

One Planet Living in Action

Shifting stubborn embodied carbon

Liz Darley and Jane Hersey

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BioRegional Development Group



Entrepreneurial charity which invents and delivers solutions for sustainability

Est. 1994, 40 staff, 8 associated companies

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BioRegional: work with partners to demonstrate solutions for..

Products & supply chain: wood, construction materials, food, paper

Communities: new, retrofit, energy, transport, sustainable lifestyles



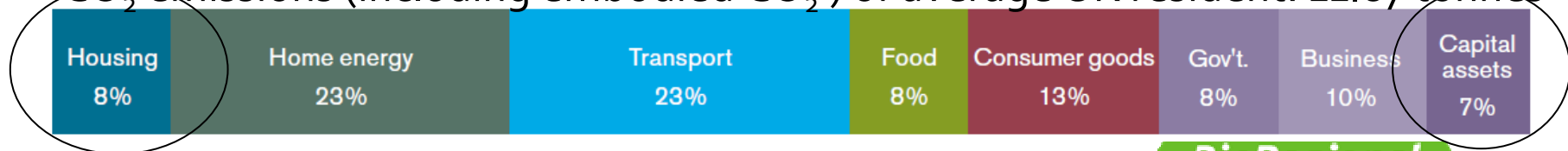
Why consider embodied carbon?



Ecological Footprint of average UK resident: 5.45 Gha



CO₂ emissions (including embodied CO₂) of average UK resident: 11.87 tonnes



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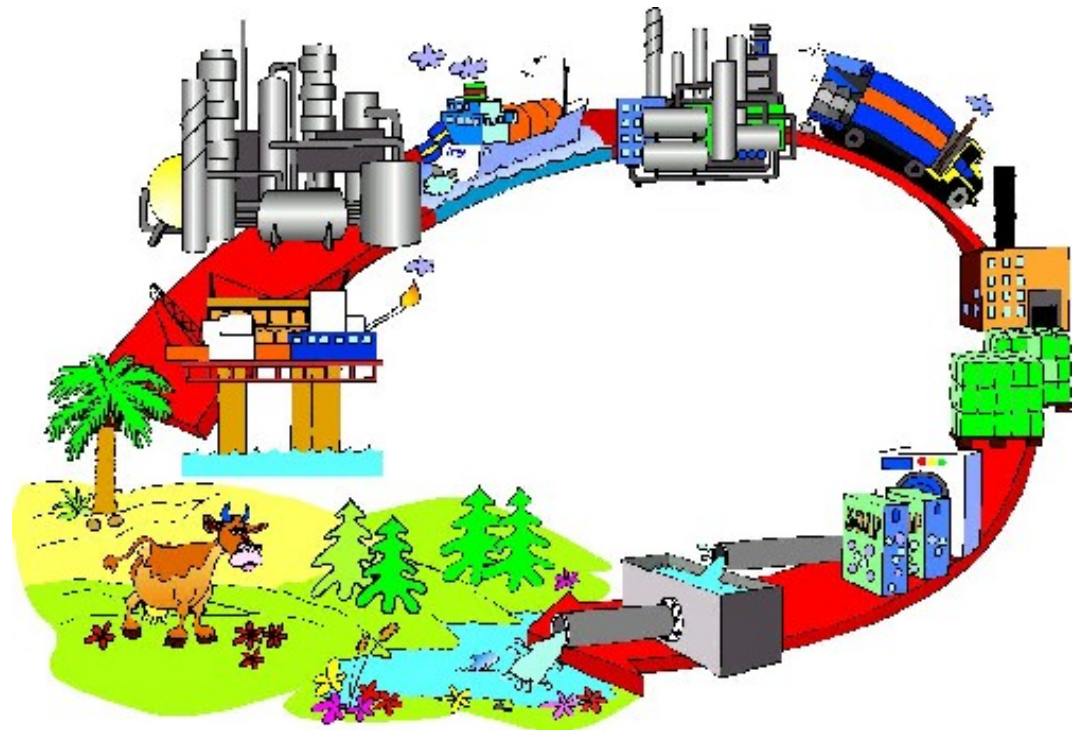
Figures derived from REAP by BioRegional

Ref: "What makes an eco-town" BioRegional & CABE Sept 2008

What is embodied carbon?

- Extraction
- Manufacturing
- Transportation
- End of product life

- Cradle to grave
- Cradle to gate



Some facts

- What % of current housing stock will be standing in 2050?

80%

- What % cut in carbon by 2050 are we committed to by the Climate Change Act?

80%

- How much of our current emissions does housing account for?

25%

- By what year are all new homes expected to be zero carbon?

2016

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2006 Building regs house

Carbon embodied: 56 tonnes

Annual emissions: 6 tonnes/yr

Lifetime emissions: 416 tonnes

Embodied = 15% of operational



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Zero carbon homes

Carbon embodied: 56 tonnes

Annual emissions: 0 tonnes/yr

Lifetime emissions: 0 tonnes

Embodied = 100% of operational

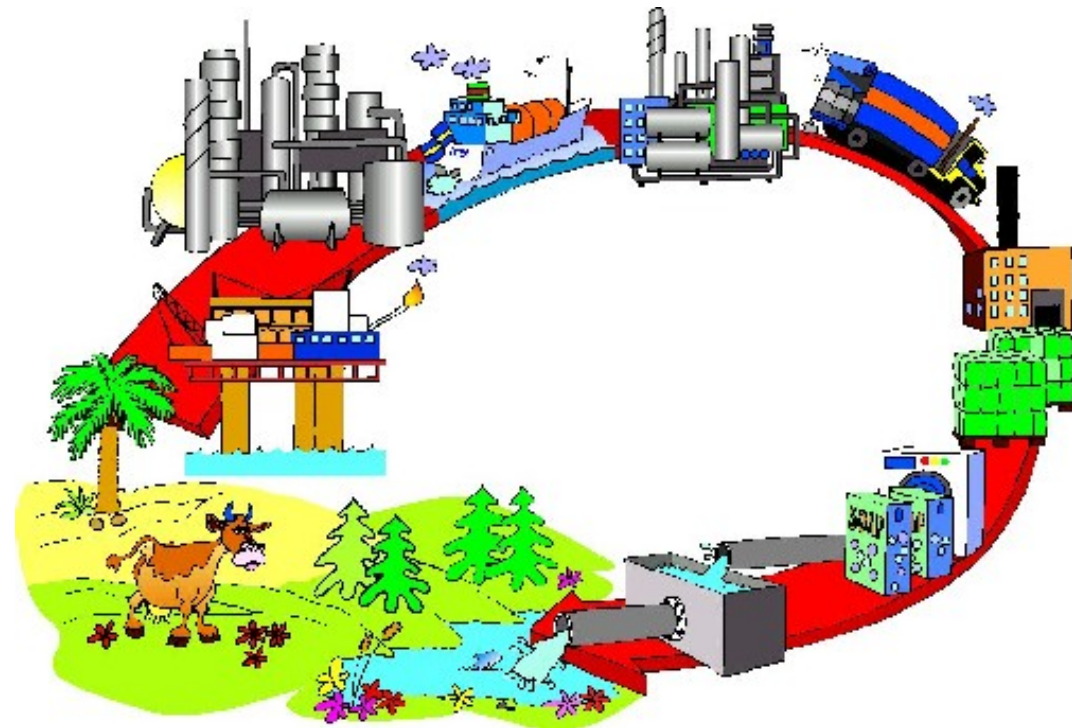
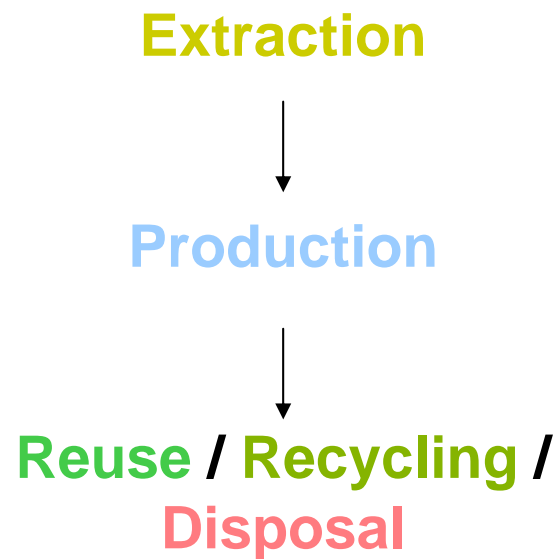


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How do we measure it?

Lifecycle Assessment is a tool to assess the potential environmental impacts of products and services at all stages of their life cycle;

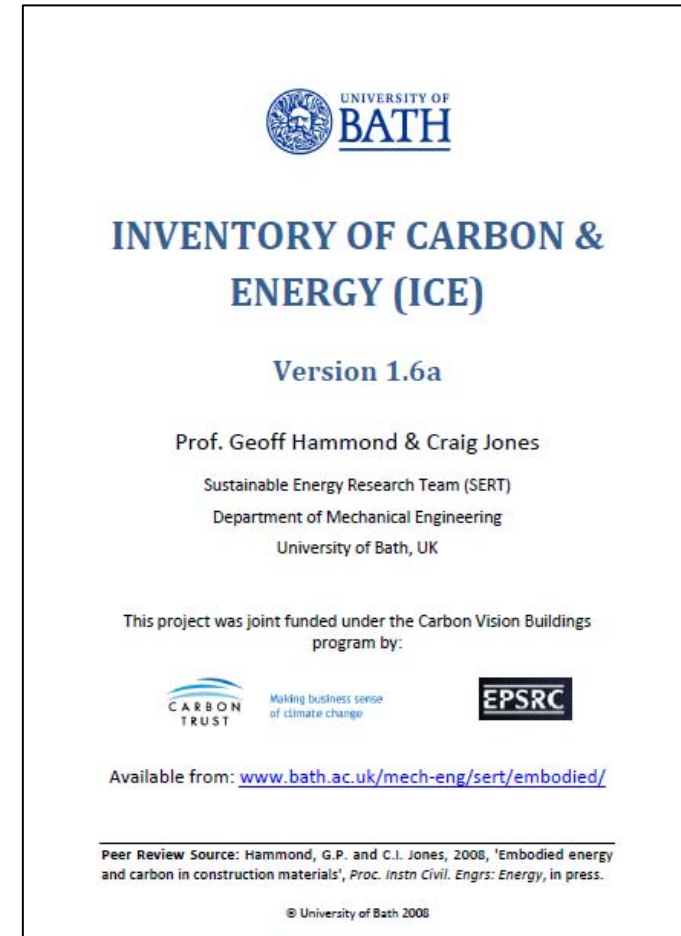


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Inventory of Carbon and Energy

- Inventory of coefficients for common building materials
 - Aggregates
 - Bricks
 - Steel
 - Timber
 - Etc



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Code for Sustainable Homes/BREEAM

- Green Guide ratings
 - Simple guide to environmental impacts of building materials
 - 1500 specifications
 - A+ to E
 - 13 environmental impact areas; climate change through to eutrophication and ozone depletion



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Why aren't green products used more?



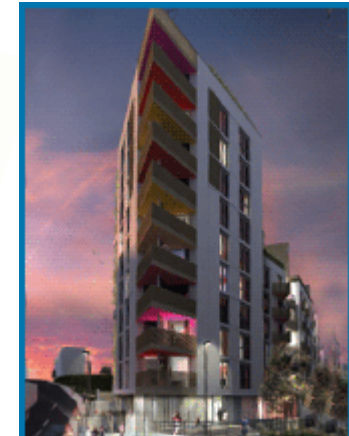
Knowledge



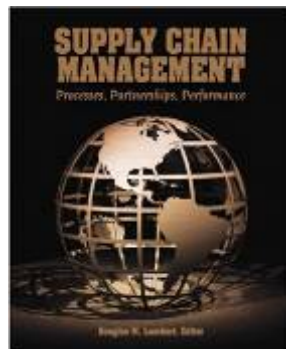
Cost



Inertia



"Meeting the needs of the present without compromising the ability of future generations to meet their own needs"



Availability



Building Expertise

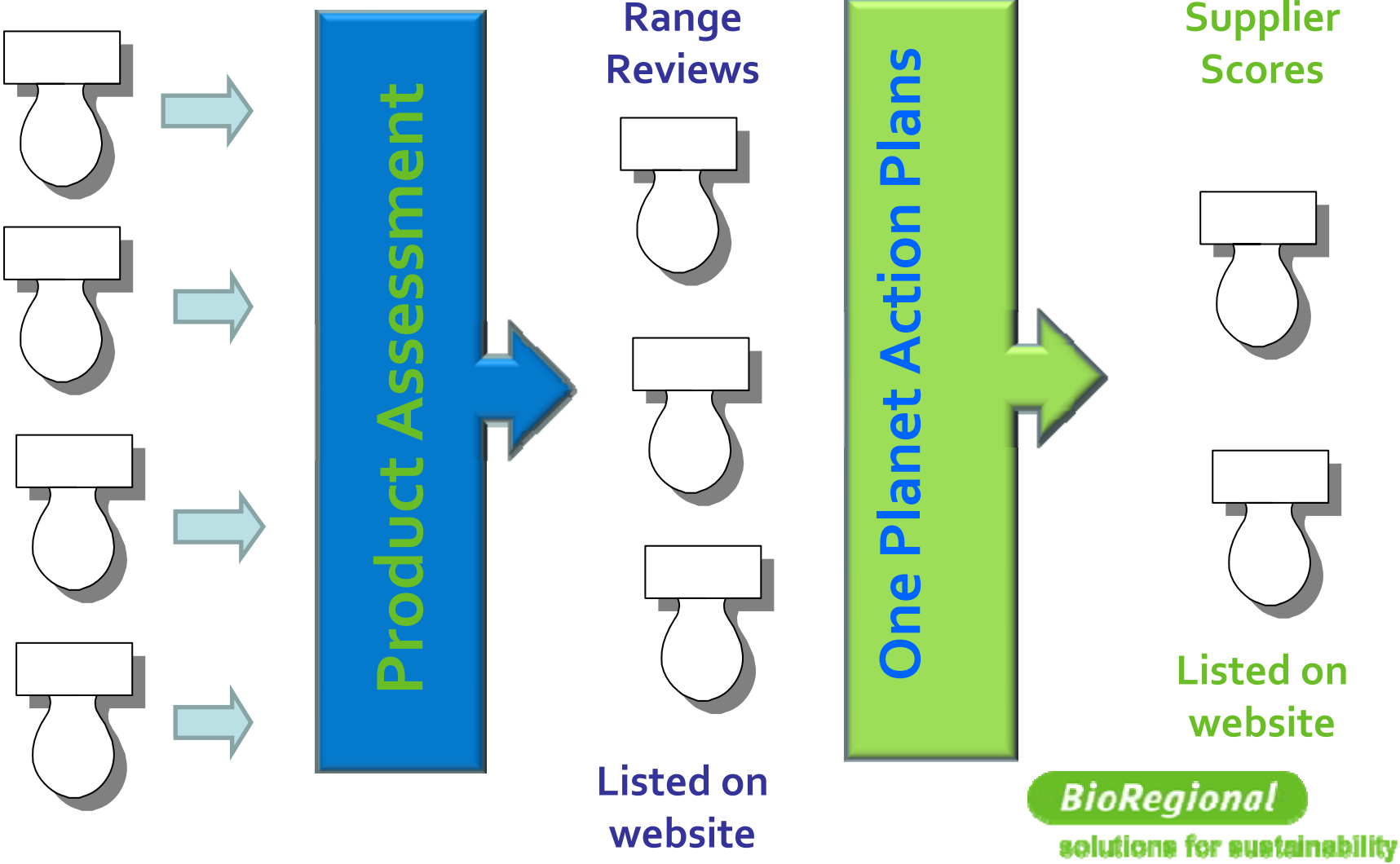


Legislation

Demand

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One Planet Products Methodology



BedZED - One Planet Living in the home



BedZED eco-village in south London (2002) 250 people plus offices. Occupied since 2002. Initiated by BioRegional working with Bill Dunster architects developed with the Peabody Trust.

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BedZED – timber studwork

- 54km
- Challenges
- Competitive price
- Saved 63 tonnes of embodied CO₂



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BedZED – reclaimed steel

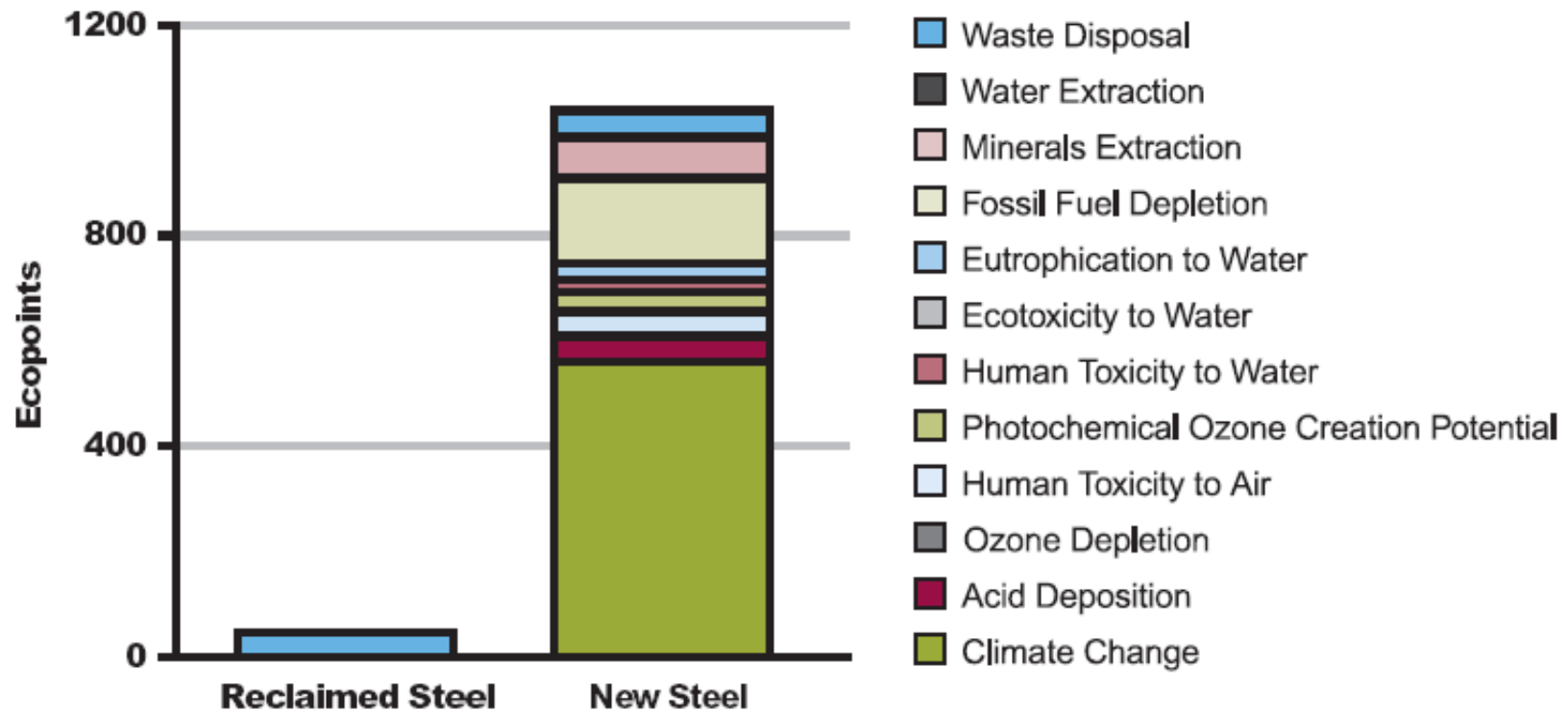
- 98 tonnes (95% of need)
- Cost neutral
- Saved 81 tonnes embodied CO₂



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Overall environmental benefits



Bar chart showing the 96% environmental impact saving by reclaiming and reusing steel sections

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one brighton

one planet | one address





Green concrete – 100% recycled aggregate

Natural clay block

- 60% less embodied energy than concrete block



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Thank you!

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Exercise 1: What is most important to you in material specification?

Possible wall specifications include:

1. Traditional brick and block
2. Timber frame
3. Low environmental impact alternative e.g.
 - Low fired clay block

Exercise 1: the criteria

1. Durability
2. Maintenance requirements
3. Human health (atmospheric pollution and carcinogens)
4. Environmental health (water pollution etc)
5. Programme; construction time
6. Programme; sourcing time
7. In use impacts
8. Embodied carbon
9. Supply chain responsibility
10. Cost

Exercise 2: the example wall

