Environmental Product Declaration

Eshabase V3/4

BMI Group Danmark

Publisher:	BMI Group Danmark
Programme operator:	BMI Group Danmark
Calculation number:	ReTHiNK-174561
Generation on:	10-08-2026
Issue date:	10-08-2026
Valid until:	10-08-2031
Status:	verified

R<THiNK

1 General information

1.1 PRODUCT

Eshabase V3/4

1.2 VALIDITY

Issue date: 10-08-2026
Valid until: 10-08-2031

1.3 OWNER OF THE DECLARATION

Declaration owner: BMI Group Danmark
Address: Kystvejen 56, 9400 Nørresundby
E-mail: kundeservice.dk@bmigroup.com
Website: www.bmigroup.com/dk/
Production location: BMI Groningen

Address production location: Hoendiep 316, 9744 TC Groningen

1.4 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

NIbe: Mantijn van Leeuwen, NIBE

1.5 PRODUCT CATEGORY RULES

EN 15804:2012+A2:2019/AC:2021

1.6 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. 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 General information

1.7 CALCULATION BASIS

LCA method R<THINK: NMD Determination method v 1.2 | Set 2

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: v3.20f (20260507)

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

1.8 LCA BACKGROUND REPORT

This EPD is generated on the basis of the LCA background report 'Eshabase V3/4 ' with the calculation identifier ReTHiNK-174561.

2 Product

2.1 PRODUCT DESCRIPTION

Eshabase V 3 /4 T/F

The environmental impacts declared in this EPD are based on the Eshabase V 3 T/F. As there is a linear correlation between the LCA results for **Eshabase V 3 T/F** and **Eshabase V 4 T/F** the following scaling factor can be used for calculating the results of all evaluation categories and modules:

Product	Thickness	Scaling Factor (from 3 mm)
Eshabase PV 3 T/F	3 mm	1.00
Eshabase PV 4 T/F	4 mm	1.33

Eshabase PV 3/4 T/F is a dimensionally stable bituminous underlay reinforced with a glass-fibre fleece. This reinforcement ensures that the membrane remains flat and resists shrinkage over time, making it a reliable choice for use as a base layer or vapour control layer in stable roofing systems. Like the PV3 variant, it is finished with a thermofusible film on the bottom and a sanded top to ensure a secure, watertight bond during installation.

This EPD is representative for the products with the following article numbers: **10038434** / **10038435**

2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

Eshabase V 3 / 4 T/F is designed as torch-applied bituminous underlays for flat or pitched roofing systems. It serve as critical base layers or intermediate layers within multi-layer waterproofing specifications for both new builds and refurbishment projects.

2.3 REFERENCE SERVICE LIFE

RSL PRODUCT

The reference service life of this averaged bituminous product is **50 years**. This value is based on internal performance testing conducted by the manufacturer, verifying the material's durability and retention of waterproofing properties over a five-decade period.

USED RSL (YR) IN THIS LCA CALCULATION:

70

RSL PARTS

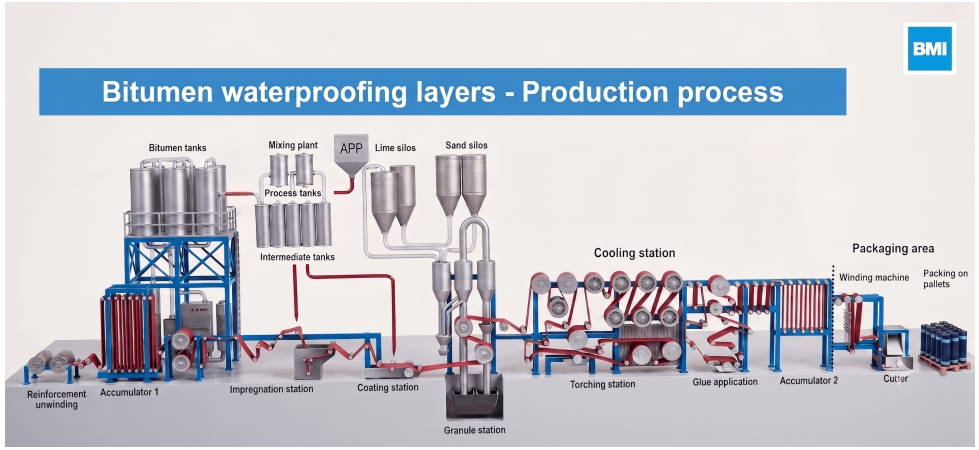
No deviation for any of the raw materials.

2.4 SUBSTANCES OF VERY HIGH CONCERN

None of the substances contained in the product are listed in the "Candidate List of Substances of Very High Concern for authorisation", or they do not exceed the threshold with the European Chemicals Agency.

2.5 DESCRIPTION PRODUCTION PROCESS

The production of APP-modified bituminous membranes begins by blending raw bitumen with Atactic Polypropylene (APP) polymers and mineral fillers at high temperatures to create a compound with enhanced heat resistance and UV stability. This mixture is then used to saturate and coat a reinforcement carrier, such as polyester or glass fiber, which provides the membrane with its necessary mechanical strength and dimensional stability. While the material is still hot, the top surface is finished with mineral granules, sand, or talc depending on the intended application, while a thin sacrificial film is applied to the underside. Finally, the membrane is cooled through a series of rollers to achieve a uniform thickness before being cut to size, rolled, and packaged for distribution.



2.6 CONSTRUCTION DESCRIPTION

The product is rolled out on the roof and attached by torching.

3 Calculation rules

3.1 FUNCTIONAL UNIT

Square meter (m2)

1 m2 of installed modified bitumen waterproofing membrane on the roof.

Reference unit: square meter (m2)

3.2 CONVERSION FACTORS

Description	Value	Unit
Reference unit	1	m2
Weight per reference unit	4.390	kg
Conversion factor to 1 kg	0.227785	m2

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	X	X	X	ND	ND	X	X	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 the products with the following article numbers: **10038434** / **10038435**

The results of this EPD are representative for the Netherlands and as well as the rest of Europe.

3.5 CUT-OFF CRITERIA

In the Life cycle assessment the following cut-off criteria are applied:

3 Calculation rules

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.

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. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

USE STAGE (B1-B7)

All (known) input flows (e.g. raw materials, transportation, energy use, packaging, etc.) and output flows (e.g. emissions to soil, air and water, construction waste, packaging waste, end-of-life waste, etc.) related to the building fabric are considered in this LCA. 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 (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

Only mass allocation has been applied regarding the energy and water consumption.

3.7 DATA COLLECTION & REFERENCE PERIOD

The data gathering is based on the production year 2025.

3.8 ESTIMATES AND ASSUMPTIONS

All data from the operational data collection, i.e. all raw materials used according to the recipe, their transport to the factory, the thermal and electrical energy used, packaging materials, all direct production waste and all available emission measurements were taken into account in the balance. This also included material and energy flows with a share of less than one percent. The limit of 5% of neglected processes in terms of mass and energy consumption required in PCR Part A is thus met.

Machines, systems and infrastructure required in production were neglected and therefore not taken into account.Transport of the packaging material has also been included. The model is based on primary data from the BMI Group. Where primary data in means of specific datasets was missing, accurate Ecoinvent datasets have been used. No further assumptions have been made as primary data has been used.

3.9 DATA QUALITY

The quality level of geographical representativeness can be considered “very good”. The quality level of technical representativeness can be considered “good”. The time representativeness can also be regarded as “good”. The overall data quality for this EPD can, therefore, be described as “good”. All relevant process-specific data were collected during data collection. The database is checked regularly and, therefore, meets the requirements of DIN EN ISO 14040/44 (background data not older than 10 years). The background data meets the requirements of EN 15804+A2. The quantities of raw materials, consumables and supplies used and the energy consumption were recorded and averaged over the entire operating year. The general rule that specific data from certain production processes or average data derived from certain processes must take precedence when calculating an EPD or LCA was adhered to. Data for processes over which the manufacturer has no influence were assigned to generic data/scenarios. When selecting these, care was taken to always choose the data set/scenario that most realistically represents the processes.

3.10 POWER MIX

The power mix that was used is the power mix for the Netherlands ; Electricity (NL) - low voltage (max 1kV), residual mix, EcoInvent 3.9.1; GWP of 0.48 kg CO2 per 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	(ei3.9.1) Lorry (Truck) >32t, EURO6 | market for (EU)
Fuel type and consumption of vehicle	not available
Distance	150 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

For flows entering the system at A5 the following scenario is assumed for module A5.

	Value	Unit
Energy consumption for installation/assembly		
(ei3.9.1) Propane burned in building machine (GLO)	0.143	l

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	0.8	%
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	0.018	kg

4.3 USE STAGE (B1)

No significant environment impact in the use stage modules, because there is no (significant) emission to air, soil or water.

4 Scenarios and additional technical information

4.4 MAINTENANCE (B2)

For maintenance no input or output flows are modelled.

4.5 REPAIR (B3)

Repairs are not applicable within the functional unit and to achieve the reference service life.

4.6 OPERATIONAL ENERGY USE (B6)

Description	Service cycle (yr)	Number of cycles (n)	Amount per cycle	Total Amount	Unit

4.7 OPERATIONAL WATER USE (B7)

Description	Service cycle (yr)	Number of cycles (n)	Amount per cycle	Total Amount	Unit

4.8 DE-CONSTRUCTION, DEMOLITION (C1)

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

4.9 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]
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	50
(ei3.9.1) Waste scenario bitumen roofing material | 90% recycling 10% incineration | Benefits Eurobitume 2025 | (NL)	(ei3.9.1) Lorry (Truck) 7.5-16t, EURO5 | market for (EU)	0	100	150	50	50
(ei3.9.1) Waste scenario bitumen roofing material | 100% recycling | Benefits filler | (NL)	(ei3.9.1) Lorry (Truck) 7.5-16t, EURO5 | market for (EU)	0	100	150	50	50

4 Scenarios and additional technical information

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	(ei3.9.1) 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

	Value and unit
Vehicle type used for transport	(ei3.9.1) Lorry (Truck) 7.5-16t, EURO5 | market for (EU)
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

4.10 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 [%]
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	NL	0	10	85	5	0
(ei3.9.1) Waste scenario bitumen roofing material | 90% recycling 10% incineration | Benefits Eurobitume 2025 | (NL)	NL	0	0	10	90	0
(ei3.9.1) Waste scenario bitumen roofing material | 100% recycling | Benefits filler | (NL)	NL	0	0	0	100	0

4 Scenarios and additional technical information

Waste Scenario	Not removed (stays in work) [kg]	Landfill [kg]	Incineration [kg]	Recycling [kg]	Re-use [kg]
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	0.000	0.092	0.784	0.046	0.000
(ei3.9.1) Waste scenario bitumen roofing material | 90% recycling 10% incineration | Benefits Eurobitume 2025 | (NL)	0.000	0.000	0.160	1.444	0.000
(ei3.9.1) Waste scenario bitumen roofing material | 100% recycling | Benefits filler | (NL)	0.000	0.000	0.000	1.863	0.000
Total	**0.000**	**0.092**	**0.945**	**3.353**	**0.000**

4.11 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]
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	0.046	11.839
(ei3.9.1) Waste scenario bitumen roofing material | 90% recycling 10% incineration | Benefits Eurobitume 2025 | (NL)	1.064	5.213
(ei3.9.1) Waste scenario bitumen roofing material | 100% recycling | Benefits filler | (NL)	1.863	0.000
Total	**2.973**	**17.052**

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 SQUARE METER

CORE ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	2.87E+0	1.26E-1	1.40E+0	4.40E+0	6.63E-2	4.36E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.37E-2	3.04E+0	1.18E-2	-1.19E+0
GWP-f	kg CO_2 eq.	2.87E+0	1.25E-1	1.42E+0	4.41E+0	6.62E-2	4.36E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.36E-2	3.03E+0	1.18E-2	-1.18E+0
GWP-b	kg CO_2 eq.	5.94E-3	4.20E-5	-2.00E-2	-1.40E-2	2.22E-5	3.08E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.12E-5	1.79E-3	6.51E-6	-2.90E-3
GWP-luluc	kg CO_2 eq.	2.30E-3	6.12E-5	2.10E-4	2.57E-3	3.23E-5	1.12E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.87E-5	3.19E-4	8.37E-7	-4.19E-4
ODP	kg CFC 11 eq.	2.92E-8	2.85E-9	6.13E-8	9.34E-8	1.50E-9	9.20E-9	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.31E-9	8.03E-8	2.55E-11	-1.29E-8
AP	mol H+ eq.	1.57E-2	3.11E-4	1.46E-3	1.75E-2	1.64E-4	8.89E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.30E-4	2.26E-3	7.93E-6	-2.53E-3
EP-fw	kg P eq.	6.09E-5	1.05E-6	5.79E-6	6.78E-5	5.55E-7	3.49E-6	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.40E-7	1.17E-5	1.67E-8	-4.01E-6
EP-m	kg N eq.	3.21E-3	8.28E-5	4.57E-4	3.75E-3	4.37E-5	2.68E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.17E-5	7.25E-4	5.21E-6	-6.26E-4
EP-T	mol N eq.	3.54E-2	8.68E-4	5.00E-3	4.13E-2	4.58E-4	2.96E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.72E-4	8.10E-3	3.12E-5	-7.54E-3
POCP	kg NMVOC eq.	1.28E-2	5.07E-4	2.87E-3	1.62E-2	2.68E-4	1.29E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.34E-4	2.75E-3	1.35E-5	-6.92E-5
ADP-mm	kg Sb-eq.	1.65E-4	3.51E-7	3.93E-6	1.69E-4	1.85E-7	2.15E-6	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.02E-7	3.11E-6	2.30E-9	-5.79E-7
ADP-f	MJ	1.01E+2	1.90E+0	2.08E+1	1.24E+2	1.00E+0	5.70E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.99E-1	9.77E+0	2.37E-2	-5.61E+1
WDP	m3 world eq.	1.06E+0	9.09E-3	7.47E-2	1.14E+0	4.80E-3	2.37E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.87E-3	1.33E-1	9.96E-4	-1.68E-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	B1	B2	B3	B6	B7	C1	C2	C3	C4	D
PM	disease incidence	1.43E-7	1.24E-8	1.45E-8	1.70E-7	6.54E-9	1.23E-8	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.91E-9	2.93E-8	1.67E-10	-3.86E-8
IR	kBq U235 eq.	8.03E-2	9.16E-4	5.58E-3	8.68E-2	4.83E-4	2.50E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.74E-4	1.01E-2	1.31E-5	-1.38E-2
ETP-fw	CTUe	4.07E+1	9.16E-1	1.68E+0	4.33E+1	4.83E-1	1.43E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.19E-1	2.53E+1	1.77E-2	-3.00E+1
HTP-c	CTUh	2.06E-9	5.58E-11	2.65E-10	2.38E-9	2.94E-11	1.67E-10	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.88E-11	6.06E-10	6.50E-13	-6.96E-10
HTP-nc	CTUh	9.85E-8	1.36E-9	3.71E-9	1.04E-7	7.18E-10	2.18E-9	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.36E-10	7.21E-9	2.55E-11	-1.81E-8
SQP	Pt	5.27E+0	1.93E+0	2.43E+0	9.63E+0	1.02E+0	4.41E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.37E-1	3.67E+0	5.36E-2	1.29E-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 index (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	A4	A5	B1	B2	B3	B6	B7	C1	C2	C3	C4	D
PERE	MJ	2.35E+0	2.78E-2	3.23E-1	2.70E+0	1.47E-2	9.75E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.48E-2	4.52E-1	4.39E-4	-4.41E-1
PERM	MJ	0.00E+0	0.00E+0	1.75E-1	1.75E-1	0.00E+0	1.40E-3	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
PERT	MJ	2.35E+0	2.78E-2	4.98E-1	2.87E+0	1.47E-2	9.89E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.48E-2	4.52E-1	4.39E-4	-4.41E-1
PENRE	MJ	5.21E+1	1.90E+0	2.02E+1	7.43E+1	1.00E+0	5.29E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	9.00E-1	9.77E+0	2.37E-2	-2.68E+1
PENRM	MJ	4.92E+1	0.00E+0	5.85E-1	4.97E+1	0.00E+0	4.03E-1	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	-2.92E+1
PENRT	MJ	1.01E+2	1.90E+0	2.08E+1	1.24E+2	1.00E+0	5.70E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	9.00E-1	9.77E+0	2.37E-2	-5.61E+1
SM	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	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	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	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	m^3	2.09E-2	2.99E-4	1.91E-3	2.31E-2	1.58E-4	6.72E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.57E-4	4.27E-3	2.43E-5	-1.99E-3

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

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OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B6	B7	C1	C2	C3	C4	D
HWD	Kg	7.44E-5	1.18E-5	8.85E-5	1.75E-4	6.24E-6	2.27E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.72E-6	4.28E-5	1.17E-7	2.75E-5
NHWD	Kg	2.55E-1	1.67E-1	6.48E-2	4.86E-1	8.80E-2	4.68E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.39E-2	1.02E+0	9.25E-2	-1.96E-2
RWD	Kg	1.04E-4	5.80E-7	3.96E-6	1.09E-4	3.06E-7	2.07E-6	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.10E-7	7.62E-6	7.97E-9	-6.13E-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	B1	B2	B3	B6	B7	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	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	Kg	1.68E-3	0.00E+0	6.82E-2	6.99E-2	0.00E+0	2.83E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.35E+0	0.00E+0	-1.86E-3
MER	Kg	9.07E-4	0.00E+0	-2.62E-6	9.04E-4	0.00E+0	7.40E-6	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	-1.00E-3
EET	MJ	0.00E+0	0.00E+0	9.47E-2	9.47E-2	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	5.43E+0
EEE	MJ	0.00E+0	0.00E+0	5.50E-2	5.50E-2	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	3.15E+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 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	0	kg C
Biogenic carbon content in accompanying packaging	0.005682	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	0.02083	kg CO2 (biogenic)

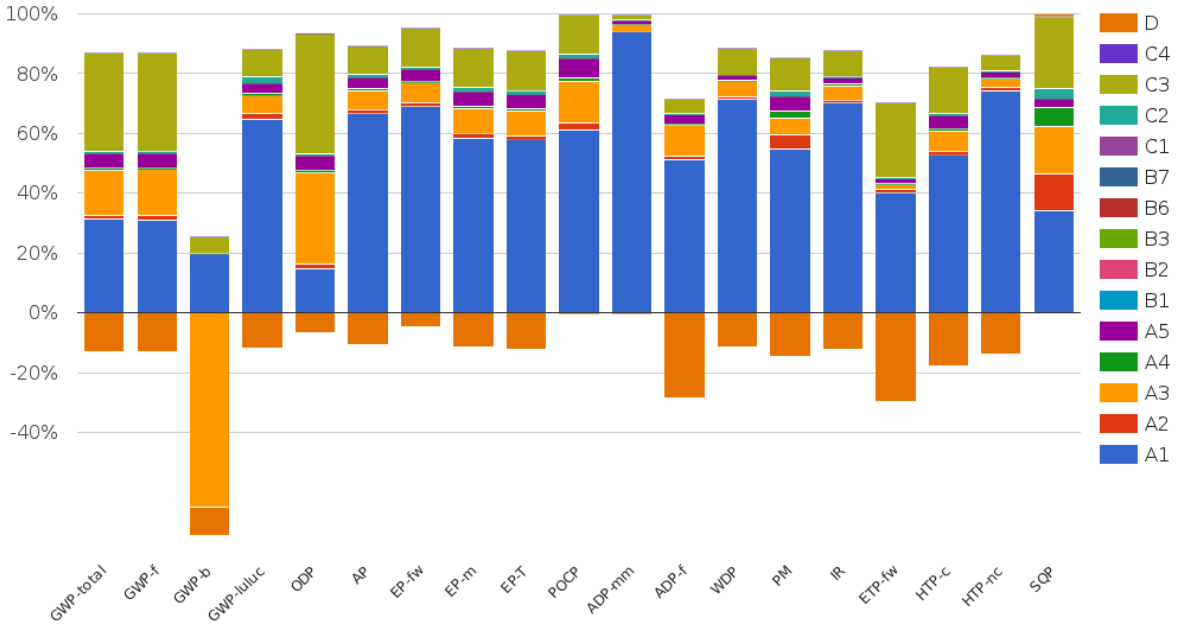
5 Results

5.4 ENVIRONMENTAL COST INDICATOR NL PER SQUARE METER

Using the environmental cost indicator (ECI) method, which is presented in the NMD Determination Method (2020), the results are aggregated to the single-point score. The ECI is a relevant valuation method, especially in the Dutch construction sector. In the Netherlands, it is a prerequisite for public tenders. The aim of the indicator is to show the shadow price for environmental impacts of a product or project. The application of single-point scores is an additional assessment tool for eco-balance results. However, it must be pointed out that weightings are always based on a value maintenance and not on a scientific basis (ISO 14040). The ECI results are shown in the following table.

Module EN15804	ECI NL 2024	Share in total (%)
A1 Raw Materials Supply	€ 0.52	51,3 %
A2 Transport	€ 0.02	2,4 %
A3 Manufacturing	€ 0.19	18,3 %
A4 Transport from the gate to the site	€ 0.01	1,2 %
A5 Construction - Installation process	€ 0.06	6,3 %
B1 Use	€ 0.00	0,0 %
B2 Maintenance	€ 0.00	0,0 %
B3 Repair	€ 0.00	0,0 %
B6 Operational Energy Use	€ 0.00	0,0 %
B7 Operational Water Use	€ 0.00	0,0 %
C1 De-construction / demolition	€ 0.00	0,0 %
C2 Transport	€ 0.01	1,2 %
C3 Waste processing	€ 0.39	38,0 %
C4 Disposal	€ 0.00	0,2 %
D Benefits and loads beyond the product system boundary	€ -0.19	-18,8 %
ECI NL 2024 per functional unit	**€ 1.02**	

6 Interpretation of results



The life cycle stages exhibit distinct contributions to the total Environmental Cost Indicator (ECI) of €1.02 per square meter. The raw material supply stage (A1) represents the dominant environmental impact, accounting for 51.30% (€0.52/m²) of the overall score. Manufacturing (A3) forms the second largest production stage burden at 18.30% (€0.19/m²), bringing the cumulative product stage share (A1–A3) to 71.96% (€0.73/m²). Transport modules A2 and A4 generate minor shares of 2.35% (€0.02/m²) and 1.24% (€0.01/m²) respectively. Construction and installation (A5) contributes 6.29% (€0.06/m²), whereas the operational use stage (B1–B7) shows zero environmental impact. At the end-of-life stage, transport to treatment (C2) adds 1.15% (€0.01/m²) and final landfill disposal (C4) accounts for 0.15% (€0.002/m²), while waste processing (C3) generates a significant impact of 38.05% (€0.39/m²) due to thermal treatment. Module D provides an environmental offset of -18.85% (-€0.19/m²) through energy recovery benefits beyond the system boundary.

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

NMD-verification protocol
NMD-Toetsingsprotocol Opname data in de Nationale Milieudatabase, Versie *1.2, August 2024*

NMD Determination method
Bepalingsmethode Milieuprestatie Bouwwerken, Berekeningswijze voor het bepalen van de milieuprestatie van bouwwerken gedurende hun gehele levensduur, gebaseerd op de EN 15804+A2, versie *1.2, January 2025*

Ecoinvent
ecoinvent Version 3.9.1 (2022)

R<THINK characterization method
ecoinvent 3.9.1: EN 15804+A2 indicators (EF 3.0)

8 Contact information

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