Environmental Product Declaration (EPD)
According to ISO 14025 and EN 15804+A2:2019

Coat and shoe rack BB82

Registration number:	EPD-Kiwa-EE-205218-EN
Issue date:	08-09-2025
Valid until:	08-09-2030
Declaration owner:	AB Byggbeslag
Publisher:	Kiwa-Ecobility Experts
Programme operator:	Kiwa-Ecobility Experts
Status:	verified

1 General information

1.1 PRODUCT

Coat and shoe rack BB82

1.2 REGISTRATION NUMBER

EPD-Kiwa-EE-205218-EN

1.3 VALIDITY

Issue date: 08-09-2025

Valid until: 08-09-2030

1.4 PROGRAMME OPERATOR

Kiwa-Ecobility Experts
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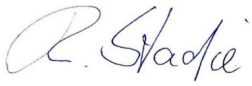
13355 Berlin
DE

Raoul Mancke

(Head of programme operations, Kiwa-Ecobility Experts)



Dr. Ronny Stadie

(Verification body, Kiwa-Ecobility Experts)

1.5 OWNER OF THE DECLARATION

Declaration owner: AB Byggbeslag

Address: Säterivägen 5, 615 12 Karlstad, Sweden

E-mail: info@byggbeslag.se

Website: https://www.byggbeslag.se/

Production location: AB Byggbeslag

Address production location: Säterivägen 5, 65341 Karlstad, Sweden

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+A2:2019 serves as the core PCR.

☐ Internal ☒ External

Lucas Pedro Berman, Senda

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-EE GPI R.3.0 (2025)

Kiwa-EE GPI R.3.0 Annex B1 (2025)

NPCR 026 Part B for Furniture and components of furniture (references to EN 15804+A2) (version 3.0)

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+A2:2019.

1 General information

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 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+A2:2019 and ISO 14025.

1.10 CALCULATION BASIS

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

LCA software*: Simapro 9.6

Characterization method: RETHINK characterization method (see references for more details)

LCA database profiles: ecoinvent (for version see references)

Version database: v3.19 (20250306)

** 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 'Coat and shoe rack BB82' with the calculation identifier ReTHiNK-105218.

2 Product

2.1 PRODUCT DESCRIPTION

The clothing rack and the shoe rack are furniture used as storage in buildings such as housing and offices, often placed in the entrance for coats, hats and shoes.

In this EPD the declared product group is clothing rack BB82 and shoe rack BB82 with the declared unit 1 piece clothing rack of 1 meter. They consist of the following parts: galvanized steel pipes, lacquered steel consoles at both ends and in between. The clothing rack is equipped with steel hooks. The racks are available in different lengths, from 490 mm up to 5000 mm. The lenghts increase gradually by 100 mm, after a length of 3000 mm the increase is in steps of 500 mm.

This EPD refers to a worst case product which is the clothing rack. The amount of steel in the shoe rack is less. The products were grouped together since they are similar in material and application.

Component	Weight %
Steel consoles	50
Steel pipes	39
Steel hooks	10
Plastic stopper	0.5
Plastic bushing	0.5

2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

The main purpose of the clothing and the shoe rack is to provide storage solutions for indoor spaces to help users effectively store and organize their belongings such as coats, hats and shoes.

The main customers of the manufacturer are other businesses.

2.3 REFERENCE SERVICE LIFE

RSL PRODUCT

The reference service life is 15 years following the PCR and is used for the calculations. The estimated service life is 25 years according to the manufacturer.

USED RSL (YR) IN THIS LCA CALCULATION:

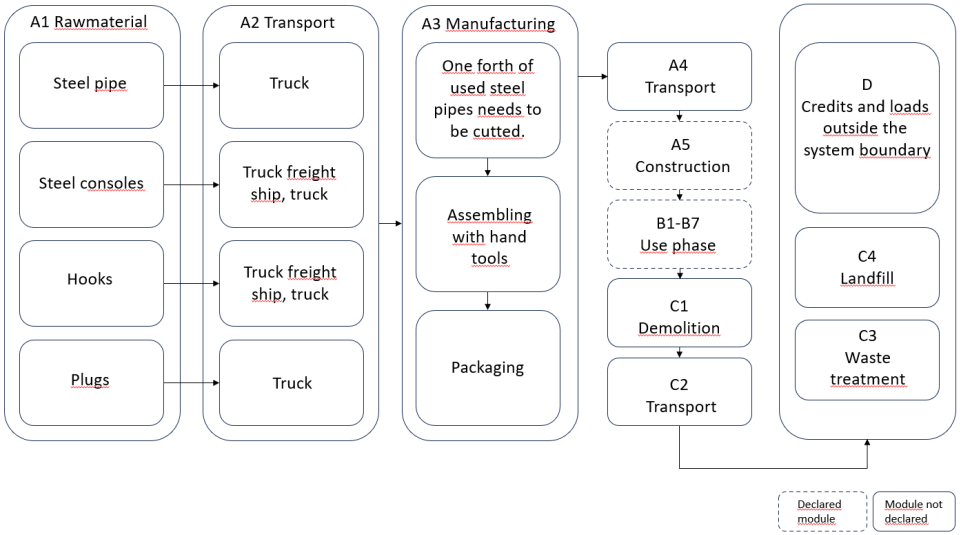
15

2.4 SUBSTANCES OF VERY HIGH CONCERN

The product in this EPD does not contain substances from the "Candidate list of substances of very high concern (SVHC) for authorization" in concentration above 0.1 %.

2.5 DESCRIPTION PRODUCTION PROCESS

All raw materials used in the production of the clothing rack are transported by truck to the production facility. At the production facility the manufacturing starts by choosing the right length of steel pipe. Depending on the needed lengths certain pipes need to be cut into appropriate lengths before assembling. The different materials are then assembled into clothing racks and shoe racks by using hand tools such as hammers and screwdrivers. After the assembly, the racks are then packaged for delivery.



2.6 CONSTRUCTION DESCRIPTION

The construction process is done through manual labor with hand tools.

3 Calculation rules

3.1 DECLARED UNIT

1 piece clothing rack of 1 m

The declared unit is 1 piece clothing rack of 1 m.

Reference unit: piece (p)

3.2 CONVERSION FACTORS

Description	Value	Unit
Reference unit	1	p
Weight per reference unit	3.456	kg
Conversion factor to 1 kg	0.289352	p

3.3 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

This is a Cradle to gate with options, 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	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

The modules of the EN 15804 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 Coat and shoe rack BB82, a product of AB Byggbeslag. 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, packaging, etc.) and output flows (e.g. production waste) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

3 Calculation rules

The manufacture of equipment used in production, buildings or any other capital goods, the transport of personnel to and within the plant, research and development activities and the long-term emissions were not taken into account in the LCA.

Construction process stage (A4-A5)

All input flows (e.g. transportation to the construction site, additional raw material use for construction, installation energy (use)of energy use for assembly , etc.) and output flows (e.g. construction waste, packaging waste, etc.) are considered in this LCA. For the construction process the customer chooses screws for installation. This is due to what's need for the project depending on the type of wall. Due to the uncertainty of what type of screws is used during installation and the few used, the weight of the screws has not been used in this EPD. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

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

There are no co-products produced during the manufacturing of this product. There are no allocations for the declared modules.

3.7 DATA COLLECTION & REFERENCE PERIOD

All relevant data was collected for the year 2024, January to December.

3.8 ESTIMATES AND ASSUMPTIONS

The following estimates and assumptions have been made for this EPD.

The racks are available in lengths between 490 mm and 5000 mm. Most of the components amounts (like pipes, hooks, plastic stoppers and bushings) increase proportionally. In these cases the amounts for one meter were determined. Where the amount of material doesn't increase proportionally (consoles) the biggest amount referring to 5 m was broken down to 1 m and thus determined the amount of consoles used for the declared unit 1 piece of 1 m (worst case material).

The energy per declared unit refers to the average amount of energy used for their total production in 2024. This is due to the fact that assembly is mainly done by hand. Energy use is minimal during the production of the clothing rack.

The averaged weight for one cardboard box has been used. The tape has been estimated based on the amount used for BB82, density of tape and sold BB82 units for 2024. The EUR-flat pallet use has been averaged to one clothing rack BB82. The averaged was calculated based on the total amount of pieces clothing rack that fits on the pallet.

The calculations have been performed in accordance with the “polluter pays” and “modularity” principles, as defined in EN 15804+A2.

3.9 DATA QUALITY

All data that is specific to the product and process was provided by the manufacturer for the operating year 2024 and is therefore up-to-date. The manufacturer and their production is located in Karlstad, Sweden.

Background data was taken from the Ecoinvent 3.9.1 database. The database is regularly checked and thus complies with the requirements of ISO 14040/44 (background data not older than 10 years). The background data meets the requirements of EN 15804.

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 scenarios included are currently in use and are representative for one of the most likely scenario alternatives. According to the criteria of the "UN Environmental Global Guidance on LCA database development" mentioned in EN 15804+A2, the data quality for all three representativeness categories (geographical, technical and time) can be described as good.

3 Calculation rules

3.10 POWER MIX

The energy used is the profile for Sweden's residual mix.

The emission factor the of carbon footprint for the applied electricity mix is declared as 0.0786 kg CO2e/kWh.

4 Scenarios and additional technical information

4.1 TRANSPORT TO CONSTRUCTION SITE (A4)

For the transport from production place to assembly/user, the following scenario is assumed for module A4 of this EPD.

	Value and unit
Vehicle type used for transport	(ei3.6) Lorry (Truck), unspecified (default) | market group for (GLO)
Fuel type and consumption of vehicle	not available
Distance	320 km
Capacity utilisation (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilisation factor	1

4.2 ASSEMBLY (A5)

The following information describes the scenarios for flows entering the system and flows leaving the system at module A5.

FLOWS ENTERING THE SYSTEM

There are no significant environment impacts as a result of materials or energy used in the construction stage (A5).

FLOWS LEAVING THE SYSTEM

The following output flows leaving the system at module A5 are assumed.

Description	Value	Unit
Output materials as result of loss during construction	3	%
Output materials as result of waste processing of materials used for installation/assembly at the building site	0.000	kg
Output materials as result of waste processing of used packaging	1.222	kg

4.3 DE-CONSTRUCTION, DEMOLITION (C1)

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

4.4 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.

4 Scenarios and additional technical information

Waste Scenario	Transport conveyance	Not removed (stays in work) [km]	Landfill [km]	Incineration [km]	Recycling [km]	Re-use [km]
(ei3.6) Metals, others (i.a. fasteners, fittings) (NMD ID 50)	(ei3.6) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	0
(ei3.6) plastics, via residue (NMD ID 43)	(ei3.6) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	0
(ei3.6) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	(ei3.6) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	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	(ei3.6) Lorry (Truck), unspecified (default) | market group for (GLO)
Fuel type and consumption of vehicle	not available
Capacity utilisation (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilisation factor	1

	Value and unit
Vehicle type used for transport	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)
Fuel type and consumption of vehicle	not available
Capacity utilisation (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilisation factor	1

4.5 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.

4 Scenarios and additional technical information

Waste Scenario	Region	Not removed (stays in work) [%]	Landfill [%]	Incineration [%]	Recycling [%]	Re-use [%]
(ei3.6) Metals, others (i.a. fasteners, fittings) (NMD ID 50)	NL	0	5	5	90	0
(ei3.6) plastics, via residue (NMD ID 43)	NL	0	20	80	0	0
(ei3.6) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	NL	0	10	85	5	0

Waste Scenario	Not removed (stays in work) [kg]	Landfill [kg]	Incineration [kg]	Recycling [kg]	Re-use [kg]
(ei3.6) Metals, others (i.a. fasteners, fittings) (NMD ID 50)	0.000	0.171	0.171	3.078	0.000
(ei3.6) plastics, via residue (NMD ID 43)	0.000	0.004	0.016	0.000	0.000
(ei3.6) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	0.000	0.002	0.014	0.001	0.000
Total	**0.000**	**0.177**	**0.201**	**3.079**	**0.000**

4.6 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]
(ei3.6) Metals, others (i.a. fasteners, fittings) (NMD ID 50)	2.634	0.000
(ei3.6) plastics, via residue (NMD ID 43)	0.000	0.493
(ei3.6) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	0.001	0.578
Total	**2.634**	**1.070**

5 Results

For the impact assessment long-term emissions (>100 years) are not considered. 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 PIECE

CORE ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	1.57E+1	5.77E-1	-1.05E+0	1.52E+1	2.02E-1	2.61E+0	0.00E+0	2.72E-2	8.08E-2	2.29E-3	-3.95E+0
GWP-f	kg CO_2 eq.	1.57E+1	5.76E-1	9.08E-1	1.71E+1	2.02E-1	5.89E-1	0.00E+0	2.72E-2	8.07E-2	2.28E-3	-3.96E+0
GWP-b	kg CO_2 eq.	2.92E-2	1.34E-4	-1.97E+0	-1.94E+0	8.14E-5	2.02E+0	0.00E+0	1.10E-5	1.80E-5	2.58E-6	5.29E-3
GWP-luluc	kg CO_2 eq.	1.04E-2	5.38E-4	1.36E-2	2.45E-2	7.41E-5	7.92E-4	0.00E+0	9.98E-6	6.83E-6	4.61E-7	2.18E-3
ODP	kg CFC 11 eq.	7.85E-7	9.62E-9	4.21E-8	8.37E-7	4.46E-8	3.11E-8	0.00E+0	6.01E-9	2.79E-9	5.71E-10	-1.09E-7
AP	mol H+ eq.	1.00E-1	1.30E-2	4.81E-3	1.18E-1	1.17E-3	4.06E-3	0.00E+0	1.58E-4	4.55E-5	1.39E-5	-1.61E-2
EP-fw	kg P eq.	6.05E-4	3.02E-6	6.19E-5	6.70E-4	2.04E-6	2.11E-5	0.00E+0	2.74E-7	2.68E-7	2.08E-8	-1.45E-4
EP-m	kg N eq.	1.70E-2	3.28E-3	2.44E-3	2.27E-2	4.13E-4	8.93E-4	0.00E+0	5.57E-5	1.29E-5	5.33E-6	-3.13E-3
EP-T	mol N eq.	1.93E-1	3.62E-2	1.52E-2	2.45E-1	4.55E-3	9.64E-3	0.00E+0	6.13E-4	1.43E-4	5.66E-5	-3.79E-2
POCP	kg NMVOC eq.	6.11E-2	1.01E-2	4.66E-3	7.58E-2	1.30E-3	2.98E-3	0.00E+0	1.75E-4	4.04E-5	1.63E-5	-2.31E-2
ADP-mm	kg Sb-eq.	5.68E-4	8.84E-7	6.21E-6	5.75E-4	5.12E-6	1.79E-5	0.00E+0	6.90E-7	1.32E-7	1.41E-8	-3.06E-6
ADP-f	MJ	1.68E+2	7.42E+0	1.53E+1	1.91E+2	3.05E+0	6.58E+0	0.00E+0	4.11E-1	8.91E-2	4.25E-2	-2.84E+1
WDP	m3 world eq.	2.11E+0	2.23E-2	4.59E-1	2.59E+0	1.09E-2	8.59E-2	0.00E+0	1.47E-3	1.79E-3	2.54E-4	-7.46E-1

GWP-total=Global Warming Potential total (GWP-total) | **GWP-f**=Global Warming Potential fossil fuels (GWP-fossil) | **GWP-b**=Global Warming Potential biogenic (GWP-biogenic) | **GWP-luluc**=Global Warming Potential land use and land use change (GWP-luluc) | **ODP**=Depletion potential of the stratosperic ozon layer (ODP) | **AP**=Acidification potential, Accumulated Exceedance (AP) | **EP-fw**=Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater) | **EP-m**=Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine) | **EP-T**=Eutrophication potential, Accumulated Exceedance (EP-terrestrial) | **POCP**=Formation potential of tropospheric ozone (POCP) | **ADP-mm**=Abiotic depletion potential for non fossil resources (ADP mm) | **ADP-f**=Abiotic depletion for fossil resources potential (ADP fossil) | **WDP**=Water (user) deprication potential, deprivation-weighted water consumption (WDP)

5 Results

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	disease incidence	1.37E-6	2.62E-8	7.28E-8	1.47E-6	1.81E-8	5.19E-8	0.00E+0	2.44E-9	7.06E-10	2.85E-10	-2.40E-7
IR	kBq U235 eq.	3.88E-1	2.13E-3	1.09E-1	4.99E-1	1.28E-2	1.68E-2	0.00E+0	1.72E-3	3.55E-4	2.10E-4	6.41E-2
ETP-fw	CTUe	5.53E+2	3.81E+0	1.07E+1	5.68E+2	2.72E+0	1.82E+1	0.00E+0	3.66E-1	1.08E+0	2.03E-1	-1.37E+2
HTP-c	CTUh	2.57E-7	2.56E-10	8.61E-10	2.58E-7	8.82E-11	7.97E-9	0.00E+0	1.19E-11	2.02E-11	1.94E-12	-6.32E-10
HTP-nc	CTUh	7.34E-7	3.16E-9	1.12E-8	7.48E-7	2.98E-9	2.38E-8	0.00E+0	4.01E-10	3.67E-10	1.57E-10	7.44E-7
SQP	Pt	8.65E+1	2.19E+0	1.24E+2	2.12E+2	2.64E+0	6.83E+0	0.00E+0	3.56E-1	6.29E-2	1.04E-1	-8.25E+1

PM=Potential incidence of disease due to PM emissions (PM) | **IR**=Potential Human exposure efficiency relative to U235 (IRP) | **ETP-fw**=Potential Comparative Toxic Unit for ecosystems (ETP-fw) | **HTP-c**=Potential Comparative Toxic Unit for humans (HTP-c) | **HTP-nc**=Potential Comparative Toxic Unit for humans (HTP-nc) | **SQP**=Potential soil quality idex (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
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2

5 Results

ILCD classification	Indicator	Disclaimer
	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	A4	A5	C1	C2	C3	C4	D
PERE	MJ	4.34E+1	7.02E-2	3.84E+0	4.73E+1	3.81E-2	1.44E+0	0.00E+0	5.14E-3	6.67E-3	2.34E-3	-1.39E+1
PERM	MJ	0.00E+0	0.00E+0	1.62E+1	1.62E+1	0.00E+0	4.87E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	4.34E+1	7.02E-2	2.01E+1	6.35E+1	3.81E-2	1.93E+0	0.00E+0	5.14E-3	6.67E-3	2.34E-3	-1.39E+1
PENRE	MJ	1.78E+2	7.42E+0	1.54E+1	2.01E+2	3.24E+0	6.89E+0	0.00E+0	4.36E-1	9.47E-2	4.51E-2	-2.95E+1
PENRM	MJ	1.30E+0	0.00E+0	1.64E-2	1.31E+0	0.00E+0	3.94E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-2.42E-2
PENRT	MJ	1.79E+2	7.42E+0	1.55E+1	2.02E+2	3.24E+0	6.93E+0	0.00E+0	4.36E-1	9.47E-2	4.51E-2	-2.96E+1
SM	Kg	4.44E-1	0.00E+0	0.00E+0	4.44E-1	0.00E+0	1.33E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	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	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	0.00E+0	0.00E+0
FW	m^3	7.01E-2	8.13E-4	1.42E-2	8.51E-2	3.71E-4	3.07E-3	0.00E+0	5.00E-5	6.74E-5	5.27E-5	-1.42E-2

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

5 Results

OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	Kg	3.37E-4	3.99E-5	4.81E-5	4.25E-4	7.73E-6	1.69E-5	0.00E+0	1.04E-6	1.83E-7	5.26E-8	-4.67E-4
NHWD	Kg	1.84E+1	1.66E-1	2.45E-1	1.88E+1	1.93E-1	1.25E+0	0.00E+0	2.60E-2	2.04E-1	1.77E-1	-4.02E-1
RWD	Kg	3.64E-4	1.23E-6	6.18E-5	4.27E-4	2.01E-5	1.51E-5	0.00E+0	2.70E-6	3.82E-7	2.80E-7	2.03E-5

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	A4	A5	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	0.00E+0	0.00E+0
MFR	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	7.15E-1	0.00E+0	0.00E+0	3.08E+0	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	0.00E+0	0.00E+0
EET	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	0.00E+0	2.84E+0
EEE	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	0.00E+0	1.65E+0

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 PIECE

BIOGENIC CARBON CONTENT

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

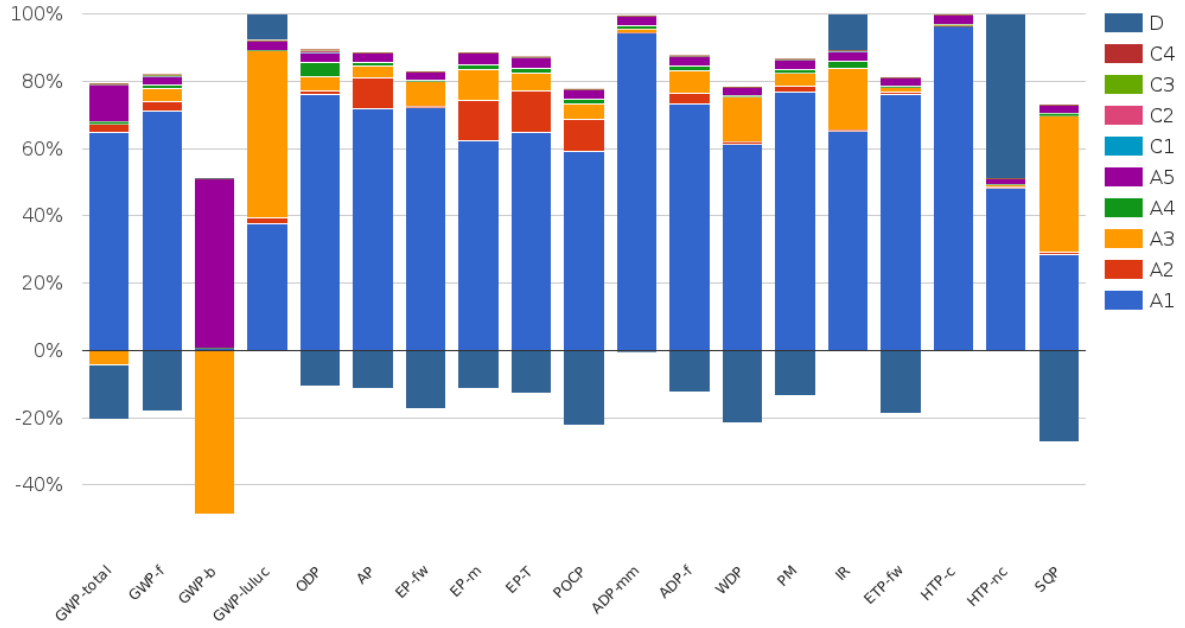
Biogenic carbon content	Amount	Unit
Biogenic carbon content in the product	0	kg C
Biogenic carbon content in accompanying packaging	0.5555	kg C

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
Packaging	2.037	kg CO2 (biogenic)

6 Interpretation of results



The figure shows the influence of the different life stages on the environmental core indicators for the clothing rack. As shown in the figure the majority of the environmental impacts are attributed to the raw material processing phase (A1) and the production process (A3). The benefits and loads beyond the system boundary (D) have a considerable impact across most of the environmental impact categories.

These three life stages and also installation into the building (A5) have the biggest impact on the GWP-total. The raw material processing phase (A1) has a larger impact than the others. The steel in the racks and consoles are the largest contributor to the environmental impact categories. The steel is also the raw material with the biggest mass in the unit.

The phases transport of raw materials, construction and waste (A2, A4 and C2), deconstruction/demolition (C1), processing (C3) and disposal (C4) have the least impact on

6 Interpretation of results

the environmental impact categories. The phase waste processing (C3) has a larger impact than the rest of the end of life stages for example due to the recycling of the packaging material and metal that in turn affects the phase benefits and loads (D). The recycling of the material contributes to a large part of the module benefits and loads (D). The packaging materials (cardboard, EUR-flat pallet) contribute to a biogenic CO2 uptake.

7 References

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

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R<THINK characterization method
EN 15804+A2 indicators (EF 3.1)

NPCR 026
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NMD
Dutch Environmental Database (NMD)

8 Contact information

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