



**CEMENT INDUSTRY  
FEDERATION**

# The Status of the Cement Industry in the Future Emission Trading Scheme

16 June 2008

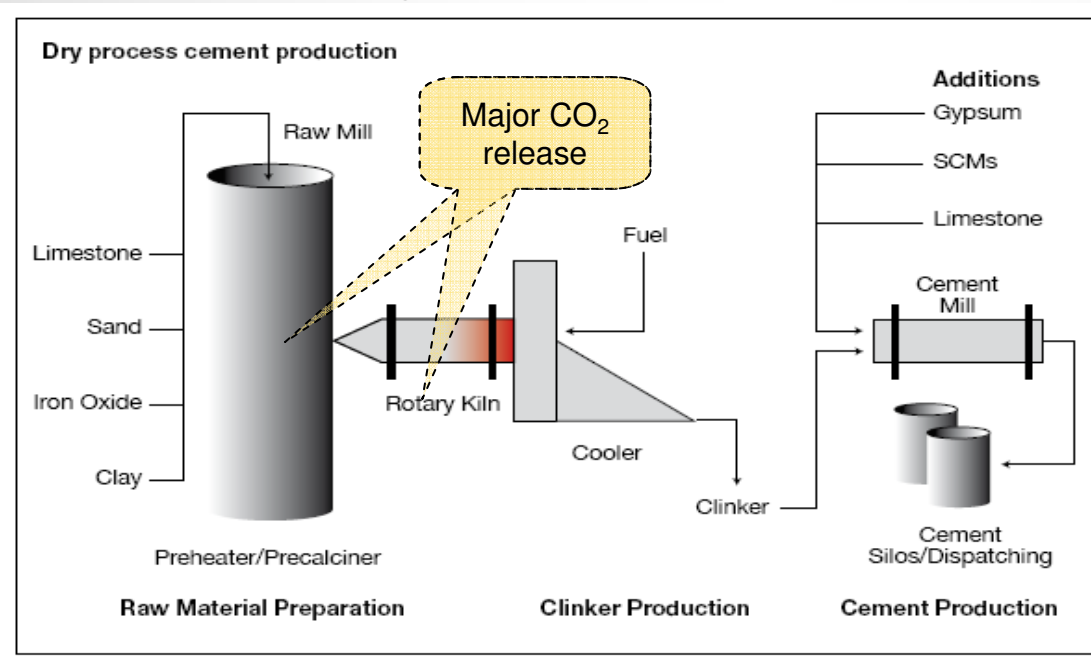


## Agenda

- An Emission Intensive Industry
- A Trade Exposed Industry
- The Impact of Implementing an ETS on the Cement Industry
- Conclusion

Cement is produced in a high temperature chemical reaction where limestone is calcined into clinker. Carbon dioxide (CO<sub>2</sub>) is emitted as a product of the reaction, through the combustion of fuels, and indirectly through electricity consumption

### Cement Manufacturing Process

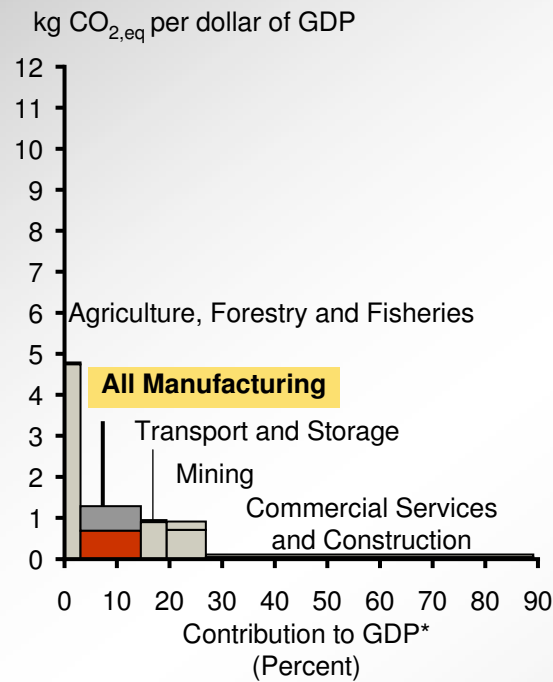


Inputs  Cement

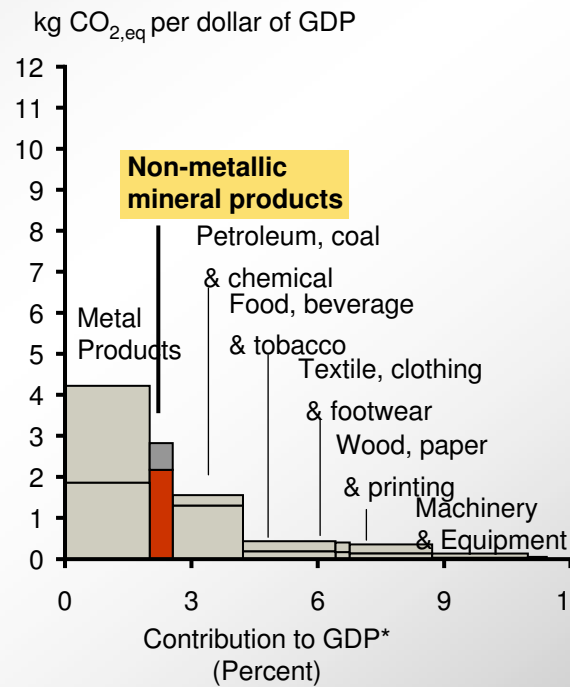
# The cement industry is one of the most emission intensive sectors in Australia

## GHG Emissions Intensity: CO<sub>2,eq</sub> Emissions Per Contribution to GDP Across Sectors (2005)

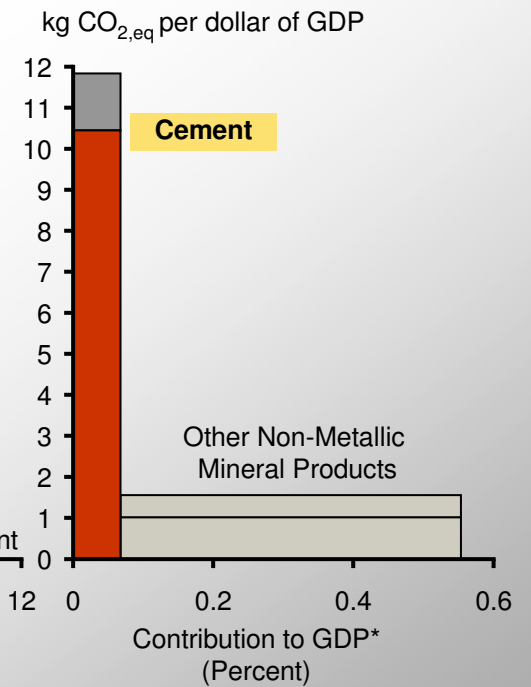
### All Businesses



### All Manufacturing



### Non-Metallic Mineral Products



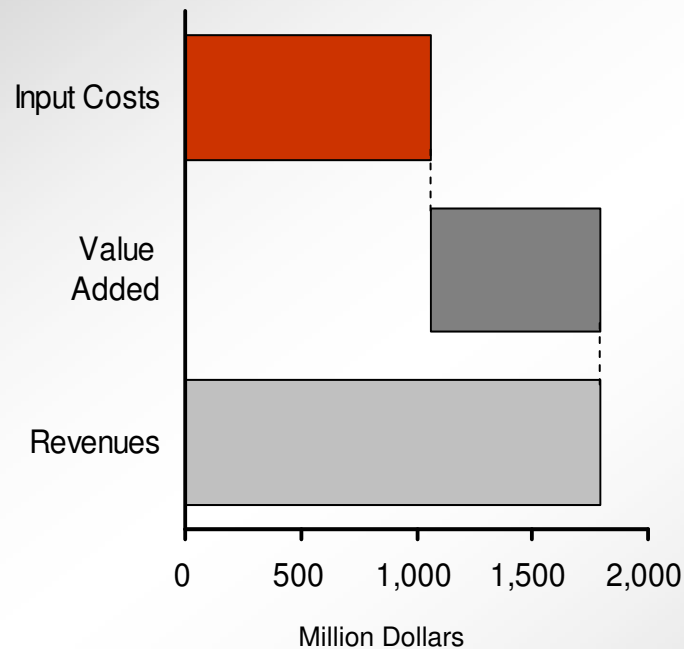
■ Direct Emissions   
 ■ Indirect Emissions

Note: \*Based on contribution to GDP at basic prices (does not include taxes and subsidies). The contribution by business is less than 100% as 'Dwellings owned by persons' contributed ~8.5%

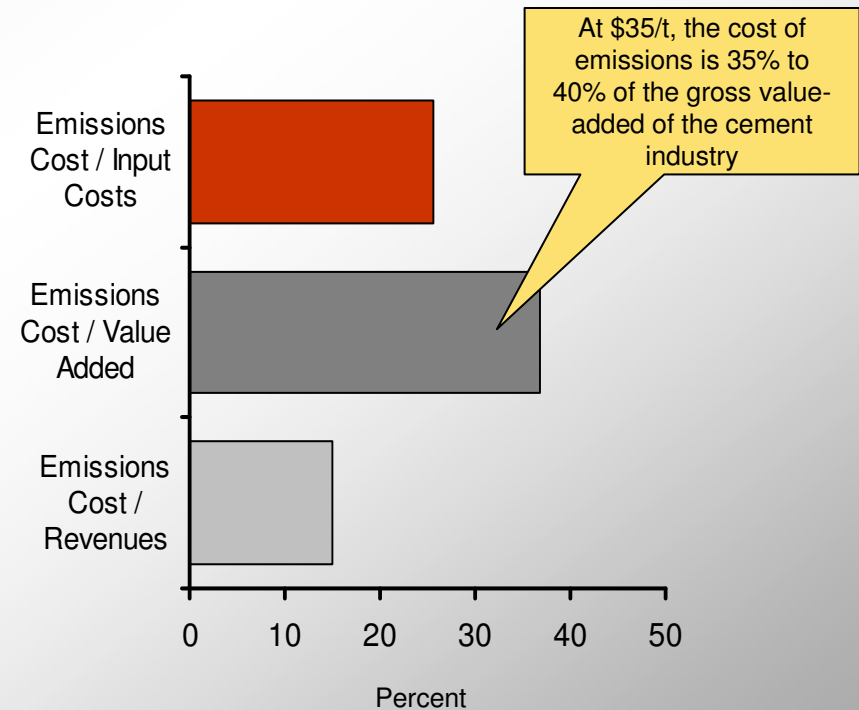
Source: ABS National Accounts and Manufacturing Industry in Australia, Australian Greenhouse Office Emissions Information System, CIF, L.E.K. Analysis

A carbon cost would have a material impact on the cement industry: the ratio of CO<sub>2</sub> emission costs relative to its contribution to GDP is approximately 35%-40%\*\*

**Industry Measures of Value (FY2007)**



**Ratios of CO<sub>2</sub> Emission Costs\* to Different Measures of Value (FY2007)**



Note: \* Assuming a cost of \$35/t CO<sub>2</sub>; includes CO<sub>2</sub> direct emissions and power indirect emissions (no other GHGs)  
 Source: CIF Industry Survey, L.E.K. Analysis



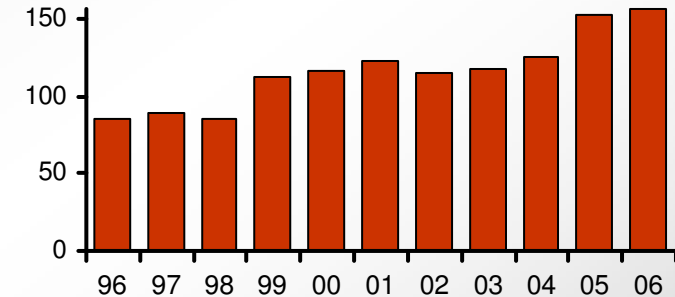
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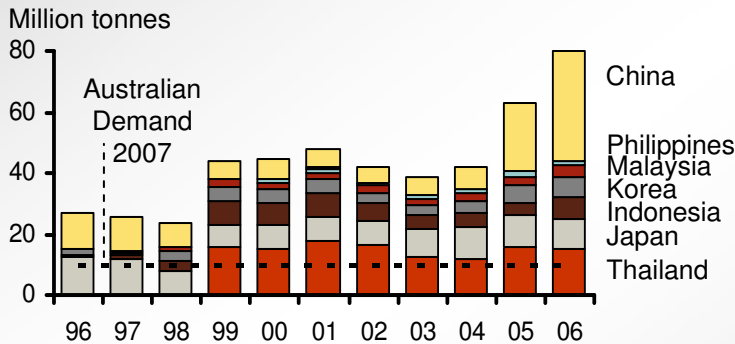
# Large volumes of cement are internationally traded, and imported to Australia

**Global exports of cement were close to 160Mt worldwide in 2006 and increasing. This is equivalent to 16 times the total Australian demand**

**Global Exports of Cement\* (1996 – 2006)**

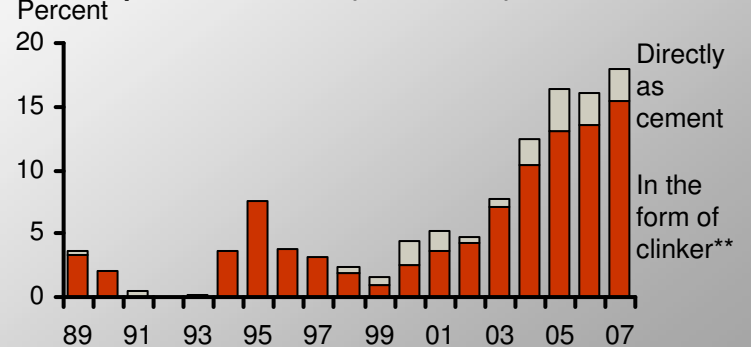


**Volume of Clinker and Cement Exported from the Top 7 Asia Pacific Countries versus Australian Cement Demand (1996-2006)**



**More than 80Mt of cement was exported from Asia-Pacific countries in 2007. This is now 8 times the Australian demand. China is the largest exporter**

**Cement Equivalent Imports as a Percentage of Consumption in Australia (1989 – 2007)**



**Australia imports c. 18% of total consumption. Imports have grown by 10% p.a. over the last 15 years.**

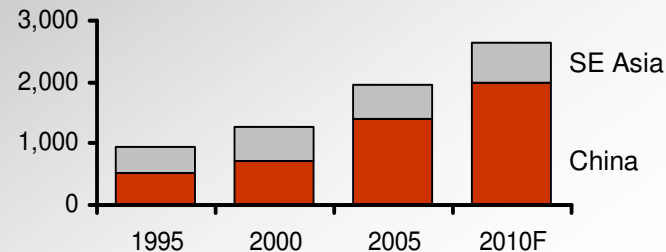
Note: \*Includes clinker; \*\*Clinker volumes are shown as the amount of cement that would be produced from the imported clinker  
Source: UNComtrade, Freedonia Report; Global Cement Report; CIF; ABS; L.E.K. Analysis

There is a significant threat of “carbon leakage” as Australian demand could be easily met by the kiln capacity available in the Asia Pacific region

**Kiln Capacity in Asia Pacific**

(1995 – 2010F)

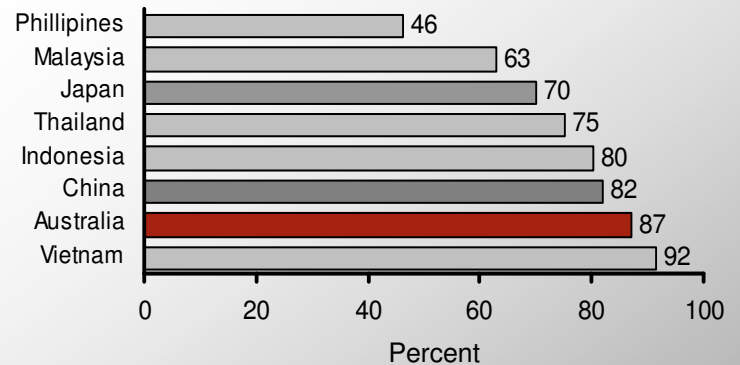
Million Tonnes



**Existing cement kiln capacity in SE-Asia and China is ~2,100Mt . An additional 550Mt of capacity is planned by 2010. Capacity equivalent to Australian kiln capacity is being added every 2 to 3 weeks in Asia Pacific**

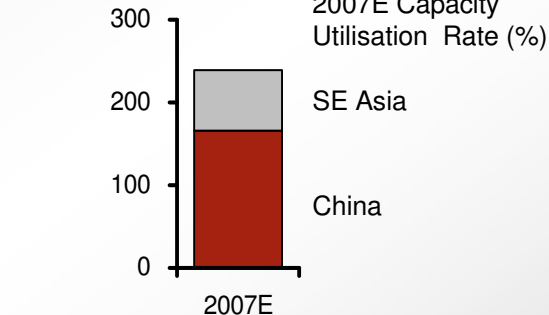
**Estimated Kiln utilisation rates in Asia Pacific vary between 50% and 90%**

**Cement Kiln Utilisation Rates (2005E-2006E)**



**Excess Cement Capacity\* (2007E)**

Millions of tonnes



**Excess capacity\* in South East Asia and China was estimated to be more than 20 times Australian demand in 2007**

Note: \*Assumes the maximum reachable utilisation rate is 95%

Source: USGS; CIF; BNP Exane Paribas; Global Cement Report; Credit Suisse 30/04/2008

It is unlikely that imported clinker or cement would incur any costs for its carbon emissions as, with the exception of Japan, the major Asia Pacific cement producers are not currently considering carbon pricing schemes

### Existing and Proposed Asia-Pacific Carbon Pricing Schemes

	Do cement companies <u>currently</u> face a cost on carbon?	Are cement companies likely to face a cost on carbon in the <u>near-future</u> ?
<b>China</b>	x	x
<b>Japan</b>	x <i>Has a voluntary emissions trading scheme. However, no cement companies participate*</i>	? <i>Compulsory trading schemes and caps on GHG emissions are being looked into but no planned date for introduction has been stated</i>
<b>Indonesia</b>	x	x
<b>Thailand</b>	x	x
<b>Malaysia &amp; Vietnam</b>	x	x

Note: \*Based on breakdown of companies participating in scheme for phase one and two

Source: UNFCC, OECD Emissions Trading: Trends and Prospects, World Bank, Institute of Global Environmental Strategies, Japanese Ministry of the Environment

## There are limited barriers to potential importers in the Australian cement market

### Cement is a commodity product

- Product types and specifications are similar worldwide
  - general purpose cement (Portland Cement) and its flyash and slag blends make up two-thirds of the cementitious products sold in Australia in 2007
- Furthermore, manufacturers engage in product swaps to avoid the transport cost

#### Example of Swaps Between Producers



### Imported product can and does reach into the Australian market

- Cement importers have access to cement users
  - unintegrated premix concrete producers represent 1/3 of concrete production
  - few customers in other sectors (hardware, concrete products, construction companies...) are integrated with cement manufacturers
- A clinker importer would have ready access to customers
  - eg BGC have a market share of 30% in WA
  - Wagners is currently setting up a grinding facility in Brisbane; capital costs are relatively low
- Imports are delivered close to end-using markets as the majority of cement consumers are located near major ports on the coast.
  - 85% of Australia's population lives within 50 km of the coast

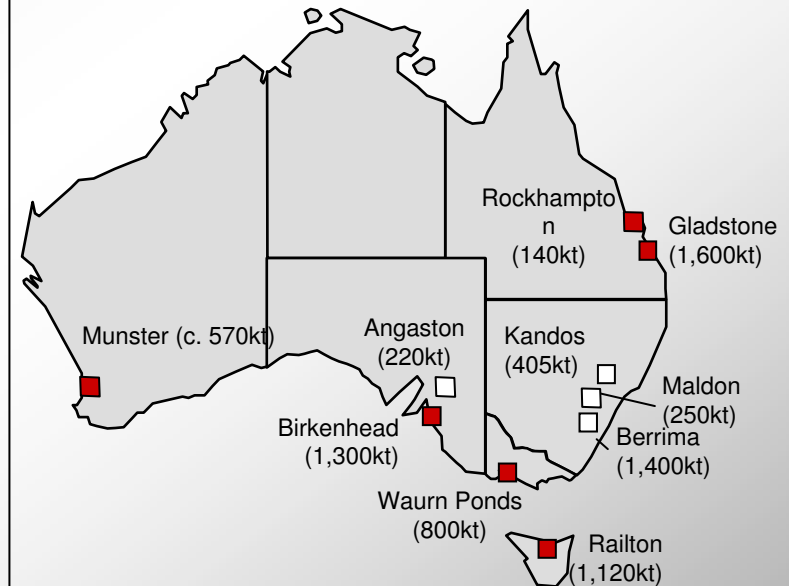
Source: CIF Industry Survey 2007, Industry Interviews; L.E.K. Research, IBIS World

# Significant volumes of foreign clinker could be substituted into Australia at short notice

## There is significant port infrastructure available for cement and clinker imports

- The existing port facilities owned by Australian cement companies could currently import up to 5.9 Mt of bulk cement and clinker
- Over 2-3 years, this capacity could be increased significantly
- Bulwer Island, Townsville, Port Melbourne and Port Kembla (for Sydney) facilities have the capability to install more silos which would significantly increase their throughput capacity

## Existing supply chains could immediately replace 2 / 3 of Australian clinker manufacturing with imported clinker or cement



### Legend

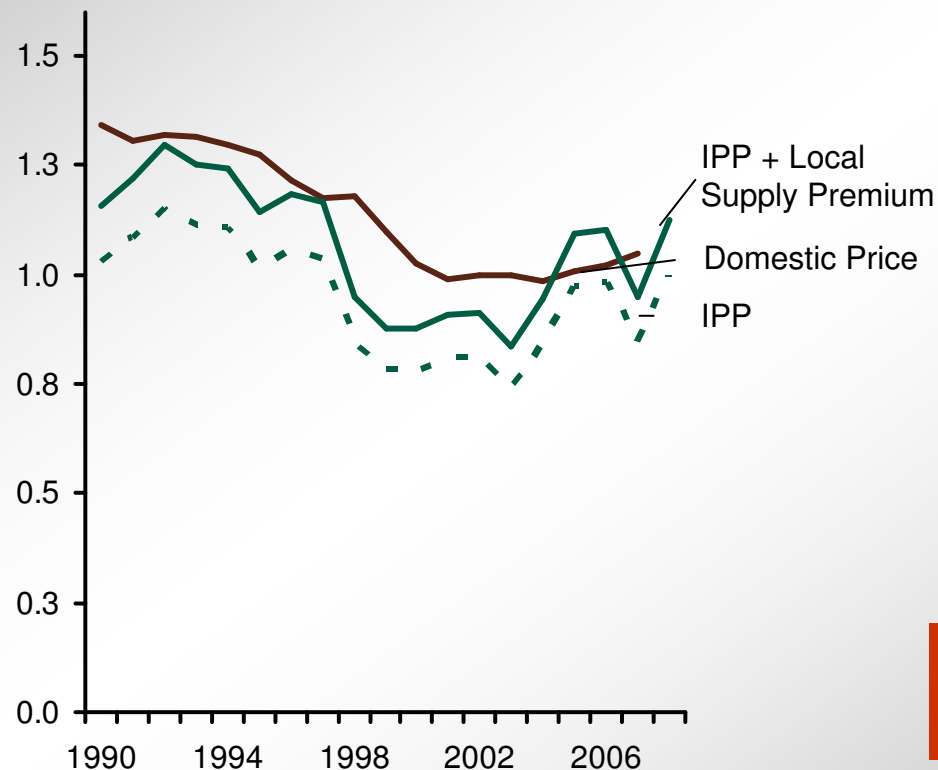
- Integrated facility immediately substitutable by imports
- Integrated facility not immediately substitutable by imports

Note: \* Capacity for clinker (e.g. kiln capacity)  
Source: CIF (Technology Model), Courier Mail, Sunstate Website, ABS

# Over the last 15 years, domestic prices have followed the Import Price Parity

## Import Price Parity and Domestic Cement Prices\* (1990 – 2008e)

Index (AUD 2008e IPP = 1)



- Whilst domestic prices follow IPP over the long term, short term movements in IPP do not translate into domestic price changes for a number of reasons
  - domestic prices are only set approximately every six months based on the expectations of what IPP will do
  - cement is not traded on an exchange. Therefore there is a lack of transparency on prices, and a low liquidity (in comparison to the oil market for instance)
  - some sharp variations in the IPP are not expected to last, notably due to the volatility of freight rates and of AUD / US exchange rate

**Domestic cement producers can not pass the carbon costs onto customers**

Note: \*Real 2007 prices  
Source: ABL, Boral, Cement Australia, L.E.K Analysis



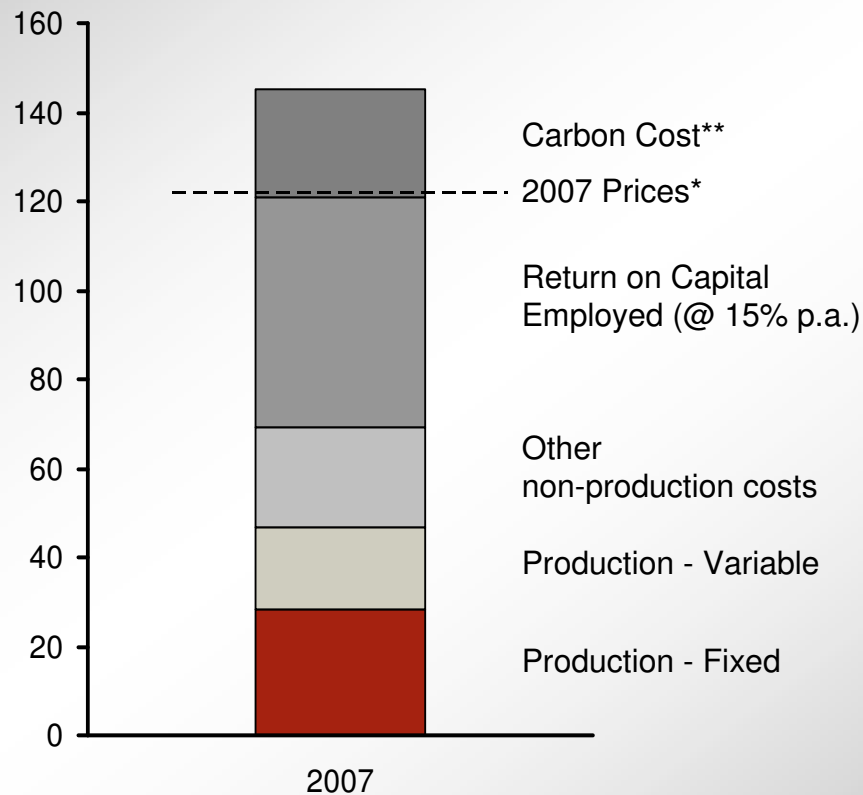
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If the cement industry's trade-exposure and emission intensity is not recognised in an ETS, the cost of carbon would result in new domestic investment failing to give an economic return limiting job creation and technological development

### Economics for a New 1,000 kt Integrated Plant

Index (100= IPP 2007)



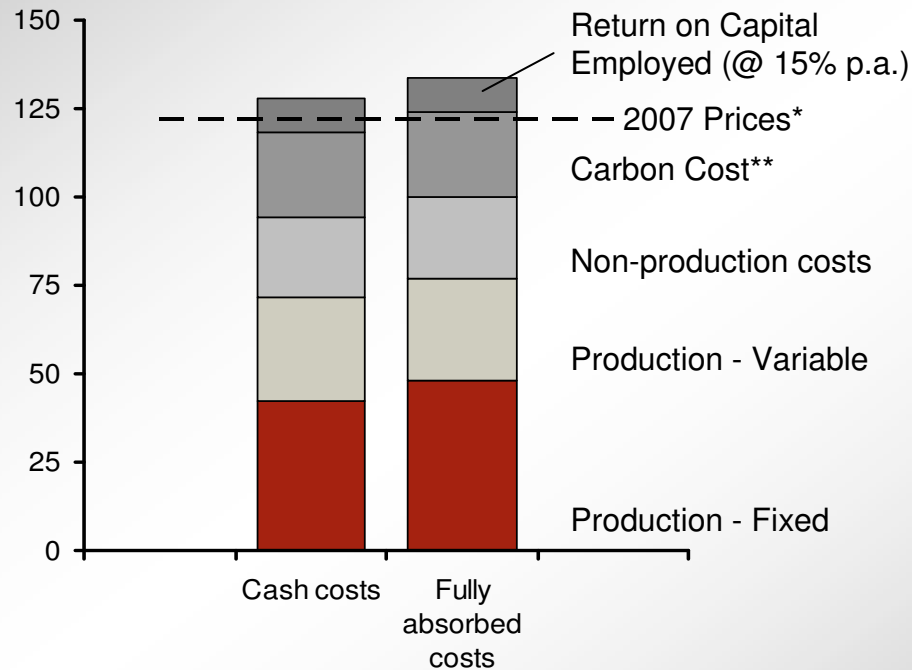
Note: \*Eastern States IPP and Prices; \*\* Carbon cost calculated at \$35/tonne and with plants emitting 0.8 tCO<sub>2</sub>/t cementitious  
Source: CIF, ABL, Boral, Cement Australia, L.E.K Analysis

- Under a carbon price, domestic manufacturers would be more likely to import rather than invest in new capacity
  - an attractive economic return for investors would not be met by the Australian cement industry
  - importing clinker or cement has a lower risk profile than investing in new clinker manufacturing capacity
  - the two new kilns currently being considered would be unlikely to be built in Australia
- A carbon cost would effectively write down the value of cement manufacturers' existing large plants assets to close to zero

Furthermore, some existing plants could close as it would be more economic for domestic manufacturers to switch to imported product

### Economics for a Small Plant<sup>^</sup>

Index (100 = IPP 2007)



- With a carbon cost, producers would barely recover cash costs on some plants
- In the long term, these plants would most likely be closed by domestic manufacturers, who would move their clinker production overseas, rather than invest in their upkeep
- Economics between plants differ and the reaction would be granular. Initial responses might be a stop of upgrade investments and a reduction of maintenance activities to extend periods of positive contribution of individual plants prior to their closure

Note: \* Eastern States prices and IPP; \*\* Carbon cost calculated at \$35/tonne and with plants emitting 0.8 tCO<sub>2</sub>/t cement; ^ Based on data for plants of 300kt to 500kt capacity

Source: CIF, ABL, Boral, Cement Australia, L.E.K Analysis

In some areas, the cement industry is the main industry and largest single source of employment. Closing down the cement operations would have significantly negative effects on the local economy through unemployment and lost GDP

### Railton and Kandos Case Studies: The Cement Industry's Contribution to Local Communities

	Railton (Large plant)	Kandos (Small plant)
Cement plant employment (FTE*)	230	125
Employees as percentage of labour force within 15 minute drive time	9.6%	17.5%
Indirect jobs from plant	1,150	625
Indirect jobs as percentage of labour force within 30 minute drive time	6.5%	58.0%
Average yearly salary for cement workers in Australia	\$82k	

- The cement industry is a significant employer of technically skilled workers in regional areas: Berrima, Maldon, Kandos, Angaston, Railton
- As well as direct employer, these facilities require local services for maintenance, supplies and construction facilities
  - "... Indirect employment generated is about four times the direct employment bringing substantial economic benefits to local communities as well as the broader economy ..."

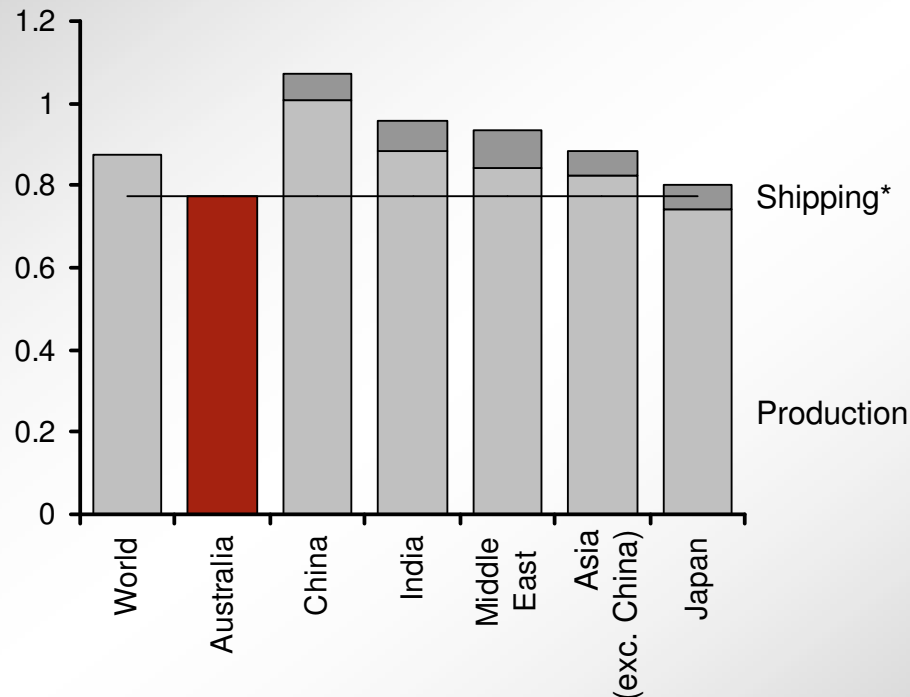
Cement Industry Federation  
Sustainability Report, 2007
- Gross value added per cement employee in Australia was \$395k in 2007 and salary was c. \$82k

Note: \*Full-time equivalent  
Source: CIF, Cement Australia, ABS, L.E.K. Analysis

Should Australian production move offshore, the result would be opposite to the intended objectives of an ETS and a responsible environmental policy

### Imported Cement CO<sub>2</sub> Emissions\*\* (2005)

t CO<sub>2</sub>/t cement



- It is likely that imported cement will result in higher emissions than Australian produced cement
  - Australia is an efficient producer of cement emitting less tonnes than average of CO<sub>2</sub> per tonne of cement
  - importing cement would result in emissions from shipping


Note: \*Shipping emissions will vary depending on whether emissions are considered for both legs or a one-way voyage and which Australian port is the destination; \*\*Emissions relate to cement and exclude other cementitious materials such as fly ash or slag

Source: L. Price & E. Worrell, Global Energy Use, CO<sub>2</sub> Emissions and the Potential for Reduction in the Cement Industry, IEA, Paris 4-5 Sept 2006, CemBureau, Searates.com, Japanese Cement Association



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## In summary, the cement industry is a trade-exposed and emission intensive industry

- The cement industry is emissions intensive
  - The production of cement emits CO<sub>2</sub> as a by-product of the reaction process, through combustion of kiln fuels and through consumption of electricity
  - With emissions amounting to approximately 12 kg CO<sub>2</sub>,eq per dollar of GDP, cement is highly emission intensive relative to other sectors
  - At a carbon price of \$35/t, the cost of CO<sub>2</sub> emissions would amount to the equivalent of 35% - 40% of the gross-value added by the industry
- The cement industry is trade exposed
  - Large volumes of cement are internationally traded with Asia-Pacific trading volumes amounting to eight times Australian demand
  - Australia currently imports a significant amount of the cement it consumes
  - There is excess capacity in Asia-Pacific of approximately 20 times Australian demand
  - There is import infrastructure in Australia to meet the majority of domestic demand immediately and all of Australian demand in the near term as well as access to customers
  - Australian cement prices are close to, and have followed IPP prices



## It is thus critical that issues relating to its competitiveness are adequately addressed by an ETS

- The impact of implementing an ETS is likely to represent an additional cost equivalent to c. 37% of the cement industry's GDP contribution. This incremental cost can not be passed on to customers
- If specific provisions for the cement industry's trade-exposed, emission-intensive nature are not included in the ETS scheme then:
  - Construction of new kiln capacity in Australia is unlikely to provide sufficient returns to justify the investment
  - The viability of existing manufacturing facilities will become questionable
  - Regional communities which are dependant on the cement industry for employment could be adversely affected
  - And, global carbon emissions would likely be increased due to cement production being shifted offshore to kilns that are likely to have higher emissions, and sea freight being required to transport the cement to Australia
- In order for the Australian ETS to meet its stated aims of reducing carbon emissions, the design has to address the issue of competitiveness of the Australian cement kilns