# ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

| | |
|---|---|
| Owner of the Declaration | Olam Agri - Congolaise Industrielle des Bois |
| Publisher | Institut Bauen und Umwelt e.V. (IBU) |
| Programme holder | Institut Bauen und Umwelt e.V. (IBU) |
| Declaration number | EPD-CON-20230314-LT1-EN |
| Issue date | 27.11.2023 |
| Valid to | 26.11.2028 |

## Sapelli Kiln Dried Timber

## Congolaise Industrielle Des Bois SA (CIB)

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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# General Information

## Congolaise Industrielle Des Bois SA (CIB)

**Programme holder**

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

**Declaration number**

EPD-CON-20230314-LT1-EN

**This declaration is based on the product category rules:**

Solid wood products, 01.08.2021
(PCR checked and approved by the SVR)

**Issue date**

27.11.2023

**Valid to**

26.11.2028

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

## Sapelli Kiln Dried Timber

**Owner of the declaration**

Olam Agri - Congolaise Industrielle des Bois
Pokola BP 41
BP 41 Ouesso
(Others)

**Declared product / declared unit**

Sapelli kiln-dried lumber, per $m^3$

**Scope:**

This Environmental Product Declaration refers to Sapelli wood that is harvested, sawn, air dried and kiln-dried by the Congolaise Industrielle des Bois (CIB). CIB's forestry concessions and industrial site are located in the Republic of the Congo, Sangha department (site of Pokola) and Likouala department (site of Enyelle).

CIB forests and production are 100% FSC certified.

This life cycle analysis is based on data from 2021.

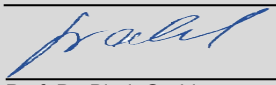
CIB is fully owned by Olam Global Agri Pte. Ltd.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

**Verification**

| |
|---|
| The standard EN 15804 serves as the core PCR |
| Independent verification of the declaration and data according to ISO 14025:2011 |
| ☐ internally ☒ externally |



Prof. Dr. Birgit Grahl,
(Independent verifier)

# Product

### Product description/Product definition

Sapelli kiln-dried lumber is produced according to the following process:

Trees are inventoried, counted, and harvested as per our forest management plans.

Logs are exported to CIB facilities in Pokola and Enyelle, sorted by quality and sawn in one of CIB's sawmills according to the customer requirements of lengths, thickness, width and quality.

Lumber is stack on stickers and left on our site for air-drying for a period varying between 3 weeks to 6 months, depending on the thickness.

When wood has reached its fibre saturation point, it is taken into our kilns for a drying cycle varying between 3 days to 6 weeks. Final moisture content depends on customer requirements and usually varies from 8% to 16%.

After kilining, bundles are destacked, inspected, defects planks are removed and final bundles are stacked, strapped and marked for export.
For the use and application of the product the respective national provisions at the place of use apply, in Germany for example the building codes of the federal states and the corresponding national specifications.

### Application

Sapelli wood has multiple used: doors and windows frame, moulded products, furnitures, etc.

### Technical Data

Technical data on Sapelli wood can be found on the CIRAD's Tropix database at the following link:
https://tropix.cirad.fr/FichiersComplementaires/EN/Africa/SAPELLI.pdf.

### Constructional data

| Name | Value | Unit |
|---|---|---|
| Wood types by trade names acc. to Tropix | Sapelli | - |
| Wood moisture | 12 | % |
| Gross density acc. to Tropix | 690 | kg/m$^3$ |
| Risk class acc. to Tropix | Class 3 - moderately durable | - |

Performance data of the product with respect to its characteristics in accordance with the relevant technical provision (no CE-marking).

### Base materials/Ancillary materials

The wood specie of this lumber is Sapelli (entandrophragma cylindricum).

1) This product contains substances listed in the candidate list (date: 17.10.2023) exceeding 0.1 percentage by mass: no

2) This product contains other Carcinogenic, Mutagenic, Reprotoxic (CMR) substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass: no

3) Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) Ordinance on Biocide Products No. 528/2012): no

### Reference service life

Depending on how and where it is used (internal, external) and various conditions (weather, exposition to sun, rain, humidity), Sapelli lumber is durable for several decades.

# LCA: Calculation rules

### Declared Unit

The declaration refers to the declared unit of 1m³ of Sapelli Kiln Dried Timber. The density of the final product is 690kg/m³.

### Declared unit

| Name | Value | Unit |
|---|---|---|
| Declared unit | 1 | m$^3$ |
| Gross density | 690 | kg/m$^3$ |
| Wood moisture (upon delivery) | 12 | % |

Water content = 11%
Moisture content = 12%

### System boundary

The type of EPD is cradle to gate with options, module C1-C4, and module D (A1-A3, C, D and additionnal modules A4 and A5).

Considered product stages:

- Production of raw materials (e.g. log extraction from the forest), extraction of energy carriers, raw material transportation, manufacture of product and packaging materials are declared in modules A1-A3. Modules A1-A3 also include the generation and supply of energy (on site production via biomass power plant).
- The scenario for the transport of the product to the construction site is declared in module A4.
- The treatment of packaging materials at installation is declared in module A5. Sapelli KD Timber is a pre-product, the installation of such product is very variable. The installation stage (e.g. installation process and potential auxiliaries) has been excluded from the scope of the study.
- The end-of-life scenarios include, deconstruction (C1), transportation to waste processing (C2), emissions and energy requirements of combustion (C3). Benefits and loads for the next system (e.g. electricity and thermal energy, which result from energy recovery in modules A5 and C3) are declared in module D.
- The CO2 incorporation in the product (from the sequestration in the wood) is considered. The C-balance is closed by considering the biotic GHG emissions according to the incorporation on input side.

The data collected by the manufacturers is based on yearly production amounts. The production data refers to the yearly consumption in 2021.

### Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Global

**Comparability**
Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. Background dataset : GaBi ts software, CUP 2022.1.

## LCA: Scenarios and additional technical information

**Characteristic product properties of biogenic carbon**
The product and packaging material (wooden wedges) contains biogenic carbon. The following biogenic carbon content is assumed :
- 0,484kg C /kg of hardwood wood (dry)
- 0,5kg C /kg of wooden wedges (dry)

**Information on describing the biogenic Carbon Content at factury gate**

| Name | Value | Unit |
|---|---|---|
| Biogenic carbon content in product | 298 | kg C |
| Biogenic carbon content in accompanying packaging | 1.48 | kg C |

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of $CO_2$.

The following technical scenario information is required for the declared modules.

**Transport to the building site (A4)**
The transportation of the Sapelli KD Timber from the manufacturing plant in Pokola, Republic of Congo to the construction site in Europe is considered.

| Name | Value | Unit |
|---|---|---|
| Litres of fuel | 1.52 | l/100km |
| Transport distance (via truck) | 1304 | km |
| Capacity utilisation (including empty runs) | 61 | % |
| Gross density of products transported | 690 | kg/m$^3$ |
| Transport distance (via ocean ship) | 9260 | km |

**Installation into the building (A5)**
Module A5 includes the waste processing up to the end-of-waste state or disposal of packaging materials during the construction process stage. The installation stage (e.g. installation process and potential auxiliaries) has been excluded from the scope of the study.

| Name | Value | Unit |
|---|---|---|
| Output substances following waste treatment on site | 4.85 | kg |

**Packaging material:**
Plastic film : 0,20 kg/m³
Plastic straps : 0,84 kg/m³
Steel straps : 0,11 kg/m³
Steel buckles: 0,11 kg/m³
Wooden wedges: 3,60 kg/m³

**End of life (C1-C4)**
The end-of-life scenarios are as follows:

C1 – Dismantling / Demolition: Sapelli KD Timber is a pre-product and the deconstruction methods of the product cannot be foreseen. The deconstruction is therefor omitted from the scope of the EPD. As module C1 is a mandatory module, it is included in the EPD but not declared, according to the PCR-A.

C2 – Transport to treatment/disposal site: Average transport distance from the demolition site to waste treatment is assumed as 50 km to thermal treatment.

C3 – Waste treatment: The Sapelli Kiln Dired Timber is 100 % combusted with energy recovery.

C4 – Disposal: No disposal scenario.

| Name | Value | Unit |
|---|---|---|
| Collected separately waste type | 690 | kg |
| Energy recovery | 690 | kg |

**Reuse, recovery and/or recycling potentials (D), relevant scenario information**

For the thermal and electrical energy generated in module A5 due to thermal treatment of packaging and C3 for the incineration of the product, avoided burdens have been calculated by the inversion of electricity grid mix and thermal energy from natural gas, using European datasets. Material benefits are also given for the recycling of metal packaging materials (steel buckles and steel straps).

## LCA: Results

The following tables display the environmentally relevant results according to EN 15804+A2 (EF 3.0) for 1 m³ of Sapelli KD Timber.

Please be aware, the module A5 only considers the disposal of packaging material, and do not the complete installation scenario because the declared product is a pre-product and installation is unknown.

**DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)**

| Product stage | | | Construction process stage | | Use stage | | | | | | | End of life stage | | | | Benefits and loads beyond the system boundaries |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Raw material supply | Transport | Manufacturing | Transport from the gate to the site | Assembly | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse-Recovery-Recycling-potential |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| X | X | X | X | X | MND | MND | MNR | MNR | MNR | MND | MND | X | X | X | X | X |

**RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m³ Sapelli KD Timber**

| Parameter | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| GWP-total | kg $CO_2$ eq | -9.08E+02 | 1.16E+02 | 8.1E+00 | ND | 2.42E+00 | 1.11E+03 | 0 | -3.63E+02 |
| GWP-fossil | kg $CO_2$ eq | 1.79E+02 | 1.13E+02 | 2.7E+00 | ND | 2.3E+00 | 1.88E+01 | 0 | -3.61E+02 |
| GWP-biogenic | kg $CO_2$ eq | -1.09E+03 | 2.65E+00 | 5.41E+00 | ND | 1.08E-01 | 1.09E+03 | 0 | -1.85E+00 |
| GWP-luluc | kg $CO_2$ eq | 7.43E-01 | 6.64E-04 | 4.14E-05 | ND | 1.55E-02 | 2.71E-03 | 0 | -3.97E-02 |
| ODP | kg CFC11 eq | 2.31E-11 | 4.16E-13 | 8.73E-13 | ND | 2.26E-13 | 1.25E-10 | 0 | -2.44E-09 |
| AP | mol $H^+$ eq | 8.6E+00 | 2.05E+00 | 1.11E-03 | ND | 2.58E-03 | 1.64E-01 | 0 | -4.76E-01 |
| EP-freshwater | kg P eq | 1.79E-04 | 2.14E-05 | 2.19E-07 | ND | 8.23E-06 | 2.82E-05 | 0 | -4.97E-04 |
| EP-marine | kg N eq | 2.64E+00 | 5.39E-01 | 3.46E-04 | ND | 8.34E-04 | 5.3E-02 | 0 | -1.29E-01 |
| EP-terrestrial | mol N eq | 4.06E+01 | 5.91E+00 | 5.22E-03 | ND | 9.98E-03 | 7.65E-01 | 0 | -1.38E+00 |
| POCP | kg NMVOC eq | 3.06E+01 | 1.52E+00 | 9.54E-04 | ND | 2.22E-03 | 1.44E-01 | 0 | -3.61E-01 |
| ADPE | kg Sb eq | 7.28E-06 | 1.04E-06 | 2.22E-08 | ND | 2.32E-07 | 2.81E-06 | 0 | -5.53E-05 |
| ADPF | MJ | 1.75E+03 | 1.54E+03 | 2.38E+00 | ND | 3.02E+01 | 2.82E+02 | 0 | -6.14E+03 |
| WDP | $m^3$ world eq deprived | 9.22E+00 | 1.39E-01 | 8.12E-01 | ND | 2.58E-02 | 1.16E+02 | 0 | -3.85E+01 |

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential)

**RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m³ Sapelli KD Timber**

| Parameter | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| PERE | MJ | 3.16E+04 | 8.74E-01 | 5.36E+01 | ND | 2.1E+00 | 1.12E+04 | 0 | -1.69E+03 |
| PERM | MJ | 1.11E+04 | 0 | -5.31E+01 | ND | 0 | -1.11E+04 | 0 | 0 |
| PERT | MJ | 4.27E+04 | 8.74E-01 | 5.09E-01 | ND | 2.1E+00 | 8.2E+01 | 0 | -1.69E+03 |
| PENRE | MJ | 1.7E+03 | 1.54E+03 | 5.02E+01 | ND | 3.03E+01 | 2.82E+02 | 0 | -6.14E+03 |
| PENRM | MJ | 4.78E+01 | 0 | -4.78E+01 | ND | 0 | 0 | 0 | 0 |
| PENRT | MJ | 1.75E+03 | 1.54E+03 | 2.38E+00 | ND | 3.03E+01 | 2.82E+02 | 0 | -6.14E+03 |
| SM | kg | 2.79E-02 | 0 | 0 | ND | 0 | 0 | 0 | 0 |
| RSF | MJ | 0 | 0 | 0 | ND | 0 | 0 | 0 | 0 |
| NRSF | MJ | 0 | 0 | 0 | ND | 0 | 0 | 0 | 0 |
| FW | $m^3$ | 2.39E-01 | 4.54E-03 | 1.91E-02 | ND | 2.42E-03 | 2.74E+00 | 0 | -1.62E+00 |

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

**RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m³ Sapelli KD Timber**

| Parameter | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| HWD | kg | 1.1E-08 | 3.79E-10 | 1.9E-10 | ND | 1.61E-10 | 2.67E-08 | 0 | -8.31E-07 |
| NHWD | kg | 4.41E+00 | 9.62E-03 | 2.73E-01 | ND | 4.94E-03 | 8.04E+00 | 0 | -3.06E+00 |
| RWD | kg | 3.63E-03 | 6.3E-05 | 1.07E-04 | ND | 5.63E-05 | 2.19E-02 | 0 | -4.84E-01 |
| CRU | kg | 0 | 0 | 0 | ND | 0 | 0 | 0 | 0 |
| MFR | kg | 2.34E+02 | 0 | 1.92E-01 | ND | 0 | 0 | 0 | 0 |
| MER | kg | 0 | 0 | 0 | ND | 0 | 0 | 0 | 0 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| EEE | MJ | 0 | 0 | 1.26E+01 | ND | 0 | 1.61E+03 | 0 | 0 |
| EET | MJ | 0 | 0 | 2.26E+01 | ND | 0 | 2.89E+03 | 0 | 0 |

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

**RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:**
**1 m³ Sapelli KD Timber**

| Parameter | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| PM | Disease incidence | 2.38E-03 | 3.43E-05 | 7.84E-09 | ND | 1.77E-08 | 8.27E-07 | 0 | -3.95E-06 |
| IR | kBq U235 eq | 5.52E-01 | 5.38E-03 | 1.65E-02 | ND | 8.51E-03 | 3.63E+00 | 0 | -8.19E+01 |
| ETP-fw | CTUe | 2.4E+03 | 4.27E+02 | 1.39E+00 | ND | 2.14E+01 | 1.24E+02 | 0 | -1.35E+03 |
| HTP-c | CTUh | 8.27E-06 | 7.01E-09 | 7.62E-11 | ND | 4.42E-10 | 7.59E-09 | 0 | -6.21E-08 |
| HTP-nc | CTUh | 6.06E-05 | 2.6E-07 | 5.24E-09 | ND | 2.39E-08 | 2.66E-07 | 0 | -2.38E-06 |
| SQP | SQP | 5.37E+05 | 6.17E-01 | 5.81E-01 | ND | 1.28E+01 | 8.69E+01 | 0 | -1.1E+03 |

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

**Disclaimer 1** – for the indicator 'Potential Human exposure efficiency relative to U235'.This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

**Disclaimer 2** – for the indicators 'abiotic depletion potential for non-fossil resources', 'abiotic depletion potential for fossil resources', 'water (user) deprivation potential, deprivation-weighted water consumption', 'potential comparative toxic unit for ecosystems', 'potential comparative toxic unit for humans – cancerogenic', 'Potential comparative toxic unit for humans - not cancerogenic', 'potential soil quality index'. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator. This EPD was created using a software tool.

## References


**Standards**

**EN 15804**
EN 15804:2012+A2:2019+AC:2021, Sustainability ofconstruction works — Environmental Product Declarations — Core rules for the product category of construction products.

**ISO 14025**
EN ISO 14025:2011, Environmental labels anddeclarations — Type III environmental declarations — Principles and procedures.

**Further References**

**IBU 2021**
Institut Bauen und Umwelt e.V.: General Instructions for the EPD programme of Institut Bauen und Umwelt e.V., Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021 www.ibu-epd.com

**GaBi**
GaBi Software System and Database for Life CycleEngineering, 1992-2021, Sphera Solutions GmbH, Leinfelden-Echterdingen, with acknowledgement of LBP University of Stuttgart, program version GaBi 10; database version 2022.1

**GaBi documentation**
GaBi dataset documentation for the software system and databases, LBP, University of Stuttgart and Sphera Solutions GmbH, Leinfelden-Echterdingen, 2021. (http://www.gabi-software.com/support/gabi/gabi[1]database-2021-lci-documentation/)

**PCR Part A**
PCR - Part A: Calculation rules for the Life Cycle Assessment and Requirements on the Background Report, version 1.3 from 08.2022, Institut Bauen und Umwelt e.V., www.bau-umwelt.com

**PCR Part B**
Part B: Requirements on the EPD for Solid wood product, version from 08.2021

**TROPIX**
Fiche de l'essence Sapelli, TROPIX database, available at: https://tropix.cirad.fr/FichiersComplementaires/EN/Africa/SAPELLI.pdf

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