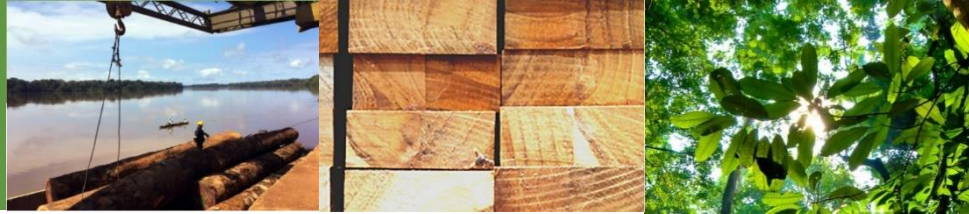


LIFE CYCLE IMPACT ASSESSEMENT (LCIA) DRIED SAWINGS

ADDRESS : 45 bis, Jardin Tropical, Av. de la belle Gabrielle, 94736 Nogent-sur-Marne, France

E-MAIL : atibt@contact.com

PHONE NUMBER : 01 43 94 72 64



GENERAL INFORMATION

In 2022, ATIBT carried out 12 life cycle inventories (LCI) for the main wood products from the Congo Basin manufactured by its members managing certified forests.

This document provides a simplified reading of the results of the Life Cycle Assessment (LCA) of certified dried sawings from the Congo Basin available in a port on the West African coast with 2 key indicators: the **Climate Change** indicator and the **Quantity of Biogenic Carbon Stored**.



The results of the life cycle inventories were obtained from data collected over 3 years (2018 - 2019 - 2020) at 4 ATIBT member companies:

- INTERHOLCO (Republic of Congo)
- PALLISCO CIFM (Cameroon)
- PRECIOUS WOOD (Gabon)
- ROUGIER (Gabon)

AIM OF THE STUDY

This study was performed according to ISO 14 040/44 and NF EN 15 804+A2, and was critically reviewed by an external independent reviewer.

The present LCIA has been established in a specific context, aiming to come as close as possible to compliance with the NF EN 15804+A2 standard, but within a partial perimeter: from the forestry operation to the shipping port. This LCIA is a preparatory and essential work for the realization of future FDES / EPD of tropical wood products. These will incorporate modules C and D and will therefore be irreproachable.

This LCI is not intended to be published under any particular program (INIES, IBU...).

You can download the LCI directly from the ATIBT website: <https://www.atibt.org/fr>

FURTHER INFORMATION

DECLARED UNIT: "To produce 1 m³ of packaged dried sawings available in a port on the West African coast".

RIGHTS HOLDERS: Every ATIBT member companies that produce tropical wood dried sawings from sustainably managed forests (certified wood). Customers of ATIBT members will be able to use these LCIA to make their environmental declaration (EPD / FDES or other LCA).

VERIFICATION DATE OF THE LCIA: June 2022

VALIDITY DATE: June 2032

MAIN RESULTS:

| | |
|--|---|
| CLIMATE CHANGE -611 (kg eq. CO ₂ /m ³) | BIOGENIC CARBON STORED 233 (kg of C/m ³) |
|--|---|

COMMONLY USED TREE SPECIES: Ayous, Kotibé, Kosipo, Tiama and Tola

VALIDITY FRAME:

The validity framework for using the LCIA for dried sawings is detailed below:

| Parameter | Range of variation covered |
|---|--|
| Certification | Wood coming from forests applying sustainable management production schemes at 100% (FSC, PEFC...) |
| Density | Up to 1060 kg/m ³ |
| Diesel consumption during the skidding | Lower than 12 L/m ³ |
| First transformation diesel consumption | Lower than 100 kWh/m ³ |
| Distance to the harbour | Lower than 1 000 km by truck and 1 300 km all transportation types included. |
| First transformation yield | Higher than 30% as an average |
| Kiln drying consumption | Lower than 60 kWh/m ³ |

WARNING AND COMPARABILITY

LCIA may not be comparable if they do not comply with EN 15804+A2, are not established on the same harmonised scientific basis and do not concern the same functional units.

WOOD FROM SUSTAINABLY MANAGED FORESTS



Using FSC or PEFC certified wood means:

- ensure that the wood comes from sustainably managed forests: <https://www.atibt.org/>
- refuse to participate in the artificialisation of land
- harvesting trees responsibly so as not to disrupt the ecosystem

How are the benefits of sustainably managed forests taken into account in LCA-type environmental calculations?

Wood is a material that captures carbon when it grows. In LCA, when a biobased resource is managed sustainably, the CO₂ capture is considered a negative emission that lowers the environmental impacts. Wood from non-sustainably managed forests does not benefit from this negative emission.



MORE DEMAND FOR EPD

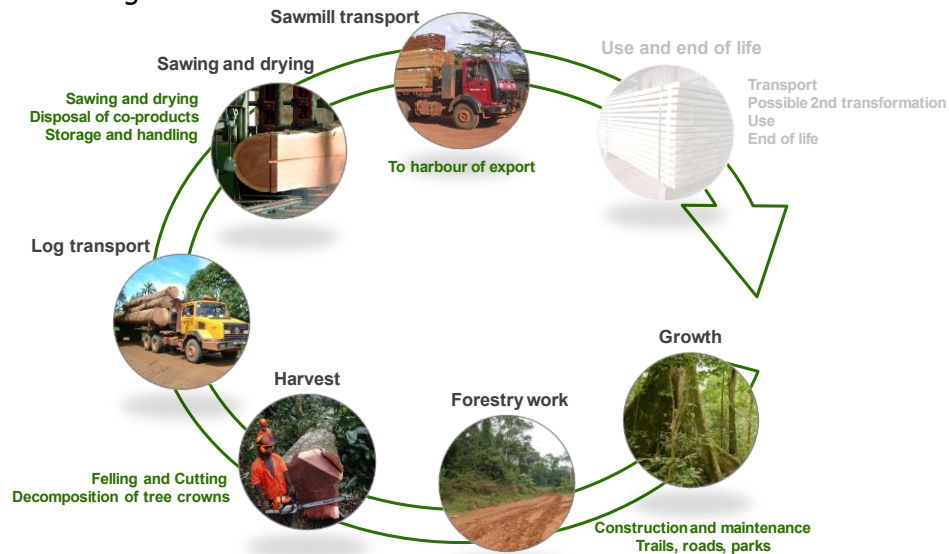
To date, manufacturers are not obliged (mandatory by law) to provide EPDs. Though, the market increasingly for proof of the environmental impact through type III environmental declaration, therefore EPDs. From EU regulations which intends to increase the need of environmental value for each build products, to label schemes such as BREEAM, LEED or HQE, EPDs aim to help the manufacturers to prove their environmental claims. Also, it has become a real need to access to the market in such countries as France or Belgium.

Tropical woods tend to be woods with high densities. The higher the density of a wood, the more biogenic carbon it stores. This biogenic carbon storage is beneficial to biobased products and results in negative impacts on the climate change indicator.

For example, 1 m³ of standing Ayous is equivalent to a capture of 622 kg eq. CO₂ (calculation carried out according to the NF EN 16485 standard). At the end of its life, only 57% will be considered as re-emitted according to the dynamic calculation. In total, 1 m³ of Ayous therefore represents -262 kg eq. CO₂ on the french environmental regulation (RE2020) threshold indicator, excluding the production and transport stages.

LIFE CYCLE STAGES COVERED

The following stages are covered by the impact of the LCA, those in transparency have to be added for integration into the building LCA:



SYNTHETIC RESULTS

| ENVIRONNEMENTAL IMPACTS | | |
|--|--|------------------|
| Climate change - total | kg of CO ₂ eq.. | -6,11E+02 |
| Climate change - fossil | kg of CO ₂ eq.. | 2,42E+02 |
| Climate change - biogenic | kg of CO ₂ eq.. | -8,54E+02 |
| Climate change -land use and land use change | kg of CO ₂ eq.. | 3,52E-01 |
| Ozone layer depletion | kg of CFC-11 eq.. | 4,38E-05 |
| Acidification potential | mole of H ⁺ eq.. | 2,90E+00 |
| Eutrophication (aquatic freshwater) | kg of PO ₄ ³⁻ eq.. | 2,14E-02 |
| Eutrophication (aquatic marine) | kg of N eq.. | 1,29E+00 |
| Eutrophication (terrestrial) | mol of N eq.. | 1,40E+01 |
| Photochemical ozone creation potential | kg of NMVOC eq.. | 5,44E+00 |
| Depletion of abiotic resources - elements, ultimate reserves | kg of Sb eq.. | 7,69E-04 |
| Depletion of abiotic resources - fossil fuels | MJ | 2,98E+03 |
| Water use | m3 of privation eq. | 3,56E+01 |
| Potential incidence of disease due to PM emissions | Disease incidence | 5,94E-05 |
| Potential Human exposure efficiency relative to U235 | kBq of U235 eq.. | 1,43E+01 |
| Potential comparative toxic unit for ecosystems | CTUe | 6,48E+03 |
| Potential comparative toxic unit for humans - cancerogenic | CTUh | 1,03E-05 |
| Potential comparative toxic unit for humans - not cancerogenic | CTUh | 5,75E-05 |
| Potential soil quality index | dimensionless | 1,07E+06 |

| ENERGY AND MATERIAL INDICATORS | | |
|--|----|----------|
| Renewable primary energy as energy carrier | MJ | 4,61E+01 |
| Renewable primary energy resources as material utilisation | MJ | 8,49E+03 |
| Total renewable primary energy use | MJ | 8,53E+03 |
| Non-renewable primary energy as energy carrier | MJ | 2,98E+03 |
| Non-renewable primary energy resources as material utilisation | MJ | 0,00E+00 |
| Total non-renewable primary energy use | MJ | 2,98E+03 |
| Use of secondary material | kg | 1,88E+00 |
| Use of renewable secondary fuels | MJ | 1,39E-02 |
| Use of non-renewable secondary fuels | MJ | 0,00E+00 |
| Net use of fresh water | m3 | 1,11E+00 |
| WASTE INDICATORS | | |
| Hazardous waste disposed | kg | 8,09E+00 |
| Non-hazardous waste disposed | kg | 3,25E+02 |
| Radioactive waste disposed | kg | 1,97E-02 |
| FLUX SORTANTS | | |
| Components for re-use | kg | 0,00E+00 |
| Materials for recycling | kg | 9,39E-02 |
| Materials for energy recovery | kg | 4,37E+02 |
| Exported energy, heat | MJ | 9,85E+00 |
| Exported energy, electricity | MJ | 1,44E+00 |
| Exported energy, gaz | MJ | 0,00E+00 |
| Exported energy | MJ | 1,13E+01 |
| Recovered energy | MJ | 0,00E+00 |