



Carbon Eviction Greenprint

an action guide for evicting embodied greenhouse gas emissions from Australian built environment assets

Acknowledgement of Country

The Materials and Embodied Carbon Leaders' Alliance, MECLA, acknowledges the Traditional Custodians of the lands and waters from across the area we now call Australia.

Australia's Traditional Custodians have always known the importance of caring for land and country. For tens of thousands of years they hunted, gathered food, lit fires and fished in the ocean and rivers, managing the lands and waters sustainably.

We recognise their ongoing stewardship and respect the lands we walk on and communities we walk with.

We pay our respects to the Elders past, present and emerging, for they hold the memories, the traditions, the culture and hopes of Aboriginal and Torres Strait Islander peoples.

Introduction

The Materials and Embodied Carbon Leaders' Alliance, MECLA, is a collaboration of organisations who have come together to drive reductions in embodied carbon in the Australian building and construction industry. It seeks to align with the Paris Agreement targets and principles of the circular economy whilst recognising that the building and construction sector is a complex ecosystem.

The MECLA Carbon Eviction Greenprint: an action guide for evicting embodied greenhouse gas emissions from Australian built environment assets has been developed by MECLA Working Group 3/4. It describes steps and actions to reduce embodied carbon in the Australian construction industry. We acknowledge that there are many other relevant and important programs that aim to address other life cycle stages, multiple sustainability metrics and various other scope boundaries. However, the scope of this project is **reducing product or material embodied carbon in the Australian construction industry**.

Reducing embodied carbon requires engagement from all stakeholders. This guide outlines where each stakeholder has some responsibility or role in reducing the embodied carbon on a construction project and what actions they may take.

This is a live guide, continually evolving and adapting with industry. It has been curated by volunteers and we welcome your input and recommendations for improvement.

Hayley Jarick

Chair, MECLA Working Group 3/4



Extract from The MECLA Dictionary of Carbon

Embodied Carbon

GHG 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 by CO₂-e.

(World Green Building Council, 2019)

Embodied Upfront Carbon

The emissions caused in the materials production and construction phases (Modules A1-5 in Figure 1) of the lifecycle before the building or infrastructure begins to be used.

(World Green Building Council, 2019)

Product Embodied Carbon

The emissions caused in the materials production cradle to gate (A1-3 in Figure 1) of the lifecycle before the product is transported or installed.

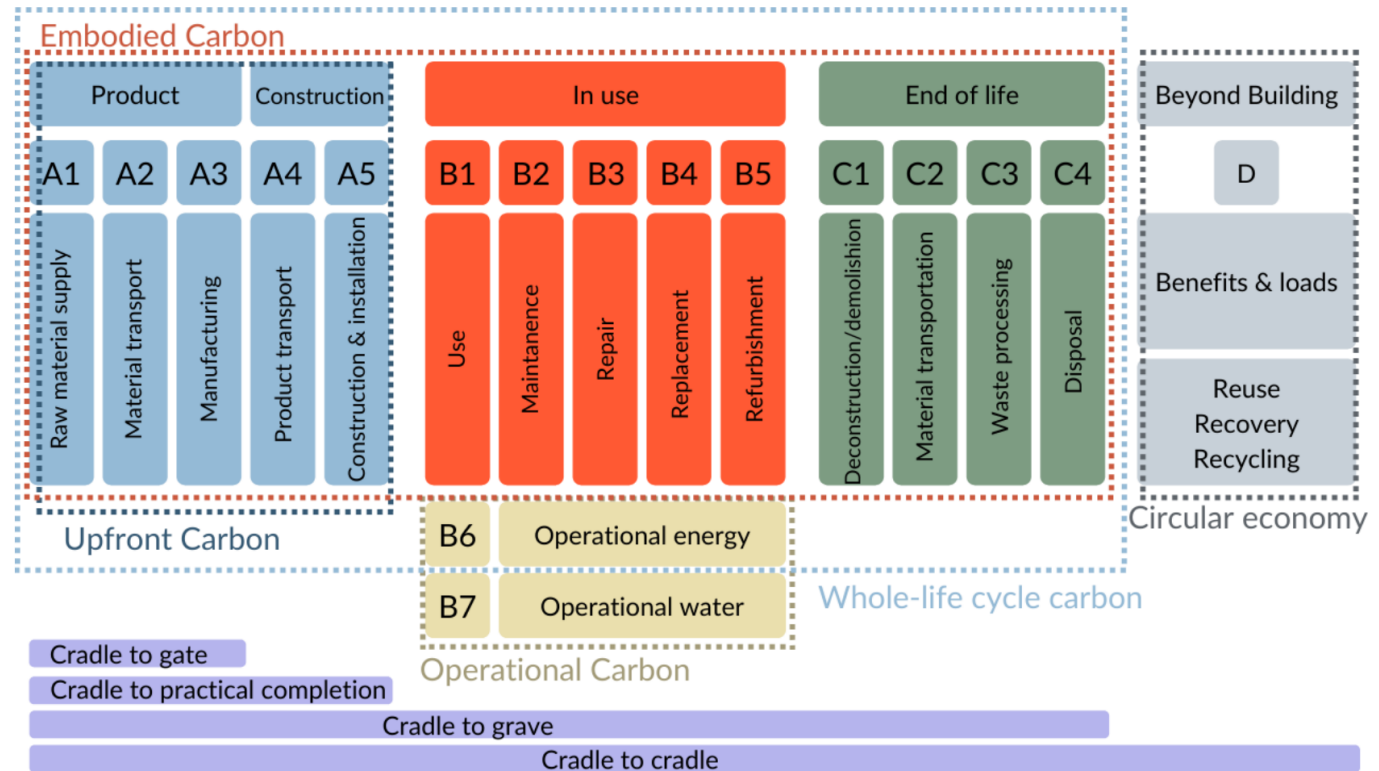


Figure 1: [BS EN 15978:2011 Sustainability of construction works. Assessment of environmental performance of buildings. Calculation method - European Standards \(en-standard.eu\)](#) (amended to include whole-life cycle carbon)

The scope of the
*Specifying, Procuring, and Supplying
Low Embodied Carbon Building
Materials
Action Guide* is reducing
product embodied carbon (A1-3)

How to use this guide

The “Action Guidance Summary” page of this guide is the starting point of your exploration of positively framed actions to reduce embodied carbon in construction.

In the left column the lifecycle of construction is broken down. In the middle column the influence of stakeholders is identified. And in the right column actions are identified.

A description of each stakeholder can be found in the “Who Does What?” section of the guide.

Each single line action on the “Action Guidance Summary” page links to a full page providing more detail. Where required additional pages provide more information.

On the action detailed pages the strategies in the

- Left column are commercially available
- Middle column are solutions that are available but not may not be commercially available in all locations
- Right column are innovative solutions that may not have ever been tried before in Australia



Project Phase

Action Guidance Summary

★ Leader
○ Supporter

| | National | State | City/Municipality | Precinct | Owner | Designer | Constructor | Material supplier | Service supplier | Facility Manager | |
|-----------|----------|-------|-------------------|----------|-------|----------|-------------|-------------------|------------------|------------------|--|
| Plan | | | | | ★★ | | ★ | ○ | ○ | | Set a Science Based Target for upfront carbon reduction Define your target - what, how, when Develop project specific targets for embodied carbon targets, benchmarks, evaluation, assurance and verification. |
| | | | | | | | | | | | |
| Design | | | | | | ★ | | ★ | ○ | | Transition market offerings to genuinely low embodied carbon products Measure, plan and innovate materials Utilise all resources within the system (no waste) Systematically integrate low carbon design and materials into project |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| Construct | | | | | | | ★ | ○ | | | Assess material suppliers against best practice environmental performance criteria. |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| Operate | | | | | ○ | | | ○ | ★ | ★ | Support decarbonisation initiatives throughout the project lifecycle Make Good / Defit / Strip Out Recycling program Reduce embodied carbon in replacement capital works |
| | | | | | ★ | | | | | | |



Who Does What?

National

National government can play a vital role in addressing embodied carbon through a variety of mechanisms.



State

State government's role in reducing embodied carbon is through establishing a regulatory roadmap for the state. State governments have the ability to set and increase embodied carbon standards across the entire building industry. For example, by introducing mandatory measuring of embodied carbon now and publishing a regulatory roadmap that will require the need to reduce embodied carbon in the future. This type of action helps pivot all stakeholders towards addressing embodied carbon.

City/Municipality



Precinct



Owners



Designers

As Buckminster Fuller knew, “to change something, build a new model that makes the existing model obsolete”. Designers can help create inspiring architecture of the future that shows how beautiful zero carbon buildings can be.

This will require understanding the wide-ranging issues of embodied carbon, aligning our skills to help lead integrated design teams to develop real and impactful change starting with:

Helping clients develop better briefs

Identifying suitable sites that can achieve outcomes in low carbon ways and

Developing appropriate design strategies that can reduce carbon from the start

Designers can work collectively with the client and team to develop agreed targets, materials and approaches that need to be considered and updated at every stage of the design process. Review and discussion after completion is critical in developing knowledge and capability about what works and what needs further development.

Constructors

The Contractor plays a vital role in addressing embodied carbon in construction projects, contributing significantly to the overall sustainability and environmental impact of the building process. Their responsibilities encompass several key aspects aimed at reducing carbon emissions and promoting greener practices.

Firstly, the Contractor is instrumental in material selection and procurement. By collaborating with the design team and the sustainability consultant, adhering to the project's sustainability goals, they procure low-carbon or recycled materials, thereby minimizing the project's embodied carbon footprint. Local sourcing of materials also helps reduce transportation-related emissions.

Efficient construction practices are another essential area of focus for the contractor. They can implement strategies to reduce waste during construction, optimize material usage, and encourage recycling or reusing materials on-site. Minimizing construction waste helps decrease the overall embodied carbon of the project.

Moreover, the Contractor plays a crucial role in ensuring proper construction techniques that enhance the building's energy efficiency. By sealing the building envelope effectively, incorporating insulation, and installing energy-efficient systems, they contribute to lowering the operational carbon footprint over the building's life cycle.

Additionally, the contractor's ability to manage and reduce the energy consumption on the construction site itself, such as using renewable energy sources or energy-efficient equipment, also impacts the project's upfront embodied carbon.

Throughout the construction process, the Contractor should collaborate closely with the sustainability consultant

Material Suppliers

Material suppliers are an important part of the process to reduce embodied carbon. Material suppliers can play a major role through obtaining and publishing independent LCA's on their products in the form of EPD's. Material suppliers support projects primarily through the design phases of a project through the publication of EPD's for design teams and ESD consultants to incorporate into their carbon reduction strategies.

Material suppliers can also help to reduce the embodied carbon of the building industry through continuing to improve and innovate manufacturing processes to produce lower carbon materials, continuing to publish EPD's, and reading the market to see where there is a demand for a low-carbon material and to meet that demand with new products.

Service Suppliers

A sustainability consultant in the context of construction and embodied carbon assessment is a professional who specialises in evaluating and reducing the environmental impact of construction projects, undertaken Life Cycle Assessments and determining the carbon emissions associated with the materials used in the construction of a project.

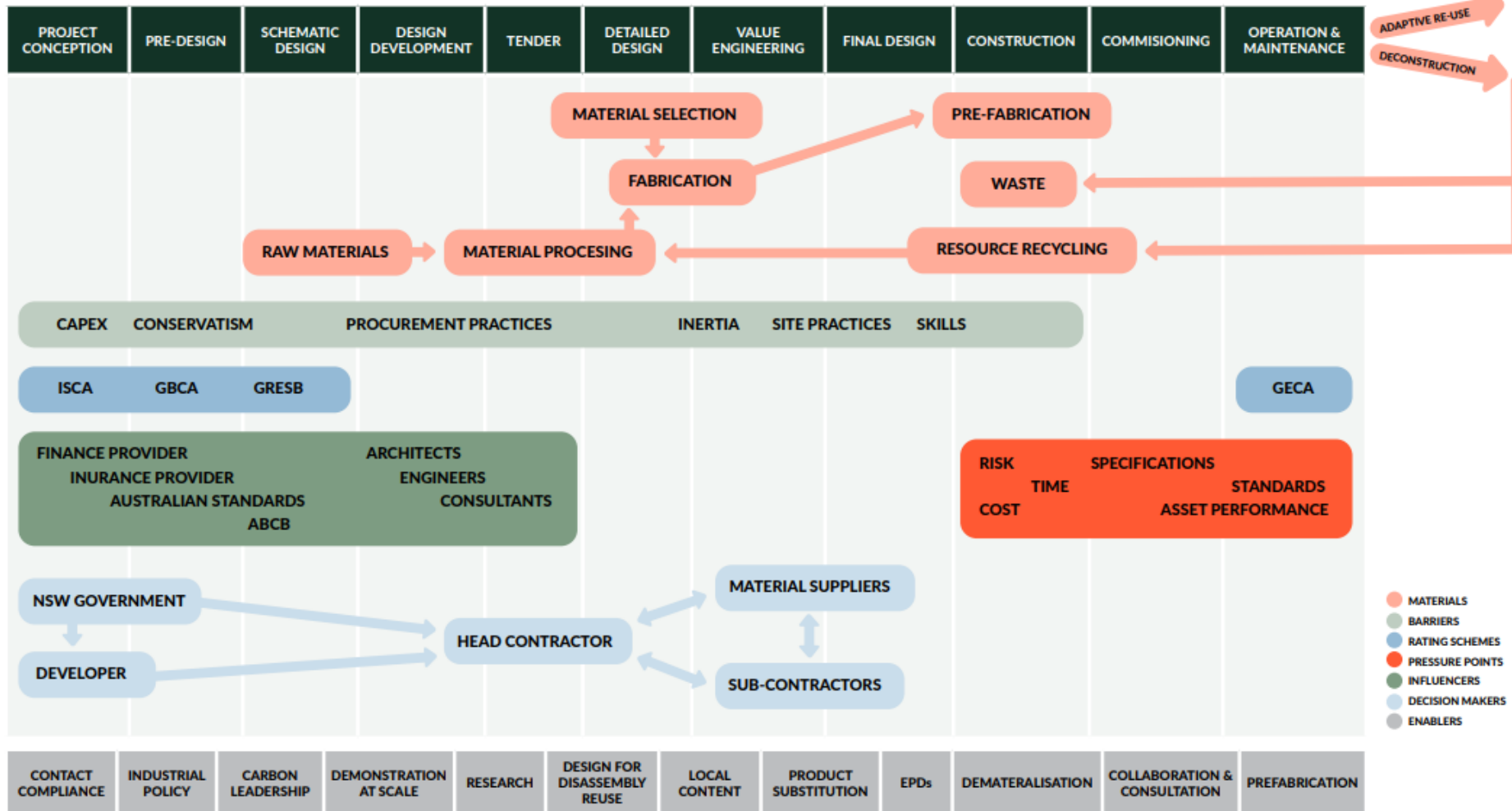
A sustainability consultant is involved in all phases of a project. The primary role is to measure the embodied carbon early in the design phase. By measuring the upfront embodied carbon at a concept stage, it gives the sustainability consultant the opportunity to work with the design team to provide alternative design and specification options, helping to reduce the embodied carbon through the remaining phases of the project.

A sustainability consultant can provide advice and data on updated project designs that have incorporated changes, to measure the upfront embodied carbon of a project as it progresses through subsequent design phases.

Facility Managers



CONSTRUCTION PROJECT LIFECYCLE



Source: https://www.firetawsassets.panda.org/downloads/wwf_decarbonising_building_and_construction_materials_report.pdf



Actions

Set a Science Based Target for upfront carbon reduction

Project Phase

Plan – Project Initiation

★ Leader > Constructor

○ Support > Materials & Service Suppliers

BEST PRACTICE

STRATEGIES

Target a minimum ten percent reduction in upfront carbon emissions of procured materials.

Target forty percent reduction in upfront carbon emissions

Target sixty percent reduction in upfront carbon emissions

STEPS

1. Address the significant use of on-site fuel (Scope 1) and embodied carbon of procured materials (Scope 3). Undertake feasibility studies and have an action plan to reduce upfront carbon.
2. Record materials, transportation, energy, water, waste. Develop, track and report upfront carbon (A1-A3, A4 and A5). Review and compare Bill of Quantities, Environmental Product Declarations. Develop rules for material substitution. Set waste diversion targets. Work with suppliers to reduce emissions from transport.
3. Complete as-built calculations post project completion.

1. Use electric construction machinery and equipment with 100% renewable electricity.
2. Or use renewable diesel for on-site fuel.

1. Mandate use of 100% electric construction machinery and equipment with 100% renewable electricity.
2. Measure Scope 3 emissions

RESOURCES

- [UQ Research – Plant and Equipment Directory](#)
- [B5 Blend – Supply Chain School](#)
- [Practical guide to upfront carbon reduction](#)

[GBCA Fossil Fuel Free Construction Leadership Challenge](#)

More Information

Low carbon concrete

MECLA WG5b is developing a guidance for the specification of low carbon concrete.

1. Early Engagement
2. Remove obstacles to low carbon concrete
3. Minimise waste
4. Low carbon concrete may not be achievable in areas that are remote/ having difficulty sourcing appropriate materials.
5. Concrete carbon reduction levels should be verified through EPDs
6. Low carbon concrete is available in all Australian metro areas and many regional centres.

Assess material suppliers against best practice environmental performance criteria.

Project Phase

Construct > Procurement

★ Leader > Constructor

○ Support > Material Suppliers

BEST PRACTICE

STRATEGIES

Preference minimum standards compliant suppliers with self-declared low embodied carbon claims.

Preference voluntary beyond compliance standards suppliers with third party verified claims.

Preference organisations investing in systems solutions beyond direct product promotional benefits.

STEPS

Preference suppliers with:

1. Low embodied carbon products and services.
2. Local manufacturing reducing carbon from kilometres travelled in training/trucking/shipping.
3. Businesses with globally recognised Environmental Management System certifications. (e.g. ISO14001 EMS, ISO50001 EMS)

Assess supply chain to preference suppliers that have:

1. Products with Environmental Product Declarations (EPDs).
2. Products with Product Stewardship Scheme certifications.
3. Products with third-party verified claims or certifications.
4. Sponsorship of industry or organisational events that promote reductions in upfront carbon.
5. Fossil Fuel Free Construction initiatives that reduce or eliminate fossil fuels and transition to electrification.

Assess supply chain to preference suppliers that have:

1. Membership of construction industry change organisations like the Green Building Council of Australia, Infrastructure Sustainability Council, Engineers/Architects/Builders Declare, etc.
2. Membership of manufacturing industry change organisations like Seamless, Responsible Steel, etc
3. Membership of or donations to bodies for organisational change, e.g. United Nations Global Compact (UNGC), Supply Chain Sustainability School, etc

RESOURCES

Transition market offerings to genuinely low embodied carbon products

Project Phase
Plan > Project Initiation

★ Leader > Material Suppliers
○ Support > Service Suppliers

BEST PRACTICE

STRATEGIES

Be transparent, measure and plan to act.

Act and gain third party verification of claims.

Get certified against a third-party best practice standard.

STEPS

1. Clarify low carbon offerings that are available to support low carbon targets.
2. Quantify the environmental and climate impacts of your product/s, ideally as a full lifecycle assessment.
3. Set upfront embodied carbon targets and benchmarks for your company and individual product lines.
4. Publish roadmap to decarbonise products. Investigate your supply chain for lower carbon content component/ingredient suppliers.
5. Develop manufacturing solutions to support low carbon outcomes e.g., by improving efficiencies

1. Provide product specific environmental product declaration (EPD) to EN 15804+A2 or verified ISO 14067 carbon footprints for your product and communicate the carbon data.
2. Seek third party verification for claims of reduced climate impacts.
3. Create new products that are low carbon or enable low carbon design solutions.
4. Investigate and install onsite renewable energy.

RESOURCES

Standards: ISO 14040, ISO 14044, ISO 14025, ISO 14001, ISO 14067, EN 15804/ ISO 21930, ISO 50001
[The Australian National Life Cycle Inventory Database \(AusLCI\)](#)
[EPD Australasia](#)
[Australian Life Cycle Assessment Society ALCAS](#)
[NSW Government Net Zero Manufacturing Initiative](#)

[GBCA: A practical guide to upfront carbon reductions](#)
[Declare, the nutrition label for products](#)

[Global Green Tag](#)
[GECA](#)
[Responsible Steel Product Certification](#)

More Information

Ensure data quality

EPDs must be current. Update EPDs as significant process improvements enacted.

EPDs must be completed to a relevant Product Category Rule (PCR), published by a fabricator, product manufacturer, other declaration holders, or by the ISO 14025 EPD Program.

Operators must complete the third-party verification and registration of the EPD, as defined in ISO 14025, ISO 14044, and ISO 21930 and/or EN 15804.

Operators must plan and implement systems to

- a) record and keep product component/ingredient (resources),
- b) record and keep updated factory input and output data, and
- c) facilitate minimum 5-yearly re-submissions.

Establish benchmarks

Manufacturers should research sources of industry benchmarks to enable comparison with your product/factory performance.

This can be done using Life Cycle Assessment databases, EPD databases and product certification schemes.

Use this data to benchmark your embodied carbon performance before setting targets.

Clarify how government can support faster transition to low carbon production / product offerings.

Project Phase
Plan > Pre Design

★ Leader > Owner/Constructor/etc
○ Support > Owner/Constructor/etc

BEST PRACTICE

STRATEGIES

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STEPS

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RESOURCES

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Define your target - what, how, when

| STRATEGIES | | |
|---|---|---|
| <p>Align with targets set by government or regulators</p> | <p>Exceed targets set by government or regulators</p> | <p>Exceed targets set by government or regulators and define additional, project-specific target(s)</p> |
| <p>STEPS</p> <ol style="list-style-type: none"> 1. Identify minimum obligations under applicable Federal, State and municipal laws 2. Define your baseline for the metric used in the target(s) 3. Determine what would be required to meet your target(s) 4. Identify how you will measure your impact (what would meeting your target look like in practice?) | <ol style="list-style-type: none"> 1. Identify minimum legal obligations 2. Define your baseline for the target metric 3. Determine requirements for minimum obligations 4. Determine requirements for exceeding minimum obligations 5. Identify how you will measure your impact 6. Identify the embodied emissions target level in any voluntary third-party rating schemes e.g. Green Star, Infrastructure Sustainability Rating Scheme, NABERS Embodied Emissions tool. | <ol style="list-style-type: none"> 1. Identify minimum legal obligations 2. Define your baseline for the target metric 3. Determine requirements for minimum obligations 4. Determine requirements for exceeding minimum obligations 5. Identify how you will measure your impact (accountability) 6. Repeat steps 2-5 based on a separate, bespoke metric for this project |
| <p>RESOURCES</p> | <p>Impact:</p> <p>What would meeting minimum obligations look like in practice?</p> <p>What are you proposing that is additional, and how will that be measured?</p> | <p>Insert text here</p> |

More Information

Government targets

[Australia's Nationally Determined Contribution \(NDC\) 1](#): committed to reduce greenhouse gas emissions to 43% below 2005 levels by 2030.

[Queensland government](#) - committed to achieving net zero emissions by 2050, with an interim target to reduce emissions by 30% below 2005 levels by 2030. Note also the [State Infrastructure Strategy](#).

[Western Australian government](#) - committed to a whole-of-government 2030 greenhouse gas emissions reduction target of 80 per cent below 2020 levels.

[Victorian government](#) - set targets that provide a clear path to net-zero emissions:

- 28-33% by 2025
- 45-50% by 2030
- 75-80% by 2035.

[South Australian government](#) - set goals to reduce greenhouse gas emissions by more than 50% below 2005 levels by 2030, and to achieve net zero emissions by 2050.

[Northern Territory government](#) - Net zero by 2050; see the [Climate Change Response: Towards 2050](#)

[New South Wales government](#) - Net zero by 2050 and 70% below 2005 levels by 2035

Benchmarking

Commonwealth DCCEEW - [Annual emissions data inventories](#)

NSW Treasury - [Guideline TPG23-08: Cost-Benefit Analysis & Technical note to NSW Government Guide to Cost-Benefit Analysis TPG23-08](#)

Verification



Examples

[QIC Active Retail Fund](#): Committed to maximising reduction of embodied carbon in new developments and major renovations, compensating for any residual upfront emissions by 2030.

[GPT](#): Committed to upfront embodied carbon neutral property developments where GPT has control, from 2023 onwards.

Develop project specific targets for embodied carbon targets, benchmarks, evaluation, assurance and verification.

Project Phase
Plan > Pre Initiation

★ Leader > Owner
○ Support >

BEST PRACTICE

STRATEGIES

Resolve upfront embodied carbon targets and benchmarks. Develop criteria for evaluation. Utilise tools for quality assurance and verification. Allocate roles and responsibilities .

Expressly recognize the role of embodied carbon objectives amongst broader project objectives

Insert text here

STEPS

1. Define project-specific ambition
2. Identify metrics for delivery
3. Quantify the 'gap' between BAU and ambition
4. Develop strategies to deliver, including contingencies
5. Confirm program expectations, roles, and responsibilities.

1. Integrate project specific targets with definition of project success
2. Consider incentives for meeting/exceeding targets
3. Identify carbon base case – outlining whole of life perspective

1. Insert text here



RESOURCES

[PC-ST1 Sustainability in Design \(dit.sa.gov.au\)](https://www.dit.sa.gov.au/PC-ST1-Sustainability-in-Design)

<https://www.tmr.qld.gov.au/business-industry/technical-standards-publications/infrastructure-contract/transport-infrastructure-contract/tic-construct-only>

<https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Project-waste-reporting>

Insert text here

Utilise all resources within the system (no waste)

Project Phase
Plan > Pre Design

★ Leader > Owner/Constructor/etc
○ Support > Owner/Constructor/etc

BEST PRACTICE

STRATEGIES

Estimate, then track actual waste generation in conjunction with identifying reuse and recycling opportunities

Net zero waste within the project boundary

Project is circular, regenerative, nature positive

STEPS

The calculator is a macro-enabled Microsoft Excel spreadsheet that allows users to estimate waste generation and record and report actual waste data quantities and recycled materials, used that minimizes use and processing of virgin materials. Steps to use Waste 2 Resource calculator are available here:

[Waste 2 Resource calculator introduction](#)
[Waste 2 Resource calculator - User Guide](#)

1. Construction tenders to specify recycled materials to be used against maximum permissible
2. Mandatory tender schedule to be completed for Transport Infrastructure Contracts and Minor Infrastructure Contracts. The tender schedule must specify the products that include recycled materials (which are currently permitted by the Technical Specification listed) that the Contractor proposes to use to complete the Works.

1. Optimise circular design strategies in the design of the project to reduce embodied emissions.

RESOURCES

[Waste 2 Resource calculator](#)
<https://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Project-waste-reporting>

Queensland [Waste Reduction and Recycling Act 2011](#)

[C7810.S12.TIC Tender Schedule S12 Waste to Resource Plan](#)

TMR website: <https://www.tmr.qld.gov.au/business-industry/technical-standards-publications/infrastructure-contract/transport-infrastructure-contract/tic-construct-only>

<https://www.energy.nsw.gov.au/business-and-industry/courses-and-guides/technology-guides/circular-design-guidelines-built>

More Information

Queensland Government reporting requirements

[Queensland government](#) - committed to achieving net zero emissions by 2050, with an interim target to reduce emissions by 30% below 2005 levels by 2030. Note also the [State Infrastructure Strategy](#).

Examples

[QIC Active Retail Fund](#): Committed to maximising reduction of embodied carbon in new developments and major renovations, compensating for any residual upfront emissions by 2030.

[GPT](#): Committed to upfront embodied carbon neutral property developments where GPT has control, from 2023 onwards.

Systematically integrate low carbon design and materials into project

Project Phase

★ Leader > Designer

Design > Detailed design

○ Support >

BEST PRACTICE

STRATEGIES

Source lower carbon products, reduce and or substitute high carbon products for lower carbon alternatives to achieve a reduction in carbon footprint across the project design.

Developing a dedicated decarbonisation strategy to establish and deeply reduce project embodied carbon footprint.

Developing a dedicated decarbonisation strategy to achieve a net zero aligned project outcome.

STEPS

Dedicated approach to sourcing the following on the project:

1. Materials with verified EPDs and transparent embodied carbon impacts
2. Materials with demonstrable emission reduction, including as a minimum steel, concrete, aluminum, kiln dried timber
3. Investigate viability of material substitutions
4. Investigate local material procurement

1. Measuring and predicting WoL embodied carbon baseline
2. Establishing decarbonisation contributions and potential reduction opportunities for each contribution
3. Prioritising reduction opportunities across the project lifecycle
4. Drive embodied emission reductions through implementation of opportunities, including through material reductions, material substitutions, onsite material reuse, local materials and trialing new and innovative materials to achieve deep reductions

1. Defining a net zero outcome for the project
2. Measuring and predicting WoL embodied carbon baseline
3. Establish a net zero pathway and/or roadmap for the project, including development of a decarbonisation management plan with responsibility allocation across the project
4. Enable embodied carbon considerations throughout all project decision making
5. Engage with value chain to define innovative materials and procurement approach aligned with net zero strategy

RESOURCES

<https://epd-australasia.com/epd-search/>

<https://www.iscouncil.org/isupply/>

https://www.bsigroup.com/globalassets/localfiles/en-th/pas-2080/pas_2080_client_guide_web_th.pdf

<https://gbca-web.s3.amazonaws.com/media/documents/a-practical-guide-to-upfront-carbon-reductions.pdf>

More Information

Tips

Design with low carbon materials in mind.

Reduce superfluous elements from your design.

Select the material relevant to the design.

Review whether there are low embodied carbon emission alternative materials.

Determine whether the construction design will still be structurally durable for its intended design life.

Determine if alternative design/useful life is viable for the intended purpose of the construction.

Concrete

MECLA WG5b is developing a guidance for the specification of low carbon concrete.

Summary:

Early Engagement

Remove obstacles to low carbon concrete

Minimise waste

Low carbon concrete may not be achievable in areas that are remote/having difficulty sourcing appropriate materials.

Concrete carbon reduction levels should be verified through EPDs

Low carbon concrete is available in all Australian metro areas and many regional centres.

Steel



Measure, plan and innovate materials

Project Phase

★ Leader > Materials Manufacturers and Suppliers

Design > Procurement

○ Support >

BEST PRACTICE

STRATEGIES

Clarify low carbon offerings that are available to support low carbon targets.

Publish roadmap to decarbonise products. Clarify how government can support faster transition to low carbon production / product offerings.

Create new products that are low carbon or enable low carbon design solutions.

STEPS

1. Calculate and seek third party verification for claims of reduced climate impacts.
2. Provide product specific environmental product declaration (EPD) to EN 15804+A2 or verified ISO 14067 carbon footprints for your product and communicate the carbon data.
3. Support the establishment of a process based National Database of Life Cycle Assessment Inventory Data derived greenhouse factors with element and material focussed delivery options

1. Set upfront embodied carbon targets and benchmarks for your company and individual product lines. Review embodied carbon guidelines and internationally recognised software, for uniformity of comparisons.
2. Investigate your supply chain for lower carbon content component/ingredient suppliers
3. Seek to minimise whole-life carbon impacts of product – mindful of life extension, enabling repair and refurbishment, and maximising benefits at the end of use (end of life) of the product.

1. Install onsite renewable energy inputs to factory
2. Develop manufacturing solutions to support low carbon outcomes e.g., by improving efficiencies
3. Gain third-party product certifications to verify action on reducing climate impact of products.
4. Implement building material passport for transparency and tracking of product impacts and attributes across whole of life cycle.
5. Develop nature positive solutions using 'Nature-based Solutions' (NbS) offsets to assist in restoring and regenerating natural systems above and beyond existing damage.

RESOURCES

Standards: ISO 14040, ISO 14044, ISO 14025, ISO 14001, ISO 14067, EN 15804/ ISO 21930, ISO 50001 PCR for construction products

auslci.com.au

[Living Future Embodied Carbon Quick Guide](#)

[GBCA: A Practical Guide to upfront carbon reductions](#)
[Living Future Embodied Carbon Guide](#)
[RICS Methodology Embodied Carbon Materials](#)
[Carbon Market Insitute: Offset providers & knowledge-base](#)
<https://cerclos.com/>
<https://greenfleet.com.au>

[GBCA Responsible Products programme – includes recognised product certifications](#)

[GBCA: 'Designing with Nature 2.0'](#)

[GBCA: 'Climate Positive buildings and our net zero ambitions'](#)

[Global GreenTag NaturePositive+ Certification & Declaration program](#)

More Information

Ensure data quality

EPDs must be current. Update EPDs as significant process improvements enacted.

EPDs to be completed to a relevant Product Category Rule (PCR), published by a fabricator, product manufacturer or other declaration holders, or by ISO 14025 EPD Program

Operators that have completed the third-party verification and registration of the EPD, as defined in ISO 14025, ISO 14044, and ISO 21930 and/or EN 15804.

Plan and implement systems to record and keep product component/ingredient (resources) and factory input and output data updated and facilitate minimum 5-yearly re-submission.

Establish benchmarks

Research sources of industry benchmarks to enable comparison with your product/factory performance using LCA databases, EPDs and Certification Schemes that have researched own product specific benchmarks and use comparative LCA not permitted within EPDs to initially establish benchmarks and then targets for your products and company overall.

National LCIA & Greenhouse Database

Support and advocate for the establishment of a process-based, National Life Cycle Impact Assessment and Greenhouse Factor Database to be available free to use, but managed, housed and updated by Government to ensure maximum compatibility of EPDs and facilitate international competitiveness as Australia dramatically increases the amount of grid-sourced renewable energy.

Third Party Certification

<https://epd-australasia.com/>
<https://www.globalgreentag.com/epd-program>
<https://geca.eco/categories/lca-and-epd/>
[ILFI 'Declare' products with embodied carbon disclosure](#)

More Information

Case study: GPT & Greenfleet

GPT uses [Greenfleet's reforestation offsets](#) – a “nature-based solution” that is protected on title for 100 years and restores biodiversity. GPT also staples its offsets “two-for-one” – so every tonne of emissions is offset with one tonne of nature-based and one tonne of energy-based offsets. That puts them into carbon-positive territory. GPT's stated goal is to have a positive overall outcome. Going carbon neutral squares the ledger. Carbon-positive is what they have determined their goal is overall.

Case study: Microsoft

Microsoft announced in 2020 their commitment to:

To be carbon negative by 2030; and by 2050 Microsoft to remove from the environment all the carbon the company has emitted either directly or by electrical consumption since it was founded in 1975.

While not many companies are in the same position as Microsoft, this demonstrates one way forward into a net positive future. If Microsoft chooses nature-based solutions for some or all of these offsets, they would be also redressing lost biodiversity and nature restoration also.

Support decarbonisation initiatives throughout the project lifecycle

Project Phase

Operate > Use

★ Leader > Service Suppliers

○ Support >

BEST PRACTICE

STRATEGIES

Measure and supply information on own emissions

Plan for emissions reduction

Lead innovation emission reductions and promote best practice emission reduction plans

STEPS

1. Measure embodied carbon for project
2. Specify measurement methodology

1. Set upfront carbon targets
2. Measure reductions achieved vs BAU delivery

1. Set upfront carbon caps or NABERS target ratings (note – benchmarks will be via NABERS, don't encourage project teams to do their own!)
2. Achieve NABERS Embodied Carbon Commitment Agreement
3. Achieve NABERS Embodied Carbon Rating

RESOURCES

GBCA Upfront Carbon Calculation Guide for BAU guidance

More Information

Construction

<https://www.corrs.com.au/site-uploads/images/PDFs/Insights/Climate-change-considerations.pdf>

<https://www.mondaq.com/australia/construction-planning/1115842/infrastructure-contracts-playing-catch-up-to-low-embodied-carbon-construction-materials>

<https://www.mondaq.com/australia/construction-planning/1019692/climate-change-are-major-infrastructure-contracts-fit-for-purpose>

<https://www.minterellison.com/articles/contracting-for-the-climate-in-infrastructure-and-construction>

Procurement

https://gazette.legislation.nsw.gov.au/so/download.w3p?id=Gazette_2023_2023-97.pdf

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Make Good / Defit / Strip Out Recycling program

Project Phase

Operate > Use

★ Leader > Facility Manager

○ Support > Owner, Service Suppliers

BEST PRACTICE

| STRATEGIES | Measure the amount of waste and the different waste streams (in tonnes) | Achieve a minimum of 60% of reuse/recycling for defits/make goods/strip outs | Achieve a minimum of 90% of reuse/recycling for defits/make goods/strip out or fully Circular Fitout process |
|------------|--|---|--|
| STEPS | <ol style="list-style-type: none"> 1. Review the scope of the defit for opportunities to recycle/reuse materials 2. Include measurement of waste as a requirement when engaging a contractor | <ol style="list-style-type: none"> 1. Review the scope of the defit for opportunities to recycle/reuse materials 2. Create a defit waste management plan that identifies opportunities for recycling 3. Investigate specialized contractors that can reuse/donate furniture 4. Include measurement of waste as a requirement when engaging a contractor | <ol style="list-style-type: none"> 1. Review the scope of the defit for opportunities to recycle/reuse materials 2. Create a defit waste management plan that identifies opportunities for recycling 3. Investigate specialized contractors that can reuse/donate furniture 4. Include measurement of waste as a requirement when engaging a contractor, report on fitout reused internally, repurposed, donated, recycled, landfill |
| RESOURCES | <p>https://www.betterbuildingspartnership.com.au/resource/stripout-waste-guidelines-procurement-systems-and-reporting/</p> <p>Green Star Performance – Refurbishment waste management credit</p> | <p>Insert text here</p> | <p>Insert text here</p> |

Reduce embodied carbon in replacement capital works

Project Phase

Operate > Use

★ Leader > Owner

○ Support >

BEST PRACTICE 

STRATEGIES

Measure Embodied Carbon in lifecycle replacement projects

Reduce embodied Carbon in lifecycle replacement projects

Achieve Net Zero Carbon for lifecycle replacement projects

STEPS

1. Include EC considerations in equipment selection
2. Include requirements for equipment to have disclosures and information

1. Include EC considerations in equipment selection
2. Include requirements for equipment to have disclosures and information
3. Select equipment with lower embodied carbon impacts

1. Include EC considerations in equipment selection
2. Include requirements for equipment to have disclosures and information
3. Select net zero carbon equipment, or lower embodied carbon with offset the remaining carbon

RESOURCES

Green Star Responsible Services credit

Green Star Responsible Services credit

Green Star Responsible Services credit
Climate Active Carbon Neutral product/service certification

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Action

Project Phase

Plan > Pre Design

★ Leader > Owner/Constructor/etc

○ Support > Owner/Constructor/etc

BEST PRACTICE

STRATEGIES

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