# Submission Form

# Productivity Commission – Low Emission Economy

**To**: New Zealand Productivity Commission
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**Submitter Details:**

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## 1.0 Background Information

Golden Bay Cement's Portland Manufacturing Plant is the largest and only fully integrated cement manufacturing plant remaining in New Zealand. The Plant, located on the southern shore of the Whangarei Harbour in Northland, is a contemporary world class cement production facility, with a very long successful innovative history. The Portland Plant recently celebrated a century of cement production at the present site.

Golden Bay Cement works 'smart and hard' to supply and retain our valued NZ customers from Northland through to Southland plus a range of export customers in the Pacific Islands. All of our customers have a choice of supply/supplier product which could also be sourced from competitors in Asia. For us to remain competitive in such an environment we are forced to manage our input costs; and the foremost of these is our energy spend.

The cement manufacturing plant has and continues to be a centre of engineering innovation and manufacturing excellence coupled with the significant economic, employment and business contribution it brings to the wider Whangarei district. It has also established and continues to cultivate a zone of supporting industry growth in a region that needs encouragement for further growth.

The total economic impact of Golden Bay Cement and sister company Winstone Aggregates (GBC Winstone) on the Whangarei district economy was an estimated $73.4 million GDP (in 2015) and the employment of approximately 550 FTEs. This represents 1.9 percent of the Whangarei District GDP and 1.8 percent of its FTE employment. The total economic impact of the activities of GBC Winstone on the New Zealand economy was $384.6 million GDP (in 2015), generating the employment of 3,920 FTEs nationally.

Golden Bay Cement has been a consistent and constructive participant in initiatives to improve energy efficiency and ghg emissions reduction. In the 1990's GBC partnered with CCANZ, EECA, Ecologic Foundation and Milburn New Zealand Ltd to form the Cement Industry Energy Management Association (CIEMA) with the Mission Statement; "To continually improve efficiencies in the cement industry by 'best practice' and demonstrate commitment to New Zealand's international climate change obligations'. The NZ cement industry via the CIEMA grouping was one of 24 Voluntary Agreements with Government committed to and achieved a significant emissions efficiency improvement from base year 1990 (BYE) in target year 2000. GBC continued to engage with Government (MfE -- Climate Change Office *et al*) during the early 2000's first with NGA options and subsequently as an active participant in the NZ ETS (cement activity).

Golden Bay Cement considers the Draft Report to be an important and constructive body of work that will stimulate cross sector engagement which is absolutely necessary to deliver meaningful emissions reductions in the coming decades. However, it is important that the recommendations remain practical, pragmatic and are achievable with known and commercially viable technologies and processes with an understanding of raw materials availability, supply chain dynamics and customer/market demands. Essentially, they need to be realistic and translatable within our industry to truly impact change that will be a benefit to wider New Zealand. Each recommendation must translate to a sustainable solution that our industry can economically support into the future.

Golden Bay Cement's submission on the **New Zealand Productivity Commission: 'Low – emissions economy' Draft Report** is as follows:

I. The Draft Report contains commentary from a broad and far reaching 'inquiry' and covers the full suite of the economy sectors (Chapters 10 through 15). The GBC Submission will primarily focus on Chapter 13; Heat and Industrial Processes.

**II. Chapter 13. Heat and industrial processes.**

a) **13.1.** Industrial sources of emissions. Cement (OPC) manufacture involves the pyro processing of the natural resource, limestone, to OPC Clinker with the unavoidable emission of $CO_2$. In utilising international industry best practice, GBC has reduced specific $CO_2$ emissions content of supplied cement. However, the options for further significant $CO_2$ reduction resides with ongoing work in the marketplace by influencing customer uptake and specification within the built environment. Thus, GBC believes there should be coordination of Building Code – Product Standards revision by industry participants focused on 2030 and 2050 emissions goals.

b) **13.2.** Process heat. The manufacturing process for cement is energy intensive and the GBC operation is a substantial consumer of electricity and user of coal for process heat.

c) **13.3.** Opportunities to reduce emissions from process heat. Alternate fuel options remain the area of significant opportunity. GBC has invested heavily in alternate fuel programmes/options during the 2000's. The prime example of this focus is the success of the wood-waste biomass fuel for coal substitution (coal is the prime thermal fuel) in the pyro processing plant. The initial project in 2004 targeted a 10% replacement level, however fine tuning of the operation lifted the substitution rate to nearer 30%. Ongoing research into future alternate fuel options coupled with new investment in imminent fuel switching opportunity will contribute to process heat derived emissions reduction. An example of this is a current project to introduce end of life tyre derived fuel into the pyro processing plant which has governmental support via the Ministry for the Environment. Fuel switching from coal to natural gas would deliver a major emissions reduction however supply certainty into the medium term future must be in place to allow project investigation and possible investment in plant change.

d) **13.6.** Industrial Processes. Lime and Cement. As previously referenced, GBC has consistently worked with our customer base and undertaken research and investment in technology and product development that has reduced $CO_2$ emissions. Changing Product Standards and Building Codes is an industry and community inclusive process that is ongoing and can benefit from an alignment of agreed goals. Cement, as currently offered in the NZ market, remains a critical component for the built environment and any revision of standards must be undertaken in a considered manner. The Table 13.3 'Beyond Zero Emissions carbon reduction strategies for cement', references a number of known options that GBC has considered over the decades. We consider that the BZE 2017 findings are Australian focused and not a good fit for our New Zealand setting. Geopolymer 'cement' binder testing undertaken by GBC in the early 2000's concluded that the required raw materials had potential supply challenges and the application of the resultant geopolymer binder finished product had a very limited market uptake potential. High-blend cements are possible but again the option is filler/extender raw material dependant and has current market and standards limitations. Blended cements will remain in the industry emissions reduction tool-kit. Mineral carbonation process options were considered in conjunction with a US research party and found to be a miss-match with the NZ concrete product range ratios; concrete 'masonry' products is a relatively small component of the NZ market. Carbon-negative Magnesium based cements remain a research topic and $CO_2$ is still released when $MgCO_3$ is decarbonised to MgO.

e) **13.7.** Carbon capture and storage. CCS is a longer term option that should be investigated. The present impediment is the current energy policy uncertainty that NZ manufacturing businesses contend with. Cement manufacturing plants are capital intensive and operate core plant on a 20 year reinvestment/upgrade cycle to maintain competitive efficiency. A CCS approach could form part of any major reinvestment project if policy risk assessment suggested a long term future for manufacture in NZ.

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## III. Chapter 13. Findings and Recommendations.

a) **F13.1.** High-temperature heat users have no viable short-term economic abatement opportunities. **Response/comment:** Cement manufacturing at GBC Portland has more than a decade of experience of successful alternate fuel substitution abatement and will continue to explore high temperature fuel substitution opportunities.

b) **F13.2.** Operational efficiencies offer scope to reduce process heat-related emissions, although large potential gains are not likely. **Response/comment:** Agree with this finding; 'business as usual' activities will not deliver step change reduction gains.

c) **F13.3.** There are more opportunities for switching to lower-emissions fuel source for low and intermediate process heat needs firms in the North Island, reflecting better access to gas and geothermal energy. **Response/comment:** Agreed. However, care needs to be taken that limited volumes of wood waste biomass suitable for high temperature processing is best targeted. GBC has also witnessed the free market effects of demand and supply imbalances when high level fuel switching occurs; this case has occurred recently with the biomass fuel market as more end users have switched and as a result biomass has become scarcer and more costly.

*d)* **F13.4.** Significant technological and logistical improvements will be needed before biomass becomes a cost-competitive and emissions-neutral alternative to fossil fuels for large industrial heat plant. **Response/comment:** As referred above in F13.1 and F13.3, the GBC cement activity has successful experience for partial substitution, however supply constraints do limit further uptake.

*e)* **F13.5.** Rising emissions prices will be central to driving emissions-reducing investments in industrial heat processes. **Response/comment:** In the open market of NZ, an increased cost of emissions on domestic manufacture must be undertaken with the same regard and recognition applied to imported competing products.

*f)* **R13.1.** The statutory functions of the Energy Efficiency and Conservation Authority (EECA) should be changed to make lowering GHG emissions its primary mandate. **Response/comment:** Support idea; energy efficiency improvements result in emissions reduction so EECA function already connected to ghg emissions reduction.

*g)* **R13.3.** New legislation should be prepared to regulate carbon capture and storage activities (CCS). **Response/comment:** Work will need to be undertaken to ensure regulation/process/ETS methodology align.

*h)* **R13.4.** Once new CCS legislation is in place, the New Zealand Emissions Trading Scheme should be amended to make CCS a recognised removal activity, no matter the source of emissions being captured and stored. **Response/comment:** Yes, if pre-legislation process gains support from activities impacted.

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IV. The uptake of new technologies and decisions for business to make energy efficiency investments requires an environment of economic and policy certainty.

In summation, Golden Bay Cement considers the Draft Report to be an important and constructive body of work that will stimulate cross sector engagement that is required to deliver any meaningful emissions reduction in the coming decades.

The GBC approach to the business of manufacture and supply of cement for our customers has been and remains consistent with world best practice principles of efficiency and emissions reduction. Cross reference of our submission content with International Energy Agency (IEA)/Cement Sustainability Initiative (CSI – WBCSD) Technology Roadmap (Low-Carbon Transition in the Cement Industry) shows that the primary emissions mitigation levers remain: Improving energy efficiency; Fuel switching; Reducing clinker content; keeping abreast of emerging and innovative technologies to suit the NZ situation.

Working towards the required low-emissions economy needs a coordinated industry/business approach on the 'built environment'. Due consideration needs to be given to a whole life-cycle view of the construction material supply/value chain which includes cement for concrete.

Golden Bay Cement would welcome discussion with the Productivity Commission representatives to expand on and clarify any of the points outlined in this submission. It is our intention to continue to engage with relevant Ministry Officials, and other stakeholders, on issues related to low-emissions and ETS reviews to ensure fair and durable policy instruments and emissions pricing methods are implemented

Regards,

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