

Low Carbon Concrete Carbon Accounting Guide



This document provides guidance for councils to measure, report and reduce the carbon impact of concrete, supporting low-carbon decisions across projects.

Introduction

Concrete is a fundamental material used on council projects, from footpaths and drainage infrastructure to buildings and car parks. Concrete represents 7-8% of the global carbon emissions. The principal source of carbon emissions in concrete is from the production of Portland cement

Intent of the guide

This guide is developed to help councils understand how choices to utilise low carbon concrete connect to **emissions reporting, sustainability schemes, and broader decarbonisation goals**. It aims to make the sustainability benefits of low carbon concrete clear and actionable at organisational and project scale.

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Why measure the carbon impact of concrete?

Sustainability benefits of low carbon concrete

The sustainability benefits of low carbon concrete go beyond reducing carbon (greenhouse gas) emissions. These broader benefits provide additional motivation for councils to pursue more sustainable outcomes when procuring concrete.

Key benefits include:

- **Reduced greenhouse gas emissions**, through lower embodied carbon associated with cement replacement and more efficient use of resources.
- **Reduced virgin material extraction and consumption**, by lowering demand for finite natural resources like crushed rock and sand.
- **Lower environmental impacts on nature**, including reduced land use and water consumption associated with quarrying and mining activities.
- **Waste diversion from landfill**, through the reuse of coal combustion products (fly ash) and other process by products (blast furnace slag), and construction materials such as crushed concrete or recycled glass fines as aggregates.
- **Contributing to a circular economy**, by using recycled content such as crushed concrete for coarse aggregate, which extends the useful life of materials that may otherwise become waste.

The importance of measurement

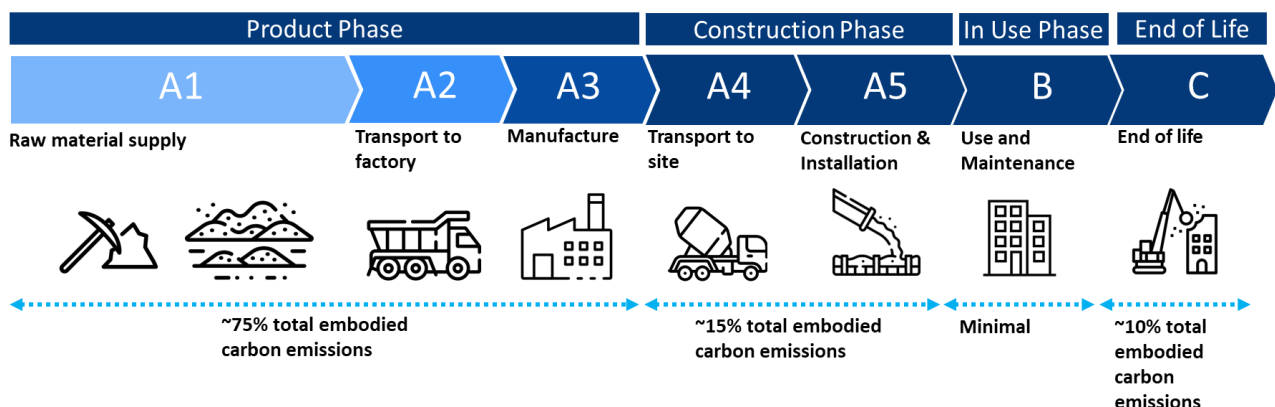
Measuring the **embodied carbon** or **Scope 3 emissions** (supply chain emissions) of concrete enables councils to quantify and improve the sustainability outcomes of their projects and/or organisation and track progress against net zero emissions targets. It supports evidence-based decision-making to reduce emissions, enables councils to benchmark performance, and demonstrates improvements over time. Transparent reporting helps councils communicate achievements to their communities and stakeholders, while preparing for emerging policies that increasingly prioritise embodied carbon or Scope 3 emissions reduction.

Project scale: Concrete embodied carbon

How does concrete contribute to the embodied carbon of a project?

Embodied carbon refers to the greenhouse gas emissions released during the extraction of raw materials, manufacturing, transportation, construction, and disposal of a product or material. For concrete, most of these emissions occur before the material even reaches the construction site, making it a critical focus for reducing the overall carbon footprint of infrastructure and building projects. Measurement of the upfront or embodied emissions of concrete within a construction project can also support a council's efforts to measure, report, reduce their Scope 3 greenhouse gas emissions and total contribution to global warming. Information on the measurement of concrete for a council Scope 3 emissions is detailed in [Organisation scale: Scope 3 emissions](#) below. For information on embodied carbon and life cycle stages see [Appendix A](#).

Concrete is the most widely used construction material in the world and is responsible for 6-10% of global carbon dioxide (CO₂) emissions. Cement in concrete is responsible for the majority of concrete's carbon emissions and the proportion of cement content can greatly influence concrete carbon impact. The below diagram presents the approximate proportion of embodied carbon associated with each of the life cycle stages. For further information on the impact of each stage for concrete see the IStructE Short guides to carbon factors by Arup [here](#).



The embodied carbon for concrete can vary depending on raw material extraction, processing and manufacturing techniques, supplementary cementitious materials, admixtures, transportation mode and distance, concrete strength and performance requirements and use of water. Additionally, the source of the data for the life cycle indicators (or carbon factors) will impact the overall carbon calculated for a concrete mix.

The [Australian Concrete Benchmark & Classification](#) tool can be used to compare reported values of embodied carbon for different concrete mixes in Australia. This is based on published environmental product declarations.

What are the NSW embodied carbon policies relevant to council projects?

There are existing policies relating to embodied carbon that may influence built environment projects by NSW councils. By extension these policies motivate the implementation of low carbon concrete. As embodied carbon continues to become a climate priority, policy will continue to emerge, and councils can expect additional regulations in the future.

Some council projects may be subject to mandatory embodied carbon measurement and reporting where reporting is required under the Infrastructure NSW (INSW) Decarbonising Infrastructure Delivery Policy (DIDP) or the NSW State Environmental Planning Policy (SEPP).

These requirements do not apply to most council projects.

It is important that councils and developers within their local government areas (LGAs) are aware of the evolution of embodied carbon requirements and measurement capabilities. *Table 1* includes information on current policies that may apply to council projects. These policies may affect only a small portion of projects by councils. However, councils should be aware of these policies as they may impact projects within their LGAs and local supply chains. In some cases, council may be seeking sustainability certifications, further details on these are provided in [Appendix B](#).

Table 1 Embodied carbon accounting policies in NSW

Policy	What projects it applies to	Embodied carbon requirements
INSW DIDP Infrastructure NSW Decarbonising Infrastructure Delivery (DID) Policy	NSW Government infrastructure delivery agencies projects. Public building projects over \$50 million and linear infrastructure projects over \$100 million.	Requires upfront carbon (embodied carbon) to be measured, reported, and considered in decision-making for public infrastructure projects.
NSW SEPP Sustainable Buildings State Environmental Planning Policy (SEPP)	All non-residential new buildings in NSW with an estimated development cost over \$5 million (and any renovation with an estimated development cost over \$10 million). All new residential buildings and renovations valued over \$50,000 in NSW must apply the Building Sustainability Index (BASIX) standards as part of the Development Application (DA) process.	Mandates disclosure of embodied emissions by a qualified professional. The process is aligned with the NABERS Embodied Carbon Framework. Requires upfront emissions (A1-A3) reporting using the EPiC database. Performance is scored as reduction per occupant from the average. For concrete, SCM content and strength class must be reported to claim reductions.

The decision-making tree in *Figure 1* can be used to identify applicable carbon policies for a council project.

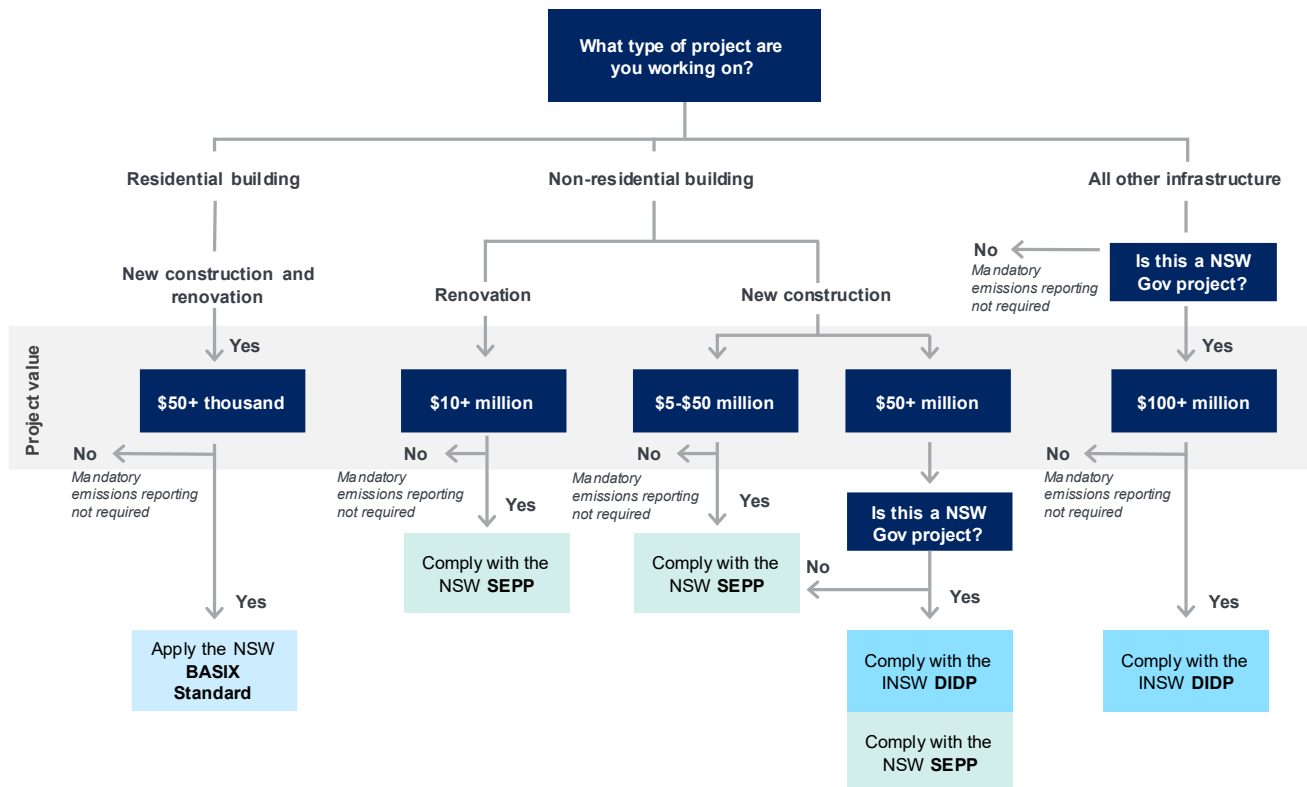


Figure 1 Decision-making tree for project applicability against embodied carbon accounting policies

How to measure the embodied carbon impact of concrete

This section outlines the tools and methods available to assess the embodied carbon of concrete utilised on a council project. The below outlines options, based on availability of data recommended for councils when calculating the embodied carbon of concrete works.

INSW have developed an emission factor hierarchy to guide preferencing of data sources for carbon calculations. This guide has been developed to align to it. This hierarchy can be found in Table 5.2 of the [Embodied Carbon Measurement for Infrastructure Technical Guidance](#).

For detailed information on calculating embodied carbon at a whole of project scale refer to [Embodied Carbon Measurement for Infrastructure Technical Guidance](#) which provides a consistent measurement framework for embodied carbon for NSW Government and associated entities.

Option 1 (Preferred): Source carbon data from a verified Environmental Product Declaration (EPD) or Product Carbon Footprint (PCF)

A product-specific emission factor, typically provided in an ISO14025 Environmental Product Declaration (EPD) or ISO14067 Product Carbon Footprint (PCF) is the most accurate source of carbon data.

What data do I need for Option 1?

To undertake the embodied carbon measurement under Option 1, councils should source or request the following information:

- Total volume of concrete procured (m³).
- Verified Environmental Product Declaration (EPD) or Product Carbon Footprint (PCF) – specifically the global warming potential for the concrete mix being used
- Optional: concrete mix design details – this will include quantities of total cementitious content (cement & supplementary cementitious materials), aggregates and water to cement ratio.

How do I calculate carbon from a verified EPD or PCF?

The steps to calculate the carbon associated with concrete using an EPD or PCF are outlined below. Refer to [Appendix C](#) for guidance on how to read an EPD or PCF.

1. Request an EPD from the supplier for the specific concrete mix being used on the project. Where an EPD is available follow the steps below. Where an EPD or PCF is not available refer to Option 2 or Option 3.
2. Identify the concrete mix/product within the EPD or PCF that corresponds to the mix being used on the project.
3. Source the global warming potential (GWP) value for that mix. Use the GWP reported for the product stage (A1–A3).
4. Multiply the GWP number by the volume of concrete of that mix type procured for the project. This provides the embodied carbon associated with the product stage of that concrete mix.

An Environmental Product Declaration (EPD) covers multiple environmental impacts of a product lifecycle. A Product Carbon Footprint (PCF) is an alternative to an EPD that covers embodied carbon only. A PCF should be developed in accordance with ISO 14067 and should be independently verified.

Option 2: Calculate the embodied carbon based on the concrete mix design

Where there is no verified EPD or PCF for the concrete mix, an estimation method can be used to calculate the carbon impact of the concrete.

What data do I need for Option 2?

To undertake the embodied carbon estimate, councils should source and/or request the following information from:

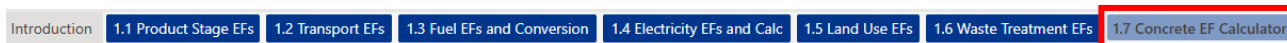
- Total volume of concrete procured (m³)
- Concrete mix design details – this will include quantities of total cementitious content (cement & supplementary cementitious materials), aggregates and water to cement ratio.

How do I calculate carbon from a concrete mix design?

The [Embodied Carbon Databook](#) (ECD) is the recommended tool for estimating embodied carbon for concrete when an EPD or PCF is not available. The ECD is owned, managed and updated by INSW and is based on industry average and generic emission factor data. It is recommended to check and use the latest available version of the ECD.

The steps to calculate the embodied carbon of a concrete mix are as follows:

1. Navigate to the “1.7 Concrete EF calculator” tab in the [Embodied Carbon Databook](#).



2. Enter the quantities of each constituent material in the concrete mix into Table 1.7a.

Component	Mix Option 1 (kg/m ³)	Mix Option 2 (kg/m ³)	Mix Option 3 (kg/m ³)
General purpose cement			
Fly ash			
GGBF slag			
Silica Fume			
Fine Aggregates			
Coarse Aggregates			
Recycled Aggregates			
Manufactured sand			
Mains Water			
Onsite Recycled / Captured Water			
Admixture			
Carbon intensity (A1 - A3) (kgCO _{2e} /m ³)*	0.0	0.0	0.0

3. The sheet will calculate the carbon intensity of the concrete mix based on the data input into the blue cells. Multiply the calculated carbon intensity (highlighted in red) by the volume of concrete of that mix type procured. This provides the embodied carbon associated with the product stage of that concrete mix.

Table 1.7a Concrete mix design inputs and resulting emission factors

Component	Mix Option 1 (kg/m ³)	Mix Option 2 (kg/m ³)	Mix Option 3 (kg/m ³)
General purpose cement	265		
Fly ash	106		
GGBF slag	159		
Silica Fume			
Fine Aggregates	770		
Coarse Aggregates	1050		
Recycled Aggregates			
Manufactured sand			
Mains Water	180		
Onsite Recycled / Captured Water			
Admixture	2.15		
Carbon intensity (A1 - A3) (kgCO₂e/m³)*	341.7	0.0	0.0

Option 3: Utilise LOCCA industry informed baselines

When the concrete mix details, an EPD or a PCF are unavailable, the LOCCA industry informed baseline can be utilised. This baseline was developed through industry consultation with suppliers, reflecting the Hunter region's business as usual practice of typically 25% fly ash replacement. The baseline has been calculated for a typical mix design using the [Embodied Carbon Databook](#) (ECD).

The steps to benchmark the embodied carbon of a concrete mix are as follows:

1. Review the LOCCA industry informed baselines.
2. Select the concrete strength grade corresponding to the concrete being procured. LOCCA baseline values for commonly used council concrete grades are provided below.

Table 2: LOCCA industry informed baselines

Compressive Strength Grade (MPa)	A1-A3 Embodied Carbon (kg CO ₂ e/m ³)
20	245
25	265
32	305
40	365
50	450

3. Multiply the A1-A3 reported carbon by the volume of concrete of that mix type procured. This provides the embodied carbon associated with the product stage of that concrete mix.

Transport for New South Wales has a concrete mix register with pre-approved concrete mixes that comply with their specifications. This mix register outlines the A1-A3 global warming potential in kgCO₂e/m³ for the approved mixes calculated using generic emission factors of concrete mix constituents. The Concrete Mix Register can be found [here](#).

Organisation scale: Scope 3 emissions

How does concrete contribute to a council's Scope 3 emissions?

Scope 1, 2 and 3 emissions are greenhouse gas emissions related to the operations and value chain of an organisation. Embodied emissions of concrete used in council works contribute to council Scope 3 emissions.

Scope 3 emissions are greenhouse gas emissions that occur outside the council's direct operations, as a consequence of its activities. While the council does not directly manufacture concrete, it is used within council activities when procured for construction, maintenance and upgrades of buildings and infrastructure. This means it can be categorised as an indirect emission and is counted under Scope 3, as a material and construction-related emission.

Measurement of the embodied emissions of concrete used within a council's works supports the council's efforts to:

- Report Scope 3 emissions;
- Identify, track and manage risks and opportunities when transitioning to lower carbon outcomes; and
- Support in climate-related disclosures.

Many councils are starting to commit to measuring, reporting and reducing their Scope 3 greenhouse gas emissions as part of their net-zero targets.

As councils work towards understanding and reducing the Scope 3 emissions and responding to public expectations, understanding the carbon impact of construction materials has become increasingly important. Low carbon concrete provides a tangible opportunity to reduce these impacts.

The use of concrete in council projects falls within Scope 3 emissions, Category 1: Purchased Goods and Services. There are four methods for calculating Category 1 under the Greenhouse Gas (GHG) Protocol Guidance, these are outlined below in order of increasing accuracy. Commentary is added with respect to concrete.

Increasing Accuracy



- **Supplier-specific method** – utilises product-level cradle-to-gate GHG emission data from goods or services suppliers. For concrete this requires the use of an environmental product declaration (EPD) or product carbon footprint (PCF). In general, supplier specific data will be a lower emissions impact than the impact calculated through the spend based method.
- **Hybrid method** – uses a combination of supplier-specific data (where available) and secondary data to fill the gaps. For concrete this may include utilising known quantities of concrete and details on the concrete mix to enable the greenhouse gas emissions to be calculated using the Infrastructure NSW Embodied Carbon Databook.
- **Average-data method** – estimates the emissions by collecting data on the quantity (e.g., kilograms or volume) of goods or services purchased and multiplying by the relevant secondary emission factors (e.g., industry average emissions per m³ of concrete).
- **Spend-based method** – estimates the emissions by collecting data on the economic value of goods and services purchased and multiplying it by relevant secondary emission factors (e.g., average emissions per monetary value of goods). This is the common approach currently being adopted by councils within NSW for construction works, including the use of concrete and asphalt.

Currently within councils there are limitations on the data that is collected for the use of concrete on projects. This typically includes spend data only.

The GHG Protocol provides standard and tools for measuring Scope 1, 2 and 3 emissions for an organisation. The *Greenhouse Gas Protocol Technical Guidance for Calculating Scope 3 Emissions (v1.0)* is commonly used to provide methods for calculation of Scope 3 emissions. *Figure 2* below outlines the decision tree to select the calculation method for Category 1: Purchased Goods and Services that is outlined within the GHG Protocol Technical Guidance. The decision tree has been updated for this carbon accounting guide to be specific for council use of concrete. The supplier specific method is the most accurate and representative method.

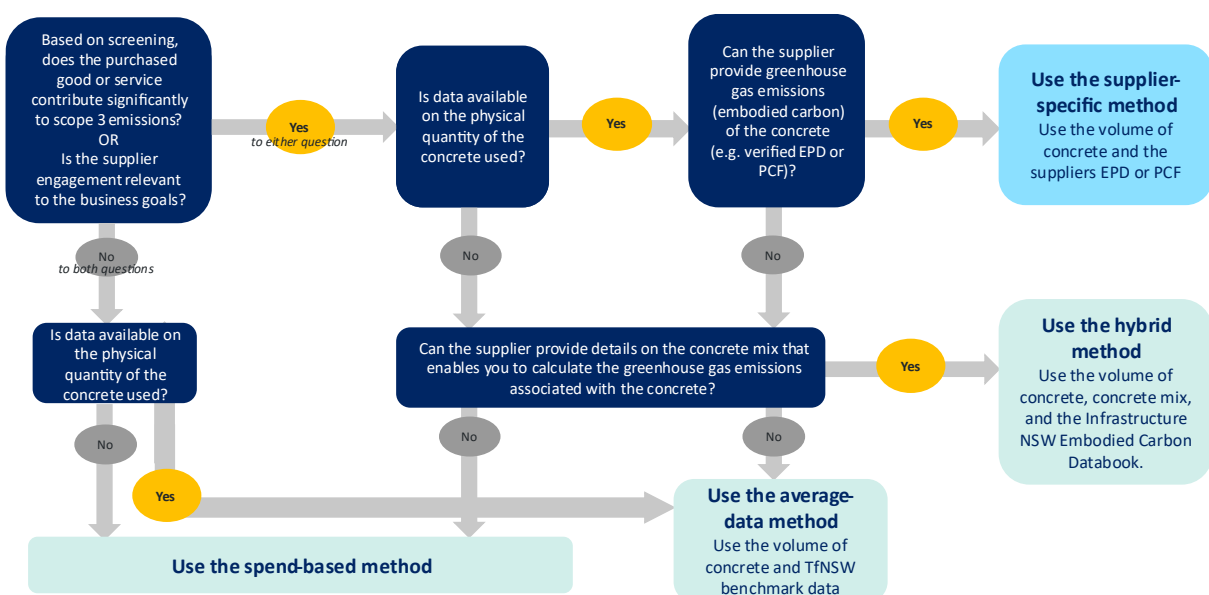


Figure 2: Decision tree for selecting a calculation method for emissions for concrete within Category 1 purchased goods and services, adapted from *Greenhouse Gas Protocol Technical Guidance for Calculating Scope 3 Emissions (v1.0)*.

When should a council assess the carbon impact of concrete?

Project scale

Ideally, carbon impacts should be assessed for every project. However, it is recognised that the project scale influences a council's capacity and capability to undertake carbon calculations.

Since the drivers and governing policy may be different depending on the project size and type, councils should consider how to change and adapt their approach accordingly to ensure the reporting outcomes are effective for the applicable carbon accounting requirements. See the *Low Carbon Concrete Project Data Capture Template* for the recommended data to collect with respect to concrete use on council projects. It is becoming more important that this data is collated to enable councils to assess the total impact of the concrete procured.

The below outlines three project scales with recommendations on reporting frequency. The division by project scale exists to cover the spectrum of carbon accounting requirements where smaller projects should have simple processes in place to meet reporting requirements and larger projects have more detailed reporting to meet higher environmental targets and align with potential rating tools.

Table 3: Recommended minimum assessment and reporting frequencies per project scale

	New construction (large scale)	New construction (small scale)	Maintenance and upgrades
Example applications of concrete in council projects	<i>Buildings (e.g. community centres, recreation reserve buildings), bridges.</i>	<i>New roads and footpaths, culverts, drainage pits, retaining walls</i>	<i>Maintenance of kerbs and gutters, shared user paths and footpaths.</i>
Complexity	Prioritise detail and accuracy	Balance detail and simplicity	Prioritise simplicity and efficiency
Assessment & Reporting frequency	All projects, design stage and as-built stage	Majority of projects, design stage and as-built stage	Consolidated summary of concrete procured on a quarterly basis

Organisational scale

When assessing and reporting Scope 3 emissions it is recommended that this is conducted annually, aligning with financial-year reporting cycles and emerging mandatory disclosure requirements. Annual reporting also supports consistent year-on-year comparison and helps track progress toward organisational emissions-reduction targets.

Appendix

Appendix A: What are the life cycle stages?

A life cycle assessment (LCA) is a methodology used to estimate the overall environmental impact of materials or products across its entire life. A project's life cycle is split into different life cycle stages A to D, each divided into modules. Embodied carbon is the greenhouse gas emissions associated with materials and construction during the whole material life, defined by life cycle modules A, B and C. In this context "carbon" means carbon dioxide equivalent (CO₂e). This captures all greenhouse gas emissions, not just carbon dioxide, by normalising different gasses based on their Global Warming Potential.

Accounting for material and construction related embodied carbon is essential for councils seeking to reduce their environmental impact. It enables the setting of targets and tracking of progress against targets over time.

The life cycle stages related to embodied carbon are split into the following:

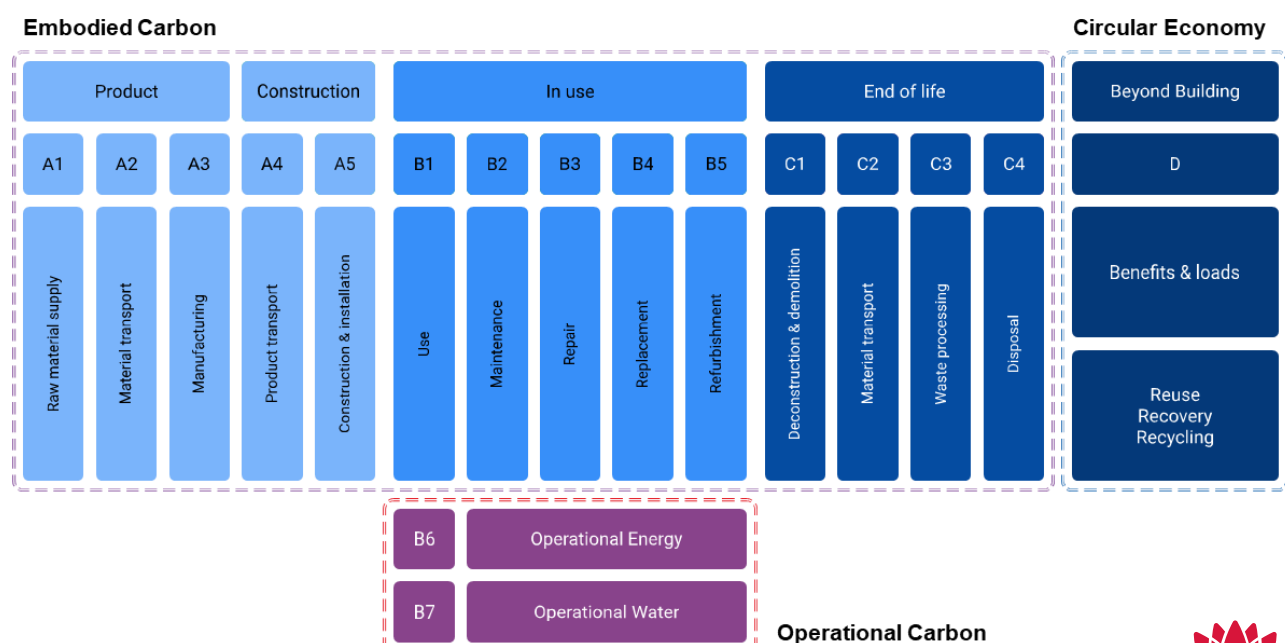
Product Stage (A1-A3): The environmental impact associated with the extraction of the raw materials, their transport to the manufacturing site, and the processing and manufacturing of the final product. This is typically referred to as 'Cradle-to-gate'.

Construction Stage (A4-A5): The environmental impact associated with the transportation of materials/products to a construction site and the construction process on site e.g. fuel used for plant equipment and waste generated during construction.

Use Stage (B1-B5): The embodied impacts include those associated with maintenance, repair, replacements and refurbishments of the asset. These modules are not mandatory in the declaration of the EPD. Designers assessing these modules will have to make assumptions based on project specifications.

End of Life Stage (C1-C4): Environmental impacts associated with the demolition, and reprocessing/handling or disposal of the construction products/materials.

EPDs and PCFs use the same life cycle assessment calculation and life cycle stages.



Appendix B: Sustainability certifications

Low carbon concrete is increasingly integral to achieving high performance in sustainability certifications.

Procuring concrete with an EPD or high proportions of Supplementary Cementitious Materials (SCMs) are common thresholds or benchmarks for compliance and scoring within sustainability certifications. Even where not directly mandated, materials with carbon declarations and low carbon materials support broader achievement of credits/points. *Table 4* provides further information on relevant certification schemes that may apply to larger capital works projects.

Table 4: Low carbon concrete within sustainability certifications

Certification	Applicability	Relevant credits or pathways	Application of low carbon concrete	EPD or PCF required?	Concrete mix design required?
NABERS Embodied Carbon	Medium to large-scale office, multi-residential, retail, industrial, aged care buildings	Whole-building carbon intensity rating (kgCO ₂ e/m ²) across all elements	- Low carbon concrete is often critical in achieving target ratings. - Low carbon concrete is only able to be recognised if an EPD or PCF for the specific mix is available to verify claims of reduced carbon intensity.	Yes – required to recognise low carbon concrete.	Yes – mix-specific data is needed to support EPD, PCF and carbon calculations.
Green Star Buildings v1	New buildings (commercial, institutional, residential) pursuing Green Star certification	- Credit 21: Upfront Carbon - Credit 26: Life Cycle Impacts - Credit 19: Circular Economy Innovation	- Credits 21 & 26: Reward reductions from a reference case (assumes 20% SCM across all concrete mixes). - Innovation credit rewards recycled content (which would include SCMs).	Not mandatory but recommended to substantiate reductions.	Yes – SCM levels and concrete performance required to demonstrate reductions at as-built stage.
Infrastructure Sustainability Council (ISC)	Public infrastructure and civil projects using the IS Rating Tool	- Rso-6: Material Lifecycle Impact Measurement and Management - Rso-7: Sustainability Labelled Products and Supply Chains	- Rso-6: Assesses materials' lifecycle impacts vs. a base case (15% SCM in-situ, 5% SCM in precast are typical base case assumptions). - Rso-7: Rewards use of sustainability-labelled products (including those with EPDs).	Yes, for Rso-7. Optional but beneficial for Rso-6.	Yes – SCM content must be known to compare to the base case and claim reductions.

Appendix C: How do I read a concrete an EPD or verified PCF?

What is an EPD or PCF?

Both EPDs and PCFs are life cycle assessment (LCA) for a specific product. A LCA is a systematic and comprehensive methodology used to evaluate and quantify the environmental impacts of a product over its entire life cycle, from extraction of raw materials and the manufacturing to use, end-of-life disposal, and potentially recycling or reuse.

An EPD is a registered and independently verified document that provides transparent and comparable data on environmental performance of a product or material over its life cycle. An EPD reports multiple environmental impacts, including global warming potential (referred to as carbon).

PCF should be registered and independently verified by a suitably qualified LCA professional under ISO14064-3. A PCF reports a single environmental impact of global warming potential (referred to as carbon). Note there are independently verified PCFs as well as self-declared PCFs.

There are different types of EPDs and PCFs including:

- **Single market and single product** – a product specific EPD or PCF reports on one specific product from one manufacturer. This can cover several manufacturing sites.
- **EPD or PCF of multiple products** by the same manufacturer – similar products produced by the same manufacturer can be included in one EPD/PCF that details multiple products. The products may be from single or several manufacturing sites and must be covered under the same Product Category Rule (PCR). Concrete EPDs or PCF often have multiple concrete mixes are reported within the one document.
- **Industry wide** – declaring the average impact of multiple companies in a defined sector or geographical area.

EPDs and PCFs are important in the carbon accounting process as they provide greater accuracy in estimating emissions factors for a product by comparison to industry average datasets.

Where can I find an EPD or PCF?

EPDs can be sourced from the product supplier. EPDs are common for medium to large scale concrete suppliers for many typical concrete mixes. However smaller or regional suppliers are generally less likely to have EPDs due to the cost. PCFs are often a lower cost option due to covering embodied carbon only. Programs are in development in New South Wales to support smaller suppliers.

What should I check for in a concrete EPD or PCF?

The below includes extracts taken from published concrete EPDs to key information to look for when reading an EPD.

1. Check the standards that the EPD or PCF is in accordance with. An EPD and PCF will reference the core and supplementary PCR against which the LCA has been undertaken. For concrete in Australia check that the EPD is in accordance with ISO 14025 and EN 15804 and that the PCF is in accordance with ISO 14067 and EN 15804.

In accordance with ISO 14025 and EN15804+A2

Programme: The International EPD® System | www.environdec.com

Programme operator: EPD International AB

Regional Programme: EPD Australasia | www.epd-australasia.com

Managed by:

EPD Process Certificate Number: 04

Accreditation Body:

EPD Registration No.: EPD-IES-23688:001

Valid from: 2025-06-19 00:00:00 | 2030-06-19 00:00:00

Revision Date: 2025-06-19 00:00:00

Revision Number: 1

EPD Process Geographical Scope: Australia

2. Check that the EPD or PCF has been externally verified. Examples of this are provided below. Note the certifiers have been removed for the purposes of this guidance.

In accordance with ISO 14025 and EN15804+A2

Programme: The International EPD® System | www.environdec.com

Programme operator: EPD International AB

Regional Programme: EPD Australasia | www.epd-australasia.com

Managed by:

EPD Process Certificate Number: 04

Accreditation Body:

EPD Registration No.: EPD-IES-23688:001

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Revision Date: 2025-06-19 00:00:00

Revision Number: 1

EPD Process Geographical Scope: Australia

Process EPD Certified By

Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

☒ EPD verification by individual verifier

Third-party verifier:

3. Check the date of issue and validity of the EPD or PCF. Both typically expire after 5 years.

Valid From	2025-06-19 00:00:00
Revision Number	1
Valid Until	2030-06-19 00:00:00

4. Check the declared unit. This is the unit in which the environmental indicators are reported for. For ready-mix concrete mix this should be a declared unit of 1m³ of ready-mix concrete.

Declared Unit

1 m³ of ready-mix concrete.

5. Reading the LCA results. There are a large number of environmental impact categories that are reported within an EPD. For the assessment of the carbon impact of a concrete mix use the **global warming potential (GWP) total**. Below are two examples, one from an EPD for a single product, and one from an EPD that cover multiple products.

Abbreviation	Unit	A1-A3
GWP-Total	kg CO ₂ eq.	194

PRIMARY INDICATORS		GWP
Strength (MPa)	Mix Code	kg CO ₂ eq
-	NFSLURRY	483.19
-	NP10:1GSS	161.99
-	NP14:1GSS	130.88
-	NP3FFF	127.39
20	NN202BR53	185.15
25	NN252BR53	201.33
32	NN322BR53	236.90
40	NN402BR53	295.62

Other key information that may be of interest for a council within an EPD includes:

- **Scope of the EPD/PCF** – check which life cycle stages are covered. For the calculations outlined in [Option 1](#) above the focus is on life cycle stages A1-A3.
- **System diagram** – outlining the process flow to produce the product and the system boundary in which the life cycle assessment covers. This shows you how the product is made.
- **The content declaration** – providing a summary of the materials included within the product
- Information on recycled materials included within the product.

Appendix D: How can a supplier obtain carbon data for their product?

There are different pathways that a supplier can take to obtain reliable and verified data that can be used to report the carbon impact of their concrete products.

Environmental Product Declaration (EPD)

An EPD is a third party verified life cycle assessment (LCA). It is a registered and independently verified document that provides transparent and comparable data on environmental performance of a product or material over its life cycle. An EPD reports multiple environmental impacts, including global warming potential (referred to as carbon). An EPD is typically valid for 5 years.

There are several standards that are applicable to EPDs. The diagram outlines the minimum standards for an independently verified EPD for construction products.

ISO 14040 and ISO 14044 set out a framework, requirements and terminology for conducting an LCA.

ISO 14025 establishes the principles and specifies the procedures for developing Type III environmental declaration programmes and Type III environmental declarations. It specifically establishes the use of the ISO 14040 series of standards in the development of Type III environmental declaration programmes and Type III environmental declarations.

EN 15804 Sustainability of construction works -

Environmental product declarations – Core rules for the product category of construction products. It is a global

standard for environmental product declarations (EPDs) for construction products and services.

Methodology for assessing and reporting the environmental performance of construction products throughout their life cycle. EPDs published in accordance with EN 15804 have been independently verified.

There are other standards that EPDs can be developed in accordance with, this includes ISO 14021: Environmental labels and declarations – Self-declared environmental claims (Type II environmental labelling). This is for self-declared claims made by a manufacturer without independent third-party certification.

The steps in to obtain an EPD are as follows:



Product Carbon Footprint (PCF)

A PCF is developed in accordance with ISO 14067 for the quantification and reporting of the carbon footprint of a product. Note this covers embodied carbon only. A PCF utilises the same life cycle assessment standards as an EPD.

A PCF is a third party verified life cycle assessment (LCA). It is a registered and independently verified document that provides transparent and comparable data on carbon impact of a product or material over its life cycle. A PCF reports on a single environmental impact, global warming potential (referred to as carbon). A PCF is typically valid for 5 years.

There are several standards that are applicable to PCFs. The diagram outlines the minimum standards for an independently verified PCF for construction products.

ISO 14040 and **ISO 14044** set out a framework, requirements and terminology for conducting an LCA.

ISO 14067 specifies principles, requirements and guidelines for the quantification and reporting of the carbon footprint of a product (CFP), in a manner consistent with International Standards on life cycle assessment (LCA) (ISO 14040 and ISO 14044).

ISO 14064-3 specifies principles and requirements and provides guidance for verifying and validating greenhouse gas (GHG) statements. It is applicable to organization, project and product GHG statements.

EN 15804 Sustainability of construction works -

Environmental product declarations – Core rules for the product category of construction products. It is a global standard for environmental product declarations (EPDs or PCFs) for construction products and services. Methodology for assessing and reporting the environmental performance of construction products throughout their life cycle. PCFs published in accordance with EN 15804 have been independently verified.

ISO 14040/44
Life cycle assessment

ISO 14067 & ISO 14064-3
Carbon footprint of products

EN 15804
Construction EPDs

Product Category
Rules

Appendix E: How to overcome carbon accounting challenges

Councils are not alone in the challenges of carbon accounting. Businesses and developers in the LGA face similar issues, and progress will be strongest when the whole supply chain builds capability together.

Accounting for embodied carbon can be challenging as the industry continues to learn what, when, and how to report. Below are recommendations to help address common issues when accounting for low carbon concrete.

- **Availability of data:** Concrete has the most published EPDs when compared to other building products. The number of PCFs in Australia is increasing. However, there is still a gap between larger suppliers and the feasibility for smaller suppliers to obtain an EPD or PCF. The guidance in how to measure has been written to support collection of data even when an EPD or PCF is not available. Resources from TfNSW such as the Engineering Cost and Carbon Library (ECCL) and Concrete Mix Register build a strong foundation for council works and should be utilised where possible.
- **Knowledge and skills gaps:** Key stakeholders of the value chain – particularly for smaller or more regional firms – may have limited understanding of how embodied carbon is reported for concrete and how it contributes to a council's sustainability goals. This can make it challenging to engage and source appropriately detailed data that allows concrete carbon to be accounted and to achieve low carbon outcomes. To counter these issues, the following is recommended:
 - **Early engagement:** Flag the requirement early in the project across all potential contractors, suppliers, or supply panels to ensure the requirements are appreciated by the engaged party and can be discussed with their supply chains.
 - **Contractual obligations:** Reporting for carbon accounting purposes must form part of the tender documentation and requirements and be acknowledged as a contractual obligation that the contractor and concrete supplier must adhere to. Refer to the LOCCA resources including *Low Carbon Concrete Procurement Guide* for guidance on requirements to include and data to collect.
 - **Simple reporting templates:** A reporting template should be provided early to the contractor (or be included in tender documents) to ensure the contractor knows exactly what data is required as early as possible. Refer to the LOCCA resources including *Low Carbon Concrete Project Data Capture Template*
- **Evolving policy and standards:** Requirements with respect to embodied carbon reporting are changing quickly. The LOCCA program aims to provide updates to keep your council informed.

Resource constraints within councils: Adopt a tiered reporting approach based on the project scale. Use centralised tools and guidance to avoid duplication of work. Build a shared internal database of commonly used mixes in your council's project. This enables future benchmarking and ease of data sharing.

Disclaimer

The information contained in this publication is based on knowledge and understanding at the time of writing (September 2026) and may not be accurate, current or complete. This document has been prepared as part of the Low Carbon Concrete Accelerator (LOCCA) program and in consultation with participating local councils. As it is currently being piloted in the Hunter region, the content is subject to review and amendment. The document is provided exclusively for participants in the LOCCA pilot program and must not be relied upon by any third party. No part of this document may be reproduced, extracted, or distributed except in its complete form. The State of New South Wales (including the Department of Climate Change, Energy, the Environment and Water and NSW Treasury), the author and the publisher take no responsibility, and will accept no liability, for the accuracy, currency, reliability or correctness of any information included in the document (including material provided by third parties). Readers should make their own inquiries and rely on their own advice when making decisions related to material contained in this publication.

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