



# Reducing the Carbon Footprint & Environmental Impacts of New Buildings

*The Tasmanian Government and community can economically reduce the carbon footprint and environmental impacts of buildings by using more timber and wood products in their design, construction and operation.*

Buildings consume great quantities of materials, energy and other resources and generate significant greenhouse gas emissions and other environmental impacts during their life-cycle.

The use of renewable materials and energy sources in sustainable building design can reduce these emissions and impacts significantly.

Tasmania produces large amounts of renewable timber products and these can be used more extensively in the State's public housing and other building types. This will deliver benefits as:

- Timber has lower carbon and environmental impacts than comparable building materials.
- Timber production is a low energy and low impact process.
- Timber provides simple solutions that meet regulatory requirements.

- Timber buildings are attractive, comfortable, and high performance.

- Timber construction is efficient, economical, and locally supported.

- Local industry supports increased timber use.

Wood products can displace more fossil — fuel intensive construction materials such as concrete, steel, aluminium, and plastics, which can result in significant emission reductions (Petersen and Solberg, 2002).

Potential exists to increase timber's use in:

- Timber floors and floor systems in houses and other buildings,
- Timber framed structures in school halls and assembly buildings, and
- Fire and sound resistant timber walls, lining and cladding.



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# Timber has Lower Carbon & Environmental Impacts than Comparable Building Materials

Timber in building reduces carbon emissions in three ways:

- The carbon stored in growing trees is retained and stored in the timber for at least the life of the building.
- Using wood instead of energy intensive materials avoids the emissions associated with producing those materials.
- Increased timber use supports the economic expansion of forests through the landscape. Forests are significant carbon sinks.

Total life cycle greenhouse gas emission savings gained from preferring timber in building can be as high as 28%.

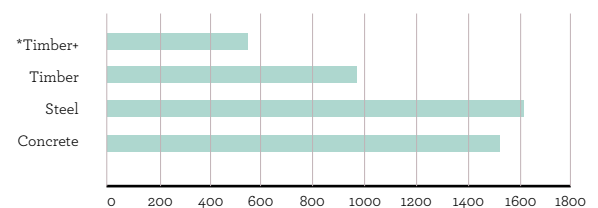
Timber is largely made from atmospheric carbon. Each cubic metre of timber in a building sequesters between 250 and 300 kg of atmospheric carbon. This is equivalent to 0.9 to 1 tonne of CO<sub>2</sub>. On the basis

of European studies, using one metre of timber also avoids another 1.1 tonnes of CO<sub>2</sub> emissions.

Timber production encourages forestry, and forestry has significantly less environmental impacts than other resource acquisition processes. Major wood processing companies can also offer chain-of-custody certification.

## Global Warming Potential

Embodied in the materials of similar commercial buildings.



t CO<sub>2</sub> equivalent

\* In addition to timber structural components, the Timber+ used timber in architectural features such as exterior cladding, windows and ceilings.

## Source

Johns S., Nebel B., Perez N., Buchanan A. 2009, Environmental Impacts of Multi-Storey Buildings Using Different Construction Materials, Research report 2008-02, University of Canterbury Christchurch, May



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# Timber Production is a Low Energy & Low Impact Process

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Sawmilling and timber fabrication are low energy and low impact production processes that convert logs into a wide range of components useful for building. Only a portion of the log becomes solid timber. Almost all of the remainder is used for fibre products such as particle board, cardboard, paper or for energy.

With the development of clean, modern boiler systems; wood chips and other wood waste now provide large amounts of the world's renewable energy. In the European Union, wood provided about 52% of all renewable energy generated in 2008. Sawdust and other biomass powers equipment in many of the state's timber mills and factories, and has significant potential to expand to electricity supply for other industrial and domestic consumers.

Wood waste can provide similar benefits in Tasmanian buildings, reducing cost, minimising waste and increasing heating efficiency.

This renewable energy source is a perfect complement to the State's capacity in hydro-electricity and wind power.



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# Timber Provides Simple Solutions that Meet Regulatory Requirements

Timber framed and lined buildings can satisfy the regulatory requirements of the Building Code of Australia (BCA) for most building types to three storeys simply and efficiently, and can go beyond this with careful design. Two key requirements are for fire-resistance and structural stability.

## **Fire resistance**

Timber elements can achieve a predictable performance in fire due to wood's natural charring behaviour. Combined with sprinklers and other features, three storey timber framed educational buildings satisfying the BCA's most demanding conditions have been built in the state recently.

## **Structural performance**

Light and easy to work, timber is a strong and versatile material, with proven performance in structures both large and small. A range of structural options are available that can be optimised for economy, workability or visual appeal.



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# Timber Buildings are Attractive, Comfortable, and High Performance

Timber rich building solutions can deliver comparable performance to other major construction systems. Timber in buildings is:

- Rugged and long lasting. Internal timber surfaces wear well and can be maintained efficiently. Timber structures last for centuries.
- Thermally efficient. Combined with sensible planning and adequate insulation, timber rich solutions can provide adaptable and thermally comfortable buildings. A natural insulator, timber also reduces wasteful thermal bridging.
- Good sound performance. The most acoustically demanding spaces are often made from wood. Sound proofing is simple with the correct detailing.
- Attractive and comfortable. Timber rich environments have a kinship with nature that resonates with those who live and work in them.



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# Timber Construction is Efficient, Economical, and Locally Supported

Timber is light, strong, easy to work and available in a wide range of complementary products. This allows for flexibility and efficiency in design.

As timber is light, construction is simpler and prefabrication is more effective.

Timber construction is cleaner and requires simpler tools than its major competitors. This leads to fewer pollutants and less noise on site.

Local prefabricators can supply construction sites around the state competitively. They provide a responsive local service and generate local employment.

Timber solutions for comparable designs are generally cheaper, especially with the rising cost of steel. Industry sources report that saving on some elements or systems can be as high as 20%.



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