

ENVIRONMENTAL PRODUCT DECLARATION

UniqueCem LCC



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Environmental Product Declaration in accordance with ISO 14025:2006 and EN15804:2021+A22019/AC:2021

An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com.

Product recently on the market – Results of this EPD shall be used with care as the LCI data is not yet based on 1 year of production which may result in increased uncertainty.



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WHAT IS AN ENVIRONMENTAL PRODUCT DECLARATION?

An Environmental Product Declaration (EPD) tells the environmental story of a product over its life cycle in a format that is clear and transparent. It is science-based, independently verified and publicly available. EPDs are often compared to the nutrition labels on food products.

EPDs help manufacturers translate complex sustainability information about their product's environmental footprint into simpler information that governments, companies, industry associations and end consumers can trust to make decisions.

An EPD communicates the environmental impacts at different stages in a product's life cycle. This may include the carbon emitted when it's made, and any emissions that pollute the air, land or waterways during its use.

This EPD covers the environmental impacts of UniqueCem LCC when used both inside and outside a building envelope subject to treatment level. The products are manufactured at Mannering Park facilities located in New South Wales, Australia.

This EPD is based on a 'cradle-to-gate' Life Cycle Assessment (LCA), with end-of-life options included. 'Cradle' refers to the raw material extraction and the 'gate' is the point of dispatch at the Mannering Park manufacturing facility as the product is ready to go out to customers.

UniqueCem Pty Ltd, as the EPD owner has the sole ownership, liability, and responsibility for the EPD.

INFORMATION ABOUT EPD OWNER



UniqueCem was founded with a vision to lead the transition to sustainable construction materials. As the Australian subsidiary of UniqueCem LCC LLC (Delaware, USA), we hold patents for innovative cement technologies designed to reduce emissions without compromising strength or functionality.

UniqueCem is at the forefront of sustainable cement innovation, dedicated to reducing the carbon footprint of the construction industry. As a licensed subsidiary of UniqueCem LCC LLC, our research and development efforts focus on producing high-quality cement from industrial waste materials such as fly ash and slag.

By turning by-products from coal-fired power stations and steel mills into valuable resources, we offer a revolutionary alternative to traditional cement, combining environmental responsibility with top-tier performance. UniqueCem is proud to provide a solution that not only meets Australian and international standards but also leads the way in the global shift towards greener, more sustainable building practices.

This research and innovation is carried out by our research and development company UniqueCem R&D Pty Ltd to further develop innovative construction and building solutions.



SUSTAINABILITY GOALS



Reduce reliance on high-emission cement production.



Promote the use of industrial by-products like fly ash and slag.



Expand research into alternative sustainable binders.

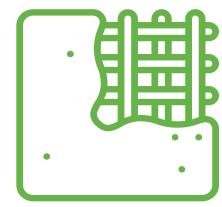
UNIQUECEM'S ENDURING COMMITMENT TO SUSTAINABILITY

We pledge to pursue continuous improvement throughout our value chain, ensuring every facet of our operations contributes to a positive and lasting impact.



CULTIVATING A CULTURE OF RESPONSIBILITY

UniqueCem Pty. Ltd. is dedicated to fostering a sustainable future for the Australian cement and concrete industry, the wider community and the environment. This commitment is deeply embedded within UniqueCem's corporate ethos. Our approach to sustainability is anchored in robust relationships with our employees, customers, suppliers, business partners, stakeholders, and the communities where we operate.



THE STRATEGIC IMPORTANCE OF ESSENTIAL MATERIALS

Materials such as cement, concrete, and masonry serve as indispensable foundations for the global economy. UniqueCem's products underpin vital sectors including construction, infrastructure, energy, mining, and agriculture. As the world transitions toward a lower-carbon future, our materials will play a pivotal role, facilitating sustainable growth and innovation throughout Australia.



COMMITMENT TO NET ZERO EMISSIONS

UniqueCem has set a clear objective to assist the Australian cement and concrete industry to achieve net zero greenhouse gas emissions by 2050. We acknowledge the considerable complexity involved, given the emissions-intensive nature of cement and lime production—processes recognised as challenging to decarbonise. Nevertheless, UniqueCem embraces its role as a facilitator striving to set industry benchmarks in emissions reduction and sustainable business practices.



INDUSTRY PROGRESS AND AMBITION

Significant progress has already been realised by the legacy industry with significant reductions already achieved. Building upon this accomplishment, UniqueCem's products will allow the continuation of these reductions through the introduction of lower carbon products derived from the circular economy.



CONTINUOUS IMPROVEMENT THROUGH COLLABORATION

For UniqueCem, sustainability is a continuous journey guided by improvement and collaboration. By engaging proactively with stakeholders across the supply chain, nurturing innovation, and adopting advanced technologies, we remain committed to delivering enduring positive outcomes for both the environment and Australian society.



PRODUCT INFORMATION

UniqueCem LCC is alkali-activated cement made from recycled and secondary materials.

It is an innovative cement alternative that transforms industrial waste into a high-performance construction material. Developed using proprietary chemistry, this dry-powder alkali-activated binder delivers the same strength and durability as traditional cement.

KEY FEATURES:

- Composed of 90% secondary materials (blast furnace slag & fly ash).
- Meets industry standards for strength and durability.
- Seamless integration into existing concrete batching systems (available in bulk or bags).
- Alkali-activated cement production process with minimal emissions.
- Low water demand.

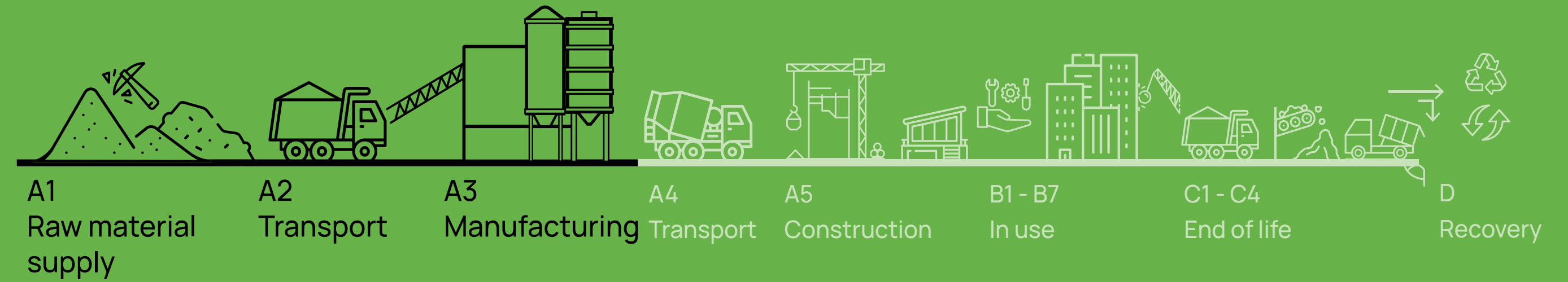
APPLICATIONS:

- Residential & commercial construction.
- Infrastructure & large-scale projects.
- Precast concrete products (pipes, masonry, etc.).
- Government & environmental Initiatives.



CERTIFICATION

Compliance to provisions of AS TS 199:2023 Design of geopolymers and alkali-activated binder concrete structures and ASTM C1157 Standard Performance Specification for Hydraulic Cement.



PRODUCT LIFE CYCLE

This EPD looks at the environmental impacts of extracting and processing raw materials, transporting these to the UniqueCem facilities and fabricating UniqueCem LCC. It also includes distributing UniqueCem products to clients across Australia.

REPRESENTATIVENESS OF EPD

This is an EPD of product recently on the market and is product-specific, based on production data from a single manufacturing facility at Mannering Park. Primary data was collected for 2025-04-01 to 2025-08-31. The product was recently put on the market, and data for one year of production is not available. The LCI data based on a shorter period of time, representing the initial production of the product is expected to be conservative, accounting for potential inefficiencies, initial losses, and uncertainties.

CLASSIFICATION

These tables show the relevant Australian standard and application for UniqueCem LCC.

Table 1: Industry classification

Product	Classification	Category
Cement	UN CPC Ver.2.1	Plaster, lime and cement
	ANZSIC 2006	Cement and Lime Manufacturing

CONTENT DECLARATION

The content declaration for this EPD is based on a specific product.

Table 2: Content declaration

Product components	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/product or declared unit
Ground Granulated Blast Furnace Slag (GGBFS)	670	0%	0%	0
Fly ash	230	0%	0%	0
Activator 1	50	0%	0%	0
Activator 2	30	0%	0%	0
Set regulator	15	0%	0%	0
Total	1 000	0%	0%	0

Table 3: Packaging declaration

Packaging materials	Mass, kg	Mass-%	Weight biogenic carbon, kg C/kg
PP bags	2	0.2%	0
Pallets	20	2%	9.33
Cardboard	0.017	0.002%	0.006
Total	22.0	2.2%	9.34



DANGEROUS SUBSTANCES FROM THE CANDIDATE

The product declared within this EPD does not contain substances exceeding the limits for registration according to the European Chemicals Agency's "Candidate List of Substances of Very High Concern for authorisation".

HOW TO USE THIS EPD

UniqueCem Pty Ltd has developed this product specific EPD to help to showcase the environmental credentials of their products.

This independently verified EPD provides environmental performance information from cradle to gate (modules A1-A3).

The results are presented for:

1 000 kg of UniqueCem LCC plus its packaging.

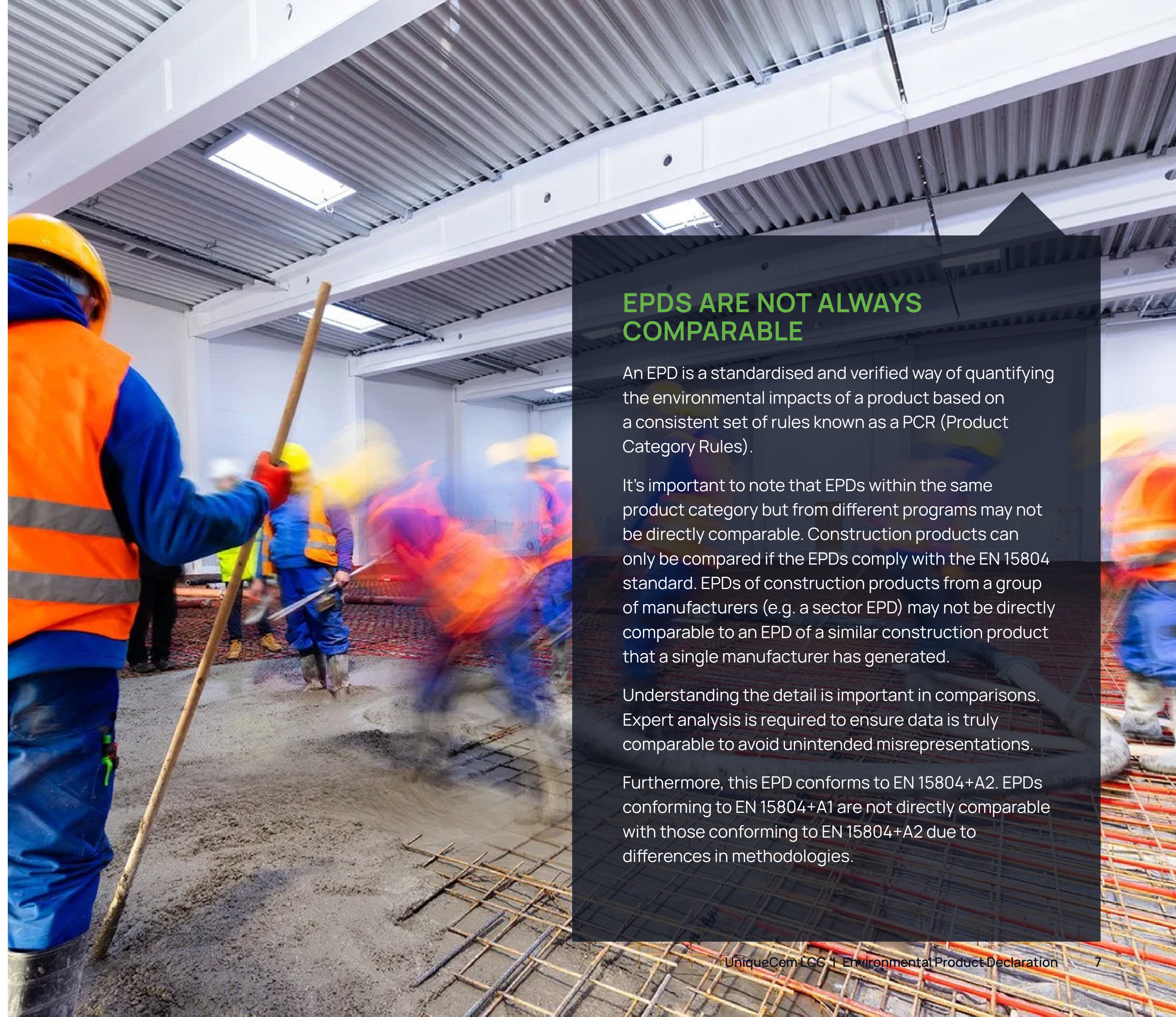
The results may be used by specifiers and developers to calculate and present the environmental impacts of particular construction projects.

GREEN STAR

Green Star is Australasia's largest voluntary sustainability rating system for non-residential buildings, fit-outs and communities

This EPD can allow the represented products to qualify for points under the Green Building Council Australia (GBCA) Green Star rating system.

The Green Star rating system has also been adopted and adapted for New Zealand conditions by the New Zealand Green Building Council.



EPDS ARE NOT ALWAYS COMPARABLE

An EPD is a standardised and verified way of quantifying the environmental impacts of a product based on a consistent set of rules known as a PCR (Product Category Rules).

It's important to note that EPDs within the same product category but from different programs may not be directly comparable. Construction products can only be compared if the EPDs comply with the EN 15804 standard. EPDs of construction products from a group of manufacturers (e.g. a sector EPD) may not be directly comparable to an EPD of a similar construction product that a single manufacturer has generated.

Understanding the detail is important in comparisons. Expert analysis is required to ensure data is truly comparable to avoid unintended misrepresentations.

Furthermore, this EPD conforms to EN 15804+A2. EPDs conforming to EN 15804+A1 are not directly comparable with those conforming to EN 15804+A2 due to differences in methodologies.

LCA INFORMATION

SYSTEM BOUNDARY

In Life Cycle Assessments (LCA), the system boundary is a line that divides the processes which are included from those which are excluded.

As shown in table 5, this EPD is of the type d) Cradle to gate (A1-A3); other life cycle stages (Modules A4-A5, B1-B7, C1-C4) are dependent on particular scenarios and best modelled at the building level.

The criteria used to define the scope as cradle-to-gate (A1-A3) followed the PCR requirements and are:

- UniqueCem LCC is physically and chemically integrated with other materials during the production of concrete, so UniqueCem LCC cannot be physically separated from the other materials at end of life,
- UniqueCem LCC is no longer identifiable at end of life because of physical and chemical transformation processes,
- UniqueCem LCC does not contain biogenic carbon, and
- The EPD is intended to be used for business-to-business communication.

DECLARED UNIT
THE DECLARED UNIT FOR THE EPD
1 000 KG OF UNIQUECEM LCC
PLUS ITS PACKAGING.

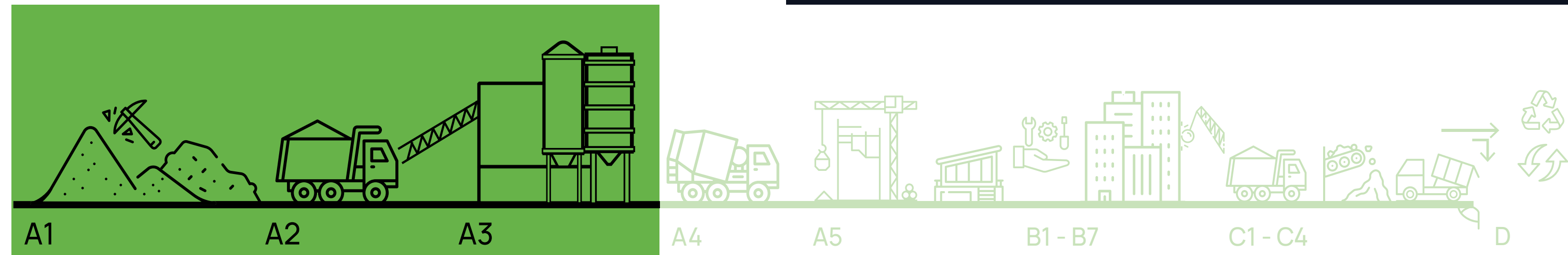


Table 4: Modules included in the scope of the EPD

Module	Product stage			Distribution/ installation stage		Use stage							End-of-life stage			Beyond product life cycle	
	Raw material	Transport	Manufacturing	Beyond product life cycle	Construction Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / demolition	Transport	Waste processing	Disposal	Future reuse, recycling or energy recovery potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Geography	GLO	GLO	AU	-	-	-	-	-	-	-	-	-	-	-	-	-	-

X = included in the EPD; ND = Module not declared (such a declaration shall not be regarded as an indicator result of zero)

MANUFACTURING PROCESS

The UniqueCem LCC cement is manufactured in a single site at Mannering Park (NSW, Australia), with no co-production. No waste other than packaging is generated. Bulk bags are reused.

Materials come in bulk. The other chemicals come in 40 kg bags. Materials are added to silos, which feed a cement batcher to a mixer. Raw materials are blended and packaged.

RAW MATERIAL SUPPLY (A1)

Extraction and processing of raw materials for base materials:

- Granulated blast furnace slag (GGBFS), derived from iron and steel manufacture
- Fly ash, derived from coal-fired power stations

TRANSPORT (A2)

Raw materials are sources from local and international sources. Land transport varies from 1-770 km, while sea transport varies from 8 000-11 000 km.

MANUFACTURING (A3)

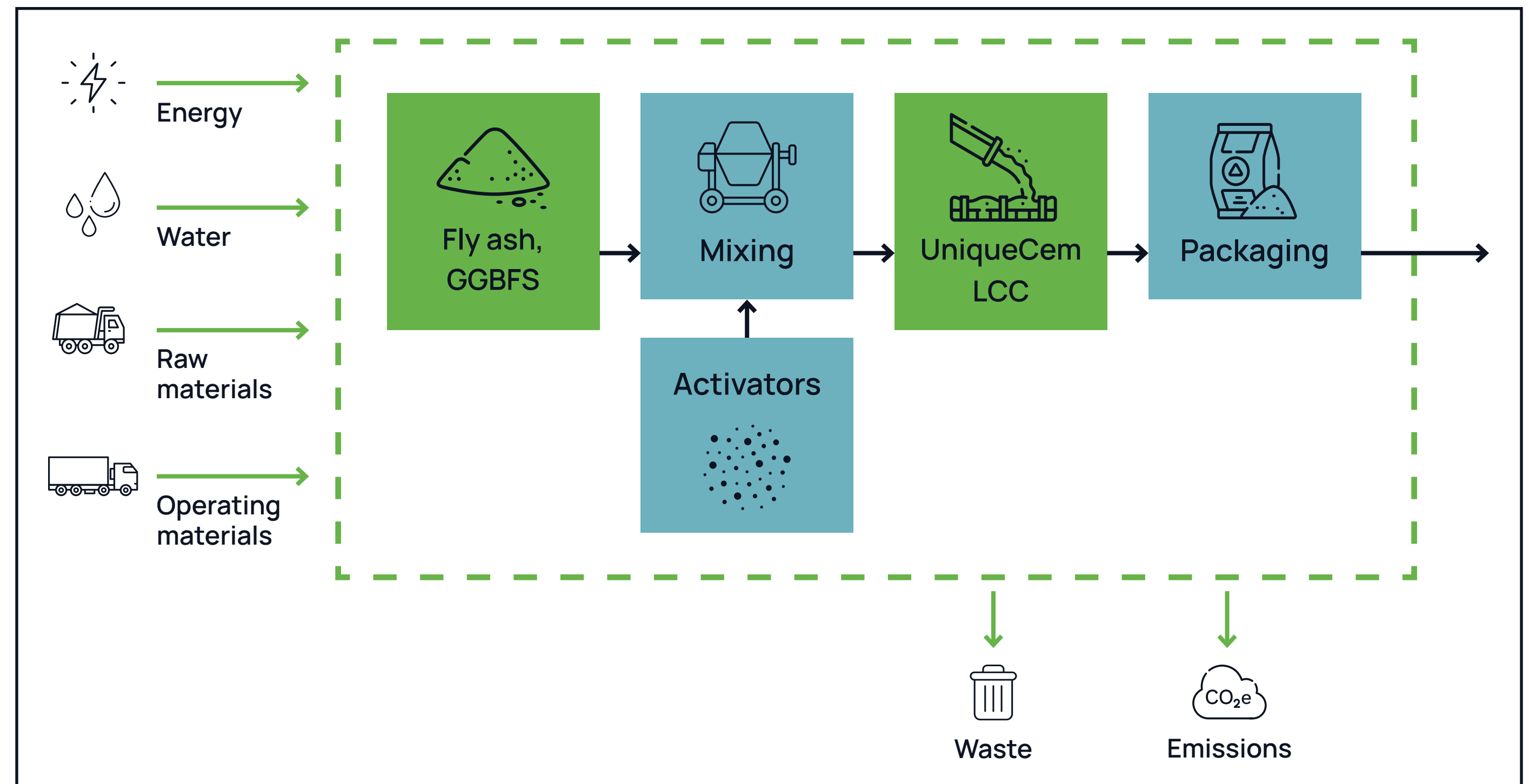
The manufacturing process includes the following process steps:

- Base materials, GGBFS and fly ash, are combined in a fixed proportion.
- Activators and regulators are added to the mix.

PRODUCT LIFE CYCLE

A high-level system boundary of the product life cycle is provided in Figure 1:

Figure 1. basic manufacturing processes



— System boundary
 - - - A3: Manufacturing

LCA SOFTWARE AND DATABASE

The LCA was conducted in Microsoft Excel. The LCA uses lifecycle inventory data from ecoinvent database version 3.11 (Wernet, 2016), system model 'Allocation, cut-off, EN15804', for several of the raw and process materials obtained from the background system. Both primary and background data fall within the EN 15804 and PCR requirements of 10 years for generic data and 5 years for producer-specific data.

The ecoinvent datasets have not been adapted as they are provided in Excel and have not been used in conjunction with an LCA software. This includes capital goods and infrastructure as they are included in the background datasets provided by the ecoinvent database for Excel, and it is not possible to subtract them within a reasonable effort.

ELECTRICITY

Electricity is directly supplied by a nearby coal thermal power plant, the Vales Point Power Station, operated by Delta.

The consumed electricity generated by the thermal power plant is diverted to UniqueCem before the electricity is sent to the grid. Vales Point Power Station sources coal from Chain Valley Colliery and other NSW mines. Electricity usage is accounted for from coal production as direct transmission from the plant (no distribution losses).

The emission factor for the electricity consumed from the hard coal power plant for the GWP-GHG indicator is 1.14 CO₂-eq/kWh (based on EF3.1).

RECYCLING AND RECYCLED INPUTS

UniqueCem LCC is produced using high proportions of recycled industrial by-products:

- Ground Granulated Blast Furnace Slag (GGBFS) from steel production.
- Fly ash from coal-fired power generation.

Neither of these inputs contributes to more than 10% of the GWP-GHG A1-A3 result.

TRANSPORT

The system includes all inbound transport of raw materials, auxiliary materials, and packaging to the manufacturing site at Mannering Park, New South Wales, Australia.

Inbound transport:

- Imported materials such as activators and the set regulator are transported by container ship from Vietnam and China to Australia, covering 8 000-11 000 km by sea, followed by 170-770 km by Euro 4 diesel trucks within Australia.
- GGBFS is shipped from Vietnam (~8 000 km) and trucked 170 km to the plant.
- Fly ash is sourced locally from Vales Point Power Station, located approximately 1 km from the production site, and transported by diesel truck.
- Packaging materials are trucked from suppliers within 118 km of the plant.
- Lubricants are trucked from suppliers at a distance of 50 km.





CUT OFF CRITERIA

Personnel-related processes are excluded as per section 4.3.2 in the PCR (EPD International, 2023).

thinkstep-anz consistently excludes environmental impacts from infrastructure, construction, production equipment, and tools that are not directly consumed in the foreground production process, ('capital goods') regardless of potential significance. High-quality infrastructure-related data isn't always available and there is no clear cut-off for what to include. For this reason, capital goods data are applied to LCA studies inconsistently. This is expected to lead to reduced consistency and comparability of EPDs. Capital goods were previously excluded from EPDs, thus including capital goods in current EPDs would further reduce their comparability.

In this study capital goods and infrastructure have been included in the background datasets as provided by ecoinvent (Wernet, 2016). It is not possible, within reasonable effort, to subtract the data on infrastructure/capital goods from these datasets.

In compliance with EN15804 6.3.5 and PCR 2019:14 (EPD International, 2025b), the following cut-off criteria were applied during data collection and analysis:

- Mass: If a flow is less than 1% of the cumulative mass of all the inputs and outputs of a unit process, it may be excluded, providing its environmental relevance is not a concern.
- The sum of all excluded material flows must not exceed 1% per unit process, or 5% per life cycle stage (A1-A3) of mass, energy or environmental relevance.
- If less than 100% of the inflows are accounted for, proxy data or extrapolation should be used to achieve 100% completeness.
- The following flows have been cut-off in line with the above rules:
 - Inbound packaging of raw materials.
 - End of life of inbound packaging of raw materials.

ALLOCATION

Where subdivision of processes was not possible, allocation rules listed in PCR chapter 4.5 have been applied. Allocation for input materials that contain secondary material occurs in the upstream datasets (such as fly ash and GGBFS). Allocation of impacts to these secondary materials follows the economic allocation method:

- GGBFS: Economic allocation between pig iron and slag based on AusLCI dataset 'blast furnace slag allocation, at steel plant/AU U'.
- Fly ash: Economic allocation factor of 0:100, as the fly ash is obtained free of charge from the nearby power station.

ASSUMPTIONS

- Production period: Primary data covers April-August 2025. As the product is new to the market, data for one full year of production were not yet available.
- System boundary: Cradle-to-gate (A1-A3) only. No downstream or use-stage impacts are included.
- Electricity: Supplied directly from Vales Point Power Station. Modelled as coal-based with no transmission losses.
- Transport: Sea freight for imported materials (8 000-11 000 km) and Euro 4 diesel trucks for local delivery.
- Pallet reuse: 90% reused, 10% landfilled.
- Biogenic carbon: Only present in packaging (wood pallets). Biogenic carbon dioxide was balanced out in Modules A1-A3.
- Economic allocation:
 - GGBFS allocated using AusLCI factor.
 - Fly ash allocated 0:100 (all burden to electricity generation).
- Infrastructure: Included through ecoinvent background datasets; no site-specific infrastructure modelling.

DATA QUALITY ASSESSMENT

Total share of primary data, of GWP-GHG results for A1-A3:

Table 5: Data sources and share of primary data

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
GGBFS	Collected data	Supplier's data, AusLCI (allocation)	2025	Primary data + representative secondary	4.8%
Fly ash	Collected data	Supplier's data, first principles	2025	Primary data + representative secondary	0%
Activator 1	Collected data	Supplier's data, first principles	2025	Primary data + representative secondary	6.7%
Activator 2	Collected data	Supplier's data, ecoinvent v3.11	2025	Primary data + representative secondary	4.5%
Set Regulator	Collected data	Supplier's data, first principles	2025	Primary data + representative secondary	3.0%
Electricity consumption	Database	ecoinvent v3.11	2024	Primary data	13.2%
Transport of input materials to manufacturing site	Database	ecoinvent v3.11	2024	Primary data	35.2%
Production of packaging	Database	ecoinvent v3.11	2024	Secondary data	0%
Other processes	Database	ecoinvent v3.11	2024	Secondary data	0%
Total share of primary data, of GWP-GHG results for A1-A3					67.3%

The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

Overall data quality assessment for A1-A3 is presented in Table 6.

Table 6: Data sources and share of primary data

Process	Geographical	Source	Reference year
GGBFS	Fair	Very Good	Very Good
Fly ash	Very Good	Very Good	Very Good
Activator 1	Very Good	Very Good	Very Good
Activator 2	Fair	Very Good	Very Good
Set Regulator	Very Good	Very Good	Very Good
Lubricant	Good	Very Good	Very Good
Electricity consumption	Very Good	Very Good	Very Good
Transport	Good	Good	Very Good
Water	Good	Good	Very Good

ASSESSMENT INDICATORS

An introduction the core environmental impact indicators is provided here. The best-known effect of each indicator is listed in the descriptions and the abbreviations, in brackets, correspond to the labels in the following results tables.

Table 7: Environmental impact indicators described



Climate change (global warming potential)

(GWP-total, GWP-fossil, GWP-biogenic, GWP-land use change)
A measure of greenhouse gas emissions, such as CO₂ and methane. These emissions are causing an increase in the absorption of radiation emitted by the earth, increasing the natural greenhouse effect. This may in turn have adverse impacts on ecosystem health, human health and material welfare. GWP is split into three sub-indicators: fossil, biogenic, and land-use and land-use change.



Ozone depletion potential (ODP)

Depletion of the ozone leads to higher levels of UVB ultraviolet rays reaching the earth's surface with detrimental effects on humans and plants. The Ozone Depletion Potential is a measure of air emissions that contribute to the depletion of the stratospheric ozone layer.



Acidification potential (AP)

Acidification Potential is a measure of emissions that cause acidifying effects to the environment. A molecule's acidification potential indicates its capacity to increase the hydrogen ion (H⁺) concentration in the presence of water, thus decreasing the pH value. Potential effects include fish mortality, forest decline, and the deterioration of building materials.



Eutrophication potential (EP-freshwater, EP-marine, EP-terrestrial)

Eutrophication covers all potential impacts of excessively high levels of macronutrients, the most important of which are nitrogen (N) and phosphorus (P). In aquatic ecosystems where this term is mostly applied, this typically describes a degradation in water quality. Eutrophication can result in an undesirable change in the type of species that flourish and an increase in the production of biomass. As the decomposition of biomass consumes oxygen, eutrophication may decrease the available oxygen level in the water column and threaten fish in their ability to respire.



Photochemical ozone formation potential (POCP)

Photochemical Ozone Formation Potential gives an indication of the emissions from precursors that contribute to ground level smog formation, mainly ozone (O₃). Ground level ozone may be harmful to human health and ecosystems and may also damage crops. These emissions are produced by the reaction of volatile organic compounds (VOCs) and carbon monoxide in the presence of nitrogen oxides and UV light.



Abiotic resource depletion (ADP-m&M, ADP-fossil)

The consumption of non-renewable resources decreases the availability of these resources and their associated functions in the future. Depletion of mineral resources and non-renewable energy resources are reported separately. Depletion of mineral resources is assessed based on total reserves.



Water use deprivation (WDP)

Water scarcity is a measure of the stress on a region due to water consumption.

The results tables describe the different environmental indicators for each product per declared unit, for each declared module. The EN 15804 reference package based on EF 3.1 is used. The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

The use of primary energy is separated into energy used as raw material and energy used as energy carrier as per option C in Annex 3 in the PCR (EPD International, 2024). Energy indicators (MJ) are always given as net calorific value. Biogenic carbon and/or recovered energy leaving the product system in module A5 has been balanced out already in modules A1-A3.

ENVIRONMENTAL PERFORMANCE

ENVIRONMENTAL IMPACT INDICATORS

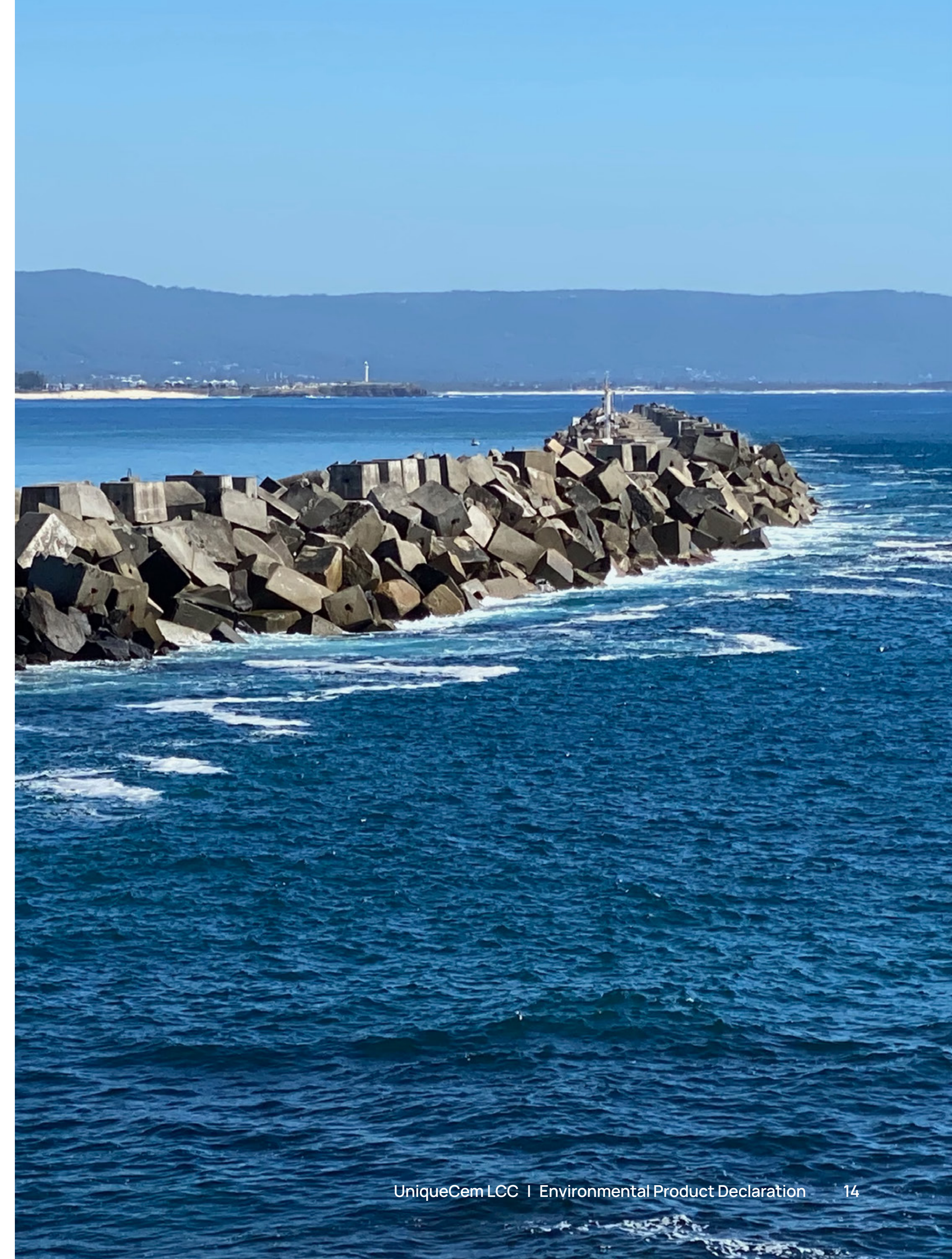
The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. The EN 15804 reference package based on EF 3.1 is used. Results for 1 000 kg of cement.

Table 8: EN15804+A2 Environmental impact indicators

Core			Production
Impact Category	Indicator	Unit	A1-A3
Climate change - total	GWP-total	kg CO ₂ eq.	233
Climate change - fossil	GWP-fossil	kg CO ₂ eq.	232
Climate change - biogenic	GWP-biogenic	kg CO ₂ eq.	0.684
Climate change - land use and land use change	GWP-luluc	kg CO ₂ eq.	0.228
Ozone Depletion	ODP	kg CFC-11 eq.	2.54E-05
Acidification	AP	Mole of H ⁺ eq.	3.12
Eutrophication aquatic freshwater	EP-freshwater	kg P eq.	0.0834
Eutrophication aquatic marine	EP-marine	kg N eq.	0.680
Eutrophication terrestrial	EP-terrestrial	Mole of N eq.	7.80
Photochemical ozone formation	POCP	kg NMVOC eq.	2.07
Depletion abiotic resources - minerals & metals ^{1,2}	ADP-minerals & metals	kg Sb eq.	0.00272
Depletion abiotic resources - fossil fuels ¹	ADP-fossil	MJ	2,630
Water use ¹	WDP	m ³ world equiv.	88.2

1 The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

2 The results of the impact categories abiotic depletion of minerals and metals, land use, human toxicity (cancer), human toxicity, noncancer and ecotoxicity (freshwater) may be highly uncertain in LCAs that include capital goods/infrastructure in generic datasets, in case infrastructure/capital goods contribute greatly to the total results. This is because the LCI data of infrastructure/capital goods used to quantify these indicators in currently available generic datasets sometimes lack temporal, technological and geographical representativeness. Caution should be exercised when using the results of these indicators for decision-making purposes.



ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

Optional environmental impact categories provide further information on environmental impacts.

Table 9: EN15804+A2 additional environmental impact indicators

Additional			Production
Impact Category	Indicator	Unit	A1-A3
Global warming potential ²	GWP-GHG	kg CO ₂ -eq.	232
IPCC AR5 GWP-GHG ³	GWP-GHG (IPCC AR5)	kg CO ₂ -eq.	236
Respiratory inorganics	PM	Disease incidences	1.47E-05
Ionising radiation – human health ⁴	IRP	kBq U235-eq.	7.26
Ecotoxicity – freshwater ^{1,5}	ETP-fw	CTUe	4,830
Human toxicity, cancer effects ^{1,5}	HTP-c	CTUh	9.94E-05
Human toxicity, non-cancer effects ^{1,5}	HTP-nc	CTUh	9.14E-05
Land use related impacts / soil quality ^{1,5}	SQP	Pt	4,830

1 The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

2 This indicator should be identical to GWP-total except that the CF for biogenic CO₂ is set to zero. It has been included in the EPD following the PCR (EPD International, 2024b). In this study it is calculated by subtracting the value of Climate change – biogenic (GWP-biogenic) from the value of Climate change – total (GWP-total) since the ecoinvent Excel LCIA results do not include the indicator.

3 GWP-GHG (IPCC AR5) is an additional GWP100 indicator that is aligned with the Intergovernmental Panel on Climate Change (IPCC) 2013 Fifth Assessment Report (AR5) (IPCC 2013), national greenhouse gas reporting frameworks in Australia and New Zealand and previous versions of the Construction Products PCR (PCR2019:14v1.3.2). It excludes biogenic carbon and indirect radiative forcing.

4 This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

5 The results of the impact categories abiotic depletion of minerals and metals, land use, human toxicity (cancer), human toxicity, noncancer and ecotoxicity (freshwater) may be highly uncertain in LCAs that include capital goods/infrastructure in generic datasets, in case infrastructure/capital goods contribute greatly to the total results. This is because the LCI data of infrastructure/capital goods used to quantify these indicators in currently available generic datasets sometimes lack temporal, technological and geographical representativeness. Caution should be exercised when using the results of these indicators for decision-making purposes.

RESOURCE USE INDICATORS

The resource use indicators describe the use of renewable and non-renewable material resources, renewable and non-renewable primary energy and water.

Table 10: Use of resources

Resource			Production
Parameter	Indicator	Unit	A1-A3
Renewable primary energy as energy carrier	PERE	MJ	412
Renewable primary energy resources as material utilisation	PERM	MJ	0
Total use of renewable primary energy resources	PERT	MJ	412
Non-renewable primary energy as energy carrier	PENRE	MJ	2,390
Non-renewable primary energy as material utilisation	PENRM	MJ	0
Total use of non-renewable primary energy resources	PENRT	MJ	2,390
Use of secondary material	SM	kg	904
Use of renewable secondary fuels	RSF	MJ	7.59
Use of non-renewable secondary fuels	NRSF	MJ	0
Use of net fresh water	FWT	m ³	2.00

WASTE MATERIAL AND OUTPUT FLOW INDICATORS

Waste indicators describe waste generated within the life cycle of the product. Waste is categorised by hazard class, end of life fate and exported energy content.

Table 11: Waste production and output flows

Inventory			Production
Parameter	Indicator	Unit	A1-A3
Hazardous waste disposed	HWD	kg	26.1
Non-hazardous waste disposed	NHWD	kg	521
Radioactive waste disposed	RWD	kg	5.11E-04
Components for re-use	CRU	kg	18.0
Materials for recycling	MFR	kg	0
Materials for energy recovery	MER	kg	0
Exported electrical energy	EEE	MJ	0
Exported thermal energy	EET	MJ	0

BIOGENIC CARBON CONTENT

Biogenic carbon refers to the carbon stored in organic materials. This is sequestered during growth and released at end of life. EN15804+A2 requires the declaration of biogenic carbon content of the product and its packaging. 1 kg biogenic carbon is equivalent to XX kg CO₂.

Table 12: Biogenic carbon content results

Carbon			Production
Parameter	Indicator	Unit	A1-A3
Biogenic carbon content – product	BCC-prod	kg	0
Biogenic carbon content – packaging	BCC-pack	kg	9.34



ABBREVIATIONS

General abbreviations	
ANZSIC	Australian and New Zealand Standard Industrial Classification
ASTM	American Society for Testing and Materials
CEN	European Committee for Standardization
CPC	Central Product Classification
EF	Environmental Footprint
EPD	Environmental Product Declaration
GBCA	Green Building Council of Australia
GGBFS	Ground Granulated Blast Furnace Slag
GHG	Greenhouse Gas
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
LCI	Life Cycle Inventory
PCR	Product Category Rules
PP	Polypropylene
R&D	Research and Development

Environmental Impact Indicators	
ADP-minerals & metals	Abiotic Depletion Potential, minerals and metals
ADP-fossil	Abiotic Depletion Potential, fossil fuels
AP	Acidification Potential
EP	Eutrophication Potential
EP-freshwater	Freshwater eutrophication potential
EP-marine	Marine eutrophication potential
EP-terrestrial	Terrestrial eutrophication potential
GWP	Global Warming Potential
GWP-total	Total global warming potential
GWP-fossil	Fossil global warming potential
GWP-biogenic	Biogenic global warming potential
GWP-luluc	Global warming potential from land use and land use change
GWP-GHG	Global warming potential (greenhouse gases only)
IRP	Ionising Radiation Potential (human health)
ODP	Ozone Depletion Potential
POCP	Photochemical Ozone Creation Potential
PM	Particulate Matter
SQP	Soil Quality Potential
WDP	Water Deprivation Potential

Resource Use Indicators	
FWT	Use of net fresh water
NRSF	Use of non-renewable secondary fuels
PENRE	Non-renewable primary energy as energy carrier
PENRM	Non-renewable primary energy as material utilisation
PENRT	Total use of non-renewable primary energy resources
PERE	Renewable primary energy as energy carrier
PERM	Renewable primary energy resources as material utilisation
PERT	Total use of renewable primary energy resources
RSF	Use of renewable secondary fuels
SM	Use of secondary material

Waste and Output Flow Indicators	
BCC-prod	Biogenic carbon content of product
BCC-pack	Biogenic carbon content of packaging
CRU	Components for re-use
EEE	Exported electrical energy
EET	Exported thermal energy
HWD	Hazardous waste disposed
MER	Materials for energy recovery
MFR	Materials for recycling
NHWD	Non-hazardous waste disposed
RWD	Radioactive waste disposed

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GENERAL INFORMATION

An Environmental Product Declaration (EPD) is a standardised and verified way of quantifying the environmental impacts of a product based on a consistent set of rules known as a PCR (Product Category Rules). The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but published in different EPD programmes may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

The results for EN15804+A1 compliant EPDs are not comparable with EN15804+A2 compliant studies as the methodologies are different. To support backwards comparability and compatibility, environmental performance results have also been provided for the indicators required in EN15804+A1, although the study does not claim compliance with this standard.

Programme information

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Product Category Rules (PCR)

CEN standard EN 15804+A2 served as the core Product Category Rules.	
PCR	PCR 2019:14 Construction Products, version 2.0.1 (published on 2025-06-05, valid until 2030-04-07)
PCR review conducted by	The Technical Committee of the International EPD System. See www.environdec.com for member list.
Review Chairs	Rob Rouwette, start2see Pty Ltd (chair), Noa Meron, thinkstep Ltd (co-chair). The review panel may be contacted via the Secretariat at www.environdec.com/support

Information about EPD owner

Declaration owner	UniqueCem	LCA accountability	thinkstep Pty Ltd; Barbara Nebel, Gustavo Moraga, Isabella Pincelli
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Geographical scope	Australia		
Reference year	2025-04-01 to 2025-08-31		

Version history	001	2026-02-09	Original version of the EPD.
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Verification

External and independent ('third-party') verification of the declaration and data, according to ISO 14025:2006, via EPD verification through:

<input checked="" type="checkbox"/> Individual EPD verification without a pre-verified LCA/EPD tool	<input type="checkbox"/> EPD Process Certification* without a pre-verified LCA/EPD tool	<input type="checkbox"/> Fully pre-verified EPD tool
<input type="checkbox"/> Individual EPD verification with a pre-verified LCA/EPD tool	<input type="checkbox"/> EPD Process Certification* with a pre-verified LCA/EPD tool	
Third party verifier	Kimberly Robertson	
	Email: kimberlyrobertson@extra.co.nz	
Verifier approved by	EPD Australasia and The International EPD System	
Procedure for follow-up of data during EPD validity involves third-party verifier	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	



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