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[4.0]

HECC

HOMESTAR EMBODIED CARBON CALCULATOR

Solution.

THINK · TALK · CREATE **CARBON TOOLS** WEBINAR SERIES

Upcoming webinars

Webinar 5 Wednesday 8 June 12–1pm

- LCAQuick

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Previously

Carbon tools webinars

- LCAPlay
- CO_2RE tool
- Life cycle assessment – an overview

Carbon Challenge – Science and Solutions webinars (March 2022)

- Carbon and the New Zealand construction industry
- Compliance and calculating building carbon footprints
- Carbon challenges
- Design and build a low-carbon dwelling

www.branz.co.nz/pubs/previous-webinars/

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About us

Sam Archer, NZGBC

Albrecht Stoecklein, Design Navigator

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Questions

Please feel free to ask questions by using the Chat feature

We will take questions at the end of the webinar

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Programme

- Background to HECC
- HECC demonstration
- Q&A

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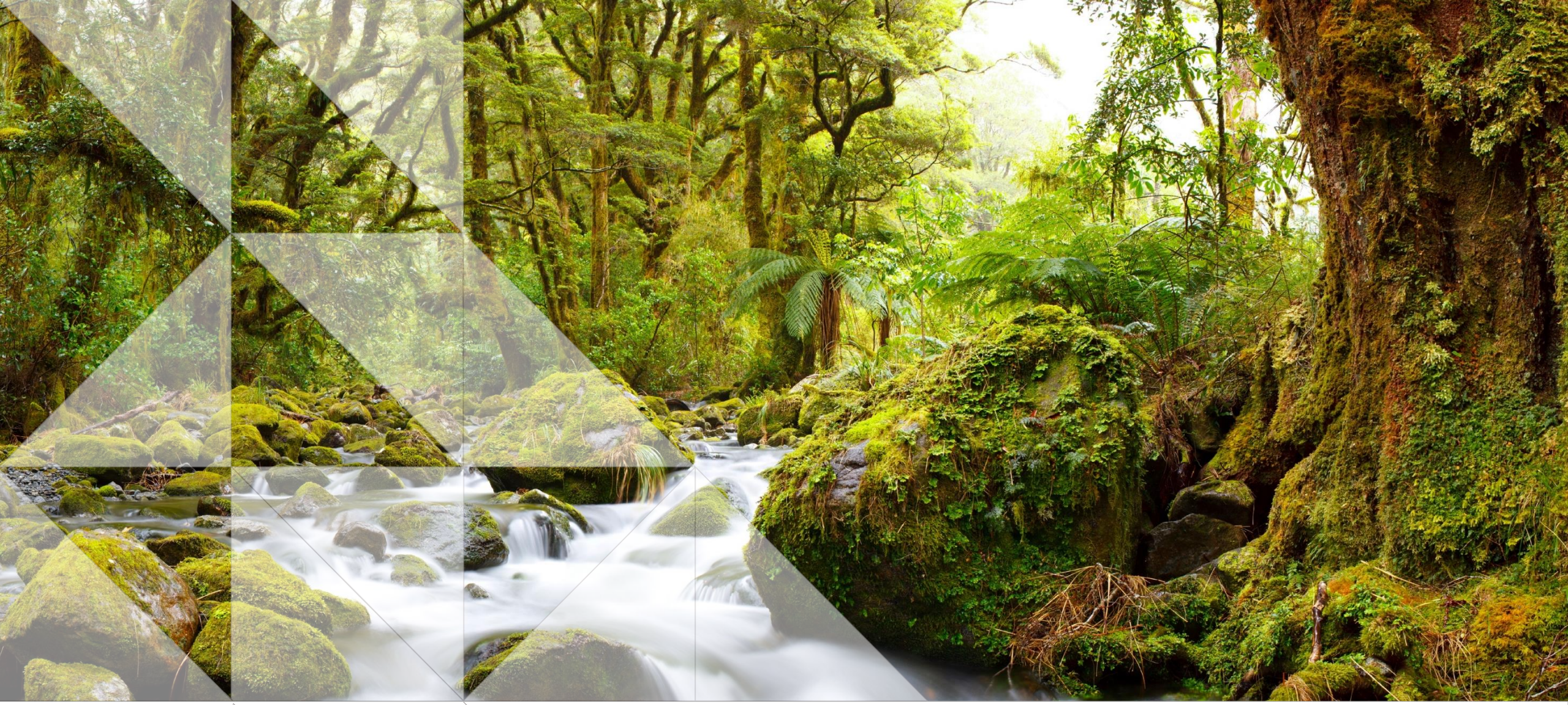

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Background to HECC

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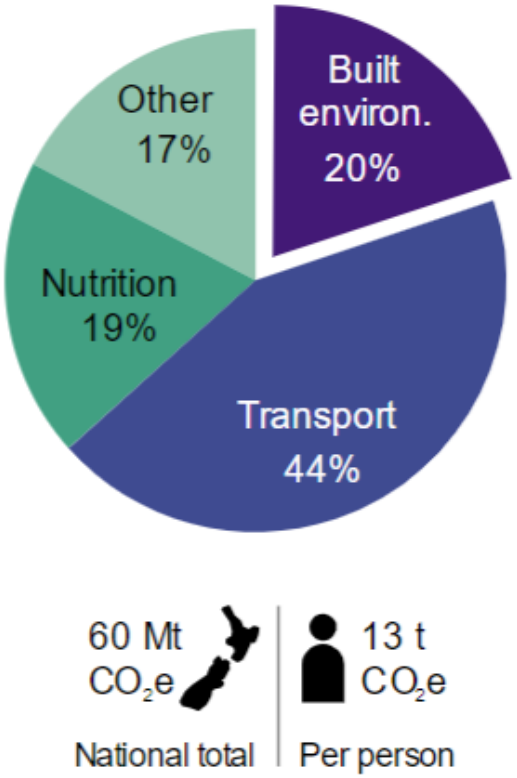
Nau mai, haere mai ki Aotearoa.
Te kainga o Te Kaunihera
Hanganga Tautaiao o Aotearoa.

H1 Introduction: Calculation Method

Embodied carbon

Background



Homestar v5

Background

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Homestar v5

homestar

EN2: Embodied Carbon

Points Available	6		
Mandatory Minimums	8 Homestar and above: Projects must carry out a full cradle-to-cradle lifecycle assessment modules A-D of EN 15978.		
Aim	To reduce greenhouse gas emissions associated with products and materials used to construct a home.		
Project-wide	Yes	Calculator	Yes

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Government efforts

Building for Climate Change

	Initial Cap	Intermediate Cap	Final Cap
Operational Emissions Cap CO_2-e/(m².a)[12]	The cap will be a reporting mechanism for the total of the operational emissions from the three components		
Fossil Fuel combustion emissions[13] CO_2-e/(m².a)	18	9	0
Electricity Use kWh/(m².a)[14]	180	90	45
Thermal performance (demand) kWh/(m².a)	60	30	15
Services efficiency (delivered) kWh/(m².a)	60	30	15
Water use l/p/d[15] (to be converted to m³/m² based on occupancy of the building type)	145	110	75

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Building for Climate Change

The need to simplify

Building firms grouped by new dwellings built (year to June 2017)

UNITS BUILT	NUMBER OF BUILDING COMPANIES	TOTAL NUMBER OF DWELLING UNITS BUILT	% OF ALL UNITS	AVERAGE UNITS PER BUILDER
>200	15	5,850	19%	390
101–200	10	1,440	5%	144
51–100	40	2,800	9%	70
21–50	140	4,900	16%	35
11–20	230	3,680	12%	16
6–10	500	4,000	13%	8
1–5	3,100	7,780	26%	2.5
Totals	4,035	30,450	100%	7.5

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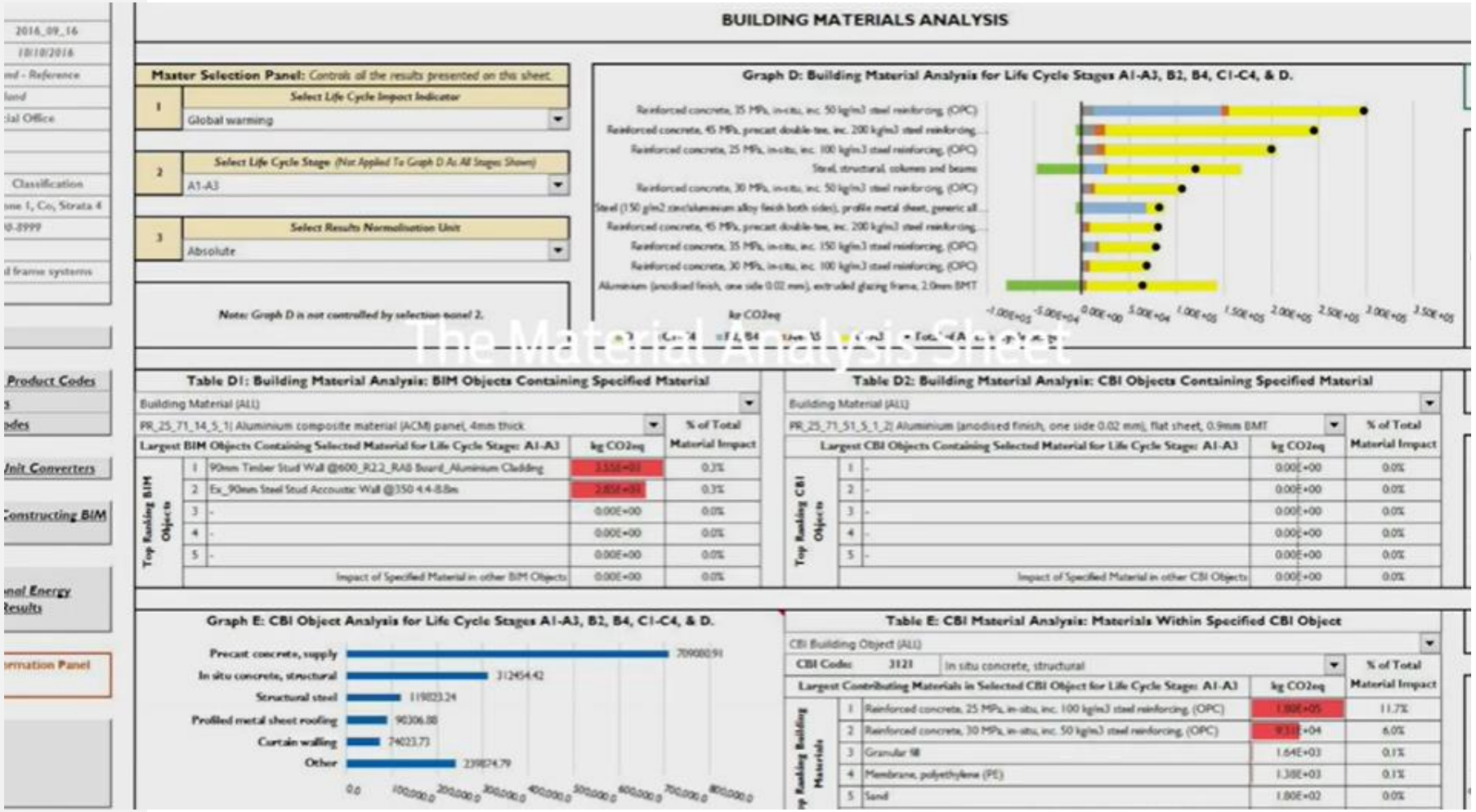
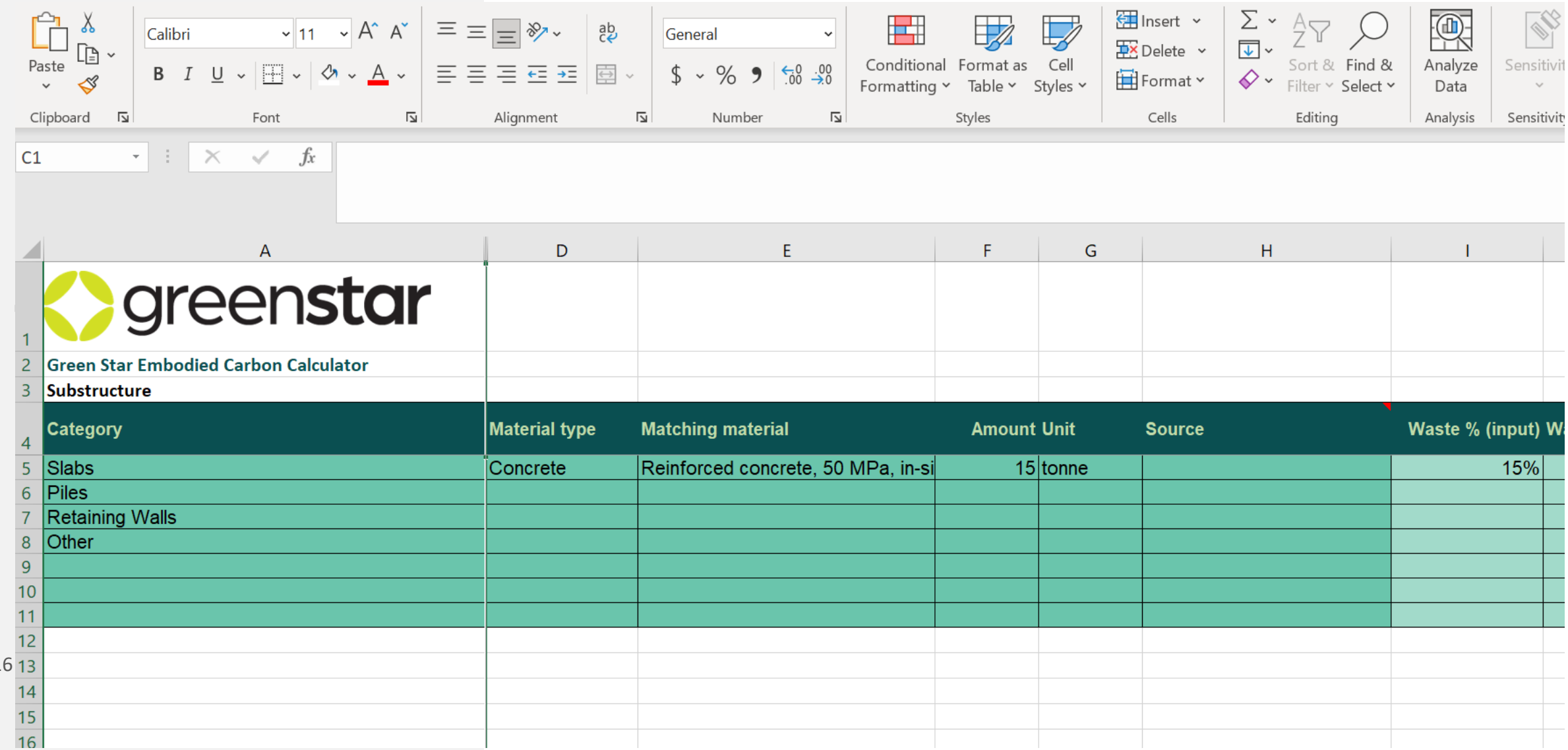
...hard to use for non LCA professional...

Previous tools



At the material level...



Green Star Embodied Carbon Calculator

Substructure

Category	Material type	Matching material	Amount	Unit	Source	Waste % (input)
Slabs	Concrete	Reinforced concrete, 50 MPa, in-si	15	tonne		15%
Piles						
Retaining Walls						
Other						

At the assembly level...

Roofs

Climate Change impact **3,426** kg CO_2 eq

ID	Element Name	Type	Description	Option	Area [m^2]
R1	Roof 1	Profiled steel	Low slope timber-framed, 190 mm rafters and battens	70 x 35 mm timber battens, insulation	100
R2	Roof 2				
R3	Roof 3				
R4	Roof 4				

Pitched timber-framed roof – R 3.3

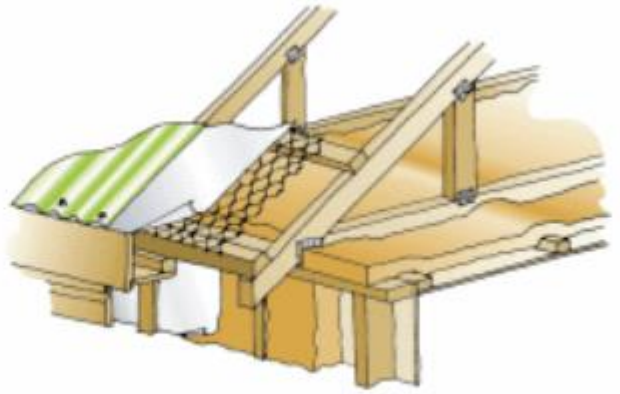
corrugated iron cladding

90 mm bottom chord

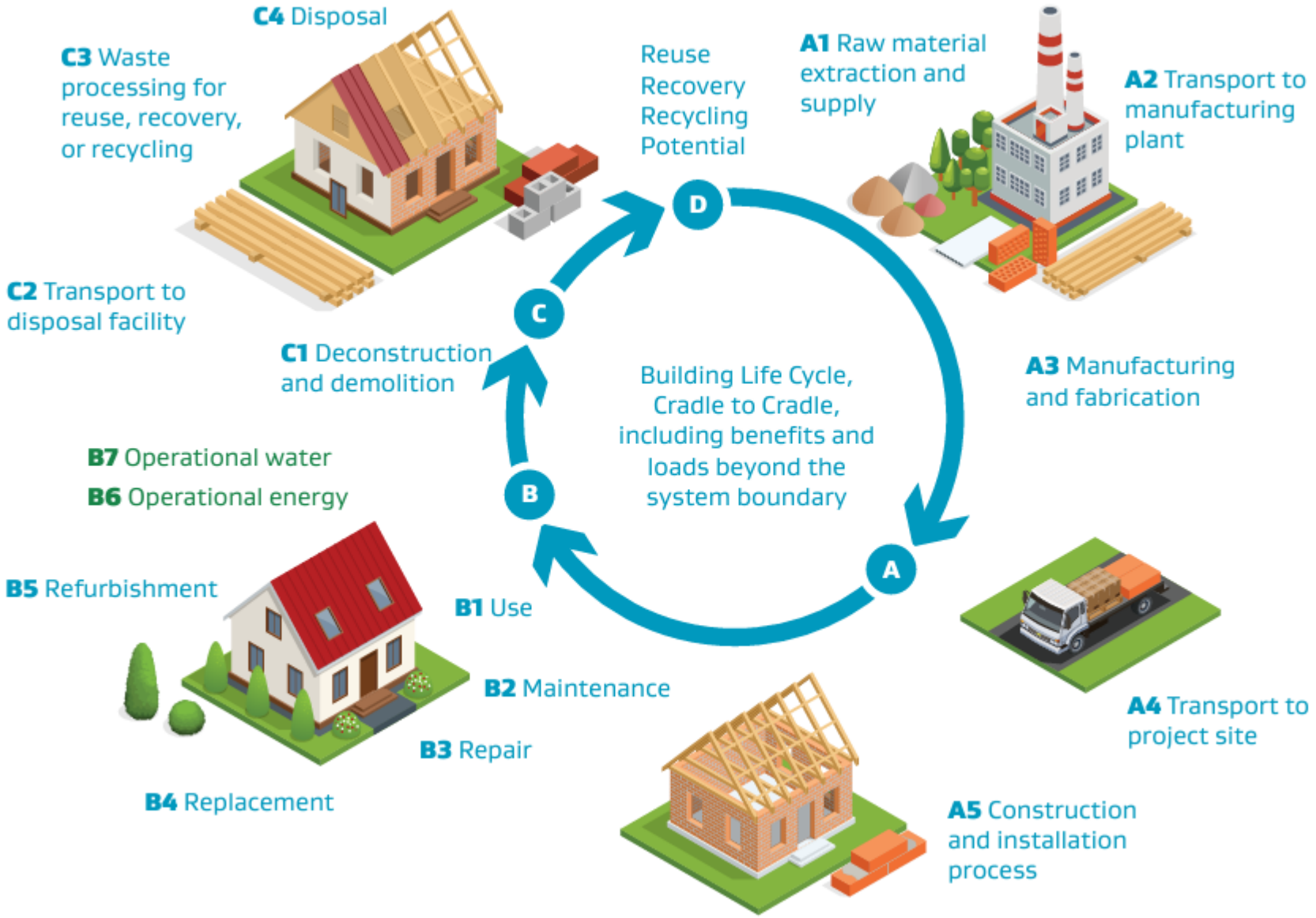
chord spacing 900 mm

insulation with R-value = 3.5

Note that an insulation R-value of R 3.5 is required in this example to get a roof R-value of 3.3

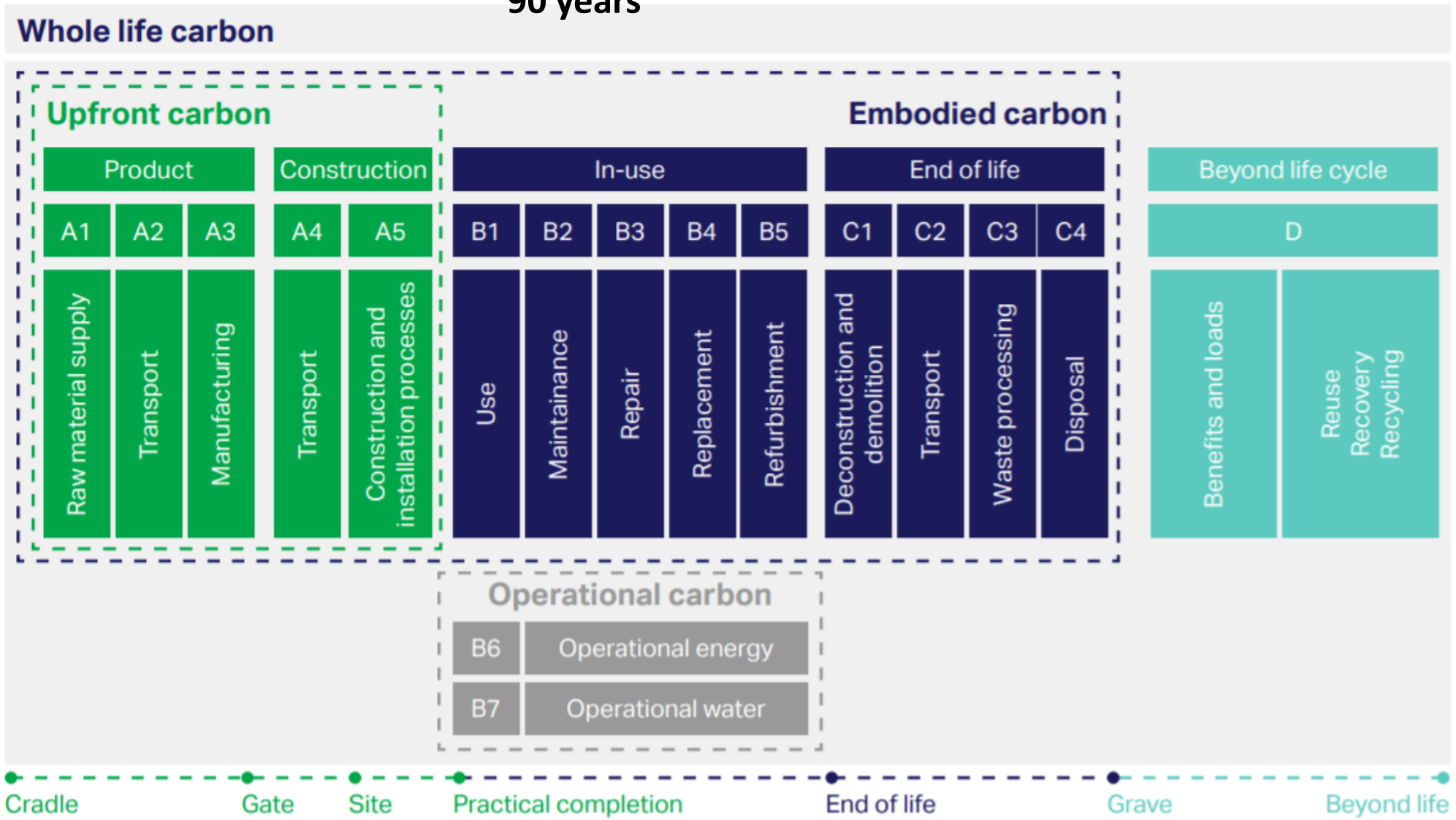


Life cycle modules

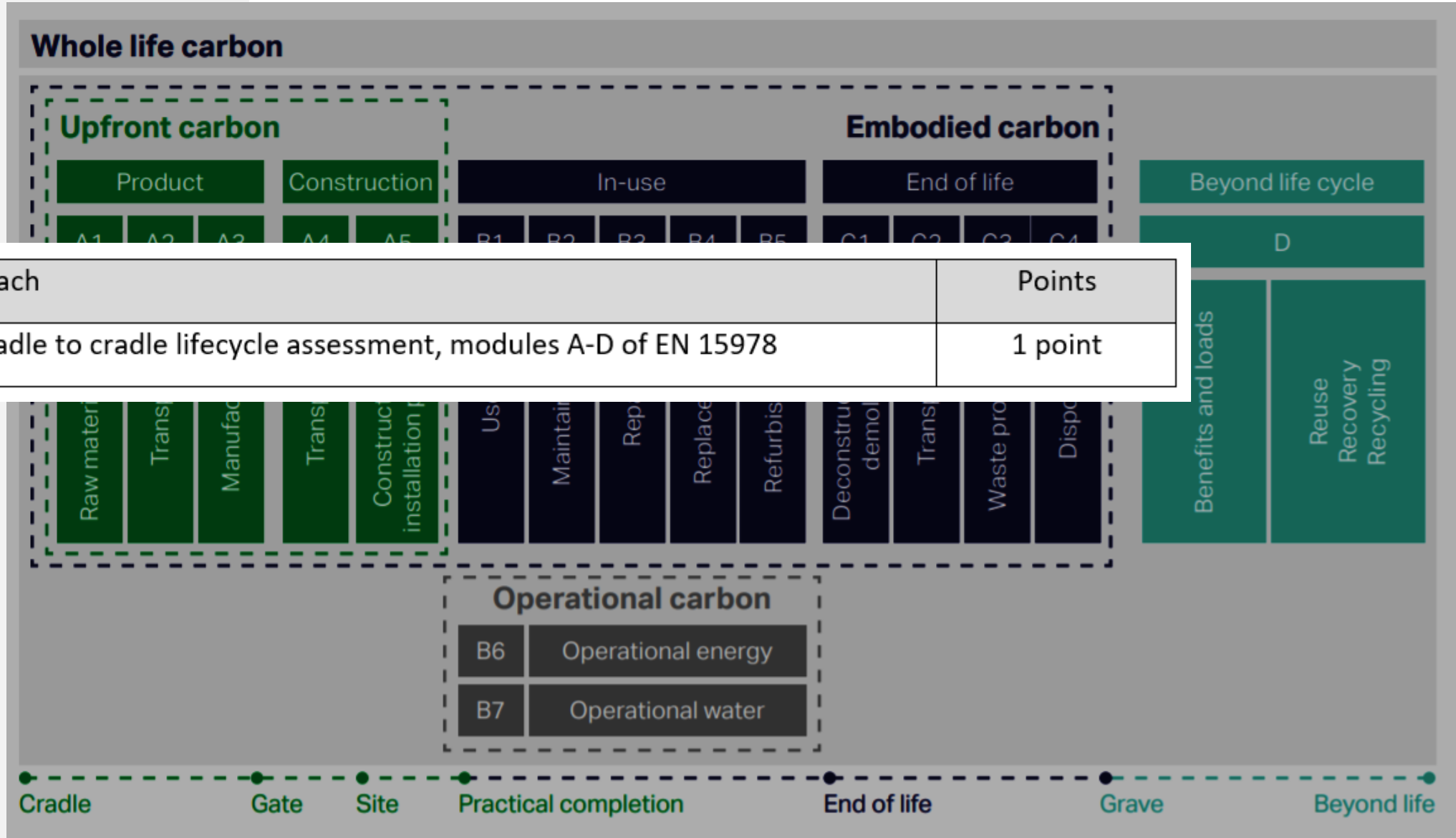


Life cycle modules

90 years



Life cycle modules



Approach	Points
Full cradle to cradle lifecycle assessment, modules A-D of EN 15978	1 point

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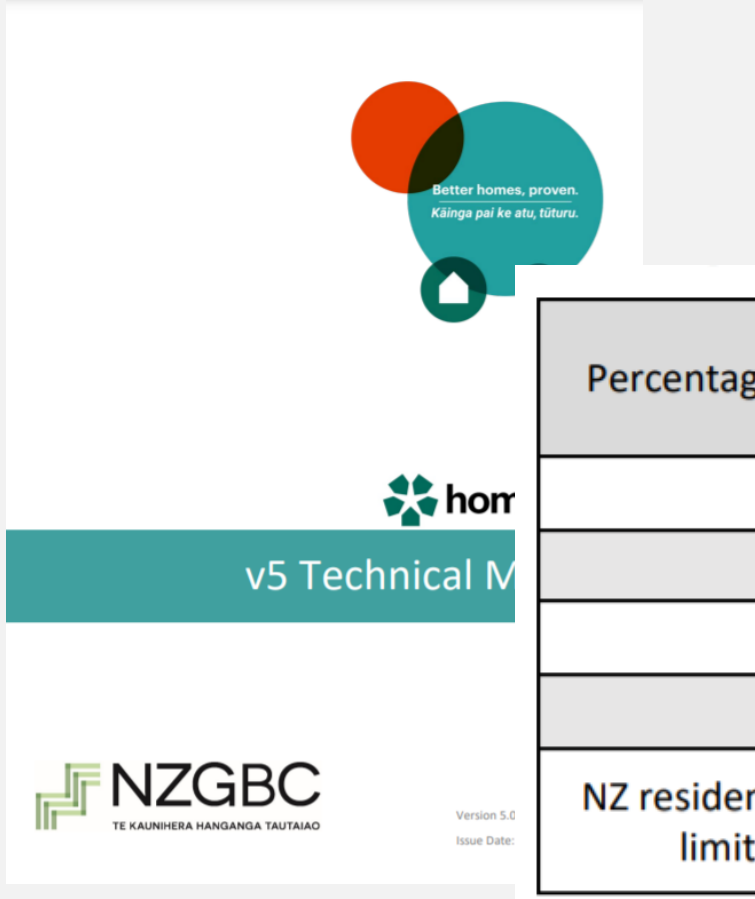
Upfront emissions

- Points awarded for reduction in upfront emissions (A1–A5)

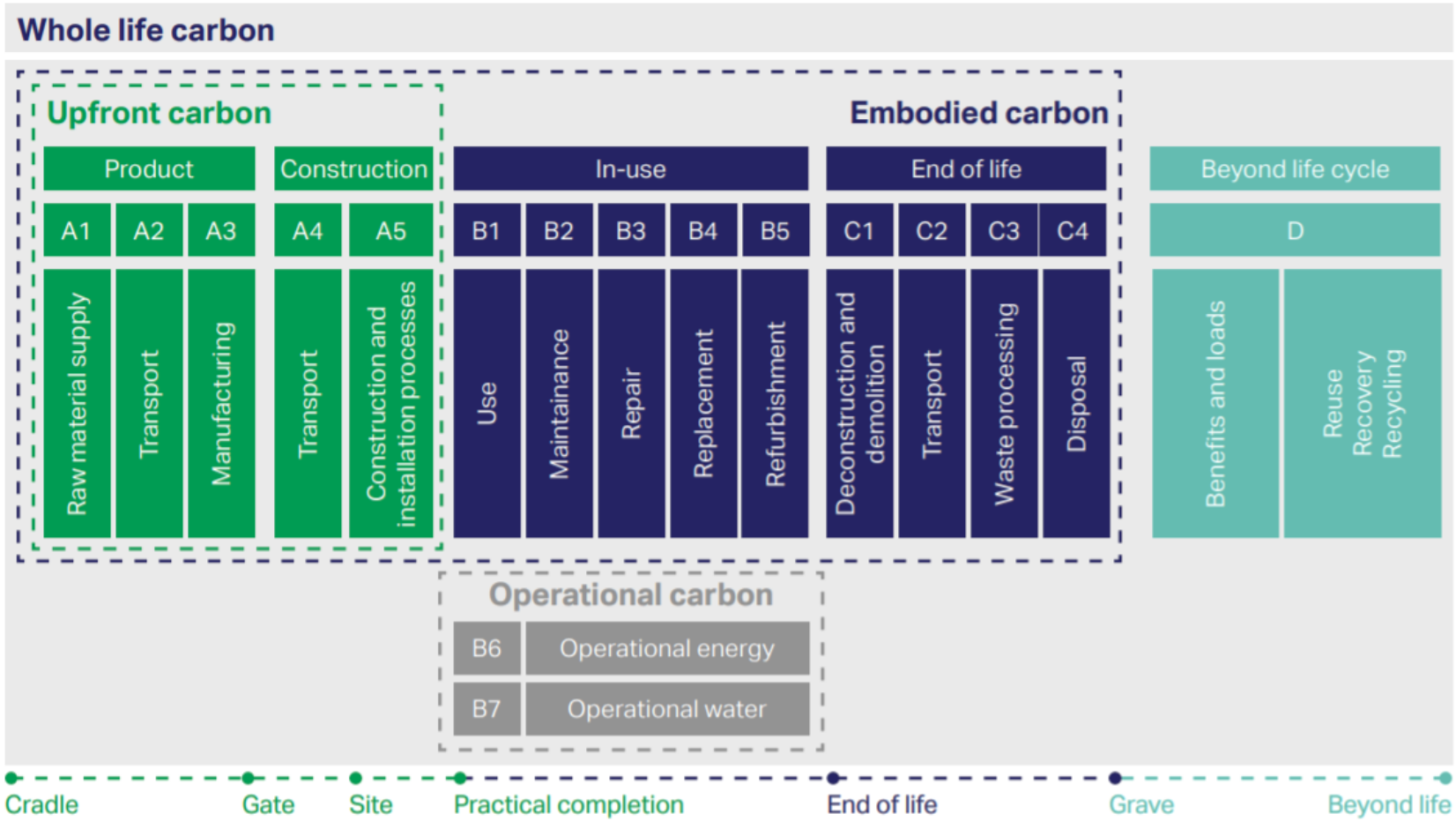


Percentage increase on emissions target	Materials and construction stage (A1-A5) emissions: $kg.CO_2\text{-}e/m^2$	Points
<160%	156	1 point
<120%	132	2 points
<80%	108	3 points
<40%	84	4 points
NZ residential carbon budget required to limit global warming to 1.5°C.	60	5 points

Why focus on upfront emissions?

Emissions now

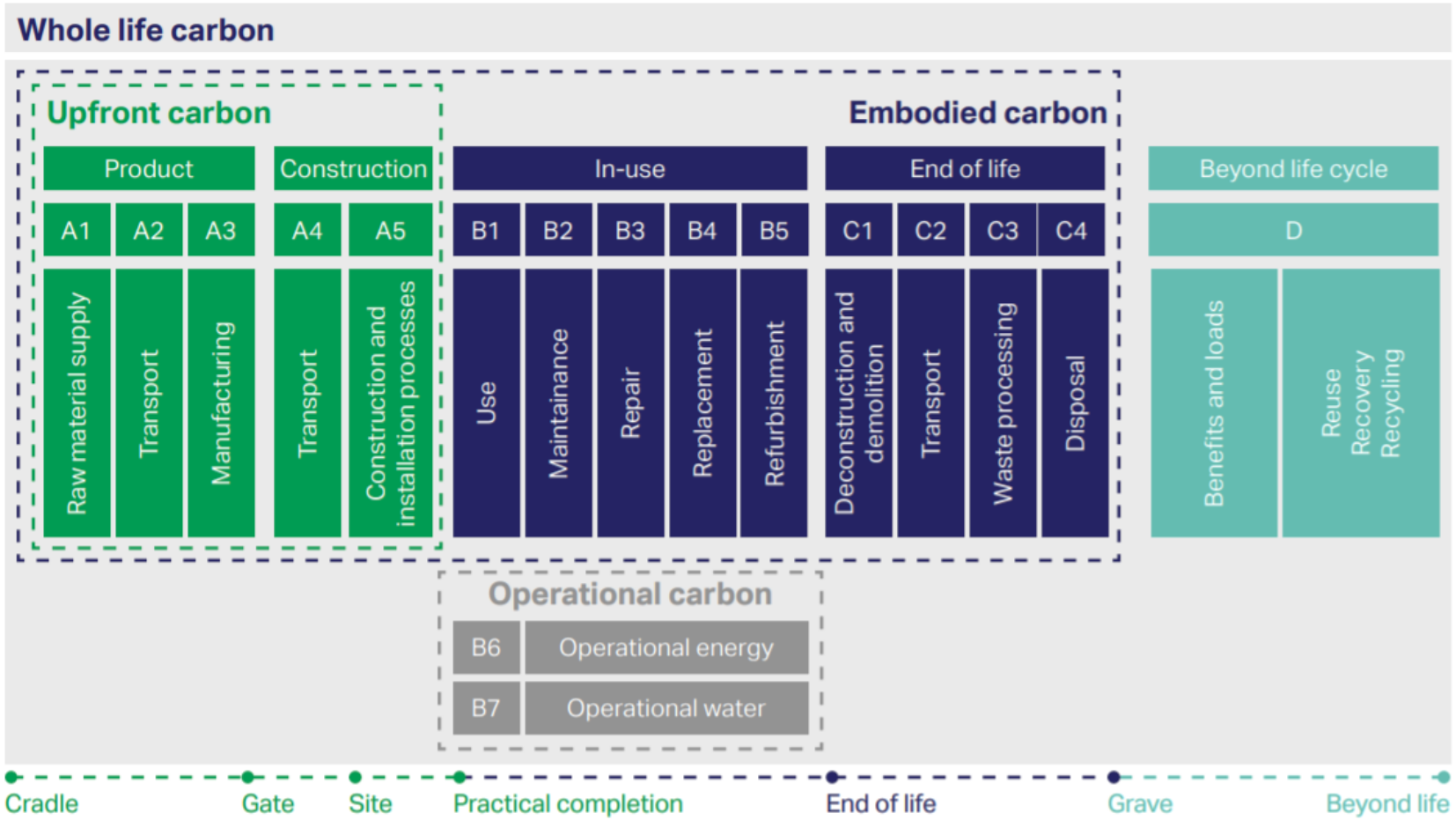
Emissions / removals later



Why focus on upfront emissions?

Certain

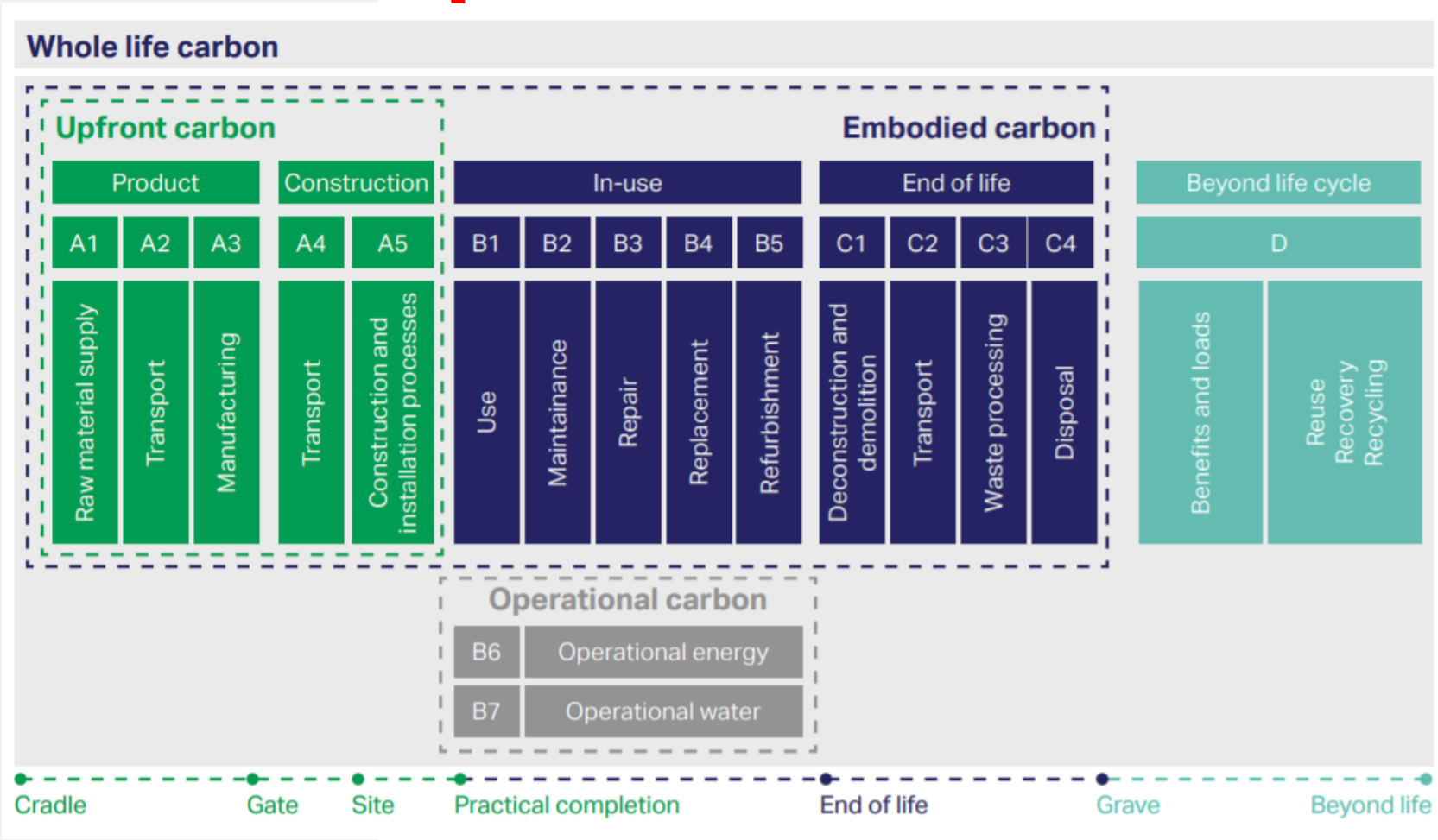
Increasing uncertainty



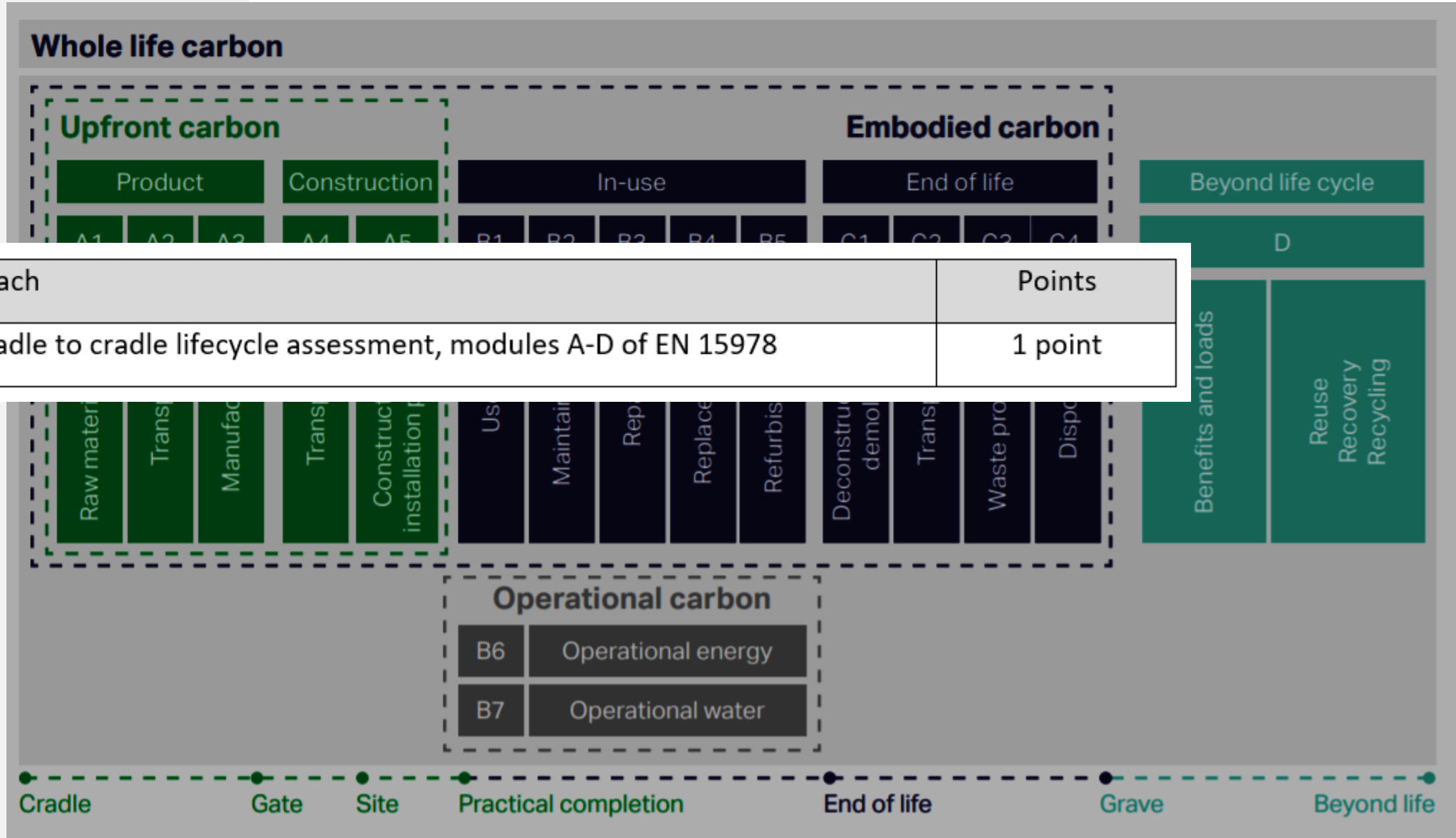
Why focus on upfront emissions?

In control of design team

Less in control of design team

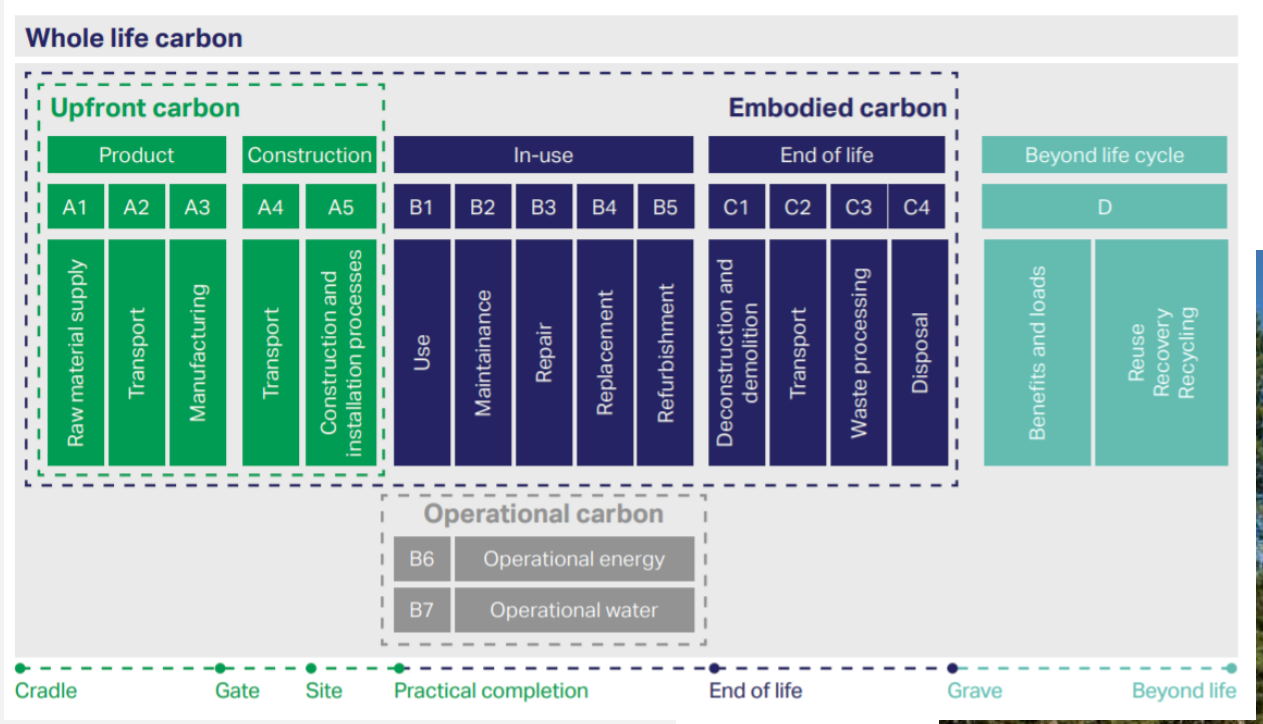


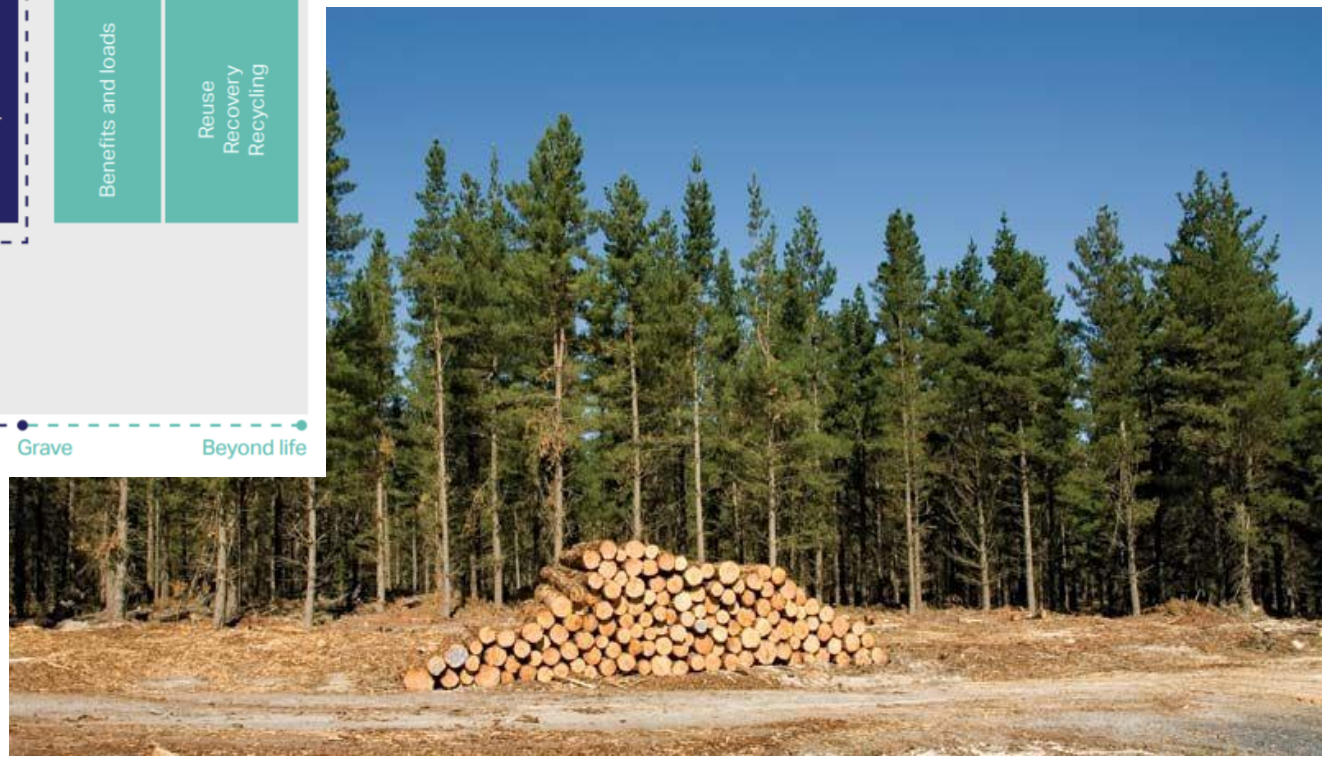
Life cycle modules



Approach	Points
Full cradle to cradle lifecycle assessment, modules A-D of EN 15978	1 point

Biogenic carbon





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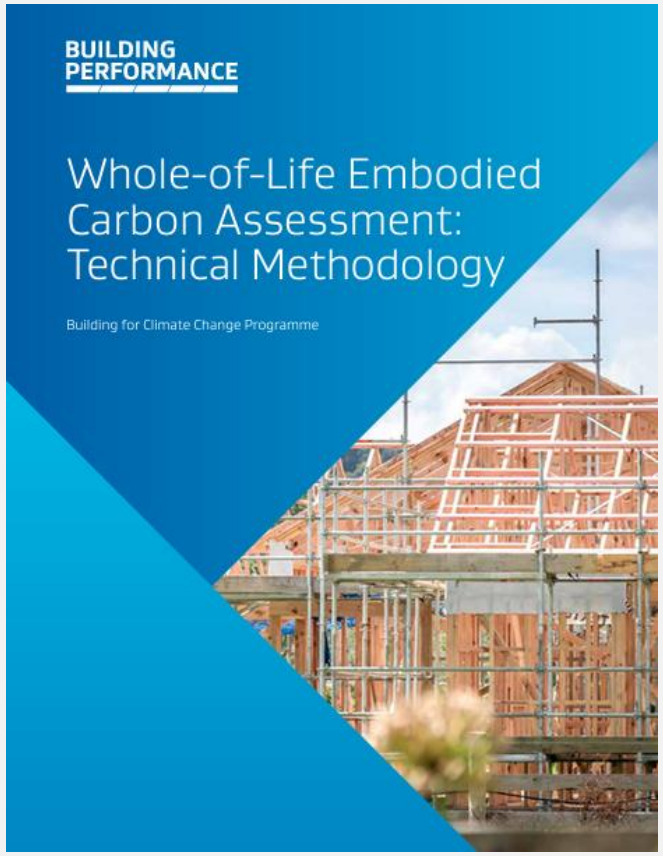
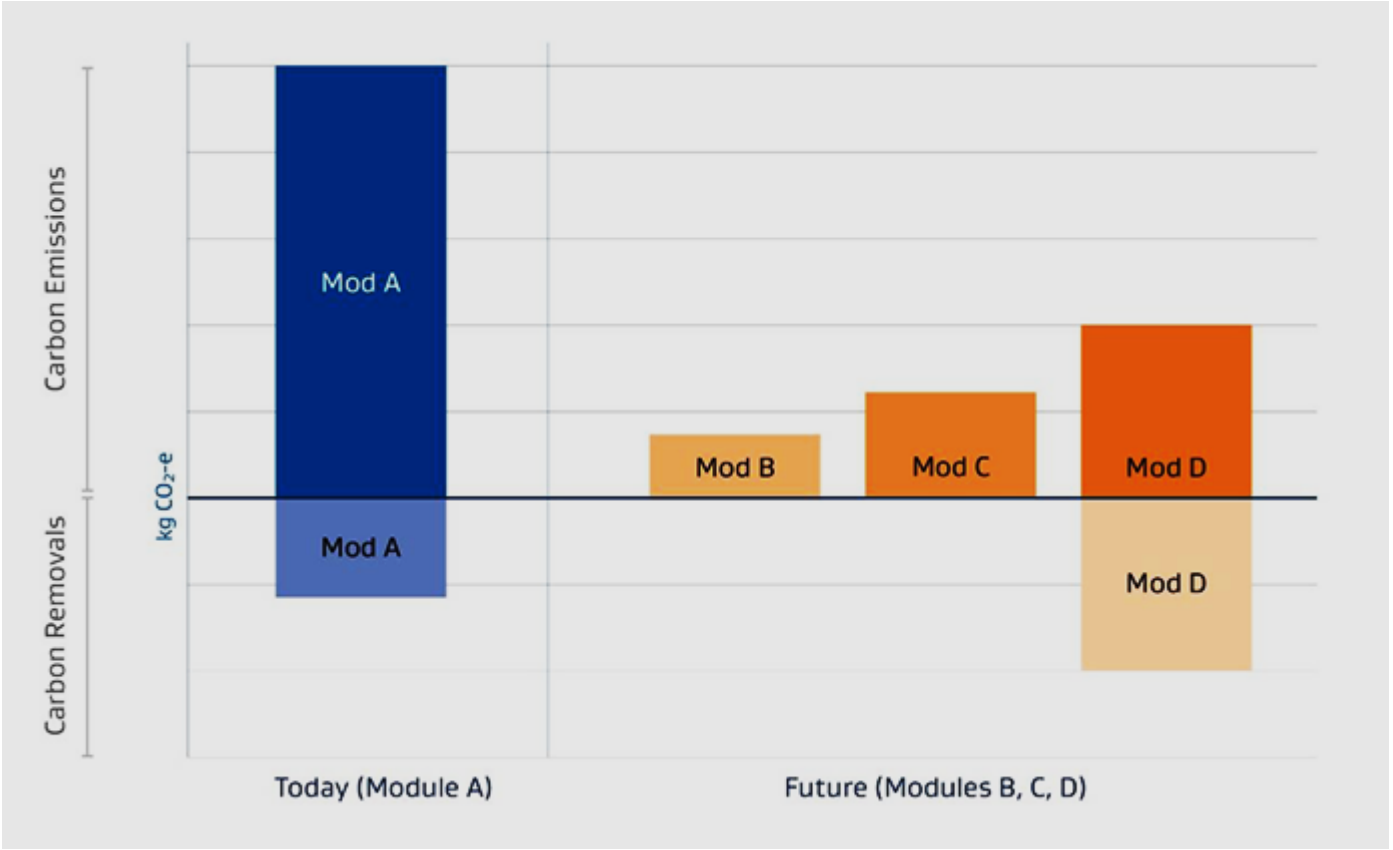
MBIE reporting framework





The Calculator

Summary Sheet

Options

Concrete Carbon Content (•) lower ( ) higher

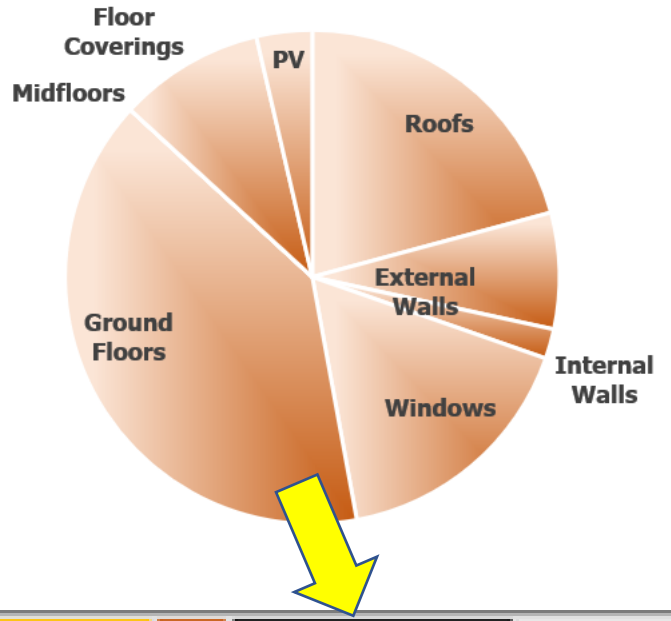
Building Gross Floor Area 200 m²

Results

Total Climate Change Impact (A1-A5)	**32,949** kg CO_2 eq
Climate Change Impact Intensity	**165** kg CO_2 eq/m²

	Climate Change [kg CO2 eq]				
	A1-A5	**B**	**C**	**D**	**Total**
Roofs	6,852	6,554	1,597	-2,808	12,196
External Walls	2,506	3,628	2,165	-638	7,661
Internal Walls	642	934	740	-95	2,222
Windows	5,524	11,215	84	-4,002	12,821
Ground Floors	13,087	0	1,601	-944	13,744
Midfloors	0	0	0	0	0
Floor Coverings	3,138	29,008	1,006	0	33,152
PV	1,200	30	40	-100	1,170
Total	**32,949**	**51,370**	**7,233**	**-8,587**	**82,965**

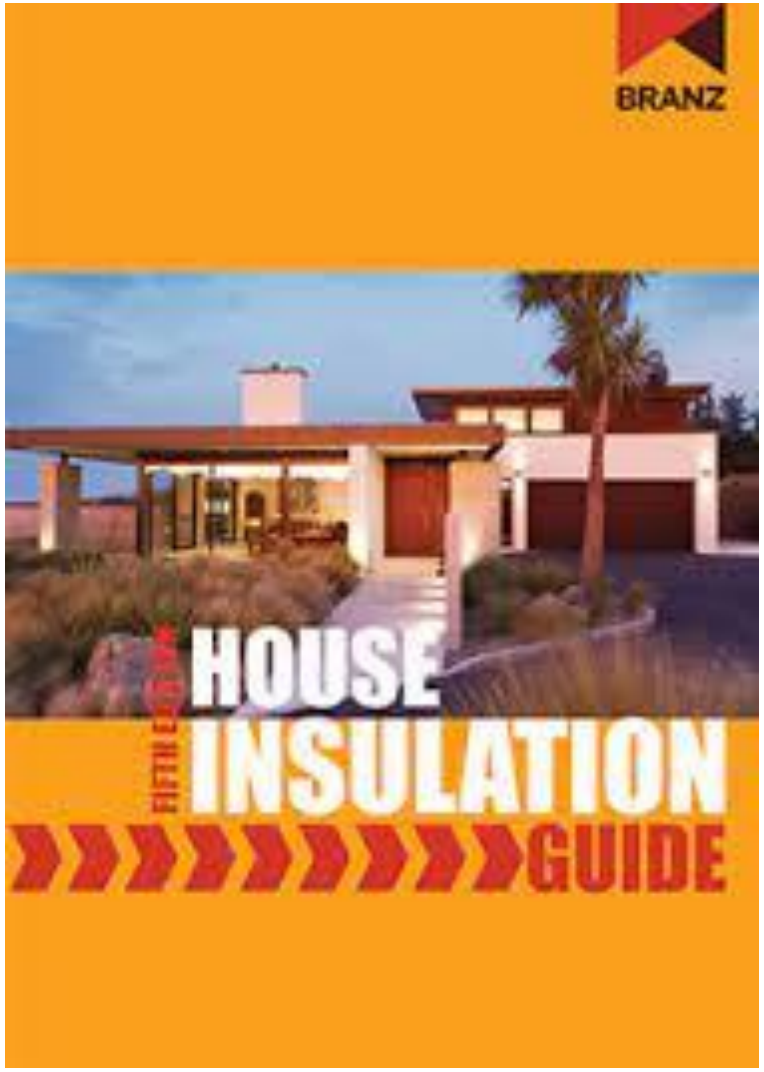
Climate Change Impact - modules A1-A5



Summary | Roofs | External Walls | Internal Walls | Windows | Ground Floors | Midfloors | Floor Coverings | PV | Custom Elements

Updates...


Firth
SEPTEMBER 2020
+ Environmental Product Declaration
For ready-mixed concrete
In accordance with ISO 14025 and EN 15804+A1 for:
FIRTH CERTIFIED READY-MIXED CONCRETE
Programme: EPD Australasia, www.epd-australasia.com
Programme operator: EPD Australasia Ltd
EPD registration number: S-P-02050
Publication date: 18/09/2020
Valid until: 18/09/2025
Geographical scope of EPD: New Zealand
AUSTRALASIA EPD®
ENVIRONMENTAL PRODUCT DECLARATION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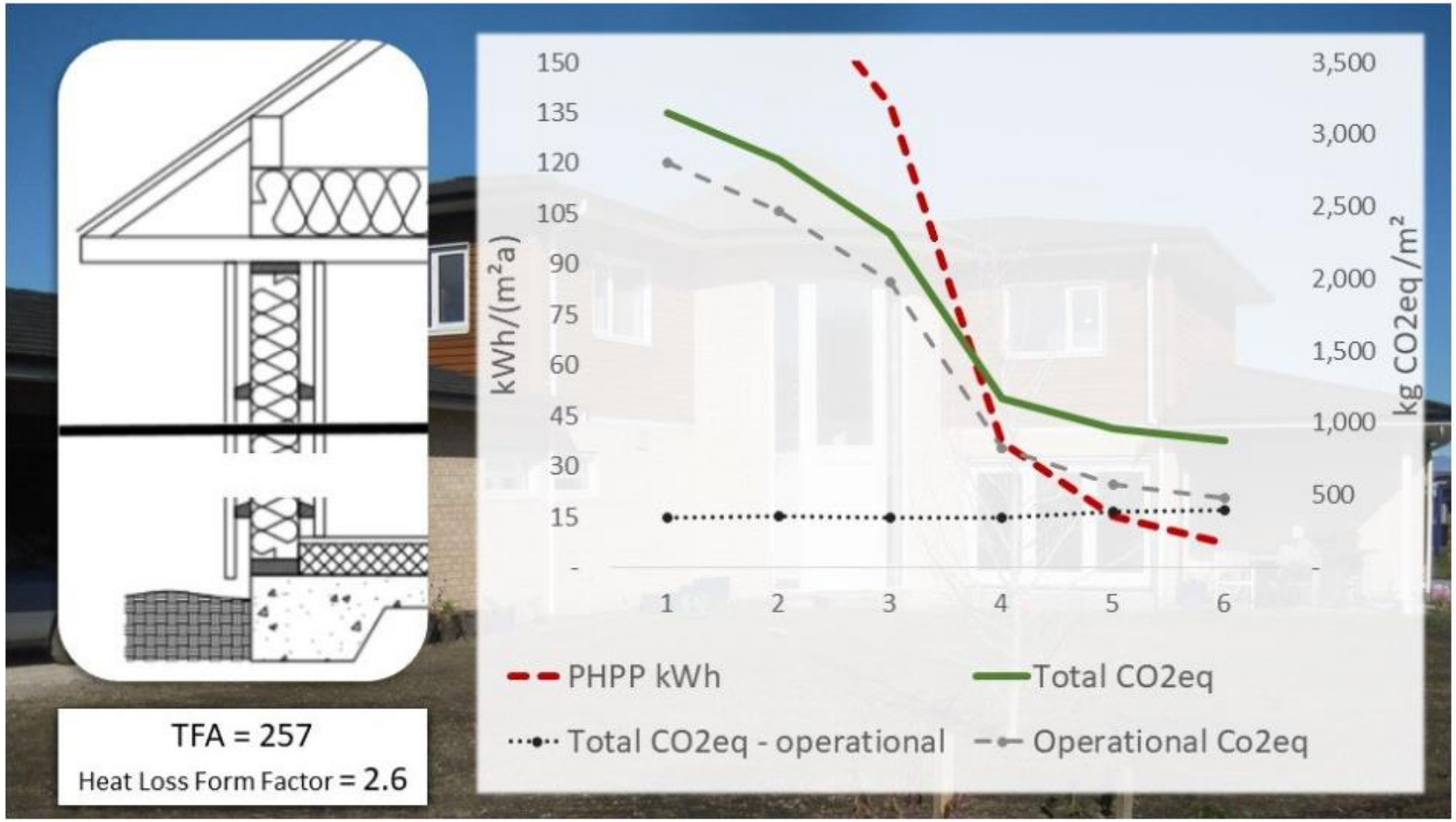
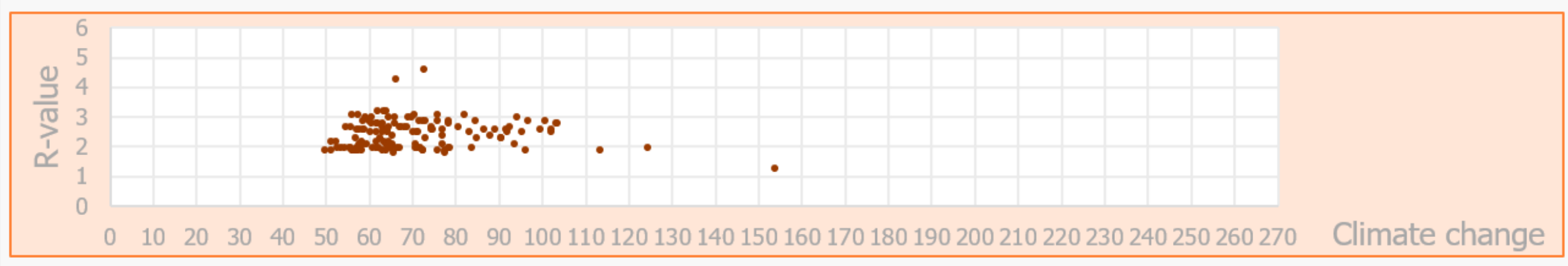
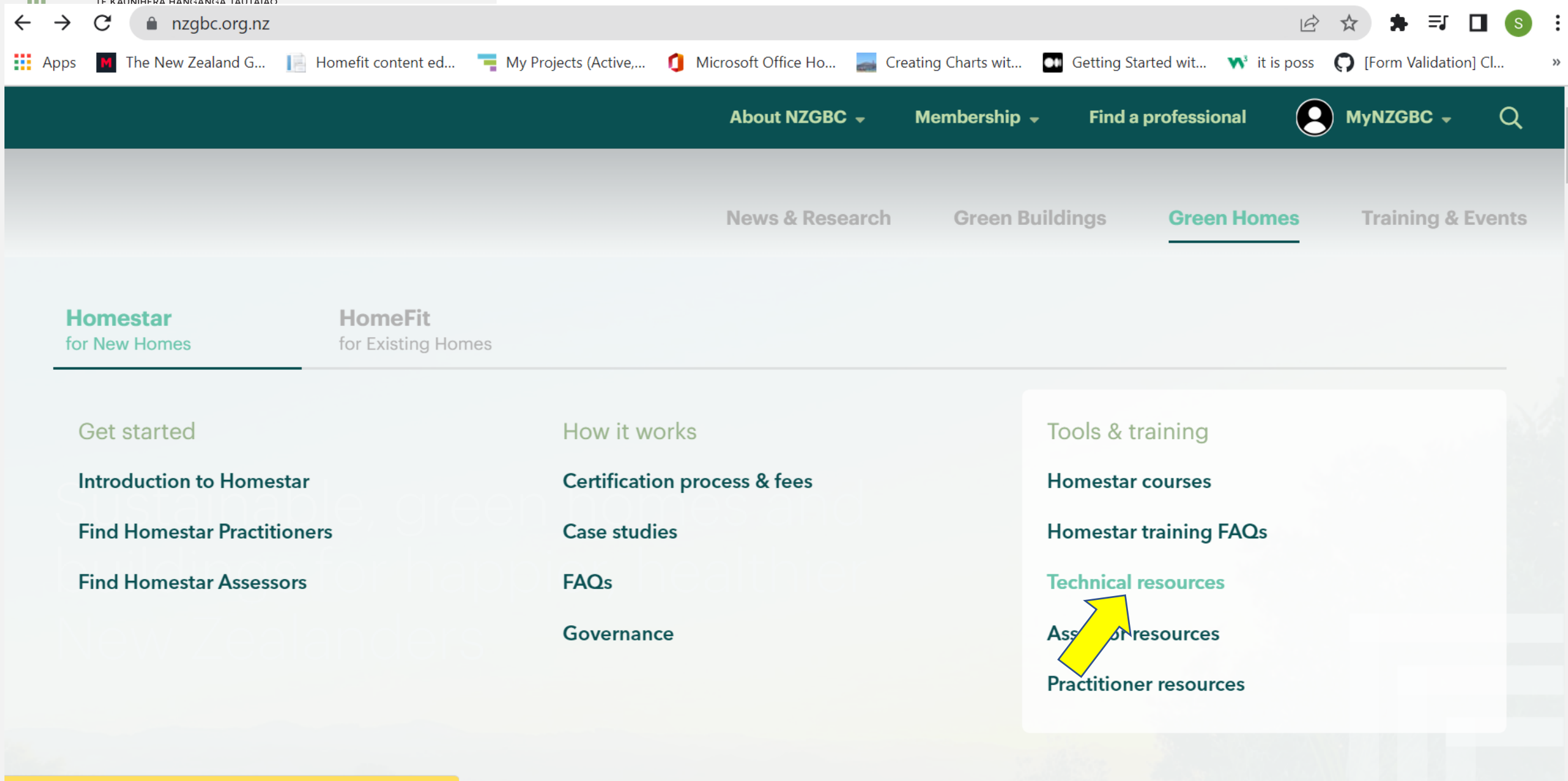
What about the full life cycle?



Correlation between R-value and embodied emissions...



Download HECC here. It's free!



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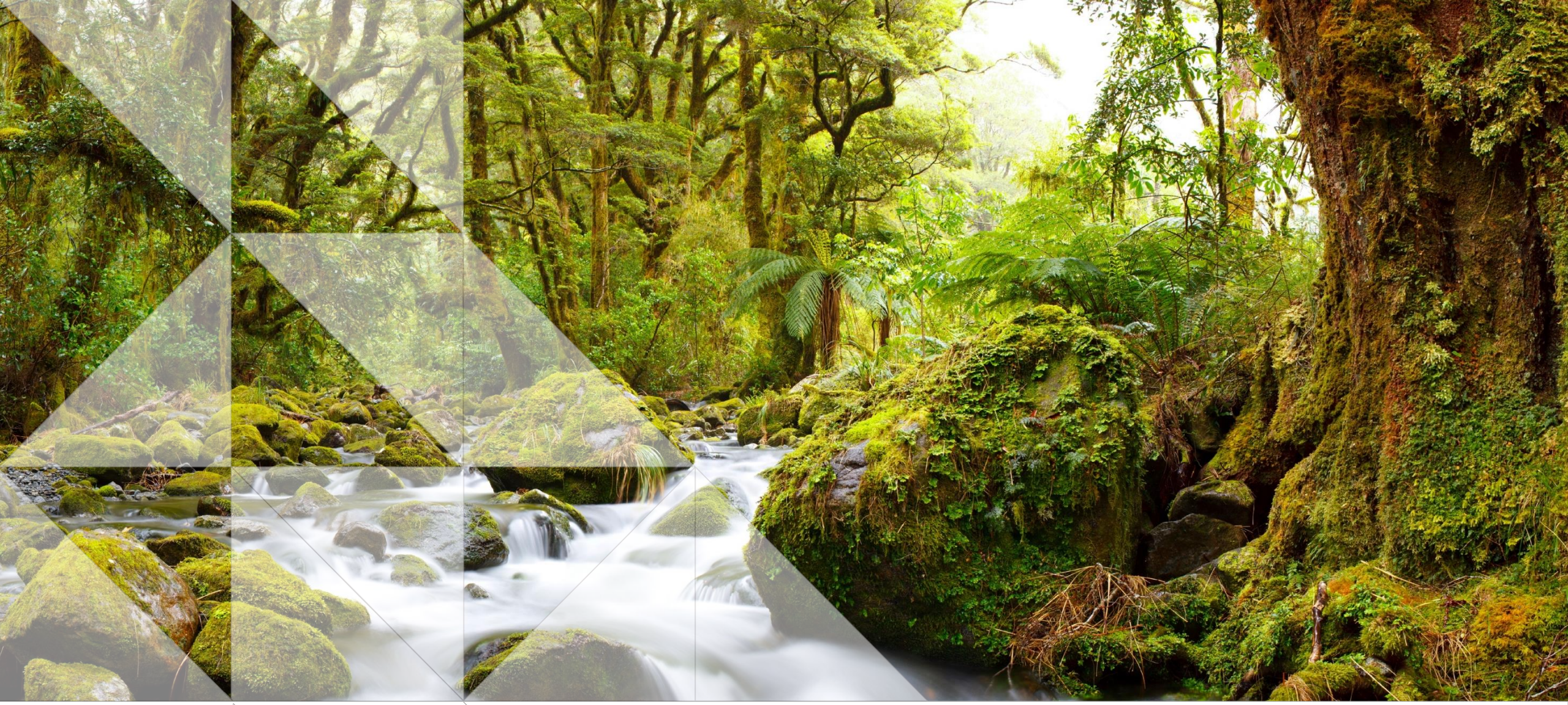

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HECC demo