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The Missing Link: Embodied Emissions Estimation
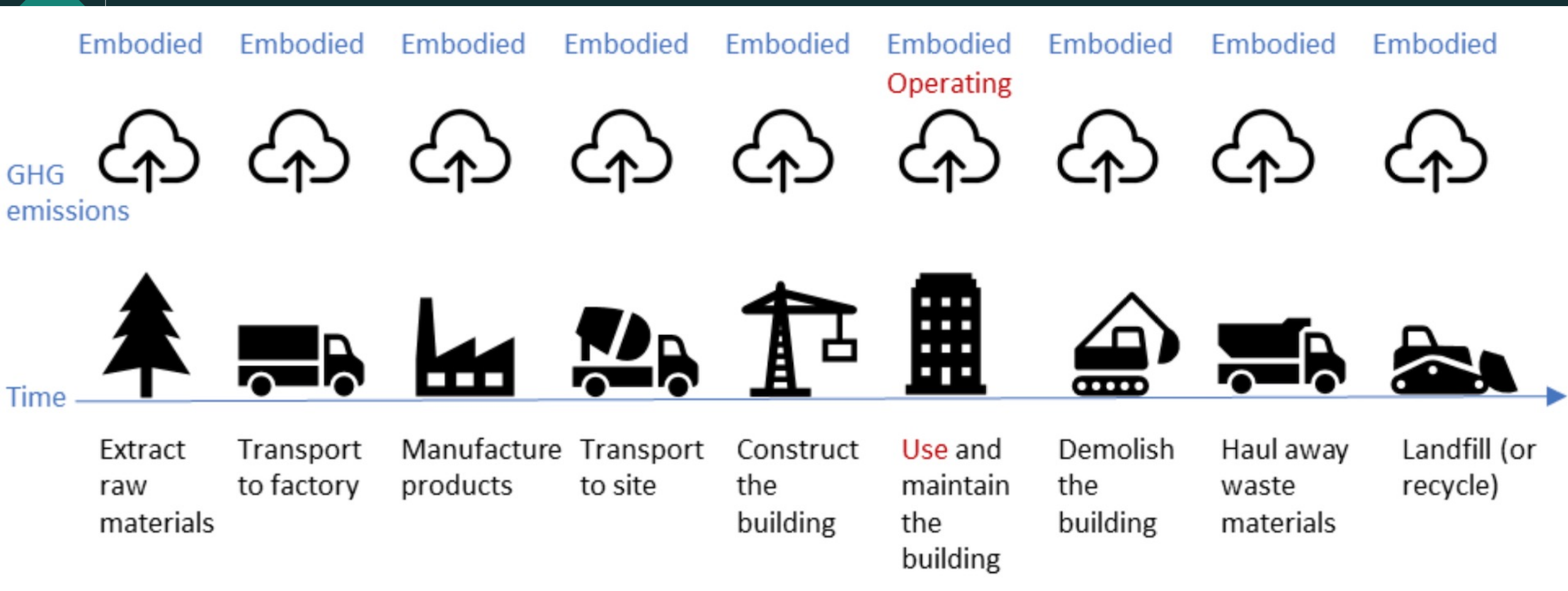
Dr Chris Cameron

Pattle Delamore Partners

The place of <u>embodied</u> carbon

- Also known as <u>capital</u> carbon

- Includes the emissions associated with extraction, manufacture, transport, construction, demolition

- Not including <u>operational</u> emissions

- Can also lead to <u>enabled</u> emissions – those generated from constructing something new (i.e., build it and they will come)

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Building life cycle GHG emissions: Embodied emissions occur at each stage — Extract raw materials, Transport to factory, Manufacture products, Transport to site, Construct the building, Use and maintain the building (Operating), Demolish the building, Haul away waste materials, Landfill (or recycle). Operating emissions occur during the Use and maintain the building stage.

Why consider embodied carbon?

Increasing pressure to consider and minimise emissions:

- National 5-year emissions budgets (x3)
- Increased requirement for capital project reporting
- Increasing cost of carbon – factoring in to overall project costs
- Claiming 'net zero'

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Estimating embodied emissions

International tools

- ISCA (Infrastructure) – Aus/NZ

- OneClick LCA (Buildings) - UK

- Tally (Buildings) – USA

- LEED (Buildings) – USA [certification]

- Other

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Estimating embodied emissions (cont.)

Some NZ tools

- LCAQuick – BRANZ (Buildings)
- Moata (Mott Macdonald tool) – Infrastructure
- Waka Kotai PEET tool (Project emissions estimation tool) – Transport

Using tools in projects

- project optioneering

- project estimating

- detailed job costing

Future outlook / considerations

- Good base-data
  - Emissions = tonnes of material x emissions factor
- Consistency of emissions factors (NZ specific)
- Alignment across industries
- Automation – link across various scales

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Future outlook / considerations (cont.)

- Reducing capital carbon generally
- Carbon storage in projects (e.g., wood)
- Are low-carbon alternatives proven?
- Best practice – PAS2080
- So, what tool should you use?

Thanks!

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