



# ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Laminated Veneer Lumber  
Seihoku Plywood Co., Ltd



**EPD HUB, HUB-7075**

Published on 29.07.2026, last updated on 29.07.2026, valid until 28.07.2031

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1



Created with One Click LCA



## 一般情報 - GENERAL INFORMATION

### メーカー

#### MANUFACTURER

|                           |                                                                   |
|---------------------------|-------------------------------------------------------------------|
| メーカー名<br>Manufacturer     | Seihoku Plywood Co., Ltd                                          |
| 住所<br>Address             | 1-25-5 Hongo, Bunkyo-ku, Tokyo, Japan                             |
| 問い合わせ先<br>Contact details | quality@seihoku-group.co.jp                                       |
| ウェブサイト<br>Website         | <a href="https://www.seihoku.gr.jp">https://www.seihoku.gr.jp</a> |

This EPD is intended for business-to-business and/or business-to-consumer communication. The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

### EPD 規格、スコープ、認証機関

#### EPD STANDARDS, SCOPE AND VERIFICATION

|                                |                                                                                                                                                                                    |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| プログラムオペレータ<br>Program operator | EPD Hub, hub@epdhub.com                                                                                                                                                            |
| 参照規格<br>Reference standard     | EN 15804:2012+A2:2019/AC:2021, ISO 14025                                                                                                                                           |
| PCR<br>PCR                     | EPD Hub Core PCR Version 1.2, 24 Mar 2025<br>EN 16485 Product category rules for Round and sawn timber                                                                             |
| 製品カテゴリ<br>Sector               | Construction product                                                                                                                                                               |
| EPD カテゴリ<br>Category of EPD    | Third party verified EPD                                                                                                                                                           |
| 親 EPD 番号<br>Parent EPD number  | -                                                                                                                                                                                  |
| EPD のスコープ<br>Scope of the EPD  | Cradle to gate with modules C1-C4, D                                                                                                                                               |
| EPD 申請者<br>EPD author          | Ryuuichi Okada                                                                                                                                                                     |
| EPD 検証<br>EPD verification     | Independent verification of this EPD and data, according to ISO 14025:<br><input type="checkbox"/> Internal verification <input checked="" type="checkbox"/> External verification |
| EPD 検証者<br>EPD verifier        | Afzal khan Peerukhan as an authorized verifier for EPD Hub                                                                                                                         |

## 製品 - PRODUCT

|                                                                 |                                                                 |
|-----------------------------------------------------------------|-----------------------------------------------------------------|
| 製品名<br>Product name                                             | Laminated Veneer Lumber                                         |
| 追加ラベル<br>Additional labels                                      | -                                                               |
| 参照製品<br>Product reference                                       | -                                                               |
| 原材料の原産地<br>Place(s) of raw material origin                      | Japan                                                           |
| 製造地<br>Place of production                                      | 1-16 Nishihama-cho Ishinomaki-city, Miyagi-Pref. 986-0844 Japan |
| 設置場所および使用場所<br>Place(s) of installation and use                 | Japan                                                           |
| データ取得年<br>Period for data                                       | 2024/04-2025/03                                                 |
| EPD 平均化<br>Averaging in EPD                                     | No grouping                                                     |
| A1-A3 の GWP-fossil 変動率<br>Variation in GWP-fossil for A1-A3 (%) | -                                                               |
| 国際貿易商品番号<br>Global Trade Item Number (GTIN)                     | -                                                               |
| ノルウェー建築製品データベース<br>Norwegian Building Product Database (NOBB)   | -                                                               |
| A1-A3 特定データ (%)<br>A1-A3 Specific data (%)                      | 66.5                                                            |

## 環境影響データ概要 - ENVIRONMENTAL DATA SUMMARY

|                                                                                    |                                            |
|------------------------------------------------------------------------------------|--------------------------------------------|
| 宣言単位<br>Declared unit                                                              | 1m <sup>3</sup> of Laminated Veneer Lumber |
| 宣言単位あたりの質量<br>Declared unit mass                                                   | 450 kg                                     |
| 梱包材の質量<br>Mass of packaging                                                        | 0.1886 kg                                  |
| GWP-fossil, A1-A3 (kgCO <sub>2</sub> e)<br>GWP-fossil, A1-A3 (kgCO <sub>2</sub> e) | 292                                        |
| GWP-total, A1-A3 (kgCO <sub>2</sub> e)<br>GWP-total, A1-A3 (kgCO <sub>2</sub> e)   | -562                                       |
| 二次材料の投入(%)<br>Secondary material, inputs (%)                                       | 0.12                                       |
| エネルギー使用量計, A1-A3 (kWh)<br>Total energy use, A1-A3 (kWh)                            | 3190                                       |
| 水使用量計, A1-A3 (m <sup>3</sup> )<br>Net fresh water use, A1-A3 (m <sup>3</sup> )     | 1.91                                       |

## 製品とメーカー

### -PRODUCT AND MANUFACTURER

#### メーカーの概要 - ABOUT THE MANUFACTURER

In 1991 (Heisei 3), the company established an LVL (Laminated Veneer Lumber) manufacturing factory in Ishinomaki City, Miyagi Prefecture and commenced production. In 2007 (Heisei 19), it obtained JAS certification. The company has since been manufacturing and selling housing components used in post-and-beam construction, including studs, pre-cut members, panel framing materials, and furring strips.

#### 製品説明 - PRODUCT DESCRIPTION

LVL (Laminated Veneer Lumber) is an engineered wood product created by edge-joining veneers of standard dimensions and bonding them in layers with parallel grain orientation. We offer standard sizes ranging from 25 to 210mm in thickness, 25 to 600mm in width, and 1800 to 6100mm in length. Our product line includes finishing-grade materials predominantly made from Japanese cedar (Sugi), as well as structural components manufactured from various softwood species including Japanese larch (Karamatsu), Japanese red pine (Akamatsu), and Douglas fir—all selected to meet specific strength categories in accordance with JAS standards.

Further information can be found at:  
<https://www.seihoku.gr.jp>

#### 主な原材料構成 - PRODUCT RAW MATERIAL MAIN COMPOSITION

| 原材料カテゴリ<br>Raw material category | 量、質量 - %<br>Amount, mass- % | 原材料源<br>Material origin |
|----------------------------------|-----------------------------|-------------------------|
| 金属<br>Metals                     | 0                           | -                       |
| 鉱物<br>Minerals                   | 1.4                         | Japan                   |
| 化石原料<br>Fossil materials         | 4.7                         | Japan,Taiwan            |
| 生物由来原料<br>Bio-based materials    | 93.9                        | Japan                   |

#### 生物起源 CO2 含有量 - BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

|                                                                     |            |
|---------------------------------------------------------------------|------------|
| 製品の生物起源 CO2 含有量、kg C<br>Biogenic carbon content in product, kg C    | 188.638393 |
| 梱包材の生物起源 CO2 含有量、kg C<br>Biogenic carbon content in packaging, kg C | 0.000684   |

#### 機能単位と耐用年数 - FUNCTIONAL UNIT AND SERVICE LIFE

|                                      |                                            |
|--------------------------------------|--------------------------------------------|
| 宣言単位<br>Declared unit                | 1m <sup>3</sup> of Laminated Veneer Lumber |
| 宣言単位あたりの質量<br>Mass per declared unit | 450 kg                                     |
| 機能単位<br>Functional unit              | -                                          |
| 参照耐用年数<br>Reference service life     | -                                          |

化学物質、REACH 高懸念物質 - SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

## 製品のライフサイクル - PRODUCT LIFE-CYCLE

### システム境界 - SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

| Product stage |           |               | Assembly stage |          | Use stage |             |        |             |               |                        |                       | End of life stage |           |                  |          | Beyond the system boundaries   |
|---------------|-----------|---------------|----------------|----------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|-------------------|-----------|------------------|----------|--------------------------------|
| A1            | A2        | A3            | A4             | A5       | B1        | B2          | B3     | B4          | B5            | B6                     | B7                    | C1                | C2        | C3               | C4       | D                              |
| x             | x         | x             | ND             | ND       | ND        | ND          | ND     | ND          | ND            | ND                     | ND                    | x                 | x         | x                | x        | x                              |
| Raw materials | Transport | Manufacturing | Transport      | Assembly | Use       | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstr./demol.  | Transport | Waste processing | Disposal | Reuse<br>Recovery<br>Recycling |

Not declared = ND.

### 製造と梱包 - MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

A market-based approach is used in modelling the electricity mix utilized in the factory.

This product is manufactured by rotary-peeling logs to produce thin veneers, drying these veneers to standard dimensions, finger-jointing them lengthwise, and laminating multiple layers with adhesive in parallel grain orientation.

Our production process includes veneer cutting, drying, finger-jointing, adhesive application, cold pressing, hot pressing, thickness calibration, dimensional cutting, quality inspection, product marking, and packaging. The product stage incorporates all raw materials, ancillary materials, and packaging components used during manufacturing.

Our facility generates steam for hot pressing and veneer drying through an on-site biomass energy system that utilizes bark and veneer trim waste produced within our operation as renewable fuel.

### 輸送と据付 - TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

This EPD excludes the A4-A5 stage. Therefore, packaging wastes are considered in the end-of-life stage.

### 製品使用とメンテナンス - PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD excludes the use stage.

Air, soil, and water impacts during the use phase have not been studied.

### 製品の廃棄・リサイクル段階 - PRODUCT END OF LIFE (C1-C4, D)

For demolition (C1), it is postulated that 0.00265L/kg of diesel fuel is consumed.

This scenario is based on "Revised New Demolition Work Estimation" issued by the Economic Research Association in April 2017.

The transport distance and method to processing facilities (C2) is postulated to be 50km by truck for all scenarios.

In this EPD, end-of-life (EOL) scenarios have been developed for each material category.

Wooden waste:

At the end of its lifetime, a timber product can have several end of life scenario options.

Because of the uncertainties surrounding waste disposal practices in the future, exact methods of disposal at the end of life is hard to determine. In this EPD, 92.1% of product wastes are assumed to be chipped for the future use as fuel, 6.3% are assumed to be incinerated without energy recovery, and 1.6% are assumed to be landfilled.

The scenario is based on the results of a Survey of construction by-products in 2018 published by the Ministry of Land, Infrastructure and Transport, with the assumption of no material recycled between construction sites.

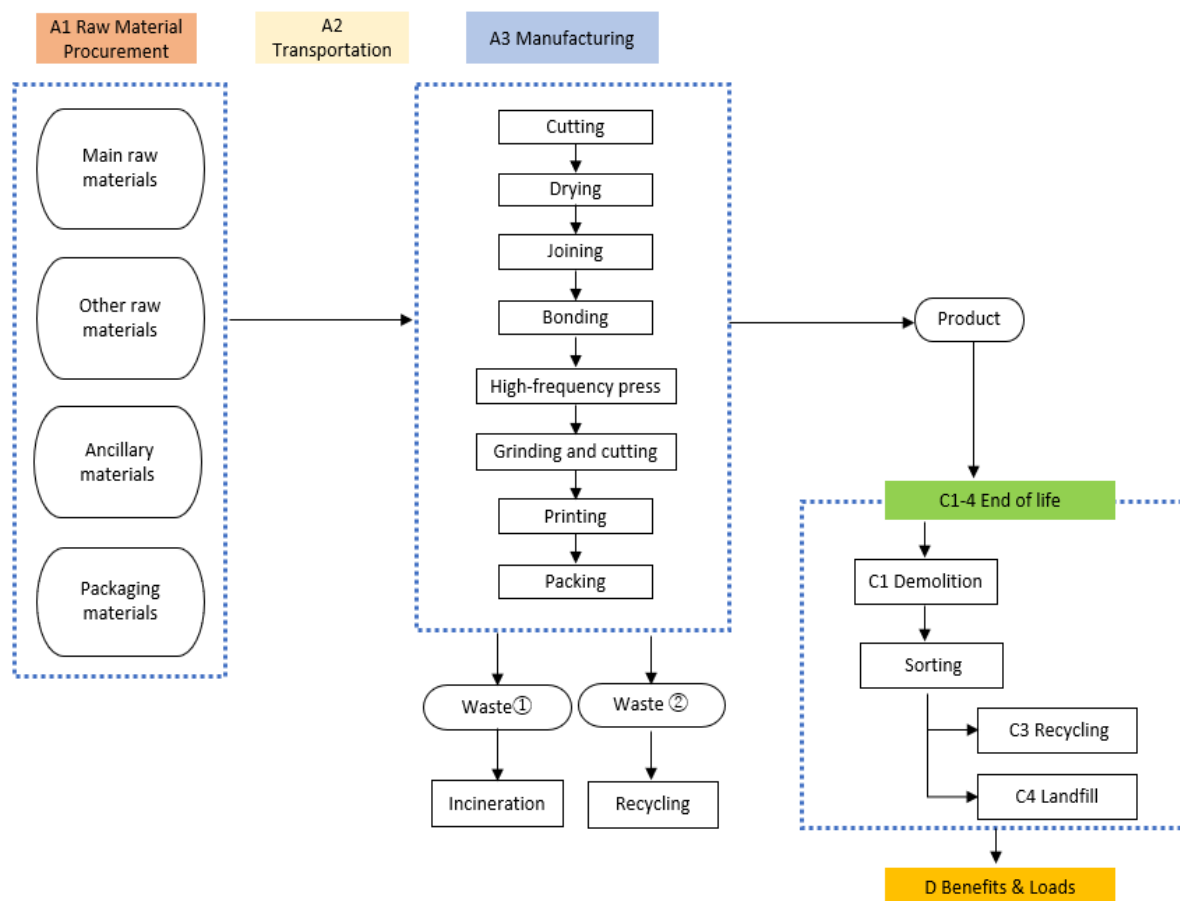
As this EPD does not include A5 stage, packaging wastes are considered in the end-of-life stage.

PP/PE packaging materials:

The EOL scenario is assumed to be 25% recycled, 57% energy recovery, 10% incinerated and 8% landfilled based on the report published by Ministry of Environment.

Based on EOL scenarios, the benefits and loads are considered in D for cases where there is recycling, reuse and energy recovery.

# 製造プロセス – SYSTEM DIAGRAM



## ライフサイクルアセスメント - LIFE-CYCLE

### ASSESSMENT

#### カットオフ基準 - CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

#### データの検証 - VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

#### 配分、推定 - ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

| データタイプ - Data type                              | 配分 - Allocation     |
|-------------------------------------------------|---------------------|
| 原材料 - Raw materials                             | No Allocation       |
| 梱包材 - Packaging materials                       | No Allocation       |
| 補助材料 - Ancillary materials                      | No Allocation       |
| 製造エネルギーと廃棄物<br>- Manufacturing energy and waste | Physical Properties |

#### 製品と製造拠点のグループ化 - PRODUCT & MANUFACTURING SITES GROUPING

|                                                                    |                |
|--------------------------------------------------------------------|----------------|
| 平均化の種類 - Type of grouping                                          | No grouping    |
| 平均化の化方法 - Grouping method                                          | Not applicable |
| A1-A3 における GWP-fossil の変動率 - Variation in GWP-fossil for A1-A3 (%) |                |

This EPD is product and factory specific.

#### LCA ソフトウェアと参考文献 - LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator for EPD Hub V3 and EPD Process Certification v3.2.5. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. Ecoinvent v3.11 and One Click LCA databases were used as sources of environmental data. Allocation used in Ecoinvent 3.11 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

## 環境影響データ - ENVIRONMENTAL IMPACT DATA

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

### 主な環境影響指標 - CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

| Impact category                     | Unit                   | A1        | A2       | A3       | A1-A3     | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3       | C4       | D         |
|-------------------------------------|------------------------|-----------|----------|----------|-----------|----|----|----|----|----|----|----|----|----|----------|----------|----------|----------|-----------|
| GWP – total <sup>1)</sup>           | kg CO <sub>2</sub> e   | -1.18E+03 | 2.66E+01 | 5.95E+02 | -5.62E+02 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 4.59E+00 | 3.62E+00 | 7.68E+02 | 1.01E+02 | -1.71E+01 |
| GWP – fossil                        | kg CO <sub>2</sub> e   | 9.08E+01  | 2.66E+01 | 1.75E+02 | 2.92E+02  | ND | ND | ND | ND | ND | ND | ND | ND | ND | 4.58E+00 | 3.62E+00 | 1.37E+01 | 5.65E-01 | -1.34E+01 |
| GWP – biogenic                      | kg CO <sub>2</sub> e   | -1.27E+03 | 1.94E-03 | 4.20E+02 | -8.55E+02 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 8.73E-04 | 5.23E-07 | 7.54E+02 | 1.01E+02 | -3.68E+00 |
| GWP – LULUC                         | kg CO <sub>2</sub> e   | 7.51E-01  | 1.25E-02 | 4.78E-02 | 8.11E-01  | ND | ND | ND | ND | ND | ND | ND | ND | ND | 4.69E-04 | 1.68E-03 | 6.04E-02 | 1.68E-04 | -6.05E-02 |
| Ozone depletion pot.                | kg CFC <sub>11</sub> e | 1.89E-06  | 3.53E-07 | 2.79E-06 | 5.03E-06  | ND | ND | ND | ND | ND | ND | ND | ND | ND | 6.80E-08 | 4.80E-08 | 1.01E-07 | 6.87E-09 | -1.01E-07 |
| Acidification potential             | mol H <sup>+</sup> e   | 4.54E-01  | 1.49E-01 | 1.15E+00 | 1.75E+00  | ND | ND | ND | ND | ND | ND | ND | ND | ND | 4.10E-02 | 1.66E-02 | 7.11E-02 | 5.13E-03 | -7.11E-02 |
| EP-freshwater <sup>2)</sup>         | kg Pe                  | 2.10E-02  | 2.64E-03 | 8.77E-02 | 1.11E-01  | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.47E-04 | 4.01E-04 | 4.94E-03 | 2.59E-04 | -4.94E-03 |
| EP-marine                           | kg Ne                  | 1.32E-01  | 3.37E-02 | 3.39E-01 | 5.05E-01  | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.91E-02 | 6.12E-03 | 1.88E-02 | 4.99E-03 | -1.88E-02 |
| EP-terrestrial                      | mol Ne                 | 1.35E+00  | 3.71E-01 | 3.60E+00 | 5.32E+00  | ND | ND | ND | ND | ND | ND | ND | ND | ND | 2.09E-01 | 6.66E-02 | 1.96E-01 | 2.57E-02 | -1.96E-01 |
| POCP (“smog”) <sup>3)</sup>         | kg NMVOCe              | 4.89E-01  | 1.38E-01 | 9.89E-01 | 1.62E+00  | ND | ND | ND | ND | ND | ND | ND | ND | ND | 6.25E-02 | 2.30E-02 | 6.54E-02 | 6.81E-03 | -6.54E-02 |
| ADP-minerals & metals <sup>4)</sup> | kg Sbe                 | 6.94E-04  | 8.23E-05 | 2.70E-04 | 1.05E-03  | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.65E-06 | 1.19E-05 | 1.89E-05 | 1.06E-06 | -1.89E-05 |
| ADP-fossil resources                | MJ                     | 1.66E+03  | 3.57E+02 | 2.42E+03 | 4.44E+03  | ND | ND | ND | ND | ND | ND | ND | ND | ND | 5.97E+01 | 5.09E+01 | 1.70E+02 | 5.65E+00 | -1.70E+02 |
| Water use <sup>5)</sup>             | m <sup>3</sup> e depr. | 5.55E+01  | 1.74E+00 | 2.89E+01 | 8.62E+01  | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.54E-01 | 2.85E-01 | 2.61E+00 | 1.03E+00 | -2.61E+00 |

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO<sub>4</sub>e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

### 追加(オプション)の環境影響指標 - ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

| Impact category                  | Unit      | A1       | A2       | A3       | A1-A3    | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3       | C4       | D         |
|----------------------------------|-----------|----------|----------|----------|----------|----|----|----|----|----|----|----|----|----|----------|----------|----------|----------|-----------|
| Particulate matter               | Incidence | 8.10E-06 | 1.55E-06 | 8.07E-06 | 1.77E-05 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.17E-06 | 3.39E-07 | 8.19E-07 | 6.42E-08 | -8.18E-07 |
| Ionizing radiation <sup>6)</sup> | kBq U235e | 2.52E+00 | 2.79E-01 | 2.21E+01 | 2.49E+01 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 2.54E-02 | 4.31E-02 | 1.02E+00 | 5.88E-03 | -1.02E+00 |
| Ecotoxicity (freshwater)         | CTUe      | 3.60E+03 | 3.92E+02 | 5.19E+03 | 9.18E+03 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 3.41E+01 | 5.89E+01 | 3.47E+02 | 1.31E+01 | -3.44E+02 |
| Human toxicity, cancer           | CTUh      | 5.53E-08 | 4.36E-09 | 4.65E-08 | 1.06E-07 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 4.67E-10 | 8.72E-10 | 2.79E-09 | 8.42E-10 | -2.77E-09 |
| Human tox. non-cancer            | CTUh      | 7.87E-07 | 1.94E-07 | 1.56E-06 | 2.54E-06 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 7.34E-09 | 3.48E-08 | 8.32E-08 | 5.67E-08 | -8.27E-08 |
| SQP <sup>7)</sup>                | -         | 8.85E+04 | 1.63E+02 | 5.14E+02 | 8.92E+04 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 3.95E+00 | 3.75E+01 | 1.12E+04 | 5.25E+00 | -1.12E+04 |

6) EN 15804+A2 disclaimer for ionizing radiation, human health. 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 nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator; 7) SQP = Land use related impacts/soil quality.

### 天然資源の利用 - USE OF NATURAL RESOURCES

| Impact category                    | Unit           | A1       | A2       | A3        | A1-A3    | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3        | C4        | D         |
|------------------------------------|----------------|----------|----------|-----------|----------|----|----|----|----|----|----|----|----|----|----------|----------|-----------|-----------|-----------|
| Renew. PER as energy <sup>8)</sup> | MJ             | 8.24E+03 | 5.00E+00 | -2.42E+03 | 5.82E+03 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 3.75E-01 | 7.30E-01 | -2.61E+03 | -6.02E+02 | 2.61E+03  |
| Renew. PER as material             | MJ             | 7.01E+03 | 0.00E+00 | 0.00E+00  | 7.01E+03 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 0.00E+00 | -6.46E+03 | -5.54E+02 | 0.00E+00  |
| Total use of renew. PER            | MJ             | 1.52E+04 | 5.00E+00 | -2.42E+03 | 1.28E+04 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 3.75E-01 | 7.30E-01 | -9.06E+03 | -1.16E+03 | 2.61E+03  |
| Non-re. PER as energy              | MJ             | 1.14E+03 | 3.58E+02 | 2.40E+03  | 3.91E+03 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 5.97E+01 | 5.09E+01 | 1.64E+02  | 4.33E+00  | -1.70E+02 |
| Non-re. PER as material            | MJ             | 4.82E+02 | 0.00E+00 | 6.61E+00  | 4.89E+02 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 0.00E+00 | -4.50E+02 | -3.93E+01 | 0.00E+00  |
| Total use of non-re. PER           | MJ             | 1.63E+03 | 3.58E+02 | 2.41E+03  | 4.39E+03 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 5.97E+01 | 5.09E+01 | -2.85E+02 | -3.50E+01 | -1.70E+02 |
| Secondary materials                | kg             | 5.28E-01 | 1.57E-01 | 3.94E-01  | 1.08E+00 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 2.47E-02 | 2.23E-02 | 9.35E-02  | 9.74E-03  | -9.33E-02 |
| Renew. secondary fuels             | MJ             | 1.54E-02 | 1.65E-03 | 1.75E+03  | 1.75E+03 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 6.47E-05 | 2.88E-04 | 1.80E-03  | 4.19E-05  | -1.80E-03 |
| Non-ren. secondary fuels           | MJ             | 0.00E+00 | 0.00E+00 | 0.00E+00  | 0.00E+00 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00  |
| Use of net fresh water             | m <sup>3</sup> | 1.28E+00 | 4.46E-02 | 5.80E-01  | 1.91E+00 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 3.82E-03 | 7.19E-03 | 5.99E-02  | -2.11E-02 | -5.99E-02 |

8) PER = Primary energy resources.

## 廃棄・リサイクル段階 — 廃棄 - END OF LIFE – WASTE

| Impact category     | Unit | A1       | A2       | A3       | A1-A3    | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3       | C4       | D         |
|---------------------|------|----------|----------|----------|----------|----|----|----|----|----|----|----|----|----|----------|----------|----------|----------|-----------|
| Hazardous waste     | kg   | 6.96E+00 | 7.75E-01 | 1.19E+01 | 1.96E+01 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 6.69E-02 | 1.16E-01 | 1.22E+00 | 1.87E-01 | -1.22E+00 |
| Non-hazardous waste | kg   | 1.07E+02 | 1.48E+01 | 4.37E+02 | 5.60E+02 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 9.75E-01 | 2.23E+00 | 2.50E+01 | 4.82E+01 | -2.49E+01 |
| Radioactive waste   | kg   | 6.20E-04 | 6.83E-05 | 4.82E-03 | 5.51E-03 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 6.24E-06 | 1.05E-05 | 2.47E-04 | 1.46E-06 | -2.47E-04 |

## 廃棄・リサイクル段階 — 出力フロー - END OF LIFE – OUTPUT FLOWS

| Impact category               | Unit | A1       | A2       | A3       | A1-A3    | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3       | C4       | D        |
|-------------------------------|------|----------|----------|----------|----------|----|----|----|----|----|----|----|----|----|----------|----------|----------|----------|----------|
| Components for re-use         | kg   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Materials for recycling       | kg   | 0.00E+00 | 0.00E+00 | 1.16E+02 | 1.16E+02 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 0.00E+00 | 4.14E+02 | 0.00E+00 | 0.00E+00 |
| Materials for energy rec      | kg   | 0.00E+00 | 0.00E+00 | 1.09E+02 | 1.09E+02 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 0.00E+00 | 1.08E-01 | 0.00E+00 | 0.00E+00 |
| Exported energy               | MJ   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 0.00E+00 | 2.75E+00 | 0.00E+00 | 0.00E+00 |
| Exported energy – Electricity | MJ   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 0.00E+00 | 4.10E-01 | 0.00E+00 | 0.00E+00 |
| Exported energy – Heat        | MJ   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 0.00E+00 | 2.34E+00 | 0.00E+00 | 0.00E+00 |

## 環境影響 - ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

| Impact category      | Unit                               | A1       | A2       | A3       | A1-A3    | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3       | C4       | D         |
|----------------------|------------------------------------|----------|----------|----------|----------|----|----|----|----|----|----|----|----|----|----------|----------|----------|----------|-----------|
| Global Warming Pot.  | kg CO <sub>2</sub> e               | 9.09E+01 | 2.64E+01 | 1.74E+02 | 2.92E+02 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 4.56E+00 | 3.60E+00 | 1.37E+01 | 9.74E-01 | -1.34E+01 |
| Ozone depletion Pot. | kg CFC <sub>11</sub> e             | 1.62E-06 | 2.84E-07 | 2.23E-06 | 4.14E-06 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 5.42E-08 | 3.87E-08 | 8.50E-08 | 5.65E-09 | -8.49E-08 |
| Acidification        | kg SO <sub>2</sub> e               | 3.48E-01 | 1.20E-01 | 8.98E-01 | 1.37E+00 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 2.88E-02 | 1.24E-02 | 5.66E-02 | 3.61E-03 | -5.67E-02 |
| Eutrophication       | kg PO <sub>4</sub> <sup>3</sup> e  | 4.76E+00 | 1.80E-02 | 1.82E-01 | 4.96E+00 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 6.79E-03 | 3.10E-03 | 9.34E-03 | 1.53E-03 | -9.14E-03 |
| POCP (“smog”)        | kg C <sub>2</sub> H <sub>4</sub> e | 3.83E-02 | 7.75E-03 | 6.25E-02 | 1.09E-01 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 2.16E-03 | 1.01E-03 | 4.71E-03 | 3.76E-04 | -4.71E-03 |
| ADP-elements         | kg Sbe                             | 5.97E-04 | 7.99E-05 | 2.50E-04 | 9.27E-04 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.60E-06 | 1.16E-05 | 1.85E-05 | 8.96E-07 | -1.84E-05 |
| ADP-fossil           | MJ                                 | 1.62E+03 | 3.53E+02 | 2.11E+03 | 4.08E+03 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 5.93E+01 | 5.02E+01 | 1.54E+02 | 5.56E+00 | -1.54E+02 |

## 環境影響 - ENVIRONMENTAL IMPACTS

| Impact category            | Unit | A1       | A2       | A3       | A1-A3    | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3       | C4       | D         |
|----------------------------|------|----------|----------|----------|----------|----|----|----|----|----|----|----|----|----|----------|----------|----------|----------|-----------|
| Radioactive waste, high    | kg   | 1.81E-04 | 2.03E-05 | 9.17E-04 | 1.12E-03 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.81E-06 | 3.09E-06 | 7.72E-05 | 4.20E-07 | -7.72E-05 |
| Radioactive waste, int/low | kg   | 4.39E-04 | 4.79E-05 | 3.91E-03 | 4.39E-03 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 4.43E-06 | 7.46E-06 | 1.70E-04 | 1.04E-06 | -1.70E-04 |

## 環境影響 - ENVIRONMENTAL IMPACTS – GWP-GHG

| Impact category       | Unit                 | A1       | A2       | A3       | A1-A3    | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1       | C2       | C3       | C4       | D         |
|-----------------------|----------------------|----------|----------|----------|----------|----|----|----|----|----|----|----|----|----|----------|----------|----------|----------|-----------|
| GWP-GHG <sup>9)</sup> | kg CO <sub>2</sub> e | 9.15E+01 | 2.66E+01 | 1.75E+02 | 2.93E+02 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 4.58E+00 | 3.62E+00 | 1.37E+01 | 5.65E-01 | -1.34E+01 |

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. In addition, the characterisation factors for the flows – CH<sub>4</sub> fossil, CH<sub>4</sub> biogenic and Dinitrogen monoxide – were updated in line with the guidance. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterisation factor for biogenic CO<sub>2</sub> is set to zero.

## シナリオドキュメント- SCENARIO DOCUMENTATION

### データソース - DATA SOURCES

### 製造エネルギーのシナリオドキュメント - Manufacturing energy scenario documentation

1. Heat production, untreated waste wood, at furnace 1000-5000 kW, World, Ecoinvent, 2.07 kgCO<sub>2</sub>e/kg
2. Market for electricity, medium voltage, Japan, Ecoinvent, 0.63 kgCO<sub>2</sub>e/kWh
3. Electricity production, photovoltaic, 3kWp flat-roof installation, single-Si, World, Ecoinvent, 0.0843 kgCO<sub>2</sub>e/kWh
4. Diesel, burned in building machine, World, Ecoinvent, 0.10 kgCO<sub>2</sub>e/MJ

## 廃棄・リサイクル段階のシナリオドキュメント - End of life (C1-C4) -

### Scenario documentation

| シナリオパラメータ - Scenario parameter                                                                | 値 - Value                  |
|-----------------------------------------------------------------------------------------------|----------------------------|
| 回収プロセス：分別回収 (kg)<br>Collection process: collected separately (kg)                             | 450.1886                   |
| 回収プロセス：混合廃棄物 (kg)<br>Collection process: Mixed waste (kg)                                     | -                          |
| 再生：再使用 (kg)<br>Recovery: re-use (kg)                                                          | 0                          |
| 再生：リサイクル (kg)<br>Recovery: recycling (kg)                                                     | 414                        |
| 再生：エネルギー回収 (kg)<br>Recovery: energy recovery (kg)                                             | 0.11                       |
| 廃棄 (kg)<br>Disposal (kg)                                                                      | 36.0786                    |
| シナリオの前提条件（例：輸送 [手段、km] およびその他）<br>Scenario assumptions e.g. transportation (mode, km) & other | Transported 50 km by lorry |

### 検証報告 - THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15804+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

#### Verified tools

Tool verifier: Magaly Gonzalez Vazquez

Tool verification validity: 27 March 2025 - 26 March 2028

Afzal khan Peerukhan as an authorized verifier for EPD Hub Limited  
29.07.2026

