SUSTAINABILITY REPORT

for Aotearoa New Zealand's Cement and Concrete Sectors

2024

concretenz
BUILDING RESILIENCE

Image: *New Beaumont Bridge, SH8, Central Otago - a 195m curved superstructure supported by four concrete piers, showcasing concrete's strength and form.*
Cover Image: *Deloitte Centre, Auckland - extended and repurposed by building atop the existing concrete frame. Jason Mann Photography.*

REPORT **CONTENTS**

Sustainability highlights 2024

- Momentum for decarbonisation remains strong despite a challenging environment.
- Supplementary Cementitious Materials (SCMs) now make up 6.6% of all binders used in New Zealand ready mixed concrete - over four times the 2020 baseline share.
- SCM infrastructure already developed to support the 2030 roadmap goal.
- As a follow-up to the roadmap, the industry is preparing a report on the *Transformation to a Low Carbon Concrete Industry* project, due early 2026, to identify and catalogue opportunities and actions for further emissions reductions.

FOREWORD FROM **OUR CEO**

Welcome to the third sustainability report for the Aotearoa New Zealand cement and concrete industry. This report marks another year of determined progress on our journey, building on the baselines and data established in our previous publications.

CHALLENGING ENVIRONMENT

While the current economic slump has led to a market-wide decrease in building & construction activity, the commitment of our members to our shared sustainability goals has not wavered. This resilience is a testament to the industry's focus on the long-term future of our built environment.

A SHRINKING FOOTPRINT

I am particularly pleased to report that our momentum on decarbonisation continues to accelerate. The uptake of Supplementary Cementitious Materials (SCMs) has risen steeply again, now accounting for about 6.6 % of all binders used in New Zealand ready mixed concrete. This is a significant step forward in reducing the embodied carbon of our products and a direct result of proactive and concerted industry action.

CONCRETE PRODUCTION IN THE SPOTLIGHT

This year's report casts a spotlight on a critical lever from our 2050 Roadmap: efficiency in concrete production and delivery. This focus represents a natural progression from our previous sustainability reports, which centred on establishing the SCM value chain (2021/22 report) and the subsequent uptake of SCMs in concrete (2023 report). We showcase how members are making smart investments to drive production efficiency forward - from upgrading batching infrastructure and using electric vehicles, to optimising material inputs and embracing digital technology for real-time quality control. These practical innovations are key to reducing our footprint while enhancing performance.

AN INDUSTRY COMMITTED TO CHANGE

To maintain the strong momentum, we continue to work on the Transformation to a *Net Zero Carbon Concrete Industry* project. Building directly on the foundations of our 2050 Roadmap, this project again gathers expertise from across our value chain to identify and catalogue the specific opportunities and actions required to translate our ambitions into tangible outcomes for a lower-carbon future.

Our ability to track this progress is only possible through the collaboration of our members. I want to extend my sincere thanks to all who contributed data, with producers representing approximately 80% of ready mixed concrete volumes as well as significant shares of precast, masonry and reinforcing processors once again participating.

We are pleased to share this report, which demonstrates tangible progress against our roadmap. It reinforces our collective commitment to driving change and delivering the durable, resilient and increasingly sustainable concrete that Aotearoa New Zealand needs for a prosperous future.

Ngā manaakitanga,

Rob Gaimster
Chief Executive | Concrete NZ

ABOUT CONCRETE NZ

Concrete New Zealand represents more than 500 corporates and individuals who contribute significantly to the construction sector.

Our industry spans cement manufacturers and producers of ready mixed concrete, masonry products and precast elements, including wall panels, pipes and culverts. We also work with steel reinforcing processors.

We advocate on behalf of the cement and concrete industry for policy settings that support a diverse, efficient, and resilient construction sector.

OUR VISION

Supporting industry to position concrete as the construction material of choice for a modern and resilient New Zealand.

OUR STRATEGY AND COMMITMENTS

Our Strategic Charter rests on four pillars:

- → we are the consolidated voice
- → we raise standards
- → we promote quality
- → we strive to improve reputation

In pursuing these strategic priorities, we undertake a wide range of activities on behalf of our members. We fund research and development, and educate and train concrete placers, specifying architects, and engineers. We audit concrete plants, influence the development of government policy, and more. We promote the good work our industry is doing in steadily reducing the carbon footprint of concrete, and to incentivise more reuse, repurposing and recycling of concrete.

Iconic 3D Show Home, Hamilton - New Zealand's first 3D-printed concrete house, built in 99 days and showcasing sustainable, efficient construction. Aaron Radford Photography.

concretenz
BUILDING RESILIENCE

CONCRETE BY THE NUMBERS*

NZ$2.483 billion
ASSET BASE

NZ$1.274 billion
CONTRIBUTION TO GDP

11,203 FTEs
EMPLOYMENT

25.6%
MĀORI EMPLOYEES

4.136 million m^3
READY MIXED CONCRETE

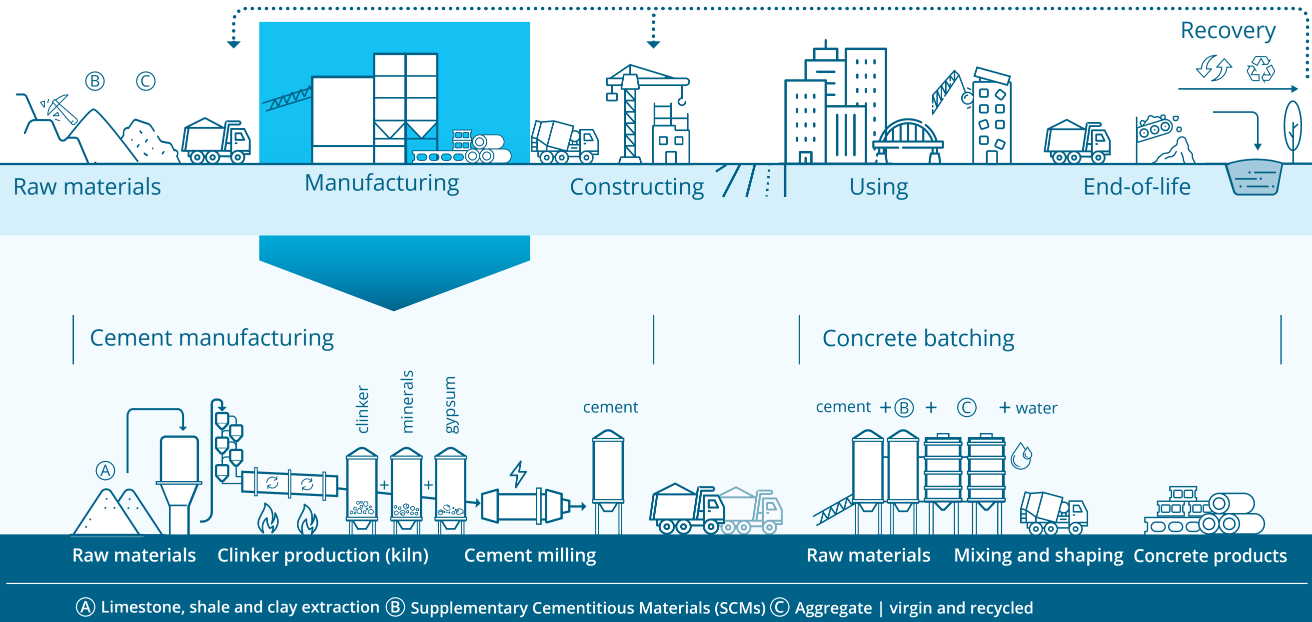
194 and 18
CERTIFIED READY MIXED CONCRETE AND PRECAST PLANTS

11.9%
FEMALE EMPLOYEES

539
NUMBER OF APPRENTICES

**2023*

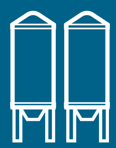
THE VALUE CHAIN OF CONCRETE



CONCRETE FUNDAMENTALS

CLINKER

= limestone and other minerals + 1,500°C



CEMENT

= CLINKER + gypsum (+limestone), finely crushed

CONCRETE

= CEMENT + water + crushed rock and sand (+additives)

The cement and concrete industry is diverse, and includes (but is not limited to) the following strands:

- **Cement** – a vital binder for concrete manufacture, produced by grinding clinker (a calcined mixture of limestone and other minerals) which can be (increasingly) partially substituted by supplementary cementitious materials to produce lower-carbon concrete and improve durability.
- **Ready mixed concrete** – manufactured and supplied predominantly to construction sites and to the precast sector.
- **Masonry** – concrete manufactured into standard-sized blocks, used for residential and commercial construction, retaining wall elements, pavers, and more.
- **Precast** – off-site manufacturing of elements such as wall panels, beams, floors, as well as bridge components, pipes and culverts, which are then transported to the construction site.
- **Reinforcing processors** – supply of cut and bent reinforcing bars, mostly to construction sites (where ready mixed concrete is then poured for foundations, floor slabs, vertical columns, etc) and into the precast industry.

The industry value chain also includes suppliers of aggregate, reinforcing steel, admixtures, and services including handling of precast components, concrete mix designers, placing contractors, and concrete services like grinding and polishing.

SPOTLIGHT ON **CONCRETE PRODUCTION**

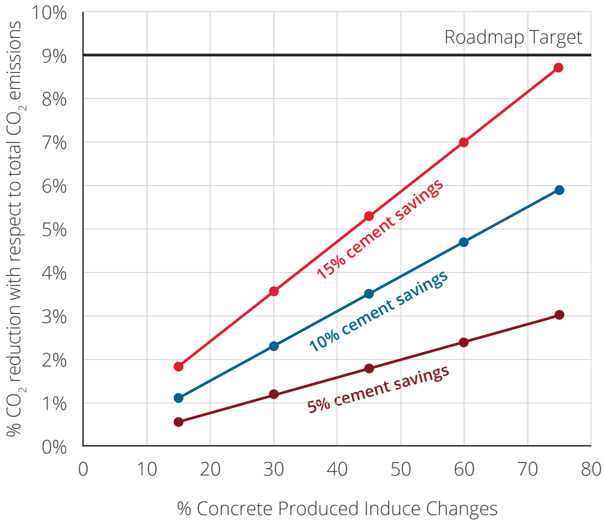
Concrete is imperative to meet growing infrastructure needs, increasing residential housing demand, and the construction of resilient structures. It is produced by mixing cement, coarse and fine aggregates, water, and additives to achieve the desired properties. Optimum material characteristics, a well-coordinated supply chain, monitoring systems, software integration, and workforce training are essential to ensure efficiency and consistency in this process. Concrete production is highly industrialised in New Zealand, ensuring consistent adherence to mix specifications and third party verified quality assurance.

Raw material characteristics, energy consumption during manufacturing, and transportation of materials all contribute to the embodied carbon in concrete (products). To reduce the associated environmental impact, improving concrete efficiency through material optimisation and production improvements is crucial, as identified in the roadmap.

PATHWAYS TO IMPROVE EFFICIENCY IN CONCRETE PRODUCTION

BINDER OPTIMISATION

The binder, traditionally the most carbon-intensive component of concrete, can be reduced through an optimised mix design. This involves refining material proportions, particularly the water-to-binder ratio, using low embodied carbon binders and fillers, alongside digital tools enabling real-time adjustments to mix design allowing for reduced binder content without compromising concrete performance.



AGGREGATE CHARACTERISTICS

Careful aggregate selection (shape, grading, fines and organic content) aids in improving packing density, reduces interference with cement hydration, and lowers the need for excess cement resulting in better workability, strength, and overall mix efficiency. We estimate using this approach could result in binder savings in the range of 5-10%.

FUEL SUBSTITUTION FOR CONCRETE / AGGREGATES TRANSPORT

Switching from predominantly diesel-fuelled to electric or clean hydrogen-powered trucks could ultimately eliminate transport emissions – particularly given that over 85% of New Zealand's electricity is generated from renewable sources.

Additionally, higher throughput in urban regions allows for more frequent use of stationary, electricity-powered concrete batching and mixing plants, reducing reliance on diesel-fuelled truck mixers.

STRENGTH ENHANCING ACTIVATORS AND CO_2 MINERALISATION

The use of accelerating admixtures, nano-materials, next-generation superplasticisers (e.g. polycarboxylate ethers – PCEs) and techniques such as subjecting the mix to ultrasonic waves or injecting CO_2 during mixing or curing to encourage mineralisation and potentially reduce binder content

Other pathways include using recycled aggregates, minimising waste, and promoting performance-based design for more efficient concrete production. The illustration below shows the potential extent of CO_2 reduction based on the level of conventional cement savings achieved through increased efficiency in concrete production and the percentage of concrete produced in the country incorporating these changes.

The case studies presented later in this report offer just a few tangible examples of how these efficiency levers are already being pulled across the industry.

Vineet Shah
Concrete Industry Transformation Lead

HOW THE CONCRETE SECTOR IS BECOMING **MORE SUSTAINABLE**

CO-PROCESSING

Waste wood and tyres are increasingly used to replace coal as both fuel and raw material in clinker production, contributing meaningfully to waste reduction and resource recovery.

LOW-CARBON BINDERS

Increased uptake of artificial (waste) and natural supplementary cementitious materials, and mineral additions, e.g. limestone, in concrete.

LOW-CARBON CONCRETE

Improved mix design, input material properties, in-transit management systems and operational efficiency at concrete batching plants.

IMPROVING CONCRETE TECHNOLOGY

Research and innovation are improving concrete's performance.

WATER RECYCLING

Concrete plants use rainwater and recycle grey water to reduce need for town supply.

GREENER TRANSPORT

Trials continue into electric, hybrid and hydrogen trucks.

RECYCLED INPUTS

Waste glass, chipped tyres, and aggregates can be used in ready mixed concrete and masonry.

EMPLOYEE WELLBEING

Firms are leading on improvements in health, safety, and mental health.

A MAJOR ROLE IN NEW ZEALAND'S BUILT ENVIRONMENT

Concrete is strong, durable and versatile – it can be formed into almost any shape. Compared with other building materials, concrete offers better fire safety, greater noise reduction, and more efficient heating and cooling. It can be reused, repurposed and recycled at the end of life of a building or other structure.

New Zealand's infrastructure pipeline is huge, and concrete will have to play a central role in delivering it. The March 2025 National Infrastructure Pipeline update included about $112 billion of initiatives underway and in planning which were reported as funded, part funded, or with a funding source confirmed.

Concrete is used in road and rail bridges, tunnels and other infrastructure, renewable electricity schemes, house pads, multi-storey buildings, sea and airports, industrial infrastructure, flood protection schemes and other climate change resilience, and more. In many cases, there are no economically viable alternative materials that can achieve the same performance as concrete.

> *"We're not reinventing the wheel here, just choosing a smarter path. For SMEs like us we are having to pivot towards low-carbon technology to stay competitive. This is a win-win-win for the environment, our business and New Zealand's civil construction sector in general."*
>
> *– DIRECTOR DR WILLY MORRELL SUMS UP THE STRATEGY*

BULLOCKS STRIDES INTO A LOW-CARBON ERA WITH ECO-MAX CONCRETE

When Ben Bullock began delivering coal by horse and cart in 1928, fossil fuels were the engine of progress. Nearly a century on, the Whanganui family business he founded is charting a different course – proving that concrete can thrive in a low-emissions future. In this context, Bullocks Group, with 40 personnel working across quarrying, ready mixed concrete and civil works, has set itself a bold goal of producing New Zealand's lowest-emission concrete.

MULTI-PRONGED ATTACK ON EMISSIONS

- The company has installed thirty-kilowatt PV arrays at its Bulls quarry and its new ready mixed concrete plant in Whanganui. These arrays are already meeting much of the Group's day-to-day electricity demands at their batching and screening operations.
- With the support from EECA's *Low Emission Transport Fund*, Bullocks Group has invested in some electric muscle to their operations. Two battery-electric front-end-loaders – a 12-tonne model in the ready mixed concrete facility and a 19-tonne unit in the quarry – have been operating for about a year now. Initial concerns around power and responsiveness proved unfounded and the EV machines have been mainstreamed into daily operations with few problems and significant fuel savings.
- Circular thinking. Wash-out water is reused, and crushed concrete is being trialled for non-structural concrete mixes, mass blocks and hard-stand areas.

ECO-CEM™: THE EMISSIONS GAME-CHANGER

Bullocks' flagship move is its transition to Eco-Max concrete that uses HR Cement's Eco-Cem™ cement, a supplementary cementitious material (SCM) made from granulated blast-furnace slag. As Eco-Cem™ replaces ordinary Portland cement one-for-one, mix designs need minimal re-engineering. International practice treats 40% substitution as routine, and New Zealand trials have validated blends up to 65%. Even a 40% swap can cut about 90 kg CO_2-e per cubic metre without compromising strength or finish quality – music to both specifiers and placers' ears.

With strong support from HR Cement, Bullocks' secondary silo is in place and its first batch of Eco-Max concrete is scheduled for production in July 2025.

Looking ahead, Bullocks Group is exploring the use of recycled aggregate in non-structural products, expanding solar capacity across the wider business, and trialling additional electric earthmoving equipment.

OUR **FOCUS AREAS**

CONCRETE NZ'S 2024 SUSTAINABILITY REPORT COVERS THE FOLLOWING KEY AREAS:

ENERGY AND CO_2 EMISSIONS
Cement and concrete companies are reducing their CO_2 footprint.

FRESHWATER
Industry recycles water to reduce dependence on town supply.

SOCIO-ECONOMIC BENEFITS
We employ people in rewarding careers and produce materials that support New Zealand's prosperity.

WASTE AND CIRCULAR ECONOMY
Concrete can be reused, repurposed and recycled. Industry is seeking more sustainable inputs.

WORKPLACE HEALTH & SAFETY
Industry is focused on zero-harm workplaces, and on employees' health and wellbeing.

CONNECTING WITH THE UN SUSTAINABLE DEVELOPMENT GOALS (SDGs)

Concrete plays a key part in pursuit of the UN's SDGs – for example:

3 GOOD HEALTH AND WELL-BEING | 6 CLEAN WATER AND SANITATION | 7 AFFORDABLE AND CLEAN ENERGY | 8 DECENT WORK AND ECONOMIC GROWTH | 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE | 11 SUSTAINABLE CITIES AND COMMUNITIES | 12 RESPONSIBLE CONSUMPTION AND PRODUCTION | 13 CLIMATE ACTION

GOAL 3 – Good health and wellbeing

Concrete reduces heating and cooling bills, and protects from noise and fire.

GOAL 6 – Clean water and sanitation

Concrete is essential to providing drinking water, wastewater and stormwater services.

GOAL 7 – Affordable and renewable energy

Concrete is critical in generating and transmitting renewable electricity.

GOAL 8 – Decent work and economic growth

The concrete industry provides rewarding jobs and contributes to the built environment which boosts economic wellbeing.

GOAL 9 – Industry, innovation and infrastructure

Concrete is used to build schools, hospitals and other public buildings, roads and rail bridges.

GOAL 11 – Sustainable cities and communities

Concrete supports urban growth, transport, mobility, and climate resilience as populations grow.

GOAL 12 – Responsible consumption and production

Waste concrete can be recycled, reused and repurposed into aggregate, buildings, and clean fill.

GOAL 13 – Climate action

Concrete provides resilience against extreme weather and sea level rise, infrastructure for renewable energy, for a reducing carbon footprint.

Concrete contributes directly to 80 of the 169 SDG targets (Global Cement and Concrete Association).

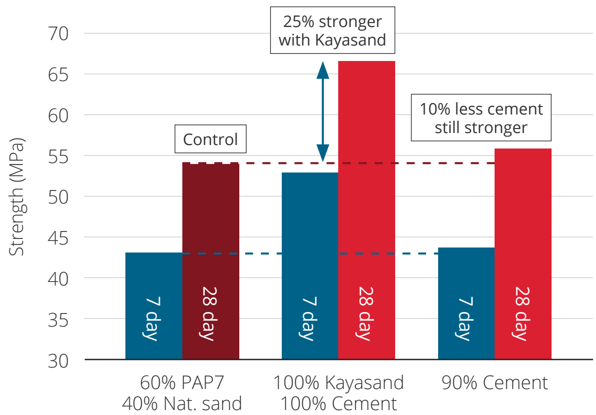
THE ROLE OF KAYASAND ENGINEERED SAND™ IN A SUSTAINABILITY-FOCUSED CONCRETE INDUSTRY

The global concrete industry faces increasing pressure to adopt sustainable practices while maintaining high performance and durability. Concrete relies heavily on natural sand - an environmentally sensitive resource that regenerates more slowly than it is extracted and is now facing increasing regulatory and ecological scrutiny. Utilising existing Japanese technology, New Zealand company Kayasand offers a transformational solution: Engineered Sand™, created from quarry byproduct using advanced dry processing technology.

The quality of concrete depends highly on the quality of the sand used to make it. Engineered Sand™ production involves precise control over particle shape, size distribution and contamination, with the most critical factor being consistent, repeatable quality from batch to batch.

The practice of using Engineered Sand™ to completely replace other sand in concrete is already common around the globe. Leading concrete producers and quarries in Sydney are the latest to adopt Kayasand plants and utilise 100% Engineered Sand™ concrete mixes. New Zealand concrete manufacturers are also increasingly looking to capitalise on the benefits of Engineered Sand™. Precision precast pipes and a first-of-its-kind factory floor in Auckland are already using sand from Kayasand's plants.

New Zealand and Australian trials show Engineered Sand™ produced from Kayasand plants will achieve 10-15% cement savings without compromising strength, finish and workability. Cement savings cut costs and contribute to a net-zero concrete industry by 2050.



For quarries that produce Engineered Sand™, there are several advantages to using Kayasand over wet processed manufactured sands including:

- → Reduction in water use
- → No slurry means less operational cost
- → Dry ultra-fines can be utilised in other products and industries
- → Costs less than natural sand due to reduced freight costs
- → Promotes a stable supply chain less susceptible to regulatory pressure
- → Costs no more to produce than wet manufactured sands

Kayasand Engineered Sand™ represents a step-change in how the concrete industry addresses sustainability. Kayasand is a part of the solution by providing a sustainable, high-performance alternative to natural sand. It supports the concrete industry's shift toward greener practices without compromising on quality or cost-efficiency.

AGAINST THE BASELINE
OUR EFFORTS IN NUMBERS

This year's data analysis covers approximately 80% of ready mixed concrete volume, along with significant shares of the masonry, precast, and reinforcing processor sectors.

ENERGY AND EMBODIED EMISSIONS

In 2023, Concrete NZ launched the industry's Roadmap to Net Zero Carbon Concrete by 2050 (the Roadmap), aligned with the Global Cement and Concrete Association's 2021 roadmap. The Concrete NZ roadmap outlines seven key strategies for reducing emissions: Clinker, Cement & Binders, Concrete Production, Design & Construction, Electricity, Carbon Uptake and Carbon Capture, Utilisation and Storage (CCUS).

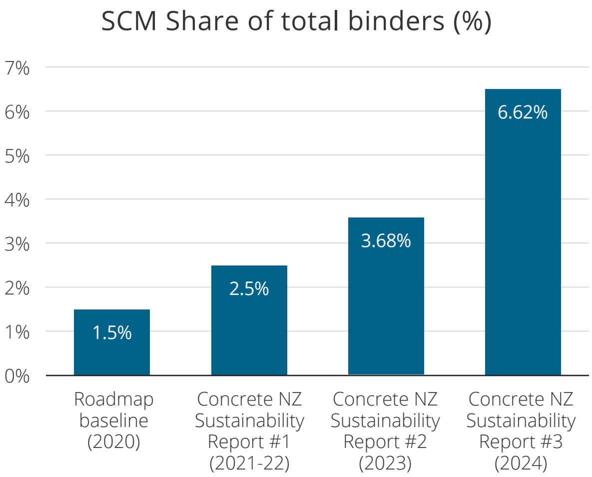
The industry has set ambitious targets: a 44% reduction in direct and electricity-related CO_2 emissions by 2030 (compared to a 2020 baseline), and net-zero carbon for cement production and concrete batching by 2050.

At present, building activity has slowed significantly, resulting in lower emissions from the sector. While this reduces absolute emissions, reporting these reductions here would obscure the underlying signal with short-term noise.

Through extensive industry engagement, the Transformation to a Low Carbon Concrete Industry project launched in August 2024 has identified enabling conditions across the supply chain, along with the technological, economic, and regulatory frameworks needed to support decarbonisation. The team is on track to publish its findings in early 2026.

MARKET UPTAKE OF SUPPLEMENTARY CEMENTITIOUS MATERIALS (SCMS)

In parallel with efforts to reduce the emissions intensity of Portland cement, the New Zealand building and construction sector is increasingly embracing the use of SCMs. The share of SCMs as a percentage of total binders in ready mixed concrete has risen significantly once again, now exceeding 6.6%.



Regional variation remains significant, with higher average cement substitution rates in urban centres such as Auckland, Tauranga, Wellington, and Christchurch. We continue to encourage customers nationwide to engage with local suppliers to explore opportunities tailored to their specific projects.

In 2024, ground granulated blast furnace slag (GGBFS) overtook fly ash as the dominant SCM in New Zealand. Together, slag and ash accounted for approximately 98% of SCMs in use. Research is ongoing into the commercial viability of natural pozzolans playing a greater role in the future.

The Roadmap project team based the 2030 emissions reduction target on the assumption that the SCM share would reach 30% by that year. Importantly, all four binder-supplying companies in Aotearoa New Zealand have either already implemented or announced increased capacity to support this transition. With a clear demand signal from customers, the sector could deliver the required absolute volumes ahead of the 2030 target.

ENERGY USAGE

Thanks to the use of mostly lightly processed raw materials, concrete remains the least energy-intensive major building material - even when including the reinforcing steel component. Lower embodied energy also correlates with reduced local air pollution, especially particulate matter emissions, as documented in published EPDs for local products.

As of 2024, primary energy sources for cement manufacturing in the sector include waste wood, waste tyres, and coal, with coal playing a diminishing role in the mix. Electricity and diesel remain the primary energy sources for concrete production and delivery, with most ready mixed concrete trucks still running on diesel - contributing to carbon emissions. However, some companies have begun commissioning **electric, hybrid, and hydrogen-powered trucks**, with green hydrogen supplying part of the fuel mix.


Te Whare o Rehua Sarjeant Gallery, Whanganui – refurbished and expanded to preserve its heritage and extend its structural life.

WASTE AND CIRCULAR ECONOMY

Recycling rates for concrete products and reinforcing steel are already significant. Work is ongoing to expand the use of recycled concrete in higher-value applications—particularly in high population areas, where shorter transport distances make this more viable.

In addition, the hydrated cement component in concrete absorbs CO_2 from the atmosphere, "recarbonating" CaO back into its natural state as $CaCO_3$. This process begins once the concrete hardens but accelerates significantly at end-of-life, when a structure is demolished and the material is crushed, greatly increasing surface area.

The Product Category Rules for Concrete Products (EN 16757:2022 Annex G) provide practical guidance on quantifying this effect during life cycle stages B (Use Stage) and C (End-of-Life Stage). The updated NZGBC Embodied Carbon Methodology explicitly identifies recarbonation in concrete as a common source of GHG removals in a building's life cycle, contributing to the LCI credit under the Green Star scheme.

Using a residential concrete slab as an example, the material could reabsorb nearly 20% of its upfront embodied emissions over the building's whole-of-life assessment - and continue to reabsorb CO_2 up to a total potential of around 35% within climate-relevant timescales.

WATER

Concrete manufacture uses very little water, around 150 litres in each cubic metre of ready mixed concrete, and a further 20 litres for washing trucks and equipment. To the extent possible, concrete manufacturers limit their dependence on reticulated supply and instead use rain or bore water and recycle used water.


Karori Crescent House, Ōrākei – five-level apartment development using concrete systems to navigate terrain and realise architectural intent.

HEALTH AND SAFETY

The health and safety (H&S) performance of the New Zealand concrete industry in 2024 reflects a strong commitment to safety and continuous improvement across its sectors. Despite some variation in specific performance indicators, the industry has made significant progress in implementing effective safety management systems and monitoring leading indicators to improve outcomes.

In 2024, most companies in the ready mixed concrete, precast, masonry, and reinforcing processor sectors demonstrated a high level of maturity in their H&S practices. This was evident in the implementation of safety systems, regular risk assessments, and the delivery of robust training programmes.

Reported Lost Time Injuries (LTIs) varied across sectors, with a total weighted Lost Time Injury Frequency Rate (LTIFR) of 4.82 per million hours worked, based on data from companies employing around 2,800 Full-Time Equivalents (FTEs). This figure reflects progress in reducing incidents and the need for ongoing targeted interventions in higher-risk areas.

A strength across the industry has been the proactive use of leading indicators to drive improvement. Reported examples include:

- **Workplace hazard assessments:** Most companies monitored and managed workplace hazards. Reviews and updates to risk registers ensured effective hazard identification and mitigation.
- **Safety training programmes:** Training remained a key focus, with most companies offering ongoing, tailored H&S education, including driver training, hazard identification, and incident response.
- **Safety observations and behavioural reporting:** Companies encouraged active employee participation in reporting safe behaviours and potential risks. This not only improved hazard identification but also supported a culture of safety ownership.

Continuous improvement is evident across the industry. Companies have adopted digital tools for real-time safety observations, incident reporting, and trend analysis.

Concrete NZ also holds H&S forums within its Sector Groups and through joint sessions to share best practice and address common risks. A current priority of Concrete NZ's Readymix Group is liaising with the concrete pumping community to better understand associated risks. Upstream, the Aggregate and Quarry Association (AQA) continues to work on silicosis, including guidance and exposure monitoring for respirable crystalline silica. Together, these efforts reflect a coordinated industry-wide commitment to safeguarding worker wellbeing.

Mānawa Bay, Auckland Airport – New Zealand's largest premium outlet centre, featuring concrete flooring and low-carbon panels in a sustainable design. Simon Devitt Photography.

CASE STUDY

SMART CONCRETE DELIVERY: HOW BRIDGEMAN CONCRETE IMPROVED EFFICIENCY AND CUT EMISSIONS WITH VERIFI

In an industry facing both cost pressures and climate expectations, Bridgeman Concrete has taken a proactive step by adopting Verifi® digital technology that automates and optimises concrete delivery. As a New Zealand-owned ready mixed concrete producer, Bridgeman Concrete saw Verifi® solutions as an opportunity to improve efficiency and support their sustainability goals.

TACKLING TIME AND EMISSIONS

Concrete delivery involves many small delays - waiting at the plant, idling on-site, and over-mixing – all of which cost time, burn diesel, and wear down trucks. Verifi® real-time sensors, automated control systems and analytics help Bridgeman Concrete identify and reduce these inefficiencies, providing systematic, continual improvement.

Key operational improvements included:

- Reducing plant wait time by 29%
- Reducing on-site wait before discharge by 17%
- Reducing post-pour site time by 13%
- Reducing total cycle time (less transit) by 7%
- Reducing average total drum revolutions by 4%
- Reducing average high-speed revolutions by 20%

These reductions make Bridgeman Concrete's fleet more productive, freeing up time for more deliveries per day without compromising quality. These numbers may appear incremental in isolation, but across a full fleet and thousands of deliveries per year, the compound effect is significant. Over a full year of operations, these changes average to be:

- 27,500 litres of diesel saved, and
- 74 metric tonnes of CO_2 emissions avoided

That is a direct reduction in transport-related emissions - an often-overlooked part of concrete's carbon footprint. Lower drum revolutions also translate to less wear and tear, reducing maintenance needs and extending equipment life.

BETTER CONCRETE, FEWER SURPRISES

Beyond emissions and fuel savings, Verifi helps Bridgeman Concrete improve concrete quality. Automated water and/or admixture additions and in-transit slump monitoring ensure more consistent loads, reduce rework, and improve site confidence. The system also provides real-time data to dispatchers and site teams, improving coordination and decision-making.

A GLOBAL EXAMPLE: HS2 IN THE UK

Bridgeman Concrete is not alone in seeing these benefits. On the HS2 high-speed rail project in the UK – one of Europe's largest infrastructure projects – Verifi plays a central role in delivering consistent concrete, reducing cement usage, and supporting carbon reduction goals. It is the largest example of Verifi® technologies being specified as an acceptance tool (see **https://www.balfourbeatty.com/media-centre/latest/balfour-beatty-vinci-adopts-hi-tech-digital-concrete-testing-to-cut-carbon-on-hs2/**). The success of Verifi on HS2 shows how digital tools can support quality, sustainability, and delivery at any scale.

A BLUEPRINT FOR NEW ZEALAND

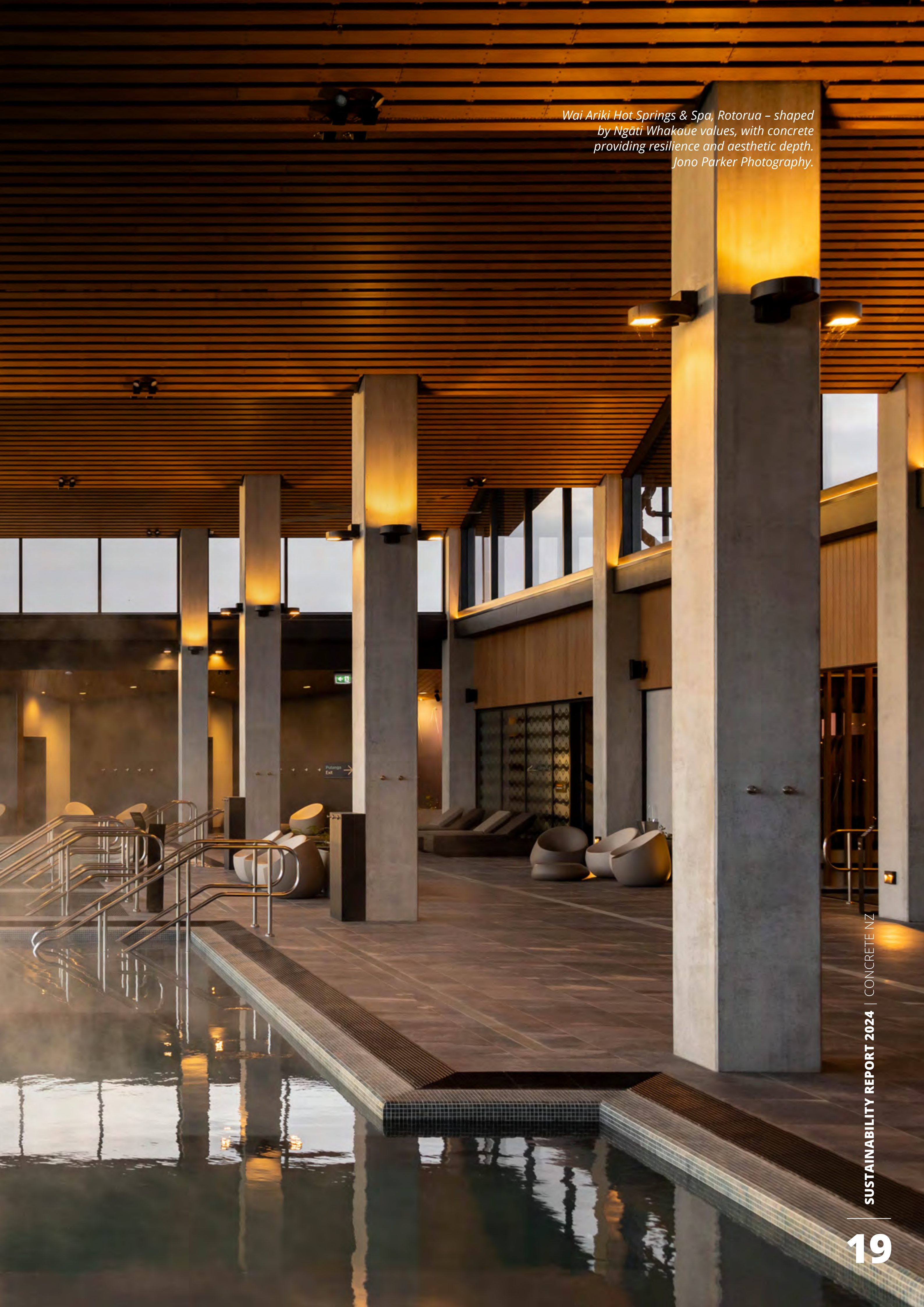
Bridgeman Concrete's success with Verifi shows that operational efficiency and sustainability go hand-in-hand. By also focusing on the delivery cycle - rather than just mix design - they unlock meaningful carbon reductions without major process changes.

For producers across New Zealand, this case shows that smarter systems can help meet the demands of modern construction: lower emissions, better performance, and greater transparency.

THANK **YOU**

Concrete NZ thanks the many companies that contributed their data, information, insights and advice:

- Allied Concrete Ltd
- Atlas Concrete Ltd
- Bridgeman Concrete Ltd
- Brilliance Steel Ltd
- Bullocks Readymix Ltd
- Busck Prestressed Concrete Ltd
- Byfords Readi-Mix Ltd
- Concretec New Zealand Ltd
- Firth Industries Ltd
- Fletcher Reinforcing Ltd
- GCP Australia Pty. Ltd (Verifi)
- HEB Precast Ltd
- Higgins Concrete Ltd
- Holcim New Zealand Ltd
- HR Cement Ltd
- Hynds Pipe Systems Ltd
- Nauhria Precast Ltd
- Nauhria Reinforcing Ltd
- Kayasand Ltd
- Precast Systems Ltd
- Stahlton Prestressed Concrete Ltd
- Stresscrete Northern Ltd
- Viblock Ltd
- Wilco Precast Ltd
- Wilco Precast Waikato Ltd



Wai Ariki Hot Springs & Spa, Rotorua – shaped by Ngāti Whakaue values, with concrete providing resilience and aesthetic depth. Jono Parker Photography.

CONTACT US

Concrete NZ
Level 7 Panama House
22 Panama Street
Wellington 6011

PO Box 448
Wellington 6140
NEW ZEALAND

P +64 4 499 8820
E admin@concretenz.org.nz
W www.concretenz.org.nz

concretenz
BUILDING RESILIENCE