Environmental Product Declaration (EPD)
According to ISO 14025 and EN 15804

# ARL Top Slide Window - Wood

| | |
|---|---|
| Registration number: | EPD-Kiwa-EE-189242-EN |
| Issue date: | 14-02-2025 |
| Valid until: | 14-02-2030 |
| Declaration owner: | UAB "ARLANGA wood" |
| Publisher: | Kiwa-Ecobility Experts |
| Programme operator: | Kiwa-Ecobility Experts |
| Status: | verified |

# 1 General information

## 1.1 PRODUCT

ARL Top Slide Window - Wood

## 1.2 REGISTRATION NUMBER

EPD-Kiwa-EE-189242-EN

## 1.3 VALIDITY

**Issue date:** 14-02-2025

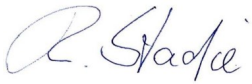
**Valid until:** 14-02-2030

## 1.4 PROGRAMME OPERATOR

Kiwa-Ecobility Experts
Wattstraße 11-13
13355 Berlin
DE

Raoul Mancke

*(Head of programme operations, Kiwa-Ecobility Experts)*



Dr. Ronny Stadie

*(Verification body, Kiwa-Ecobility Experts)*

## 1.5 OWNER OF THE DECLARATION

**Manufacturer:** UAB "ARLANGA wood"

**Address:** Jankiškiu str. 30, LT-02300 Vilnius

**E-mail:** wood@arlangawood.lt

**Website:** https://arlangawood.lt/

**Production location:** UAB ARLANGA wood

**Address production location:** Jankiškių g. 30, LT-02300 Vilnius

## 1.6 VERIFICATION OF THE DECLARATION

The independent verification is in accordance with the ISO 14025:2011. The LCA is in compliance with ISO 14040:2006 and ISO 14044:2006. The EN 15804:2012+A2:2019 serves as the core PCR.

☐ Internal ☒ External

Niklas van Dijk, Kiwa GmbH

## 1.7 STATEMENTS

The owner of this EPD shall be liable for the underlying information and evidence. The programme operator Kiwa-Ecobility Experts shall not be liable with respect to manufacturer data, life cycle assessment data and evidence.

## 1.8 PRODUCT CATEGORY RULES

Kiwa-Ecobility Experts (Kiwa-EE) – General Product Category Rules (2022-02-14)

EN 17213:2020 Windows and doors – Environmental Product Declarations – Product category rules for windows and pedestrian doorsets

## 1.9 COMPARABILITY

In principle, a comparison or assessment of the environmental impacts of different products is only possible if they have been prepared in accordance with EN 15804+A2. For the evaluation of the comparability, the following aspects have to be considered in particular: PCR used, functional or declared unit, geographical reference, the definition of

# 1 General information

the system boundary, declared modules, data selection (primary or secondary data, background database, data quality), scenarios used for use and disposal phases, and the life cycle inventory (data collection, calculation methods, allocations, validity period). PCRs and general program instructions of different EPD program operators may differ. Comparability needs to be evaluated. For further guidance, see EN 15804+A2 (5.3 Comparability of EPD for construction products) and ISO 14025 (6.7.2 Requirements for comparability).

## 1.10 CALCULATION BASIS

**LCA method R<THINK:** Ecobility Experts | EN15804+A2

**LCA software*:** Simapro 9.1

**Characterization method:** EN 15804 +A2 Method v1.0

**LCA database profiles:** EcoInvent version 3.6

**Version database:** v3.17 (2024-05-22)

** Simapro is used for calculating the characterized results of the Environmental profiles within R<THINK.*

## 1.11 LCA BACKGROUND REPORT

This EPD is generated on the basis of the LCA background report 'ARL Top Slide Window - Wood ' with the calculation identifier ReTHiNK-89242.

# 2 Product

## 2.1 PRODUCT DESCRIPTION

This Environmental Product Declaration (EPD) covers Top slide wood windows, which are outward-opening, triple-glazed, customized building components. The dimensions (1000mm x 1000mm) are tailored to meet the customer's requirements.

Mass percentage of the main materials

| Material | Weight kg | Percentage of material weight |
|---|---|---|
| Wood | 24,37 | 47,0% |
| Primer | 1,61 | 3,1% |
| Paint | 2,01 | 3,9% |
| Metal | 1,56 | 3,0% |
| Plastic | 0,06 | 0,1% |
| Aluminium | 0,20 | 0,4% |
| Rubber | 0,43 | 0,8% |
| Silicone | 0,14 | 0,3% |
| Total glass weight | 21,27 | 41,0% |
| Aluminium profile for IGU | 0,22 | 0,4% |
| Argon gas | 0,04 | 0,1% |
| Weight | 51,896 | 100,0% |

## 2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

The products are used as enclosures for openings in facades of buildings. The intended uses are in domestic and commercial locations.

## 2.3 REFERENCE SERVICE LIFE

**RSL PRODUCT**

According to the standard EN 17213, a reference service life of 30 years is assumed without IGU replacement. This is on the basis that the installation, maintenance and servicing of the product follows the relevant instructions of the manufacturer which are submitted to every customer and also available on the web page of UAB ARLANGA Wood. It should be noted that the Use stage with modules B1-B7 is not declared.

**USED RSL (YR) IN THIS LCA CALCULATION:**

30

## 2.4 TECHNICAL DATA

| **Characteristic** | **Value** |
|---|---|
| **Type** | **Top slide wood window** |
| Glass type | Flat glass, Triple glazing |
| Total Weight* | 51,89 kg |
| Size | 1000mm x 1000mm |
| Glass surface* | 0,71 m2 |
| Heat permeability, window (Uw-value) (EN 10077) depends on the glass configuration. | 1 W/(m2*K) |
| Safety equipment | n.a. |
| Sound insulation | n.a. |
| Air permeability (EN 1026) | Class 4 |
| Water tightness (EN12208) | AE1200 |
| Resistance to wind load, test pressure (EN 12210) | Class 5 |
| Resistance to wind load, frame deflection (EN 12210) | Class C |
| Dangerous substances | None |

# 2 Product

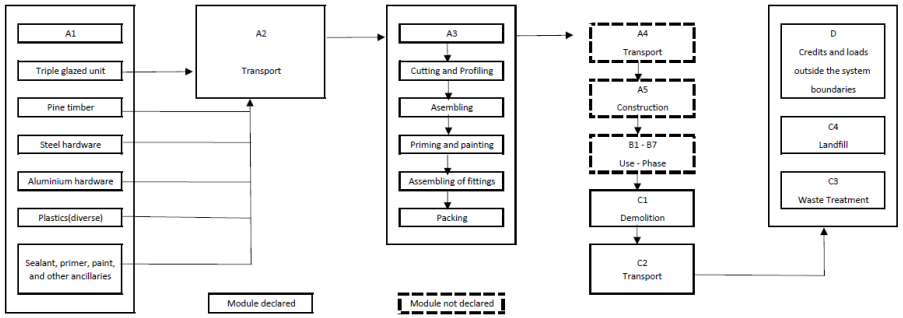
## 2.5 SUBSTANCES OF VERY HIGH CONCERN

The product does not contain any substances from the “Candidate List of Substances of Very High Concern” (SVHC) in amounts greater than 0,1% (1.000 ppm).

## 2.6 DESCRIPTION PRODUCTION PROCESS

The manufacturing contains the following processes:

- Extraction and delivery of raw materials;
- Cutting and profiling;
- Assembly of frame;
- Priming and painting of frame;
- Assembly of complete product;
- Packing and delivery.



# 3 Calculation rules

## 3.1 DECLARED UNIT

**Wood Window**

The declared unit is 1 m² of a standard-sized wooden window with triple glazing and the following dimensions: 1000 x 1000 mm. Calculations are performed in accordance with EN 15804+A2 standards, considering the product life cycle stages from production to its use.

Reference unit: square meter (m2)

## 3.2 CONVERSION FACTORS

| Description | Value | Unit |
|---|---|---|
| Reference unit | 1 | m2 |
| Weight per reference unit | 51.896 | kg |
| Conversion factor to 1 kg | 0.019269 | m2 |

## 3.3 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

This is a Cradle to gate with modules C1-C4 and module D EPD. The life cycle stages included are as shown below:

(X = module included, ND = module not declared)

| 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 |

The modules of the EN15804 contain the following:

| | |
|---|---|
| Module A1 = Raw material supply | Module B5 = Refurbishment |
| Module A2 = Transport | Module B6 = Operational energy use |
| Module A3 = Manufacturing | Module B7 = Operational water use |
| Module A4 = Transport | Module C1 = De-construction / Demolition |
| Module A5 = Construction - Installation process | Module C2 = Transport |
| Module B1 = Use | Module C3 = Waste Processing |
| Module B2 = Maintenance | Module C4 = Disposal |
| Module B3 = Repair | Module D = Benefits and loads beyond the product system boundaries |
| Module B4 = Replacement | |

## 3.4 REPRESENTATIVENESS

This EPD is representative for ARL Top Slide Window - Wood , a product of UAB "ARLANGA wood". The results of this EPD are representative for European Union.

## 3.5 CUT-OFF CRITERIA

**Product stage (A1-A3)**

All input flows (e.g., raw materials, transportation, energy use.) and output flows (e.g., production waste) are considered in this LCA. The neglected input flows do not exceed the limit of 5% of energy use and mass. Excluded processes are long-term emissions, the

# 3 Calculation rules

manufacture of equipment used in production, buildings or any other capital goods, the transport of personnel to the plant, the transportation of personnel within the plant, and research and development activities. The packaging materials represent 0.87% of the total product weight, which is below the 1% threshold specified in EN 15804+A2 for exclusion. Therefore, these materials were not included in the primary LCA calculation due to their negligible contribution to the overall environmental impact.

**End of life stage (C1-C4)**

All input flows (e.g. energy use for demolition or disassembly, transport to waste processing, etc.) and output flows (e.g. end-of-life waste processing of the product, etc.) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

**Benefits and loads beyond the system boundary (Module D)**

All benefits and loads beyond the system boundary resulting from reusable products, recyclable materials and/or useful energy carriers leaving the product system are considered in this LCA.

## 3.6 ALLOCATION

Allocations were avoided as far as possible. There are no coproducts or by-product in the manufacturing of the examined product. Based on energy consumption measurements, the energy requirements of the production were allocated to the individual products. Specific information about allocations within the background data is included in the documentation of the Ecoinvent datasets.

## 3.7 DATA COLLECTION & REFERENCE PERIOD

All process-specific data was collected for the manufacturing year 2023. The quantities of raw and ancillary materials as well as energy consumption have been recorded and averaged over the entire operating year 2023.

## 3.8 ESTIMATES AND ASSUMPTIONS

All installed raw materials of the product were analysed, and the masses were determined following the allocation and cut-off requirements. Production-specific energy consumption was measured and provided by UAB ARLANGA Wood.

Since the production process is quite similar for all products produced at the manufacturing site, the energy consumption, ancillary materials and production waste are allocated according to the annual production of the standard-sized elements and then declared per square meter of the product. The total annual production data is recorded to a high standard of accuracy and precision.

The production waste of wood, paint and other mixed production waste is collected separately. As the product is marketed internationally, no country-specific waste scenario can be considered. Therefore, the waste scenario of PCR B (EN 17213 Appendix B.3) was adopted. Removing the window does not result in any emissions to air or soil, so the value for module C1 is assumed to be zero.

Additionally, the 'Acrylic dispersion' and 'Acrylic binder' used in the product are ready-to-use materials that do not require additional water for their application or processing. These materials are delivered in their final state and used directly without modifications. Therefore, the inclusion of water in the calculations is not necessary, as it does not contribute to the product's life cycle impact.

## 3.9 DATA QUALITY

In the operating data survey, all relevant process-specific data has been collected. The data relating to the manufacturing phase of the window was determined by UAB ARLANGA Wood.

Secondary data was taken from the Ecoinvent 3.6 (2019) database. The database is regularly checked and thus complies with the requirements of ISO 14040/44 (background data is not older than 10 years). The background data meets the requirements of EN 15804.

The scenarios included in this report represent the current practices in the relevant processes and are based on real data collected from suppliers and operational observations. They are representative of one of the most likely scenario alternatives for the product's life cycle.

The general rule was followed that specific data from specific production processes or average data derived from specific processes must be given priority when calculating an EPD or Life Cycle Assessment. Data for processes that the manufacturer cannot influence or choose, were backed up with generic data.

The data quality assessment (DQR) for this EPD was conducted in accordance with the requirements of EN 15804 Annex E, taking into account geographical, technical, and temporal representativeness. The DQR value for each material was calculated as the average of these three criteria, ensuring high data accuracy and reliability.

Summary of DQR values for the main materials:

# 3 Calculation rules

| | | | |
|---|---|---|---|
| Timber - Pine | 2,3 | Glass | 1,7 |
| Paint | 1,7 | Aluminium for IGU | 2,0 |
| Metal | 2,0 | Argon gas | 2,0 |
| Plastic | 1,7 | Electricity (LT) | 1,0 |
| Aluminium | 2,0 | Heat (Gas) | 2,3 |
| Rubber | 2,0 | | |

These values reflect a high level of data quality and ensure that the results of the life cycle analysis are reliable and compliant with the standards.

## 3.10 POWER MIX

The electricity mix used in this Environmental Product Declaration follows the country-specific residual mix for Lithuania, as no contractual instruments (e.g., Guarantees of Origin or supplier-specific grid mix data) are available. The Global Warming Potential (GWP) impact per kWh of electricity used in the production process is based on the Lithuanian residual mix, following the latest available data.

# 4 Scenarios and additional technical information

## 4.1 DE-CONSTRUCTION, DEMOLITION (C1)

No inputs are needed for the product at the de-construction / demolition phase

## 4.2 TRANSPORT END-OF-LIFE (C2)

The following distances and transport conveyance are assumed for transportation during end of life for the different types of waste processing.

| Waste Scenario | Transport conveyance | Not removed (stays in work) [km] | Landfill [km] | Incineration [km] | Recycling [km] | Re-use [km] |
|---|---|---|---|---|---|---|
| EoL Wood contaminated (EN 17213) (Incineration Denmark) | Lorry (Truck), unspecified (default) \| market group for (GLO) | 0 | 100 | 150 | 50 | 0 |
| Finishes (adhered to wood, plastic, metal) (NMD ID 2) (Incineration Lithuania) | Lorry (Truck), unspecified (default) \| market group for (GLO) | 0 | 100 | 150 | 50 | 0 |
| EoL Steel (EN 17213) | Lorry (Truck), unspecified (default) \| market group for (GLO) | 0 | 100 | 150 | 50 | 0 |
| EoL Plastics (EN 17213) (Incineration Denmark) | Lorry (Truck), unspecified (default) \| market group for (GLO) | 0 | 100 | 150 | 50 | 0 |
| EoL Alu (EN 17213) | Lorry (Truck), unspecified (default) \| market group for (GLO) | 0 | 100 | 150 | 50 | 0 |
| polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57) (Incineration Denmark) | Lorry (Truck), unspecified (default) \| market group for (GLO) | 0 | 100 | 150 | 50 | 0 |
| glass (i.a. flat glass) (NMD ID 28) | Lorry (Truck), unspecified (default) \| market group for (GLO) | 0 | 100 | 150 | 50 | 0 |
| waste not applicable or evaporated (empty scenario) (NMD ID 26) | Lorry (Truck), unspecified (default) \| market group for (GLO) | 0 | 0 | 0 | 0 | 0 |

The transport conveyance(s) used in the scenario(s) for transport during end of life has the following characteristics.

| | Value and unit |
|---|---|
| Vehicle type used for transport | Lorry (Truck), unspecified (default) \| market group for (GLO) |
| Fuel type and consumption of vehicle | not available |

# 4 Scenarios and additional technical information

| | |
|---|---|
| Capacity utilisation (including empty returns) | 50 % (loaded up and return empty) |
| Bulk density of transported products | inapplicable |
| Volume capacity utilisation factor | 1 |

## 4.3 END OF LIFE (C3, C4)

The scenario(s) assumed for end of life of the product are given in the following tables.
First the assumed percentages per type of waste processing are displayed, followed by the assumed amounts.

| Waste Scenario | Region | Not removed (stays in work) [%] | Landfill [%] | Incineration [%] | Recycling [%] | Re-use [%] |
|---|---|---|---|---|---|---|
| EoL Wood contaminated (EN 17213) (Incineration Denmark) | EU | 0 | 5 | 95 | 0 | 0 |
| Finishes (adhered to wood, plastic, metal) (NMD ID 2) (Incineration Lithuania) | EU | 0 | 0 | 100 | 0 | 0 |
| EoL Steel (EN 17213) | EU | 0 | 5 | 0 | 95 | 0 |
| EoL Plastics (EN 17213) (Incineration Denmark) | EU | 0 | 5 | 95 | 0 | 0 |
| EoL Alu (EN 17213) | EU | 0 | 5 | 0 | 95 | 0 |
| polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57) (Incineration Denmark) | EU | 0 | 10 | 85 | 5 | 0 |
| glass (i.a. flat glass) (NMD ID 28) | NL | 0 | 30 | 0 | 70 | 0 |
| waste not applicable or evaporated (empty scenario) (NMD ID 26) | NL | 0 | 0 | 0 | 0 | 0 |

| Waste Scenario | Not removed (stays in work) [kg] | Landfill [kg] | Incineration [kg] | Recycling [kg] | Re-use [kg] |
|---|---|---|---|---|---|
| EoL Wood contaminated (EN 17213) (Incineration Denmark) | 0.000 | 1.218 | 23.151 | 0.000 | 0.000 |
| Finishes (adhered to wood, plastic, metal) (NMD ID 2) (Incineration Lithuania) | 0.000 | 0.000 | 3.618 | 0.000 | 0.000 |
| EoL Steel (EN 17213) | 0.000 | 0.078 | 0.000 | 1.478 | 0.000 |
| EoL Plastics (EN 17213) (Incineration Denmark) | 0.000 | 0.003 | 0.059 | 0.000 | 0.000 |
| EoL Alu (EN 17213) | 0.000 | 0.021 | 0.000 | 0.394 | 0.000 |
| polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57) (Incineration Denmark) | 0.000 | 0.057 | 0.484 | 0.029 | 0.000 |
| glass (i.a. flat glass) (NMD ID 28) | 0.000 | 6.381 | 0.000 | 14.889 | 0.000 |
| **Total** | **0.000** | **7.758** | **27.313** | **16.790** | **0.000** |

# 4 Scenarios and additional technical information

## 4.4 BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

The presented Benefits and loads beyond the system boundary in this EPD are based on the following calculated Net output flows in kilograms and Energy recovery displayed in MJ Lower Heating Value.

| Waste Scenario | Net output flow [kg] | Energy recovery [MJ] |
|---|---|---|
| EoL Wood contaminated (EN 17213) (Incineration Denmark) | 0.000 | 326.899 |
| Finishes (adhered to wood, plastic, metal) (NMD ID 2) (Incineration Lithuania) | 0.000 | 16.325 |
| EoL Steel (EN 17213) | 0.711 | 0.000 |
| EoL Plastics (EN 17213) (Incineration Denmark) | 0.000 | 1.931 |
| EoL Alu (EN 17213) | 0.088 | 0.000 |
| polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57) (Incineration Denmark) | 0.029 | 13.174 |
| glass (i.a. flat glass) (NMD ID 28) | 14.889 | 0.000 |
| waste not applicable or evaporated (empty scenario) (NMD ID 26) | 0.000 | 0.000 |
| **Total** | **15.717** | **358.329** |

# 5 Results

For the impact assessment, the characterization factors of the LCIA method EN 15804 +A2 Method v1.0 are used. Long-term emissions (>100 years) are not considered in the impact assessment. The results of the impact assessment are only relative statements that do not make any statements about end-points of the impact categories, exceedance of threshold values, safety margins or risks. The following tables show the results of the indicators of the impact assessment, of the use of resources as well as of waste and other output flows.

## 5.1 ENVIRONMENTAL IMPACT INDICATORS PER SQUARE METER

### CORE ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

| Abbr. | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| AP | mol H+ eqv. | 3.61E-1 | 1.71E-2 | 8.62E-2 | 4.65E-1 | 0.00E+0 | 4.47E-3 | 1.04E-2 | 3.97E-4 | -6.36E-2 |
| GWP-total | kg CO2 eqv. | -4.55E+0 | 2.96E+0 | 6.62E+1 | 6.46E+1 | 0.00E+0 | 7.72E-1 | 4.86E+1 | 2.14E+0 | -2.09E+1 |
| GWP-b | kg CO2 eqv. | -4.25E+1 | 1.36E-3 | 3.89E-1 | -4.21E+1 | 0.00E+0 | 3.56E-4 | 3.79E+1 | 2.09E+0 | -2.97E-1 |
| GWP-f | kg CO2 eqv. | 3.79E+1 | 2.95E+0 | 6.58E+1 | 1.07E+2 | 0.00E+0 | 7.71E-1 | 1.07E+1 | 5.23E-2 | -2.06E+1 |
| GWP-luluc | kg CO2 eqv. | 6.83E-2 | 1.08E-3 | 3.02E-2 | 9.96E-2 | 0.00E+0 | 2.82E-4 | 3.89E-4 | 1.37E-5 | -3.03E-2 |
| EP-m | kg N eqv. | 5.49E-2 | 6.04E-3 | 2.38E-2 | 8.47E-2 | 0.00E+0 | 1.58E-3 | 4.35E-3 | 1.78E-4 | -1.07E-2 |
| EP-fw | kg P eq | 1.37E-3 | 2.98E-5 | 4.45E-4 | 1.85E-3 | 0.00E+0 | 7.78E-6 | 1.94E-5 | 6.23E-7 | -7.56E-4 |
| EP-T | mol N eqv. | 6.51E-1 | 6.65E-2 | 2.61E-1 | 9.79E-1 | 0.00E+0 | 1.74E-2 | 4.90E-2 | 1.56E-3 | -1.52E-1 |
| ODP | kg CFC 11 eqv. | 4.46E-6 | 6.52E-7 | 6.88E-6 | 1.20E-5 | 0.00E+0 | 1.70E-7 | 1.12E-7 | 1.79E-8 | -1.63E-6 |
| POCP | kg NMVOC eqv. | 1.24E+1 | 1.90E-2 | 4.99E+0 | 1.74E+1 | 0.00E+0 | 4.96E-3 | 1.29E-2 | 4.78E-4 | -3.76E-2 |
| ADP-f | MJ | 6.61E+2 | 4.45E+1 | 1.09E+3 | 1.80E+3 | 0.00E+0 | 1.16E+1 | 7.14E+0 | 1.23E+0 | -2.66E+2 |
| ADP-mm | kg Sb-eqv. | 9.87E-3 | 7.48E-5 | 2.99E-3 | 1.29E-2 | 0.00E+0 | 1.95E-5 | 1.38E-5 | 2.77E-7 | 8.89E-4 |
| WDP | m3 world eqv. | 1.67E+1 | 1.59E-1 | 4.01E+0 | 2.08E+1 | 0.00E+0 | 4.16E-2 | 2.05E-1 | 1.82E-2 | -2.74E+0 |

**AP**=Acidification (AP) | **GWP-total**=Global warming potential (GWP-total) | **GWP-b**=Global warming potential - Biogenic (GWP-b) | **GWP-f**=Global warming potential - Fossil (GWP-f) | **GWP-luluc**=Global warming potential - Land use and land use change (GWP-luluc) | **EP-m**=Eutrophication marine (EP-m) | **EP-fw**=Eutrophication, freshwater (EP-fw) | **EP-T**=Eutrophication, terrestrial (EP-T) | **ODP**=Ozone depletion (ODP) | **POCP**=Photochemical ozone formation - human health (POCP) | **ADP-f**=Resource use, fossils (ADP-f) | **ADP-mm**=Resource use, minerals and metals (ADP-mm) | **WDP**=Water use (WDP)

# 5 Results

### ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

| Abbr. | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| ETP-fw | CTUe | 8.49E+2 | 3.97E+1 | 6.18E+1 | 9.50E+2 | 0.00E+0 | 1.04E+1 | 8.52E+1 | 1.36E+1 | -3.45E+2 |
| PM | disease incidence | 3.09E-6 | 2.66E-7 | 4.22E-7 | 3.78E-6 | 0.00E+0 | 6.94E-8 | 9.31E-8 | 8.07E-9 | -4.77E-7 |
| HTP-c | CTUh | 4.38E-8 | 1.29E-9 | 1.16E-8 | 5.67E-8 | 0.00E+0 | 3.36E-10 | 1.02E-7 | 1.92E-11 | -5.69E-9 |
| HTP-nc | CTUh | 7.12E-7 | 4.34E-8 | 2.79E-7 | 1.03E-6 | 0.00E+0 | 1.13E-8 | 7.01E-8 | 6.22E-10 | 6.50E-8 |
| IR | kBq U235 eqv. | 1.48E+0 | 1.87E-1 | 8.74E-1 | 2.55E+0 | 0.00E+0 | 4.87E-2 | 2.73E-2 | 5.21E-3 | -6.89E-1 |
| SQP | Pt | 1.79E+2 | 3.86E+1 | 7.22E+1 | 2.90E+2 | 0.00E+0 | 1.01E+1 | 4.92E+0 | 2.76E+0 | -1.64E+2 |

**ETP-fw**=Ecotoxicity, freshwater (ETP-fw) | **PM**=Particulate Matter (PM) | **HTP-c**=Human toxicity, cancer (HTP-c) | **HTP-nc**=Human toxicity, non-cancer (HTP-nc) | **IR**=Ionising radiation, human health (IR) | **SQP**=Land use (SQP)

### CLASSIFICATION OF DISCLAIMERS TO THE DECLARATION OF CORE AND ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

| ILCD classification | Indicator | Disclaimer |
|---|---|---|
| ILCD type / level 1 | Global warming potential (GWP) | None |
| | Depletion potential of the stratospheric ozone layer (ODP) | None |
| | Potential incidence of disease due to PM emissions (PM) | None |
| ILCD type / level 2 | Acidification potential, Accumulated Exceedance (AP) | None |
| | Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater) | None |
| | Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine) | None |
| | Eutrophication potential, Accumulated Exceedance (EP-terrestrial) | None |
| | Formation potential of tropospheric ozone (POCP) | None |
| | Potential Human exposure efficiency relative to U235 (IRP) | 1 |
| ILCD type / level 3 | Abiotic depletion potential for non-fossil resources (ADP-minerals&metals) | 2 |
| | Abiotic depletion potential for fossil resources (ADP-fossil) | 2 |
| | Water (user) deprivation potential, deprivation-weighted water consumption (WDP) | 2 |
| | Potential Comparative Toxic Unit for ecosystems (ETP-fw) | 2 |

# 5 Results

| ILCD classification | Indicator | Disclaimer |
|---|---|---|
| | Potential Comparative Toxic Unit for humans (HTP-c) | 2 |
| | Potential Comparative Toxic Unit for humans (HTP-nc) | 2 |
| | Potential Soil quality index (SQP) | 2 |

**Disclaimer 1** – 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.

**Disclaimer 2** – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

## 5.2 INDICATORS DESCRIBING RESOURCE USE AND ENVIRONMENTAL INFORMATION BASED ON LIFE CYCLE INVENTORY (LCI)

**PARAMETERS DESCRIBING RESOURCE USE**

| Abbr. | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| PERE | MJ | 3.18E+2 | 5.58E-1 | 1.48E+2 | 4.67E+2 | 0.00E+0 | 1.46E-1 | 5.25E-1 | 2.45E-2 | -7.31E+1 |
| PERM | MJ | 2.25E+2 | 0.00E+0 | 9.01E+1 | 3.15E+2 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| PERT | MJ | 5.41E+2 | 5.58E-1 | 2.38E+2 | 7.80E+2 | 0.00E+0 | 1.46E-1 | 5.25E-1 | 2.45E-2 | -7.31E+1 |
| PENRE | MJ | 6.41E+2 | 4.73E+1 | 1.19E+3 | 1.88E+3 | 0.00E+0 | 1.23E+1 | 7.64E+0 | 1.31E+0 | -2.88E+2 |
| PENRM | MJ | 4.18E+1 | 0.00E+0 | 3.61E+0 | 4.55E+1 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| PENRT | MJ | 6.83E+2 | 4.73E+1 | 1.20E+3 | 1.93E+3 | 0.00E+0 | 1.23E+1 | 7.64E+0 | 1.31E+0 | -2.88E+2 |
| SM | Kg | 1.09E+0 | 0.00E+0 | 8.01E-3 | 1.10E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 4.66E-3 |
| RSF | MJ | 1.02E-3 | 0.00E+0 | 4.09E-4 | 1.43E-3 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| NRSF | MJ | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| FW | M3 | 4.62E-1 | 5.43E-3 | 2.13E-1 | 6.80E-1 | 0.00E+0 | 1.42E-3 | 1.71E-2 | 1.43E-3 | -3.20E-1 |

**PERE**=renewable primary energy ex. raw materials | **PERM**=renewable primary energy used as raw materials | **PERT**=renewable primary energy total | **PENRE**=non-renewable primary energy ex. raw materials | **PENRM**=non-renewable primary energy used as raw materials | **PENRT**=non-renewable primary energy total | **SM**=use of secondary material | **RSF**=use of renewable secondary fuels | **NRSF**=use of non-renewable secondary fuels | **FW**=use of net fresh water

# 5 Results

## OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

| Abbr. | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| HWD | Kg | 1.46E-1 | 1.13E-4 | 5.98E-2 | 2.06E-1 | 0.00E+0 | 2.95E-5 | 2.64E-3 | 1.30E-6 | 2.87E-3 |
| NHWD | Kg | 7.80E+0 | 2.83E+0 | 3.38E+0 | 1.40E+1 | 0.00E+0 | 7.38E-1 | 9.07E-1 | 7.76E+0 | -1.32E+0 |
| RWD | Kg | 4.05E-3 | 2.92E-4 | 1.63E-3 | 5.98E-3 | 0.00E+0 | 7.63E-5 | 3.09E-5 | 8.09E-6 | -5.32E-4 |

**HWD**=hazardous waste disposed | **NHWD**=non hazardous waste disposed | **RWD**=radioactive waste disposed

## ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

| Abbr. | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| CRU | Kg | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| MFR | Kg | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 1.68E+1 | 0.00E+0 | 0.00E+0 |
| MER | Kg | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| EET | MJ | 0.00E+0 | 0.00E+0 | -4.27E+1 | -4.27E+1 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | -1.11E+2 |
| EEE | MJ | 0.00E+0 | 0.00E+0 | -2.48E+1 | -2.48E+1 | 0.00E+0 | 0.00E+0 | 0.00E+0 | 0.00E+0 | -6.45E+1 |

**CRU**=Components for re-use | **MFR**=Materials for recycling | **MER**=Materials for energy recovery | **EET**=Exported Energy Thermic | **EEE**=Exported Energy Electric

# 5 Results

## 5.3 INFORMATION ON BIOGENIC CARBON CONTENT PER SQUARE METER

### BIOGENIC CARBON CONTENT

The following Information describes the biogenic carbon content in (the main parts of) the product at the factory gate per square meter:

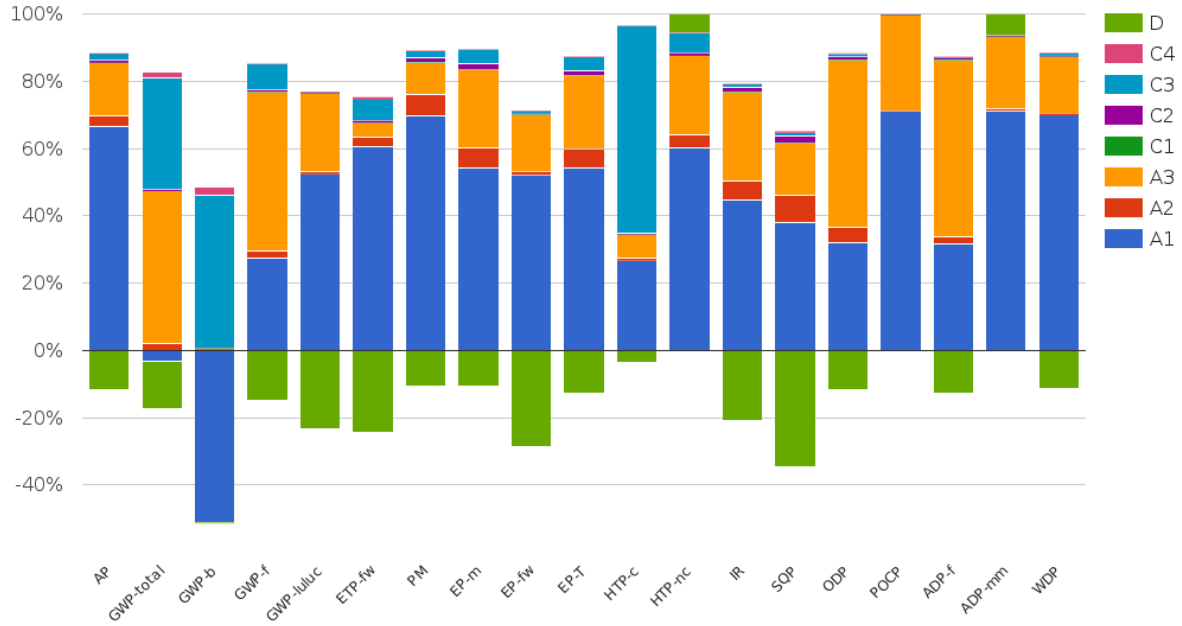
| Biogenic carbon content | Amount | Unit |
|---|---|---|
| Biogenic carbon content in the product | 10.97 | kg C |
| Biogenic carbon content in accompanying packaging | 0 | kg C |

### UPTAKE OF BIOGENIC CARBON DIOXIDE

The following amount of carbon dioxide uptake is taken into account. Related uptake and release of carbon dioxide in downstream processes are not taken into account in this number although they do appear in the presented results. One kilogram of biogenic Carbon content is equivalent to 44/12 kg of biogenic carbon dioxide uptake.

| Uptake Biogenic Carbon dioxide | Amount | Unit |
|---|---|---|
| product | 10.97 | kg CO2 (biogenic) |

# 6 Interpretation of results




The environmental impact data reveals that **Module A1 (Raw Material Supply)** and **Module A3 (Manufacturing)** are the primary contributors to the product's Global Warming Potential (GWP). This is driven by the energy-intensive processes involved in steel and glass production (A1) and the energy consumption required for manufacturing (A3). Together, these modules account for the majority of the total environmental load. Module D offers significant credits due to material recovery, particularly recycling steel and glass.

# 7 References

**ISO 14040**
ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework; EN ISO 14040:2006

**ISO 14044**
ISO 14044:2006-10, Environmental management - Life cycle assessment - Requirements and guidelines; EN ISO 14044:2006

**ISO 14025**
ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

**EN 15804+A2**
EN 15804+A2: 2019: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

**EN 17213:2020** Windows and doors – Environmental Product Declarations – Product category rules for windows and pedestrian doorsets.

**General PCR - Ecobility Experts**
Kiwa-Ecobility Experts (Kiwa-EE) – General Product Category Rules (2022-02-14)

**CML-IA**

Characterisation factors developed by the Institute of Environmental Sciences (CML):

University Leiden (NL) – http://www.cml.leiden.edu/software/data-cmlia.html

**Ecoinvent Database**

Version 3.6 (2019)

**REACH**

REACH Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) https://echa.europa.eu/candidate-list-table

**Stichting National Environmental Database (NMD), Rijswijk 2022**

# 7 References

Verification protocol –inclusion of data in the Dutch environmental database, Version 1.1

**EN 16449**

EN 16449:2014, Wood and wood-based products – Calculation of the biogenic carbon content of wood and conversion to carbon dioxide

**EN 17213**

EN 17213:2020, Windows and doors - Environmental Product Declarations - Product category rules for windows and pedestrian doorsets

# 8 Contact information

| Publisher | Operator | Owner of declaration |
|---|---|---|

**Kiwa-Ecobility Experts**
Wattstraße 11-13
13355 Berlin, DE

**E-mail:**
DE.Ecobility.Experts@kiwa.com
**Website:**
https://www.kiwa.com/de/en/themes/ecobility-experts/ecobility-experts-epd-program/

**Kiwa-Ecobility Experts**
Wattstraße 11-13
13355 Berlin, DE

**E-mail:**
DE.Ecobility.Experts@kiwa.com
**Website:**
https://www.kiwa.com/de/en/themes/ecobility-experts/ecobility-experts-epd-program/

**UAB "ARLANGA wood"**
Jankiškiu str. 30
LT-02300 Vilnius, LT

**E-mail:**
wood@arlangawood.lt
**Website:**
https://arlangawood.lt/

Kiwa-Ecobility Experts is established member of the ECO PLATFORM