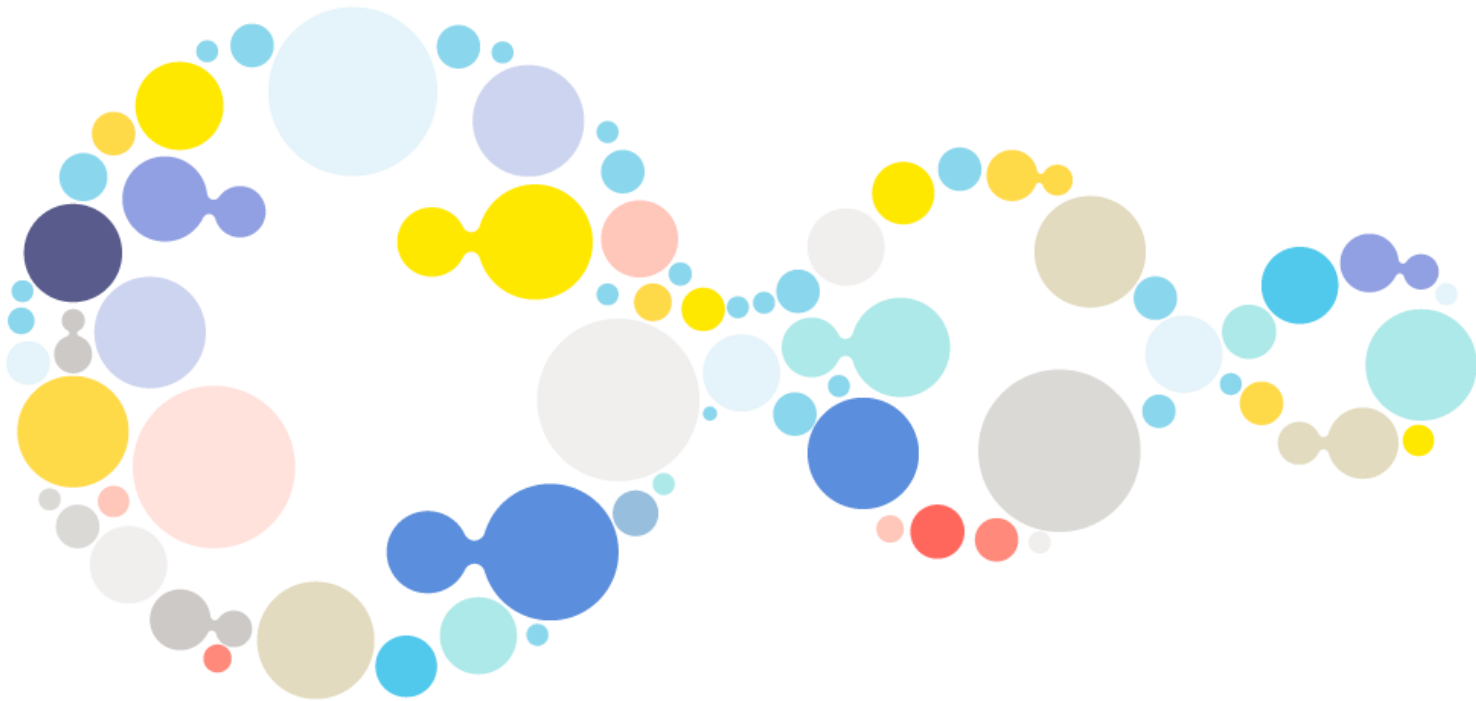


Development of Embodied Emissions Database

Tim Grant

Director, Lifecycles



AusLCI

- AusLCI launch began in 2011
- Is fully cross sectoral in scope
 - Agriculture
 - Energy
 - Water
 - Packaging
 - Construction
- Now over 900 processes
- New releases on demand but at minimum annual updates
- Very limited funding hinders further updates



Australian EPD scheme

- AusLCI launch began in 2015
- Has been mostly successful in construction space
- Now over 200 EPD covering 1000's of processes
- EPDs updated every five years
- Commercially focused organisation



Other data activities by other organisations

- Global Green Tag - extensive engagement with many producers and publication of EPDs and development of inventory data
- Development of Input output and hybrid IO/Process databases - EPIC
- Company LCA reports and carbon neutral claims.
- Ecoinvent development of data for Australia - particularly energy and some metals.

Why the National Embodied Carbon Data project?

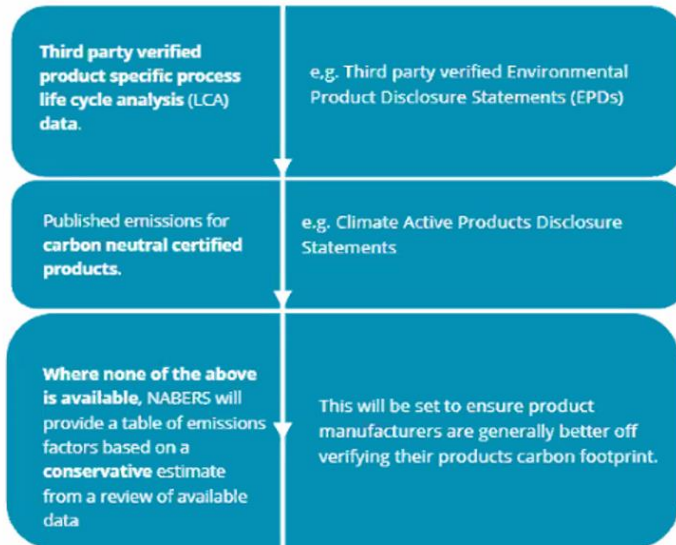
Currently in Australia there is an extremely high interest in the topic of 'embodied' or 'upfront' carbon in the building, infrastructure, and construction sector generally, including major green project rating tools, and potentially some regulatory processes requiring specific carbon mitigation levels as a prerequisite.

It is increasingly important in a changing and decarbonising economy to have a central and active database, to provide representative embodied carbon factors for assessments and decision-making.

Data Methodology

After much industry consultation, agreement has been reached that for assessment of the embodied carbon impacts of building products or full buildings that a 'Process-based LCA/EPD' approach is the preferred methodology.

New Proposed NABERS Data Hierarchy



**additional allowable data sources will be considered if necessary*



The problem

While there has been significant development over the past 10 years in data through AusLCI and Environmental Product Declarations (EPDs), there is no single accepted 'publicly available Australian dataset of agreed 'process LCA based Carbon Emission Factors for the construction sector'.

Potential users of embodied carbon data are generally **confused** about what data to use and when.

They are too **time and resource constrained** to source appropriate embodied carbon data, instead using inconsistent or outdated data.

There is **duplication of effort** and resources with several individual organisations resorting to building and maintaining their own databases.



Proposed Solution

The Australian LCA sector will undertake a collaborative effort involving key stakeholders to collate and publish user-friendly Australian embodied carbon factors for building and construction materials and relevant meta-data based on Australian process LCA in a consistent, freely available, and accessible format, and to continuously update, grow and expand the database's scope and use.

The project will be delivered as an industry collaboration, the project partners (data providers & LCA experts) and supporters (data users and industry)

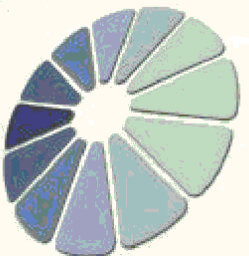


The challenge

- Data sources come with different boundaries, characterisation factors, data sources, timeframes and quality.
- Users of data has different requirements - at this time.
- How to make data responsive and dynamic to changing economy.

AusLCI

The Australian Life Cycle Inventory Database Initiative



Sample mockup of EF database - Transparent, quality-rated and regularly updated.

Greenstar LCA

Select Data for: Greenstar LCA data set are compliant with EN5804, including background infrastructure and biogenic carbon storage. It's important that this data is calculated cradle to grave to capture the full life cycle of biogenic carbon.

Category	Product	Emission factor (kg CO2 e/unit)	Unit	Mass per unit (t)	Scope	Data source	Version No	Standard	Greenstar LCA compliance	Last updated	Geography	Market coverage	Quality
Masonry	Clay brick	2.82	Standard brick	0.0026	Cradle to Gate	AusLCI	V1.42	AusLCI requirements	Yes	2023	AU	Australian average	Generic technology
Masonry	GB SANDSTONE ROCK FACE	159	Tonne	1	A1-A3	Austral Masonry EPD	Version 1.2	EN15804 + A2	Yes	2022	AU & NZ	Producer specific	Company data
Masonry	BREEZE BLOCKS	171	Tonne	1	A1-A3	Austral Masonry EPD	Version 1.2	EN15804 + A1 & A2	Yes	2022	AU & NZ	Producer specific	Company data
Masonry	Bricks for the Future	3.9	Standard brick	0.0028	A1-A3	Island Block & Paving EPD	Version 1.0	EN15804 + A1	No. Based on 2013 GWP values	2019	AU	Producer specific	Company data
Masonry	Blocks for the future	3.42	390L x 90W x 190H mm	0.0078	A1-A3	Island Block & Paving EPD	Version 1.0	EN15804 + A2	Yes	2019	AU	Producer specific	Company data

Same data set will be nuanced for different end uses/standards where needed.

- Greenstar LCA
- NABERS embodied carbon
- ISCA standard
- EN15978 & EN15804
-

ISCA standard

Select Data for: Greenstar LCA, NABERS embodied carbon, ISCA standard, EN15978 & EN15804

Infrastructure Sustainability Council of Australia. Number exclude background infrastructure from LCA databases where possible. Using global warming potentials from AR5 2013 and do not include biogenic carbon embodied in products.

Category	Product	Emission factor (kg CO2 e/unit)	Unit	Mass per unit (t)	Scope	Data source	Version No	Standard	ISCA compliance	Last updated	Geography	Market coverage	Quality
Masonry	Clay brick	2.62	Standard brick	0.0026	Cradle to Gate	AusLCI	V1.42	AusLCI requirements	Yes	2023	AU	Australian average	Generic technology
Masonry	GB SANDSTONE ROCK FACE	159	Tonne	1	A1-A3	Austral Masonry EPD	Version 1.2	EN15804 + A2	No. Background infrastructure included	2022	AU & NZ	Producer specific	Company data
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Benefits

- 1. Reduce cost:** Save time and resources for building professionals and users to collate and maintain embodied carbon libraries.
- 2. Reduce emissions:** By enabling comparison of embodied carbon, it will be easier to select low embodied carbon options.
- 3. Encourage innovation:** By enabling industry to publish and showcase emission data and continuous improvements.
- 4. Aligning efforts:** As an industry collaboration and open access, enables industry to use a single source of truth for embodied carbon...



Project Team and Collaborators:

- **Project Delivery & Quality Management:** Lifecycles, Edge, TPC Solutions (Aust), Global GreenTag International,, etc. - open to expanding this coalition and
- **Potential Data Supply Partners:** ALCAS/AusLCl, EPD Australasia, Global GreenTag Lifecycles, etc.
- **Potential Project Supporters – Data Users:** Representatives from GBCA, BPIC, AIQS, NABERS, ISC, Climate Active, ASBEC, PCA, Engineers Australia, AIA, Architects Declare, BASIX, eToolLCD, Slattery, BPI, Melbourne Water Corporation.
- **Project will be progressive development:** Get started to meet immediate needs and build on requirements over time

