government to expand its Wagerup refinery. Together these projects could generate \$23 billion in additional exports for Australia and thousands of new jobs.

Alcoa provides around \$6 million each year in community sponsorships and partnerships. A further \$8 million is invested to support community-based apprentices and trainees. Over 1500 tradespeople have been trained by Alcoa through its apprentice program.

## 2.2 Alcoa on Climate Change

A defining feature of the aluminium industry is its stability and longevity. The industry operates long life assets with high capital and replacement costs. Sustainability is therefore critical to the aluminium industry and underpins its decisions, actions and products.

Alcoa has taken a global leadership role on climate change policy, and will continue to do so. Alcoa's record is one of substantial emission reductions.

At a global level Alcoa has already reduced direct emissions by 25% compared to 1990 levels. This was achieved in 2003.

In Australia, Alcoa has reduced the direct emissions intensity of aluminium smelting by 20% compared to 1990 levels.

## 2.3 Deployment of new technology to reduce greenhouse emissions

Alcoa's greenhouse improvements have been underpinned by innovation and new technology. As Australia addresses climate change, Alcoa will continue to take a leading role through its application of technologies that reduce greenhouse emissions.

### *2.3.1 New smelting technology*

Alcoa is developing new aluminium smelting technology that will further improve greenhouse performance.

The technology, when available, has the potential to eliminate all consumable carbon anodes and related CO<sub>2</sub> emissions. It could also eliminate all perfluorocarbon (PFC) emissions which are a potent greenhouse gas.

### *2.3.2 Gas-fired cogeneration*

Alcoa and Alinta Limited are partnering to build greenhouse friendly cogeneration power plants at our refineries in Western Australia. The plants produce electricity and steam from natural gas, delivering substantial greenhouse efficiency benefits.

Cogeneration plants at Alcoa's Pinjarra and Wagerup refineries could save over 1.8 million tonnes of greenhouse emissions each year compared to coal-fired plants. This is equivalent to taking 450,000 cars off the road in Australia – a significant greenhouse benefit.

### *2.3.3 Carbon capture*

Alcoa has developed new carbon capture technology that uses waste CO<sub>2</sub> to treat bauxite residue. Bauxite residue is produced by alumina refineries and currently requires long term storage.

This new process delivers significant greenhouse benefits by permanently locking up CO<sub>2</sub> that is otherwise released into the atmosphere.

Alcoa's first residue carbonation plant is operating at Alcoa's Kwinana refinery in Western Australia and uses waste CO<sub>2</sub> from a nearby ammonia plant. Eventual deployment across Alcoa's operations in Australia alone could save up to 300,000 tonnes of CO<sub>2</sub> each year. The company will also deploy the technology to its refineries across the globe when practical.

### *2.4 Action at the grassroots level*

Although climate change is a global issue, in Australia Alcoa is working with its workforce and the communities in which it operates to address climate change at a grassroots level.

In a first for Australian industry, Alcoa and Greening Australia have developed a greenhouse reduction program for Alcoa employees and communities called 'Make an Impact'

The 'Make an Impact' program includes a greenhouse footprint calculator and tips to cut energy, water use and waste. Given that households generate almost one-fifth of Australia's greenhouse emissions, helping change everyday activities and habits can have a real impact. This Australian initiative will subsequently be implemented to Alcoa staff across the world.

Alcoa employees also participate in voluntary tree planting, and the company is supporting this through the global 'Ten Million Trees' program. The program aims to plant 10 million new trees worldwide by 2020 which will absorb more than 250,000 tonnes of carbon dioxide each year.

Alcoa has been consistently recognised in the Dow Jones Sustainability Index and by the World Economic Forum as one of the most sustainable companies in the world.

### *2.5 Asia-Pacific Partnership on Clean Development and Climate.*

The Australian aluminium industry is actively supporting the work of the Partnership through the Aluminium Taskforce chaired by Australia. The Taskforce is examining

opportunities to share best practice and technology to reduce greenhouse emissions. This includes Alcoa's new carbon capture technology.

Importantly, the Partnership includes the world's major greenhouse emitting countries, including the United States, India and China. For example, China has over 80 aluminium smelters - compared to Australia's six smelters - and accounts for over a quarter of global aluminium production. Sharing best practices and technology will have a significant impact in reducing greenhouse emissions.

Alcoa is an active participant in the work of Asia-Pacific Partnership on Clean Development and Climate (APP) and sub forums, including those associated with technology development.

### 2.6 Alcoa and USCAP

Alcoa is a member of the US Climate Change Action Partnership (USCAP) includes a broad range of large US corporates, including Alcoa Inc, BP, Caterpillar, Duke Energy, Du Pont, FPL Group, GE, PG&E Corporation and PNM Resources. Also included are Environmental Defense, the Natural Resources Defense Council, The Pew Centre on Global Climate Change and the World Resources Institute.

In 2007 the USCAP group called on the US Government to enact a policy framework for mandatory reduction of GHG emissions from major emitting sources, transportation, and energy use in commercial and residential buildings. The cornerstone of this approach would be a cap-and-trade program. The environmental goal is to reduce global; atmospheric GHG concentrations to a level that minimises large scale adverse impacts to humans and the natural environment. The group recommended the US Congress provide leadership and establish short and mid term emissions reduction targets; a national program to accelerate technology research, development and deployment; and approaches to encourage action by other countries, including those in the developing world.

The recommendations are based on the following six principles:

- Account for the global dimensions of climate change;
- Recognise the importance of technology
- Be environmentally effective;
- Creative economic opportunity and advantage;
- Be fair to sectors disproportionately impacted; and
- Recognise and encourage early action.

More information on USCAP is available at <http://www.us-cap.org/index.asp>

### 3. RESPONSE TO SPECIFIC MODEL ELEMENTS

#### 3.1 Setting and changing an emissions limit

Setting an emissions limit is a fundamental component of establishing an ETS and the Review has proposed this should take the form of a trajectory of annual emissions targets over time. Alcoa supports a budget-like approach to setting emissions targets, recognising that an appropriate level of borrowing and banking would allow market participants the flexibility to assign emissions within and across budget periods (see Section 3.7).

It is also logical to assume that the initial trajectory may require modification as Australia progresses towards its long term emission reduction goal. Advances in climate science and technological innovation, among many other factors will inevitably influence what is an appropriate trajectory during the coming decades. Whether this is reflected in the early choice of several trajectories, as proposed by the Review, or through some other adaptive management approach, it is important to facilitate investment confidence through maximum practical certainty.

The Review's recognition of the need to provide forewarning by "announcing a firm, five-year schedule for the release of permits" or announcing a shift in trajectory five years in advance of the change is welcomed. However, given that significant carbon-sensitive investment decisions are frequently based on a 25 or 30 year investment timeframe, it is important to maximise the amount of forewarning. Where possible a forward trajectory fixed for the coming 10 to 20 years should be considered desirable.

To this end, the National Emissions Trading Taskforce (NETT) has proposed that firm caps be set for 10 year periods, with a 'gateway' approach for the following ten years delineating possible future caps.<sup>1</sup> These would be revised on a rolling 5 year basis. This would help to increase certainty for investors, while retaining flexibility for governments. We support the intent of the NETT approach, but would argue that firm 15 year periods are to be preferred to provide certainty for long lived investments.

Alcoa also supports transparency in the conditions under which a change in trajectory would be triggered, either through a move to an alternative, pre-determined trajectory, or through modification of an existing trajectory. The emissions limit specified by a trajectory will have enormous influence on price and economic viability. Therefore the conditions that will trigger such a change should form part of the ETS policy context

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<sup>1</sup> National Emissions Trading Taskforce 2007, *Possible design for a national greenhouse gas emissions trading scheme: Final Framework report on scheme design*, [www.garnautreview.org.au](http://www.garnautreview.org.au)

and be subject to extensive consultation and rigorous examination, with any sharp discontinuities avoided.

In considering the establishment of an initial trajectory it is relevant to note that Australia does not require rapid contraction (e.g. by 2012) of greenhouse gas emissions to meet the upcoming Kyoto Protocol target. In this respect Australia has the opportunity to use the first years of an Australian ETS through to 2015 to deal with the inevitably complex implementation issues, in an environment that is not supercharged by pressure from looming allocation cuts. This opportunity for a “walk before we run” approach should be utilised, in setting the initial emissions trajectory and developing and implementing key aspects of the permit allocation framework. This will be important to build confidence in the operation of the scheme among business and the community.

### 3.2 Coverage

Alcoa supports coverage by the Australian ETS of the six commonly accepted (and Kyoto Protocol specified) greenhouse gases: carbon dioxide; methane; nitrous oxide; sulphur hexafluoride; perfluorocarbons; and hydrofluorocarbons – expressed as carbon dioxide equivalents. However, it is important to apply a reasonable materiality test to ensure coverage of the ETS applies only to those facilities emitting above an agreed threshold quantity of greenhouse gases.

It is desirable to have as broad as possible coverage of sectors in an Australian ETS and it is a logical prerequisite to be able to reliably and accurately measure, monitor and verify emissions, for a sector to be included. As such there has been a question over when it is appropriate for agriculture and forestry to enter the ETS.

There is great potential for the agriculture and forestry sectors to play a significant role in carbon sequestration and therefore the provision of credits or offsets, which Alcoa strongly supports. However, this offset role will bring with it assessment and verification obligations and an argument may be sustained that if a sector can implement sufficient measurement and verification protocols to participate in an offset regime it may be appropriate for inclusion in an ETS.

### 3.3 Domestic Offsets

Alcoa agrees there is a role for domestic offsets and supports the Review’s recommendations that this should be unlimited in quantity. As previous reports have highlighted it is important that offsets are environmentally additional, verifiable, permanent and enforceable. The role of domestic offsets is likely to increase as international linkages are developed and the widely discussed “international patchwork” of emissions trading schemes evolves.

### 3.4 Point of obligation

As the Review states a natural starting point for considering where the point of obligation should be is the emissions source. However, the review also acknowledges a distinction between direct and indirect emissions which is relevant for consideration of responsibility or accounting for emissions.

Alcoa's alumina refining operations in Western Australia predominately generate their own heat and steam through the combustion of natural gas, a combination of this power and gas is then used to run the alumina refining process. The vast majority of CO<sub>2</sub>-e emissions that Alcoa is responsible for in Western Australia are direct emissions. However, in Victoria much of the electricity used in the smelting of aluminium is purchased from the electricity grid. In 2007 over 90% of Alcoa's CO<sub>2</sub>-e emissions in Victoria were indirect emissions from the generation of power which Alcoa purchased and used in the smelters. Alcoa recognises the importance of both the direct emissions from its facilities and the indirect emissions released in the creation of purchased power.

The allocation of permits under the proposed EITEI arrangements must cover both direct and indirect emissions. A failure to recognise this imperative in the initial EU scheme has had major detrimental impacts on the viability of the European aluminium industry despite the other provisions included in the European scheme.

Furthermore, it is important that the indirect emissions component of permit allocation to the EITEI sector account for any specific contract arrangements between the EITEI and the energy supplier. This is because different suppliers have different emissions intensities and contracts may bind a EITEI to a particular supplier for lengthy time periods.

Both direct and indirect emissions are reflected in the accounting process implemented as part of the Australian Greenhouse Challenge Plus program. Alcoa's reporting of greenhouse emissions under this scheme in 2007 is shown in Figures 1a and 1b.

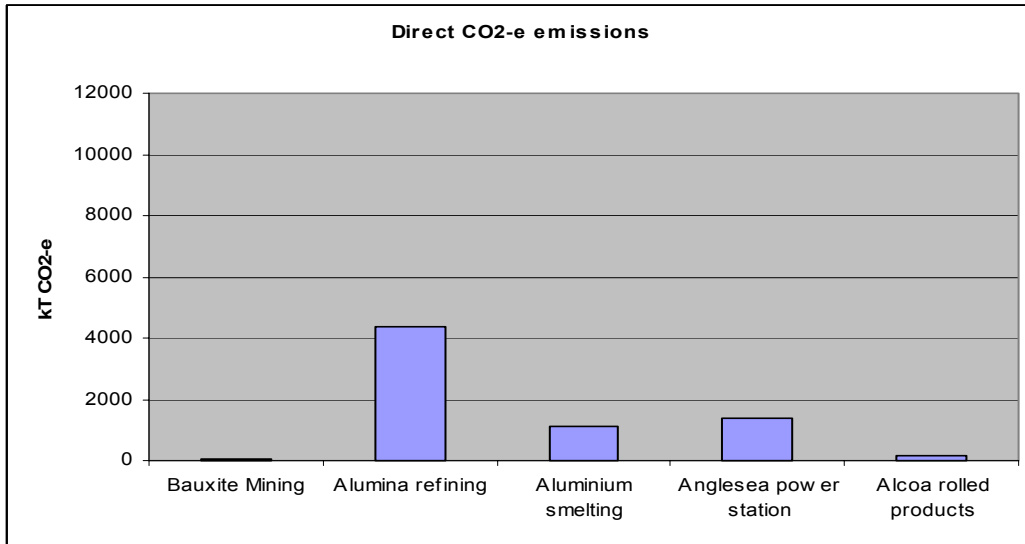


Figure 1a) Alcoa of Australia Greenhouse Direct Gas Emissions 2007

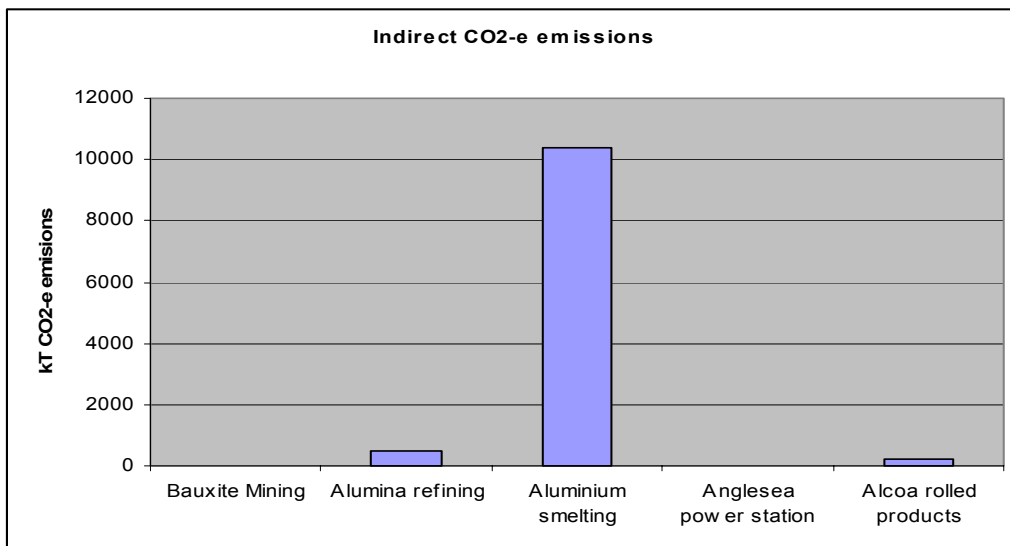


Figure 1b) Alcoa of Australia Greenhouse Indirect Gas Emissions 2007

### 3.5 International linkages

A comprehensive response to the challenge of climate change will require either a truly global ETS or a “patchwork” of trading schemes with well defined and managed linkages and covering the vast majority of major emitting jurisdictions.

International linkages may play a significant role in Australia’s response through the provision of international offsets or credits, particularly low cost abatement

opportunities from developing countries. When practical, Australian firms, governments and individuals should have the option to meet all or part of their permit obligation through this mechanism. However, during the formative years of the Australian ETS it is important that international linkages do not simply result in the Australian ETS importing the emissions price and volatility of other, linked schemes.

Building a strongly functioning domestic scheme should be a priority, with opportunities to link to other schemes and harness the 'gains from trade' pursued when appropriate – particularly where these lower the costs of achieving effective abatement for Australia. The Review's proposal for linkages with developing neighbouring countries such as Indonesia and PNG is to be commended in this context.

### 3.6 Price controls

The discussion paper gives several reasons why the Review does not support price control, including the dampening of secondary markets and difficulty in developing international linkages. It is acknowledged that price caps create problems with banking, and with linking to other schemes and these are sound reasons to avoid price controls in a well established or mature trading scheme. Alternatively appropriate setting of initial budgets, and allowing borrowing, could provide an effective means to manage the costs of the scheme in the early years

However, consideration could be given to using the penalty provisions as a price capping mechanism in the formative years of the ETS, such as the period from 2010 to 2015, or until the time of a scheme review. This would help mitigate against price volatility experienced in other schemes. A price cap is worthy of further evaluation as a transition mechanism, as set out by the 2007 Task Group on Emissions Trading.<sup>2</sup> Such a provision might increase confidence in the early years of scheme implementation and avoid wild fluctuations in price until the scheme is well understood and early implementation bugs or unforeseen consequences are dealt with.

### 3.7 Inter-temporality

The Review proposes that inter-temporal options (the ability to bank or borrow permits) offer a mechanism to encourage early emission reductions as well as establishing a forward curve in permit price. It is well established that the ability to store ("bank") commodities, such as permits, reduces the underlying price volatility and therefore the risk to market participants. It also establishes a basis for lower volatility in forward markets as future prices reflect the underlying cost of carry of the current commodity. In

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<sup>2</sup> Prime Ministerial Task Group on Emissions Trading 2007, *Report of the Task Group*, [www.pmc.gov.au](http://www.pmc.gov.au).

the context of an Australian ETS, this means the ability to surrender prior year permits for a current year liability.

We note that banking is an accepted feature of most similar schemes, and has been supported by both the NETT and the 2007 Task Group on Emissions Trading. On the other hand, borrowing was not supported, on the grounds of environmental and taxpayer risk. While the effectiveness of borrowing will ultimately depend on the allocation of future permits, the ability to borrow may provide an incentive for participants to delay emissions reductions by borrowing from the future for current liabilities.

Borrowing should be further considered within the context described above – with potential for risks to the environment or to taxpayers to be dealt with through the rate of release of future dated permits and prudential limits on lending by the independent market operator, and by penalty and compliance arrangements.

### 3.8 Permit release & the treatment of EITEIs

The Discussion Paper states “Australia, with its well established legal, regulatory and administrative structure, is in a favourable position for full auctioning of permits.” However, this statement is qualified on various occasions by recognition that the Emission Intensive Trade Exposed industry (EITEI) sector must be treated differently.

This policy imperative was also recognised by the 2007 Task Group on Emissions Trading and by the then incoming Labor Government. In the lead up to the 2007 federal election the Australian Labor Party explicitly acknowledged the importance of EITEI recognition in an Australian ETS – the document “Labor’s Plan for a Stronger Resources Sector” committed the Rudd Government to:-

- *“Ensure that Australia’s international competitiveness is not compromised by the introduction of emissions trading” and*
- *“Establish specific mechanisms to ensure that Australian operations of emissions intensive trade exposed firms are not disadvantaged by emissions trading.”*

These policy positions are driven by two converging desires; to ensure Australia’s international competitiveness is not jeopardised and to ensure carbon leakage to other countries does not result from the introduction of an Australian ETS.

In a speech to the Australian Industry Group in February 2008, the Minister for Climate Change, The Hon Penny Wong summed up this imperative in the following way.

*“The [ETS] design will address the competitive challenges facing emissions-intensive trade-exposed industries in Australia. The introduction of a carbon price ahead of effective international action can lead to perverse incentives for such industries to relocate or source production offshore. There is no point in imposing a carbon price domestically which results in emissions and production transferring internationally for no environmental gain. Therefore, we need to assess carefully the impact of the scheme on industries for which this might impose a real risk. In addressing competitiveness concerns during this phase, attention will also need to be paid to ensuring that incentives remain for these industries to adjust their emissions profiles consistent with an emerging global carbon constraint.”*

Emissions-intensive trade-exposed industries are those that have a high carbon burden but are unable to pass the additional cost onto their customers because the price for their commodity is set by the international marketplace – where many of their competitors will not experience a commensurate carbon cost.

Many trade-exposed emissions-intensive firms committed to business will not see the situation as an “incentive” to relocate. However, the addition of even a modest carbon cost to production could force plant closures in Australia with the market shortfall then met by growth by competitors in other countries, including some with significantly higher emission intensities. The net result would be the loss of Australian jobs and increased carbon emissions – the “perverse” outcome Minister Wong referred to.

The Review proposes that this perverse outcome could be avoided by the granting of free permits or cash to EITEIs. The 2007 Task Group on Emissions Trading recommended the free allocation of permits to existing and new investments in EITEIs while key international competitors do not face similar carbon constraints, but which also provides ongoing incentives for abatement and adoption of industry best practice. This is a solid approach to dealing with the international competitiveness exposure.

Alcoa does not support the allocation of cash to EITEI firms. The purpose should be to avoid EITEIs experiencing the carbon cost in isolation of key competitors and the simplest way to achieve this is through the granting of permits. Permits provide for automatic adjustment to the impact of fluctuations in permit prices, so provide for simpler and more certain compensation through time for increased direct and indirect costs.

The granting of permits to EITEIs should not come without obligations, including:

- Potentially, an obligation to continue to produce the EITEI commodity – or surrender the permits;
- Demonstration of “best in class” for direct emissions management;
- Periodic international competitiveness review;

Consideration should also be given to restricting the sale of freely issued permits covering indirect emissions<sup>3</sup>; which then reduces the risk of so-called “gaming”. The ability to trade direct emission permits is desirable as an incentive to invest marginal emission reduction projects at the EITEI facilities.

The sole purpose of freely issued permits to EITEIs is to retain the viability of Australian industry while international competitors do not face an equivalent carbon cost. This had led to suggestions that EITEIs be required to continue to produce, or surrender the free permits. Their position deserves further evaluation during the Review process to consider whether it is practical and could reasonably be implemented by mechanisms such as a specific category of permits for EITEIs. The Review also proposes that cash payments could be made to EITEIs, rather than issue free permits. Alcoa does not support this proposal and doubts that many members of the public would prefer to see cash payments, rather than permit issue to EITEIs.

Both the Review and the 2007 Task Group reports recommended that EITEIs be required to demonstrate a form of “best practice” in emissions management, in order to qualify for free permits. The reasoning behind this is logical and obvious – without such a requirement there may be a temptation to avoid costly investment in new emissions reduction technology.

However, care needs to be taken to ensure the assessment is appropriate and relevant to the facility in question. It is appropriate that a “best in class” approach be taken to this best practice assessment.

There are significant limitations in what technology can be applied on a site by site basis. The vintage of a facility potentially restricts the technology that can be deployed on-site, even in refurbishment programs – otherwise significant operational, maintenance and occupational health and safety conflicts arise.

Best practicable technology should be determined by a “best in class” approach where the emissions efficiency of a facility is considered with respect to local power options, the age of the facility and its various technical limitations. In this way facility’s best practice assessment is made against what can reasonably be expected given its physical limitations.

The Review proposes a policy formula that could be used to determine how many permits a facility would be entitled to achieve, as follows:

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<sup>3</sup> Where the supplier (eg...generator) is the liable party and the liability for indirect emissions is reflected as a cost pass through under a supply contract, EITEI businesses should be entitled to surrender their allocated permits via the supplier. This provides for a more efficient, transparent and a lower risk outcome for all participants.

- Calculate the differential of the actual international commodity price and price that would have been paid if all substantial competitors and potential competitors had a carbon price. The product of this differential and the amount of trade exposed sales will represent a maximum assessment (M);
- The Independent Carbon Bank will calculate a reasonable expected annual improvement rate in emissions efficiency for well-managed firm's (efficiency factor e)
- The EITE firm's entitlement will be M in the first year and M discounted by the efficiency factor e in the second year, with additional discounts of e applying in subsequent years

There is a logical basis to this approach; however, there may be substantial challenges in fairly calculating both M and e – with considerable likelihood of arduous debate and conflict over detail.

Importantly, there is little point in seeing Australian firms reduce production or close in *advance* of a truly global emissions regime, which seems to be implied by Review's statement on page 39:

*"The concern arising out of differences in carbon constraints among our trading partners is not that some Australian firms may reduce their level of production, but rather that some firms may reduce their levels of production too far. 'Too' far means beyond the level that would eventuate if competitor countries were subject to commensurate carbon constraints."*

Adopting the 'M' approach in advance of a truly global system would be very likely to lead to leakage – with associated costs to Australia – but no certainty that global emissions outcomes may improve. Calculations about compensation for EITEIs should take the world price as a given, rather than resort to complex 'what if' analysis in relation to those prices. What is more important is the differential in carbon price faced in Australia compared to that faced by key competitors. As recommended by the NETT:

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...if emissions constraints in competitor nations are phased in over time, assistance measures to Australian EITEI firms could be correspondingly phased out; if competitor emissions constraints are partial compared to Australia's, assistance to EITEI firms could be adjusted accordingly.

To ensure that EITEI firms have certainty in relation to new investments, it will be important to establish clear criteria for the phasing out or adjustment down of EITEI assistance. We recognise that EITEI assistance should not provide tariff style protection for domestic exporters. Instead, EITEI assistance could be based on the *lowest level of emissions constraint and resulting carbon price* in substantial and potential competitors.

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<sup>4</sup> National Emissions Trading Taskforce 2007, op.cit., pp 80.

The concept proposed in the discussion paper of an efficiency measure (e) being reviewed yearly offers significant potential to erode certainty and increase administrative burden.

As the review itself notes there is a strong case for simplicity. This reflects the limited time available to implement the ETS and a desire for ease of understanding and transparency. A simple approach to the international competitiveness test is simply to identify the main competitors to an Australian EITEI and if they are not subject to an equivalent carbon cost there is a case for the issue of free permits in Australia.

A simple approach may also be taken to determining what constitutes a trade-exposed emissions-intensive industry. For example, EITEIs could be considered those industries which:

- have energy as one of the major costs of production, or suffer a significant cost increase as a result of the ETS;
- are based on facilities with high capital costs;
- have long lived plants and hence limited opportunities for capital stock turnover and restrictions on the introduction of new more efficient technology;
- rely on large scale operations that are essential to achieve international unit cost levels;
- are directly trade exposed (import or export competing);
- have competitors based in countries that are not subject to equivalent carbon costs.

For the best in class assessment an independent technical review can be used to determine a target emissions intensity. This test should apply to emissions, over which the EITEI has direct control (direct emissions). This may then allows a scaling factor to be applied to the issue of free permits, which would be adjusted as major new technologies are proven to be practical and cost effective.

Given a facility's power source limitations and issues of vintage and embedded technology, indirect emissions and allocations should be determined with regard to current operating environment and supply arrangements for the plant.

### 3.9 Governance

The Review's proposal that the Australian Federal Government undertake the following functions is supported:

- Set the emissions limit or trajectory, the nature, timing and extent of any trajectory changes. The Federal Government should also be responsible for determining what conditions need to be met to justify a change in trajectory.
- Make the design conditions underpinning the ETS, including matters of coverage and points of obligation.
- Issue permits and enforce penalties.
- Decide to whom permits are issued and how the revenue from permit sales will be used.
- Make decisions on and administer permit issue to EITEIs.
- Specify the rules and supervise any lending of permits together with the relationship between lending, hoarding and stability of the market.
- Administer the rules for any international trade in permits.
- Exercise a general responsibility for supervision of the market.

The Federal Government should also specify the rules relating to domestic offsets and the importation of international offsets into the Australian system.

The review also suggests that administration of the ETS be made the responsibility of an independent authority – such as an Independent Carbon Bank (ICB). This is supported, however, it is critical that the responsibility for clearly establishing ETS rules and thereby increasing process certainty and investment certainty) must be the responsibility of elected Government.

### 3.10 Compliance & penalties

The Review logically proposes that the ETS should include a financial penalty, significant enough to discourage non-compliance. The penalty would apply to the extent that insufficient permits were acquitted, or repaid. The alternative that a non-compliant body could be required to fund the purchase of credits or offsets equivalent to the permit short-fall also has merit, and direct environmental relevance.

The discussion paper goes on to propose “*financial penalties would need to be accompanied by a make-good provision applying to the non-compliant party that requires them to rectify an overrun of emissions*”. As the 2007 Task Group on Emissions Trading concluded this establishes a double penalty and would be undesirable at the commencement of the scheme – once the ETS is well-established, teething problems have been addressed and companies have confidence in its operation it may be more appropriate to consider harsher penalty provisions.

### 3.11 Use of permit revenue

It is the responsibility of Government to determine how best permit revenue should be used. Important priorities include initiatives to stimulate the development and

deployment of practical low-emissions technology, structural adjustment assistance for disproportionately impacted sectors and the offsetting of unsustainable financial impacts, such as potential cost increases to low income households. The Australian Federal Government has already recognised these potential uses, along with several others of merit.

#### **4. RESPONSE TO OTHER ASPECTS OF THE DISCUSSION PAPER**

##### 4.1 Investment Certainty

Alcoa supports the position of the Australian Aluminium Council (AAC) on the importance of permit security. Investment decisions for both green-fields and brown-fields developments are typically based on a 25 year investment time-frame – shorter periods would greatly curtail capital investment in Australia. Significant new alumina or aluminium projects typically have a 5 year lead time and significant returns on investment may not be realised for a further 10 – 15 years.

The security of permit allocation will be critical to future investment decision-making by Alcoa of Australia. Any risk that EITEI permit allocations might be withdrawn, or reduced, before our major international competitors face comparable carbon constraints would significantly discourage new and sustaining investment and job creation. This applies equally to the initial allocation of permits and any periodic review of permit allocation.

As an example of the significance of this issue to employment in Australia, independent specialist consultants, ACIL Tasman, have estimated that a \$1.95 B investment in the Victorian aluminium industry would generate more than 6,000 ongoing Victorian jobs.

Alcoa also supports the view of the Australian Industry Greenhouse Network (AIGN) that new EITEI projects should be excluded from budgets and gateway trajectories until a global agreement is fully functioning. Alcoa believes this consideration will be critical to increasing investment certainty and employment growth in Australia. This should come with an obligation to demonstrate “best in class” energy efficiency for the new facility at the time of the financial investment decision being made.

The AIGN has also made recommendations on permit security for new EITEI investments that deserve further consideration including the following

For new emission intensive trade exposed projects, the amount of permits could be estimated and guaranteed for the first 25 years of the project prior to the Final Investment Decision for the project. Allocation would be made

when production starts and once in operation, annual ex post adjustments would be made based on actual production.

These options deserve careful consideration to ensure the early implementation of an Australian ETS does not result in investment leakage due to unforeseen ETS-driven investment uncertainty.

#### 4.2 MRETS

Increased uptake of low-carbon renewable energy is an important response to the challenges of climate change. Ideally investment in renewable energy technology development will facilitate lower costs within the sector, thereby making low-carbon energy increasingly price competitive. However, at present renewable power is typically available only at a significant price premium, for example \$40/MWh.

As a result the Federal Government has announced measures to drive uptake of renewable power, whilst still investing in renewables technology development. The Mandatory Renewable Energy Target (MRET) obliges companies reliant on State power grids to purchase a percentage of their energy from higher cost, renewable sources.

An MRET represents the same challenge to international competitiveness for EITEIs as a carbon price. It is a potentially significant increase in power cost that cannot be passed on to customers and which is not imposed on key competitors and, as such, may have unsustainable cost impacts on some EITEIs.

To avoid unintended and potentially unsustainable impacts on the trade-exposed emissions-intensive sector it will be important to apply the same concession principles in the MRET as proposed for the Australian ETS.

#### 4.3 ETS Discussion Paper Appendix 3

Alcoa acknowledges that the information contained in Appendix 3 describes some of the broad macroeconomic factors influencing EITEI production. However, the presentation appears to assume that production can readily be scaled back in response to increasing costs. This is not always the case.

Many facilities need to operate at or near capacity to remain globally competitive and periodic increases in production capacity, via “production creep” or expansions, are necessary to retain profitability. Therefore an increase in production cost may see a facility closed, or mothballed, with resultant job losses, rather than simply a scaling back of production.

The AIGN submission in response to the Review's discussion paper correctly identifies that the sustainable production level of some Australian EITEI facilities (only a few years into ETS operation) may be higher than the current production level.

## **5. AUSTRALIAN ALUMINIUM INDUSTRY & GREENHOUSE GAS MANAGEMENT - BACKGROUND INFORMATION**

(Extracts from a recent position paper by the Australian Aluminium Council)

### **Greenhouse Performance**

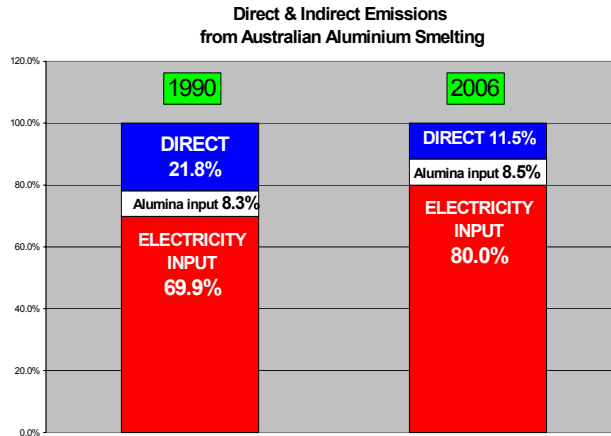
The Australian Aluminium industry has not waited for emissions trading to respond to climate change and has made significant abatement gains and greenhouse gas emission reductions. For example direct emissions per unit of production are down 59% since 1990.

As an inaugural GH Challenge member, the aluminium industry recognised the issue of climate change and took early action to reduce CO<sub>2</sub>-e emissions. The greenhouse gas intensity of Australian aluminium smelting has fallen sharply over time, reflecting advances in emission controls and investment in efficiency technology.

With a production increase of 56 per cent since 1990, the changes in direct emissions per unit of production are impressive: falling from 5.05 tonnes of CO<sub>2</sub>-e per tonne of metal produced in 1990 to 2.04 tonnes of CO<sub>2</sub>-e per tonne of metal in 2006 – a reduction of 59 per cent.

Indirect emissions from electricity and alumina consumption in the aluminium smelting process have risen in absolute terms, reflecting growth in production. Importantly, indirect emissions growth has been at a rate well below the increase in production.

Indirect emissions from the consumption of electricity by Australian aluminium smelters are the dominant emissions for the industry – seven times greater than direct emissions – accounting for 80% of total emissions attributable to aluminium production. Indirect emissions from the alumina consumption account for a further 8.5% of total emissions ... leaving just 11.5% of total emissions attributable to direct emissions generated inside the smelter gate and falling within the control of the smelter operator.



Overall, the emissions intensity (including direct emissions and indirect emissions from both electricity and alumina inputs) of Australia's aluminium smelters in 2006 has improved 23 per cent since 1990. Our electricity performance can be seen in a global comparison:

#### Regional Average Electricity Use for Primary Aluminium Production (kWh/tonne)

	2006
Africa and South Asia	14 622
North America	15 452
Latin America	15 030
Asia	15 103
Europe	15 387
<b>Oceania</b>	<b>14 854</b>
Weighted average	15 194

Source: International Aluminium Institute Electrical Power Used in Aluminium Production ES002 21 December 2007

#### Regional Average Energy Use of Metallurgical Alumina Production (GJ/tonne)

	2006
Africa and South Asia	14.5
North America	11.9
Latin America	11.2
Europe	13.1
<b>East Asia and Oceania</b>	<b>11.8</b>
Weighted average	12.0

Source: International Aluminium Institute Electrical Power Used in Metallurgical Alumina Production ES012 21 December 2007

Growth in the alumina refining sector has been even higher than in aluminium smelting with a 64% increase in production from 1990 levels. During this period, growth in total industry CO<sub>2</sub>-e emissions was only 29% higher, reflecting a 21% improvement in emissions intensity.

The available data indicate that the Australian alumina and aluminium industry is a world-leading performer in greenhouse gas performance. For example, several large gas-powered Australian alumina refineries produce less than half the amount of greenhouse gases per tonne of alumina in comparison to Chinese alumina refineries. Energy intensity in Australia is also enhanced by the higher quality bauxite being processed.

### Key Characteristics Comparison 1990:2006

<b>Australian Alumina</b>	<b>2006</b>	<b>Variation on 1990</b>
Production	18.4 Mt	+ 64%
Share of global production	28%	
Alumina export tonnage	14.7 Mt	+ 68%
Alumina export value	\$5.99 billion	+ 101%
Total alumina ghg emissions	13.9 MtCO <sub>2</sub> -e	+ 29%
Per unit ghg emissions	0.75 t CO <sub>2</sub> -e/t	- 21%
<b>Australian Aluminium</b>		
Production	1.94 Mt	+ 56%
Share of global production	5.8%	
Aluminium export tonnage	1.62 Mt	+ 73%
Aluminium export value	\$5.46 billion	+ 173%
Total direct ghg emissions	4.0 MtCO <sub>2</sub> -e	- 37%
Per unit direct ghg emissions	2.1 tCO <sub>2</sub> -e/t	- 59%
Total indirect ghg emissions from electricity	27.4 MtCO <sub>2</sub> -e	+ 37%
Per unit indirect ghg emissions from electricity	14.2 tCO <sub>2</sub> -e/t	- 12%
Total indirect ghg emissions from alumina	2.9 MtCO <sub>2</sub> -e	+ 23%
Per unit indirect ghg emissions from alumina	1.5 tCO <sub>2</sub> -e/t	- 21%
Total aluminium ghg emissions	31.4MtCO <sub>2</sub> -e	+ 20%

Source: Australian Aluminium Council Sustainability Report 2006. Note: In the Report, indirect emissions from the alumina consumed in the smelting process are not included to avoid double counting these emissions.

The Australian aluminium industry is fully engaged with international actions under the voluntary global sustainability initiative of the International Aluminium Institute – and is a direct industry contributor to the work of the Aluminium Task Force under the Asia Pacific Partnership for Clean Development and Climate where the capacity for industry to address regional emissions is available and tangible. We are working in close collaboration with our industry counterparts in China to achieve improved environmental outcomes within the industry.

In the absence of a global ETS, any leakage of existing or new investment to countries such as China, South Africa or the Middle East would both harm the Australian

economy and, in many cases, be environmentally detrimental. Climate change is a truly global challenge and maintaining production and investment in countries with modern emission controls, relatively high greenhouse efficiency, a history of environmental improvement and a strong desire to achieve even more must be a sustainability priority.

A number of new investments have been identified for the sector in Australia:

- Bauxite: new mine in Cape York Qld around 6.5 million tonnes capacity: investment around \$0.7 – 1.0 billion.
- Alumina: three advanced projects around 6 million tonnes additional capacity; investment around \$10 – 11 billion.  
two further projects under development, with around 2.2 million tonnes additional capacity: investment around \$4 billion.
- Aluminium: three advanced projects on hold pending resolution of electricity supply/pricing: around 525,000 tonnes additional capacity: investment around \$2.7 – 3.0 billion

### A Key Value-adding Industry

The industry is a notable example of value adding within Australia through facilities refining bauxite into alumina and then the smelting of alumina to create aluminium. The loss of alumina refining and aluminium smelting opportunities would send Australia back down the value-adding ladder to being a bauxite quarry for the world – this is in direct contrast to the desire/intent of Australian governments and the industry. The following summarises the value adding role played by the Australian aluminium industry in 2006.

<b>Bauxite exports</b>	5.6mt	\$131m	<b>\$23/tonne</b>
<b>Total value bauxite production</b>	64mt	=	<b>\$1,472m</b>
<b>Alumina exports</b>	14.5mt	\$5,427m	<b>\$374/tonne</b>
<b>Total value alumina production</b>	18.4mt	=	<b>\$6,881m</b>
<b>Aluminium exports</b>	1.62mt	\$4,939m	<b>\$3,054/tonne</b>
<b>Total value aluminium production</b>	1.94mt	=	<b>\$5,924m</b>

Source: ABARE Australian commodities vol. 14 no. 1 march quarter 2007

### Recognition of Emissions Intensive Trade Exposed Industries (EITEIs)

The Australian aluminium industry is export-focussed and trades in the global metals marketplace. The sector faces global competition from China, India, Canada, USA, Brazil, Europe, Russia, Middle East and South Africa.

This high reliance on the global market potentially exposes the industry to a significant competitive disadvantage if competitors do not face similar carbon price imposts to that resulting from an Australian ETS.

At this time it is not possible to accurately predict the quantity of a carbon price signal once an Australian ETS is operational. However, it is clear that price signals even at the lower end of the speculated range have great potential to undermine the existing competitiveness of Australian EITE industries in the absence of similar action by our competitors.

To date both Federal and State Governments within Australia have recognised the importance of a level playing field – which now needs to be carried forward as the detail of the Australian ETS policy is formulated.

During the 2007 federal election the Australian Labor Party explicitly acknowledged the importance of EITEI recognition in an Australian ETS: “Labor’s Plan for a Stronger Resources Sector” committed the Rudd Government to:-

- “Ensure that Australia’s international competitiveness is not compromised by the introduction of emissions trading” and
- “Establish specific mechanisms to ensure that Australian operations of emissions intensive trade exposed firms are not disadvantaged by emissions trading.”

EITEI recognition was integral to the 2007 Task Group evaluating the development of an Australian Emissions Trading Scheme (ETS) which proposed that EITEIs receive a free allocation of permits to avoid prejudice to the international competitiveness of key Australian industries. Without this arrangement, global competitors not subject to a similar carbon cost would receive significant cost and market advantages which could result in growth opportunities being lost to Australia or even the closure of some Australian operations and associated job losses over the longer term.

The State based NETTS proposal also recognised the importance of maintaining competitiveness of EITEIs , and proposed similar mechanisms of free allocation of permits until a level playing field existed internationally.

### **Alumina Refineries and Aluminium Smelters ... high energy users**

Often used as a proxy for emissions intensity, energy forms a major component of the operating costs profile of both alumina refineries and aluminium smelters. Average costs estimated for the Australian industry by Commodity Research Unit (CRU) are shown in the following two tables:

### **Alumina refining costs 2007 (% of site operating costs)**

Bauxite	22.1%
Caustic Soda	18.3%
Labour	15.0%
Fuel*	22.0%
Power*	1.6%
Other Materials	6.6%
By-Product Credits	0.0%
Sustaining Equipment Costs	14.4%
SOC (Site Operating Costs)	100.0%

\* Fuel and power costs combine to represent the total cost of energy  
Data: CRU

### **Aluminium smelting costs 2007 (% of site operating costs)**

Alumina	43.3%
Potroom and Auxilliary Power (electricity)	19.0%
Carbon Plant + Potroom + Maintenance Labour	11.2%
Bath Materials and anode costs	9.9%
Relining Costs, repairs and maintenance	7.1%
Site Admin Costs	2.3%
Sustaining Equipment	2.6%
Casthouse Costs	4.6%
SOC (Site Operating Costs)	100.0%

Data: CRU

The amalgamated figure showing 19% of smelting costs arising from potroom and auxiliary power varies significantly based on local circumstances and can rise to more than 25% under some circumstances. Similarly, individual alumina facilities face a range of energy costs, depending on location and fuel source.

Including the energy used in the alumina refinery stage, the share of energy in aluminium operating costs rises to 29.2% - and for some individual facilities this is in the order of 35%. Energy is also the main component in anode costs.