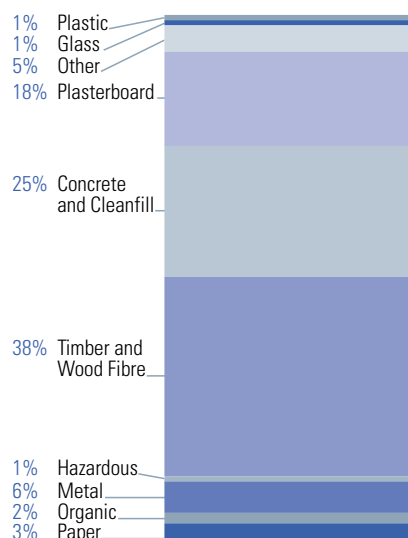


## Sustainable Building

**To encourage more sustainable building design, the sustainability of materials must be considered over the entire life of the product, building or material from extraction of resources to recycling or disposal at end of life. The relative impact of materials must be understood using rigorous assessment of the life cycle impact using peer reviewed life cycle assessment.**

The use of individual criteria such as Embodied Energy (EE) must be viewed with caution, for a number of reasons:

- There is no standard calculation for Embodied Energy, EE is only one part of a life cycle – one indicator.
- The ratio of EE (within the building materials) versus operational energy is relatively low. "A comparative environmental LCA of modern office buildings" by the UK Steel Construction Institute shows the ratio of embodied versus operational energy to be 1:8 based on an office building over 60 years. This ratio is reflected by the 10% weighting for materials in the Green Star NZ Office Design v1 sustainability assessment tool.
- EE does not take into account durability, recyclability, re-use or maintenance of materials.
- Does not account for any other environmental issues such as water use, waste, land use or pollution. Inter-relationships not accounted for such as by-products.



Typical construction site waste composition  
(Source: MfE)

- EE comparisons between materials do not highlight the high strength to weight ratio of steel, as EE is often measured by mass in the manner the material is used. E.g. in a per m<sup>2</sup> basis. For roofing and walling, a steel wall weighs 1/10th of a concrete tiled roof.
- Does not consider design or how the materials are used.

Sustainability assessment tools such as Green Star, NZ Office Design Version 1 use individual criteria (recycled content), however the New Zealand Green Building Council (NZGBC) are working towards LCA methodologies across all material types.

Steel has many unique characteristics, which make it ideal for sustainable construction and long-term environmental performance.

- Steel is 100% recyclable and is the most recycled material in the world. It does not suffer product degradation through endless recycling.
- Steel is relatively easy to recover from waste streams.
- The metal recycling industry in New Zealand is well established.
- More than 90% of commercial steel construction waste is recycled.
- 40% of global steel output is made from recycled scrap.
- Steel contributes low levels of construction waste (6%) (Source: MfE).
- Steel products are light weight and easily transported to building site.
- Steel is strong, long lasting and versatile, non-combustible and non-toxic.
- Factory applied finishes add durability.
- Steel lends itself to design for disassembly and re-use.
- Many steel products are easily precision prefabricated, minimising waste.



**Kiwi to the core**

**NEW ZEALAND STEEL  
100% RECYCLABLE**



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## Commitment to Research

New Zealand steel is conducting and participating in research for product improvement and sustainable building solutions including:

- Lighter structures
- Design for re-use
- Composite materials

New Zealand Steel is a shareholder in Beacon Pathway – a collaborative research consortium to improve the sustainability of residential buildings in New Zealand.

[www.beaconpathway.co.nz](http://www.beaconpathway.co.nz)

[www.nowhome.co.nz](http://www.nowhome.co.nz)



*Craig Robertson Photography for Beacon Pathway Ltd.*