

# Why use Timber as a Building Material?

## Why Wood is Good!

**Wood is the only building material on the planet which is naturally renewable, recyclable and leaves a lighter footprint than any other. In its production the embodied energy in wood is a fraction of the energy required to produce almost any other building material. Wood is carbon negative, as a result of "carbon sequestration", or in other words "storage". To grow a kilo of it takes 1.47 Kg of carbon dioxide on average and gives off 1.07 Kg of oxygen. So, using wood from sustainably managed forests minimises CO2 omissions. The thermal insulation properties of wood save energy and therefore save emissions throughout the life of a building.**

## Carbon Sequestration

- The best way to use forests as carbon sinks is to harvest the timber and convert it into products (which continue to store the carbon) while replanting more trees than before
- Growing trees absorbs CO2 from the atmosphere and converts it into carbohydrates through photosynthesis, releasing the oxygen we breathe
- The resulting carbon is locked away for the tree's life and the life of the timber and paper products coming from the tree

## Sustainable Building with Wood

"Green Building" around the world is here to stay and wood provides solutions that contribute to a sustainable built environment. As architects, designers and their clients increasingly demand the use of sustainable materials, they seek a one-stop shop for sustainable wood products. APP Timber offers hardwoods from sustainable forests in USA, Australia and Europe. These are either from natural forests managed under a framework of environmental legislation or from plantations, which is just one solution to sustainable forestry. Selective harvesting of trees allows natural regeneration of the most suitable species for any particular growing site and meanwhile preserves the habitat.

## European Forestry and Building

- The European timber industry has overseen a steady expansion of Europe's forests over the past 60 years
- Between 1990 and 2000 the European forest area has grown by 30%
- This growth continues, as only 65% of the annual growth is harvested, adding some 252 million cubic metres to the carbon sink annually (source: UN-ECE Temperate and Boreal Forest Assessment, 2000)
- The European wood product stock is estimated at 60m tonnes
- Using 1m<sup>3</sup> of wood instead of other materials results in to around 2 tonnes of CO2 sequestration
- A 10% increase in the share of timber houses built annually in Europe would result in a significant reduction in CO2 emissions
- Wood products achieve negative net CO2 emissions – lower than any other building material (source: Building Information Foundation RTS, 2003)
- They require very little non-renewable energy for their manufacture, as over 75% of energy for manufacturing comes from wood residues and recovered wood
- The LCA (lifecycle) of wood products is highly advantageous
- Wood's thermal efficiency means timber frame houses use less energy to heat in the European climate.

- [www.bre.co.uk](http://www.bre.co.uk)

- [www.forestry.gov.uk](http://www.forestry.gov.uk)
- [www.woodforgood.com](http://www.woodforgood.com)

## **American Forestry**

In the USA hardwood forest growth has been measured since 1953. The RPA 2000 Assessment shows that between 1953 and 2007, the volume of U.S. hardwood growing stock more than doubled from 5,210 million m<sup>3</sup> to 11,326 million m<sup>3</sup>. U.S. Forest Service forecasts indicate that further increases of 15 to 20 percent are expected in the hardwood growing stock inventory through 2030. Projections of hardwood growth and removals nationwide indicate that growth will continue to exceed removals through to 2050. The U.S. operates an effective and enforced regulatory framework to deliver sustainable forest management. All forest owners in the United States are subject to Federal legislation to protect habitats for threatened species. Tough regulations governing other aspects of forest management on private land have been implemented by individual states. The 2000 RPA Assessment shows that these regulations have been increasing overall. Based on a comprehensive analysis of U.S. forestry regulatory systems and practices, the 2008 Seneca Creek study concludes that there can be high confidence of legal compliance in the hardwood sector and estimates that stolen timber represents less than 1% of total U.S. hardwood production. The 2008 Seneca Creek study indicates that hardwood purchased from the U.S. should be considered Low Risk in all five risk categories of the FSC Controlled Wood standard. This means there is Low Risk of any U.S. hardwood being sourced from an illegal source, a GM crop, a forest harvested in violation of traditional and civil rights, a forest where high conservation values are threatened by management activities, or a forest being converted to plantations or non-forest use. The 2008 Seneca Creek study concludes that given the safety-net of effective national and state regulations and programs that address unlawful conduct and faulty forest practices, the need for traceability, independent chain of custody and/or controlled wood certification to demonstrate legal and sustainable supplies should not be crucial for U.S. sourcing of hardwood products. American hardwoods derive from forests which have high natural bio-diversity, provide a habitat for a wide range of species, and are very resilient to fire and pests. The 2000 RPA Assessment indicates that overall hardwood forests are getting older in the United States and that this maturation is leading to increased eco-system diversity. Fertile forest soils and favourable growing conditions in the US mean that hardwood forests are most effectively renewed through natural regeneration. Selection harvesting, involving the removal of specified individuals or small groups of trees, is typical in American hardwood forests. American hardwood forests offer a greater diversity of timber species than any other temperate hardwood forest resource. Over the last 50 years, throughout the U.S. there has been a 39% increase in the amount of wood and paper products produced per cubic foot of wood input. The application of a set of the internationally recognised NHLA grading rules, established more than 100 years ago has made a major contribution to waste-minimisation in the American hardwood lumber sector.

- [www.americanhardwood.com](http://www.americanhardwood.com)

Sawn softwood for construction framing in North America produces on average 33 Kg of carbon to produce one metric ton of material due to harvesting, processing, primary and secondary manufacturing and transportation. However because of the sequestration of carbon by felling trees, there is an impact of -457 Kg per ton of carbon. By contrast, brick is +88, concrete is +265, steel is +649 and aluminium is +4,532. (Source: AWI)

- [www.americansoftwood.org](http://www.americansoftwood.org)

**Tropical Forestry and Plantations** have both provided some solutions to global concerns about rainforest deletion, that has led to more positive management and harvesting changes in some countries. Tropical wood products have consequently suffered from poor reputation, but to avoid their use from responsible and well managed sources would not only be unfair, but would also encourage landowners to convert forestlands for other uses.

Greenpeace data suggests that only 1.01% of all tropical 'forestry' is used for industrial purposes, including construction and furniture. Of this figure only about 18% (or less than 0.2% of all tropical forest depletion) enters international trade. The major causes of deforestation are identified as poverty, population pressure, and shifting agriculture. It is, therefore, healthy markets for wood products that will actually help prevent deforestation, encouraging those countries to follow carefully monitored forest management. Suddenly it's relatively simple economics: a lack of interest in wood products may only serve to decrease the value of the land; thus endangering the future of those very same forests that could play such an important role in the prevention of the world's impending implosion. [www.broadleafconsulting.com](http://www.broadleafconsulting.com)

**Climate Change** A report from the United Nations' Intergovernmental Panel on Climate Change (IPCC) highlights the necessity of reducing emissions and provides strong endorsement of wood's environmental credentials. "Wood is the ultimate material for the age of sustainability which is now upon us. The environmental credentials of forests and wood are excellent, and wood has a vital role to play in the transition of the world's economies to greater sustainability," said Geoff Henley, programme manager, NZ Wood. The report summarises earlier findings from the IPCC that detail the role that forests and wood will play in the fight against climate change. "If the most serious effects of global warming are to be avoided, it is critical that the world acts now to reduce emissions and moves towards sustainable practices such as greater use of wood," said Henley. The report states that sustainable forest management of both natural and planted forests is essential to achieving sustainable development. It is a means to reduce poverty, reduce deforestation, halt the loss of forest biodiversity, reduce land and resource degradation and contribute to climate change mitigation.

Brick, concrete, steel and aluminium all contribute to carbon emissions which cause climate change.

"In spite of the overwhelming evidence to the contrary, the use of wood substitutes, and the belief that these substitutes are better for the environment than wood, are both increasing. Greenhouse Gas emissions reporting under the United Nations Framework Convention on Climate Change unjustifiably favours non-wood alternatives by classifying harvested forest products as emissions as soon as they leave the forest site. Building and packaging standards also place barriers in the way of wood use, often despite technological advances which might overcome structural or hygiene concerns. Recycling and recovery programmes for wood are often dismissed in favour of incineration and landfill, due to prevailing attitudes and lack of political will. Each of these policies has the perverse effect of favouring more carbon intensive wood substitutes. The development of a workable carbon intensity labelling system, pro-wood building and packaging standards and invigorated recycling programmes would help to maximise the climatic advantages of wood use."

**IIED, Could wood combat climate change? 2004**

**Sustainability & Certification** There are many sources of non-certified wood around the world from well managed forests and many countries and companies in North America and Europe regarded as responsible guardians of forests, using Best Management Practices (BMPs). There are also several forest certification schemes, recognised internationally by professionals and by governments, which provide assurances to users that wood is grown and harvested sustainably:

**FSC** is an independent, non-governmental, not-for-profit organization established to promote the responsible management of the world's forests. Established in 1993 as a response to concerns over global deforestation, the Forest Stewardship Council claims to be regarded as one of the most important initiatives of the last decade to promote responsible forest management worldwide. [www.fsc.org](http://www.fsc.org)

**PEFC** The PEFC Council (Programme for the Endorsement of Forest Certification schemes) is an independent, non-profit, non-governmental organisation, founded in 1999 which promotes sustainably managed forests through independent third party certification. The PEFC provides an assurance mechanism to purchasers of wood and paper products that they are promoting the sustainable management of forests and claims to be the world's largest forest certification organisation. [www.pefc.org](http://www.pefc.org)

**SFI** The Sustainable Forestry Initiative® (SFI®) label is a sign you are buying wood and paper products from well-managed forests, backed by a rigorous, third-party certification audit. (Specifying Southern Pine can now come with the reassurance that the timber is sourced from sustainable resources. This follows the UK Government's acceptance that the Sustainable Forestry Initiative (SFI) provides a clear indicator of sustainable forest management with companies within the SFI programme planting or growing more trees than they harvest each year.) [www.sfiprogram.org](http://www.sfiprogram.org)

**MTCS** The Malaysian Timber Certification Council (MTCC) is an independent organisation established to develop and operate the Malaysian Timber Certification Scheme (MTCS) in order to provide independent assessments of forest management practices in Malaysia as well as to meet the demand for certified timber products. Timber certification is a market-linked tool to promote and encourage sustainable forest management as well as to provide an assurance to buyers that the timber products they buy come from sustainably managed forests. [www.mtcc.com.my](http://www.mtcc.com.my)

**AFCS** The Australian Forest Certification Scheme supports the sustainable management of Australian forests and promotes Australian produced and made products and support the work force in Australia. The AFCS has the only Sustainable Forest Management (SFM) and the only Chain of Custody (CoC) certification process that are Australian Standards®; [www.forestrystandard.org.au](http://www.forestrystandard.org.au)