ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025, ISO 14040, ISO 14044, EN 15804+A2 and ISO 21930.

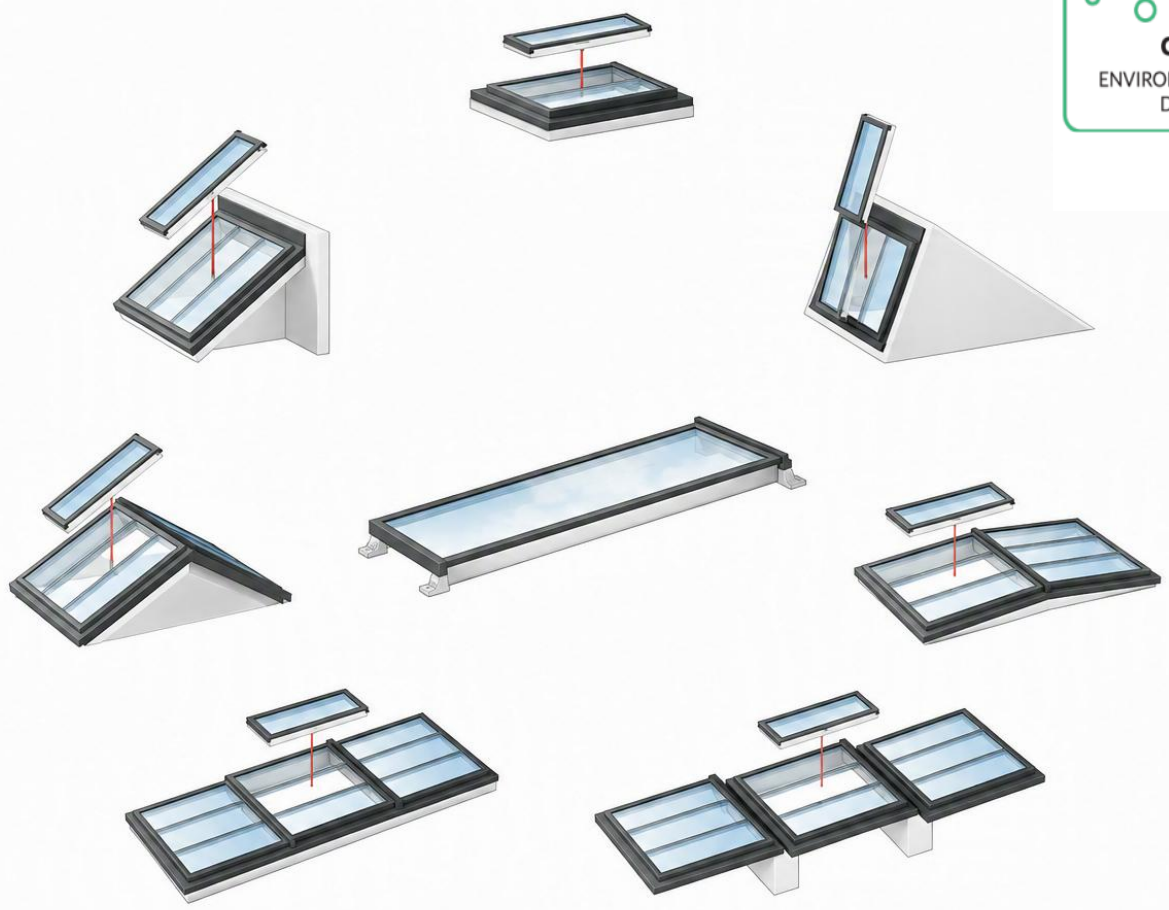
Owner of the Declaration	**Velux Group**
Program operator	Smart EPD
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	SmartEPD-2026-077-1130-01
Registration number	MR-SMA-EPD-VEL-20260878-EN
Issue date	05.11.2026
Valid to	05.11.2031

VELUX Modular Skylights - Triple Glazing Configuration

Velux Group

Registered under the scope of mutual recognition between Institut Bauen und Umwelt e.V. (IBU) and Smart EPD®

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General Information

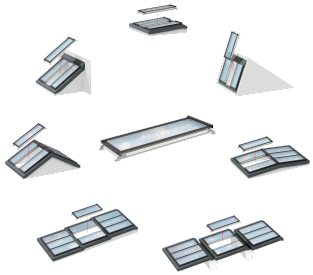
VELUX

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velux.com



Product Name:	VELUX Modular Skylights - Triple Glazing Configuration
Declared Unit:	1 m² of a window ≤ 2.3 m² (reference dimensions according to EN 17213: 1.23 m × 1.48 m)
Declaration Number:	SmartEPD-2026-077-1130-01
Date of Issue:	November 05, 2026
Expiration:	November 05, 2031
Last updated:	November 05, 2026
EPD Scope:	Cradle to gate with other options A1 - A3, A4, A5, C1 - C4, D
Market(s) of Applicability:	Europe

General Organization Information

VELUX is a Danish manufacturing company that specializes in roof windows, skylights, sun tunnels and related accessories. The company is headquartered in Hørsholm, Denmark and is a part of VKR Holding A/S. VELUX Group is a founding partner of the global Active House Alliance.

Further information can be found at: https://www.velux.com

Limitations, Liability and Ownership

Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance of products using EPD information shall be based on the product's use and impacts at the building level, and therefore EPDs may not be used for comparability purposes when not considering the whole building life cycle. EPD comparability is only possible when all stages of a life cycle have been considered. However, variations and deviations are possible. Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared. The EPD owner has sole ownership, liability, and responsibility for the EPD.

Reference Standards

Standard(s):	ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021
Core PCR:	IBU PCR for Building-Related Products and Services Part A v1.4 Date of issue: April 15, 2024
Sub-category PCR:	IBU PCR Part B: Requirements on the EPD for Windows and Doors v1.0/1.7/1.4 Date of issue: January 26, 2021 Valid until: August 01, 2026

Sub-category PCR review panel:	Contact Smart EPD for more information.
General Program Instructions:	Smart EPD General Program Instructions v.2.0, March 2025

Verification Information

LCA Author/Creator:	juan@parqhq.com parq juan@parqhq.com
EPD Program Operator:	Smart EPD info@smartepd.com www.smartepd.com 585 Grove St., Ste. 145, Herndon, VA 20170, USA
Verification:	Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071: External Rifat Karim | Independent Consultant | rifat.chimique@gmail.com Independent external verification of EPD, according to ISO 14025 and reference PCR(s): External Rifat Karim | Independent Consultant | rifat.chimique@gmail.com

Product Information

Declared Unit:	1 m² of a window ≤ 2.3 m² (reference dimensions according to EN 17213: 1.23 m × 1.48 m)
Mass:	69.18 kg
Product Specificity:	✗ Product Average ✓ Product Specific

Product Description

VELUX Modular Skylights (VMS) are sash-frame constructed single roof windows and are CE-marked in accordance with EN 14351-1. The modules fit together and can be configured in several predefined daylight solutions. The skylights come as fixed or venting modules and are delivered with dedicated factory finished flashings to ensure watertightness in every solution. The EPD covers VMS modules in sizes from 0.405 m² up to 2.3 m², the chain actuator (motor) is not included in this EPD. The glass panes are triple glazing and different glass configurations are covered by the EPD. The glass thickness ranges from 18 to 22 mm. The glass panes have cavities filled with Argon gas others with Krypton. The representative glass configuration used for the EPD calculations has 8 mm toughened glass, 12 mm spacer, 4 mm toughened glass, 12 mm spacer and 10 mm laminated glass. This configuration is conservative with regards to the environmental impact results. The product has a reference service life of 30 years according to EN 17213.

Product Specifications

Product SKU(s):	VMS HVC 1230x1480 - Triple Glazed (0016TB)
Product Classification Codes:	EC3 - Openings -> TranslucentWallAndRoofAssemblies

Material Composition

Material/Component Category	Origin	% Mass
Aluminum profile	DK	1.67
Fasteners	DK	0.26
Gaskets, washers	DK	0.18
Hard plastics	DK	0.27
Insulated glass	DK	75.89
Other polymer parts	DK	0.01
Others		1.0
Sash	DK	13.95
Sealing, gaskets	DK	0.83
Steel	DK	5.94

Packaging Material	Origin	kg Mass
Cardboard	EU	0.11
Pallet	EU	0.07
Plastic cover	EU	0.55

Biogenic Carbon Content	kg C per m²
Biogenic carbon content in product	0
Biogenic carbon content in accompanying packaging	0.08

Hazardous Materials
No regulated hazardous or dangerous substances are included in this product.

EPD Data Specificity

Primary Data Year: Jan 1, 2025 - Dec 31, 2025

Manufacturing Specificity:

- ✗ Industry Average
- ✗ Manufacturer Average
- ✓ Facility Specific

Averaging:

Averaging was not conducted for this EPD

System Boundary

Production	A1	Raw material supply	✓
	A2	Transport	✓
	A3	Manufacturing	✓
Construction	A4	Transport to site	✓
	A5	Assembly / Install	✓
Use	B1	Use	ND
	B2	Maintenance	ND
	B3	Repair	ND
	B4	Replacement	ND
	B5	Refurbishment	ND
	B6	Operational Energy Use	ND
	B7	Operational Water Use	ND
End of Life	C1	Deconstruction	✓
	C2	Transport	✓
	C3	Waste Processing	✓
	C4	Disposal	✓
Benefits & Loads Beyond System Boundary	D	Recycling, Reuse Recovery Potential	✓

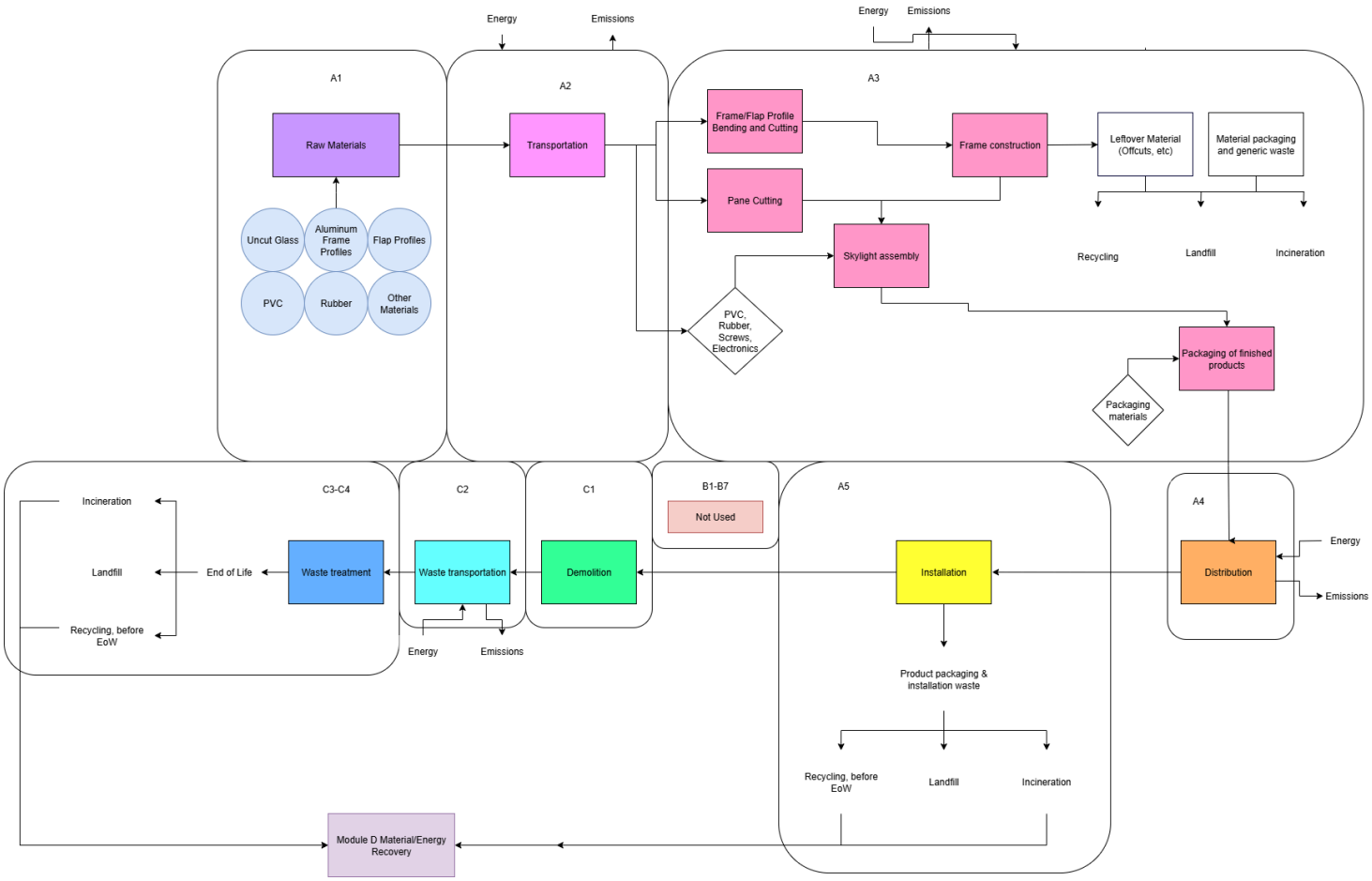
Note:

ND = Module not declared

Plants

Østbirk Østvej 2, Ostbirk, Denmark

Product Flow Diagram



Software And Database

LCA Software:	SimaPro v. 10.2	
LCI Foreground Database(s):	Ecoinvent v. 3.9.1	Cut-off by Classification
LCI Background Database(s):	Ecoinvent v. 3.9.1	Cut-off by Classification

A foreground LCI database is the database used to model the primary, site-specific data collected for this EPD. A background LCI database is the database used to model generic or non-specific data.

Data Quality

Precision & Completeness

- **Precision:** Inventory data were directly measured, calculated, or conservatively estimated from primary sources using consistent units and QA checks. Background processes from ecoinvent v3 were adopted with their documented uncertainty/precision metadata where available, preserving a transparent record of data quality.

- **Completeness:** The product system's mass balance and inventory completeness were thoroughly checked. Some exclusions were made in line with the PCR requirements, such as personnel impacts, R&D activities, business travel, and point-of-sale infrastructure. However, no data were intentionally omitted.

Consistency and Reproducibility

- **Consistency:** Primary data for all modules were consistently gathered aiming at the highest level of detail possible. Background processes were modeled mainly with the ecoinvent database. The same allocation rules, cut-off criteria, and impact assessment methods were applied throughout, ensuring methodological coherence and consistent data quality across the entire LCA model.
- **Reproducibility:** This study ensures reproducibility by providing comprehensive disclosure of input–output data, dataset choices, and modeling approaches. A knowledgeable third party should be able to approximate the results using the same data and modeling methods.

Representativeness

- **Temporal:** Primary data were collected for a 12-month period representing the 2025 calendar year to ensure the representativeness of post-consumer content. Secondary data from the ecoinvent v3 database are typically representative of recent years.
- **Geographical:** Primary data represent VELUX's production facilities. Where applicable, differences in electric grid mix were considered using appropriate secondary data. The use of country-specific data ensures high geographical representativeness, and proxy data were only used when country-specific data were unavailable.
- **Technological:** Both primary and secondary data were tailored to the specific technologies studied, ensuring high technological representativeness.

Life Cycle Module Description

Modules A1–A3: The LCA model covers the manufacture of raw materials and components for VELUX products (A1) which are then transported to VELUX facilities by truck (A2). The manufacturing stage (A3) begins with receipt of these materials, which are bent, cut, welded, and assembled into finished flaps and skylight systems. When required, additional parts like DSL grids and electronic components for home-automation systems are custom-cut and assembled to order.
Modules A4–A5: Once manufacture is completed, products are shipped to distribution centers and then to the end user by truck (A4). For installation (A5), a 3% material installation loss was assumed. This module includes disposal of that waste and of the product packaging.
Modules C1–C4 and D: At end of life (C1–C4), the product is assumed to be collected, and each waste stream (e.g., aluminum, glass, PVC) is handled separately—landfilled, recycled, or incinerated with energy recovery. Loads and benefits beyond the system boundary are considered in Module D (e.g., displacement of virgin materials and electricity).

LCA Discussion

Allocation Procedure

Allocation of co-products was avoided, to the extent possible, based on the guidance given in ISO 14044:2006, 4.3, and in EN 15804+A2:2019. Energy use at the facility level was allocated by the amount of product produced. The manufacturing process does not consume water or generate wastewater or air emissions, other than those from fuel combustion. Solid waste was estimated using packaging masses and material losses and allocated following the polluter pays principle.

Cut-off Procedure

The system boundary was defined based on relevance to the goal of the study. For the raw material (A1) and process related inputs (A3), all available energy and material flow data have been included in the model.

Renewable Electricity

Energy Attribute Certificates (EACs) such as Renewable Energy Certificates (RECs) or Power Purchase Agreements (PPAs) are included in the baseline reported results:	✓ Yes
Electricity Source:	Offsite
Renewable type(s):	solar
Percent of EPD Owner's product-related electricity covered:	100 %
Commitment pledged for entire EPD validity period:	✓ Yes
Electricity accounting methodology:	Market-based

Scenarios

Transport to the building/construction site (A4)

A4 Module

Fuel Type:	Diesel
Vehicle Type:	Truck and Trailer
Transport Distance:	350 km
Capacity Utilization:	33 %
Packaging Mass:	0.73 kg
Weight of products transported:	69.91 kg
Capacity utilization volume factor:	1
Assumptions for scenario development:	Transport distance includes finished product to distribution center and distribution center to point of sale.

Installation in to the building/construction site (A5)

A5 Module

Installation Scrap Rate Assumed:	0 %
Mass of Packaging Waste Specified by Type:	0.734 kg
Biogenic Carbon Contained in Packaging (kg C):	0.08453 kg
Assumptions for scenario development:	No installation product loss as these are modular systems

End of Life (C1 - C4)

C1 - C4 Modules

Collection Process

Collected Separately:	69.18 kg
Collected with Mixed Construction Waste:	0 kg

Recovery

Recycling:	21.15 kg
Landfill:	36.99 kg
Incineration:	11.03 kg

Assumptions for scenario development:

Disposal and recycling rates as per Environmental Performance Assessment Method for Construction Works / version 1.2 (January 2025).

Reuse, Recovery and / or Recycling Potentials & Relevant Scenario Information (D)

D Module

Recycling Rate of Product:	30.58 %
Recycled Content of Product:	9.50 %
Net Energy Benefit from Energy Recovery from Waste Treatment Declared as Export Energy in C3:	88.80 MJ
Process and Conversion Efficiencies:	Recycling rates for aluminum, steel and other metals >90%; energy recovery from incineration assumes 18% electrical efficiency and 31% thermal, as per Environmental Performance Assessment Method for Construction Works / version 1.2 (January 2025).

Results

Environmental Impact Assessment Results

EF 3.1

per 1 m² of product of a window ≤ 2.3 m² (reference dimensions according to EN 17213: 1.23 m × 1.48 m).

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Impact Category	Unit	Method	A1 - A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO2 eq	EF 3.1	2.08e+2	2.45e+0	1.36e+0	0	6.43e-1	7.78e+0	1.06e-1	-2.27e+1
GWP-biogenic	kg CO2 eq	EF 3.1	7.66e-1	8.21e-4	2.97e-1	0	2.15e-4	5.12e-4	1.94e-5	-2.07e-3
GWP-fossil	kg CO2 eq	EF 3.1	2.07e+2	2.45e+0	1.07e+0	0	6.42e-1	7.78e+0	1.06e-1	-2.26e+1
GWP-luluc	kg CO2 eq	EF 3.1	1.81e-1	1.20e-3	1.30e-5	0	3.13e-4	5.92e-5	1.26e-5	-2.98e-2
ODP	kg CFC11 eq	EF 3.1	3.76e-6	5.56e-8	1.34e-9	0	1.46e-8	8.02e-9	1.59e-9	-8.18e-7
AP	mol H+ eq	EF 3.1	1.28e+0	6.07e-3	2.80e-4	0	1.59e-3	1.78e-3	9.56e-4	-8.46e-2
EP-freshwater	kg P eq	EF 3.1	3.48e-2	1.81e-4	4.36e-6	0	4.74e-5	2.33e-5	5.37e-6	-4.81e-3
EP-marine	kg N eq	EF 3.1	2.82e-1	1.65e-3	1.53e-4	0	4.33e-4	1.01e-3	4.29e-4	-1.54e-2
EP-terrestrial	mol N eq	EF 3.1	2.41e+0	1.70e-2	1.32e-3	0	4.45e-3	8.65e-3	4.66e-3	-1.72e-1
POCP	kg NMVOC eq	EF 3.1	7.89e-1	9.91e-3	3.54e-4	0	2.60e-3	2.18e-3	1.40e-3	-7.15e-2
ADP-minerals&metals	kg Sb eq	EF 3.1	1.01e-3	6.85e-6	7.96e-8	0	1.80e-6	3.75e-7	3.79e-8	9.21e-5
ADP-fossil	MJ	EF 3.1	2.85e+3	3.72e+1	3.54e-1	0	9.74e+0	1.44e+0	1.36e+0	-2.68e+2
WDP	m3 depriv.	EF 3.1	1.16e+2	1.78e-1	4.82e-2	0	4.65e-2	3.53e-1	3.02e-3	-6.13e+0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

GWP = Global Warming Potential, 100 years (may also be denoted as GWP-total, GWP-fossil (fossil fuels), GWP-biogenic (biogenic sources), GWP-luluc (land use and land use change)), ODP = Ozone Depletion Potential, AP = Acidification Potential, EP = Eutrophication Potential, SFP = Smog Formation Potential, POCP = Photochemical oxidant creation potential, ADP-Fossil = Abiotic depletion potential for fossil resources,

ADP-Minerals&Metals = Abiotic depletion potential for non-fossil resources, WDP = Water deprivation potential, PM = Particular Matter Emissions, IRP = Ionizing radiation, human health, ETP-fw = Eco-toxicity (freshwater), HTP-c = Human toxicity (cancer), HTP-nc = Human toxicity (non-cancer), SQP = Soil quality index.

Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase when product performance and specifications have been established and serve as a functional unit for comparison. Environmental impact results shall be converted to a functional unit basis before any comparison is attempted. Any comparison of EPDs shall be subject to the requirements of ISO 21930 or EN 15804. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries, are based on different product category rules or are missing relevant environmental impacts. Such comparison can be inaccurate, and could lead to erroneous selection of materials or products which are higher-impact, at least in some impact categories.

Resource Use Indicator

per 1 m² of product of a window ≤ 2.3 m² (reference dimensions according to EN 17213: 1.23 m × 1.48 m).

Indicator	Unit	A1 - A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	3.48e+2	5.44e-1	1.04e-2	0	1.43e-1	5.90e-2	1.12e-2	-9.21e+0
PERM	MJ	6.70e+1	0	0	0	0	0	0	0
PERT	MJ	4.15e+2	5.44e-1	1.04e-2	0	1.43e-1	5.90e-2	1.12e-2	-9.21e+0
PENRE	MJ	2.85e+3	3.72e+1	3.54e-1	0	9.74e+0	1.44e+0	1.36e+0	-2.68e+2
PENRM	MJ	8.65e-1	1.57e-3	1.50e-5	0	4.11e-4	6.36e-5	1.59e-5	5.86e-3
PENRT	MJ	2.85e+3	3.72e+1	3.54e-1	0	9.74e+0	1.44e+0	1.36e+0	-2.68e+2
SM	kg	7.89e+0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m3	2.99e+0	5.04e-3	1.53e-3	0	1.32e-3	1.11e-2	7.26e-5	-1.48e-1

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

RPRE or PERE = Renewable primary resources used as energy carrier (fuel), RPRM or PERM = Renewable primary resources with energy content used as material, RPRT or PERT = Total use of renewable primary resources with energy content, NRPRE or PENRE = Non-renewable primary resources used as an energy carrier (fuel), NRPRM or PENRM = Non-renewable primary resources with energy content used as material, NRPRT or PENRT = Total non-renewable primary resources with energy content, SM = Secondary materials, RSF = Renewable secondary fuels, NRSF = Non-renewable secondary fuels, RE = Recovered energy, ADPF = Abiotic depletion potential, FW = Use of net freshwater resources, VOCs = Volatile Organic Compounds.

Waste and Output Flow Indicators

per 1 m² of product of a window ≤ 2.3 m² (reference dimensions according to EN 17213: 1.23 m × 1.48 m).

Indicator	Unit	A1 - A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	0	0	0	0	0	0	0	0
NHWD	kg	4.07e+0	0	1.14e-1	0	0	0	3.70e+1	0
RWD	kg	2.47e-3	1.13e-5	1.47e-7	0	2.97e-6	7.31e-7	1.60e-7	-1.59e-6
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	5.35e+0	0	1.01e-1	0	0	2.12e+1	0	0
MER	kg	0	0	0	0	0	0	0	0
EE	MJ	3.32e+1	0	7.15e+0	0	0	8.88e+1	0	0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

HWD = Hazardous waste disposed, NHWD = Non-hazardous waste disposed, RWD = Radioactive waste disposed, HLRW = High-level radioactive waste, ILLRW = Intermediate- and low-level radioactive waste, CRU = Components for re-use, MFR or MR = Materials for recycling, MER = Materials for energy recovery, MNER = Materials for incineration, no energy recovery, EE or EEE = Recovered energy exported from the product system, EET = Exported thermal energy.

Carbon Emissions and Removals

per 1 m² of product of a window ≤ 2.3 m² (reference dimensions according to EN 17213: 1.23 m × 1.48 m).

Indicator	Unit	A1 - A3	A4	A5	C1	C2	C3	C4	D
Bio Carbon Removal from Product	kg CO2	0	0	0	0	0	0	0	0
Bio Carbon Emission from Product	kg CO2	0	0	0	0	0	0	0	0
Bio Carbon Removal from Packaging	kg CO2	-7.00e+0	0	0	0	0	0	0	0
Bio Carbon Emission from Packaging	kg CO2	6.69e+0	0	3.10e-1	0	0	0	0	0
Bio Carbon Emission from Waste during Manufacturing (renewable source)	kg CO2	0	0	0	0	0	0	0	0
Calcination Carbon Removal	kg CO2	0	0	0	0	0	0	0	0
Carbonation Carbon Emission	kg CO2	0	0	0	0	0	0	0	0
Carbon Emission from Waste during Manufacturing (non-renewable source)	kg CO2	0	0	0	0	0	0	0	0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

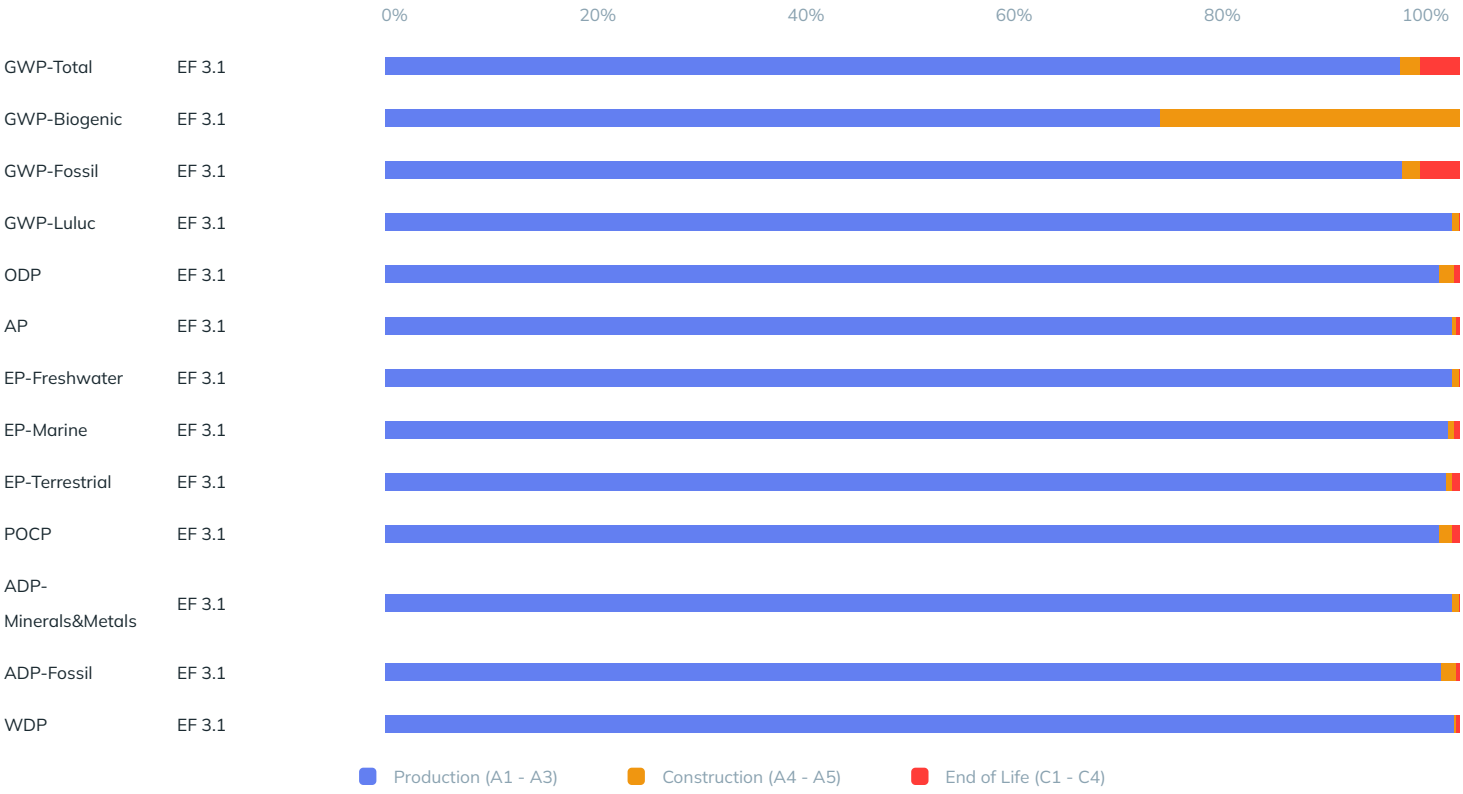
Abbreviations:

BCRP = Biogenic Carbon Removal from Product, BCEP = Biogenic Carbon Emission from Product, BCRK = Biogenic Carbon Removal from Packaging, BCEK = Biogenic Carbon Emission from Packaging, BCEW = Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes, CCE = Calcination Carbon Emissions, CCR = Carbonation Carbon Removals, CWNR = Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes, GWP-luc = Carbon Emissions from Land-use Change.

Interpretation

The manufacturing of the products in this analysis involves the direct procurement of raw materials from suppliers. These materials are then transported to manufacturing facilities in the EU where they are stored, processed, and combined to produce finished products. Notably, the product stage has the highest impact contribution, mainly attributed to the environmental impacts of raw material manufacturing.

Given that the raw materials used in product manufacturing have a significant impact, exploration of opportunities to substitute these materials with alternatives that have a lower environmental impact. Additionally, consideration should be given to collaborating with suppliers who employ sustainable manufacturing techniques or integrate more renewable energy into their production processes. Such initiatives can lead to more environmentally friendly products and further enhance the sustainability of the products in this analysis.



Further Information

Technical characteristics

Name	Value	Unit
Fire resistance class	B-s1.d0	class
Air permeability	4	class
Resistance to win load, (for window width >1000 mm or height > 2400 mm no performance is determined)	C5	class

Name	Value	Unit
Resistance to snow loads	8 mm toughened - 16 mm - 10.76 mm (55.2) laminated float	mm
Watertightnes	E1200	class
Impact resistance, (for window width >550 mm or height > 778 mm no performance is determined	test is passed	-
Load bearing capacity of safety devices	test is passed	-
Acoustic performance	38 (-1; -4)	-
Thermal transmittance, 0 degree installation acc. to EN 10077-1/2	1.1	W/(m^(2)K)
Solar factor	0.50	-
Light transmittance	0.71	-

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