Environmental Product Declarations and the Built Environment

Hello

Stephen Mitchell
Over twenty years' experience in reducing the impact of building materials by waste reduction, recycling and measuring and improving production processes

Worked within government (NSW Department of Environment) and industry (mainly timber industry)

Worked with Australian timber industry to develop 6 EPDs for Australian timber products

Since 2017 - Chair of EPD Australasia

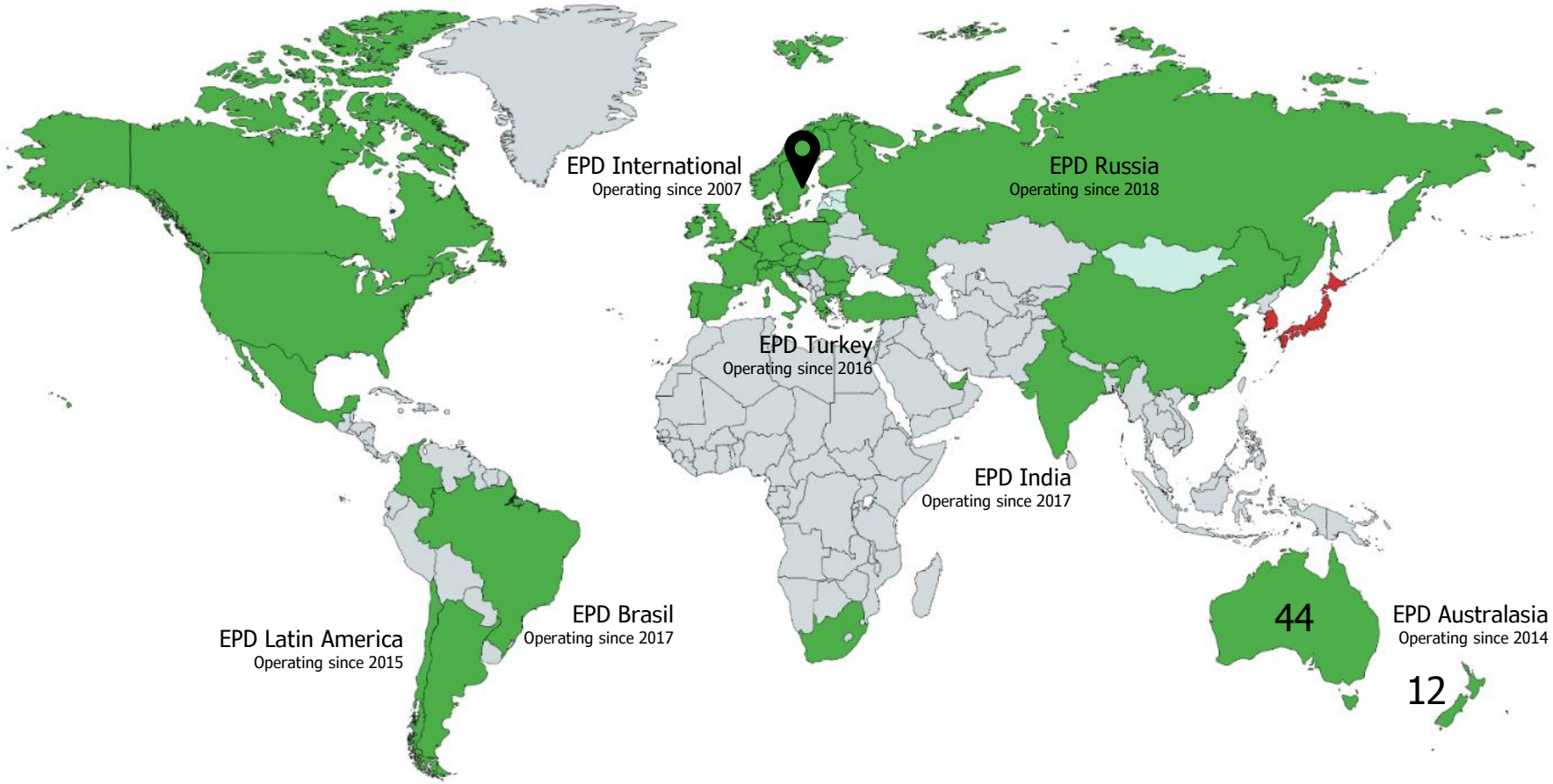
Masters in Environmental Management at the University of New South Wales.

Agenda

- Who is EPD Australasia?
- What are Environmental Product Declarations (EPDs)
- How to find and read an EPD
- Comparing products
- EPDs informing building and design decisions
- Embodied carbon
- Conclusions and a Call to Action!

EPD Australasia

We are part of the International EPD® System with over 1,100 EPDs registered in over 45 countries



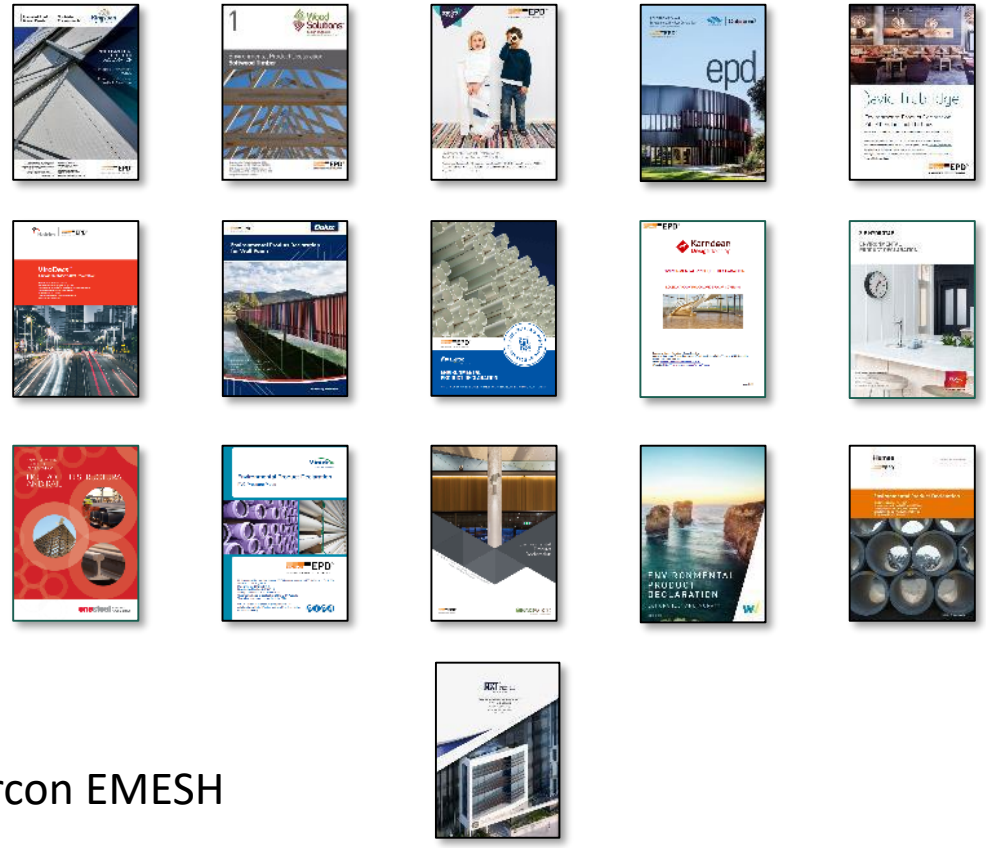
EPD Australasia: EPD owners

- 31 EPD owners
- 62 EPDs
- 3 climate declarations
- Data for hundreds of products

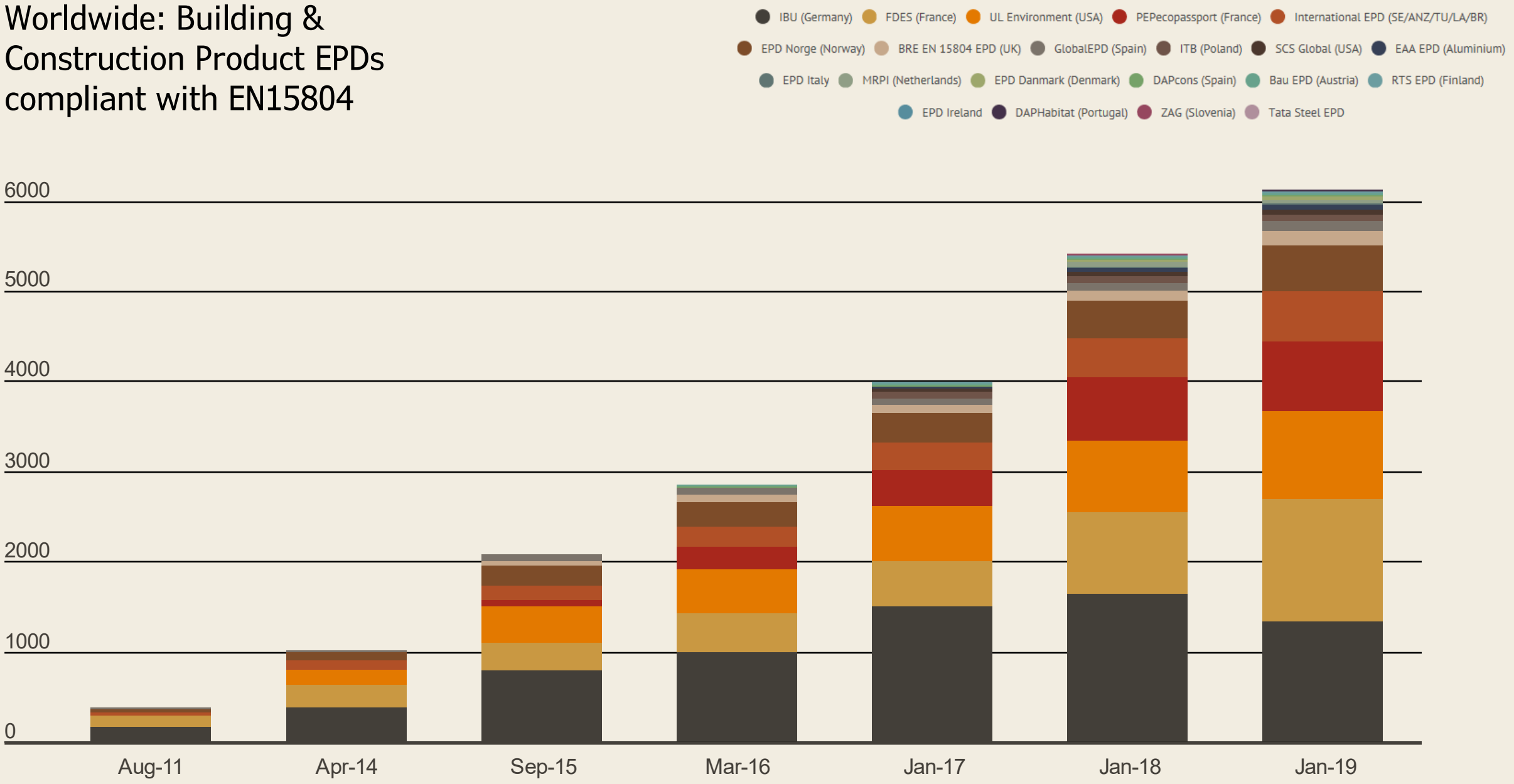
Range of Australasian EPDs available

- **Structural**
- **Façade**
- **Fit-out products**
- **Whole buildings**

Cladding & façade elements
Concrete & concrete elements
Floor coverings
Floor systems
Galvanizing
Interior lining & panels
Lighting
Paint & coatings
Pipes & conduits
Steel & other metal products
Structural panels
Thermal insulation
Wood & wood-based products
Other: Zip HydroTap®, InnoWood, Fibercon EMESH
NXT™ Concept Building
PLUS: tissues, wool fabric, railway carriage



Worldwide: Building & Construction Product EPDs compliant with EN15804



EPDs: Building & Infrastructure Sustainability Ratings

green building council australia

Green Building Council of Australia

"Environmental Product Declarations play an important role in achieving the GBCA's vision to create healthy, resilient and positive places for people. We support the development of EPDs in the market as they represent verified, transparent environmental impact data, and have a transformational impact by enabling the built environment to understand its impact on a deeper level. We commend our member Holcim for demonstrating leadership in trying to achieve these outcomes."

Davina Rooney
CEO, Green Building Council of Australia

ISCA

Infrastructure Sustainability Council of Australia

"ViroDecs™, Holcim Australia's range of ready-mix concrete covered by an Environmental Product Declaration, is a step forward for the construction industry. For the first time, stakeholders will have access to third-party verified life cycle data for CO_2-e emissions in one of Australia's essential construction materials.

Holcim's ViroDecs™ will help shape the way the construction industry analyses the environmental impact of infrastructure, and enable projects to achieve positive outcomes and score points using the IS rating scheme."

Ainsley Simpson
CEO, Infrastructure Sustainability Council of Australia

ENVIRONMENTAL PRODUCT DECLARATIONS (EPDs)

Building & construction materials are driven by performance data

Stress grade	Bending	Tension	Panel shear	Rolling shear	Compression in the plane of the sheet	Bearing normal to the plane of the sheet	Modulus of elasticity	Modulus of rigidity
	f_b	f_t	f_s	f_r	f_c	f_p	E	G
	(MPa)	(MPa)	(MPa)	(MPa)	(MPa)	(MPa)	(GPa)	(MPa)
F17	50	30	6.8	2.4	40	20	14.0	700
F14	40	25	6.1	2.2	30	15	12.0	625
F11	35	20	5.3	1.9	25	12	10.5	525
F8*	25	15	4.7	1.7	20	9.7	9.1	455
F7	20	12	4.2	1.5	15	7.7	7.9	345

Species	Janka (kN)
Bamboo (strand woven)	16.1
Grey Box	15.0
Ironbark	14.0
Red Mahogany	12.0
Turpentine	12.0
Spotted Gum	11.0
Brushbox	9.5
Blackbutt	9.1
Forest Reds	9.1
Sydney Blue Gum	9.0
Karri	9.0
Tallowwood	8.6
Merbau	8.6
Jarrah	8.5
Stringybark	8.1
Australian Beech	7.5
Flooded / Rose Gum	7.5
Northern Beech	7.5
Messmate	7.1
Bamboo (vertical)	6.6
Cypress Pine	6.1
New England Oak	6.1
American Oak	6.0
Bamboo (horizontal)	5.9
Tasmanian Oak	5.5
Victorian Ash	4.5
Baltic Pine	2.9

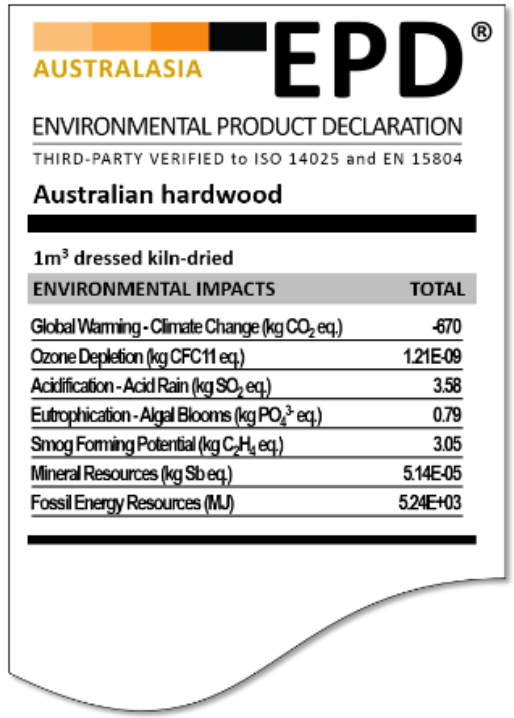
	12 mm thick or greater		19 mm thick or greater	
	CRF	Smoke Development Rate % - minute	CRF	Smoke Development Rate % - minute
Ash, Alpine	-	<750	More than 2.2 and less than 4.5	<750
Ash, Mountain	More than 2.2 and less than 4.5	<750	More than 2.2 and less than 4.5	<750
Ash, Silvertop	More than 2.2 and less than 4.5	<750	More than 2.2 and less than 4.5	<750
Beech, Myrtle	More than 2.2 and less than 4.5	<750	4.5 or greater	<750

What is an EPD?

An Environmental Product Declaration (EPD) provides the **environmental performance data** of a product over, at least, the production phase of its life cycle.

The data is accurate, independently **verified** and **globally recognised**.

An EPD demonstrates a supplier's commitment to sustainability and transparency.



AUSTRALASIA EPD®

ENVIRONMENTAL PRODUCT DECLARATION

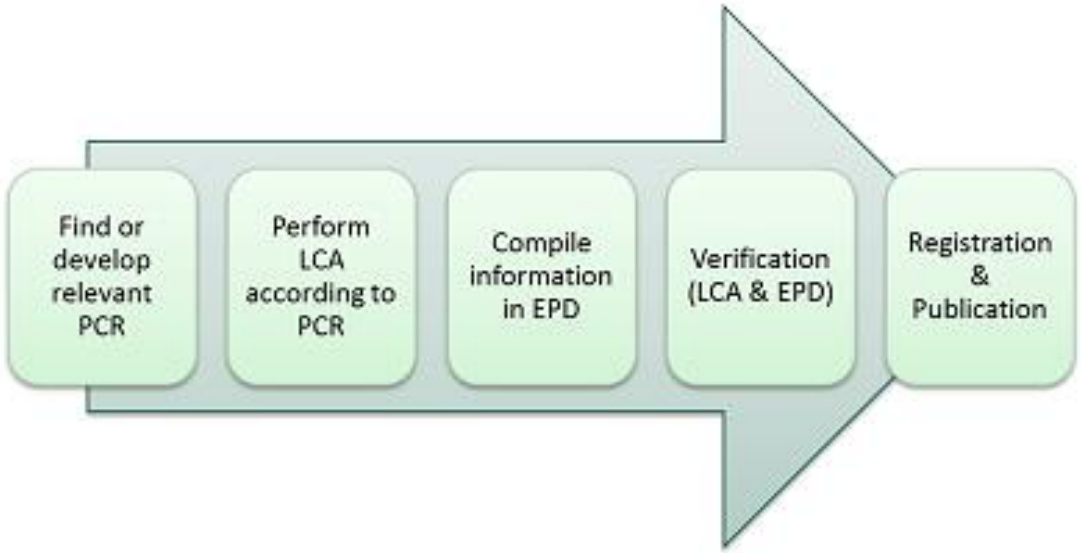
THIRD-PARTY VERIFIED to ISO 14025 and EN 15804

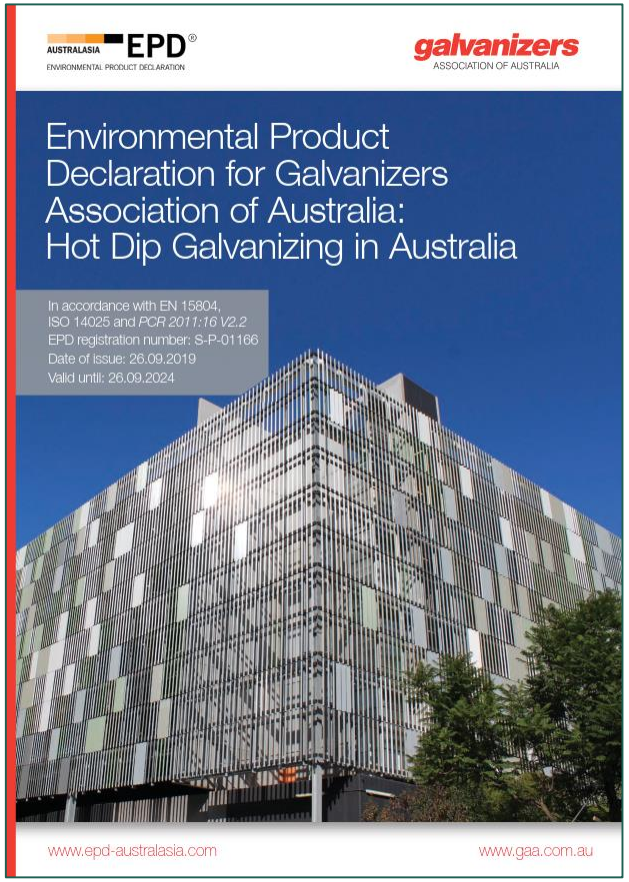
Australian hardwood

1m³ dressed kiln-dried

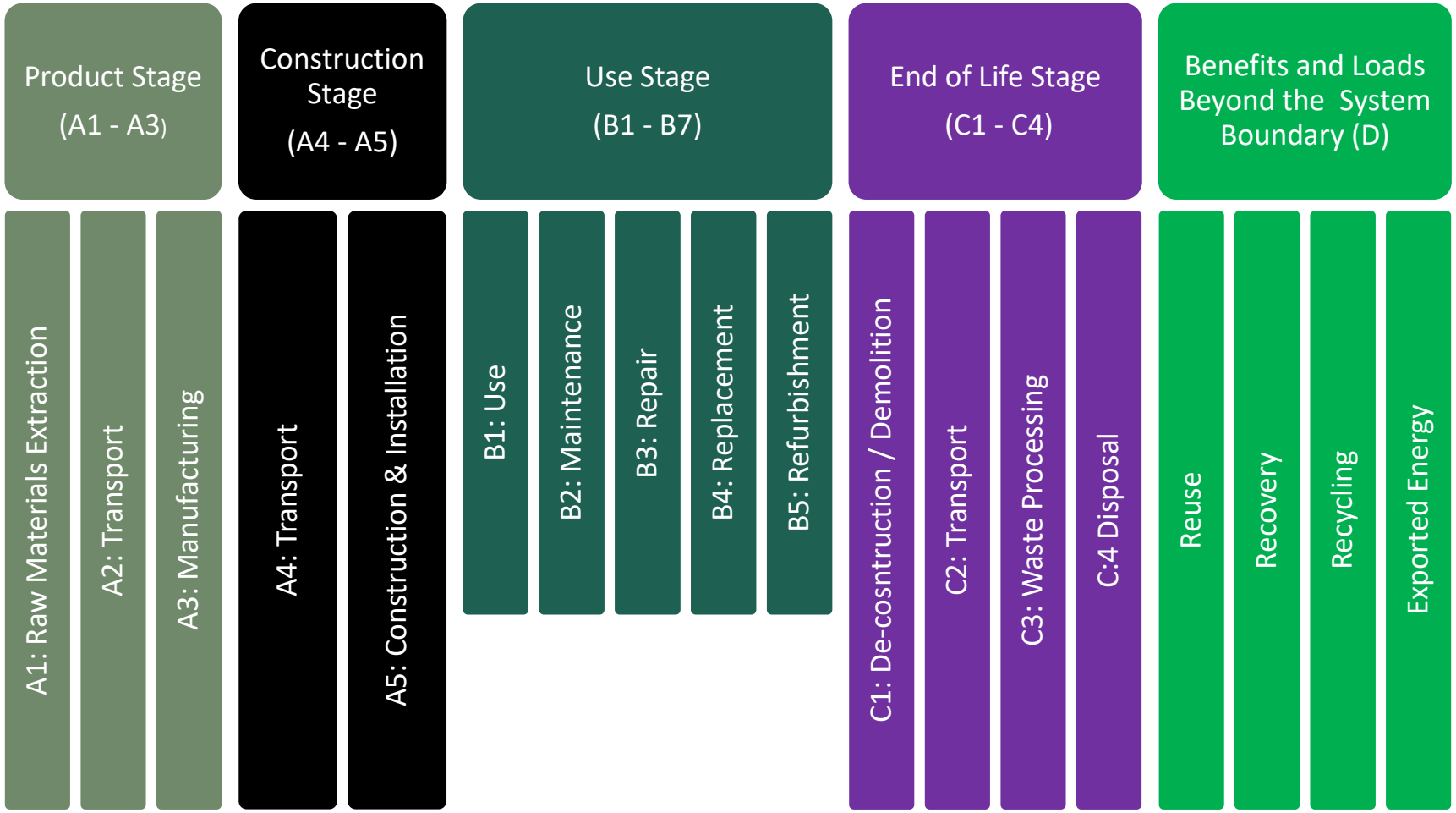
ENVIRONMENTAL IMPACTS	TOTAL
Global Warming - Climate Change (kg CO_2 eq.)	-670
Ozone Depletion (kg CFC11 eq.)	1.21E-09
Acidification - Acid Rain (kg SO_2 eq.)	3.58
Eutrophication - Algal Blooms (kg PO_4^{3-} eq.)	0.79
Smog Forming Potential (kg C_2H_4 eq.)	3.05
Mineral Resources (kg Sb eq.)	5.14E-05
Fossil Energy Resources (MJ)	5.24E+03

Creating an EPD





Creating an EPD: Life Cycle Stages



EPDs: Environmental impacts

CARBON FOOTPRINT		Global Warming Potential → Climate Change
AIR POLLUTION		Ozone Depletion Potential → Ozone Hole
		Photochemical Ozone Creation Potential → Smog
WATER POLLUTION		Eutrophication Potential → Algal Blooms
		Acidification Potential → Acid Rain
NON-RENEWABLE RESOURCE CONSUMPTION		Abiotic Depletion Potential → Mineral Resource Consumption
		Abiotic Depletion Potential → Fossil Fuel Resource Consumption

EPDs: Resource use, waste and other outputs

Resources:

- Renewable energy
- Non-renewable energy
- Use of secondary materials
- Use of net fresh water

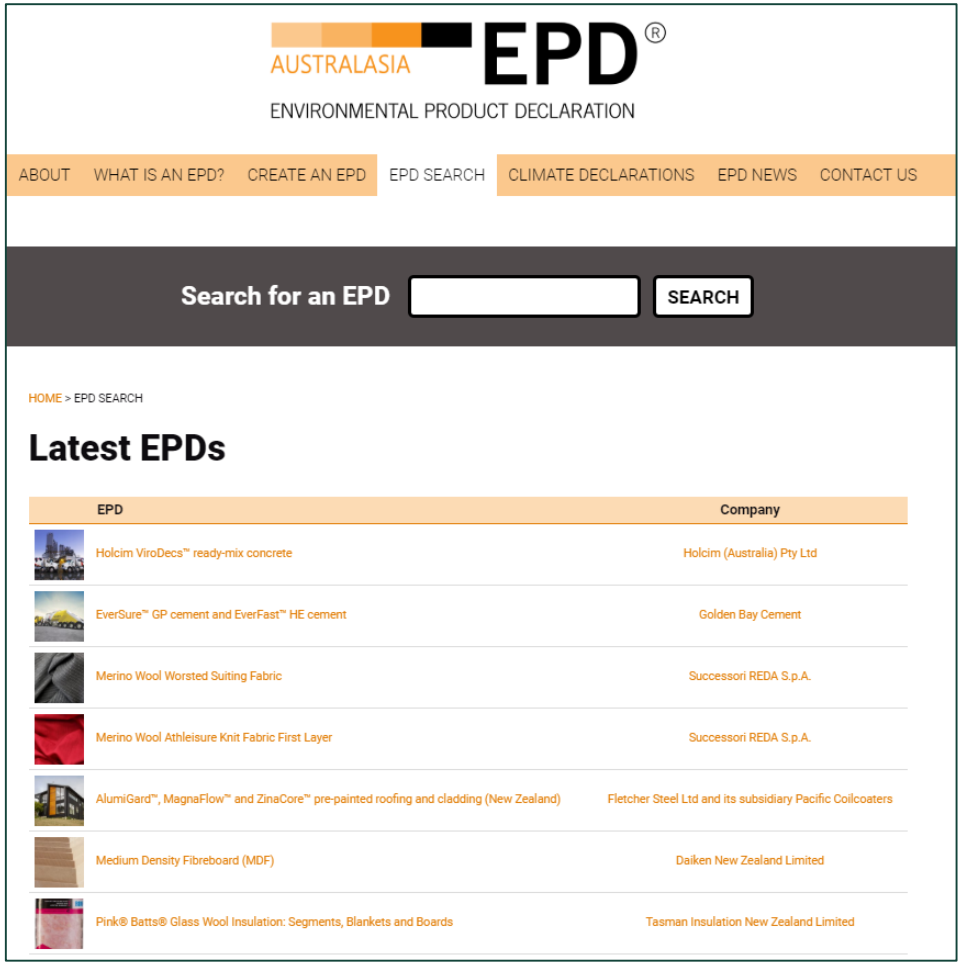
Wastes etc:

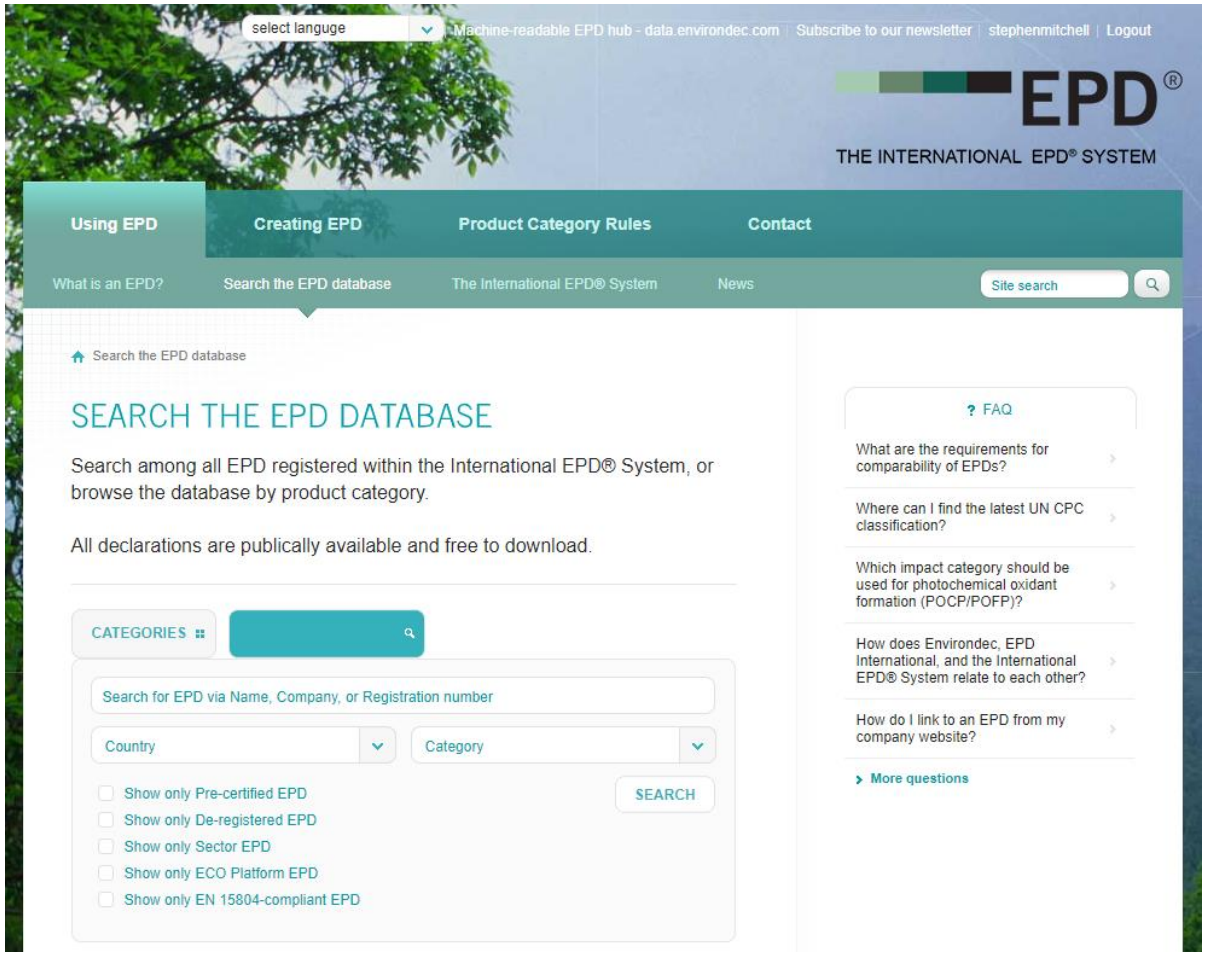
- Hazardous & non-hazardous waste
- Radioactive wastes
- Materials for recycling
- Exported electricity
- Exported thermal energy

HOW TO FIND and READ AN EPD

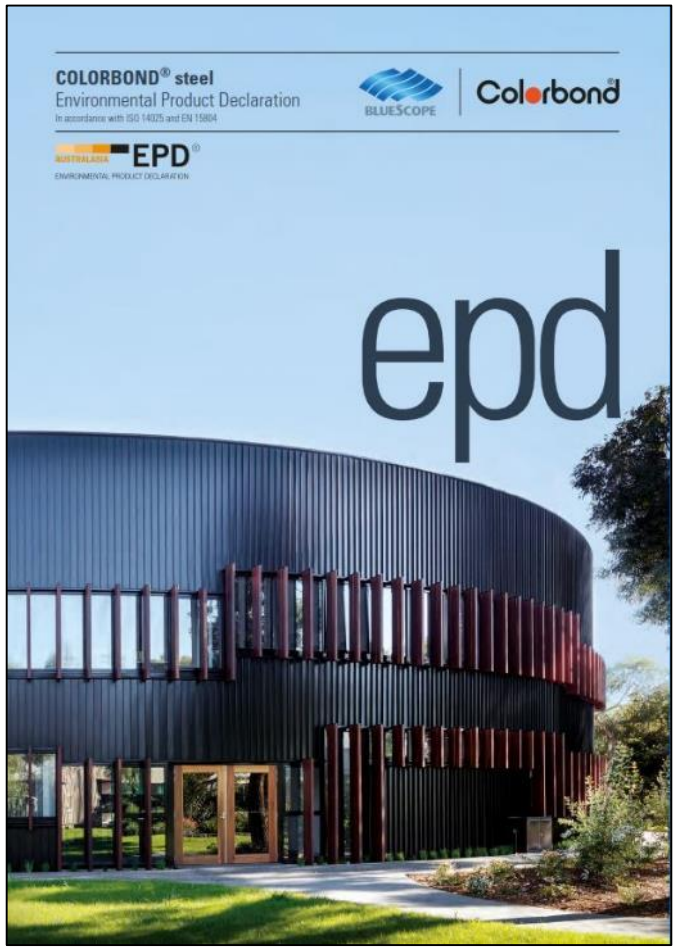
FOCUS: EMBODIED CARBON DATA

EPD Australasia: www.epd-australasia.com
EPD International: www.environdec.com





How to read an EPD



© BlueScope

← Product story

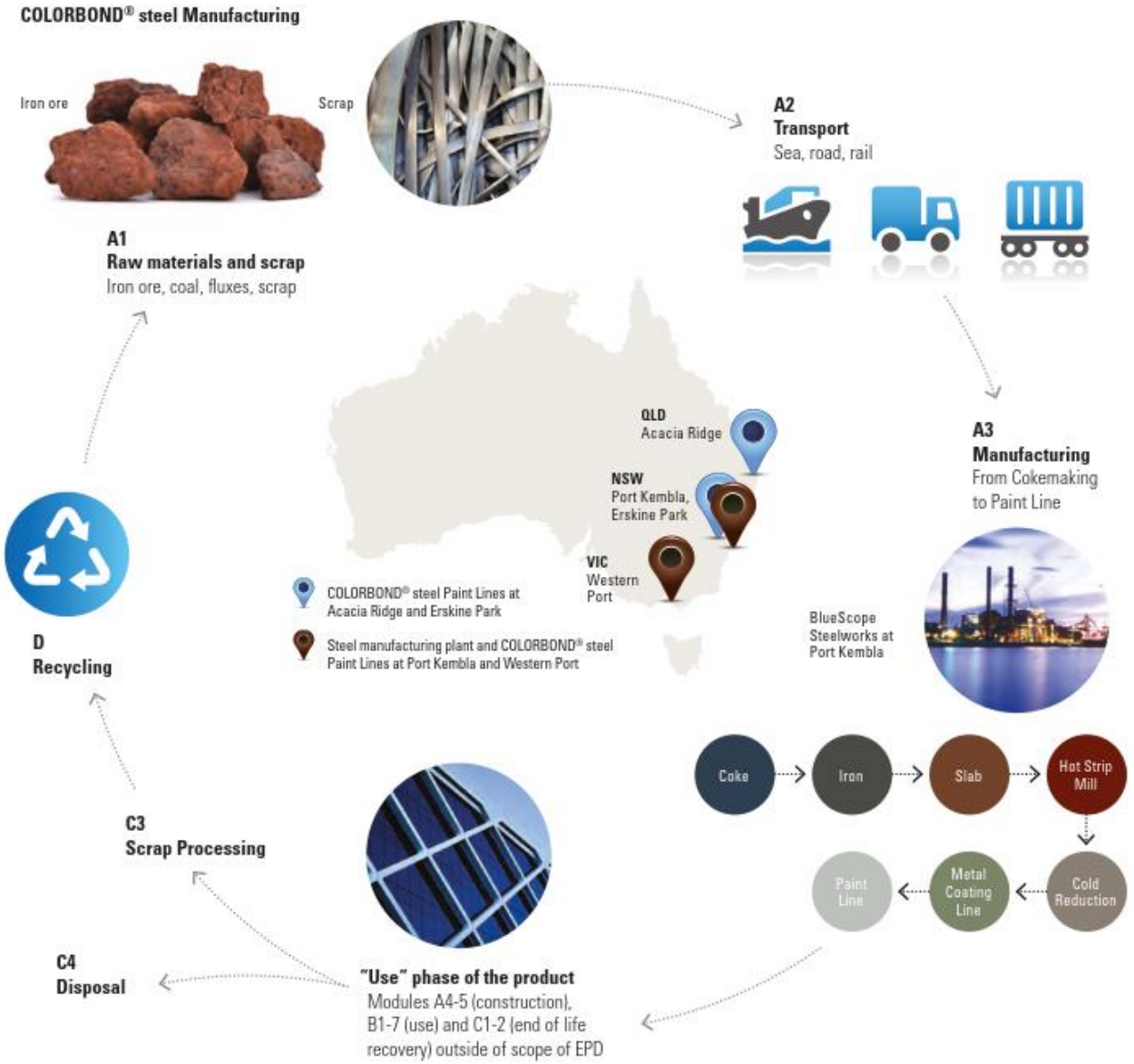
How to read an EPD

Table 1. Scope of Declaration in EPD

Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
Raw materials	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse – recovery – recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X

X = Module declared; MND = Module Not Declared (such a declaration shall not be regarded as an indicator of a zero result).

← Scope – what life cycle data is declared



← Product life cycle

How to read an EPD

EPD Registration Number	S-P-01165
Valid From	2019-06-30
Version	1.0
Valid Until	2024-06-30
Product category rules	PCR 2012:01 Construction Products and Construction Services, Version 2.3, 2018-11-15
Product group classification	UN CPC 54
Geographical Scope	Australia
Reference Year for Data	2017

Declaration Owner	Holcim (Australia) Pty Ltd Level 8, 799 Pacific Highway Chatswood NSW 2067, Australia Web: www.holcim.com.au Phone: +61 2 9412 6600	Holcim
EPD Programme Operator	EPD Australasia Limited 315a Hardy Street Nelson 7010 New Zealand Web: www.epd-australasia.com Email: info@epd-australasia.com Phone: 02 8005 8206	AUSTRALASIA EPD® ENVIRONMENTAL PRODUCT DECLARATION
EPD Produced by	Charlotte Wang and Jonas Bengtsson Edge Environment Pty Ltd Web: www.edgeenvironment.com Phone: +612 9438 0100 Email: info@edgeenvironment.com	EDGE

← Period of validity

← Geographical scope

← EPD owner

← EPD programme operator

How to read an EPD

CEN standard EN 15804:2012+A1:2013 served as the core PCR

Product category rules	PCR 2012:01 Construction Products and Construction Services, Version 2.3, 2018-11-15
PCR review was conducted by	The Technical Committee of the International EPD® System. Chair: Massimo Marino. Contact via info@environdec.com
Independent third-party verification of the declaration and data, according to ISO 14025:2006:	☐ EPD process certification ☒ EPD verification
Third Party Verifier	Jane Anderson ConstructionLCA Limited Approved by: EPD Australasia
Procedure for follow-up of data during EPD validity involves third party verifier:	☐ Yes ☒ No

Product Category Rules – Construction Products EN15804

Independent third-party verification

Data results: Holcim ViroDecs™ concrete

New South Wales (NSW) and the Australian Capital Territory (ACT)

NSW/ACT: 1 m³ of ViroDecs™ normal-class ready-mix concrete - Primary indicators

PRIMARY INDICATORS			GWP	ODP	AP
Strength (MPa)	Blend	Cement content† (kg/m³)	kg CO_2 eq	kg CFC-11 eq	kg SO_2 eq
20	G	245 - 280	2.73E+02	3.05E-06	6.08E-01
	F	180 - 224	2.28E+02	2.97E-06	5.04E-01
	B	118 - 145	1.71E+02	2.70E-06	3.89E-01
	T	100 - 123	1.52E+02	2.84E-06	3.54E-01
25	G	255 - 315	2.97E+02	3.21E-06	6.55E-01
	F	200 - 249	2.41E+02	3.09E-06	5.45E-01
	B	130 - 159	1.85E+02	2.85E-06	4.17E-01
	T	106 - 124	1.54E+02	2.87E-06	3.61E-01
32	G	298 - 355	3.43E+02	3.53E-06	7.50E-01
	F	227 - 285	2.73E+02	3.40E-06	6.07E-01
	B	138 - 170	1.96E+02	2.95E-06	4.36E-01
	T	122 - 147	1.76E+02	3.01E-06	3.99E-01
40	G	380 - 430	4.05E+02	3.97E-06	8.73E-01
	F	279 - 347	3.28E+02	3.85E-06	7.17E-01
	B	177 - 216	2.43E+02	3.38E-06	5.25E-01
	T	156 - 189	2.19E+02	3.51E-06	4.85E-01
50	G	500 - 515	5.14E+02	4.74E-06	1.09E+00
	F	371 - 436	4.14E+02	4.58E-06	8.91E-01
	B	233 - 285	3.03E+02	3.92E-06	6.44E-01
	T	241 - 255	2.84E+02	3.99E-06	6.13E-01

Carbon footprint
A1-A3 = embodied carbon

Carbon footprint
A1-A3 = embodied carbon

ViroDecs™ General Blend (G) | ViroDecs™ Fly Ash Blend (F) | ViroDecs™ Slag Blend (B) | ViroDecs™ Triple Blend (T)

Data results: Colorbond®

Table 2. Life Cycle Impact Assessment Indicators

		COLORBOND® steel AM100							
Base Metal (Steel) Thickness (BMT)		**0.42mm**				**0.48mm**			
Declared Unit		**1m²**				**1m²**			
EN 15804 INDICATORS	**units**	**A1-A3**	**C3**	**C4**	**D**	**A1-A3**	**C3**	**C4**	**D**
Global warming potential	kg CO_2-eq.	11.4	0.131	0.0182	-3.72	12.7	0.149	0.0207	-4.27
Depletion potential of the stratospheric ozone layer	kg CFC11-eq.	1.18E-11	6.92E-16	4.83E-15	2.27E-08	1.26E-11	7.83E-16	5.49E-15	2.59E-08
Acidification potential of land and water	kg SO_2-eq.	0.0350	5.60E-04	5.07E-05	-0.00355	0.0386	6.34E-04	5.761E-05	-0.00409
Eutrophication potential	kg PO_4^3-eq.	0.00365	4.79E-05	6.38E-06	-0.000125	0.00403	5.42E-05	7.25E-06	-0.000147
Photochemical ozone creation potential	kg C_2H_4-eq.	0.00580	2.98E-05	4.56E-06	-0.00167	0.00645	3.37E-05	5.18E-06	-0.00191
Abiotic depletion potential for non fossil resources	kg Sb-eq.	2.99E-05	1.44E-08	1.97E-09	-3.52E-06	3.00E-05	1.63E-08	2.24E-09	-4.01E-06
Abiotic depletion potential for fossil resources	MJ	131	1.51	0.264	-37.3	144	1.71	0.300	-42.5

Carbon footprint
A1-A3 = embodied carbon

Carbon footprint
D = EoL recycling benefit

Data results: Woven Image EchoPanel® and Mura™

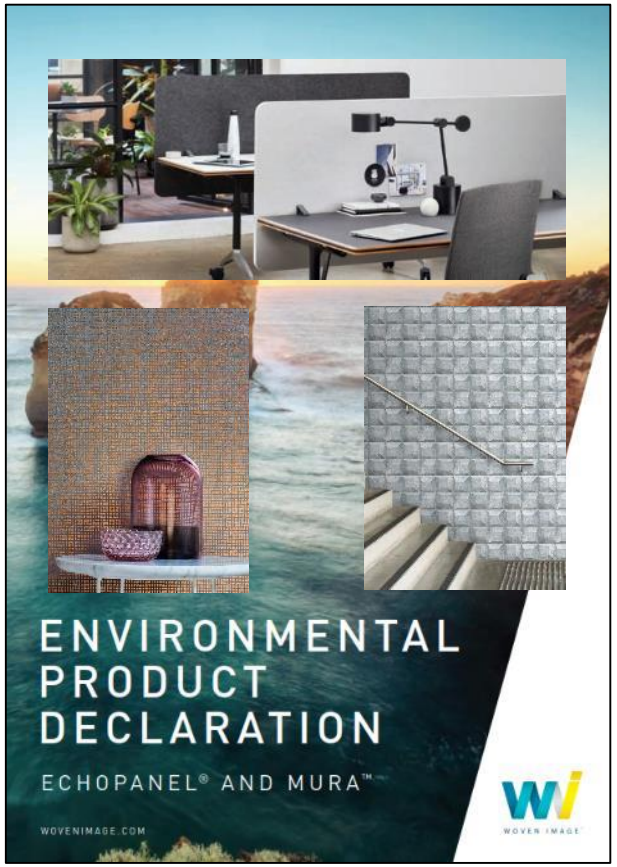


TABLE 10: 7MM ECHOPANEL® HEX PER 1M²

	A1-A3	C2	C4
GWP ($kgCO_2$ eq)	5.24E+00	1.82E-02	2.81E-02
ODP (kgCFC11 eq)	2.63E-07	3.11E-09	2.36E-09
POCP (kgC_2H_2 eq)	9.00E-04	3.48E-06	7.03E-06
AP ($kgSO_2$ eq)	2.12E-02	8.76E-05	1.14E-04
EP ($kgPO_4^{3-}$ eq)	2.97E-03	1.64E-05	2.50E-05
ADPE (kgSb eq)	1.11E-05	9.70E-08	1.15E-07
ADPF (MJ)	8.82E+01	2.70E-01	4.06E-01

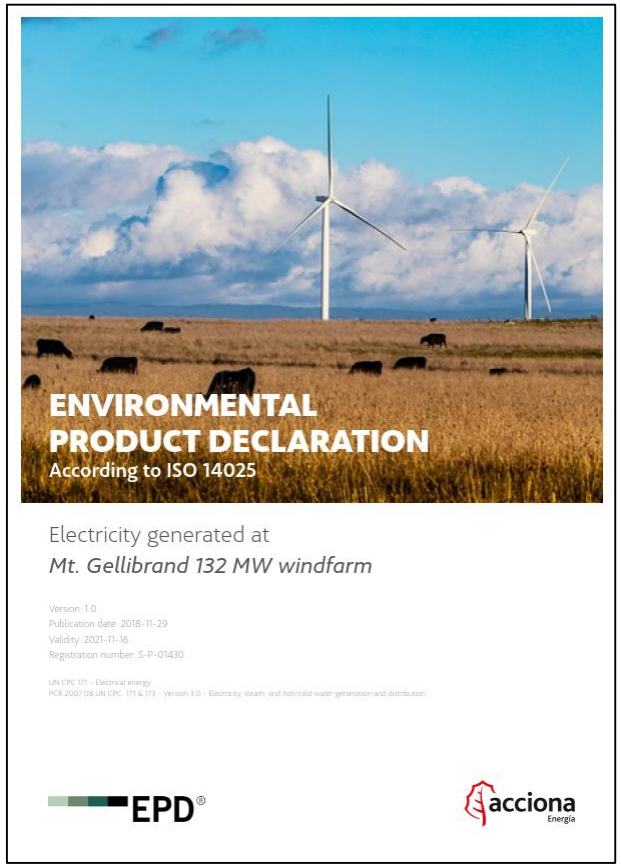
← Carbon footprint A1-A3 = embodied carbon

TABLE 7: MURA™ GLOW WALLCOVERING PER 1M²

	A1-A3	C2	C4
GWP ($kgCO_2$ eq)	1.33E+00	4.55E-03	7.03E-03
ODP (kgCFC11 eq)	6.27E-08	7.79E-10	5.89E-10
POCP (kgC_2H_2 eq)	2.22E-04	8.69E-07	1.76E-06
AP ($kgSO_2$ eq)	5.12E-03	2.19E-05	2.85E-05
EP ($kgPO_4^{3-}$ eq)	7.14E-04	4.11E-06	6.24E-06
ADPE (kgSb eq)	2.91E-06	2.43E-08	2.87E-08
ADPF (MJ)	2.22E+01	6.74E-02	1.02E-01

← Carbon footprint A1-A3 = embodied carbon

Data results: Mt Gellibrand Windfarm



- Emissions intensity
  = 11.5g CO^2e/kWh
- Energy generated (20 years)
  = 31 241 235 GJ / 8 678 121 MWh
- Energy for materials, construction, maintenance
  = 1 537 607 GJ
- Payback period
  < 12 months

Grid VIC = 1.02 tonnes/kWh

Climate Declarations: Woven Image, ASP Access Floors

AUSTRALASIA EPD®

CLIMATE DECLARATION FOR
ECHOPANEL® AND MURA™ PRODUCTS

DECLARED UNIT: 1m² OF PRODUCT

The climate declaration shows the emissions of greenhouse gases, expressed as CO_2-equivalents. It is based on verified results from a lifecycle assessment (LCA) performed as the basis for an Environmental Product Declaration (EPD), in accordance with ISO 14025 and EN 15804.

PRODUCT

This climate declaration covers a broad range of colours and printed designs of EchoPanel® and Mura products from Woven Image.

Environmentally preferable products and sustainability are at the core of Woven Image's company values and, because of their commitment, they became pioneers in the design of high-performance acoustic solutions and textiles using recycled and environmentally preferable materials.

OTHER ENVIRONMENTAL INFORMATION

This declaration is limited to one impact category. For information about other relevant environment impacts, see the EPD available at www.epdaustralasia.com

CONTACT INFORMATION

Woven Image
Enquiries@wovenimage.com
www.wovenimage.com

CLIMATE DECLARATION

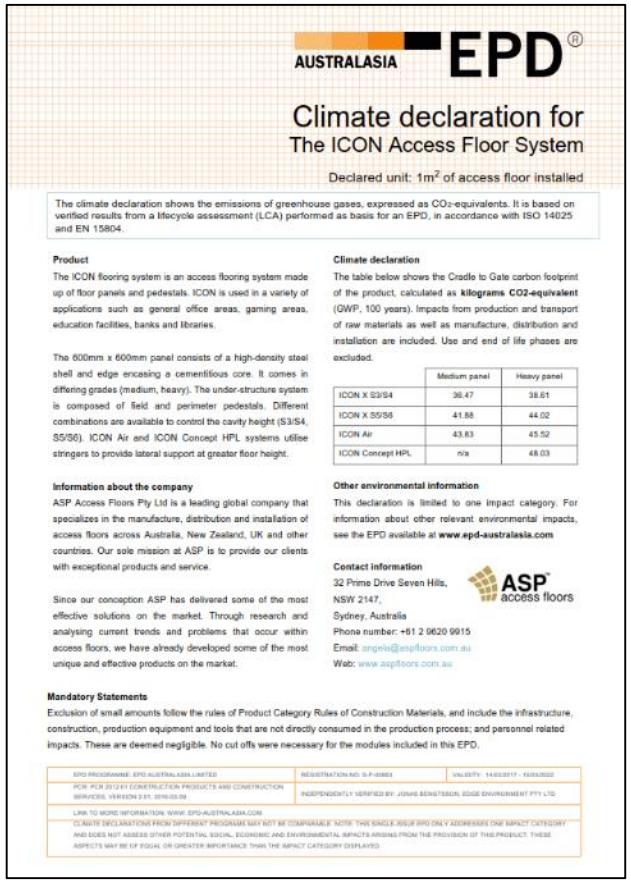
Global Warming Potential (GWP) as kgCO2 eq	Product stage – raw material, transport and manufacture	End of life stage - transport	End of life stage – final disposal
MURA™ GLOW WALLCOVERING	1.33E+00	4.55E-03	7.03E-03
MURA™ OTTO WALLCOVERING	1.62E+00	4.55E-03	7.03E-03
MURA™ WALLCOVERING NON-PRINTED	1.28E+00	4.55E-03	7.03E-03
7MM ECHOPANEL® HEX	5.24E+00	1.82E-02	2.81E-02
7MM ECHOPANEL® NON-PRINTED	5.09E+00	1.82E-02	2.81E-02
12MM ECHOPANEL® TILT	8.81E+00	3.12E-02	4.82E-02
12MM ECHOPANEL® PUZZLE PRINTED ON ONE SIDE	8.81E+00	3.12E-02	4.82E-02
12MM ECHOPANEL® NON-PRINTED	8.63E+00	3.12E-02	4.82E-02
24MM ECHOPANEL® NON-PRINTED	1.08E+01	3.90E-02	6.03E-02

MANDATORY STATEMENTS

Exclusion of small amounts follow the rules of Product Category Rules of Construction Materials, and include the infrastructure, construction, production equipment and tools that are not directly consumed in the production process; and personnel related impacts. These are deemed negligible. No cut offs were necessary for the modules included in this EPD.
The scenarios included are currently in use and are representative for one of the most likely scenarios alternatives.

PROGRAMME: THE AUSTRALASIAN EPD® PROGRAMME | REGISTRATION NO: S-P-01162 | VALIDITY: 24/11/2019 - 24/11/2023
PCR: PCR FOR CONSTRUCTION PRODUCTS AND CONSTRUCTION SERVICES, CPC SUBDIVISION 22, 23/10/15-38 | INDEPENDENTLY VERIFIED BY: JAMIE ANDERSON CONSTRUCTION4CA LIMITED
LCA TO MORE INFORMATION: WWW.EPD-AUSTRALASIA.COM
CLIMATE DECLARATIONS FROM DIFFERENT PROGRAMS MAY NOT BE COMPARABLE.NOTE: THIS SINGLE-ISSUE EPD ONLY ADDRESSES ONE IMPACT CATEGORY AND DOES NOT ASSESS OTHER POTENTIAL SOCIAL, ECONOMIC AND ENVIRONMENTAL IMPACTS ARISING FROM THE PROVISION OF THIS PRODUCT. THESE ASPECTS MAY BE OF EQUAL OR GREATER IMPORTANCE THAN THE IMPACT CATEGORY DISPLAYED.

WOVEN IMAGE



AUSTRALASIA EPD®

Climate declaration for
The ICON Access Floor System

Declared unit: 1m² of access floor installed

The climate declaration shows the emissions of greenhouse gases, expressed as CO_2-equivalents. It is based on verified results from a lifecycle assessment (LCA) performed as basis for an EPD, in accordance with ISO 14025 and EN 15804.

Product

The ICON flooring system is an access flooring system made up of floor panels and pedestals. ICON is used in a variety of applications such as general office areas, gaming areas, education facilities, banks and libraries.

The 600mm x 600mm panel consists of a high-density steel shell and edge encasing a cementitious core. It comes in differing grades (medium, heavy). The under-structure system is composed of field and perimeter pedestals. Different combinations are available to control the cavity height (S3/S4, S5/S6). ICON Air and ICON Concept HPL systems utilise stringers to provide lateral support at greater floor height.

Information about the company

ASP Access Floors Pty Ltd is a leading global company that specializes in the manufacture, distribution and installation of access floors across Australia, New Zealand, UK and other countries. Our sole mission at ASP is to provide our clients with exceptional products and service.

Since our conception ASP has delivered some of the most effective solutions on the market. Through research and analysing current trends and problems that occur within access floors, we have already developed some of the most unique and effective products on the market.

Mandatory Statements

Exclusion of small amounts follow the rules of Product Category Rules of Construction Materials, and include the infrastructure, construction, production equipment and tools that are not directly consumed in the production process; and personnel related impacts. These are deemed negligible. No cut offs were necessary for the modules included in this EPD.

Climate declaration

The table below shows the Cradle to Gate carbon footprint of the product, calculated as **kilograms CO2-equivalent** (GWP, 100 years). Impacts from production and transport of raw materials as well as manufacture, distribution and installation are included. Use and end of life phases are excluded.

	Medium panel	Heavy panel
ICON X S3/S4	39.47	38.61
ICON X S5/S6	41.88	44.02
ICON Air	43.83	45.52
ICON Concept HPL	n/a	48.03

Other environmental information

This declaration is limited to one impact category. For information about other relevant environmental impacts, see the EPD available at **www.epd-australasia.com**

Contact information

32 Prime Drive Seven Hills,
NSW 2147,
Sydney, Australia
Phone number: +61 2 9620 9915
Email: angela@aspfloors.com.au
Web: www.aspfloors.com.au

ASP access floors

Simplified carbon footprint data (must have a full EPD)

COMPARING PRODUCTS

Comparing products

- Can be done provided they are based on the same product category rules (e.g., based on EN 15804 within International EPD System)
- Need to make sure you are comparing like with like (e.g. not kg/kg or m3/m3)
- Better to compare within context of design
- CAUTION: If manufacturer – use an LCA specialist if wanting to make public claims.

Comparing products

F17 sawn hardwood

2 x 240x45mm x 4 metres

Carbon footprint

Australian hardwood

Data available / m3

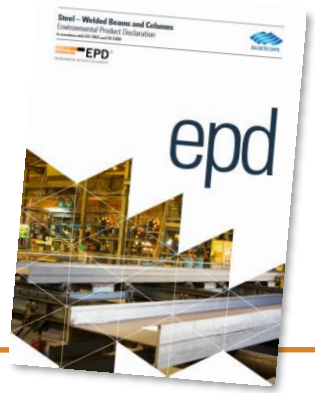
Steel universal beam

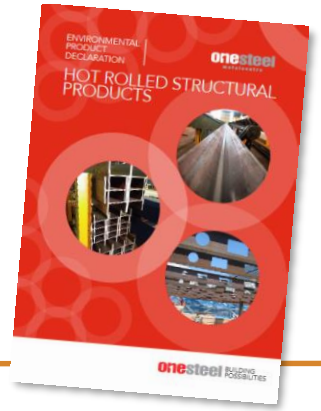
150x77mm x 4 metres

Carbon footprint

Australian steel

Data available / kg

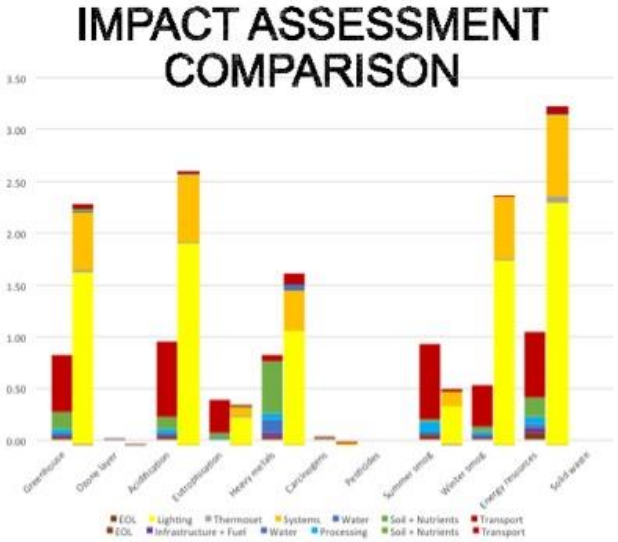




EPDs INFORMING BUILDING & DESIGN DECISIONS

Using EPD data to inform design and construction

EN 15978
Assessment of environmental performance of buildings
(whole of building life cycle assessment).



Tools: eTool / GABI / SIMAPRO
Consultants: Edge Environment, thinkstep anz, Start2See, Life Cycle Logic

Whole building life cycle assessment (LCA) and EPDs

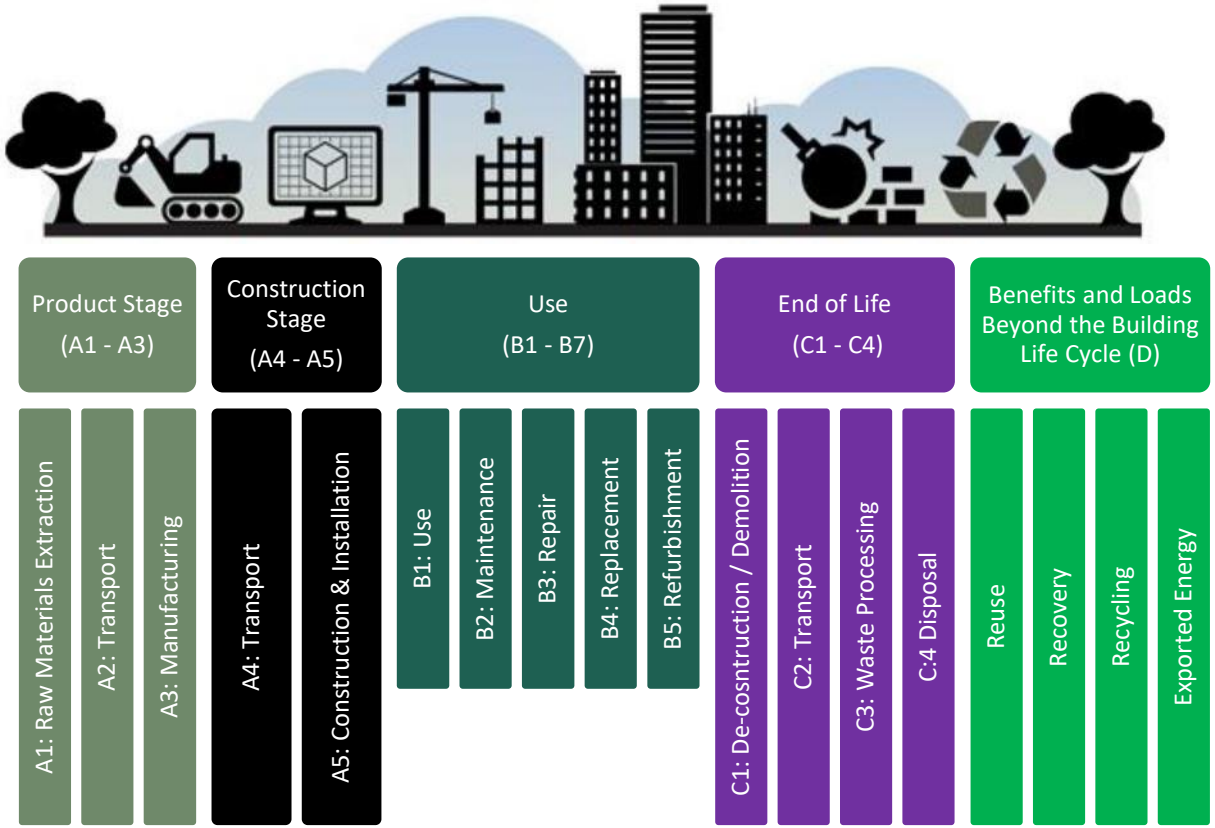
Building LCA (and EPDs) is used to help communicate, identify and drive sustainability improvements at three key stages:

1. Concept Design
2. Supply Chain Engagement & Tendering
3. Final Project Design & Construction.

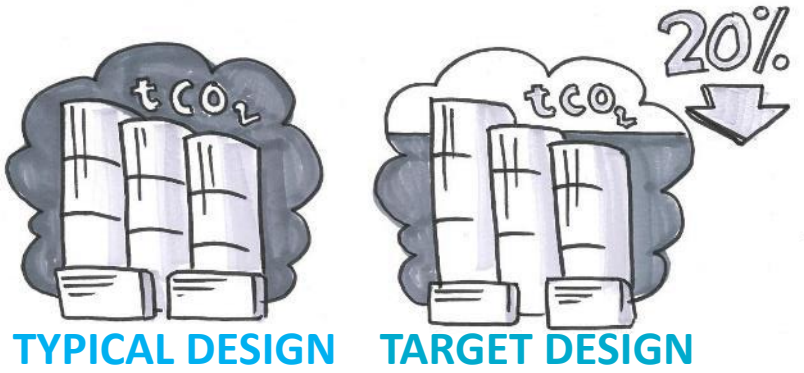
Source: Lend Lease May 2019 Darryl Stuckey, *Aiming Even Higher With EPDs*
Supplier Engagement and Whole-Building LCA. Available at: https://www.thinkstep.com/content/aiming-even-higher-epds

Whole of Building Life Cycle Assessment

- *EN 15978 Sustainability of construction works*
- EPDs compliant to EN 15804 provide the verified data.



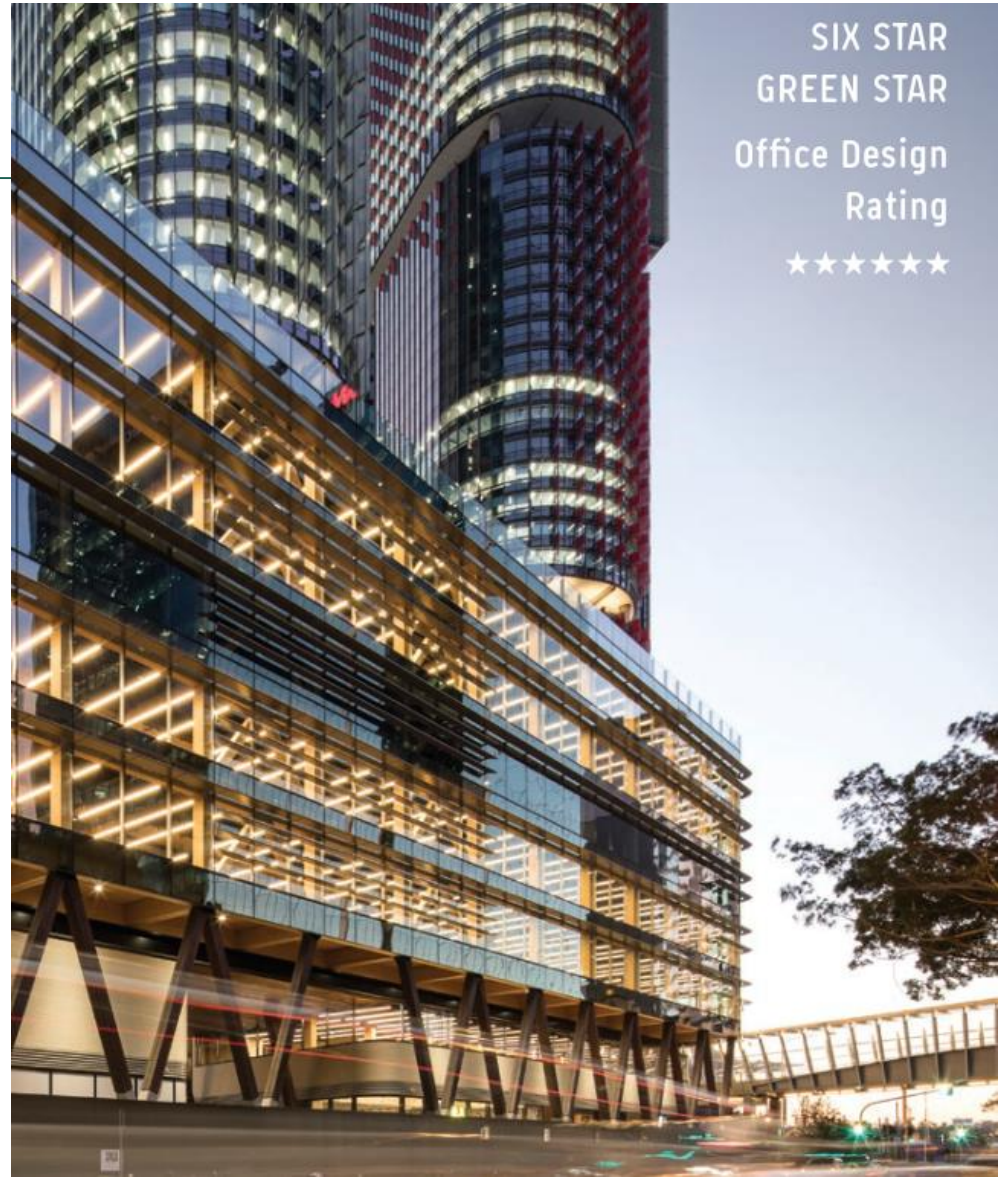
South Barangaroo: Lendlease



Source: Lend Lease May 2019 Darryl Stuckey, *Aiming Even Higher With EPDs Supplier Engagement and Whole-Building LCA*. Available at: https://www.thinkstep.com/content/aiming-even-higher-epds

International House Sydney

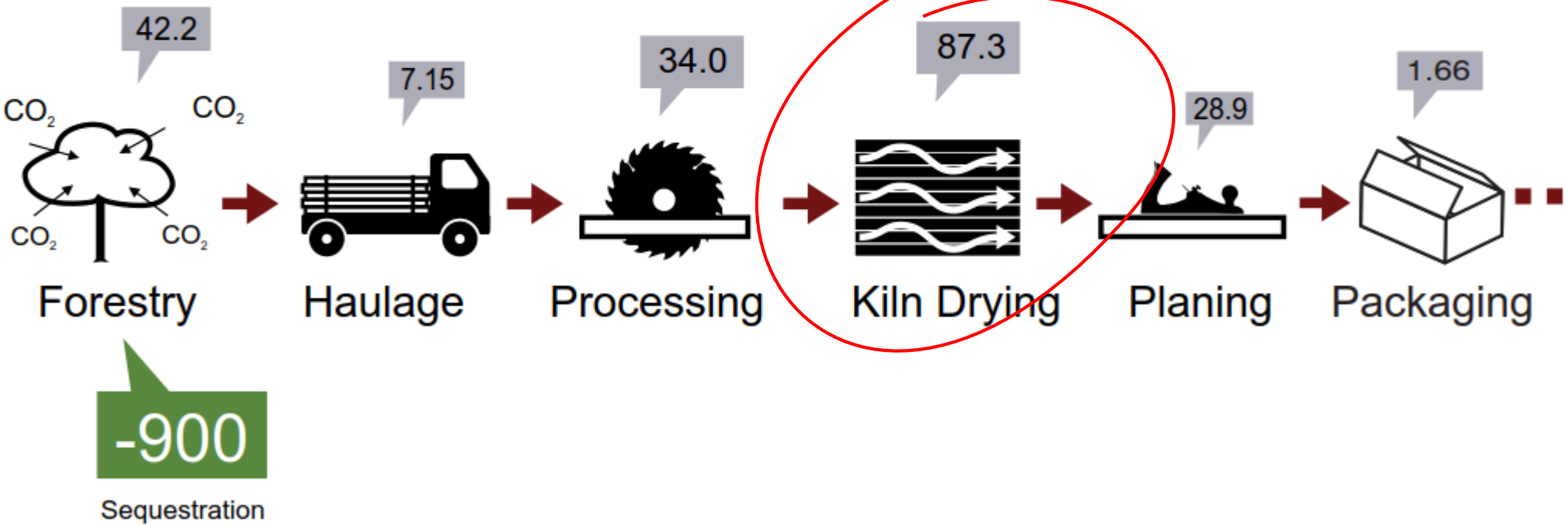
- 41% reduction in embodied carbon impacts
- IHS was one third of the 'true cost' of a standard commercial building:
  - US $7.71 m2 p.a.
  - Typical: US $24.76 m2p.a.



EPDs DRIVING IMPROVEMENT AT MANUFACTURER LEVEL

Life cycle of dressed, kiln-dried softwood

Life cycle carbon footprint in kg CO_2-equivalent per m^3 kiln-dried softwood (12% moisture content), including both biogenic and fossil carbon



LCA and EPDs help manufacturers measure and improve

- Hyne
- Wespine
- Timberlink
- AKD Softwoods
- Tasco
- OneFortyOne

In the news

New state-of-the-art kiln system helps future-proof Wespine operations

Wespine has placed its future on a firm footing "This technique also allows for the wood to be dried at a lower temperature, which will into the future," said Wespine Chairperson Andrew Webster. "The whole project has Phillip Best Gas and Plumbing, Millers Contracting, BIS, BVA Fabricators and Cooper Dardanup region's timber hub. "The sawmill is centrally

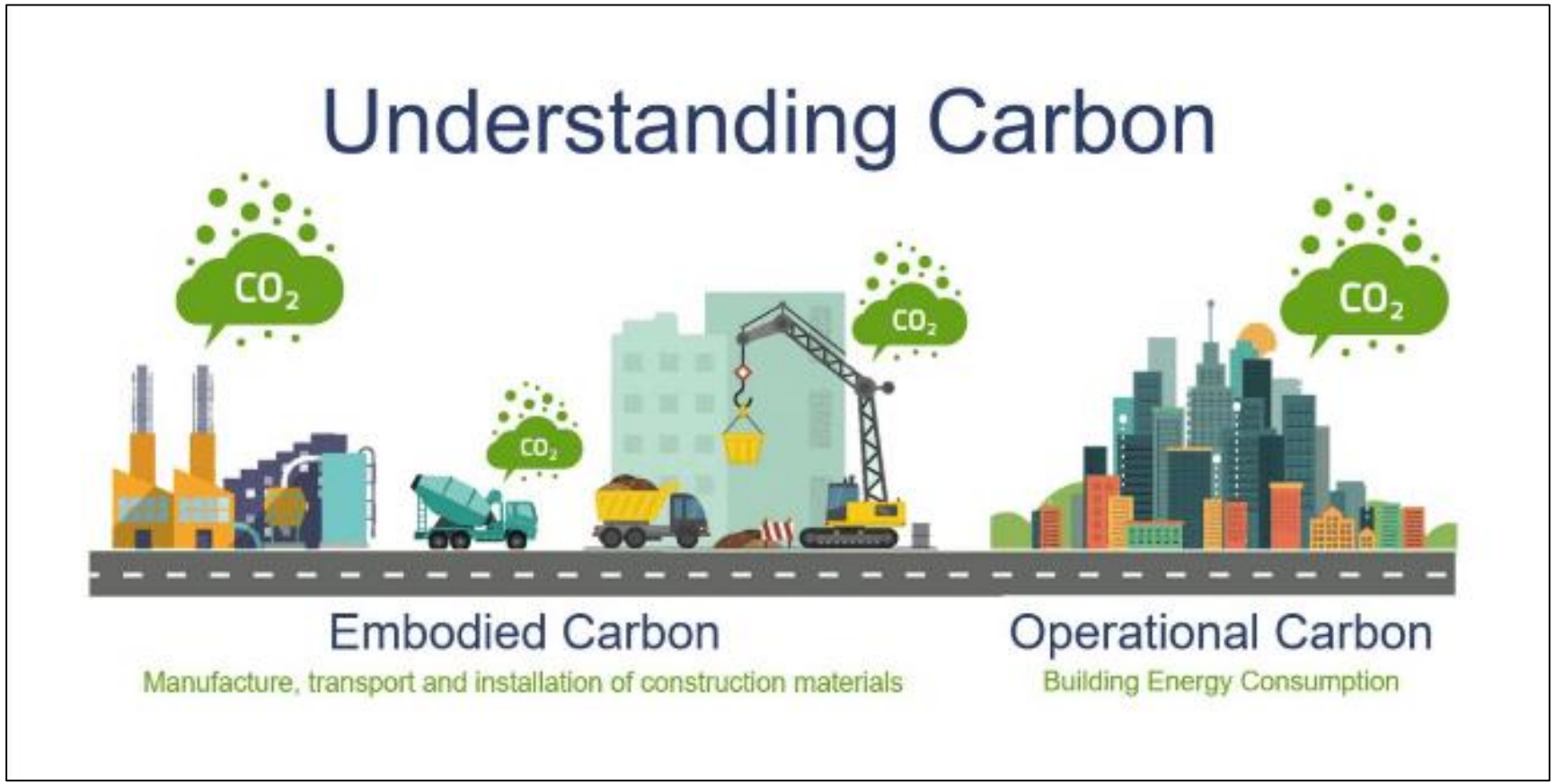
PRODUCT GROUP	SPECIFIC PRODUCTS	CARBON FOOTPRINT IMPROVEMENT 2005-06 to 2015-16
Australian softwood, kiln-dried and dressed	Structural framing grades, utility, joinery, furniture grades, flooring	-12%
Australian hardwood, kiln-dried and dressed	Hardwood flooring, decking, cladding, stair treads, kiln-dried structural timber and commercial decking	-10%

LCA and EPDs help manufacturers measure and improve

- BlueScope
- Liberty

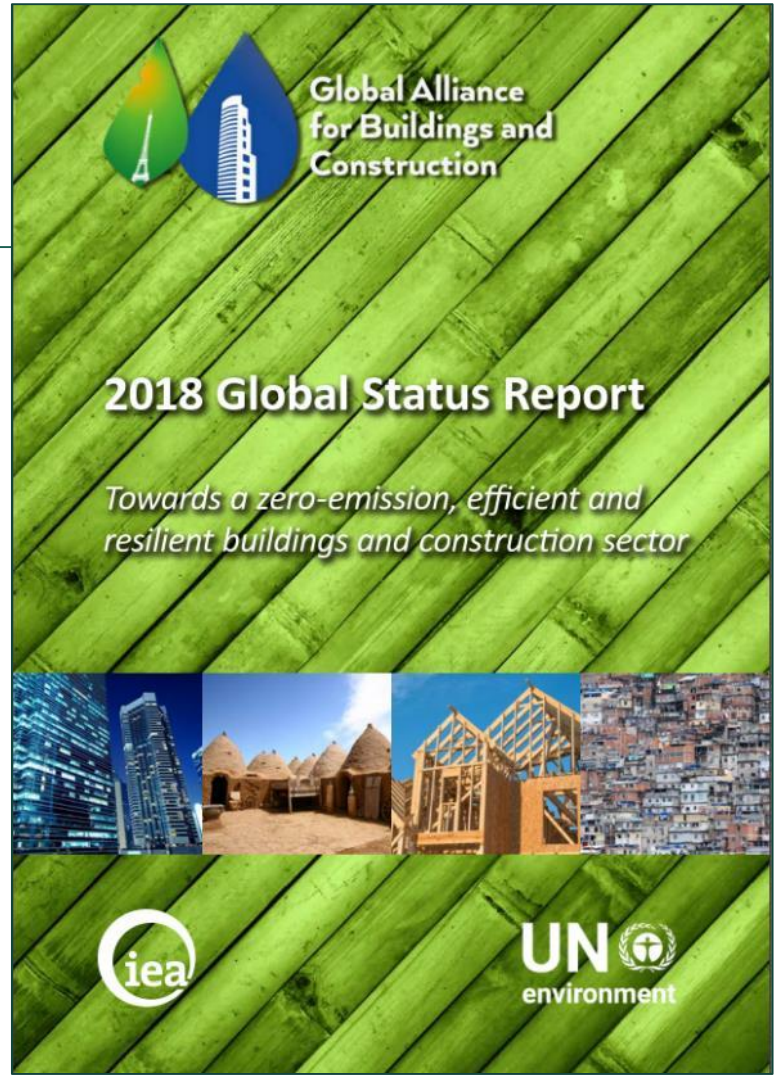
EMBODIED CARBON

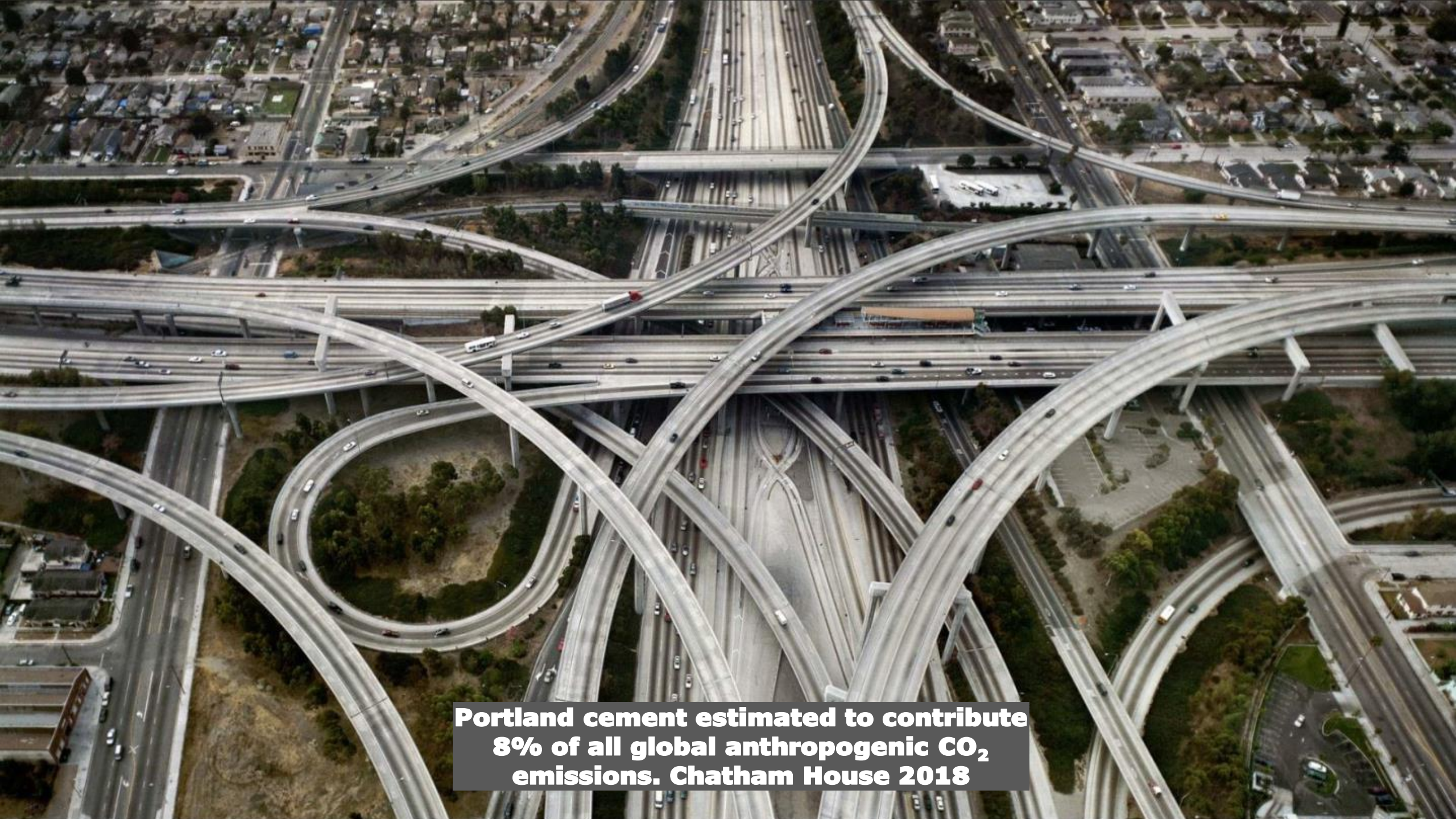
Embodied and operational carbon



Why embodied carbon?

- CO_2 emissions resulting from material use in buildings account for 28% of annual building-related CO_2 emissions.



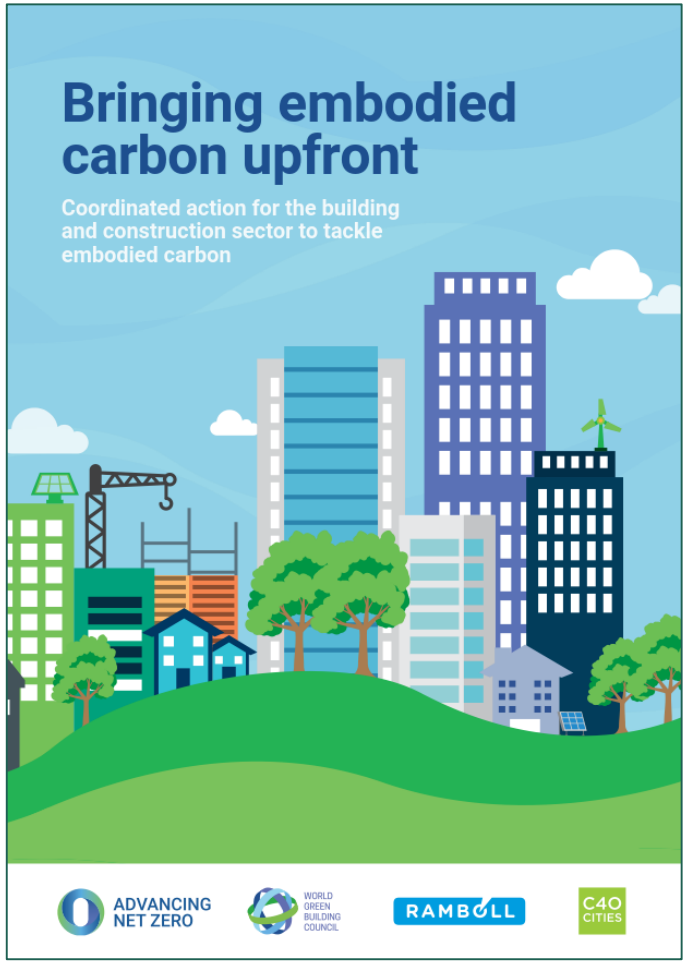


Portland cement estimated to contribute 8% of all global anthropogenic CO_2 emissions. Chatham House 2018


Steel production estimated to contribute 7-9% of direct emissions from the global use of fossil fuel. World Steel Council


Emissions from loss of tropical forest contributes 8-10% of annual emissions of carbon dioxide. WRI 2018

Embodied carbon: A call to action



Australian Engineers Declare Climate and Biodiversity Emergency

Signatories:
125 organisations
1444 engineers

– Upgrade existing infrastructure and technology for extended use when the opportunity arises for carbon emissions reduction.

– Accelerate the shift to circular economy principles (e.g. minimise wasteful use of resources) and low embodied carbon materials in all our work.

Shanghai Tower, Gensler, 2014

Structural optimisation - a 120º twist:

- Reduces wind loads by 24%
- Reduces structural materials by 32% (less 20,000 tonnes of steel = ~60,000 tonnes CO^2)
- Reduces cost by $58 million USD

http://du.gensler.com/vol6/shanghai-tower/#/why-this-shape

CONCLUSIONS

Engineers: Why ask for EPDs?

- You are encouraging suppliers to quantify impacts across production
- An EPDs means that a manufacturer has to do a life cycle assessment of their product
- LCA's identify "hot spots" of impact and climate risks in a manufacturing process
- Can invest with confidence to reduce their costs of production.

Engineers: Why work with industry and companies with EPDs?

- Need to go beyond specifying a green tick
- You need numbers!
- EPD owners are being transparent about their products environmental impact
- They are providing quality verified data that helps you make quantifiably better and more sustainable design and build decisions.

Call to Action

- Ask for EPDs
- Ask for EPDs
- Ask for EPDs
- Use the data in them to inform your design and build
- Do your bit to reduce environmental impacts today.

Questions?

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AUSTRALASIA EPD®
ENVIRONMENTAL PRODUCT DECLARATION