Environmental Product Declaration

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

Thermafleece Cosywool, Ultrawool

from

Eden Renewable Innovations Limited

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-04468
Publication date:	2021-11-01
Valid until:	2026-10-31

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
Website:	www.environdec.com
E-mail:	info@environdec.com

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): PCR 2019:14 Construction products (version 1.11) and C-PCR-005 Thermal Insulation Products, version: 2019-12-20. Valid until 2024-12-20 UN CPC Code 27922 (Textile articles other than apparel – nonwovens)
PCR review was conducted by: International EPD® System (life Cycle Engineering Committee) info@environdec.com
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: Dr. Hudai Kara, Metsims Sustainability Consulting [www.metsims.com] 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

Owner of the EPD: Eden Renewable Innovations Ltd, Soulands Gate, Dacre, Penrith, Cumbria, CA11 0JF, UK
Contact: Mark Lynn
Description of the organisation: Eden Renewable Innovations Ltd designs and markets thermal and acoustic insulation made using natural and recycled fibres. All insulation is manufactured in the UK. Minimising our impact on the environment is at the very heart of the Eden Renewable Innovations Ltd philosophy and mission. The products we currently sell and those that we are researching have a specific focus to offer the consumer a greener alternative and to make best use of the technical benefits of natural and recycled fibres. Eden Renewable Innovations Ltd is committed not only to minimising the environmental impact of our products but also strives to be environmentally responsible in the day-to-day running of the company's activities. Through our environmental focus we aim to inspire our staff and encourage our customers and all those involved in our supply chain to reduce their own environmental impact.
Product-related or management system-related certifications: Insulation manufactured under ISO 9001 Quality Assurances System.
Name and location of production site(s): Nunbrook Mills, Huddersfield Rd, Mirfield WF14 0EH

Product information

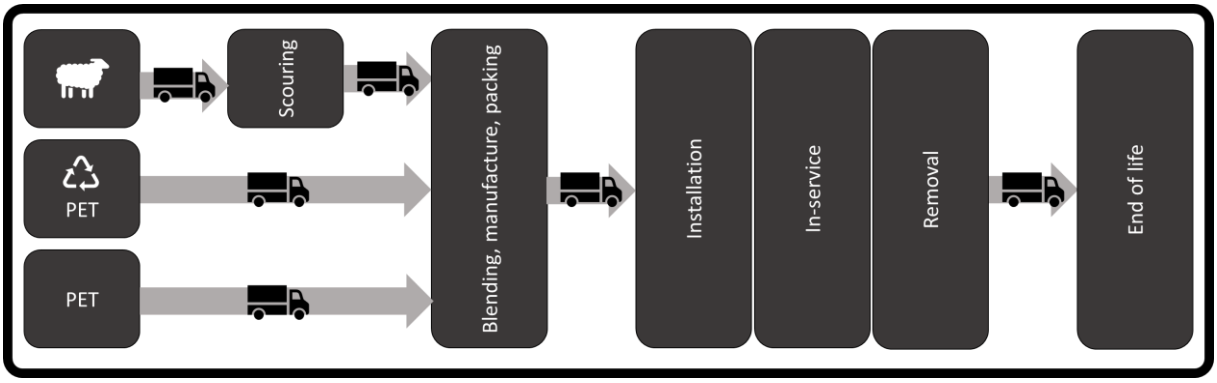
Product name: Thermafleece
Product identification: CosyWool Roll, CosyWool Slab, UltraWool
Product description: Thermal and acoustic insulation made using British sheep's wool combined with recycled PET lofting agent and thermally-bonded using a PET bi-component binder to prevent slumping in service. All Thermafleece products are manufactured to ISO 9001 and wool is processed to ISO 14001. CosyWool was VOC tested according to EN 16516:2017 and for formaldehyde release according to ISO 16000-3:2011 by Shirley Technologies Ltd. Date of test: May 2019. Formaldehyde levels at 3 days and 28 days were less than 2.0 µg/m^3. Packaging is low density poly(ethylene) (LDPE).

Product	Width (mm)	Thickness (mm)	Density (kg/m^3)	Thermal conductivity (λ) (W/mK)
CosyWool Roll	370 and 570	50, 75, 100, 140 and 150	18	0.039
CosyWool Slab	390 and 590	50, 75, 100 and 140	21	0.038
UltraWool Slab	390 and 590	50, 70 and 90	31	0.035

UN CPC code: 27922 (Textile articles other than apparel – nonwovens)
Commodity Code: 5603949090

LCA information

Functional unit / declared unit: 1 m^2 of CosyWool roll or slab, or UltraWool roll with an R = 1 m^2K/W, plus packaging.
Reference service life: Products are expected to last the lifetime of the building.
Time representativeness: 2019
Database(s) and LCA software used: Ecoinvent 3.7, with Simapro 9.1.1.
Description of system boundaries:
Construction product EPD: Cradle to grave with modules A1-A5, B1-B7, C1-C4 and D. Some modules have nil entries because there is no impact.
System diagram:



More information: **https://www.thermafleece.com/**
This EPD is based upon an underlying LCA of the manufacturing facility, with operational data obtained for 2019, combined with a site visit. The underlying LCA was conducted by Dr Andrew Norton, Renuables Ltd (**http://renuables.co.uk/**).
Cut-off criteria were based upon input flows being less than 1% of the total individually, subject to the sum of all flows being less than 5% of the total, and subject to verification that the impacts associated with such flows were not of a magnitude to affect the reported data significantly (less than 5% in total).
For characterization factors: the characterization factors stated in EN 15804 + A2 (2019) were used. See: **http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml**
Electricity supply: Average GB grid primary energy mix.
The assumption for module A4 is for transport to construction site of 100 km by logistics company, which is representative. Actual distances should be used as appropriate – GHG impacts associated with transport can be found here if calculations of actual distance to site are required: **https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021**
Economic allocation was used where direct assignment of environmental burdens was not possible, e.g., between wool and meat.
Assumptions for Module A5 are manual installation with no requirement for utilities. No maintenance is required during the lifetime of the product and the product will have an expected lifetime equal to that of the building. There is no requirement for operational energy or water. Manual removal at end of life is assumed and waste treatment and disposal are included in calculating environmental burdens for module C3. Transport to a waste disposal facility of 10 km is assumed for module C2. Nil entries are therefore recorded for modules A5, B1-B7, C1 and they are not included in the tables, although they are declared in this EPD.
Scenario for Module D: it is assumed that the insulation is manually removed at end of life and incinerated in a small-scale heating facility, replacing natural gas as the energy source. Other scenarios are possible, including re-use of the product at end of life.

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	X	X	X	X	X	X	X

Content information – CosyWool, Ultrawool

Product components	**Weight, kg**		
	Cosywool roll	**Cosywool slab**	**Ultrawool slab**
Sheep wool	0.527	0.599	0.814
Recycled poly(ethylene terephthalate)	0.105	0.120	0.163
Poly(ethylene terephthalate)	0.070	0.080	0.109
TOTAL	**0.702**	**0.798**	**1.085**
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	
PE (CosyWool roll)	0.00102	0.146	
PE (CosyWool slab)	0.00314	0.394	
PE (UltraWool slab)	0.00436	0.402	

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

Environmental Information

This EPD contains information about environmental impact, use of resources and waste production in the form of quantitative indicators. The following abbreviations and have been used in the tables which quantify environmental performance:

Indicator	Abbreviation
Global warming potential (Fossil, biogenic, land use and transformation (LUT))	GWP
Depletion potential of the stratospheric ozone layer	ODP
Acidification potential	AP
Eutrophication potential	EP
Formation potential of tropospheric ozone	POCP
Abiotic depletion potential – Elements	ADPE
Abiotic depletion potential – Fossil resources	ADPF
Water deprivation potential	WDP
Primary energy resources – Renewable (use as energy carrier)	PERE
Primary energy resources – Renewable (use raw materials)	PERM
Primary energy resources – Renewable (total)	PERT
Primary energy resources – Non-renewable (use as energy carrier)	PENRE
Primary energy resources – Non-renewable (use raw materials)	PENRM
Primary energy resources – Non-renewable (total)	PENRT
Secondary material	SM
Renewable secondary fuels	RSF
Non-renewable secondary fuels	NRSF
Net use of fresh water	NUFW
Hazardous waste disposed	HWD
Non-hazardous waste disposed	NHWD
Radioactive waste disposed	RWD
Components for re-use	CFR
Material for recycling	MFR
Materials for energy recovery	MFER
Exported energy, electricity	EE-E
Exported energy, thermal	EE-T

Potential environmental impact – mandatory indicators according to EN 15804

Results per m^2 CosyWool roll with R = 1 m^2K/W										
Indicator	**Unit**	**A1**	**A2**	**A3**	**Tot.A1-A3**	**A4**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	7.07E-01	2.61E-02	1.70E-01	9.03E-01	6.14E-03	6.14E-04	9.28E-04	0.00E+00	-1.26E+00
GWP-biogenic	kg CO_2 eq.	-8.59E-01	1.55E-05	2.90E-04	-8.58E-01	3.65E-06	3.65E-07	1.18E-06	8.95E-01	1.29E-04
GWP-luluc	kg CO_2 eq.	5.14E-03	8.82E-06	1.83E-04	5.33E-03	2.07E-06	2.07E-07	2.87E-07	0.00E+00	-1.95E-04
GWP-total	kg CO_2 eq.	-1.47E-01	2.62E-02	1.71E-01	5.00E-02	6.14E-03	6.14E-04	9.29E-04	8.95E-01	-1.26E+00
ODP	kg CFC 11 eq.	6.43E-08	6.40E-09	2.06E-08	9.13E-08	1.50E-09	1.50E-10	3.81E-10	0.00E+00	-1.73E-07
AP	mol H^+ eq.	2.93E-03	8.38E-05	4.32E-04	3.45E-03	1.97E-05	1.97E-06	8.77E-06	0.00E+00	-1.31E-03
EP-freshwater	kg PO_4^{3-} eq.	1.19E-03	1.47E-05	1.14E-04	1.31E-03	3.46E-06	3.46E-07	1.44E-06	0.00E+00	-2.39E-04
EP-marine	kg N eq.	7.29E-04	1.88E-05	9.29E-05	8.41E-04	4.41E-06	4.41E-07	3.04E-06	0.00E+00	-3.04E-04
EP-terrestrial	mol N eq.	6.22E-03	2.05E-04	9.95E-04	7.42E-03	4.81E-05	4.81E-06	3.33E-05	0.00E+00	-3.26E-03
POCP	kg NMVOC eq.	1.94E-03	8.00E-05	2.74E-04	2.29E-03	1.88E-05	1.88E-06	9.65E-06	0.00E+00	-1.23E-03
ADPE*	kg Sb eq.	1.28E-05	4.31E-07	4.40E-07	1.37E-05	1.01E-07	1.01E-08	8.84E-09	0.00E+00	-2.63E-06
ADPF*	MJ	1.19E+01	4.22E-01	3.45E+00	1.58E+01	9.92E-02	9.92E-03	2.58E-02	0.00E+00	-1.83E+01
WDP*	m^3	1.99E-01	1.46E-03	6.64E-03	2.07E-01	3.43E-04	3.43E-05	1.16E-03	0.00E+00	-1.68E-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

Results per m^2 CosyWool roll with R = 1 m^2K/W										
Indicator	**Unit**	**A1**	**A2**	**A3**	**Tot.A1-A3**	**A4**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1.20E+00	5.62E-03	4.06E-01	1.61E+00	1.32E-03	1.32E-04	2.21E-04	0.00E+00	-1.19E-01
PERM	MJ	1.26E+01	0.00E+00	0.00E+00	1.26E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.26E+01
PERT	MJ	1.38E+01	5.62E-03	4.06E-01	1.42E+01	1.58E-03	1.58E-04	2.68E-04	0.00E+00	-1.27E+01
PENRE	MJ	1.31E+01	4.15E-01	3.68E+00	1.72E+01	9.74E-02	9.74E-03	2.54E-02	0.00E+00	-1.88E+01
PENRM	MJ.	3.74E+00	0.00E+00	0.00E+00	3.74E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.74E+00
PENRT	MJ	1.68E+01	4.15E-01	3.68E+00	2.09E+01	9.74E-02	9.74E-03	2.54E-02	0.00E+00	-2.25E+01
SM	kg	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
RSF	MJ	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	MJ	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	m^3	8.82E-03	3.93E-05	4.84E-04	9.34E-03	9.24E-06	9.24E-07	2.73E-05	0.00E+00	-5.50E-04

Waste production and output flows

Waste production

Results per m^2 CosyWool roll with R = 1 m^2K/W										
Indicator	**Unit**	**A1**	**A2**	**A3**	**Tot.A1-A3**	**A4**	**C2**	**C3**	**C4**	**D**
HWD	kg	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
NHWD	kg	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
RWD	kg	3.36E-06	1.46E-08	1.80E-06	5.18E-06	3.43E-09	3.43E-10	5.00E-10	0.00E+00	-2.12E-07

Output flows

Results per m^2 CosyWool roll with R = 1 m^2K/W										
Indicator	**Unit**	**A1**	**A2**	**A3**	**Tot.A1-A3**	**A4**	**C2**	**C3**	**C4**	**D**
CFR	kg	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	kg	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
MFER	kg	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
EE-E	MJ	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
EE-T	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.67E+01

Information on biogenic carbon content

Results per m^2 CosyWool roll with R = 1 m^2K/W		
BIOGENIC CARBON CONTENT	Quantity (kg C)	Quantity (kg CO_2e)
Biogenic carbon content in product	0.25	-0.90
Biogenic carbon content in packaging	0.00	0.00

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2e.

Potential environmental impact – mandatory indicators according to EN 15804

Results per m^2 CosyWool slab with R = 1 m^2K/W										
Indicator	**Unit**	**A1**	**A2**	**A3**	**Tot.A1-A3**	**A4**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	8.03E-01	2.97E-02	1.98E-01	1.03E+00	6.98E-03	6.98E-04	1.05E-03	0.00E+00	-1.43E+00
GWP-biogenic	kg CO_2 eq.	-9.76E-01	1.76E-05	6.71E-04	-9.75E-01	4.15E-06	4.15E-07	1.34E-06	1.02E+00	1.47E-04
GWP-luluc	kg CO_2 eq.	5.84E-03	1.00E-05	2.74E-04	6.13E-03	2.36E-06	2.36E-07	3.26E-07	0.00E+00	-2.21E-04
GWP-total	kg CO_2 eq.	-1.67E-01	2.97E-02	1.99E-01	6.24E-02	6.98E-03	6.98E-04	1.06E-03	1.02E+00	-1.43E+00
ODP	kg CFC 11 eq.	7.31E-08	7.27E-09	2.39E-08	1.04E-07	1.71E-09	1.71E-10	4.33E-10	0.00E+00	-1.96E-07
AP	mol H^+ eq.	3.33E-03	9.53E-05	5.14E-04	3.94E-03	2.24E-05	2.24E-06	9.97E-06	0.00E+00	-1.49E-03
EP-freshwater	kg PO_4^{3-} eq.	1.35E-03	1.67E-05	1.43E-04	1.51E-03	3.93E-06	3.93E-07	1.64E-06	0.00E+00	-2.72E-04
EP-marine	kg N eq.	8.29E-04	2.14E-05	1.11E-04	9.61E-04	5.02E-06	5.02E-07	3.45E-06	0.00E+00	-3.46E-04
EP-terrestrial	mol N eq.	7.07E-03	2.33E-04	1.18E-03	8.48E-03	5.47E-05	5.47E-06	3.78E-05	0.00E+00	-3.71E-03
POCP	kg NMVOC eq.	2.20E-03	9.09E-05	3.25E-04	2.62E-03	2.14E-05	2.14E-06	1.10E-05	0.00E+00	-1.40E-03
ADPE*	kg Sb eq.	1.46E-05	4.90E-07	5.47E-07	1.56E-05	1.15E-07	1.15E-08	1.00E-08	0.00E+00	-2.99E-06
ADPF*	MJ	1.36E+01	4.80E-01	4.00E+00	1.80E+01	1.13E-01	1.13E-02	2.93E-02	0.00E+00	-2.08E+01
WDP*	m^3	2.26E-01	1.66E-03	1.19E-02	2.40E-01	3.90E-04	3.90E-05	1.32E-03	0.00E+00	-1.90E-02

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Use of resources

Results per m² CosyWool slab with R = 1 m²K/W										
Indicator	**Unit**	**A1**	**A2**	**A3**	**Tot.A1-A3**	**A4**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1.36E+00	6.39E-03	4.75E-01	1.84E+00	1.50E-03	1.50E-04	2.52E-04	0.00E+00	-1.36E-01
PERM	MJ	1.43E+01	0.00E+00	0.00E+00	1.43E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.43E+01
PERT	MJ	1.74E+00	7.64E-03	6.93E-01	1.61E+01	1.50E-03	1.50E-04	2.52E-04	0.00E+00	-1.44E+01
PENRE	MJ	1.49E+01	4.71E-01	4.28E+00	1.97E+01	1.11E-01	1.11E-02	2.88E-02	0.00E+00	-2.14E+01
PENRM	MJ.	4.25E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-4.25E+00
PENRT	MJ	1.49E+01	4.71E-01	4.28E+00	1.97E+01	1.11E-01	1.11E-02	2.88E-02	0.00E+00	-2.57E+01
SM	kg	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
RSF	MJ	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	MJ	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	m^3	1.00E-02	4.47E-05	6.57E-04	1.07E-02	1.05E-05	1.05E-06	3.10E-05	0.00E+00	-6.26E-04

Waste production and output flows

Waste production

Results per m² CosyWool slab with R = 1 m²K/W										
Indicator	**Unit**	**A1**	**A2**	**A3**	**Tot.A1-A3**	**A4**	**C2**	**C3**	**C4**	**D**
HWD	kg	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
NHWD	kg	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
RWD	kg	3.82E-06	1.66E-08	2.08E-06	5.92E-06	3.89E-09	3.89E-10	5.69E-10	0.00E+00	-2.41E-07

Output flows

Results per m² CosyWool slab with R = 1 m²K/W										
Indicator	**Unit**	**A1**	**A2**	**A3**	**Tot.A1-A3**	**A4**	**C2**	**C3**	**C4**	**D**
CFR	kg	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	kg	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
MER	kg	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
EE-E	MJ	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
EE-T	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.90E+01

Information on biogenic carbon content

Results per m² CosyWool slab with R = 1 m²K/W		
BIOGENIC CARBON CONTENT	**Quantity (kg C)**	**Quantity (kg CO_2e)**
Biogenic carbon content in product	0.28	-1.02
Biogenic carbon content in packaging	0.00E+00	0.00E+00

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

Potential environmental impact – mandatory indicators according to EN 15804

Results per m^2 UltraWool slab with R = 1 m^2K/W										
Indicator	**Unit**	**A1**	**A2**	**A3**	**Tot.A1-A3**	**A4**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	1.09E+00	4.04E-02	2.31E-01	1.36E+00	9.49E-03	9.49E-04	1.43E-03	0.00E+00	-1.94E+00
GWP-biogenic	kg CO_2 eq.	-1.33E+00	2.40E-05	9.03E-04	-1.33E+00	5.64E-06	5.64E-07	1.82E-06	1.38E+00	1.99E-04
GWP-luluc	kg CO_2 eq.	7.95E-03	1.36E-05	3.42E-04	8.30E-03	3.20E-06	3.20E-07	4.44E-07	0.00E+00	-3.01E-04
GWP-total	kg CO_2 eq.	-2.27E-01	4.04E-02	2.32E-01	4.61E-02	9.50E-03	9.50E-04	1.44E-03	1.38E+00	-1.94E+00
ODP	kg CFC 11 eq.	9.93E-08	9.89E-09	2.77E-08	1.37E-07	2.32E-09	2.32E-10	5.89E-10	0.00E+00	-2.67E-07
AP	mol H^+ eq.	4.53E-03	1.30E-04	6.03E-04	5.26E-03	3.04E-05	3.04E-06	1.36E-05	0.00E+00	-2.03E-03
EP-freshwater	kg PO_4^{3-} eq.	1.83E-03	2.27E-05	1.71E-04	2.03E-03	5.34E-06	5.34E-07	2.23E-06	0.00E+00	-3.69E-04
EP-marine	kg N eq.	1.13E-03	2.90E-05	1.30E-04	1.29E-03	6.82E-06	6.82E-07	4.69E-06	0.00E+00	-4.71E-04
EP-terrestrial	mol N eq.	9.61E-03	3.17E-04	1.38E-03	1.13E-02	7.44E-05	7.44E-06	5.14E-05	0.00E+00	-5.05E-03
POCP	kg NMVOC eq.	3.00E-03	1.24E-04	3.80E-04	3.50E-03	2.90E-05	2.90E-06	1.49E-05	0.00E+00	-1.90E-03
ADPE*	kg Sb eq.	1.98E-05	6.66E-07	6.49E-07	2.11E-05	1.56E-07	1.56E-08	1.37E-08	0.00E+00	-4.07E-06
ADPF*	MJ	1.84E+01	6.52E-01	4.65E+00	2.37E+01	1.53E-01	1.53E-02	3.99E-02	0.00E+00	-2.83E+01
WDP*	m^3	3.08E-01	2.26E-03	1.54E-02	3.25E-01	5.30E-04	5.30E-05	1.79E-03	0.00E+00	-2.59E-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

Results per m² UltraWool slab with R = 1 m²K/W										
Indicator	**Unit**	**A1**	**A2**	**A3**	**Tot.A1-A3**	**A4**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1.85E+00	8.69E-03	5.54E-01	2.41E+00	2.04E-03	2.04E-04	3.42E-04	0.00E+00	-1.85E-01
PERM	MJ	1.94E+01	0.00E+00	0.00E+00	1.94E+01	3.99E-04	3.99E-05	7.25E-05	0.00E+00	-1.94E+01
PERT	MJ	2.13E+01	8.69E-03	5.54E-01	2.18E+01	2.44E-03	2.44E-04	4.15E-04	0.00E+00	2.13E+00
PENRE	MJ	2.03E+01	6.41E-01	4.98E+00	2.59E+01	1.51E-01	1.51E-02	3.92E-02	0.00E+00	-2.91E+01
PENRM	MJ.	5.78E+00	0.00E+00	0.00E+00	5.78E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.78E+00
PENRT	MJ	2.03E+01	6.41E-01	4.98E+00	3.17E+01	1.51E-01	1.51E-02	3.92E-02	0.00E+00	3.49E+01
SM	kg	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
RSF	MJ	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	MJ	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	m^3	1.36E-02	6.08E-05	7.98E-04	1.45E-02	1.43E-05	1.43E-06	4.22E-05	0.00E+00	-8.51E-04

Waste production and output flows

Waste production

Results per m² UltraWool slab with R = 1 m²K/W										
Indicator	**Unit**	**A1**	**A2**	**A3**	**Tot.A1-A3**	**A4**	**C2**	**C3**	**C4**	**D**
HWD	kg	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
NHWD	kg	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
RWD	kg	5.20E-06	2.25E-08	2.42E-06	7.64E-06	5.29E-09	5.29E-10	7.73E-10	0.00E+00	-3.27E-07

Output flows

Results per m² UltraWool slab with R = 1 m²K/W										
Indicator	**Unit**	**A1**	**A2**	**A3**	**Tot.A1-A3**	**A4**	**C2**	**C3**	**C4**	**D**
CFR	kg	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	kg	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
MER	kg	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
EE-E	MJ	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
EE-T	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.58E+01

Information on biogenic carbon content

Results per m² UltraWool slab **with R = 1 m²K/W**		
BIOGENIC CARBON CONTENT	**Quantity (kg C)**	**Quantity (kg CO_2e)**
Biogenic carbon content in product	0.38	-1.39
Biogenic carbon content in packaging	0.00	0.00

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

Additional information

Environmental Policy Aims:

- To continually assess, monitor and reduce any effect of Eden Renewable Innovations' activities on the environment by:
- Ensuring that environmental considerations are integrated into business decision-making.
- Complying where applicable with environmental legislation.
- Preventing pollution on site.
- Reducing waste wherever practicable, and re-using and recycling remaining waste where we can.
- Improved energy efficiency wherever possible.
- Make purchasing decisions based on environmental performance of products and suppliers.
- To strive for continual development in environmental performance by setting and reviewing improvement targets.

Specific Objectives:

- As a minimum, operate within all applicable statutory environmentally-related obligations, associated official guidance and appropriate industry standards.
- Minimise the negative environmental impacts of our business.
- Promote our energy efficient products and provide advice, with the objective of ensuring the installation of the best practicable energy efficient installations.
- Actively promote sustainable development and be an exemplar of its principles.
- All of the Eden Renewable Innovations team are responsible for ensuring that this policy is implemented.

Biogenic Carbon

Biogenic carbon stored in the sheep wool is declared in module A1, where this is reported as under the entry for climate change – biogenic. This includes both emissions of biogenic carbon due to processing and the atmospheric carbon stored in the wool, which is reported as a negative flow.

According to EN15804:2012+A2:2019 the reporting of biogenic carbon should be treated as follows:

'The degradation of a product's biogenic carbon content in a solid waste disposal site, declared as GWP-biogenic, shall be calculated without time limit. Any remaining biogenic carbon is treated as an emission of biogenic CO_2 from the technosphere to nature.'

The emission of biogenic carbon is therefore declared in module C4 of the EPD in the entry for climate change – biogenic. This entry declares the total biogenic carbon stored in the product as carbon dioxide equivalents, where it is reported as a positive flow.

The biogenic carbon stored in the products is:

Product	Biogenic carbon per kg ($kgCO_2e$)	Biogenic carbon per FU ($kgCO_2e$)
CosyWool roll	-1.28	-0.90
CosyWool slab	-1.28	-1.02
UltraWool	-1.28	-1.39

The use of materials containing biogenic carbon in long-life products can be used as a climate change mitigation strategy. The benefit of the storage of atmospheric carbon in such products is greater as the lifetime of the product is extended. However, the time effect of storage of atmospheric carbon is not

included in any standards describing the methodology for LCA calculations to be used for EPDs. The different methods of calculating the temporal aspects of carbon storage are reviewed by Tellnes et al. (2017).

The IPCC uses a stocks and flows approach to reporting stored biogenic carbon, where the inflows and outflows of biogenic carbon are reported for each year and the biogenic carbon stocks determined accordingly. Annual inputs of biogenic carbon into the built environment carbon pool can be determined from statistical data, but the quantities of biogenic carbon exiting the pool (as carbon dioxide) are generally not known and have to be calculated using a decay function. The default decay function is exponential decay with recommended half-lives.

Calculation of environmental impact per m^2 of material

The environmental burdens are reported for 1 m^2 of a product with an R=1. In order to convert this data to calculate the burdens per m^2 for each of the different products on the market please refer to the table below:

Product	Thickness (mm)	Density (kg/m^3)	λ (W/mK)	R (m^2K/W)
CosyWool roll	50	18	0.039	1.28
CosyWool roll	75	18	0.039	1.92
CosyWool roll	100	18	0.039	2.56
CosyWool roll	140	18	0.039	3.59
CosyWool roll	150	18	0.039	3.85
CosyWool slab	50	21	0.038	1.32
CosyWool slab	75	21	0.038	1.97
CosyWool slab	100	21	0.038	2.63
CosyWool slab	140	21	0.038	3.68
UltraWool slab	50	31	0.035	1.43
UltraWool slab	70	31	0.035	2.00
UltraWool slab	90	31	0.035	2.57

Information related to Sector EPD

N/A

Differences versus previous versions

N/A

References

General Programme Instructions of the International EPD® System, version 3.01, based on ISO 14025:2006, ISO 14040:2006 and ISO 14044:2006
PCR 2019:14 Construction products (version 1.11) and C-PCR-005 Thermal Insulation Products, version: 2019-12-20. Valid until 2024-12-20
EN 15804:2012+A2:2019 Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products
EN 16516:2017 Construction products: Assessment of release of dangerous substances - Determination of emissions into indoor air
EN 16783:2017 Thermal insulation products. Product category rules (PCR) for factory made and in-situ formed products for preparing environmental product declarations
ISO 9001:2015 Quality management systems — Requirements
ISO 14001:2015 Environmental management systems — Requirements with guidance for use
ISO 16000-3:2011 Indoor air – Part 3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air – active sampling method
ISO 21930:2017 Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services (This standard is used in selected sections, such as allocation, when it provides additional but not contradictory rules to EN 15804)
Tellnes, L., Ganne-Chedeville, C., Dias, A., Dolezal, F., Hill, C., Escamilla, E. (2017) Comparative assessment for biogenic carbon accounting methods in carbon footprint of products: a review study for construction materials based on forest products. iForest, 10, 815-823 [DOI: 10.3832/ifor2386-010].

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