



16 December 2011

Mr. Gary Banks
Chairman
Productivity Commission
LB2 Collins Street East
MELBOURNE VIC 8003

Dear Mr. Banks

BARRIERS TO EFFECTIVE CLIMATE CHANGE ADAPTATION

Cement Concrete & Aggregates Australia thanks the Productivity Commission for the opportunity to make a submission to its inquiry into the Barriers to Effective Climate Change Adaptation.

CCAA is the peak industry body for the heavy construction materials industry in Australia including the cement, pre-mixed concrete and extractive industries. For your information, a list of CCAA's members is attached.

CCAA members operate rock quarries, sand and gravel extraction sites, cement production and distribution facilities and concrete batching plants throughout Australia.

CCAA's members service local, regional and national building, construction and infrastructure markets. The reliable and cost-effective supply to these markets is fundamental to sustainable growth and it is CCAA's aim to promote policies and planning frameworks that recognise the importance of these materials to Australia's sustainable future.

CLIMATE CHANGE AND CONCRETE

Concrete is the predominant construction material in Australia. Concrete is extensively used throughout the Australian community, in our roads, bridges, footpaths, schools, hospitals, workplaces and homes.

Concrete infrastructure may be designed to last a very long time and can have a life expectancy of 200 plus years. This time scale needs to be factored into investment and maintenance decisions of those who are developing, designing and building Australia's infrastructure.

Concrete is a resilient material that can withstand climate change. It is expected that atmospheric carbon and temperatures will increase over time and this will change humidity levels. The CSIRO¹ has conducted research that indicates that there could be a number of impacts on concrete due to climate change. These are summarised below:

- The increase in atmospheric carbon could accelerate the rate and depth of carbonation in concrete. Carbonation is a chemical reaction that decays the concrete and exposes the steel reinforcement to corrosion, which causes structural damage and weakness.
- Elevated temperatures may also accelerate carbonation and also increase the rate at which chloride can penetrate the concrete. Chloride penetration into concrete exacerbates corrosion and the resulting structural damage.
- Changing humidity could also impact on concrete. Lower humidity can prevent chloride penetration and can stop carbonation. Higher humidity accelerates both these processes.

These impacts are well understood by the industry and can be mitigated and even eliminated through the application of appropriate design principles and standards. It will be vital that Australia's infrastructure is designed and built to withstand the impacts of climate change and concrete is the most durable construction material.

There are a number of strategies available to enhance the resilience of concrete to climate change. For existing structures and infrastructure cover designs, surface coating barriers and cathodic protection can be applied. For new infrastructure, the design principles and standards will need to be amended to ensure that climate change is taken into consideration.

ADVERSE WEATHER EVENTS AND HEAVY CONSTRUCTION MATERIALS

It is anticipated that climate change will increase the frequency and intensity of adverse weather events. This includes stronger cyclones, longer and more intense droughts, more extensive flood phenomena and more frequent bushfires. These events will impact on the built environment, of which concrete is an integral part.

For example, Queensland was recently affected by a strong cyclone and a number of flood events that have had a major impact on its infrastructure, such as roads and bridges. The Queensland Reconstruction Authority has estimated that about 9,500 km of State and local roads and 89 bridges have been damaged by these adverse weather events. It is estimated that to reconstruct the State and local road network it will cost some \$6 billion. Approximately 20-25% of this amount will be spent on quarried materials, such as road base, aggregates and gravel.

This example also highlights the need to construct durable infrastructure. Concrete roads and bridges designed to withstand adverse weather events will minimise damage and reduce the cost associated with rebuilding after such an event.

¹ CSIRO, 2009, *Analysis of Climate Change Impacts on the Deterioration of Concrete Infrastructure*, available at: <http://www.csiro.au/Portals/Publications/Research--Reports/concrete-durability-report-synthesis.aspx>

The reconstruction efforts also impact on the demand for skilled and unskilled labour, which exacerbates the skill shortage currently being experienced in Australia. It also increases the demand for specialist equipment required for reconstruction work, such as spreaders, mixers and road profilers. It can also be expected to impact on the demand for heavy vehicles used to transport materials.

Reconstruction from adverse weather events will increase the demand for heavy construction materials, including aggregates, cement and concrete. This is on top of the natural increase in demand for these materials as Australia's population increases. For example, if the Australian population increases to 35 million by 2050, as is predicted and current consumption rates are maintained the Australian industry will need to produce some 210 million tonnes per year, which is a 60% increase in production.

Current State and local government planning policies are not taking into account the natural increase in demand for heavy construction materials and are not accounting for the spikes in demand that will result from adverse weather events.

If Australia's planning and environmental laws prevent the access to vital strategic resources it will have an adverse impact on the nation's capacity to reconstruct after adverse weather events. As such CCAA recommends that Australia's planning regulations need to identify and protect key resource areas from incompatible land use.

In this regard, CCAA has analysed the resource protection mechanisms utilised in the different State jurisdictions and considers that the Queensland *Key Resource Area* system provides the best model within Australia.

The features of the model that are particularly effective are:

- Identifies an extractive materials area, a processing site and an associated transport route.
- Provides a buffer around the identified areas to prevent encroachment of incompatible land usage.

The identified Key Resource Area then provides a mapped framework to the Australian, State and local government authorities to be utilised in the planning process, when making development assessments and for the provision of environmental approvals.

In order to meet future demand key strategic resources need to be identified and then protected from incompatible land use.

RECOMMENDATIONS

Well designed concrete infrastructure is resilient to the impacts of climate change. The standards and design principles used within Australia will need to recognise the possible impacts of climate change to ensure that our infrastructure is resilient and durable.

The expected increase in adverse weather events will cause spikes in demand for concrete and its constituent parts, aggregates and cement. To meet future demands it is important that State and local governments identify key strategic resources and protect these from incompatible land use.

Thank you for the opportunity to participate in the consultation and please do not hesitate to contact

Yours sincerely

KEN SLATTERY
Chief Executive Officer
CEMENT CONCRETE & AGGREGATES AUSTRALIA

CEMENT CONCRETE & AGGREGATES AUSTRALIA

MEMBERSHIP

AS AT 31 AUGUST 2011

FOUNDATION MEMBERS



Adelaide Brighton Ltd



Boral Construction Materials



Boral Cement Limited



Cement Australia Pty Ltd



Hanson Australia Pty Ltd



Holcim (Australia) Pty Ltd

ORDINARY MEMBERS

<p>Aidan J Graham Pty Ltd Alsafe Pre-Mix Concrete Pty Ltd Axedale Sands & Gravel Barossa Quarries Pty Ltd Barro Group Benedict Sand & Gravel Besmaw Pty Ltd BIS Industries Limited T/A BIS Industrial Logistics Bowen Tug & Barge Pty Ltd Brisbane City Council T/A Bracalba Quarries Broadway & Frame Premix Concrete Pty Ltd Byrne Bros Pty Ltd Clare Quarry Pty Ltd Clay & Mineral Sales Pty Ltd Cleary Bros (Bombo) Pty Ltd Concrete 4 Goulburn Concite Pty Ltd CSR PGH Bricks Davalan Concrete Pty Ltd D K Quarries Pty Ltd Elvin Group Pty Ltd Entire Concrete Pty Ltd</p>	<p>Eziway Concrete (T/as T & M Lynch Pty Ltd) Fulton Hogan Construction Pty Ltd Gaspersic Contracting Pty Ltd Glenella Quarry Pty Ltd Handycrete Concrete Pty Ltd HBMI Pty Ltd H B Resources Pty Ltd High Quality Concrete Hillview Quarries Pty Ltd Hymix Australia Pty Ltd Lime Industries Pty Ltd Independent Cement & Lime Pty Ltd Lloyd's North Pty Ltd Mackay Sand and Gravel Sales Mantina Quarries Metromix Concrete Pty Ltd MSD Construction Pty Ltd MSP Group Pty Ltd Mount Marrow Blue Metal Quarries Pty Ltd Neilsen's Quality Gravels Pty Ltd Nucrush Pty Ltd Ostwald Quarries Pty Ltd Premix Concrete Pty Ltd</p>	<p>Parkes Ready Mixed Concrete Pty Ltd Penrice Soda Products Permian Resources Pty Ltd Premier Resources T/A Hy-Tec Industries Pty Ltd Ransberg Pty Ltd T/a WA Premix and WA Bluemetal RNB Trading Pty Ltd Riverside Industrial Sands Pty Ltd Rocla Pty Ltd Santos Ready Mixed Concrete Pty Ltd Sloans Sands Pty Ltd Southern Pacific Sands Southern Quarries Pty Ltd Stornoway Quarrying Stornoway Hewitt Pty Ltd Sunstate Cement Ltd The Concrete Yard Pty Ltd T/as Queanbeyan Pre-Mix Concrete Treloar Transport Urban Resources Pty Ltd Wagner Investments Pty Ltd Western Suburbs Concrete Zanows Sand and Gravel</p>
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ASSOCIATE MEMBERS

<p>Agi-Kleen Pty Ltd Astec Australia Pty Ltd BASF Construction Chemicals Australia Pty Ltd Bulkquip Pty Ltd Concrete Colour Systems</p>	<p>Concrete Waterproofing Manufacturing Pty Ltd T/a Xypex Australia Fieldwicks Crushing & Screening Grace Construction Products Sika Australia Pty Ltd</p>	<p>WAM Australia Westrac</p>
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