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Research Director Environment and resources Committee Parliament House BRISBANE QLD 4000

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# Environment and Resources Committee Inquiry into Energy Efficiency Improvements

### 1 Introduction

Cement Australia is pleased to provide this submission to the Environment and Resources Committee in relation to their current inquiry into energy efficiency improvements.

By way of background, Cement Australia is the leading manufacturer of cementitious products in Australia. The company supplies 47% of the Australian market. Its international shareholders provide the business with world-class global support on related technical, environmental and sustainability issues, including benchmarking of key performance indicators such as energy efficiency.

Through early action, Cement Australia has continued to realise energy efficiency improvements, in part resulting in the maintenance of total carbon dioxide emissions at less than 1990 levels while achieving sales increases of over 49%.

This improvement in greenhouse emissions intensity has been delivered by significant investment in new technology processes, cementitious material substitution advances and market demand education. Energy efficiency improvements are one of a number of activities that have achieved these savings in carbon dioxide emissions. Currently, 88% of Cement Australia's clinker production comes from best-practice kiln technology.

It is critically important to recognise that the drivers for this substantial abatement achievement are our emissions and energy intensity. To effectively reduce our costs to remain competitive in an import-exposed market, Cement Australia has, over a number of years, invested in a range of improvement measures that have also resulted in us being both energy-efficient and greenhouse gas emissions-efficient in our manufacturing processes.

Cement is also a strategically important commodity – the security of supply of cement is critical to social and economic infrastructure, a major commitment of the government in coming decades.



While we understand the imperative for government's to promote energy efficiency, this must be done in a manner that recognises the existing variability in drivers and behaviours, as well as improvements achieved by industry to date. This recognition is critical to ensure that additional costs are not imposed on business unnecessarily.

# 2 Cement Australia and Energy Efficiency Improvements

#### 2.1 Relevant aspects of cement manufacture

Making cement is an energy and resource intensive process, requiring a precise combination of lime, silica, alumina, and iron that are fused together during the mixing and cooking process in the kiln. The raw materials are initially heated to 1000 °C, calcining the calcium carbonate in limestone to calcium oxide and releasing carbon dioxide, a process usually referred to as calcination and contributing to approximately 50% of our total carbon dioxide emissions (refer Figure 1). This calcination process is unique to only a few manufacturing processes and highlights the importance of focussing on emissions rather than energy when discussing climate change policy.

Within the rotary kiln, the materials are mixed and further heated to about 1,450 °c causing a high-temperature sintering reaction to occur, forming a calcium silicate matrix called 'clinker'. All of the materials fed into the kiln become part of the clinker, forming an intrinsic matrix which, once cooled, is then ground with small amounts of gypsum and other minerals to produce the grey powder commonly recognised as cement.

Manufacture of the intermediate product – clinker, is responsible for about 90% of carbon dioxide emissions. Clinker is also a much easier material to transport than cement with most global trade occurring in this form.

Cement manufacture is capital intensive with economically efficient increases in capacity being substantial in comparison with Australia's market size. For optimum energy and economic efficiency, kilns must operate at full production with typically only a major maintenance shutdown of perhaps four weeks duration annually.

Cement manufacture is predominantly domestic, requiring access to mineral resources most commonly found in limestone, energy supplies and markets. Demand shortfalls are made up from imports due to the aforementioned issues relating to capital intensiveness.

#### 2.2 The strategic importance of cement

Cement is a vital commodity for the Australian economy, not only as a critical component of any infrastructure development program, but increasingly in resource recovery and reuse innovation – in both cases providing significant economic and social benefits. Cement's relatively low value and independence from unique geological raw materials, as well as its critical importance for the built environment mean that only very few countries do not maintain a viable and strategically important domestic cement manufacturing industry.



#### Building materials are the backbone of socio-economic development

Over the last five years, the world economy has grown at a rate of 4–5% and the world population is projected to increase from 6.7 billion people in 2007 to more than 8 billion by 2030, with most of the growth taking place in the developing world. Continued economic growth, driven by entrepreneurship, is indispensable in raising living standards across all strata of society, not least in securing high rates of employment and creating opportunities for millions of entrants in the job market.

These rates of growth require the construction of urban and rural infrastructure and housing. The EU estimates that buildings account for up to 40% of primary energy consumption. Adopting a more sustainable approach to construction will be key to securing long-term environmental, economic and social viability. Given its long life cycle, and owing to its natural thermal inertia, concrete is one of the most energy-efficient and eco-friendly building materials. - Holcim Corporate Sustainable Development Report 2007

#### 2.3 Energy and carbon management at Cement Australia

Cement Australia's strong links with global cement players provides us with real benefits including:

- global benchmarking of our operations;
- · access to the latest in cement processing technology; and
- links to the World Business Council for Sustainable Development ("WBCSD") through our shareholders Cemex, Holcim and Heidelberg all founding members of the Cement Sustainability Initiative that provides an international focus on greenhouse issues, emissions reporting, and resource sustainability.

Cement Australia has an annual turnover of \$950 million dollars, through 4.2 million tonnes of cement sales, as well as sales of lime products, fly ash and slag, on an asset base of \$1 billion dollars. We employ a fleet of transport assets and some 1,500 employees – largely in regional Australia.

Cement Australia has the commitment and capacity to drive worthwhile sustainable outcomes in cement manufacture and sustainable materials, and has been actively involved over the last decade in responding to the climate change challenge, with the following milestones:

- 1997: Cement Australia, through our peak industry body, the Cement Industry Federation (CIF), became an early signatory to the Greenhouse Challenge Plus program
- 1999: along with other major multi-national cement manufacturers, Holcim, Cemex and Heidelberg Cement (all shareholders of Cement Australia) embark on the WBCSD Cement Sustainability Initiative which identifies climate change as a key sustainability issue for the industry
- 2004: Cement Australia participates in an industry-wide 'Technology Pathway' exercise to identify the likely course of technology investment and determine the resulting efficiency and carbon dioxide savings



- 2006: Cement Australia collaborates in drafting the Cement Industry Action Agenda, which outlines government and industry recommendations to progress technology adoption and carbon dioxide emissions abatement.
- 2006: Ongoing and substantive involvement in the Cement Sector Task Force of the Asia-Pacific Partnership for Clean Development and Climate

As a result of this early and concerted action, Cement Australia has maintained total carbon dioxide emissions at less than 1990 levels while achieving cementitious sales increases of over 37%.

**Figure 1:** the total of Cement Australia's greenhouse gas emissions since 1990 against our total sales of cement and cementitious product. We report our emissions by their source, which includes emissions: from the limestone that we heat in our kilns (which releases carbon dioxide); from the coal, diesel and other fuels that we use; and from the electricity that we purchase.



While a significant focus of our efforts has been carbon emissions reduction, much of this has arisen from energy efficiency improvements. Figure 2 highlights these outcomes for two important cement industry efficiency indicators being our thermal efficiency (or the thermal energy required to produce one tonne of clinker) and our electrical efficiency (or the electrical energy required to produce one tonne of cement).



**Figure 2:** shows improvements in two key cement industry efficiency indicators compared with the same indicators sourced from the Cement Sustainability Initiative's "Getting the Numbers Right" project which includes data from over 840 cement installations. (http://www.wbcsdcement.org/index.php?option=com\_content&task=view&id=57&Itemid=118)



### 3 Specific Issues raised by the Terms of Reference

# 3.1 The economic and environmental costs and benefits arising from energy efficiency improvements

The benefits of energy efficiency improvements are clear, with the obvious reduction in energy costs and, commonly, lower carbon dioxide emissions. The associated costs however, may be less clear with those most commonly identified focussing on capital and operating costs. We would refer the Inquiry to the comments made on this matter within the submission to the Inquiry by the Chamber of Commerce and Industry Queensland.

#### 3.2 Potential barriers and impediments to improved energy efficiency

Further to the above aspects, it is important to consider that other factors are likely to influence a business decision whether or not to proceed with a particular energy efficiency improvement. The capacity of a business to proceed with any given initiative is a factor given scant regard within existing energy efficiency regulations. This capacity may be influenced by cash-flow considerations, human resources capacity, and/or the availability of other resources that may be required to proceed. All of these aspects require the due



consideration of the executive of a company in determining the merit order and ability to proceed with one or a number of energy efficiency projects.

Within some industries, or perhaps some businesses that may have acted early and previously implemented key energy efficiency projects, there may well be technological limitations to achieving energy efficiency improvements.

#### 3.3 Potential policy options for energy efficiency improvements

Cement Australia considers that any discussion of policy options needs to recognise that legislation already exists in relation to energy efficiency, at the commonwealth level in the form of the *Energy Efficiency Opportunities Act 2006*. Victoria has also regulated in this area with legislation mandating the implementation of energy efficiency projects if certain criteria are met.

Cement Australia, as a national company, is very concerned where regulation occurs that effectively results in legislation at one level of government competing with legislation at another level of government. The additional resources that a company is then required to direct to meeting multiple compliance requirements is counterproductive in relation to achieving the (usually aligned) objectives of the competing legislation.

Also, and for the reasons outlined in the preceding section, we do not agree that legislation can or should usurp the prerogative of company decision makers on the basis of criteria that are too simplistic and fail to take into consideration the numerous complexities involved in running a business.

We do believe that policy options should focus on promoting and enabling activity in this area. Policy that assists business in identifying inefficient practices and that assist in developing the business case for improvement will be welcomed.

# 3.4 The role of the CPRS and other Commonwealth Government initiatives in encouraging energy efficiency

The CPRS, in applying a cost on carbon, and therefore on many energy supplies, will provide a substantial incentive for business to adopt more energy efficient practices. We would contend that those enterprise best able to respond to this price signal will be those businesses that already have a focus on energy – typically the medium to large businesses with a resource capacity better able to address the significant administrative and compliance requirements of the scheme. We would contend that a lack of capacity would restrict smaller businesses in responding effectively.

The *Energy Efficiency Opportunities Act 2006*, while administratively cumbersome, does target identification and exposure of energy efficiency projects and should be effective in driving improved business practice.

Ideally, any policy measure adopted by the Queensland Government should work to enhance these existing policy approaches rather than duplicate or compete with such measures. The latter approach will simply add unnecessary administrative burden to industry, while achieving no further improvement in energy efficiency.



#### 4 Cement Australia's Preferred Position

Cement Australia not only recognises the threat that climate change poses to our natural environment, but has been working diligently on this challenge, through significant investment over the last decade; achieving reductions in the carbon intensity of our product of 37% per tonne cementitious product since 1990.

We maintain committed to continuously improving our performance but stress that, to ensure the competitiveness of trade-exposed industries such as ours; government regulation needs to be well targeted, effective, but most importantly efficient in its application.

We trust that the Inquiry will give our submission due regard. Questions can be directed to the undersigned.

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