

Life Cycle Assessment of Wood

Management of Sustainable Construction Assignment 1 Part B

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Introduction

When deciding what materials to use for a construction project it is important to understand the process that it has to go through to be a ready made construction material. Wood is an interesting material as with the world trying to get more sustainable in construction, wood as a material comes into its own from the extraction phase all the way to its potential at the end of its life cycle.

The aim of this piece is to discuss the life cycle of wood in terms of:

- Extraction
- Transport
- Manufacturing and Uses
- Construction
- End of Life

(Refer to Figure 1)

When undertaking a life cycle assessment its important to refer to CEN/TC 350 as these are the specific standards to follow when it comes to this but mainly focuses on the construction phase of the cycle.

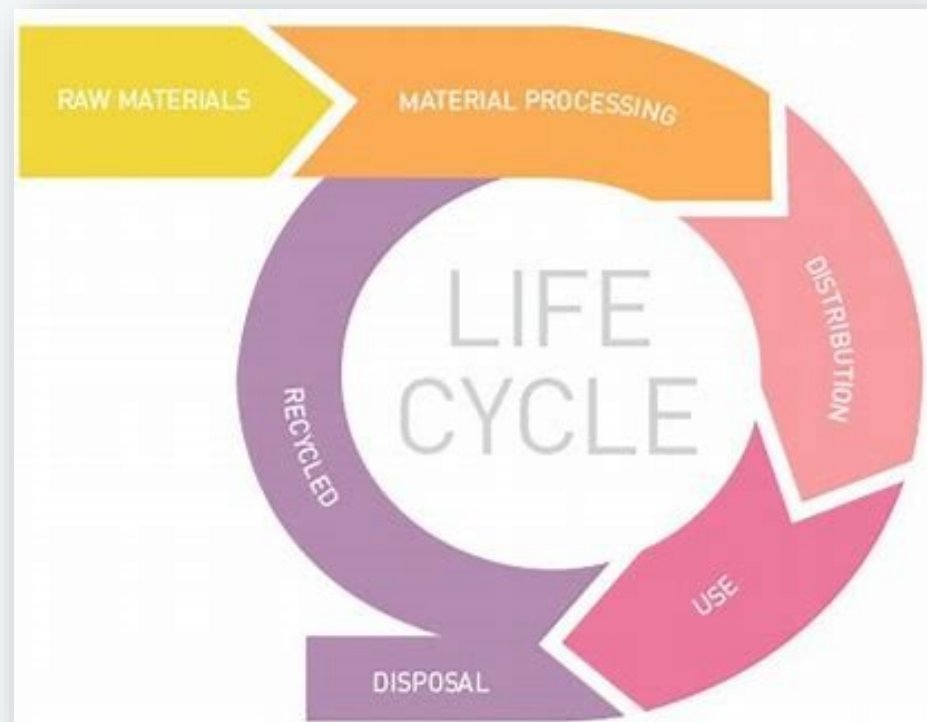


Figure 1. Diagram of a standard material lifecycle (Cds.pratt.edu, n.d.)

What is a Life Cycle Assessment?

A life cycle assessment is a ‘cradle-to-grave’ system that determines the environmental impacts of a material through the processes as shown above and in figure and assess all the aspects giving a clear understanding of these environmental impacts and where possible make improvements (Guinée & Lindeijer, 2002).

Extraction & Manufacturing

Given the wide range of uses that wood has, the logs are extracted from natural forests or plantations and that is then split between timber and sawdust/woodchips. The split of this is:

- 35-45% Timber
- The rest becomes by – product like sawdust and wood chippings

(Cds.pratt.edu, n.d.)

When considering the environmental factors surrounding wood extraction it is vital that to ensure the process stays sustainable no more trees are harvested than what's being grown (Pacheco-Torgal, Cabeza, Labrincha & De Magalhaes, 2014)

Construction and Uses

CEN/TV 350 offers standards for all aspects of sustainable construction, the main focus for us is the environmental standards that they produce which are:

- EN 15643-2 - ‘provides the specific principles and requirements for the assessment of environmental performance of buildings taking into account technical characteristics and functionality of a building. Assessment of environmental performance is one aspect of sustainability assessment of buildings under the general framework of EN 15643-1.’ (Portailgroupe.afnor.fr, n.d.)

In terms of wood it can be used for a wide range of purposes but is mainly used on the structural side in ways of a timber frame and things such as trusses. It’s also an extremely useful material for civil engineers when creating profiles for things like road level etc, these uses are typically designed using natural timber so can be recycled and put back into the cycle when finished.

However wood can also be used for flooring but due the fact it’s a flammable material it needs to be enhanced and made into vinyl flooring which given the composition cannot be recycled as the wood will be contaminated and therefore will have to be disposed of in the appropriate manor.

Transport

The transportation of wood requires the use of heavy duty trucks so the environmental impact at this stage is quite negative due to the carbon emissions that it produces during the transportation of the material.

- Due to the sheer size of the material it usually takes large trucks to move the wood to where it is manufactured into design materials and products (See Figure 2)
- It also gets transported after the manufacturing stage also as the product needs to be delivered to sites that require it



Figure 2. Trucks used for transporting logs (Tenfourmagazine.com, n.d.)

End of Life

This aspect of the cycle refers too the process that can occur once the disassembly or the demolition of the building as that’s the end of the use of this material. With all materials it is the aim to find methods to utilise the materials even after the practical use is finished so that it limits the negative impact on the environment.

Given the different uses that wood has in a project its important to understand the different methods and processes that the wood will have to go through in order to be re-used or recycled (Reinhardt & Garrecht, 2013). This is important as wood used in construction could be contaminated and that would alter the process that it would have to go through in order to be recycled sustainably (Reinhardt & Garrecht, 2013).

Unlike some other materials used in construction projects natural wood offers benefits once it comes to the end of its life cycle as it can be recycled and placed back into the cycle. However its not that easy in the construction industry due to the reason stated above (Contaminated with other materials) and so often it doesn’t actually get recycled and ends up being a detriment to the environment even with the sustainable nature of wood (Recycle Aid The No1 Recycling Directory Recycling Centre Locator, n.d.)



Figure 3. Typical Life Cycle of Wood (Sustainability| James Jones and Sons Limited, n.d.)

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