



The benefits of using timber in the built environment

The offsite timber frame and truss industry has a great story to tell, as our products store carbon for life and help create a greener future. But how do you get the discussion started, and what are easy responses to back up our story.

Below, we have outlined answers to potential questions that may be asked of you, when you promote the fact that timber stores carbon for life.

We encourage you to be proud, loud Carbon Warriors!

Overview

40% of the world's emissions come from the built environment. By implementing policies which target the use of renewable materials, such as timber, which stores carbon for life, we can build a greener future.

Q. Why should we use wood and how does timber store carbon for life?

Trees absorb CO₂ from the atmosphere as they grow, using the process of photosynthesis and the solar energy from the sun, the CO₂ is converted into emitted Oxygen - which we breathe, whilst the carbon is stored in the woody mass of the tree. When the tree is harvested for timber products, that carbon is stored and locked in the timber for the life of the product whilst it is being used, or if it is recycled into another product. The accumulated storage in Australia's harvested wood products In-Use is estimated to be approx. 97 million tonnes of carbon.

Recent quote from Prof Chubb - former Australian chief scientist (9/1/13)

*"The only pathway known to science that has the immediate capacity - immediate capacity - to remove greenhouse gases, particularly CO₂, from the atmosphere at scale is **photosynthesis**, the means by which plants absorb CO₂ and water to create energy to fuel their eventually growth."*

Timber products remove more CO₂ from the atmosphere than they emit through the manufacturing process, unlike other materials. In fact, 1 cubic metre of softwood contains roughly 0.9 tonne of CO₂, or for hardwood 1.2 tonne of CO₂.

Q. How much carbon is stored in the average timber framed house?

An average Australian home uses approximately 12m³ of sawn softwood timber framing, which effectively stores almost 3 tonnes of Carbon - equating to approx. 7.6 tonnes of Carbon Dioxide (CO₂). Over 7 tonnes of oxygen is also released replenishing the atmosphere during the photosynthesis process.

Approximately 50% of timber is carbon. If you are sitting at a timber table, approximately 50% of that table is locked up carbon for life.

Q. How quickly does the timber for a house grow back?

Australia's sustainable and renewable Forest Industry replants each tree harvested which in turn continues the natural carbon cycle (over 70 million trees each year).

Australia's softwood plantations can regrow the timber used in an average framed house in just 150 seconds! Timber grows back, steel and concrete do not.

Q. What can we do with timber products at the end of their life?

Timber has the ability to be a fully circular-economy positive material, that at the end of its first life can either be reused, recycled, or the energy recovered (bioenergy).

At end-of-product-use, timber products should no longer be seen just as "waste", but effectively they should be seen as becoming a valued "feedstock" for another process; either a by-product (recycling), or recovered resource for another industrial process, or as regenerative resources for nature (e.g., compost, or for biomass-based products, energy generation – displacing non-renewable fossil fuels).

This is why Amsterdam's roadmap to become one of the first fully circular cities in the world, included implementing a Timber Construction policy to help them on the way to becoming a circular economy. The City of Amsterdam's Green Deal Timber Construction mandates that 20% of all new housing projects in the Dutch capital must be constructed with wood or other bio based materials from 2025.

Q. If timber ends up in landfill, does it decay and emit carbon?

At the end of the service life, if it can't be reused or recycled any further, some wood products may be disposed of in landfill and under the anaerobic conditions of most landfills this carbon will remain stored. Recent research has shown that the rate of decay in landfill is much slower than previously thought, with studies finding that more than 95% of the carbon in wood remaining stored after being buried for 30 years in landfill. In theory if there is no oxygen in the landfill, virtually no carbon loss will occur, and the carbon will remain stored forever - this is a scientific fact that is at odds with many current 'landfill - discouraging' policies that make the incorrect assumption that 'all the carbon is released as soon as the wood product is disposed of in a landfill'.

Q. What about Green Steel? Is that an answer to net-zero housing?

The concept of 'Green Steel' – 'manufactured without the use of fossil fuels' – is still just that, 'a concept' – whilst admirable, reality is that green steel currently is not available.

The steel manufacturing sectors aim is to transition from coal fired plants to electric and water plants which will allow hydrogen production. However, hydrogen production at scale will require billions of dollars of investment in renewable power generation and is not a current solution.

Europe's biggest steelmaker, ArcelorMittal, has told the Financial Times that decarbonising its operations on the continent in line with EU targets could cost them up to \$40 billion. The technology, even though expensive, is still not available within any market.

Using certified wood ensures trees are replanted. It is important to remember, no matter how changes are made to their manufacturing process, that you cannot replace the ore, rocks and minerals extracted from the planet for steel or concrete, but by using certified, renewable and sustainable plantation timber, you can be guaranteed a tree is replanted and regrown and the cycle of carbon storage continues.

Q. But does Australia have enough timber to meet our demands?

Australia needs to put more trees in the ground if we are to be self-sufficient when it comes to our timber needs.

Currently we import approximately 37% of all our structural timber needs, and it is envisaged that within the next decade this could rise to over 40%. Australia is fortunate to have quality importers, who are committed to the Australian market.

The Federal Government has also made policy changes which will allow greater investments into plantations such as the inclusion of plantations with the Emissions Reduction Fund.

Q. What evidence is there to show that timber stores carbon for life and that we should be using more timber to tackle our climate crisis?

Recently, the Intergovernmental Panel on Climate Change (IPCC) cited sustainable forest management along with sustainably produced forest products, as key solutions to fighting climate change.

When you look at countries leading the way in climate action, one thing they have in common is sustainable construction policies that recognise the role renewables, such as timber, plays in lowering the built environment's carbon emissions.

For example, France has introduced a policy that all new public buildings must be built with at least 50% wood or other natural materials. This policy not only aligns with the country's net-zero targets, but also with their ambitions to host the most sustainable Olympics ever in 2024. The Olympic Village will include beautiful mid-rise timber buildings, which will be turned into social housing after the games, and which will store carbon for life.

There are many other examples from around the world, where countries, leading the fight against our climate crisis, have introduced sustainable construction policies recognising the role timber plays by storing carbon for life, such as:

Växjö, Sweden	<p>The Swedish city, Växjö, dubbed the <i>'Greenest City in Europe'</i> is aiming to be fossil fuel free by 2030. In Växjö's declaration of becoming fossil fuel free they state, "Växjö builds in wood. We build passive houses, low-energy houses and energy plus houses in close collaboration between the municipality, private sector and academia". Currently, over 50% of all new builds are built with timber, a target that was set by the city and reached in 2020.</p> <p>Furthermore, the Swedish municipality's steering document for sustainable development explains that Växjö needs to build sustainably and continue to be a role model for wood construction.</p>
Finland	<p>The Wood Building Programme coordinated by the Finnish Ministry of the Environment, has set out national targets for the use of wood in public construction.</p> <p>These targets were set as the Finnish Government identified timber construction as a key measure for reducing regional emissions, as timber stores carbon dioxide in the building stock.</p> <p>Targets have been set for the share of timber in all new public construction and for the types of buildings with the greatest construction volumes, including a goal of 65% of timber construction of educational buildings by 2025.</p>

**The City of
Amsterdam,
Netherlands**

The City of Amsterdam's Green Deal Timber Construction mandates that 20% of all new housing projects in the Dutch capital must be constructed with wood or other bio-based materials from 2025. This is **in line with the city's goal to be a full circular city** by 2050.

To meet the agreement and qualify as a timber building, a detached house would have to be constructed with at least 80 per cent timber or bio-based materials. For multistorey housing up to 10 storeys, this is reduced to 65 per cent, while multistorey housing over 10 storeys must contain at least 50 per cent.

According to the Amsterdam Institute of Advanced Metropolitan Solutions (AMS Institute) this move will lead to an annual reduction of approximately 220,000 tons of CO2 emissions (equivalent to the average emissions of 22,000 households).

Q. Will these kind of policies be introduced in Australia?

If Australia is fair dinkum about tackling our climate crisis, then they must act now. This isn't about reinventing the wheel, but about following in the footsteps of those countries leading the world when it comes to tackling our climate crisis.

We must introduce policies that make a difference now.

For example, if the Federal Government ensured all social houses built under the National Housing Accord were built using timber frames and trusses, they would store nearly 8 million tonnes of carbon.

The National Housing Accord suggests 1,023,866 social houses are built throughout the country. If you calculate these houses by the average 12m³ used, which stores 7.65 tonne of carbon dioxide per house this equates to 7,832,574.90 tonne of carbon dioxide stored.

How can any Government walk away from this.

Q. Will these kinds of policies be challenged by more carbon intensive sectors?

When the City of Helsinki introduced planning and zoning requirements that mandated all building of newly developed neighbourhoods to have timber frames, trusses and facades, it was challenged in their Supreme Court. However, the decision was upheld, as the Supreme Court recognised the sustainability nature of timber and that it is an answer to our climate crisis.

Q. What will happen if sustainable construction policies are not introduced now

Embodied carbon emissions are expected to double by 2050 if Australia doesn't act now. This is why we cannot wait, and why sustainable construction policies, recognising the role timber plays, are needed now.

More Information

If anyone would like more information on FTMA's environmental arm, Carbon Warrior, please direct them to below.

Email	Instagram
info@carbonwarrior.com.au	@carbonwarrior

**You now have the answers, it's time to get the discussion started.
Be a proud Carbon Warrior and help create a greener future.**