Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A2:2019
for:

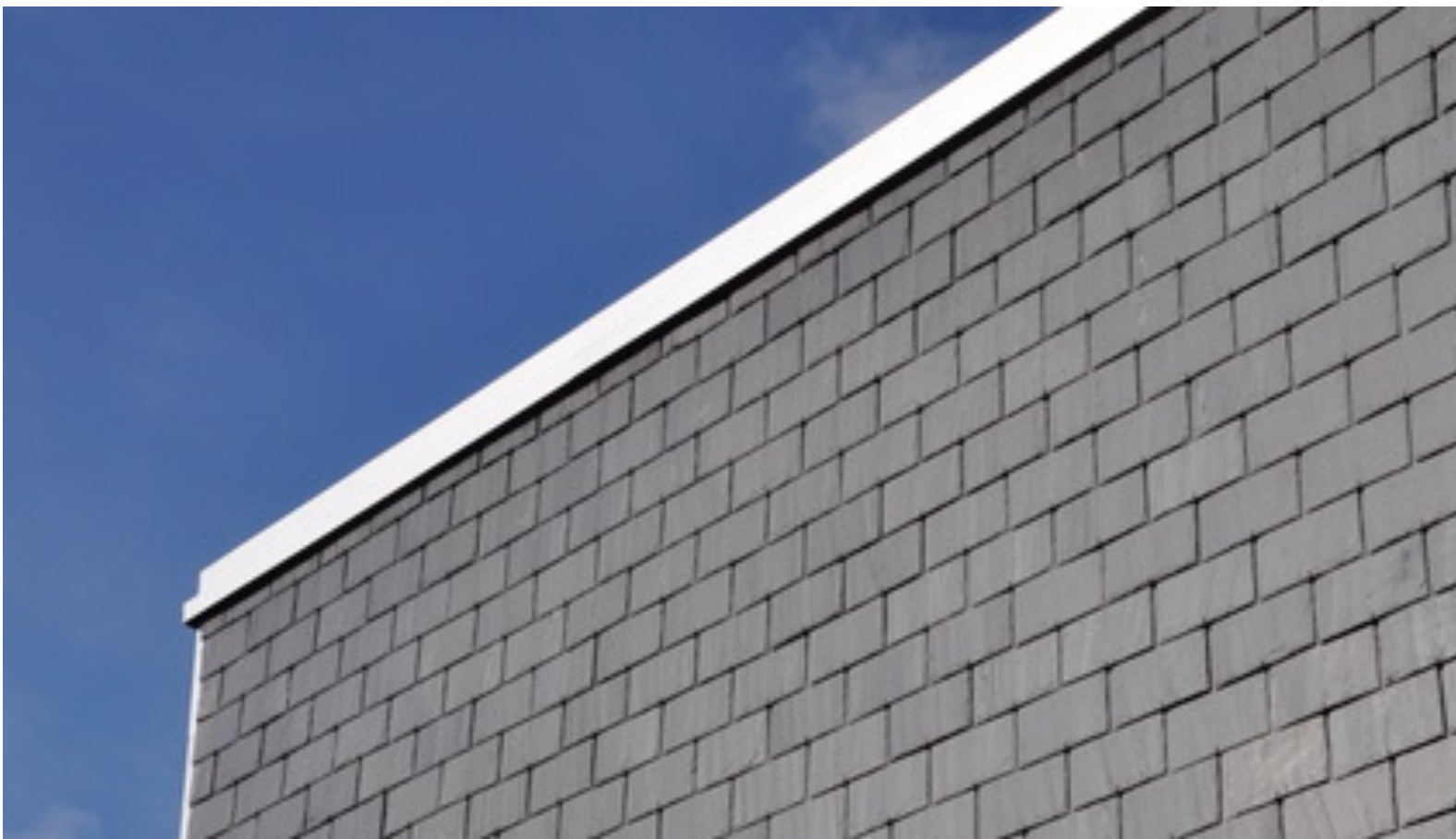
NordClad façade system

from

Nordskiffer AB

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-05351
Publication date:	2022-01-24
Valid until:	2027-01-23

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
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CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): EN15804:2012+A2:2019, PCR 2019:14 Version 1.1 Construction products, GPI v. 3.01. UN CPC code 151
PCR review was conducted by: *The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.*
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: *Pär Lindman*, *Miljögiraff, Övre hövik 25b, 43084 Styrsö* *In case of accredited certification bodies:* Accredited by: *In case of recognised individual verifiers:* Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☒ Yes ☐ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

Company information

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Description of the organisation:
Nordskiffer AB is a leading supplier of slate for roof, cladding, floor and landscaping in Sweden. At Nordskiffer you will find some of the most leading slate experts in Sweden and the company has natural stone project in all of Scandinavia. This is due to the close contact with carefully chosen slate producers and that Nordskiffer has a very good insight in the production. It makes it possible for the company to keep a high quality of the products and secure the whole chain from slate quarries, during transport all the way to the delivery to the particular project. The close contact with the producers is also crucial for Nordskiffer to ensure that the slate is produced under good conditions. This is of utmost importance to the company. All employees are educated in human rights.
Since 2017 Nordskiffer is included as subsidiary company to St Eriks, which is a leading company in Sweden on concrete and nature stone.

Product-related or management system-related certifications:
Nordskiffer has implemented a quality and environmental management system corresponding to ISO 9001 and ISO 14001. Nordskiffer's products are registered and evaluated in Byggvarubedömningen and SundaHus. In addition, the system is Fire105 tested and approved.

Name and location of production site(s):
Höganäs, Sweden

Product information

Product name:
NORDSKIFFER SYSTEM NordClad

Product identification:
EN12326 EN-standard and ASTM A1-S1 quality CE marked

Product description:

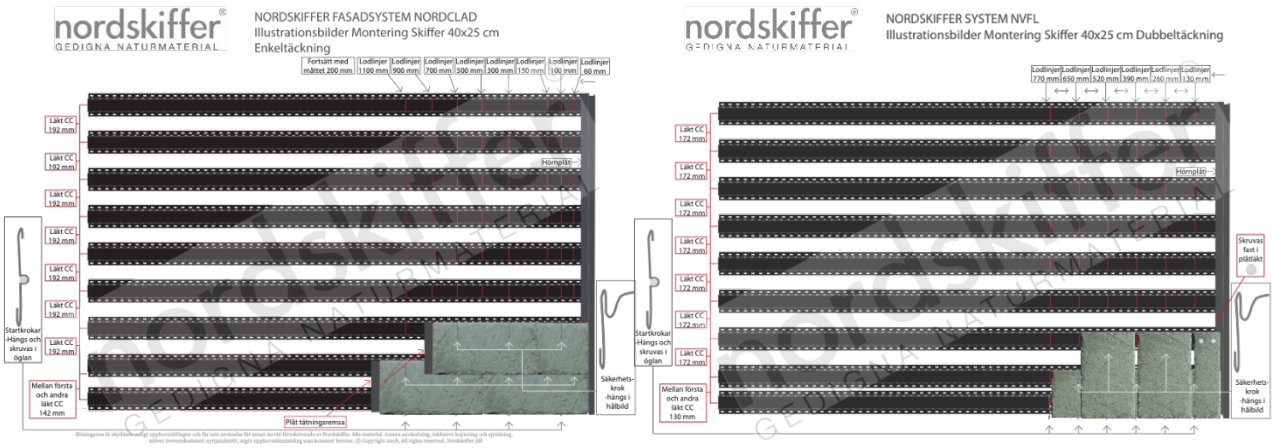


Figure 1: NordClad facade system with single cover (left) and double cover (right).

NordClad is a facade system developed for the mounting of roofing slate. The products come in two sizes and in a double cover and a single cover execution as presented in Figure 1. The products are intended to be used as a cladding for buildings. NordClad is fire tested with SPFire 105, wind load tested and has been on the market for more than 15 years. Both tests have been implemented at RISE. The facade system is developed in accordance with Swedish building standard (ByggAMA) and is produced to make a ventilated facade and to make the facade mounting safe. It is a high qualitative slate plate for new construction or renovation. Nordskiffer's roof slate is defined technical by EN12326 EN-standard and ASTM A1-S1 quality CE marked. Frost proof and classified as a no combustible material. The expected life span is 80 – 200 years. See Table 1 for technical specifications for the slate.

NordClad is offered in many different forms and colors and have a simple installation procedure. Nordskiffer's roof slate is fire tested, has low water absorption, requires minimal maintenance and has a long lifespan. Slate makes solid facades, roofs and floors.

Table 1: Technical specifications for the slate.

Standard thickness	7-9 mm
Standards followed	EN 12326-1/2, ASTM C121-90, C120-05
Type of slate	Clay/Phyllite slate
Water absorption	0,1% - 0,41%
Freeze thaw	Resistant
Thermal cycle test	T1/S1
Resistance to fire	Class A1 resistant
Flexural strength longitudinal	41,2 MPa - 82 MPa
Resistance to acid	Resistant
Release of dangerous substances	None

Geographical scope: The NordClad facade system is made from slate from quarries in Brazil, Norway, Spain, U.K. and U.S (see Figure 2). The slates are transported to Nordskiffer's facility in Höganäs, Sweden. The NordClad facade system is sold in the Nordic countries.

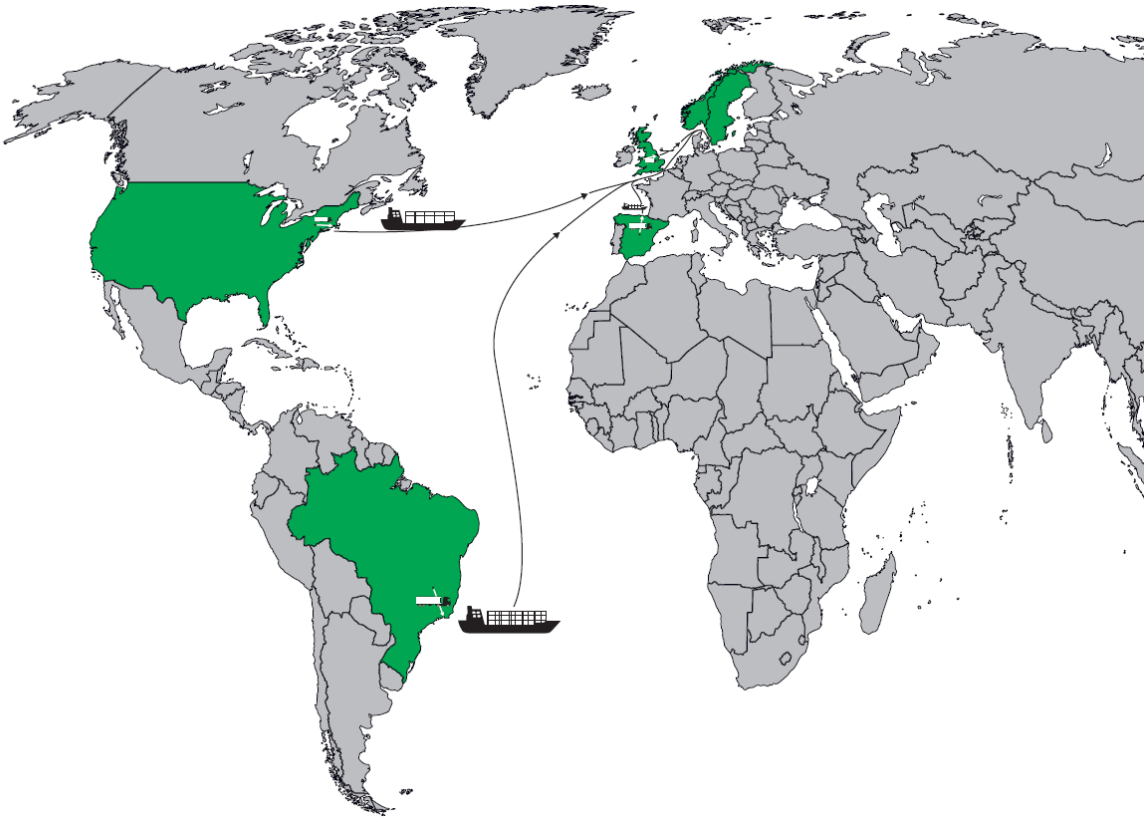


Figure 2: Slate producers for Nordskiffer NordClad system.

The following products are included in this EPD.

- NORDSKIFFER SYSTEM NordClad 40x25 double cover (44.9 kg/m^2)
- NORDSKIFFER SYSTEM NordClad 30x50 double cover (43.9 kg/m^2)
- NORDSKIFFER SYSTEM NordClad 40x25 single cover (27.1 kg/m^2)
- NORDSKIFFER SYSTEM NordClad 30x50 single cover (26.0 kg/m^2)

UN CPC code: 15110 Slate

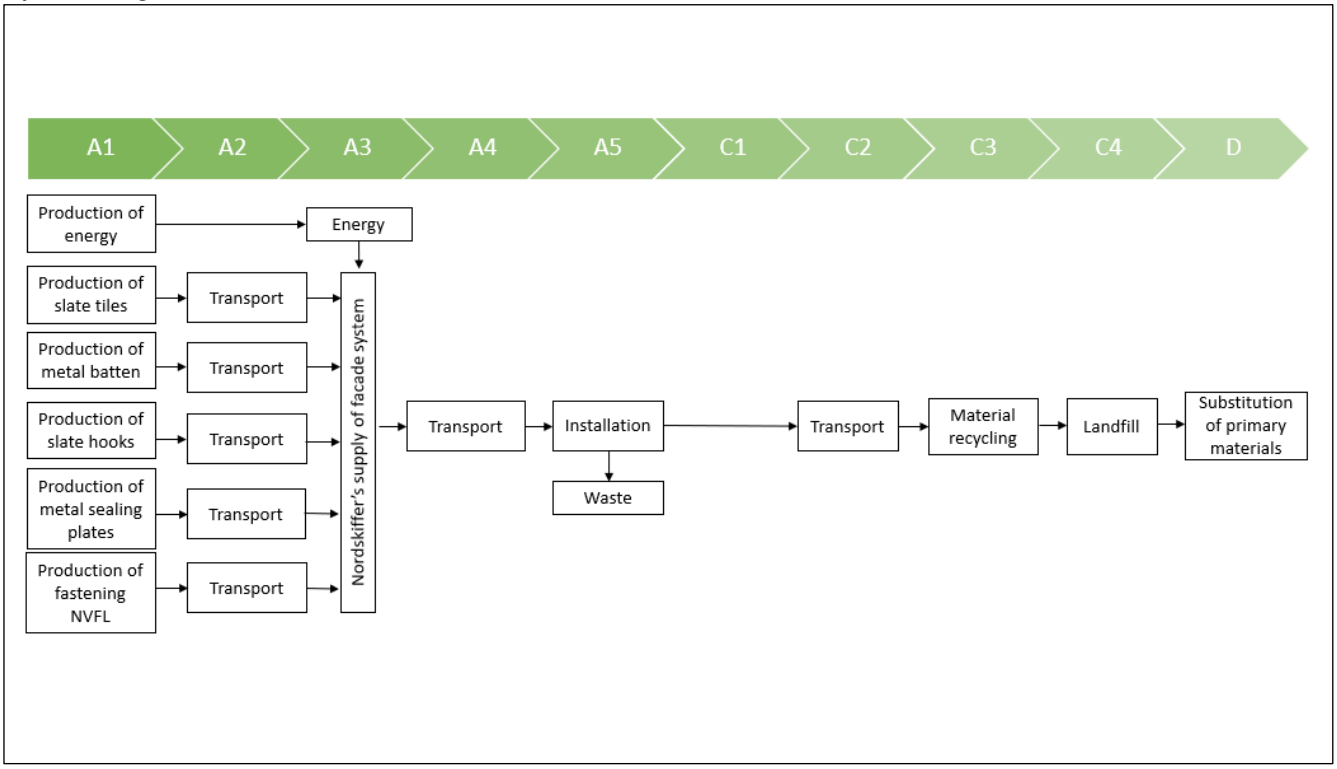
LCA information

Functional unit / declared unit: 1 m^2 of roof slate façade system
Reference service life: not relevant
Time representativeness:
The production data are from year 2020. The database data are from 2012 – 2020. No data used is older than 10 years.

Database(s) and LCA software used:
The databases used are mainly Ecoinvent 3.4 and Sphera's own database from 2021. The LCA program used is GaBi 10.

Description of system boundaries:
Cradle to gate with options, modules C1–C4, module D and with optional modules (A1–A3 + A4–A5 + C + D and additional modules).
The slate tiles and fastening parts are transported to Nordskiffer where they are stored before transportation to the building site for installation.

System diagram:



More information:
The LCA study has been carried out by IVL Swedish Environmental Research Institute.

Cut-off
The study applies a cut-off of maximum 1%.

Scenarios
Module A4 include transport by truck to construction site. The transport distance is based on an average of 200 km with a EURO 6 34-40t truck.

Module A5 includes a 5% waste during installation of the NordClad system. The system is installed without heavy machines and the energy consumption on site Is assumed to be negligible.

Module C1-C4 includes the most probable scenario to process waste from the NordClad system. According to Nordskiffer, the most common way of treating slate roof tiles at the end of life is to reuse those slate tiles which are in good condition and to recycle the rest as rubble or aggregates. 95% of the steel is assumed to be recycled.

Module D includes the replacement of primary materials. It was assumed that approximately 90% of the tiles can be reused and 10% will be crushed and reused as aggregates.

Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation:

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X								X	X	X	X	X
Geography	GLO	GLO	SE	SE	SE								SE	SE	SE	SE	SE
Specific data used	>90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	18%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components	NordClad 40x25 double cover	NordClad 30x50 double cover	NordClad 40x25 single cover	NordClad 30x50 single cover
Slate tiles [kg]	40.82	40.82	22.44	22.44
Steel [kg]	4.04	3.09	4.63	3.58
Total weight of product [kg]	44.86	43.91	27.07	26.02
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**		
Packaging, wooden pallet	0,75 kg	Weight per m^2 for each product		

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per functional or declared unit
None			

Environmental Information

For construction services, the total value of A1-A3 shall be replaced with the total value of A1-A5.

Potential environmental impact – mandatory indicators according to EN 15804

Table 1. Results for Single cover (40x25) 1 m² of roof slate façade system.

Indicator	Total A1-A3	Raw material supply (A1)	Transport (A2)	Manu-facturing (A3)	Transport (A4)	Installation (A5)	Decon s-truction (C1)	Transport (C2)	Waste processing (C3)	Disposal (C4)	Module D
GWP – total	1.91E+01	1.76E+01	1.49E+00	3.64E-02	3.20E-01	0.00E+00	0.00E+00	2.67E-01	7.90E-02	3.14E-03	-7.22E+00
GWP – fossil	2.00E+01	1.85E+01	1.48E+00	3.63E-02	3.18E-01	0.00E+00	0.00E+00	2.65E-01	7.84E-02	3.23E-03	-8.12E+00
GWP – biogenic	-9.00E-01	-9.00E-01	-1.31E-05	5.78E-05	-4.08E-04	0.00E+00	0.00E+00	-3.40E-04	2.56E-05	-9.37E-05	9.09E-01
GWP – LULUC	1.21E-02	5.73E-03	6.34E-03	9.12E-07	2.62E-03	0.00E+00	0.00E+00	2.18E-03	5.42E-04	9.48E-06	-8.71E-03
GWP – GHG[1]	1.95E+01	1.80E+01	1.46E+00	3.59E-02	3.14E-01	0.00E+00	0.00E+00	2.62E-01	7.69E-02	3.18E-03	-8.00E+00
ODP	2.05E-09	2.05E-09	1.74E-16	4.44E-18	4.08E-17	0.00E+00	0.00E+00	3.41E-17	2.03E-16	1.25E-17	-2.05E-09
AP	6.42E-02	4.22E-02	2.20E-02	1.98E-05	2.92E-04	0.00E+00	0.00E+00	2.44E-04	7.59E-04	2.30E-05	-3.22E-02
EP-freshwater	2.00E-05	1.75E-05	2.45E-06	1.00E-08	9.49E-07	0.00E+00	0.00E+00	7.91E-07	2.24E-07	5.42E-09	-1.50E-05
EP - marine	1.64E-02	9.25E-03	7.11E-03	3.50E-06	8.87E-05	0.00E+00	0.00E+00	7.40E-05	3.72E-04	5.96E-06	-9.51E-03
EP-terrestrial	1.77E-01	9.93E-02	7.81E-02	3.86E-05	1.07E-03	0.00E+00	0.00E+00	8.92E-04	4.09E-03	6.55E-05	-1.04E-01
POCP	5.13E-02	3.17E-02	1.96E-02	1.75E-05	2.51E-04	0.00E+00	0.00E+00	2.09E-04	1.09E-03	1.81E-05	-2.76E-02
ADP-minerals & metals	7.57E-06	7.49E-06	8.13E-08	1.34E-09	2.43E-08	0.00E+00	0.00E+00	2.03E-08	8.61E-08	3.04E-10	-4.07E-06
ADP-fossil fuels	2.26E+02	2.06E+02	1.94E+01	5.42E-01	4.25E+00	0.00E+00	0.00E+00	3.55E+00	1.53E+00	4.28E-02	-1.10E+02

[1] The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

WDP	1.57E+00	1.56E+00	7.82E-03	6.75E-05	2.77E-03	0.00E+00	0.00E+00	2.31E-03	1.47E-02	3.46E-04	-6.04E-01
PM*	1.05E-06	6.89E-07	3.60E-07	1.26E-10	1.80E-09	0.00E+00	0.00E+00	1.50E-09	1.71E-08	2.85E-10	-6.33E-07
IRP*	2.96E-01	2.93E-01	3.20E-03	8.31E-05	7.38E-04	0.00E+00	0.00E+00	6.15E-04	3.13E-03	4.73E-05	-9.97E-02
ETP-fw*	9.51E+01	8.07E+01	1.40E+01	3.92E-01	3.07E+00	0.00E+00	0.00E+00	2.56E+00	1.06E+00	2.44E-02	-7.82E+01
HTP-c*	8.91E-08	8.88E-08	2.73E-10	7.30E-12	6.20E-11	0.00E+00	0.00E+00	5.18E-11	2.27E-11	3.60E-12	-9.12E-09
HTP-nc*	2.05E-07	1.91E-07	1.35E-08	3.04E-10	3.23E-09	0.00E+00	0.00E+00	2.69E-09	1.37E-09	3.97E-10	-5.90E-08
SQP*	2.09E+02	2.05E+02	3.55E+00	1.40E-03	1.46E+00	0.00E+00	0.00E+00	1.22E+00	3.41E-01	8.64E-03	-2.01E+02

Table 2. Results for Single cover (50x30) 1 m² of roof slate façade system.

Indicator	Total A1-A3	Raw material supply (A1)	Transport (A2)	Manu-facturing (A3)	Transport (A4)	Installation (A5)	Decon s-truction (C1)	Transport (C2)	Waste processing (C3)	Disposal (C4)	Module D
GWP – total	1.61E+01	1.46E+01	1.48E+00	3.64E-02	3.08E-01	0.00E+00	0.00E+00	2.49E-01	7.38E-02	2.43E-03	-6.66E+00
GWP – fossil	1.70E+01	1.55E+01	1.48E+00	3.63E-02	3.06E-01	0.00E+00	0.00E+00	2.48E-01	7.32E-02	2.49E-03	-7.53E+00
GWP – biogenic	-9.00E-01	-9.00E-01	-6.09E-06	5.78E-05	-3.92E-04	0.00E+00	0.00E+00	-3.17E-04	2.39E-05	-7.24E-05	8.73E-01
GWP – LULUC	1.07E-02	4.42E-03	6.29E-03	9.12E-07	2.52E-03	0.00E+00	0.00E+00	2.04E-03	5.06E-04	7.32E-06	-7.92E-03
GWP – GHG[1]	1.66E+01	1.51E+01	1.46E+00	3.59E-02	3.02E-01	0.00E+00	0.00E+00	2.45E-01	7.18E-02	2.45E-03	-7.42E+00
ODP	2.05E-09	2.05E-09	1.74E-16	4.44E-18	3.92E-17	0.00E+00	0.00E+00	3.18E-17	1.90E-16	9.68E-18	-1.97E-09
AP	5.51E-02	3.31E-02	2.20E-02	1.98E-05	2.81E-04	0.00E+00	0.00E+00	2.28E-04	7.09E-04	1.77E-05	-2.97E-02
EP-freshwater	1.84E-05	1.60E-05	2.43E-06	1.00E-08	9.12E-07	0.00E+00	0.00E+00	7.39E-07	2.09E-07	4.18E-09	-1.42E-05
EP - marine	1.45E-02	7.41E-03	7.11E-03	3.50E-06	8.52E-05	0.00E+00	0.00E+00	6.91E-05	3.48E-04	4.61E-06	-8.96E-03
EP-terrestrial	1.58E-01	7.97E-02	7.81E-02	3.86E-05	1.03E-03	0.00E+00	0.00E+00	8.33E-04	3.82E-03	5.06E-05	-9.84E-02

POCP	4.51E-02	2.55E-02	1.96E-02	1.75E-05	2.41E-04	0.00E+00	0.00E+00	1.96E-04	1.01E-03	1.40E-05	-2.59E-02
ADP-minerals & metals	6.16E-06	6.08E-06	8.09E-08	1.34E-09	2.34E-08	0.00E+00	0.00E+00	1.89E-08	8.04E-08	2.35E-10	-3.44E-06
ADP-fossil fuels	1.96E+02	1.76E+02	1.93E+01	5.42E-01	4.09E+00	0.00E+00	0.00E+00	3.31E+00	1.43E+00	3.30E-02	-1.03E+02
WDP	1.15E+00	1.14E+00	7.77E-03	6.75E-05	2.67E-03	0.00E+00	0.00E+00	2.16E-03	1.37E-02	2.67E-04	-4.89E-01
PM*	9.18E-07	5.58E-07	3.60E-07	1.26E-10	1.73E-09	0.00E+00	0.00E+00	1.41E-09	1.60E-08	2.20E-10	-5.82E-07
IRP*	2.46E-01	2.43E-01	3.19E-03	8.31E-05	7.09E-04	0.00E+00	0.00E+00	5.74E-04	2.92E-03	3.65E-05	-9.70E-02
ETP-fw*	8.96E+01	7.52E+01	1.40E+01	3.92E-01	2.95E+00	0.00E+00	0.00E+00	2.39E+00	9.88E-01	1.88E-02	-7.38E+01
HTP-c*	5.67E-08	5.64E-08	2.71E-10	7.30E-12	5.96E-11	0.00E+00	0.00E+00	4.83E-11	2.12E-11	2.78E-12	-6.19E-09
HTP-nc*	1.68E-07	1.54E-07	1.35E-08	3.04E-10	3.10E-09	0.00E+00	0.00E+00	2.51E-09	1.28E-09	3.07E-10	-5.40E-08
SQP*	2.07E+02	2.03E+02	3.53E+00	1.40E-03	1.40E+00	0.00E+00	0.00E+00	1.14E+00	3.19E-01	6.67E-03	-1.93E+02

Table 3. Results for Double cover (40x25) 1 m² of roof slate façade system.

Indicator	Total A1-A3	Raw material supply (A1)	Transport (A2)	Manufacturing (A3)	Transport (A4)	Installation (A5)	Deconstruction (C1)	Transport (C2)	Waste processing (C3)	Disposal (C4)	Module D
GWP – total	2.25E+01	1.98E+01	2.68E+00	6.62E-02	5.30E-01	0.00E+00	0.00E+00	4.11E-01	1.22E-01	2.70E-03	-1.11E+01
GWP – fossil	2.41E+01	2.14E+01	2.67E+00	6.61E-02	5.27E-01	0.00E+00	0.00E+00	4.09E-01	1.21E-01	2.77E-03	-1.26E+01
GWP – biogenic	-1.64E+00	-1.64E+00	9.14E-06	1.05E-04	-6.75E-04	0.00E+00	0.00E+00	-5.24E-04	3.94E-05	-8.06E-05	1.50E+00
GWP – LULUC	1.76E-02	6.24E-03	1.13E-02	1.66E-06	4.33E-03	0.00E+00	0.00E+00	3.36E-03	8.35E-04	8.15E-06	-1.34E-02
GWP – GHG[1]	2.36E+01	2.09E+01	2.64E+00	6.53E-02	5.21E-01	0.00E+00	0.00E+00	4.04E-01	1.18E-01	2.73E-03	-1.24E+01
ODP	3.73E-09	3.73E-09	3.14E-16	8.08E-18	6.76E-17	0.00E+00	0.00E+00	5.25E-17	3.13E-16	1.08E-17	-3.40E-09
AP	8.24E-02	4.25E-02	3.99E-02	3.61E-05	4.84E-04	0.00E+00	0.00E+00	3.76E-04	1.17E-03	1.98E-05	-5.00E-02

EP-freshwater	3.08E-05	2.64E-05	4.37E-06	1.82E-08	1.57E-06	0.00E+00	0.00E+00	1.22E-06	3.45E-07	4.66E-09	-2.42E-05
EP - marine	2.27E-02	9.73E-03	1.29E-02	6.37E-06	1.47E-04	0.00E+00	0.00E+00	1.14E-04	5.73E-04	5.13E-06	-1.53E-02
EP-terrestrial	2.47E-01	1.05E-01	1.42E-01	7.02E-05	1.77E-03	0.00E+00	0.00E+00	1.37E-03	6.30E-03	5.63E-05	-1.68E-01
POCP	6.87E-02	3.31E-02	3.56E-02	3.18E-05	4.16E-04	0.00E+00	0.00E+00	3.22E-04	1.67E-03	1.55E-05	-4.40E-02
ADP-minerals & metals	8.58E-06	8.44E-06	1.46E-07	2.44E-09	4.03E-08	0.00E+00	0.00E+00	3.13E-08	1.33E-07	2.62E-10	-5.17E-06
ADP-fossil fuels	2.91E+02	2.55E+02	3.49E+01	9.86E-01	7.05E+00	0.00E+00	0.00E+00	5.46E+00	2.36E+00	3.68E-02	-1.74E+02
WDP	1.63E+00	1.62E+00	1.40E-02	1.23E-04	4.60E-03	0.00E+00	0.00E+00	3.57E-03	2.26E-02	2.98E-04	-7.47E-01
PM*	1.43E-06	7.75E-07	6.55E-07	2.29E-10	2.99E-09	0.00E+00	0.00E+00	2.32E-09	2.64E-08	2.45E-10	-9.81E-07
IRP*	3.59E-01	3.53E-01	5.76E-03	1.51E-04	1.22E-03	0.00E+00	0.00E+00	9.48E-04	4.82E-03	4.06E-05	-1.73E-01
ETP-fw*	1.54E+02	1.28E+02	2.52E+01	7.13E-01	5.09E+00	0.00E+00	0.00E+00	3.95E+00	1.63E+00	2.10E-02	-1.26E+02
HTP-c*	8.05E-08	8.00E-08	4.91E-10	1.33E-11	1.03E-10	0.00E+00	0.00E+00	7.97E-11	3.50E-11	3.09E-12	-9.21E-09
HTP-nc*	2.24E-07	1.99E-07	2.43E-08	5.53E-10	5.34E-09	0.00E+00	0.00E+00	4.14E-09	2.10E-09	3.41E-10	-8.85E-08
SQP*	3.72E+02	3.66E+02	6.34E+00	2.55E-03	2.42E+00	0.00E+00	0.00E+00	1.88E+00	5.26E-01	7.43E-03	-3.33E+02

Table 4. Results for Double cover (50x30) 1 m² of roof slate façade system.

Indicator	Total A1-A3	Raw material supply (A1)	Transport (A2)	Manu-facturing (A3)	Transport (A4)	Installation (A5)	Decon s-truction (C1)	Transport (C2)	Waste processing (C3)	Disposal (C4)	Module D
GWP – total	1.98E+01	1.71E+01	2.68E+00	6.62E-02	5.19E-01	0.00E+00	0.00E+00	3.96E-01	1.17E-01	2.06E-03	-1.06E+01
GWP – fossil	2.14E+01	1.87E+01	2.67E+00	6.61E-02	5.16E-01	0.00E+00	0.00E+00	3.93E-01	1.16E-01	2.12E-03	-1.21E+01
GWP – biogenic	-1.64E+00	-1.64E+00	1.35E-05	1.05E-04	-6.61E-04	0.00E+00	0.00E+00	-5.03E-04	3.79E-05	-6.16E-05	1.47E+00
GWP –	1.64E-02	5.09E-03	1.13E-02	1.66E-06	4.24E-03	0.00E+00	0.00E+00	3.23E-03	8.03E-04	6.23E-06	-1.27E-02

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GWP – GHG[1]	2.10E+01	1.83E+01	2.63E+00	6.53E-02	5.10E-01	0.00E+00	0.00E+00	3.88E-01	1.14E-01	2.09E-03	-1.19E+01
ODP	3.73E-09	3.73E-09	3.13E-16	8.08E-18	6.62E-17	0.00E+00	0.00E+00	5.04E-17	3.01E-16	8.24E-18	-3.33E-09
AP	7.43E-02	3.43E-02	3.99E-02	3.61E-05	4.74E-04	0.00E+00	0.00E+00	3.61E-04	1.12E-03	1.51E-05	-4.78E-02
EP-freshwater	2.94E-05	2.50E-05	4.36E-06	1.82E-08	1.54E-06	0.00E+00	0.00E+00	1.17E-06	3.31E-07	3.56E-09	-2.34E-05
EP - marine	2.10E-02	8.09E-03	1.29E-02	6.37E-06	1.44E-04	0.00E+00	0.00E+00	1.10E-04	5.51E-04	3.92E-06	-1.48E-02
EP-terrestrial	2.29E-01	8.75E-02	1.42E-01	7.02E-05	1.73E-03	0.00E+00	0.00E+00	1.32E-03	6.06E-03	4.31E-05	-1.62E-01
POCP	6.31E-02	2.75E-02	3.56E-02	3.18E-05	4.07E-04	0.00E+00	0.00E+00	3.10E-04	1.61E-03	1.19E-05	-4.25E-02
ADP-minerals & metals	7.33E-06	7.18E-06	1.46E-07	2.44E-09	3.94E-08	0.00E+00	0.00E+00	3.00E-08	1.28E-07	2.00E-10	-4.61E-06
ADP-fossil fuels	2.64E+02	2.28E+02	3.49E+01	9.86E-01	6.90E+00	0.00E+00	0.00E+00	5.25E+00	2.27E+00	2.81E-02	-1.67E+02
WDP	1.27E+00	1.26E+00	1.40E-02	1.23E-04	4.50E-03	0.00E+00	0.00E+00	3.43E-03	2.17E-02	2.27E-04	-6.47E-01
PM*	1.31E-06	6.59E-07	6.55E-07	2.29E-10	2.92E-09	0.00E+00	0.00E+00	2.23E-09	2.53E-08	1.87E-10	-9.36E-07
IRP*	3.15E-01	3.09E-01	5.75E-03	1.51E-04	1.20E-03	0.00E+00	0.00E+00	9.11E-04	4.64E-03	3.11E-05	-1.71E-01
ETP-fw*	1.49E+02	1.23E+02	2.52E+01	7.13E-01	4.98E+00	0.00E+00	0.00E+00	3.80E+00	1.57E+00	1.60E-02	-1.23E+02
HTP-c*	5.27E-08	5.22E-08	4.90E-10	1.33E-11	1.01E-10	0.00E+00	0.00E+00	7.66E-11	3.36E-11	2.36E-12	-6.68E-09
HTP-nc*	1.90E-07	1.65E-07	2.43E-08	5.53E-10	5.23E-09	0.00E+00	0.00E+00	3.98E-09	2.02E-09	2.61E-10	-8.40E-08
SQP*	3.70E+02	3.64E+02	6.32E+00	2.55E-03	2.37E+00	0.00E+00	0.00E+00	1.80E+00	5.05E-01	5.68E-03	-3.26E+02

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

Use of resources

Table 5. Results for Single cover (40x25) 1 m² of roof slate façade system.

Indicator	Total A1-A3	Raw material supply (A1)	Transport (A2)	Manu-facturing (A3)	Transport (A4)	Installation (A5)	Decon s-truction (C1)	Transport (C2)	Waste processing (C3)	Disposal (C4)	Module D

PERE	1.81E+01	1.75E+01	6.04E-01	1.81E-03	2.37E-01	0.00E+00	0.00E+00	1.98E-01	1.13E-01	5.76E-03	-1.35E+01
PERM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	1.81E+01	1.75E+01	6.04E-01	1.81E-03	2.37E-01	0.00E+00	0.00E+00	1.98E-01	1.13E-01	5.76E-03	-1.35E+01
PENRE	2.29E+02	2.09E+02	1.94E+01	5.43E-01	4.26E+00	0.00E+00	0.00E+00	3.55E+00	1.53E+00	4.28E-02	-1.14E+02
PENRM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	2.29E+02	2.09E+02	1.94E+01	5.43E-01	4.26E+00	0.00E+00	0.00E+00	3.55E+00	1.53E+00	4.28E-02	-1.14E+02
SM	4.82E-05	4.82E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-4.83E-05
RSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	4.74E-02	4.67E-02	7.06E-04	2.98E-06	2.72E-04	0.00E+00	0.00E+00	2.27E-04	4.22E-04	1.06E-05	-2.01E-02

Table 6. Results for Single cover (50x30) 1 m² of roof slate façade system.

Indicator	Total A1-A3	Raw material supply (A1)	Transport (A2)	Manu-facturing (A3)	Transport (A4)	Installation (A5)	Decon s-truction (C1)	Transport (C2)	Waste processing (C3)	Disposal (C4)	Module D
PERE	1.64E+01	1.58E+01	6.00E-01	1.81E-03	2.28E-01	0.00E+00	0.00E+00	1.85E-01	1.05E-01	4.45E-03	-1.27E+01
PERM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	1.64E+01	1.58E+01	6.00E-01	1.81E-03	2.28E-01	0.00E+00	0.00E+00	1.85E-01	1.05E-01	4.45E-03	-1.27E+01
PENRE	2.00E+02	1.80E+02	1.93E+01	5.43E-01	4.09E+00	0.00E+00	0.00E+00	3.32E+00	1.43E+00	3.31E-02	-1.07E+02
PENRM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	2.00E+02	1.80E+02	1.93E+01	5.43E-01	4.09E+00	0.00E+00	0.00E+00	3.32E+00	1.43E+00	3.31E-02	-1.07E+02
SM	4.82E-05	4.82E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-4.64E-05
RSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

NRSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	3.50E-02	3.43E-02	7.01E-04	2.98E-06	2.61E-04	0.00E+00	0.00E+00	2.12E-04	3.94E-04	8.16E-06	-1.59E-02

Table 7. Results for Double cover (40x25) 1 m² of roof slate façade system.

Indicator	Total A1-A3	Raw material supply (A1)	Transport (A2)	Manu-facturing (A3)	Transport (A4)	Installation (A5)	Decon s-truction (C1)	Transport (C2)	Waste processing (C3)	Disposal (C4)	Module D
PERE	2.78E+01	2.68E+01	1.08E+00	3.29E-03	3.93E-01	0.00E+00	0.00E+00	3.05E-01	1.74E-01	4.96E-03	-2.18E+01
PERM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	2.78E+01	2.68E+01	1.08E+00	3.29E-03	3.93E-01	0.00E+00	0.00E+00	3.05E-01	1.74E-01	4.96E-03	-2.18E+01
PENRE	2.98E+02	2.62E+02	3.49E+01	9.88E-01	7.05E+00	0.00E+00	0.00E+00	5.47E+00	2.36E+00	3.68E-02	-1.80E+02
PENRM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	2.98E+02	2.62E+02	3.49E+01	9.88E-01	7.05E+00	0.00E+00	0.00E+00	5.47E+00	2.36E+00	3.68E-02	-1.80E+02
SM	8.77E-05	8.77E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-7.99E-05
RSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	4.99E-02	4.86E-02	1.26E-03	5.42E-06	4.50E-04	0.00E+00	0.00E+00	3.49E-04	6.50E-04	9.08E-06	-2.45E-02

Table 8. Results for Double cover (50x30) 1 m² of roof slate façade system.

Indicator	Total A1-A3	Raw material supply (A1)	Transport (A2)	Manu-facturing (A3)	Transport (A4)	Installation (A5)	Decon s-truction (C1)	Transport (C2)	Waste processing (C3)	Disposal (C4)	Module D
PERE	2.64E+01	2.53E+01	1.08E+00	3.29E-03	3.85E-01	0.00E+00	0.00E+00	2.93E-01	1.67E-01	3.79E-03	-2.11E+01
PERM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	2.64E+01	2.53E+01	1.08E+00	3.29E-03	3.85E-01	0.00E+00	0.00E+00	2.93E-01	1.67E-01	3.79E-03	-2.11E+01

PENRE	2.71E+02	2.35E+02	3.49E+01	9.88E-01	6.91E+00	0.00E+00	0.00E+00	5.26E+00	2.27E+00	2.81E-02	-1.74E+02
PENRM	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	2.71E+02	2.35E+02	3.49E+01	9.88E-01	6.91E+00	0.00E+00	0.00E+00	5.26E+00	2.27E+00	2.81E-02	-1.74E+02
SM	8.77E-05	8.77E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-7.83E-05
RSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	3.91E-02	3.78E-02	1.26E-03	5.42E-06	4.41E-04	0.00E+00	0.00E+00	3.36E-04	6.25E-04	6.94E-06	-2.09E-02

Waste production and output flows

Waste production

Table 9. Results for Single cover (40x25) 1 m^2 of roof slate façade system.

Indicator	Total A1-A3	Raw material supply (A1)	Transport (A2)	Manu-facturing (A3)	Transport (A4)	Installation (A5)	Decon s-truction (C1)	Transport (C2)	Waste processing (C3)	Disposal (C4)	Module D
HWD	1.05E-04	1.05E-04	5.85E-10	4.18E-12	2.15E-10	0.00E+00	0.00E+00	1.79E-10	8.56E-11	4.55E-12	-8.76E-05
NHWD	6.01E+01	6.01E+01	2.44E-03	5.44E-05	6.33E-04	0.00E+00	0.00E+00	5.28E-04	4.11E-04	2.14E-01	-5.94E+01
RWD	1.63E-03	1.61E-03	2.24E-05	5.86E-07	5.15E-06	0.00E+00	0.00E+00	4.30E-06	1.98E-05	4.49E-07	-1.21E-03

Table 10. Results for Single cover (50x30) 1 m^2 of roof slate façade system.

Indicator	Total A1-A3	Raw material supply (A1)	Transport (A2)	Manu-facturing (A3)	Transport (A4)	Installation (A5)	Decon s-truction (C1)	Transport (C2)	Waste processing (C3)	Disposal (C4)	Module D
HWD	7.71E-05	7.71E-05	5.82E-10	4.18E-12	2.06E-10	0.00E+00	0.00E+00	1.67E-10	7.99E-11	3.51E-12	-6.46E-05
NHWD	6.00E+01	6.00E+01	2.43E-03	5.44E-05	6.08E-04	0.00E+00	0.00E+00	4.93E-04	3.83E-04	1.65E-01	-5.71E+01
RWD	1.45E-03	1.43E-03	2.23E-05	5.86E-07	4.95E-06	0.00E+00	0.00E+00	4.01E-06	1.85E-05	3.47E-07	-1.15E-03

Table 11. Results for Double cover (40x25) 1 m² of roof slate façade system.

Indicator	Total A1-A3	Raw material supply (A1)	Transport (A2)	Manufacturing (A3)	Transport (A4)	Installation (A5)	Deconstruction (C1)	Transport (C2)	Waste processing (C3)	Disposal (C4)	Module D
HWD	1.20E-04	1.20E-04	1.05E-09	7.60E-12	3.55E-10	0.00E+00	0.00E+00	2.76E-10	1.32E-10	3.91E-12	-9.97E-05
NHWD	1.09E+02	1.09E+02	4.39E-03	9.90E-05	1.05E-03	0.00E+00	0.00E+00	8.13E-04	6.33E-04	1.84E-01	-9.85E+01
RWD	2.52E-03	2.48E-03	4.03E-05	1.07E-06	8.53E-06	0.00E+00	0.00E+00	6.62E-06	3.05E-05	3.86E-07	-1.97E-03

Table 12. Results for Double cover (50x30) 1 m² of roof slate façade system.

Indicator	Total A1-A3	Raw material supply (A1)	Transport (A2)	Manufacturing (A3)	Transport (A4)	Installation (A5)	Deconstruction (C1)	Transport (C2)	Waste processing (C3)	Disposal (C4)	Module D
HWD	9.53E-05	9.53E-05	1.04E-09	7.60E-12	3.48E-10	0.00E+00	0.00E+00	2.65E-10	1.27E-10	2.99E-12	-7.99E-05
NHWD	1.09E+02	1.09E+02	4.38E-03	9.90E-05	1.03E-03	0.00E+00	0.00E+00	7.81E-04	6.08E-04	1.40E-01	-9.64E+01
RWD	2.36E-03	2.32E-03	4.03E-05	1.07E-06	8.35E-06	0.00E+00	0.00E+00	6.36E-06	2.93E-05	2.95E-07	-1.92E-03

Output flows

Table 13. Results for Single cover (40x25) 1 m² of roof slate façade system.

Indicator	Total A1-A3	Raw material supply (A1)	Transport (A2)	Manufacturing (A3)	Transport (A4)	Installation (A5)	Deconstruction (C1)	Transport (C2)	Waste processing (C3)	Disposal (C4)	Module D
CRU	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	5.71E-01	5.71E-01	0.00E+00	0.00E+00	0.00E+00	1.35E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.71E-01
MER	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 14. Results for Single cover (50x30) 1 m² of roof slate façade system.

Indicator	Total A1-A3	Raw material	Transport (A2)	Manufacturing (A3)	Transport (A4)	Installation (A5)	Deconstruction (C1)	Transport (C2)	Waste processing (C3)	Disposal (C4)	Module D

		supply (A1)									
CRU	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	5.71E-01	5.71E-01	0.00E+00	0.00E+00	0.00E+00	1.31E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.49E-01
MER	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 15. Results for Double cover (40x25) 1 m² of roof slate façade system.

Indicator	Total A1-A3	Raw material supply (A1)	Transport (A2)	Manu-facturing (A3)	Transport (A4)	Installation (A5)	Decon s-truction (C1)	Transport (C2)	Waste processing (C3)	Disposal (C4)	Module D
CRU	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	1.04E+00	1.04E+00	0.00E+00	0.00E+00	0.00E+00	2.30E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-9.45E-01
MER	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 16. Results for Double cover (50x30) 1 m² of roof slate façade system.

Indicator	Total A1-A3	Raw material supply (A1)	Transport (A2)	Manu-facturing (A3)	Transport (A4)	Installation (A5)	Decon s-truction (C1)	Transport (C2)	Waste processing (C3)	Disposal (C4)	Module D
CRU	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	1.04E+00	1.04E+00	0.00E+00	0.00E+00	0.00E+00	2.24E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-9.25E-01
MER	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Information on biogenic carbon content

Results per functional or declared unit					
BIOGENIC CARBON CONTENT	**Unit**	**Single C. (40x25)**	**Single C. (50x30)**	**Double C. (40x25)**	**Double C. (40x25)**
Biogenic carbon content in product	kg C	0	0	0	0
Biogenic carbon content in packaging	kg C	0.33	0.33	0.61	0.61

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

Additional information

Wastage in the workplace during processing / adaptation do not need to be collected. It can be mixed with filling materials locally.
We buy back leftover material which is then sold in smaller packages to a new end-customer via an online store, which are products that might otherwise have been thrown away.
All slate is processed with hand tools.
All employees are and will be trained in human rights for a sustainable society and we do not buy slate from countries that generally cannot prove that they promote this.
We support the staff in the slate quarries in good working environment and assist with knowledge and in some cases protective material (breathing masks).

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