

EUROPEAN WOOD FACTSHEETS

4. WOOD PRODUCTS AND CLIMATE CHANGE

Wood products
help slow
Global Warming

• The
choice of
materials

• How much
CO₂ can we
save?

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Government
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Wood products help slow Global Warming

"Wood plays a major role in combating climate change... Greater use of wood products will stimulate the expansion of Europe's forests and reduce greenhouse gas emissions by substituting for fossil fuel intensive products. The Commission is examining ways to encourage these trends."

European Commission's DG Enterprise 2003

Global Warming is a major concern. Reducing energy use and improving technologies will be the main ways to reduce Climate Change.

But our choices about the materials we use can also have a significant effect on the carbon dioxide emissions which are one of the main causes of Global Warming.

In Europe we can increase the carbon sink created by our forests by continuing their expansion.

We can also help reduce CO₂ emissions by choosing sustainably produced wood and paper products.

These products help reduce Climate Change in four ways.

Storage

of the forest's carbon right through the life of the products – and beyond, through recycling

Substitution

for other products which produce higher CO₂ emissions

Recovery

of the energy stored in the wood at the end of the products' life by combustion as a substitute for fossil fuels

Renewal

of the forests, as timber use stimulates the expansion of Europe's forests, increasing the carbon sink effect and sequestering more CO₂ from the atmosphere.



The choice of materials

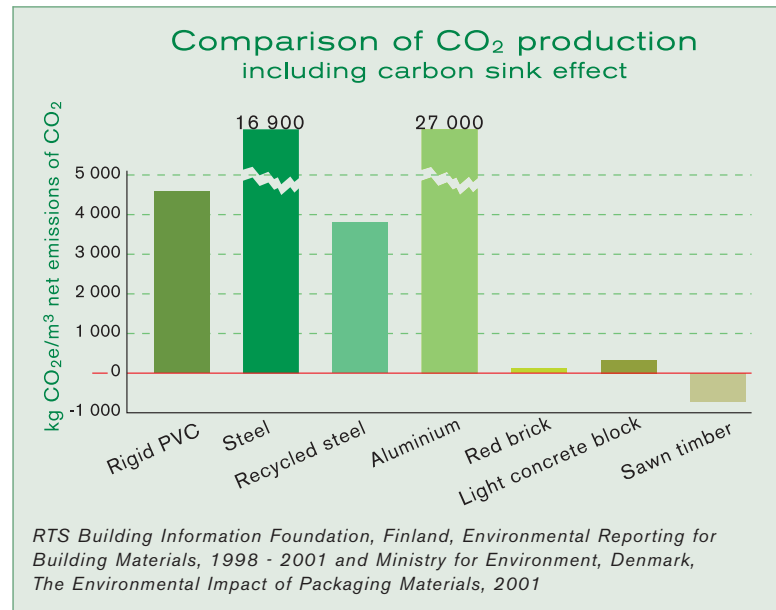
CO₂ emissions from materials production

The choice of material, and especially building materials, is becoming a major factor in the climate policies of many countries.

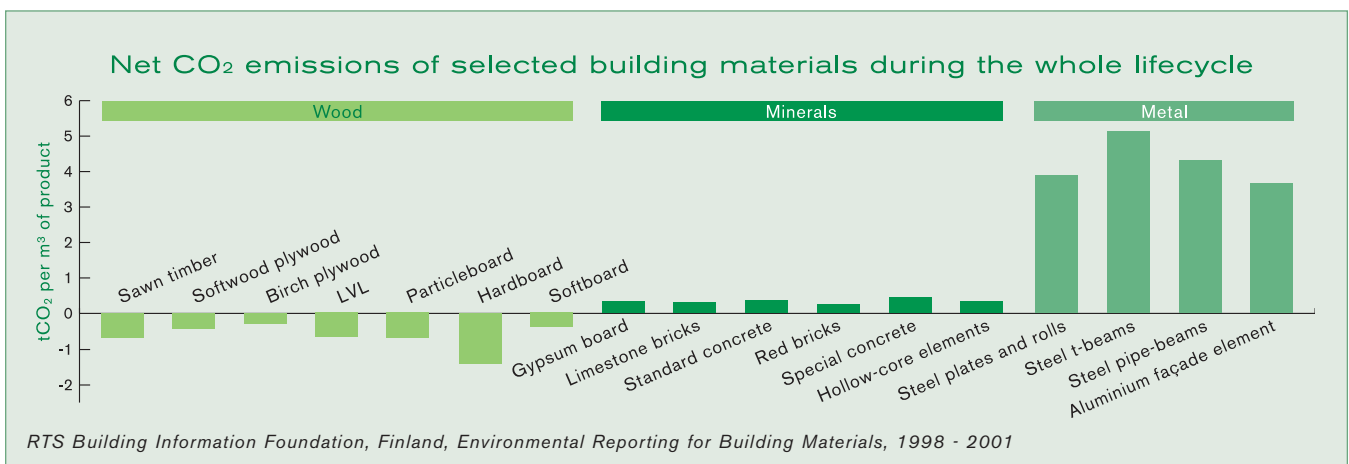
The study on the right illustrates the net negative CO₂ emissions from the production of sawn wood (having offset the emissions from production against the sequestration of the forest) compared with significant emissions from the production of other building materials.

CO₂ lifecycle emissions

But CO₂ emissions resulting from the production of different building materials is just part of the story. Consideration needs to be given to the emissions throughout the whole lifecycle of a material in a building, from sourcing, to manufacturing, to transport,

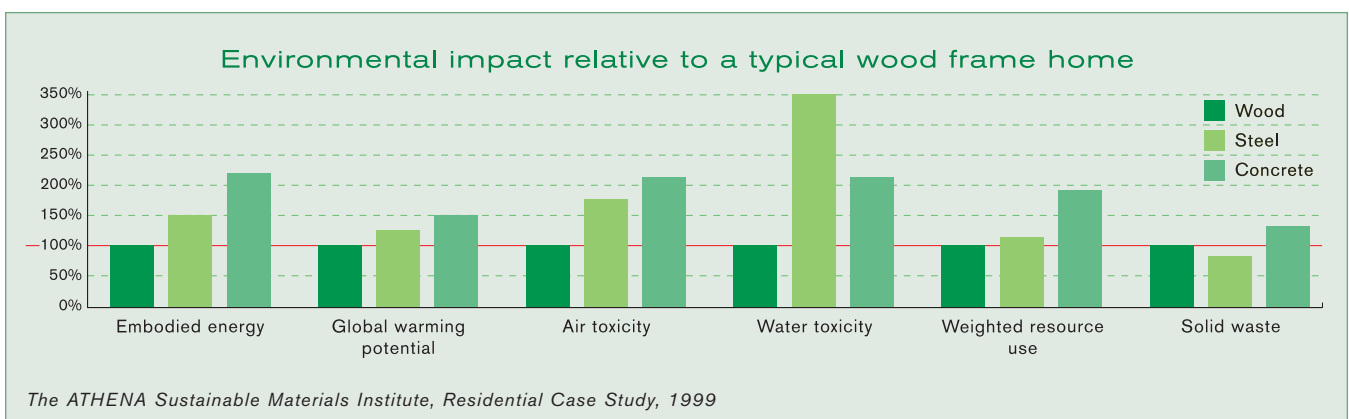


construction, maintenance and in-use energy costs (see below). Here wood does similarly well.



Many studies use Lifecycle Assessment methods to demonstrate the wider environmental impacts of different materials on whole buildings. Here again, in a Canadian

study (see below), the results show that wood frame buildings represent a significantly lower environmental burden than buildings made of competing materials.



How much CO₂ can we save?

On average building a house in timber instead of brick reduces carbon emissions by 10 tonnes.

If an additional 10% of all houses in Europe were built with wood, carbon emissions would be reduced by 1.8 million tonnes (~2% of all European carbon emissions).

Frühwald Dr. A, University of Hamburg, The Miracle of the Carbon Cycle, 2002

Choosing wood saves CO₂

Nowadays there are many different products, materials and solutions to choose from. That choice can have a significant effect on CO₂ emissions. For example, substituting wood for heavy concrete blocks would result in a saving of over a tonne of CO₂ for every cubic metre of wood. The table below shows how much CO₂ a cubic metre of wood can save when used instead of other materials.

Material	Saving (tonnes CO ₂)
Light concrete blocks	0,725
Heavy concrete blocks	1,010
Red brick	0,922

RTS Building Information Foundation, Finland, Environmental Reporting for Building Materials, 1998 - 2001 and IIED - Using Wood Products to Mitigate Climate Change, 2004

Wood walls

Environmental Profile information in the UK shows you can save up to **3,45 tonnes CO₂ per 50m² wall** using timber frame and softwood cladding. The table below compares CO₂ emissions for different wall constructions. Methods of timber construction, and therefore wood content, vary across Europe, but CO₂ savings of around 5-15 tonnes per house can be expected (5 tonnes is roughly the amount

Materials	Emissions Tonnes CO ₂ /50m ² wall
Brick & dense block	5
Brick & timber frame	3,45
Rendered dense block & timber frame	3
Brick & aerated block	5
Rendered aerated block & timber frame	3
Softwood cladding & timber frame	1,55

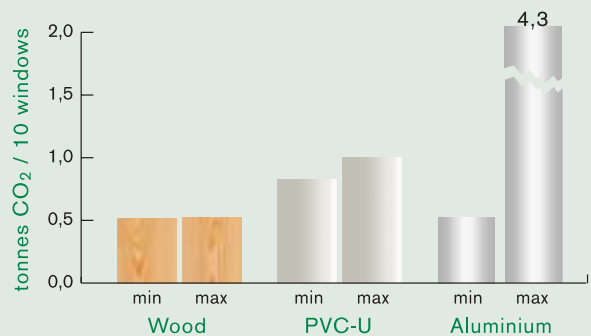
BRE Environmental Profiles database, tonnes of CO₂ equivalent/50m² over 60yr life, 2004

produced by a 1,4 litre car driving 23 000km). So a small increase in the percentage of houses built across Europe using timber will result in a significant reduction in CO₂ emissions.

Wood windows

By substituting wood for PVC-U up to 0,5 tonnes CO₂ can be saved per 10 windows, or up to 4,0 tonnes CO₂ when substituting wood for aluminium (see below).

Comparison of CO₂ emissions in the production of different window materials

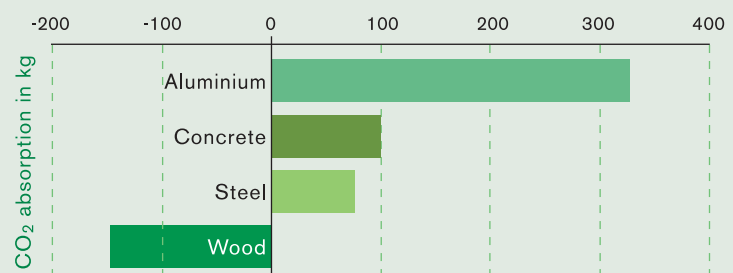


Carbon Mitigation in Forestry and Wood, Industry workshop, 1998 - Lifecycle Assessment of Wood Products, K Richter

Wood beams

A French study (see below) has shown the CO₂ savings to be made by choosing wood beams, which have a negative CO₂ impact - they can absorb 150kg CO₂ per tonne - while aluminium, for example, emits almost 330kg per tonne.

Comparison of CO₂ emissions of beams made of different materials



Indufor, CEI Bois Roadmap 2010, 2004

Government policies

Within Europe, wood has particularly good sustainability credentials...

"Most European wood comes from Europe. Over 90% of imports of roundwood and sawnwood into Europe are from other European countries:

- *Softwood – roundwood and sawn – is almost entirely sustainable (and only 2% of imports in Europe are from outside Europe) – the few question marks extend to sources in the Russian Federation.*
- *Hardwood – roundwood and sawn – is mostly sustainable (only 9% of hardwood roundwood and 40% of sawnwood originates from outside Europe) – of these,*

some imports from Africa and South America come from certified forests, but supplies from a number of sources in Africa, South East Asia and Latin America are strongly questioned.

- *Panels are mostly sustainable – Europe imports just over 20% of its total panel consumption – the main concern is over tropical hardwood plywood from South East Asia where overcapacity is a major problem.*
- *Secondary processed wood products are of questionable sustainability when sourced outside of Europe."*

International Institute for Environment and Development, Could Wood Combat Climate Change? 2004

Legislation

Governments across Europe are addressing sustainability issues through legislation.

France is preparing a specific decree to 'define the conditions for using a minimum rate of wood material in public buildings' in the framework of its law on air and rational energy use. The Air Law (Article 21-V) identifies 12 types of buildings classified in three classes according to their wood content.

In the UK, the Sustainable and Secure Buildings Act will introduce new powers to address sustainability for the first time, for example by tackling the environmental impact of materials used in new and existing buildings. A Code for Sustainable Building is to be introduced in 2006.

Several countries are trying to include specific clauses in public tenders to encourage the use of wood because of its Climate Change benefits and subsidies for the use of wood as fuel already exist in some countries. (*Enterprise DG unit E4 Comprehensive Report 2002 – 2003 regarding the role of forest products for climate change mitigation.*)

Climate change

An asset

Wood's carbon storage properties make it an asset in the fight to reduce Climate Change.

A target

By 2008-2012 greenhouse gases must be reduced by 8% in the EU compared to 1990 emissions. Using more wood products can contribute to reaching the target.

A market

With the setting up of the EU emissions trading scheme for industrial undertakings as well as other initiatives, Climate Change now has a marketable value. In the medium to long term, carbon accounting may include wood and wood products, allowing the trading of wood products carbon credits.

LITERATURE

RTS Building Information Foundation, Finland – *'Environmental Reporting for Building Materials'* – 1998 - 2001

Ministry for Environment, Denmark – *'The Environmental Impact of Packaging Materials'* – 2001

The ATHENA Sustainable Materials Institute, Residential Case Study, 1999

Frühwald Dr. A, University of Hamburg – *'The Miracle of the Carbon Cycle'* – 2002

IIED – *'Using Wood Products to Mitigate Climate Change'* – 2004

BRE Environmental Profiles, 2004

Carbon mitigation in forestry and wood, Industry workshop, 1998 – *'Life-cycle Assessment of Wood Products'* – K Richter

Indufor – CEI Bois Roadmap 2010, 2004