



CONCRETE MASONRY AND ROOF TILE SUSTAINABILITY STRATEGY AND ROADMAP

MARCH 2024

MESSAGE FROM THE CEO

The Australian Concrete Masonry and Roofing Tile industry understands our responsibility to minimise our impact on the environment and support our local communities. We take pride in manufacturing beautiful, durable, versatile and lower carbon products for Australia. Our focus over the coming decade will be on measuring, understanding and reducing our carbon emissions as an industry. Our goal as an industry is to transition our businesses and the products we make to a low carbon and circular economy. Our members are already taking steps towards a sustainable future. This roadmap sets out our commitment to supporting our industry to ensure we bring everyone along with us.

ACKNOWLEDGEMENT OF COUNTRY:

We acknowledge the Traditional Owners of Country throughout Australia and recognise their continuing connection to lands, waters and communities. We pay our respect to Aboriginal and Torres Strait Islander cultures; and to Elders past and present.



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ABOUT US



The Concrete Masonry Association of Australia (CMAA) is the peak body that represents Australia’s concrete masonry manufacturers. Concrete Masonry includes bricks, blocks, pavers and retaining walls. CMAA monitors, develops and researches technical issues in the concrete masonry industry.



The Australian Roofing Tile Association represents roof tile manufacturers nationally and our members include the major industry leaders. We strive to push for sustainable and innovative roofing solutions that Australians can be proud of. We assist our members with technical resources and research whilst advocating for industry collaboration.



This strategy and roadmap is a joint initiative between members of the Concrete Masonry Association of Australia and the Australian Roofing Tile Association. Together we will set a plan to lead Australia’s concrete brick, paver and roof tile industry towards a lower carbon future.

OUR VISION

To make concrete masonry and roof tiles the contemporary construction material of choice for a resilient built environment.

WHAT WE DO

The Concrete Masonry Association of Australia is the credible voice of the industry and aims to inspire contemporary architecture and sustainable design using our products through research, education and advocacy.

The Australian Roofing Tile Association provides the industry with technical resources to assist with the design and construction of tiled roofs. We inform on technical and regulatory changes to ensure products are being used in a safe and sustainable manner.

We also support our members’ sustainability ambitions by setting targets and tracking progress.

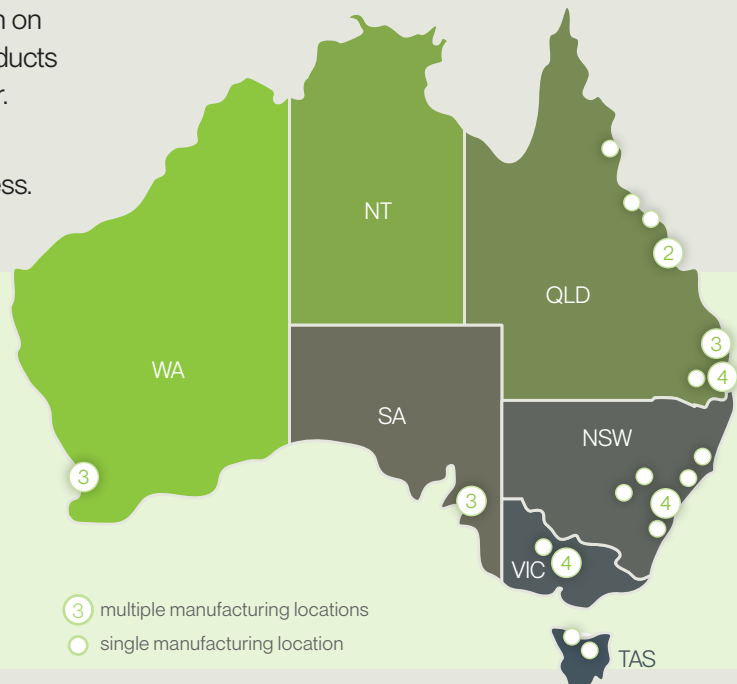
OUR ROAD AHEAD

We developed this roadmap towards the goal of a lower carbon future together with our members. It covers concrete masonry roof tiles, bricks, blocks, pavers and retaining wall products.

To reach our sustainability targets we need more research, investment and commitment from all stakeholders in our supply chain.

INDUSTRY SNAPSHOT

- 14 manufacturer members
- 30+ manufacturing locations
- >\$1 billion industry worth
- Approximately 10 million m³ of concrete manufactured
- Over 12,000 jobs from all associated manufacturing and construction activities



OUR MANUFACTURERS

MASONRY	LOCATION	INTERESTING FACTS
Adbri Masonry est 1882	NSW: Moorebank, Newcastle, Nowra QLD: Beenleigh, Toowoomba, Maroochydore, Townsville, Mackay VIC: Campbellfield, Bendigo SA: Ottoway TAS: Ulverstone	Australia's largest masonry manufacturer.
Austral Masonry est 1908	NSW: Coffs Harbour, Horsley Park QLD: Ormeau, Caloundra, Gympie, Mackay, Cairns, Ayr	By adding oxides and coloured sands to their mix of raw materials, Austral produce products with contemporary colours, textures and appeal.
Baines Masonry est 1982	NSW: Appin	Baines developed the 'BETTA BLOCK' technology which drastically reduces the carbon footprint of masonry products.
Cowra Concrete Products est 1971	NSW: Cowra	Family owned and operated supporting the Cowra community.
Island Block and Paving est 1994	TAS: Breadalbane	Island Block achieved Global GreenTag Level A certification.
Lutum est 1960	SA: Pooraka	Lutum is the largest Australian privately-owned roofing and masonry company.
Midland Brick est 1946	WA: Middle Swan, Hazlemere	Midland Brick is Western Australia's largest concrete masonry manufacturer offering a range of pavers and construction blocks. It is proud to be part of a number of sustainability initiatives such as BGC's Reconciliation Action Plan.
National Masonry est 2013	QLD: Gold Coast, Wacol VIC: Deer Park	National Masonry produces concrete bricks, standard blocks and pavers. These bricks have been specified in thousands of Australian projects.
Natural Brick Co	NSW: Warragamba	Handcrafted sustainable masonry products from recycled materials.
Urbanstone est 1993	WA: Jandakot	Urbanstone produce over 150 paver products and although they manufacture in WA, they supply pavers for jobs across Australia.
ROOFING		
Bristle Roofing est 1929	QLD: Wacol VIC: Dandenong	One the country's largest suppliers of concrete and terracotta roof tiles, producing up to 250,000 units per day from two plants and offering a comprehensive range of more than 40 colours and seven profiles.
Harmony Roof Tiles est 1990s	WA: Armadale	WA's largest concrete roof tile manufacturer offering a range of durable profiles and colours.
Lutum est 1960	NSW: Emu Plains, Wyee VIC: Dingley Village SA: Pooraka	The name 'Lutum' comes from the Latin word for earth or clay, representing the materials in their products.

ABOUT CONCRETE BUILDING PRODUCTS

Concrete is the most widely used building material in the world and the second most consumed commodity after water. It plays an integral role in delivering durable and resilient housing and infrastructure.

BENEFITS OF CONCRETE BUILDING PRODUCTS

Affordable: Concrete is a cost-effective material and the price tends to remain more consistent than other materials.

Durable: Concrete building products have been protecting communities from extreme temperatures and weather events for thousands of years. Our members have warranties for up to 50 years!

Fire Resistant: Concrete building products and roof tiles are non-combustible. This means they do not burn and do not contribute to fire spreading in a dwelling.

Versatile: Concrete masonry units and roof tiles are contemporary and stylish. Individual units are available in a variety of shapes, formations and colours.

Low maintenance: Concrete masonry units and roof tiles are low maintenance and do not require as much upkeep over their longer lifespan when compared to other materials.

OUR PROCESSES

The process for making concrete is relatively simple. Cement, aggregates and water are mixed together. Additions such as oxides and admixtures can be added to the concrete mix depending on the needs of the end consumer.

ABOUT CONCRETE

A typical concrete mix is made up of 12% cement, 8% water, 77% crushed stone/gravel and sand and 3% supplementary cementitious materials (SCMs). However, proportions vary depending on the type of concrete masonry unit or roof tile product being manufactured, among other factors.

Harmony and Lutum roof tiles use a natural curing process that removes the need for gas burners. Midland Brick uses natural curing for their large format landscape backing blocks that are made with recycled materials. Through this process these members have been able to reduce the amount of fossil fuels needed in the manufacturing process.



CEMENT

Cement, a main ingredient in concrete, is a binder made from materials like limestone and clay. The raw materials are heated to 1,450°C to create clinker, which is a key part of cement and the biggest contributor to CO₂ emissions in concrete. The clinker is then combined with a small amount of gypsum to control how fast the cement hardens.

SUPPLEMENTARY CEMENTITIOUS MATERIALS

Waste materials like fly ash or slag can be added as a part substitution of cement to the concrete. These materials are referred to as supplementary cementitious materials (SCMs). SCMs are used to reduce the carbon footprint associated with the manufacture of concrete products.

CONCRETE FUNDAMENTALS



Clinker
= limestone and other minerals
+ 1,450°C



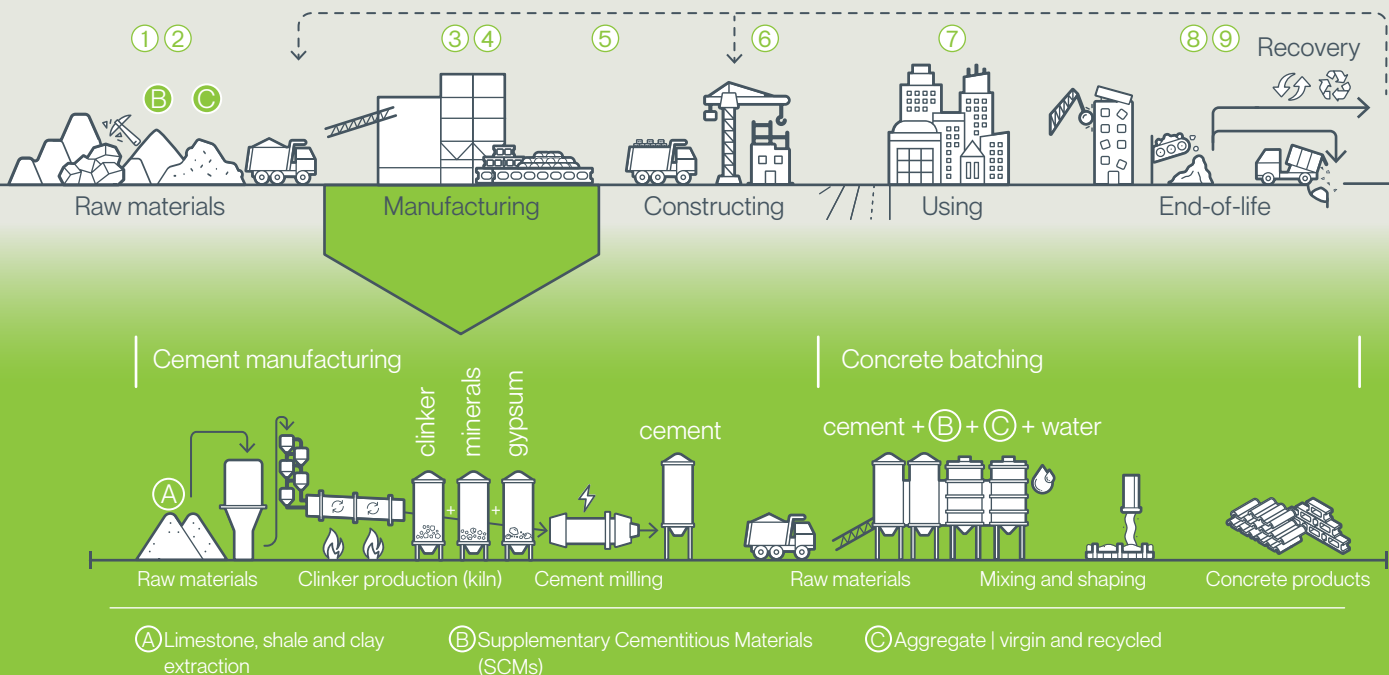
Cement
= Clinker + gypsum



Concrete
= Cement + water + aggregates
(+ additives)

LOCAL AND SUSTAINABLE MANUFACTURING

1. We use locally sourced materials.
2. We use recycled materials.
3. We are using more cement alternatives.
4. We employ locally.
5. We use recyclable packaging.
6. We comply with Australian laws and legislation.
7. Our members' products have desirable thermal characteristics that can reduce operational energy in a well designed building.
8. We reuse any unused materials.
9. Our members support the circular economy through schemes to reduce, reuse and recycle concrete masonry products and roof tiles.





OUR ROADMAP

HOW WE DEVELOPED THE ROADMAP

The Concrete Masonry Association of Australia and Australian Roofing Tile Association members worked with sustainability firm thinkstep-anz to create the roadmap. We are committed to meeting our Environmental, Social and Governance (ESG) obligations and to supporting a more resilient and sustainable Australia.

ASSUMPTIONS

- Australia's electricity network continues to decarbonise.
- The transport sector increases its decarbonisation efforts.

THE ROAD AHEAD

This roadmap covers concrete masonry and roof tile products manufactured by members of the Concrete Masonry Association of Australia and the Australian Roofing Tile Association.

To successfully reduce our emissions and lessen our impact we need:



More research and development



Investment and commitment from researchers, government and all stakeholders through our value chains



PATHWAY TO 2050



2024-2030

We will begin working with our members in 2024 to develop a baseline for their scope 1 and 2 greenhouse gas (GHG) emissions and water use. This will involve providing training for our members who need extra support to collect data and set targets.

In 2025 we will use this baseline to set an industry target for 2030 and 2050.

Until 2030 we expect to make the biggest difference by:

- finding alternative fuel sources for curing
- moving to renewable energy in our factories where feasible
- continued innovation into more efficient materials.

While reducing our emissions is a big focus, we also know that we need to take a balanced approach by:

- using less potable water and increasing the number of factories with closed loop water systems
- moving into the circular economy by continuing to increase how much of our product can be repurposed, remanufactured and recycled
- increasing the circularity of our products through material innovation such as more SCM use
- continuing to support our local communities and the next generation of bricklayers and blocklayers.

Towards 2050

- The Australian Government is developing a plan to achieve Net Zero by 2050. All Australian states and territories have individually committed to net zero by 2050 at the latest. We understand the part our industry will need to play in meeting these obligations.
- In 2030 we will update our roadmap to ensure we are supporting national, state, and territory targets.
- We will continue to make our manufacturing processes and materials more efficient.
- Our aim is to do our part to support Australia's 2050 obligations.

We will follow the carbon reduction hierarchy to avoid, reduce and replace before offsetting the remainder of our emissions to move towards a lower carbon future and will not rely on carbon offsetting in our targets.



CARBON

WHERE ARE WE COMING FROM?

EPIc database process Greenhouse Gas Emissions are:

- 0.17 kg CO₂e/kg for concrete blocks
- 0.24 kg CO₂e/kg for concrete roof tiles

INTERNATIONAL LEADERSHIP

We want to ensure that our performance stacks up globally, so our targets will be informed by global leadership.

Global Cement and Concrete Association

- Targeting a 25% CO₂ reduction per m² of concrete by 2030 from a 2020 baseline.
- Targeting a 20% CO₂ reduction per tonne of cement by 2030 from a 2020 baseline.
- Targeting net zero by 2050.

New Zealand

- Targeting to reduce scope 1 and scope 2 emissions by 44% from 2020 levels by 2030 and to be net-zero CO₂ emissions by 2050.

UK

- The UK concrete and cement industry is working to being net negative by 2050.
- CO₂ emissions from concrete and cement achieved a 53% drop from 1990 levels (at 2018).

WHERE ARE WE NOW?

The Australian cement and concrete industry has worked on reducing its CO₂ emissions and cutting down its emissions by 25% since 2000.

We need to support our masonry and roof tile members to continue to move towards net-zero by 2050. The first step of our roadmap is to support all members in collecting, collating and reporting on data, especially the small family businesses.

Canada

- Targeting net zero by 2050.
- Matching Canada's Emission Reduction Plan which is targeting a 40% reduction in emissions by 2030 from 2005 levels.

Germany

- By 2020 had achieved an approximately 25% reduction in CO₂ emissions from 1990 levels.
- Targeting a 36% reduction in CO₂ emissions by 2050 compared to 2019 levels.

SPOTLIGHT ON OUR MEMBERS

Island Block & Paving Pty Ltd have achieved Global GreenTag GreenRate Level A certification. Island Block & Paving's Blocks for the Future, Bricks for the Future, Pavers for the Future, Freestone Blocks for the Future are manufactured with 37.68% recycled glass aggregate, which is a by-product derived from recycled glass container bottles.

The top three benefits identified in the GreenRate certification are:

- Low toxicity
- Post Consumer Recycled Content
- Durability



HOW WE PLAN TO REDUCE CARBON

Measuring emissions consistently

We will develop an industry-wide strategy for measuring direct (scope 1) and electricity-related (scope 2) greenhouse gas emissions. Indirect (scope 3) emissions are not a part of this roadmap, but will be considered in the future.

Supporting Environmental Product Declarations (EPDs)

We will support member organisations to produce EPDs for their products. EPDs tell the environmental story of a product over its life cycle in a clear, simple format that can be understood by a wide audience. It is science-based, independently verified and publicly available. EPDs provide consistent data sources when developing reduction targets.

Currently, time and financial restraints are the main barriers for companies wanting to get an EPD. This applies especially to small businesses.

Setting targets

We need to understand our members' scope 1 and scope 2 emissions and water use compared to the wider industry. This will support us in setting accurate and realistic targets for our members.

In 2024 we will begin by supporting our members in measuring and recording baseline scope 1 and scope 2 emissions and water use. This baseline will be developed based on our average emissions and water use across all members.

In 2025 we will develop and release our industry reduction targets for 2030 and 2050 based on the 2024 baseline and feedback from our members. Reduction targets will represent an average reduction across all members and will require each business to show how they will consistently improve their performance. This is a collaborative effort and we want to make sure that every member, from the biggest company through to the smallest family business, can meet them.

Reducing our impact

From 2025 we will finish establishing our baseline and setting our reduction targets to 2030. In 2030 we will re-assess and re-set our targets based on the previous five years.

WHAT IS AN EPD?

An EPD tells the environmental story of a product over its life cycle in a clear, simple format that can be understood by a wide audience. It is science-based, independently verified and publicly available. EPDs are often compared to the nutrition labels on food products.

MEMBER EPDS

Some of our members are already producing EPDs for their products. The data from our members' EPDs will help us set informed and reasonable targets for reducing our environmental impacts.

Adbri - Masonry Products

The [Adbri Masonry Products EPD](#) was published in March 2023 and covers 22 product groups. The EPD provides an interpretation of the results which found that for brick products, the vast majority of environmental impacts are in the Product stage (A1-A3). For Block, Ecotrihex® and Versaloc® products, Product stage (A1-A3) and Construction stage (A5) are the highest contributions to environmental impacts, with similar impacts in total Global Warming Potential (GWP).

The EPD also found that within manufacturing cement is the largest contributor to almost all environmental and resource use impacts. It accounts for up to 64% of total GWP.

Austral Masonry - GB Masonry Range

The [Austral Masonry GB Masonry Range EPD](#) was published in 2022 and covers 18 product groups.

The Austral Masonry Grey Blocks have the lowest GWP per tonne of product at 142 kg CO₂ e/t. The GB Veneer coloured blocks have the highest GWP per tonne of product at 174 kg CO₂ e/t.

INNOVATION IN MATERIALS

Cement is a major contributor to our industry's total emissions mainly through the energy-intensive production of clinker.

Research is underway into more efficient materials and we have identified several opportunities for our industry.

- Geopolymer concretes are a lower CO₂ material than Portland cement concretes as they are made from industrial by-products like fly ash and ground granulated blast furnace slag.
- Supplementary Cementitious Materials (SCM) can be used to lower the amount of cement used in concrete. The New Zealand concrete industry has identified that fly ash can substitute up to 30% of cement in a binder and slag up to 65%.
- Using more recycled content may reduce emissions associated with producing concrete, e.g. recycled aggregates, recycled sand, recycled water.



Opportunities

- We will support research and development into the design of concrete mixes using SCMs.
- We will develop initiatives to increase understanding of the benefits of SCMs.
- We will advocate for changes in standards and building codes to better support innovation in materials.



Barriers/Considerations

- Standards and government policies often hinder innovation in materials.
- The environmental impact of alkali activators may need to be considered in some locations to increase the use of geopolymers.
- Members have identified a limited supply of fly ash (a by-product of coal combustion) beyond the next ten years. There may be an opportunity to reclaim tailings from dams at mines.

Our members are working out ways to use more recycled materials.

GB Masonry's new GB Aura range combines cement, sand and aggregates containing 17% total recycled material, including glass and ash.

ALTERNATIVE ENERGY SOURCES

Our members have been exploring alternative energy sources for factories for many years and are taking action to increase the use of renewable energy (solar PV) in factories. Based on their actions and those of the wider Australian concrete industry we have identified more opportunities.



Opportunities

- We will drive research and development into alternative fuel sources to transition from traditional fuels like diesel to renewable energy.
- We will advocate for financial support or incentives from the government to support research and development.
- We will support our members to navigate red tape and will advocate for policy change where needed.



Barriers/Considerations

- Adopting alternative energy sources needs to be led at an industry level.
- Transitioning to renewable energy sources requires financial support and government investment, especially for smaller members.
- Navigating red tape, especially at a local level, can hinder innovation when transitioning to alternative energy sources.

SCOPE 3 EMISSIONS

Our members are just starting to understand and measure the scope 3 emissions in their value chains. In 2024 and 2025 we will work with our members to understand and measure their scope 3 emissions. We will publish industry averages annually from 2025 and will set targets based on this data.



Opportunities

Relatively simple value chains will help us measure and collect data.



Barriers/Considerations

Businesses will need training and support to start measuring scope 3 emissions.

INDUSTRY ADVOCACY

Permeable Concrete Pavement

We are working with our members to drive the uptake of Permeable Interlocking Concrete Pavements (PICPs) in public spaces.

PICPs can be used as a part of a fully or partially permeable system that can capture, treat and even recycle rain and surface water runoff. Permeable pavements can also reduce pollution in our waterways and mitigate downstream flood events. Permeable systems work by allowing stormwater runoff to infiltrate through special voids in the pavement surface and into the ground below where it can be harvested, or returned to the natural water table at a controlled rate.

Mortarless Masonry

A mortarless masonry system uses blocks that interlock to provide a strong, durable and cost-effective construction method. This method requires significantly less mortar than standard construction practices.

Our industry is working with the Queensland University of Technology on research and development into mortarless masonry construction. CMAA is currently working with QUT to develop and publish simple and generic design guidelines for mortarless masonry systems that can be used with member products.

Standards Reform

To encourage innovation we need to work with policy makers to update construction standards and codes. As industry associations we will support our members to drive updates to construction standards. We will also support research and development that supports standard reform.

Leppington Bus Depot

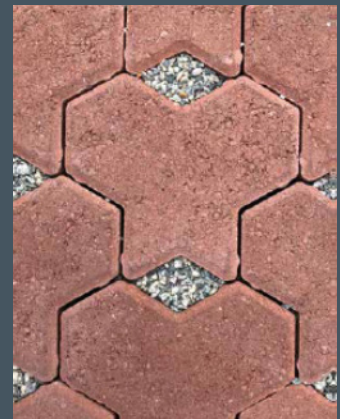
Interline Bus Services, a bus company that operates in South West Sydney, needed a new bus depot for its 120 buses. The council's development application required the new bus depot in Leppington to store 200 kilolitres (kL) of water on site.

- Austral Masonry used 7,000 m² of commercial paving and 1,000 m² of permeable paving.
- Two permeable paving pits store the required 200 kL of water on site and eliminate the need for drains and stormwater pipes. One pit is on the far corner of the hardstand and the other is used for staff parking.

Carparks in Belmont

In 2018, the City of Belmont built two carparks using permeable concrete paving from Midland Brick. Trees were then planted the following year to provide shelter for cars. As the PICP allows water and oxygen to enter the root zone, the pavement will not be uplifted as the roots grow larger.

As the trees are able to grow freely, they will likely not need to be cut down and will create a natural canopy for cars as well as reduce the urban heat island (urban heating) effect.





CIRCULAR ECONOMY

The concept of a circular economy involves reducing waste and consuming fewer non-renewable resources. It focuses on enabling economic growth by designing long-lasting products that can be repurposed, remanufactured, recycled, or reintroduced to the environment.

Negative impacts on the environment and nature are minimised by extracting fewer materials from ecosystems and producing less pollution and waste.

Research shows that circular strategies – using regenerative materials, extending the life of products and using waste as a raw material – can support reducing CO₂ emissions and achieving the goals of the Paris Agreement.

We will match our industry strategy to the [four circular solutions](#) for the built environment in the [Circularity Report 2023](#).

Solution one: Be as energy efficient as possible

We will support the development of new technologies and alternative fuels to help our industry transition to renewable energy and reduce the energy needed to produce concrete masonry and roof tile products.

Solution two: Make the most of what already exists

Concrete masonry structures can be re-purposed once they are at the end of their useful life. Concrete masonry products and roof tiles taken from demolished structures can be crushed and used as a replacement for primary aggregates.

We will work with the wider construction industry to promote resilience in the built environment. The longevity of concrete masonry products and roof tiles will allow infrastructure to have an increased lifespan, reducing the need to build new.

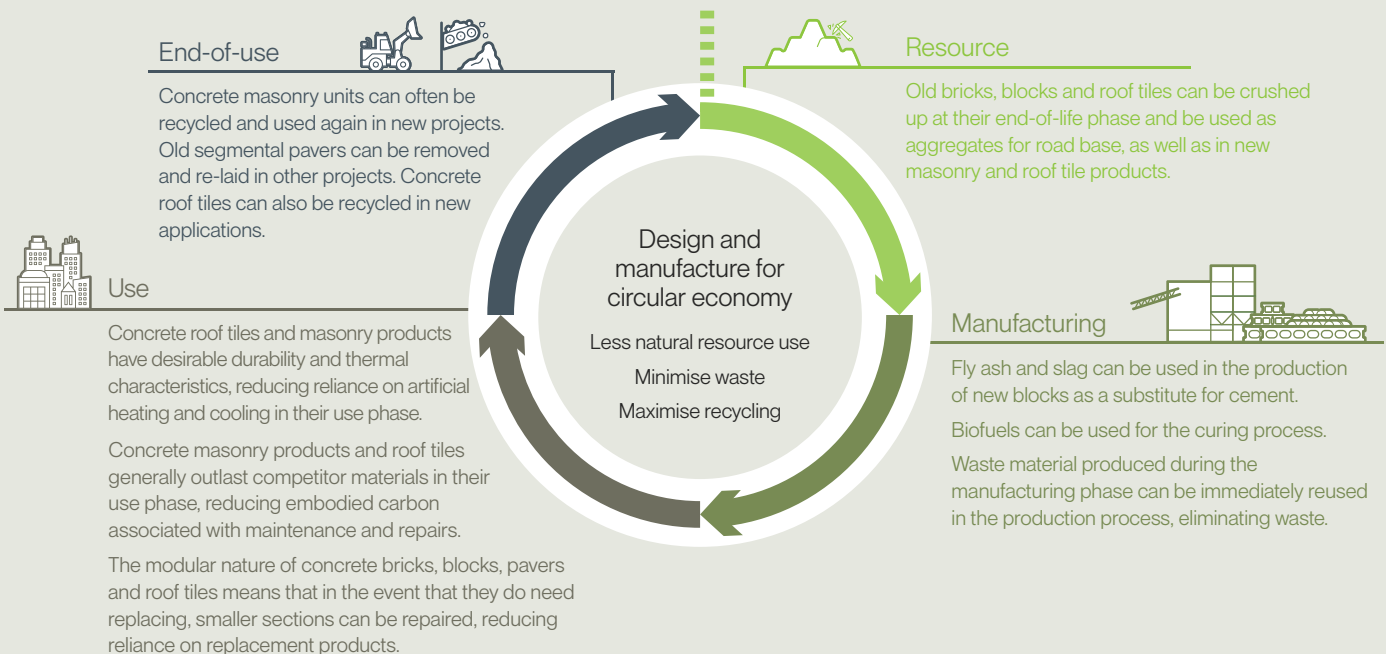
We will also advocate for standards and building codes to be updated to support increased recycled content.

Solution three: Prioritise circular materials and approaches

The industry uses recycled material from other waste streams such as secondary aggregates and SCMs. We will continue to support research and development in increasing recycled content in concrete mixes.

Solution four: Recycle

As industry associations, we will explore funding for recycling facilities that industry can use to access clean and consistent recyclable products.





OTHER ENVIRONMENTAL OUTCOMES

DURABILITY AND RESILIENCE

Concrete masonry structures are long-lasting and need minimal maintenance. It is becoming more common for these structures to be repurposed and reused rather than demolished at the end of their life. Structures utilising concrete masonry and roof tiles stay standing more often in disasters such as fire and flooding. This reduces the need for rebuilding and helps communities to recover faster.

Between 2024 and 2030 we will work with other industry associations and certification bodies to encourage renovation and refurbishment of existing buildings over new construction. We will continue to advocate for building with durable and resilient products.

WATER

Limiting potable water use is especially important in water-stressed locations like Australia. Our members are saving and recycling water as much as possible in the manufacturing process.

Research and development is underway into increasing the use of dry-cast pavers and roof tiles. A dry-cast mixture has just enough water to start cement hydrating without the use of admixtures.

We will continue to advocate and promote innovations like permeable pavements which can capture urban water runoff for harvesting and recycling.

LOCAL SOURCING

Our members source materials and resources locally and operate on a state-by-state basis which reduces transport needs and helps keep our supply chains transparent.

We will continue to advocate for more recognition for using local Australian-made products in the wider construction industry.

Our next steps to support all members to follow the path set by our leaders:

- In 2024 we will support all members in measuring and recording water usage per tonne of product to create a baseline.
- In 2025 we will develop and release our industry water reduction targets for 2030 and 2050 based on the 2024 baseline and feedback from our members.
- From 2025 our industry focus will be to reduce our impacts according to our 2024 baseline data and 2025 reduction targets. In 2030 we will re-assess and re-set our targets based on the previous five years.



GOING ELECTRIC

Midland Brick has received the first-ever XCMG Group model XC968EV electric loader in Australia. This groundbreaking addition to their fleet will be put to work at the Blok-pave plant. The arrival of this electric loader will help Midland Brick in continuing to reduce their carbon footprint.



SOCIAL OUTCOMES

AUSTRALIAN-MADE

The Australian concrete masonry and roof tile industry is a local industry. We can supply the country with quality-assured concrete products that meet Australian standards and are resilient to supply chain constraints.

We will continue to promote the benefits of using Australian-made products and supporting local economies.

HEALTH AND SAFETY

We take care of our people. We manufacture locally and employ locally. This ensures everyone involved in our manufacturing process is protected by Australia's health and safety requirements. Our members are proud of their high health and safety ratings.

We will work with our members to measure and report on health and safety performance across the industry.

SUPPORTING OUR LOCAL COMMUNITIES

We work locally and employ locally. Most of our members are Australian-owned and family-run businesses. Our local manufacturing ensures we help create jobs and opportunities for our local communities.

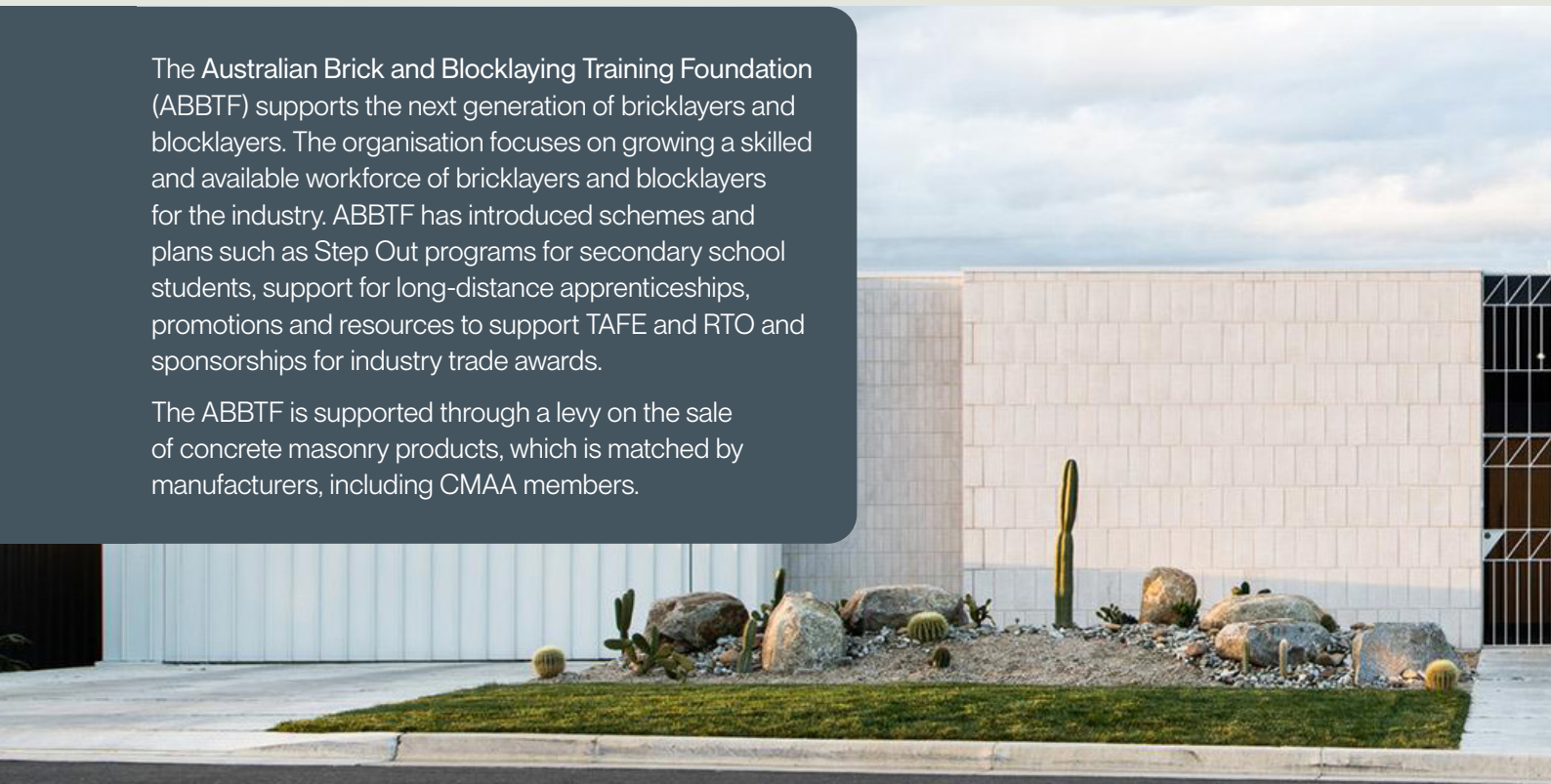
WORKING TOWARDS A TRANSPARENT SUPPLY CHAIN

Our simple and local supply chains are transparent. Our larger members report under the Modern Slavery Act 2018 and have published modern slavery statements.

We will support all members to understand and report on their supply chains.

The Australian Brick and Blocklaying Training Foundation (ABBTF) supports the next generation of bricklayers and blocklayers. The organisation focuses on growing a skilled and available workforce of bricklayers and blocklayers for the industry. ABBTF has introduced schemes and plans such as Step Out programs for secondary school students, support for long-distance apprenticeships, promotions and resources to support TAFE and RTO and sponsorships for industry trade awards.

The ABBTF is supported through a levy on the sale of concrete masonry products, which is matched by manufacturers, including CMAA members.





WHAT WE NEED FOR SUCCESS

SUPPORT ACROSS INDUSTRIES

Delivering on our ambitions will need industry action but we cannot do it alone. The government is critical to supporting local industries to achieve better sustainability outcomes. We need the input, support and action of policymakers, investors, researchers, innovators and end users.

NEW REGULATORY FRAMEWORKS

The existing regulatory frameworks, which include standards and work methods across the supply chain, must be updated. Barriers to innovation in using recycled materials and production methods should be addressed to drive innovation and research and development.

STANDARDISING REGULATIONS

Feedback from our members highlights the need for consistency, transparency and communication across jurisdictions especially at a local level. Navigating red tape is stifling businesses' opportunities to innovate and achieve better environmental outcomes.

GOVERNMENT SUPPORT

As industry associations we are working with the government to advocate for improved sustainability outcomes across the life cycle of concrete building products.

RESEARCH AND INNOVATION

To put this roadmap into action we need innovation across the concrete value chain. It will be essential to remove barriers to innovation and encourage knowledge sharing across industry.

WE NEED MORE RESEARCH AND DEVELOPMENT TO SUPPORT:

- removing barriers to the use of and developing alternative SCMs
- updating construction standards to support innovations in materials and construction methods
- development of low carbon technology.



GLOSSARY

Aggregates: Aggregates for concrete comprise small stones, gravel and sand.

Biofuel: An alternative fuel that is developed from biological, natural and renewable sources.

Carbon dioxide (CO₂): A colourless, odourless and non-combustible gas. It is a greenhouse gas that contributes to global warming. Formed by complete combustion of fossil fuels (coal, natural gas, petroleum) and CO₂-containing products (such as limestone).

Carbon dioxide equivalents (CO₂-e): A measure that quantifies the global warming effect of different greenhouse gases in terms of the amount of carbon dioxide that would deliver the same global warming effect.

Carbon offsets: An action intended to compensate for the emission of CO₂-e into the atmosphere as a result of industrial or other human activity, especially when quantified and traded as part of a commercial scheme.

Cement: Cement is a powder manufactured through a closely controlled chemical combination of calcium, silicon, aluminium, iron and other ingredients. When cement is mixed with water, sand and gravel, it will form concrete and mortar.

Clinker: Clinker is a material produced by heating limestone and clay at a temperature of about 1400° – 1500°C. It is the basic ingredient of cement.

Embodied carbon: Greenhouse gas emissions associated with materials and construction processes throughout the whole life cycle of a building or infrastructure being the sum of upfront embodied carbon, in-use embodied carbon and end-of-life embodied carbon, measured as CO₂-e.

Embodied energy: The total energy necessary for an entire product life cycle including raw material extraction, transport, manufacture, assembly, installation, maintenance, repair, disassembly, replacement, deconstruction and/or decomposition. This includes renewable and non-renewable energy.

Environmental Product Declaration (EPD): An independently verified and registered document that communicates transparent and comparable information about the life-cycle environmental impact of products and services in a credible way. An EPD is compliant with the standard ISO 14025 and is known as a Type III environmental declaration.

Global Warming Potential (GWP): GWP is a measure of how much heat a greenhouse gas traps in the atmosphere relative to carbon dioxide (CO₂). It has been developed to compare the global warming impact of different gases. The GWP depends on how effective the gas is at trapping heat and how long it stays in the atmosphere before it breaks down.

Life Cycle Assessment (LCA): An analysis of the environmental and/or social impacts of a product, process or a service for its entire life cycle. It looks at the raw material extraction, production, manufacture, distribution, use and disposal of a product or building.

Mortar: Mixture of cement-like materials with water and sand (or other fine material). Used in masonry work to bind two masonry units together and then hardens in place.

Mortarless masonry: A method of building structures without mortar by stacking blocks with interlocking keys.

Net zero: Reduction of anthropogenic greenhouse gas emissions to zero or to a residual level that is consistent with reaching net zero emissions in eligible 1.5 °C pathways (hence time-bound) and neutralizing the impact of residual emissions (if any) by removing an equivalent volume of carbon.

Operational emissions: The emissions associated with energy used to operate the building or in the operation of infrastructure.

Potable water: Water that is suitable for human consumption.

Renewable energy: Renewable energy is energy that is produced from renewable sources such as energy from wind, hydro, solar, geothermal, tide, waves and biomass.

Scope 1 emissions: GHG emissions released to the atmosphere as a direct result of an activity, or series of activities at a facility level. Scope 1 emissions are sometimes referred to as direct emissions.

Examples are:

- emissions produced from manufacturing processes
- emissions from the burning of diesel fuel in trucks
- fugitive emissions, such as methane emissions from coal mines
- production of electricity by burning coal.

Scope 2 emissions: GHG emissions released to the atmosphere from the indirect consumption of an energy commodity. For example, 'indirect emissions' come from the use of electricity produced by the burning of coal in another facility.

Scope 3 emissions: Indirect GHG emissions other than Scope 2 emissions that are generated in the wider economy. They occur as a consequence of the activities of a facility, but from sources not owned or controlled by that facility's business. Some examples are extraction and production of purchased materials, transportation of purchased fuels, use of sold products and services and flying on a commercial airline by a person from another business.

Supplementary Cementitious Material (SCM): SCMs, or clinker substitutes, are a wide range of materials that can be used to replace part of the clinker in cement. They can either be blended with cement or used directly in concrete batching. They can be naturally occurring materials, industrial byproducts, or manufactured products. Examples include ground granulated blast furnace slag (GGBS), fly ash, silica fume, calcined clays (metakaolin) and natural pozzolans (high-silica volcanic ash and pumice).

Concrete Masonry Association of Australia

Suite 7.01, Level 7

154 Pacific Highway

St Leonards NSW 2065

Telephone +61 2 8448 5500

Technical hotline 1300 667 617

PO Box 275

St Leonards NSW 1590

www.cmaa.com.au

www.rtaa.com.au

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