

*Submission to*

**New Zealand  
Productivity Commission**

*on*

**Improving Economic Resilience:  
Enhancing Economic Resilience of  
Industries and Communities to  
Persistent Supply Chain Disruptions**

17 April 2023



17 April 2023

New Zealand Productivity Commission  
Level 15 Fujitsu Tower  
141 The Terrace  
WELLINGTON 6011

By email: [info@productivity.govt.nz](mailto:info@productivity.govt.nz)

Dear Madam/Sir

**IMPROVING ECONOMIC RESILIENCE:  
ENHANCING ECONOMIC RESILIENCE OF INDUSTRIES AND COMMUNITIES TO  
PERSISTENT SUPPLY CHAIN DISRUPTIONS**

**INTRODUCTION**

Concrete New Zealand (NZ) represents more than 500 corporates and individuals who contribute significantly to the construction sector. Concrete NZ advocates on behalf of the cement and concrete industry.

Our industry spans cement manufacturers, and producers of ready-mixed concrete, masonry products and precast elements, including wall panels, pipes and culverts.

The broader New Zealand cement and concrete industry employs 10,382 FTEs, of whom approximately 24 percent are Māori, and 12 percent are female (Infometrics, 2022). We have around 600 apprentices in various trades. The part of the industry Concrete NZ represents has an asset base of \$2 billion, including 183 certified concrete plants around the country, and 40 precast concrete plants. Our industry's contribution to GDP is \$1.1 billion. Annual ready mixed concrete production has varied in recent years between 4 and 4.5 million cubic metres.

Concrete NZ welcomes the opportunity to submit on the New Zealand Productivity Commission's issues paper - *Improving Economic Resilience: Enhancing Economic Resilience of Industries and Communities to Persistent Supply Chain Disruptions*.

Concrete NZ draws the following statement from the Commission as a guide for this submission:

Economic resilience is defined as *the capacity of industries and associated communities to anticipate, prepare, absorb, recover and learn from supply chain disruptions* – focusing on the interdependence of industries and communities in Aotearoa, the importance of proactively investing in resilience, and how the unique features of New Zealand’s economy shape those investments in resilience-enhancing policy.

## **CONCRETE SUPPLY CHAIN FUNDAMENTALS**

Ready mixed concrete is made of cement, aggregates (coarse and sand), water and additives (a small quantity of chemicals with properties such as reducing water content or delaying the setting time of concrete).

Cement manufacture starts conventionally with crushed limestone and certain other minerals, heated to around 1,500°C to produce clinker. To clinker is added a small percentage of gypsum (calcium sulphate), and crushed limestone. This mix is milled to a certain grain size to produce “general purpose cement”.

The industry also makes lower-carbon cements, either by adding Supplementary Cementitious Materials (SCMs), and/or by adding a higher fraction of limestone to clinker, and/or calcined clay, which is processed clay minerals of suitable type and quality. This last technology is yet to be developed in New Zealand.

In turn, a ready mixed concrete manufacturer can make lower-carbon concrete by using lower-carbon cement, and/or by adding SCMs into the concrete mix design.

SCMs are becoming an increasingly important part of the supply chain as the industry continues to decarbonise, and include:

- Fly ash from coal-fired power stations,
- Ground Granulated Blast Furnace Slag (GGBFS) from iron and steel mills,
- Silica fume, or microsilica (a further industrial by-product); and
- Natural mineral materials, such as high-silica volcanic ash and pumice, and diatomite (a deposit formed of the silica skeletons of a plant plankton), collectively termed “natural pozzolans”, after Pozzuoli, a location in Italy.

Cement manufacture requires a significant amount of energy, which in New Zealand is drawn from coal, waste wood and waste tyres (Golden Bay’s Whangarei cement plant).

The concrete industry as a whole also uses electricity, diesel, petrol, and LPG or natural gas for a variety of purposes.

### **Out of scope for this submission**

Concrete NZ excludes consideration of electricity, diesel, petrol, LPG and natural gas, waste wood, and waste tyres from this submission, on the basis that these commodities will be covered by other submitters or are unlikely to present supply chain concerns.

Also out of scope are water, additives (such as fibres and/or chemical admixtures), silica fume and microsilica and gypsum. The reasons are that these commodities are readily available or that sourcing them in the future will not add material cost to cement and concrete manufacture, or they are not strategically important.

### **In scope for this submission**

The following materials are in scope for the Concrete NZ submission:

- Concrete – local manufacture.
- Cement – imported and locally manufactured, and exported.
- Clinker – imported and locally manufactured.
- Aggregates (crushed rock and sand) – local.
- Limestone – local.
- Other minerals in cement manufacture (including ironsands and shale) – local.
- Clay minerals suitable for calcined clay manufacture – local.
- Fly ash – imported and local.
- GGBFS – imported.
- Natural pozzolans – local.
- Coal – imported and local (including for the manufacture of steel, an essential co-material in building and construction using concrete).
- Steel – imported and local.
- Ironsands – local, for local steel manufacture.

### **ANSWERS TO THE COMMISSION'S QUESTIONS**

Concrete NZ provides answers below to the four questions the Commission posed. To begin with, our headline comments.

The issues paper seems focused on exports and imports, in terms of supply chains. The cement and concrete industry also has important domestic supply chains where disruption is also a risk. The Commission needs to be concerned with supply chain constraints within New Zealand, as well as in terms of international trade.

The issues paper contains no discussion on the issue of waste and circular economy, and how work in this space can contribute to supply chains and their resilience. We do not discuss this aspect in any detail in this submission, and welcome engagement from the Commission on this, and other points of our submission.

#### **1. What supply chain disruptions and trends are you worried about?**

Concrete NZ's answer takes into the account the interdependence of related industries, as per the Commission's terms of reference.

### Access to New Zealand economic mineral deposits

One source of supply chain concerns spans the naturally and locally occurring mineral inputs into cement and concrete. They are for ease of reference: limestone, aggregates, ironsands, shale, clay minerals and natural pozzolans.

The general concern is future access to the extraction of these minerals, close to where they are needed, to reduce transport costs and CO<sub>2</sub> emissions. The proposed resource management reforms could constrain the ability to source New Zealand minerals. In the context of cement and concrete manufacture, they are all “critical” minerals. It is of concern that New Zealand, unlike most other OECD countries, has no strategy for securing supply chains for critical minerals.

In the case of clay mineral deposits (for calcined clay manufacture), and natural pozzolans, further research and development is needed for the commercialisation, at scale, of these deposits, noting their importance for cement and concrete industry decarbonisation.

### Steel

While the cement / concrete industry is separate from the steel industry, the two are closely linked. Reinforcing steel is essential to making precast concrete components, and in almost all building and construction using concrete.

The Glenbrook iron and steel mill employs around 1,400 people in South Auckland, and supplies an estimated 65 percent of New Zealand steel demand. Its continuation is important to safeguarding the supply chain for steel, and this, in turn, is important for the concrete industry.

### Fly ash and GGBFS

New Zealand is not the only country in the world with demand for these low-carbon partial substitutes for cement, which today are almost all imported. (Note that slag produced at the Glenbrook iron and steel mill is not suitable as an SCM.)

Supply, and, therefore cost, including of shipping, are among concerns.

### Coal

Please refer to the Straterra submission on the issue of coal supply chains.

### Labour

While there are currently around 600 apprentices in the concrete industry, there is a labour shortage in the industry, as is the case for many industries. Immigration policy settings during the Covid-19 period has had a negative impact on the labour market. It remains to be seen whether amended policy settings for immigration will have the desired impact, e.g. to fill positions for concrete truck drivers.

### Bitumen

Partly as a result of Covid-19, the Marsden Point oil refinery closed, ending domestic production of bitumen. Around 170,000 tonnes of bitumen are used per year for

roading in New Zealand. The roading industry is now 100 percent reliant on bitumen imports for making asphalt as surfacing for roads. At times bitumen has increased fourfold in price. Disruption of this supply chain would provide opportunities for alternatives to bitumen in roading, including concrete, in appropriate settings. To date Waka Kotahi NZ Transport Agency has seemed unwilling to explore, or as been uninterested in exploring concrete's potential as a roading material.

## **2. What is your industry/community currently doing or planning to do to address supply chain concerns?**

### Access to New Zealand economic mineral deposits

Concrete NZ supports:

- The quarry and mining sectors in their advocacy for fit-for-purpose regulation for the responsible extraction and development of economic mineral deposits.
- Mining industry body Straterra in its advocacy to the Ministry of Business, Innovation and Employment (MBIE) on developing a critical minerals list or strategy for New Zealand.
- An out-of-cycle application to BRANZ for research funding to investigate barriers to the uptake of SCMs in New Zealand, including natural pozzolans.

### Steel

Concrete NZ supports the steel industry in maintaining a domestic presence, and have close relationships with Metals NZ, and other relevant industry associations.

### Fly ash and GGBFS

There are synergies between imports of cement and clinker, and of SCMs, in terms of managing supply chains.

### Coal

For Concrete NZ, the coal supply chain is an issue for coal producers and importers, and users such as the Glenbrook iron and steel mill. Our role is to keep a watching brief on developments in this space.

### Labour

Concrete NZ has a good relationship with the industry training organisation *Te Pukenga* and runs training courses covering many aspects of the concrete industry.

### Bitumen

Concrete NZ has encouraged Waka Kotahi to trial a concrete road in New Zealand, to no avail, despite a fourfold increase in the price of bitumen (as delegates to the *Future Roads* conference in Hamilton last year heard).

Concrete NZ is scoping research into determining the extent of existing concrete roads in New Zealand, to engage with local government, and help improve their practices. For example, it is unnecessary to coat a concrete road with an asphalt surface.

### **3. How can the government help to enhance the resilience of your industry/community to supply chain disruptions?**

#### Access to New Zealand economic mineral deposits

Government should do the following as regards access to minerals:

- Rescind the *Natural and Built Environment and Spatial Planning Bills*, and replace relevant parts of the *Resource Management Act 1991* with the proposed enabling provisions for infrastructure, the national planning framework, and a modified process for regional spatial strategies and natural and built environment plans.
- Seek advice from Te Waihanga NZ Infrastructure Commission, and the Aggregate and Quarry Association on ensuring a reliable and cost-effective future supply chain of aggregates for concrete, roading and other infrastructure and construction.
- Develop a critical minerals strategy for New Zealand, drawing on overseas experience, and include within its coverage all of the minerals that are strategic or critical to cement and concrete, including lower-carbon cement and concrete. This strategy should supersede the suggestion, aired at times, of no new mines on conservation land.
- Support research and development into the commercialisation, at scale, of natural pozzolans, and of clay mineral deposits suitable for processing into calcined clay.

#### Steel

Government to ensure a level playing field for the domestic steel industry, to allow the Glenbrook iron and steel mill to continue operating, to safeguard the steel supply chain.

#### Fly ash and GGBFS

Government procurement to increase uptake of lower-carbon concretes, and thereby support the industry's drive towards decarbonisation.

#### Coal

Please refer to the Straterra submission.

#### Labour

Government to continue to provide for immigration to fill needed jobs.

### Bitumen

Government to actively explore alternatives to bitumen in roading where this makes sense. This includes trialling concrete roading, where this solution is appropriate, e.g., in areas of heavy traffic, heavy vehicles, and related wear and tear on roading.

## **4. What should the Commission study to learn more about the economic resilience of industries and communities?**

### Concrete

Learn about the cement and concrete industry's *Concrete Decarbonisation: Roadmap to Net Zero Concrete by 2050* and *Sustainability Report* (both soon to be published), and about the role concrete plays in delivering resilience to New Zealand, via:

- Durable structures having a design life of 100+ years.
- Strong structures for resilience against natural hazards, including the effects of climate change.
- An essential material in the delivery of renewable electricity generation and transmission, three waters provision, affordable housing, and other infrastructure and construction.
- Thermal mass, reducing heating and cooling bills.
- Noise reduction.
- Fire safety.
- Carbon uptake by exposed concrete, equivalent to 6 percent of concrete's emissions.

### Upstream supply chain for concrete and concrete products

Learn how cement and concrete are made, and how concrete and steel together create the infrastructure and buildings that New Zealand needs.

Learn how the New Zealand cement and concrete industry has been reducing CO<sub>2</sub> emissions, and how it plans to continue reducing CO<sub>2</sub> emissions.

### Downstream supply chain

Learn about the barriers to uptake of lower-carbon concrete in New Zealand (e.g., funding for the revision of New Zealand Standards), and consider ways of eliminating or reducing those barriers.

### Waste and circular economy

The diversion of construction and demolition waste from landfills provides an opportunity for recycling and repurposing of concrete, which feeds into supply chains.

### Engage with Concrete NZ

On the above matters, we invite the Commission to engage with Concrete NZ. We are more than happy to share ideas and information.



### Other comments

Below are comments on the content of the issues paper, for the Commission's consideration.

Figure 1 on page 8 of the issues paper omits the concept of **supply chain security**, i.e., that even if overseas producers are better at producing something, New Zealand still needs to have at least some of its own capability and capacity. Box 2 on page 8 does cover this point to an extent, under socio-political factors.

We note the statement on page 12: "Previous research by the Commission has identified the benefits of diversification – not having all eggs in one basket." Concrete NZ agrees, and the Government's allowing Marsden Point to close is an example of having all eggs in one basket.

The statement on page 20 - "Economic resilience may require re-allocating resources to more productive uses as firms experience supply chain disruptions" – merits elaboration. The balance can change if the Government were to adopt fit-for-purpose policy settings. A more enabling environment for minerals exploration and extraction would improve concrete industry productivity by reducing input costs, for example.

On page 20, we note an omission from the research questions, being the ability for Government to improve or stymie the pursuit of economic efficiency, via good or bad policy settings.

Page 22 says: "Cabinet has asked the Commission to identify medium-term policies and interventions that can enhance the resilience of New Zealand's economy and living standards to persistent supply chain disruptions." Strongly supported.

Page 26, figure 5, omits the role Government can play to strengthen domestic supply chains by removing unnecessary distortions to markets, and enhancing new markets (e.g., natural pozzolan resources in the central North Island).

Concrete NZ expects that the experience of Cyclone Gabrielle will spur the Commission to make recommendations to the Government on rethinking the forestry industry in New Zealand, which has damaged the resilience of New Zealand's infrastructure, buildings and people's livelihoods, at enormous cost.

Concrete NZ thanks the New Zealand Productivity Commission for the opportunity to comment on the issues paper - *Improving Economic Resilience: Enhancing Economic Resilience of Industries and Communities to Persistent Supply Chain Disruptions*.

Yours faithfully



Rob Gaimster  
CHIEF EXECUTIVE