

Life Cycle Assessment

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

Sisu® Luxury Vinyl Floor Tiles

From:

EnviroBuild Materials Ltd. (EnviroBuild)

Calculation Method

The International EPD® System

Publication Date

2022-02-28



Company

Owner of the LCA
EnviroBuild Materials Ltd.

Contact
Hayden Cotgrove

Description of the organisation
Agents involved in the sale of timber and building materials

Name and location of the product site(s)

Head office
EnviroBuild
30 Great Guildford Street
London
United Kingdom
SE1 0HS

envirobuild.com
info@envirobuild.com

Warehouse
Essex
United Kingdom

Production site
Zhejiang Province
China

Product-related or management system-related certifications

- ISO9001:2008 Quality Management Systems
- ISO14001:2004 Environmental Management Systems

Programme Information

Core Product Category Rules (PCR)
CEN standard EN 15804

Product category rules (PCR)
Construction Products 2019:14 version 1.1

UN CPC Code
36910 Floor coverings of plastics

Product

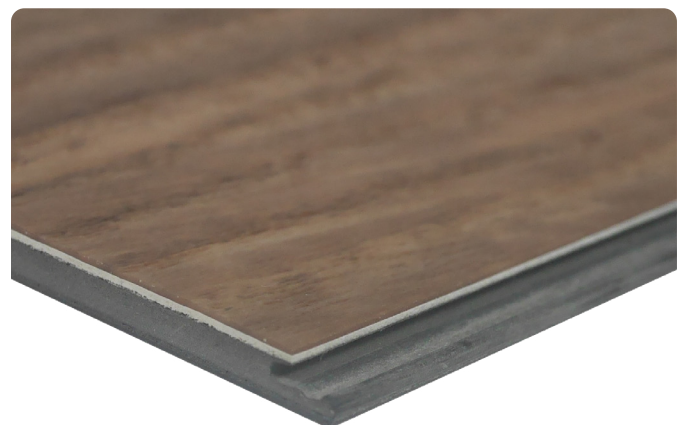
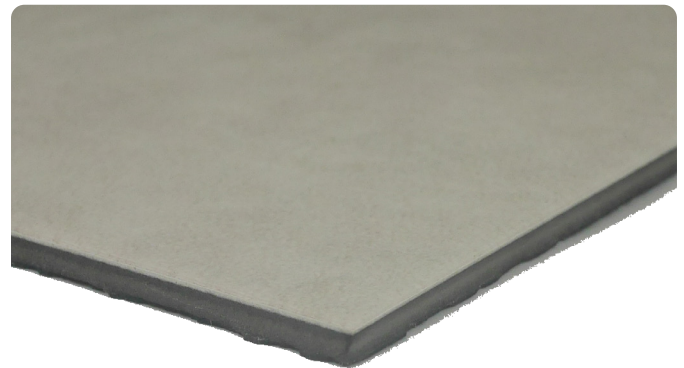
Product name
Sisu® Luxury Vinyl Floor Tiles

Product identification
Resilient, textile and laminate floor coverings, EN 14041

Product description
Sisu® Luxury Vinyl Tiles create the perfect, welcoming indoor space in a range of authentic and natural shades and tones.

The Dryback system ensures a quick and, secure installation, using, the award winning and environmentally friendly Ultrabond Eco adhesive.

The 'Click' system ensures a simple, seamless adhesive-free DIY installation and combined with LVT underlay makes a truly luxurious feel under foot, helps noise dampening and improves heat insulation.



Product Dimensions

Product Code	Name & Description	Weight (kg/m ²)
LV-SC-__	LVT Click	8.6
LV-SD-__	LVT Dryback	5.0

Product Characteristics

Characteristic	Reference	Unit
Slip Resistance	DIN 51130	R11
Staining Resistance	EN 423	Excellent
Castor Chair Continuous Use	EN ISO 4918	Pass
Furniture Continuous Use	EN ISO 16581	Pass
Abrasion Resistance	EN 660-2	Group T (Fv ≤ 2.0)
Residual Indentation	EN ISO 24343-1	0.56 mm
Acoustic Impact Noise Resistance	EN ISO 10140-3	$\Delta L_w = 20$ dB $C_{\Delta} = -10$ dB
Colour Fastness to Artificial Light	EN ISO 105-B02	Grade 6
Dimensional Stability	EN 434	0.05%
Curling	EN 434	0.0%

UN CPC code: 36910 Floor coverings of plastics, in rolls or in the form of tiles: wall or ceiling coverings of plastic

Other codes for product classification: UK Commodity Code 3918 1010 90, Floor coverings of plastics, whether or not self-adhesive, in rolls or in the form of tiles; wall or ceiling coverings of plastics, as defined in note 9 to this chapter — Of polymers of vinyl chloride — Consisting of a support impregnated, coated or covered with poly(vinyl chloride) — Other

LCA Information

Functional unit

1 m² of Sisu® LVT, installed for 10 years

Reference service life

10 years

Time representativeness

2019-2020

Geographical scope

UK and China

Database(s) and LCA software used

Database: EcolInvent 3.6

LCA Software: OpenLCA 1.10.3

Impact Assessment Method: As specified in EN 15804+A2, using the characterisation factors published by the European Commission's Joint Research Centre and implemented in EuGeos' IA15804 database.

Description of system boundaries

(c) Cradle to grave and module D (A + B + C + D)

LCA practitioner

Hayden Cotgrove

hc@envirobuild.com

EnviroBuild

305-308 Metal Box Factory

30 Great Guildford Street

London

United Kingdom

SE1 0HS

Assumptions

Quantity	Unit	Description	Module	Justification
-	-	Additives	A1	Additive quantities are known, but composition unknown. So typical compositions have been found, and similar chemicals modelled in the LCA.
100	km	Distance from warehouse to construction site	A4	Distance from warehouse to construction site is assumed to be a typical distance of 100 km.
0	kWh	Energy of warehouse	A5	Products are not expected to stay in the warehouse for a significant amount of time, so the energy use of their storage has not been considered.
0.03	kWh	Electricity used per sqm of flooring	A5	Electricity to cut tiles down to size around the perimeter of the floor
0.03	kg	Adhesive needed per sqm of flooring	A5	Only applies to dryback tiles.
10	Years	Reference service life	B2	EnviroBuild expectations. LVT as a material will last longer, but on average customers are predicted to keep their flooring for around 10 years.
1	Week	Frequency of flooring maintenance	B2	EnviroBuild recommendation to maintain flooring quality and lifespan.
0.022	kWh	Electricity usage per m ² of flooring per year	B2	Vacuum cleaning
5.80	L	Soap and water usage per m ² of flooring per clean	B2	Mopping
100	km	Distance from construction site to landfill site	C2	Typical distance
		Landfill end of life	C4	Whilst EnviroBuild recommend that any left-over materials or materials at the end of life be remade into other products, all material is eventually expected to end up in landfill even if not at the end of the RSL, so all has been modelled as being landfilled.

Common Scenarios

Transport to building site	Quantity (per declared unit)
Fuel type and consumption of vehicle or vehicle type used for transport	Freight container ship, heavy fuel oil, 2.51E-03 kg per t*km Freight lorry, diesel, 1.62E-02 kg per t*km
Distance	Freight container ship, 22,000 km Freight lorry, 370 km
Capacity utilisation	100%
Bulk density of transport goods	152 kg/m ³

Installation in the building

Quantity (per declared unit)

Ancillary materials for installation	None considered
Water use	None considered
Other resource use	None considered
Quantitative description of energy type and consumption during the installation process	Market mix of UK electricity, 3.89E-04 kWh per m ²
Waste materials on building site before waste processing, generated by product's installation	5% waste LVT, considered to be 100% inert waste
Output materials as a result of waste processing at the building site	None considered
Direct emissions to ambient air, soil, and water	None considered

Maintenance

Quantity (per declared unit)

Maintenance process	Use soap and water, in a ratio of 1:99, for a quantity of 5.88 L per m ² per maintenance
Maintenance cycle	Once every week
Ancillary materials for maintenance	None considered
Waste material from maintenance	Wastewater 5.8 L per m ² per maintenance
Net fresh water consumption during maintenance	5.8 L per m ² per maintenance
Energy input during maintenance	None considered

RSL Information

Quantity (per declared unit)

Reference Service Life	10 years
Design application parameters	Installed according EnviroBuild installation guides
An assumed quality of work, when installed in accordance with the manufacturer's instructions	5% waste, no need for replacement of parts
Indoor environment	Average UK humidity and temperature for indoor conditions, without extreme variation.
Usage conditions	Typical residential environment.
Maintenance	Clean every two years with soap and water (see maintenance)

End-of-life	Quantity (per declared unit)
Collection process	Waste collection by lorry freight, 100 km distance
Recovery system	None considered
Disposal specified by type	1 kg for final deposition. 100% inert waste
Assumptions for scenario development	All material goes to landfill. No material is reused or recycled. No waste processing.

Scenarios	Date	Floor Type	Details
Scenario 1	Before September 2021	2.5 mm Sisu® LVT Dryback	Manufactured with grid electricity
Scenario 2	September - December 2021	2.5 mm Sisu® LVT Dryback	A3 wind electricity
Scenario 3	From January 2022	2.5 mm Sisu® LVT Dryback	A1-A3 wind electricity, 45% recycled PVC in backing
Scenario 4	Before September 2021	4 mm Sisu® LVT Click	Manufactured with grid electricity
Scenario 5	September - December 2021	4 mm Sisu® LVT Click	A3 wind electricity
Scenario 6	From January 2022	4 mm Sisu® SPC Click	A1-A3 wind electricity, 100% recycled PVC in backing

Cut-off Rules and Data Quality

Life cycle inventory data is according to EN 15804. 100% of all inflows (mass and energy) have been accounted for, for every declared module.

Whilst this EPD is based on a range of products, as those products are all manufactured from identical materials and from almost identical production processes, it can be asserted that GWP-GHG indicator does not differ between the products (per declared unit) by more than 10%.

Allocation

Co-product allocation is based on the physical mass of each product from the manufacturing process, as per EN 15804. Whilst each product from the factory may have a slightly different value, as the analysis has been completed on the basis of the declared unit of 1 kg of the material overall, the differences in value of the products were not considered as the material content and manufacturing processes were identical or close enough to. As every product from the manufacturing process was considered for the process, the co-product allocation did not need to be considered.

The only exception here is for the industrial residual wood powder content, which is produced as a by-product of the production of plywood. As this process is for a biogenic carbon input, the coproduct allocation must also be physical, according to EN 15804.

Energy for Manufacturing

Data for the energy used in module A3 (manufacturing) is from the EcolInvent 3.6 database for average power production in China, the total climate change impact of which is **1.06 kg CO2 eq./kWh**.

For the wind energy scenarios, the total climate change impact for wind energy in China is **0.0368 kg CO2 eq./kWh**.

Wind energy is produced using the Green Energy Certificate scheme in China, which enables companies to purchase renewable energy by the MWh, which replaces the grid energy they would otherwise be using. More about the system can be read here:

www.there100.org/sites/re100/files/2020-10/Chinese%20GEC%20Paper_RE100_2020%20FINAL.pdf

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	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
Geography	CN	CN	CN	CN, GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB	GB
Specific data used	>90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation: Products	<10%					-	-	-	-	-	-	-	-	-	-	-	-
Variation: Sites	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-

Content Information for LVT Dryback

Product Component	Weight, kg	Post-consumer material weight, %	Renewable material weight, %
Polyvinyl Chloride	2.26	0 (45.0 for Scenario 3)	0
Calcium Carbonate Powder	2.40	0	0
Additives	0.30	0	0
Total	4.97	0 (11.5 for Scenario 3)	0

Content Information for LVT Click

Product Component	Weight, kg	Post-consumer material weight, %	Renewable material weight, %
Polyvinyl Chloride	3.52	0	0
Calcium Carbonate Powder	4.55	0	0
Additives	0.52	0	0
Total	8.59	0	0

Content Information for SPC Click

Product Component	Weight, kg	Post-consumer material weight, %	Renewable material weight, %
Polyvinyl Chloride	3.00	61.4	0
Calcium Carbonate Powder	5.15	0	0
Additives	0.252	0	0
Total	8.40	21.9	0

Potential Environmental Impact – Mandatory Indicators According to EN 15804

Results per functional unit

Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B2	B1 & B3-B7	C1	C2	C3	C4	D
GWP Fossil	kg CO ₂ eq.	6.98 E+00	3.56 E-01	3.31 E+00	1.06 E+01	2.53 E+00	1.59 E-01	1.05 E-01	0.00 E+00	1.16 E-02	6.15 E-01	0.00 E+00	3.78 E-02	0.00 E+00
GWP Biogenic	kg CO ₂ eq.	1.42 E-02	-1.68 E-05	-2.95 E-02	-1.54 E-02	-6.10 E-04	-4.80 E-04	4.07 E-05	0.00 E+00	-3.08 E-06	9.51 E-05	0.00 E+00	1.40 E-04	0.00 E+00
GWP LULUC	kg CO ₂ eq.	1.03 E-01	1.30 E-04	3.60 E-04	1.04 E-01	1.38 E-03	1.30 E-04	1.40 E-04	0.00 E+00	1.51 E-05	5.24 E-05	0.00 E+00	1.85 E-05	0.00 E+00
GWP Total	kg CO ₂ eq.	7.10 E+00	3.56 E-01	3.28 E+00	1.07 E+01	2.53 E+00	1.58 E-01	1.05 E-01	0.00 E+00	1.16 E-02	6.15 E-01	0.00 E+00	3.80 E-02	0.00 E+00
ODP	kg CFC 11 eq.	2.91 E-06	7.73 E-08	2.01 E-08	3.00 E-06	5.30 E-07	2.33 E-08	1.04 E-08	0.00 E+00	1.18 E-09	1.30 E-07	0.00 E+00	1.03 E-08	0.00 E+00
AP	mol H ⁺ eq.	3.32 E-02	1.46 E-03	1.70 E-02	5.16 E-02	5.07 E-02	7.00 E-04	4.20 E-04	0.00 E+00	4.37 E-05	3.70 E-03	0.00 E+00	1.90 E-04	0.00 E+00
EP Freshwater	kg P eq.	5.80 E-04	4.05 E-06	7.32 E-05	6.57 E-04	1.97 E-05	7.29 E-06	4.52 E-06	0.00 E+00	3.90 E-07	1.70 E-06	0.00 E+00	6.98 E-07	0.00 E+00
EP Marine	kg N eq.	6.35 E-03	4.30 E-04	3.53 E-03	1.03 E-02	1.25 E-02	1.20 E-04	7.37 E-05	0.00 E+00	8.10 E-06	1.58 E-03	0.00 E+00	5.20 E-05	0.00 E+00
EP Terrestrial	mol N eq.	6.43 E-02	4.70 E-03	3.88 E-02	1.08 E-01	1.39 E-01	1.35 E-03	8.60 E-04	0.00 E+00	9.59 E-05	1.74 E-02	0.00 E+00	5.70 E-04	0.00 E+00
POCP	kg NMVOC eq.	2.06 E-02	1.40 E-03	1.00 E-02	3.20 E-02	3.66 E-02	5.50 E-04	2.30 E-04	0.00 E+00	2.40 E-05	6.05 E-03	0.00 E+00	1.90 E-04	0.00 E+00
ADP Minerals & Metals*	kg Sb eq.	1.90 E-04	9.36 E-06	4.16 E-06	2.04 E-04	3.97 E-05	2.88 E-06	1.21 E-06	0.00 E+00	8.46 E-08	3.67 E-06	0.00 E+00	5.88 E-07	0.00 E+00
ADP Fossil*	MJ	1.53 E+02	5.29 E+00	4.21 E+01	2.01 E+02	3.45 E+01	3.17 E+00	1.76 E+00	0.00 E+00	1.99 E-01	7.94 E+00	0.00 E+00	7.65 E-01	0.00 E+00
WDP*	m ³	1.23 E+02	5.10 E-01	7.53 E-01	1.24 E+02	7.74 E+00	1.45 E-01	1.14 E+01	0.00 E+00	1.73 E-02	4.80 E+00	0.00 E+00	5.00 E-01	0.00 E+00

Acronyms

GWP Fossil = Global Warming Potential, fossil fuels; GWP Biogenic = Global Warming Potential, biogenic; GWP LULUC = Global Warming Potential, land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP Freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP Marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP Terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP Minerals & Metals = Abiotic depletion potential for non-fossil resources; ADP Fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

* 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.

Potential Environmental Impact – Mandatory Indicators According to EN 15804

Results per functional unit

Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B2	B1 & B3-B7	C1	C2	C3	C4	D
GWP Fossil	kg CO ₂ eq.	6.98 E+00	3.56 E-01	1.12 E-01	7.45 E+00	2.53 E+00	1.59 E-01	1.05 E-01	0.00 E+00	1.16 E-02	6.15 E-01	0.00 E+00	3.78 E-02	0.00 E+00
GWP Biogenic	kg CO ₂ eq.	1.42 E-02	-1.68 E-05	-1.50 E-04	1.40 E-02	-6.10 E-04	-4.80 E-04	4.07 E-05	0.00 E+00	-3.08 E-06	9.51 E-05	0.00 E+00	1.40 E-04	0.00 E+00
GWP LULUC	kg CO ₂ eq.	1.03 E-01	1.30 E-04	1.60 E-04	1.04 E-01	1.38 E-03	1.30 E-04	1.40 E-04	0.00 E+00	1.51 E-05	5.24 E-05	0.00 E+00	1.85 E-05	0.00 E+00
GWP Total	kg CO ₂ eq.	7.10 E+00	3.56 E-01	1.12 E-01	7.56 E+00	2.53 E+00	1.58 E-01	1.05 E-01	0.00 E+00	1.16 E-02	6.15 E-01	0.00 E+00	3.80 E-02	0.00 E+00
ODP	kg CFC 11 eq.	2.91 E-06	7.73 E-08	6.15 E-09	2.99 E-06	5.30 E-07	2.33 E-08	1.04 E-08	0.00 E+00	1.18 E-09	1.30 E-07	0.00 E+00	1.03 E-08	0.00 E+00
AP	mol H ⁺ eq.	3.32 E-02	1.46 E-03	9.10 E-04	3.55 E-02	5.07 E-02	7.00 E-04	4.20 E-04	0.00 E+00	4.37 E-05	3.70 E-03	0.00 E+00	1.90 E-04	0.00 E+00
EP Freshwater	kg P eq.	5.80 E-04	4.05 E-06	1.64 E-05	6.00 E-04	1.97 E-05	7.29 E-06	4.52 E-06	0.00 E+00	3.90 E-07	1.70 E-06	0.00 E+00	6.98 E-07	0.00 E+00
EP Marine	kg N eq.	6.35 E-03	4.30 E-04	1.20 E-04	6.90 E-03	1.25 E-02	1.20 E-04	7.37 E-05	0.00 E+00	8.10 E-06	1.58 E-03	0.00 E+00	5.20 E-05	0.00 E+00
EP Terrestrial	mol N eq.	6.43 E-02	4.70 E-03	1.34 E-03	7.04 E-02	1.39 E-01	1.35 E-03	8.60 E-04	0.00 E+00	9.59 E-05	1.74 E-02	0.00 E+00	5.70 E-04	0.00 E+00
POCP	kg NMVOC eq.	2.06 E-02	1.40 E-03	4.30 E-04	2.24 E-02	3.66 E-02	5.50 E-04	2.30 E-04	0.00 E+00	2.40 E-05	6.05 E-03	0.00 E+00	1.90 E-04	0.00 E+00
ADP Minerals & Metals*	kg Sb eq.	1.90 E-04	9.36 E-06	9.77 E-06	2.09 E-04	3.97 E-05	2.88 E-06	1.21 E-06	0.00 E+00	8.46 E-08	3.67 E-06	0.00 E+00	5.88 E-07	0.00 E+00
ADP Fossil*	MJ	1.53 E+02	5.29 E+00	1.29 E+00	1.60 E+02	3.45 E+01	3.17 E+00	1.76 E+00	0.00 E+00	1.99 E-01	7.94 E+00	0.00 E+00	7.65 E-01	0.00 E+00
WDP*	m ³	1.23 E+02	5.10 E-01	8.23 E-02	1.24 E+02	7.74 E+00	1.45 E-01	1.14 E+01	0.00 E+00	1.73 E-02	4.80 E+00	0.00 E+00	5.00 E-01	0.00 E+00

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GWP Fossil	kg CO ₂ eq.	1.69 E+00	1.03 E-01	9.90 E-01	2.79 E+00	2.53 E+00	1.59 E-01	1.05 E-01	0.00 E+00	1.16 E-02	6.15 E-01	0.00 E+00	3.78 E-02	0.00 E+00
GWP Biogenic	kg CO ₂ eq.	-5.88 E-02	5.84 E-05	1.06 E-01	4.69 E-02	-6.10 E-04	-4.80 E-04	4.07 E-05	0.00 E+00	-3.08 E-06	9.51 E-05	0.00 E+00	1.40 E-04	0.00 E+00
GWP LULUC	kg CO ₂ eq.	1.02 E-01	1.29 E-04	3.59 E-04	1.02 E-01	1.38 E-03	1.30 E-04	1.40 E-04	0.00 E+00	1.51 E-05	5.24 E-05	0.00 E+00	1.85 E-05	0.00 E+00
GWP Total	kg CO ₂ eq.	1.80 E+00	1.08 E-01	1.02 E+00	2.94 E+00	2.53 E+00	1.58 E-01	1.05 E-01	0.00 E+00	1.16 E-02	6.15 E-01	0.00 E+00	3.80 E-02	0.00 E+00
ODP	kg CFC 11 eq.	2.18 E-06	7.41 E-08	1.99 E-08	2.28 E-06	5.30 E-07	2.33 E-08	1.04 E-08	0.00 E+00	1.18 E-09	1.30 E-07	0.00 E+00	1.03 E-08	0.00 E+00
AP	mol H ⁺ eq.	7.30 E-03	3.88 E-04	4.64 E-03	1.23 E-02	5.07 E-02	7.00 E-04	4.20 E-04	0.00 E+00	4.37 E-05	3.70 E-03	0.00 E+00	1.90 E-04	0.00 E+00
EP Freshwater	kg P eq.	4.19 E-04	3.17 E-06	5.90 E-05	4.81 E-04	1.97 E-05	7.29 E-06	4.52 E-06	0.00 E+00	3.90 E-07	1.70 E-06	0.00 E+00	6.98 E-07	0.00 E+00
EP Marine	kg N eq.	1.28 E-03	1.01 E-04	8.71 E-04	2.25 E-03	1.25 E-02	1.20 E-04	7.37 E-05	0.00 E+00	8.10 E-06	1.58 E-03	0.00 E+00	5.20 E-05	0.00 E+00
EP Terrestrial	mol N eq.	1.03 E-02	9.05 E-04	7.70 E-03	1.89 E-02	1.39 E-01	1.35 E-03	8.60 E-04	0.00 E+00	9.59 E-05	1.74 E-02	0.00 E+00	5.70 E-04	0.00 E+00
POCP	kg NMVOC eq.	5.08 E-03	4.14 E-04	3.05 E-03	8.54 E-03	3.66 E-02	5.50 E-04	2.30 E-04	0.00 E+00	2.40 E-05	6.05 E-03	0.00 E+00	1.90 E-04	0.00 E+00
ADP Minerals & Metals*	kg Sb eq.	1.61 E-04	9.72 E-06	4.45 E-06	1.75 E-04	3.97 E-05	2.88 E-06	1.21 E-06	0.00 E+00	8.46 E-08	3.67 E-06	0.00 E+00	5.88 E-07	0.00 E+00
ADP Fossil*	MJ	6.12 E+01	2.59 E+00	2.13 E+01	8.51 E+01	3.45 E+01	3.17 E+00	1.76 E+00	0.00 E+00	1.99 E-01	7.94 E+00	0.00 E+00	7.65 E-01	0.00 E+00
WDP*	m ³	9.28 E+01	4.88 E-01	7.42 E-01	9.40 E+01	7.74 E+00	1.45 E-01	1.14 E+01	0.00 E+00	1.73 E-02	4.80 E+00	0.00 E+00	5.00 E-01	0.00 E+00

Acronyms
GWP Fossil = Global Warming Potential, fossil fuels; GWP Biogenic = Global Warming Potential, biogenic; GWP LULUC = Global Warming Potential, land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP Freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP Marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP Terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP Minerals & Metals = Abiotic depletion potential for non-fossil resources; ADP Fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

* 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.

** Values for modules A1, A2, and A3 have been estimated, their values reduced by the factor of improvement that moving to wind electricity made to the modules' total A1-A3.

Potential Environmental Impact – Mandatory Indicators According to EN 15804

Results per functional unit

Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B2	B1 & B3-B7	C1	C2	C3	C4	D
GWP Fossil	kg CO ₂ eq.	9.82 E+00	5.41 E-01	4.53 E+00	1.49 E+01	4.37 E+00	1.16 E-02	1.05 E-01	0.00 E+00	1.16 E-02	1.06 E+00	0.00 E+00	6.53 E-02	0.00 E+00
GWP Biogenic	kg CO ₂ eq.	2.84 E-02	-2.56 E-05	0.00 E+00	2.84 E-02	-1.05 E-03	-3.08 E-06	4.07 E-05	0.00 E+00	-3.08 E-06	1.60 E-04	0.00 E+00	2.40 E-04	0.00 E+00
GWP LULUC	kg CO ₂ eq.	1.77 E-01	2.00 E-04	4.90 E-04	1.77 E-01	2.39 E-03	1.51 E-05	1.40 E-04	0.00 E+00	1.51 E-05	9.05 E-05	0.00 E+00	3.19 E-05	0.00 E+00
GWP Total	kg CO ₂ eq.	1.00 E+01	5.41 E-01	4.49 E+00	1.51 E+01	4.37 E+00	1.16 E-02	1.05 E-01	0.00 E+00	1.16 E-02	1.06 E+00	0.00 E+00	6.55 E-02	0.00 E+00
ODP	kg CFC 11 eq.	4.02 E-06	1.17 E-07	2.75 E-08	4.17 E-06	9.15 E-07	1.18 E-09	1.04 E-08	0.00 E+00	1.18 E-09	2.25 E-07	0.00 E+00	1.78 E-08	0.00 E+00
AP	mol H ⁺ eq.	4.72 E-02	2.23 E-03	2.32 E-02	7.26 E-02	8.74 E-02	4.37 E-05	4.20 E-04	0.00 E+00	4.37 E-05	6.39 E-03	0.00 E+00	3.30 E-04	0.00 E+00
EP Freshwater	kg P eq.	9.10 E-04	6.16 E-06	1.00 E-04	1.02 E-03	3.41 E-05	3.90 E-07	4.52 E-06	0.00 E+00	3.90 E-07	2.94 E-06	0.00 E+00	1.20 E-06	0.00 E+00
EP Marine	kg N eq.	9.12 E-03	6.50 E-04	4.82 E-03	1.46 E-02	2.16 E-02	8.10 E-06	7.37 E-05	0.00 E+00	8.10 E-06	2.73 E-03	0.00 E+00	8.98 E-05	0.00 E+00
EP Terrestrial	mol N eq.	9.14 E-02	7.15 E-03	5.31 E-02	1.52 E-01	2.40 E-01	9.59 E-05	8.60 E-04	0.00 E+00	9.59 E-05	3.00 E-02	0.00 E+00	9.90 E-04	0.00 E+00
POCP	kg NMVOC eq.	2.92 E-02	2.13 E-03	1.37 E-02	4.50 E-02	6.31 E-02	2.40 E-05	2.30 E-04	0.00 E+00	2.40 E-05	1.04 E-02	0.00 E+00	3.20 E-04	0.00 E+00
ADP Minerals & Metals*	kg Sb eq.	2.70 E-04	1.42 E-05	5.68 E-06	2.90 E-04	6.86 E-05	8.46 E-08	1.21 E-06	0.00 E+00	8.46 E-08	6.33 E-06	0.00 E+00	1.01 E-06	0.00 E+00
ADP Fossil*	MJ	2.15 E+02	8.04 E+00	5.76 E+01	2.80 E+02	5.95 E+01	1.99 E-01	1.76 E+00	0.00 E+00	1.99 E-01	1.37 E+01	0.00 E+00	1.32 E+00	0.00 E+00
WDP*	m ³	1.71 E+02	7.75 E-01	1.03 E+00	1.72 E+02	1.34 E+01	1.73 E-02	1.14 E+01	0.00 E+00	1.73 E-02	8.28 E+00	0.00 E+00	8.63 E-01	0.00 E+00

Acronyms
GWP Fossil = Global Warming Potential, fossil fuels; GWP Biogenic = Global Warming Potential, biogenic; GWP LULUC = Global Warming Potential, land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP Freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP Marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP Terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP Minerals & Metals = Abiotic depletion potential for non-fossil resources; ADP Fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

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Potential Environmental Impact – Mandatory Indicators According to EN 15804

Results per functional unit

Indicator	Unit	A1	A2	A3	Tot. A1-A3	A4	A5	B2	B1 & B3-B7	C1	C2	C3	C4	D
GWP Fossil	kg CO ₂ eq.	9.82 E+00	5.41 E-01	9.45 E-02	1.05 E+01	4.37 E+00	1.16 E-02	1.05 E-01	0.00 E+00	1.16 E-02	1.06 E+00	0.00 E+00	6.53 E-02	0.00 E+00
GWP Biogenic	kg CO ₂ eq.	2.84 E-02	-2.56 E-05	-2.60 E-04	2.82 E-02	-1.05 E-03	-3.08 E-06	4.07 E-05	0.00 E+00	-3.08 E-06	1.60 E-04	0.00 E+00	2.40 E-04	0.00 E+00
GWP LULUC	kg CO ₂ eq.	1.77 E-01	2.00 E-04	2.60 E-04	1.77 E-01	2.39 E-03	1.51 E-05	1.40 E-04	0.00 E+00	1.51 E-05	9.05 E-05	0.00 E+00	3.19 E-05	0.00 E+00
GWP Total	kg CO ₂ eq.	1.00 E+01	5.41 E-01	9.45 E-02	1.07 E+01	4.37 E+00	1.16 E-02	1.05 E-01	0.00 E+00	1.16 E-02	1.06 E+00	0.00 E+00	6.55 E-02	0.00 E+00
ODP	kg CFC 11 eq.	4.02 E-06	1.17 E-07	5.40 E-06	9.54 E-06	9.15 E-07	1.18 E-09	1.04 E-08	0.00 E+00	1.18 E-09	2.25 E-07	0.00 E+00	1.78 E-08	0.00 E+00
AP	mol H ⁺ eq.	4.72 E-02	2.23 E-03	1.12 E-03	5.05 E-02	8.74 E-02	4.37 E-05	4.20 E-04	0.00 E+00	4.37 E-05	6.39 E-03	0.00 E+00	3.30 E-04	0.00 E+00
EP Freshwater	kg P eq.	9.10 E-04	6.16 E-06	2.52 E-05	9.41 E-04	3.41 E-05	3.90 E-07	4.52 E-06	0.00 E+00	3.90 E-07	2.94 E-06	0.00 E+00	1.20 E-06	0.00 E+00
EP Marine	kg N eq.	9.12 E-03	6.50 E-04	9.78 E-05	9.87 E-03	2.16 E-02	8.10 E-06	7.37 E-05	0.00 E+00	8.10 E-06	2.73 E-03	0.00 E+00	8.98 E-05	0.00 E+00
EP Terrestrial	mol N eq.	9.14 E-02	7.15 E-03	1.10 E-03	9.97 E-02	2.40 E-01	9.59 E-05	8.60 E-04	0.00 E+00	9.59 E-05	3.00 E-02	0.00 E+00	9.90 E-04	0.00 E+00
POCP	kg NMVOC eq.	2.92 E-02	2.13 E-03	3.80 E-04	3.17 E-02	6.31 E-02	2.40 E-05	2.30 E-04	0.00 E+00	2.40 E-05	1.04 E-02	0.00 E+00	3.20 E-04	0.00 E+00
ADP Minerals & Metals*	kg Sb eq.	2.70 E-04	1.42 E-05	1.05 E-05	2.95 E-04	6.86 E-05	8.46 E-08	1.21 E-06	0.00 E+00	8.46 E-08	6.33 E-06	0.00 E+00	1.01 E-06	0.00 E+00
ADP Fossil*	MJ	2.15 E+02	8.04 E+00	1.15 E+00	2.24 E+02	5.95 E+01	1.99 E-01	1.76 E+00	0.00 E+00	1.99 E-01	1.37 E+01	0.00 E+00	1.32 E+00	0.00 E+00
WDP*	m ³	1.71 E+02	7.75 E-01	1.19 E+00	1.73 E+02	1.34 E+01	1.73 E-02	1.14 E+01	0.00 E+00	1.73 E-02	8.28 E+00	0.00 E+00	8.63 E-01	0.00 E+00

Acronyms

GWP Fossil = Global Warming Potential, fossil fuels; **GWP Biogenic** = Global Warming Potential, biogenic; **GWP LULUC** = Global Warming Potential, land use and land use change; **ODP** = Depletion potential of the stratospheric ozone layer; **AP** = Acidification potential, Accumulated Exceedance; **EP Freshwater** = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP Marine** = Eutrophication potential, fraction of nutrients reaching marine end compartment; **EP Terrestrial** = Eutrophication potential, Accumulated Exceedance; **POCP** = Formation potential of tropospheric ozone; **ADP Minerals & Metals** = Abiotic depletion potential for non-fossil resources; **ADP Fossil** = Abiotic depletion for fossil resources potential; **WDP** = Water (user) deprivation potential, deprivation-weighted water consumption

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Potential Environmental Impact – Mandatory Indicators According to EN 15804

Results per functional unit

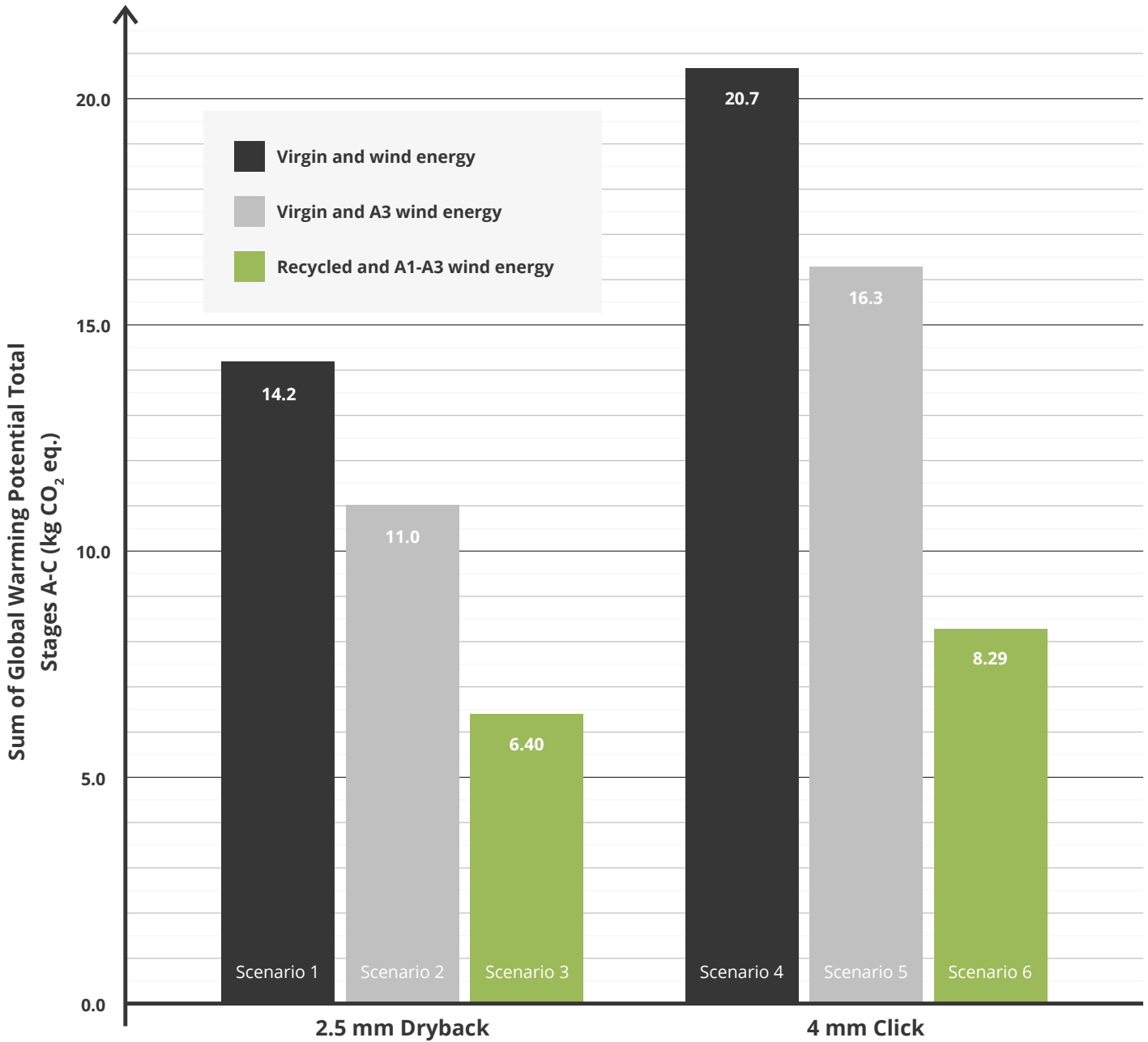
Indicator	Unit	A1**	A2**	A3**	Tot. A1-A3	A4	A5	B2	B1 & B3-B7	C1	C2	C3	C4	D
GWP Fossil	kg CO ₂ eq.	1.76 E+00	1.66 E-01	7.31 E-01	2.66 E+00	4.28 E+00	1.16 E-02	1.05 E-01	0.00 E+00	1.16 E-02	1.04 E+00	0.00 E+00	6.39 E-02	0.00 E+00
GWP Biogenic	kg CO ₂ eq.	5.45 E-02	-8.25 E-05	0.00 E+00	5.44 E-02	-1.03 E-03	-3.08 E-06	4.07 E-05	0.00 E+00	-3.08 E-06	1.60 E-04	0.00 E+00	2.30 E-04	0.00 E+00
GWP LULUC	kg CO ₂ eq.	8.55 E-02	1.59 E-04	2.09 E-04	8.59 E-02	2.34 E-03	1.51 E-05	1.40 E-04	0.00 E+00	1.51 E-05	8.85 E-05	0.00 E+00	3.12 E-05	0.00 E+00
GWP Total	kg CO ₂ eq.	1.86 E+00	1.72 E-01	7.50 E-01	2.78 E+00	4.28 E+00	1.16 E-02	1.05 E-01	0.00 E+00	1.16 E-02	1.04 E+00	0.00 E+00	6.41 E-02	0.00 E+00
ODP	kg CFC 11 eq.	1.54 E-06	9.48 E-08	1.17 E-08	1.65 E-06	8.95 E-07	1.18 E-09	1.04 E-08	0.00 E+00	1.18 E-09	2.20 E-07	0.00 E+00	1.74 E-08	0.00 E+00
AP	mol H ⁺ eq.	6.96 E-03	5.97 E-04	3.27 E-03	1.08 E-02	8.55 E-02	4.37 E-05	4.20 E-04	0.00 E+00	4.37 E-05	6.25 E-03	0.00 E+00	3.20 E-04	0.00 E+00
EP Freshwater	kg P eq.	3.49 E-04	4.18 E-06	3.58 E-05	3.90 E-04	3.33 E-05	3.90 E-07	4.52 E-06	0.00 E+00	3.90 E-07	2.88 E-06	0.00 E+00	1.18 E-06	0.00 E+00
EP Marine	kg N eq.	1.34 E-03	1.68 E-04	6.58 E-04	2.17 E-03	2.11 E-02	8.10 E-06	7.37 E-05	0.00 E+00	8.10 E-06	2.67 E-03	0.00 E+00	8.79 E-05	0.00 E+00
EP Terrestrial	mol N eq.	1.18 E-02	1.60 E-03	6.28 E-03	1.96 E-02	2.35 E-01	9.59 E-05	8.60 E-04	0.00 E+00	9.59 E-05	2.93 E-02	0.00 E+00	9.70 E-04	0.00 E+00
POCP	kg NMVOC eq.	5.21 E-03	6.62 E-04	2.24 E-03	8.10 E-03	6.17 E-02	2.40 E-05	2.30 E-04	0.00 E+00	2.40 E-05	1.02 E-02	0.00 E+00	3.10 E-04	0.00 E+00
ADP Minerals & Metals*	kg Sb eq.	1.17 E-04	1.23 E-05	2.60 E-06	1.32 E-04	6.71 E-05	8.46 E-08	1.21 E-06	0.00 E+00	8.46 E-08	6.20 E-06	0.00 E+00	9.93 E-07	0.00 E+00
ADP Fossil*	MJ	5.18 E+01	3.61 E+00	1.36 E+01	6.90 E+01	5.82 E+01	1.99 E-01	1.76 E+00	0.00 E+00	1.99 E-01	1.34 E+01	0.00 E+00	1.29 E+00	0.00 E+00
WDP*	m ³	6.65 E+01	6.24 E-01	4.37 E-01	6.76 E+01	1.31 E+01	1.73 E-02	1.14 E+01	0.00 E+00	1.73 E-02	8.10 E+00	0.00 E+00	8.44 E-01	0.00 E+00

Acronyms
GWP Fossil = Global Warming Potential, fossil fuels; GWP Biogenic = Global Warming Potential, biogenic; GWP LULUC = Global Warming Potential, land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP Freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP Marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP Terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP Minerals & Metals = Abiotic depletion potential for non-fossil resources; ADP Fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

* 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.

** Values for modules A1, A2, and A3 have been estimated, their values reduced by the factor of improvement that moving to wind electricity made to the modules' total A1-A3.

Potential Environmental Impact per Functional Unit



Analysis

To compare each scenario, a single environmental impact category was chosen, to make the comparison easier. We chose Global Warming Potential Total, as we believed this category was indicative of some overall environmental impact of this product category, as well as being easier for consumers to understand, as it is roughly the carbon footprint of a product across its entire lifecycle. For comparison, the Global Warming Potential for each scenario was also summed across all lifecycle stages (except for Module D, to avoid double counting).

The results indicate that by switching to using wind energy in the production of Sisu® LVT, EnviroBuild have been able to reduce the environmental impact of their 2.5 mm Dryback LVT by 22.3% and of their 4 mm Click LVT by 21.2%.

Further reductions were then achieved by increasing the recycled content of the flooring. By using 45% recycled PVC and wind energy for all electricity used in A1-A3 in the 2.5 mm Dryback, the impact is reduced by 54.9% in total. And changing the LVT formulation to SPC and using recycled PVC and wind energy for all electricity used in A1-A3 for the 4 mm Click, its impact is reduced by 60.2% in total.

Results Interpretation

Most of the environmental impact of Sisu® LVT lies in the raw material supply (A1) or in manufacturing (A3), and secondarily in the importing of the material from China to the warehouse in the UK (A4). With a few exceptions depending on the impact category, other stages tend to have negligible impact by comparison, especially taking into that they vary so widely depending on the product application and use case anyway. Whilst Sisu® LVT is technically recyclable, which could offset its environmental impact in the recovery stage (D), at present none is reclaimed for recycling at its end of life. Therefore, though this stage is declared, since there are no savings to be made for now it is zero for every indicator.

Instructions For Proper Use and Maintenance

To help maximise the lifespan of Sisu® LVT, the floor should be washed with soap and water every week, and vacuum cleaned.

End-of-Life

Once the flooring products have reached their end of life, EnviroBuild recommend reusing the tiles for other projects. This is possible as the tiles are not expected to lose much of their structural integrity over their expected use time.

However, EnviroBuild do recognise that it's unlikely many customers will do this with their EnviroBuild products, and even if they did, they would still need to be disposed of eventually anyway, only its service life will have increased somewhat.

The procedure for disposal of Sisu® LVT is to arrange to take the tiles to a local dump, where they will likely be sent to landfill.

Product Comparisons

Comparisons to other products, especially from LCAs not conducted by EnviroBuild as well, are discouraged due to differences in product scenarios and the data used. Between different flooring products there will be differences in the weight per square metre, which must also be kept in mind when comparing products.

Renewable Energy Use In Manufacturing

Following these results that indicate around 24% of the climate change total of the products come from module A3 (manufacturing), EnviroBuild switched energy production from using the electrical grid in China for the time period of this EPD (2019-20) to using wind energy starting from the September 2021. This way, the climate change total of the energy for manufacturing fell 96% from 1.06 kg CO₂ / kWh to 0.0371 kg CO₂ / kWh.

To further reduce the environmental impact, the use of wind energy was extended to include all electricity used up to the factory gate, A1-A3.

This was done through China's Green Energy Certificate scheme. This system allows companies to purchase renewable energy (either as solar energy or wind energy) voluntarily, and thus claim the environmental benefits of its production. More about the system can be read here:

www.there100.org/sites/re100/files/2020-10/Chinese%20GEC%20Paper_RE100_2020%20FINAL.pdf

Other Environmental Activity

We are on an environmental mission; looking to supply products that offer functional and environmental benefits over traditional construction materials. We look to supply solutions that reduce material usage, have high level of recycled content, use renewable energy in their manufacturing process, have a long working life and can be recycled again themselves. Wherever possible we incorporate environmentally friendly solutions into our supply chain, to give our products a lower carbon footprint to traditional alternatives. To go a step further, we donate 10% of our profits to sustainable causes to help become a carbon negative business.

The Rainforest Trust is a non-profit charity that helps to preserve Earth's remaining rainforests through community engagement and local partnerships in vulnerable areas around the world. Rainforests are the pinnacle of life's variety and complexity, and are the most diverse places on our planet, however, an average of 200,000 acres are destroyed every day. This has detrimental consequences that are felt around the world, negatively affecting atmospheric balance, human health and organism survival, amongst others. The Rainforest Trust focuses their efforts around three main protected area types; land acquisition, land designation and community-managed areas. You can find out more about their crucial work in our blog post. Since starting donations in 2016, we have donated towards a wide variety of Rainforest Trust projects with 100% of all donations going directly to these sustainable causes. The mission of the Rainforest Trust is incredibly important; protecting vast areas of rainforest, which consequently protects us, alongside every living organism. We are proud to support its cause and share its values.

For more information, visit www.envirobuild.com/pages/sustainability-what-we-give.

References

- General Programme Instructions of the International EPD® System. Version 4.0
- PCR 2019:14. Construction Products. Version 1.1
- EN 15804:2012 + A2:2019 Sustainability of Construction Works. Environmental Product Declarations. Core Rules for the Product Category of Construction Products

