

Residential Embodied Carbon

Tom Petty

tompetty@carbontrace.com.au



CarbonTrace

www.carbontrace.com.au

Acknowledgement of Country

Part 1: **What is 'embodied carbon'?**

Part 2: **Where do you make a start?**

Part 3: **Why should you care about it?**

Introduction

CarbonTrace is cleantech software platform which measures residential embodied carbon.

Tom Petty

Masters of Architecture
Registered builder (Grenville Architectural Construction)
Carbon nerd

Ben Cryan

Civil engineer (Praxis Engineering)
Linear infrastructure optimising (Axesse)
Cleantech entrepreneur



Part 1

What is embodied carbon?

Part of our total carbon emissions.



CarbonTrace

Emissions of a home:

'Operational' Emissions

Carbon emissions in 'running' a home:

- Heating/Cooling
- Hot Water
- Lighting/appliances etc

**Higher efficiency (ie 7 Stars)
& PV reduces these emissions.**

'Embodied' Emissions

Carbon emissions in making the bricks & mortar going into a home:

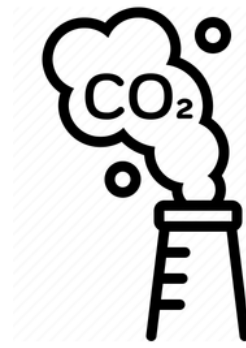
- Digging stuff out of ground
- Using energy to turn it into brick, concrete steel etc
- Moving stuff around

Some materials have lower emissions than others.

How it is calculated



Strength (MPa)	Mix Code	kg CO ₂ eq
32	VN322B	266.21
32	VS321MSPR	324.73
25	VS251BPV	252.50
25	VS252BOX	244.19



25.428 Tonnes CO₂e

Quantity of material

Tendering or procurement quantities.

X

'Emission factor'

Scientists have number-crunched these.

=

Carbon footprint

Do this for every material to get a total for a project.

After measuring it, you can think about it:

Experts can't agree on the right 'emission factor'.

What if a low-emissions material needs replacing all the time?

What if a high-emissions materials makes the operational emission lower?

Timber Emissions Factor

(kgCO₂e/m³)

EPIC

549kg

NABERS

188kg

EPD

-711kg

Three different databases with different values for the same material.

Builders Measuring Embodied

Builders have **the best** understanding of how much
'stuff' is in a house.

'Amount of stuff' is **critical information** in measuring
embodied carbon.

This is a **unique** and **valuable** position in the value chain.

Part 2

Where do you start?

Keep it simple.

It's ok it's not perfect.



CarbonTrace



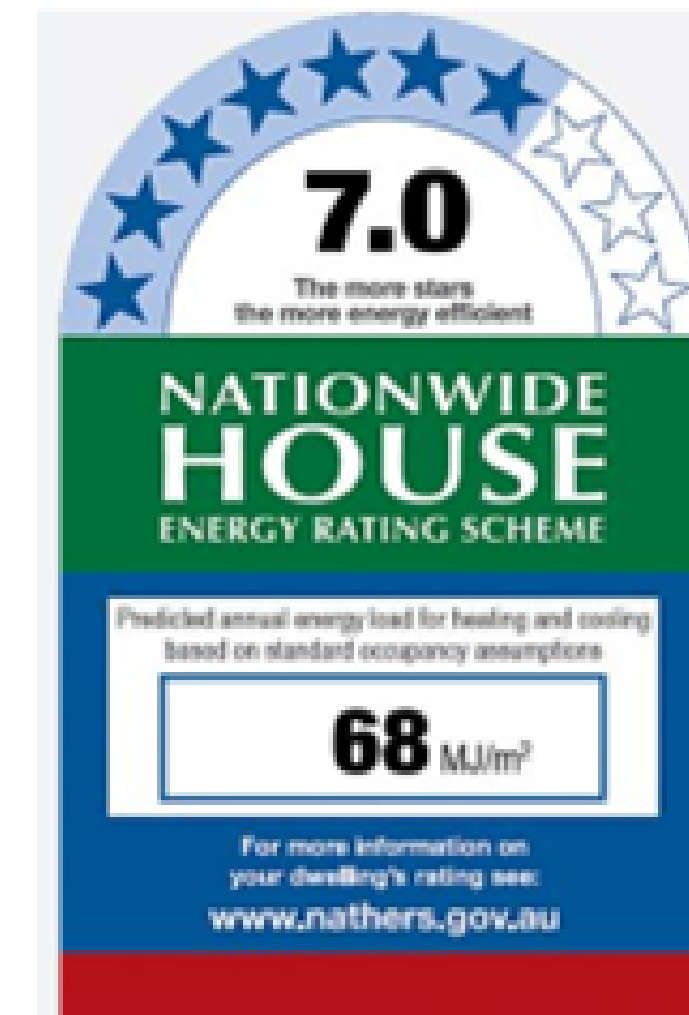
We turn a NatHERS certificate into embodied carbon.

7 Star NatHERS solutions

+

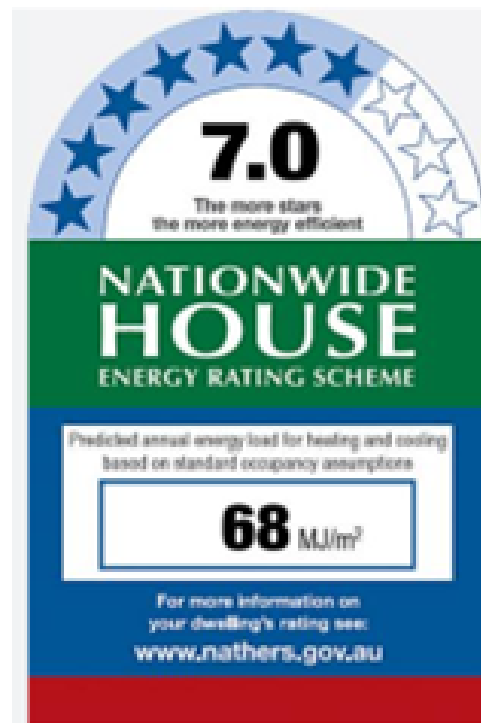
Embodied Carbon Analysis

Embodied & Operational Carbon “One-Stop-Shop”.

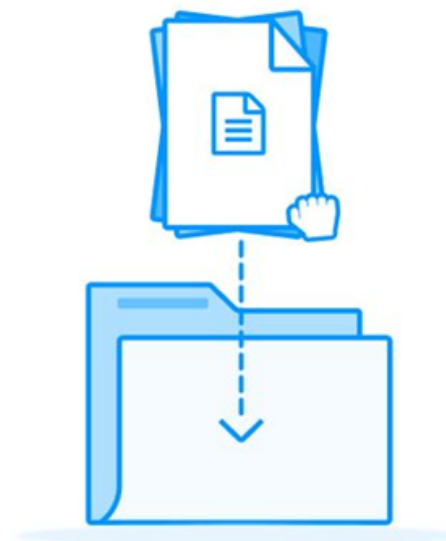




CarbonTrace



We deliver a 7 star
energy certificate



We 'drag & drop' into our
algorithm

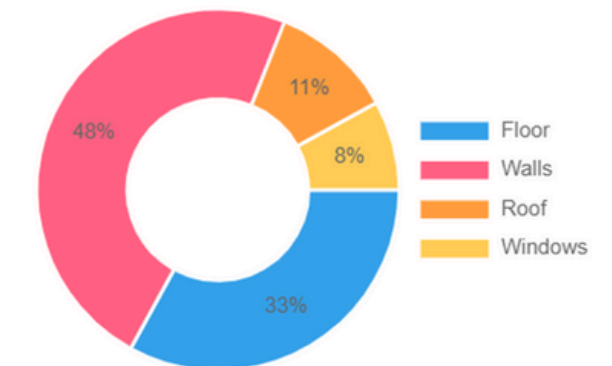


Upfront Carbon

Total	Per m ²
31 T	161 kgCO ₂ e/m ²



Component Breakdown



Instant embodied
carbon analysis

kgCO2e/m2
(EPD data)



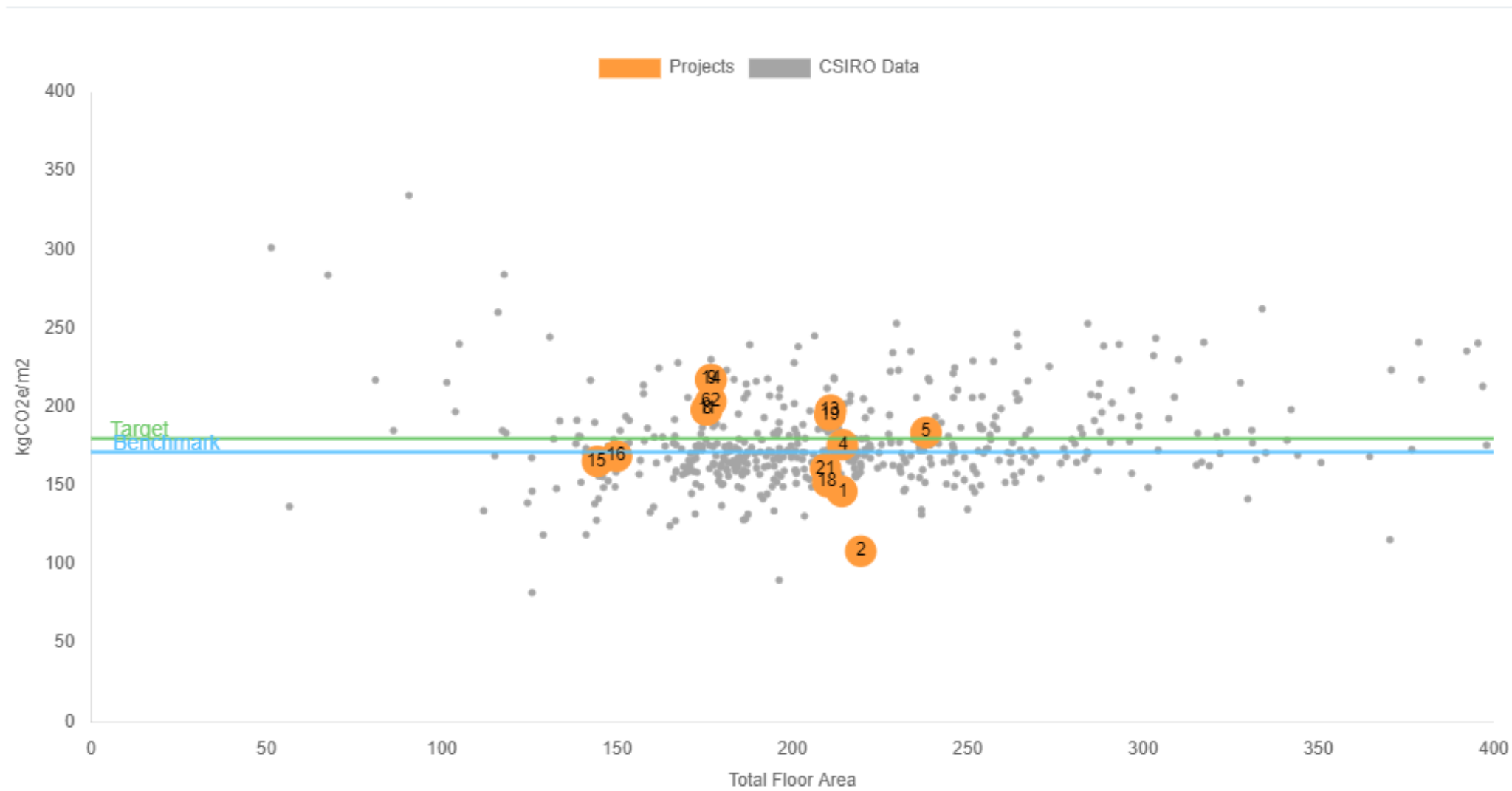
Total m2 (GFA)

‘Apples for apples’ comparison against 1 million datapoints.

Embodied carbon vs area

Industry benchmark

NSW



	217.37	38.43	▲ +20.76%	Completed		
	0.00	0.00		Active		
	198.21	34.79	▲ +10.12%	Completed		
	0.00	0.00		Active		
	197.90	41.74	▲ +9.94%	Completed		
	217.37	38.43	▲ +20.76%	Completed		
	165.39	23.88	▼ -8.12%	Completed		
	168.78	25.30	▼ -6.23%	Completed		

Group Average

Difference to target

179.29 kgCO₂e/m²

▼ -0.40%

Total number of projects

Active Completed

176

15

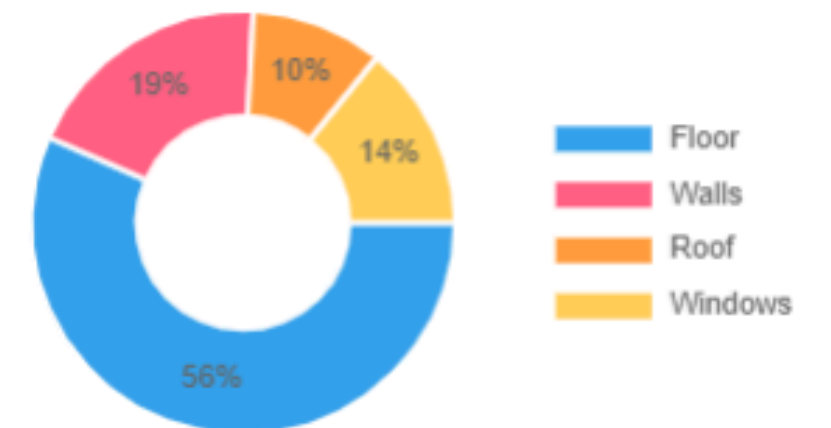
Target Embodied Carbon

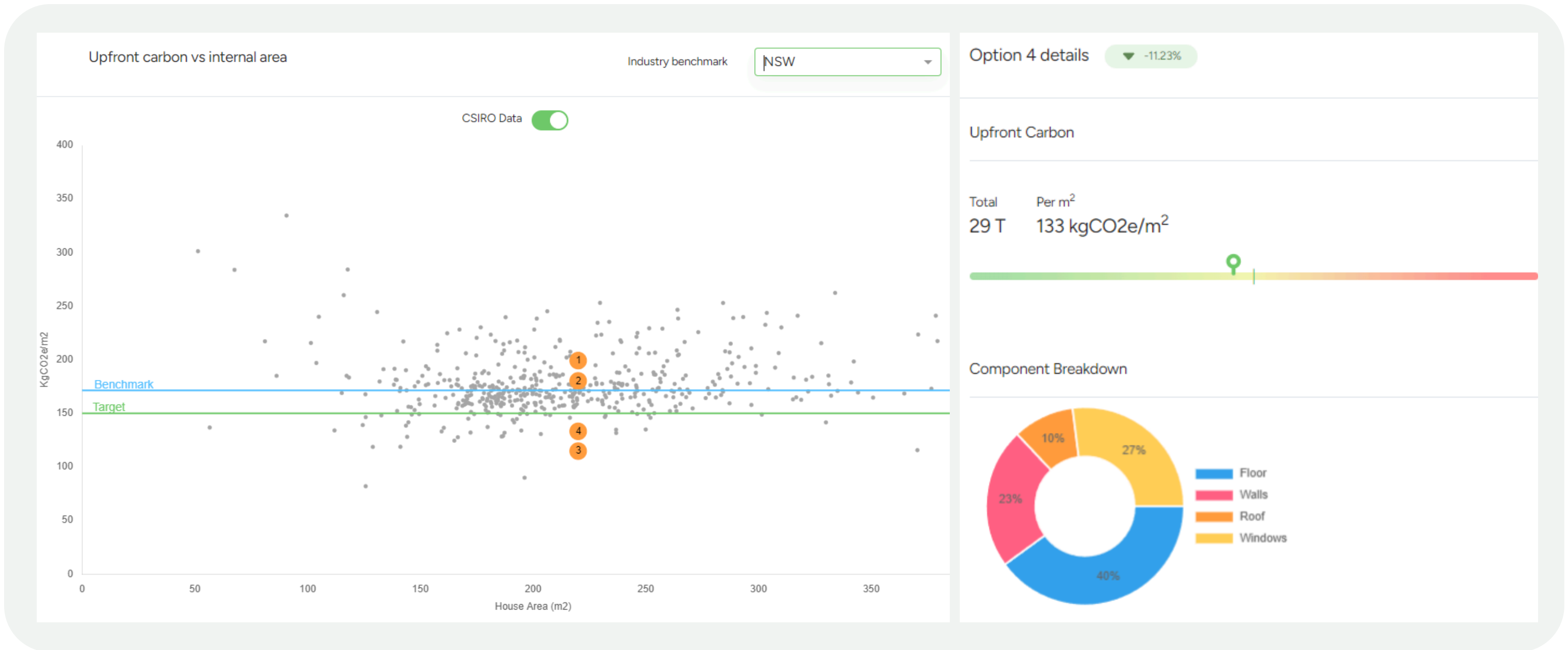
180 kgCO₂e/m²

Total Scope 3 Emissions

516.69 T

Component Breakdown





Reduction Option:

- Use low-C concrete
- Brick G.F. & weatherboard F.F.
- Use a low-C brick

- Saved 4 Tonnes**
- Saved 7 Tonnes**
- Saved 4 Tonnes**

11.23% below your target

Part 3 **Why should you care about it?**

It's coming.



It is becoming good business to get across embodied carbon.

1. Reporting Requirement

2. Financial Opportunity

3. NCC 2028

Large organisations need to report on their emissions.

Banks: Anything they finance.

Developers: Their developments.

This is keeping CEO's up at night.



Mandatory ESG Reporting.

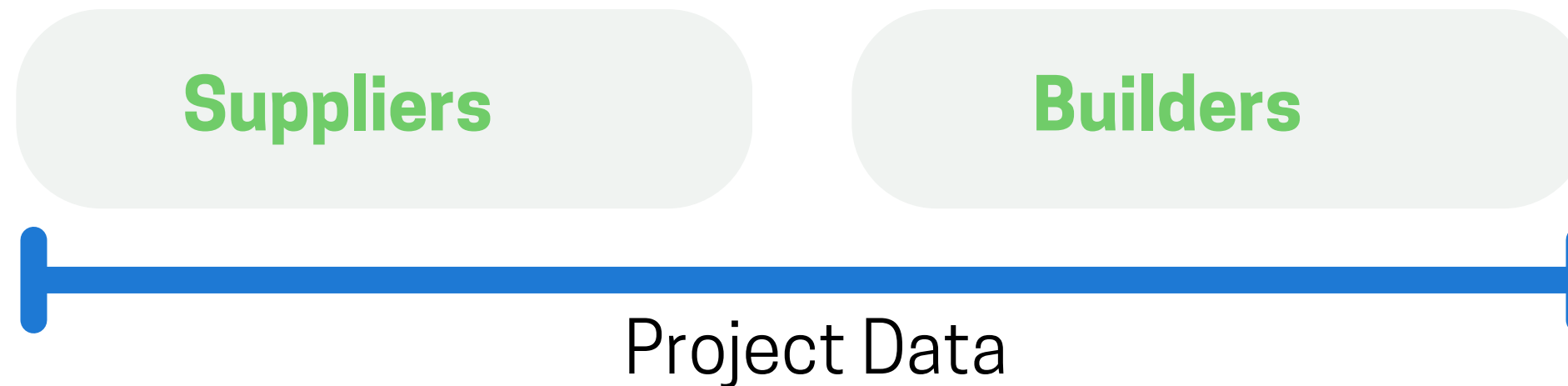
Passed in Senate last week.

Data in the value-chain



“Upstream”

**Where does their data
come from?**



“Downstream”

Why should you care about it?



Is there potential business advantage
to **providing emission data**?



Is there potential business risk in
having no idea?

Key takeaways:

Don't get bogged down in the detail.

Builders have unique & valuable quantity data.

It is coming.

Get your toe in the water.