



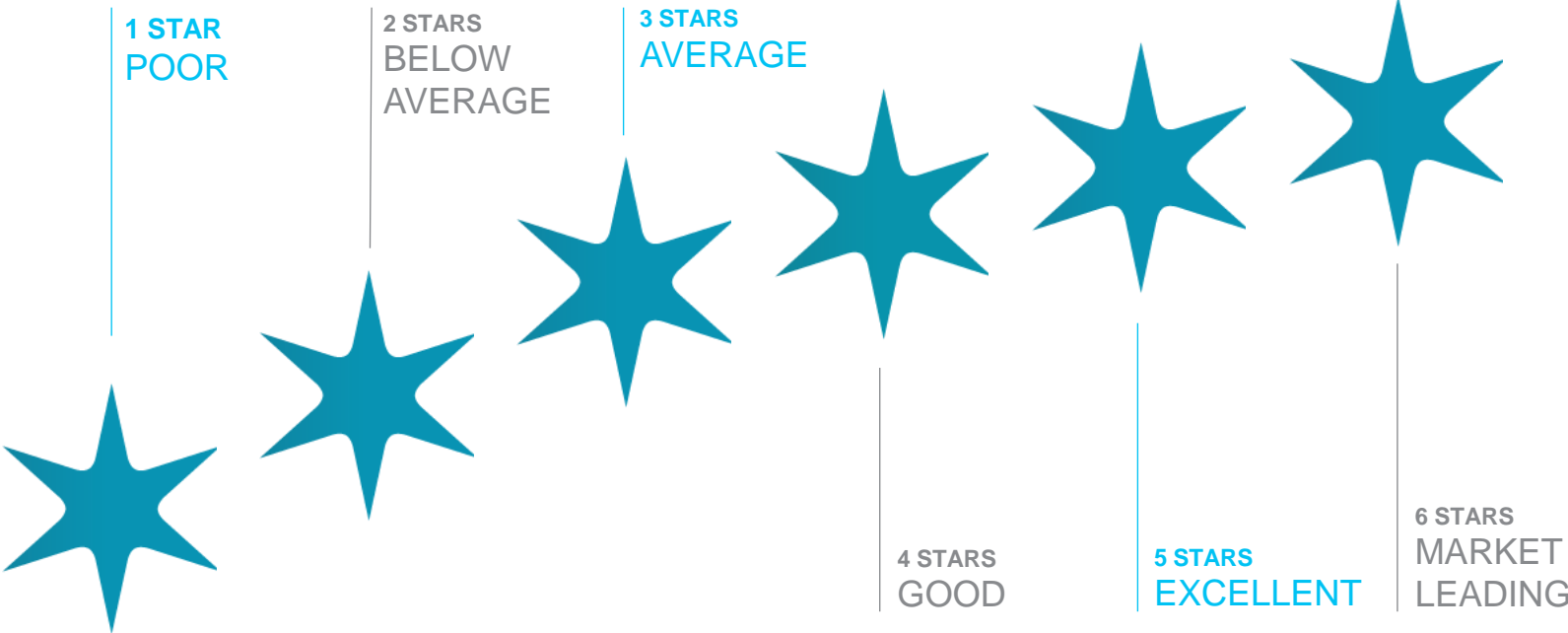
N A B E R S

Introducing the NABERS embodied carbon tool

Katie Eyles

**BUILDING
PRODUCT
LEADERS
FORUM
AUG 2024**

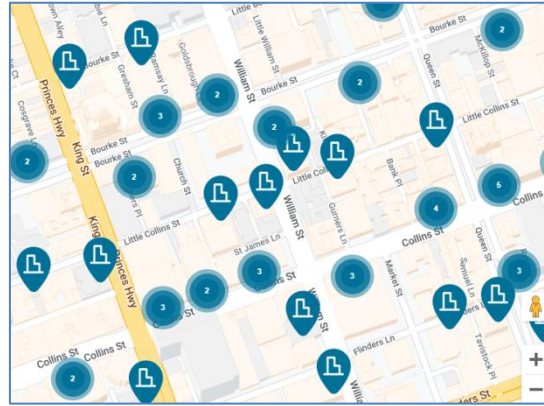
NABERS is Australia's largest building sustainability initiative



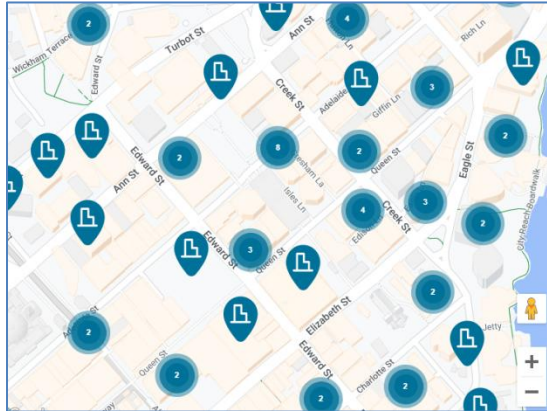
Sydney



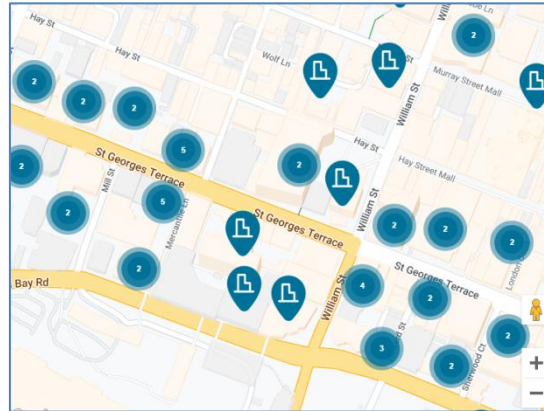
Melbourne



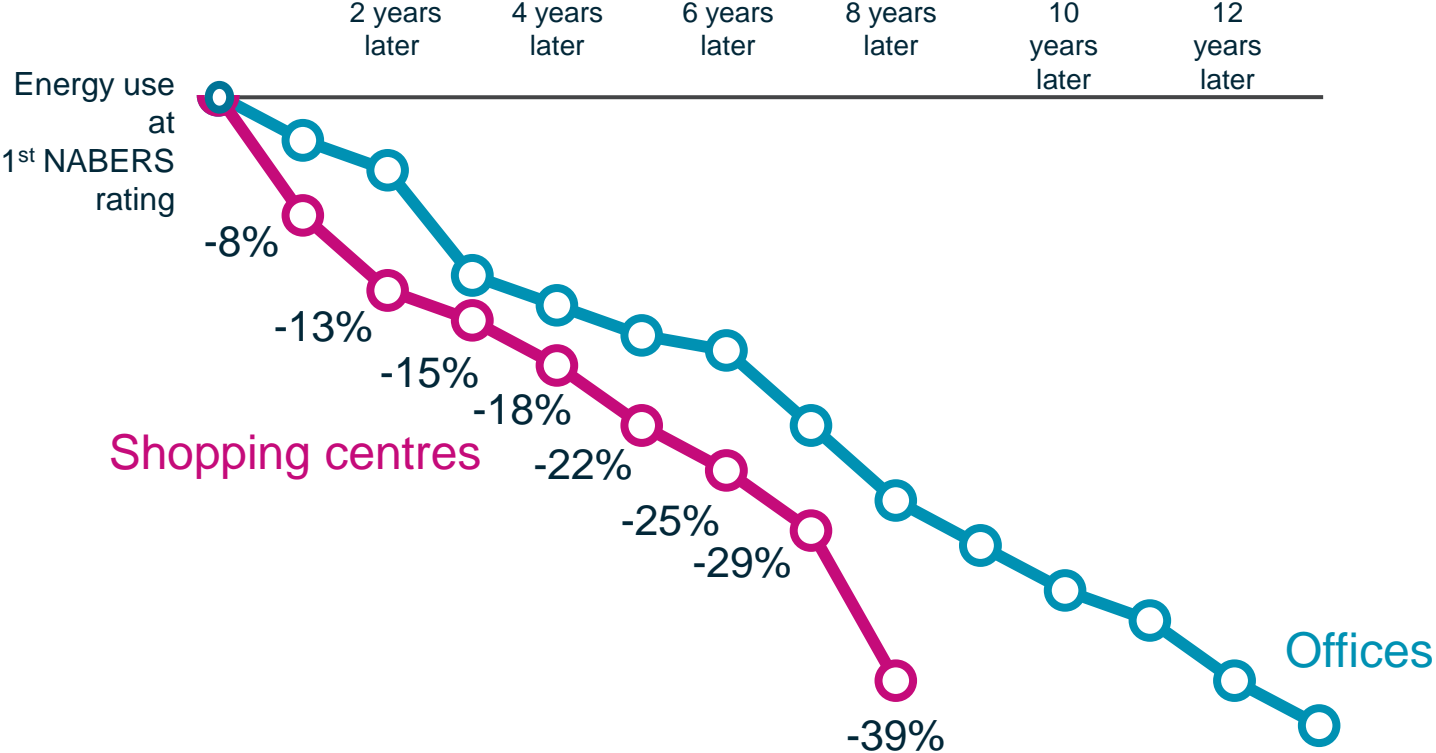
Brisbane



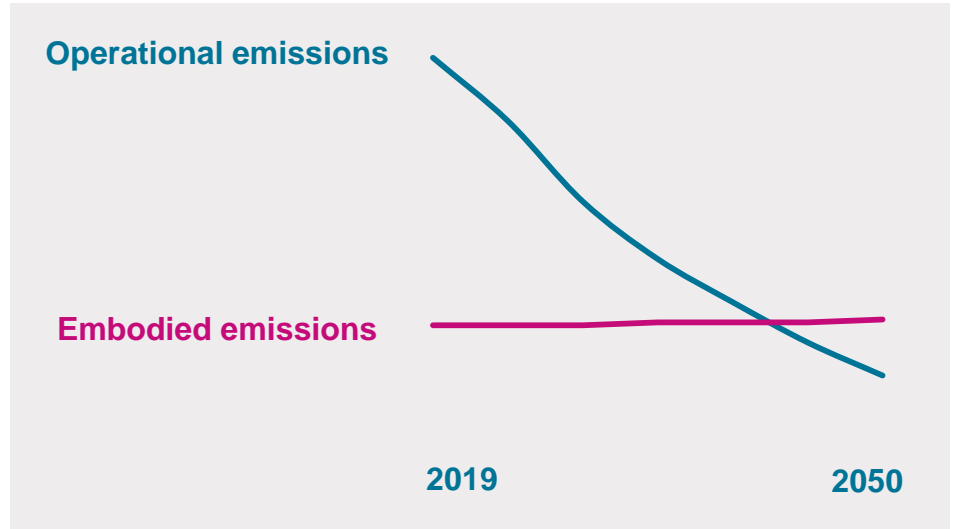
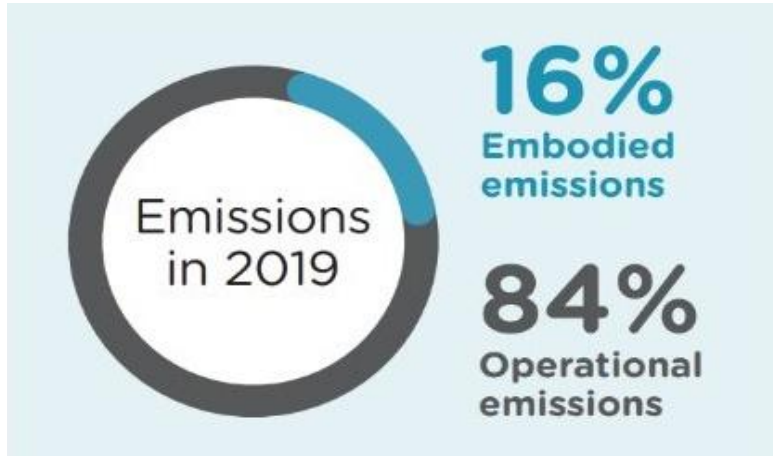
Perth



Measurement leads to improvement



Greenhouse gas emissions from buildings



NABERS has been developing the national standard for embodied carbon since 2021

300 +
people



Decision makers

Developers, owners, tenants



Project teams

Architects, engineers, quantity surveyors, construction, LCA experts



Influencers

Policy makers, investors, industry peaks, standards bodies, academics



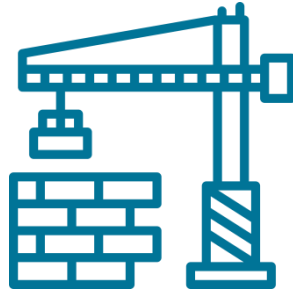
Supply side

Product manufacturers

What the NABERS embodied carbon standard will look like



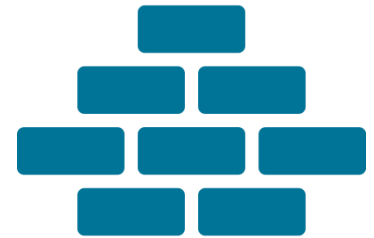
It will focus on new buildings and major refurbishments.



It will capture emissions from building materials, transport and construction.



It will enable buildings to set and verify targets, then certify as built.

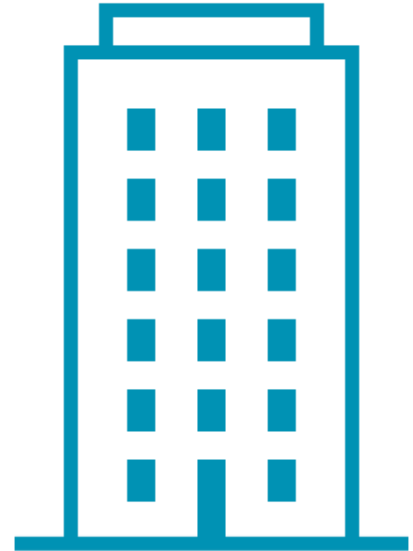


It will encourage using products with known emissions (EPD certified).

How to measure

(Transport + construction) +

Quantity of material
x emissions of material



PRODUCT

CONSTRUCTION

USE

END OF USE

NEXT PRODUCT SYSTEM

A1: Raw material supply

A2: Transport

A3: Manufacturing

A4: Transport

A5: Construction

B1: Use

B2: Maintenance

B3: Repair

B4: Replacement

B5: Refurbishment

C1: Deconstruction

C2: Transport

C3: Waste processing

C4: Disposal

D: Recovery, reuse, recycling

B6: Operational energy use

B7: Operational water use

Upfront carbon

What materials to measure

- Main structure of the building
- Major mechanical services and vertical transport



Material quantities: as built

- Bill of quantities
- Evidence of what was delivered to site

Bill of quantities

	Amount	Unit
Product 1	X	m ³
Product 2	X	tonne
Product 3	X	kg
Product 4	X	m ²



Emissions data

- Strong industry preference for product specific emissions data, i.e. EPDs
- NABERS emission factors database

Environmental product
declaration (EPD)

independently
verified
(Climate

NABERS
conservativ
default



How to measure

(Transport + construction) +

Quantity of material
x emissions of material



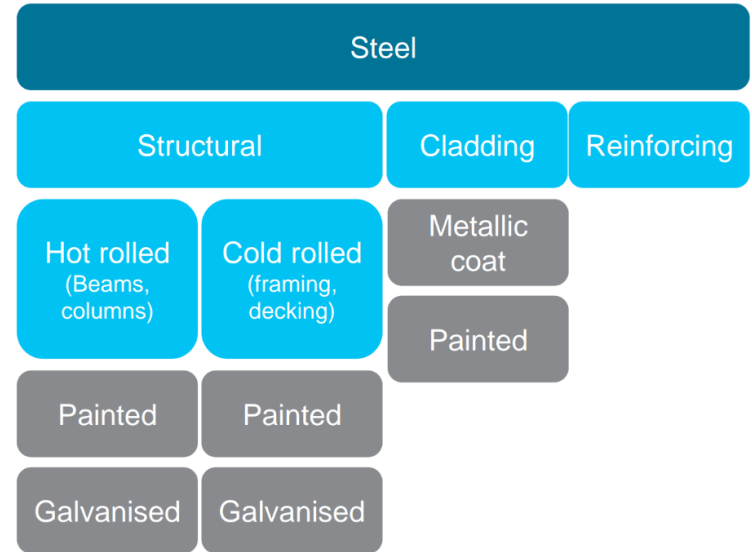
NABERS national emission factors database



1. Define groups

- Are products performing the same function?
- Do we need to divide based on production technology?
- Does it match the materials found in quantity data?
- Does it match what industry and manufacturers expect?

How we created defaults



1. Define groups

**2. Source
emission factors**

**3. Statistical
analysis**

**4. Qualitative
analysis**

How we created defaults

- Did we get all key suppliers and products that are in the market?
- Is there anyone missing?
- Is the data skewed to one product or type of product within the grouping?
- Is there appropriate geographical representation particularly for imported products?
- How does the average EF compare to other EF sources (i.e. AusLCI)?

How we created defaults

1. Define groups

2. Source
emission factors

3. Statistical
analysis

4. Qualitative
analysis

Industry workshops

Steel

Concrete

Facades

Timber

Building services

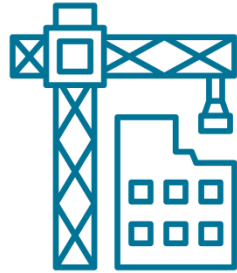
Emission Factor material type	Emission Factor material category	Description	Declared unit	Data qualitative Rating	Uncertainty adjustment (%)	Quantity basis (kgCO ₂ e/declared unit)			
						Default (uncertainty adjusted)	Max in category EF	Min in category EF	Average EF
Concrete in-situ	≤10 MPa	Any concrete mix with a strength rating of 10 MPa or lower.	m ³	Tier 3	110%	273	248	142	181
Concrete in-situ	>10 MPa to ≤20 MPa	Any concrete mix with a strength rating of 20 MPa or lower and greater than 10MPa	m ³	Tier 1	102%	371	364	136	198
Concrete in-situ	>20 MPa to ≤25 MPa	Any concrete mix with a strength rating of 25 MPa or lower and greater than 20 MPa	m ³	Tier 1	102%	396	388	149	220
Concrete in-situ	>25 MPa to ≤32 MPa	Any concrete mix with a strength rating of 32 MPa or lower and greater than 25 MPa	m ³	Tier 1	102%	468	459	167	249
Concrete in-situ	>32 MPa to ≤40 MPa	Any concrete mix with a strength rating of 40 MPa or lower and greater than 32 MPa	m ³	Tier 1	102%	556	545	185	300
Concrete in-situ	>40 MPa to ≤50 MPa	Any concrete mix with a strength rating of 50 MPa or lower and greater than 40 MPa	m ³	Tier 1	102%	621	609	101	357
Concrete in-situ	>50 MPa to ≤65 MPa	Any concrete mix with a strength rating of 65 MPa or lower and greater than 50 MPa	m ³	Tier 2	105%	640	609	274	382
Concrete in-situ	>65 MPa to ≤80 MPa	Any concrete mix with a strength rating of 80 MPa or lower and greater than 65 MPa	m ³	Tier 3	110%	670	609	301	426
Concrete in-situ	>80 MPa +	Any concrete mix with a strength rating above 80 Mpa	m ³	Tier 4	120%	731	609	444	444
Concrete pre-cast Wall panel - precast cc		Any precaste concrete panel i.e. wall, deck, or balcony panel.	tonne	Tier 4	120%	261	218	183	208

The NABERS embodied carbon standard



Emissions

Including a national database of default emission factors



Scope

A standardise scope and documentation requirements



Certification

As-built verification of the emissions of a building



Benchmarks

To set targets and compare buildings against others

National agreement

- Developed in partnership with the GBCA and industry
- Fully aligned with international standards for measuring embodied carbon in buildings
- Joined up approach with Infrastructure NSW, Infrastructure Australia, Climate Active
- Approved by the NABERS National Steering Committee, by all states and territories
- Already in policy: NSW Sustainable Buildings SEPP, Environmentally Sustainable Procurement Policy, voluntary pathway in NCC 2025

Launching November 2024

- Piloting now

Thank you

katie.eyes@environment.nsw.gov.au



NABERS