

Environmental Product Declaration (EPD)

Environmental Product Declaration (EPD) in accordance with ISO 14025 and EN 15804:2012+A2:2019 for Buildonix® building components, from Stonelake Pty Ltd

Product Name: Buildonix® Building Components | Product Category Rules PCR 2019:14, version 1.11 Construction Products EPD International., 2021-02-05. CEN standard EN 15804 serves as the core Product Category Rules (PCR)

Programme Operator: EPD Australasia Limited | EPD Registration No: S-P-08460 | Publication Date: 24-05-2023 | Version Number 1.0 | Date of Revision: NA | Valid until: 23-05-2028 | Geographical Scope: Buildonix® is manufactured in Australia and the product is currently produced for the Australian market.



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 <u>www.environdec.com</u>.







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Stonelake Pty Ltd

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The Buildonix Building System is a product invented by the Stonelake Group of companies. Buildonix Aus/NZ Pty Ltd produces and distributes the Buildonix building system to the Australian market, specialising in residential projects and internal fit-out and external facade commercial projects. The Stonelake Group of companies are a vertically integrated construction technology producer and supplier in the Australian market, designing, testing, producing and distributing a range of different components and construction material products which are collectively referred to as the Buildonix building technology.

The Buildonix building technology consists of a set range of components that can be assembled to form an infinite range of custom design variations with both commercial and residential applications. This means that Buildonix components are generic across all our structures, removing the need for custom-designed, single-use materials or components.

The Buildonix building technology provides our clients with unparalleled project speed achieving projects between 60% and 70% faster than comparable projects using traditional methods, complete design customisability made possible through our mass customisation capability, complete design adaptability allowing clients to disassemble, alter, expand and reassemble a structure with no waste or damage and the imbedded environmental sustainability which comes from re-useable building components which can be used over multiple lifecycles.

Product-related or management system-related certifications:

The Buildonix building system is a high-quality residential and commercial building technology that is systematically tested to meet Australian building standards in the National Construction Code for residential construction.

Stonelake commits to producing high-quality products tested and assessed to Australian Standards in both material component production and building assembly.

Beyond this, Stonelake R&D Management P/L and the Stonelake Group of companies do not yet hold any ISO certifications.

Name and location of production site(s):

Buildonix components are designed and produced in NSW at our Coffs Harbour Manufacturing Facilities (Unit 4/9-11 Keona Circuit, Coffs Harbour). Once produced, completed components are quality checked, catalogued, and warehoused on-site.

A Buildonix building can be packed and delivered to the site for assembly guickly and easily. All components are specifically designed to enable fast and waste-free assembly, allowing for packing containers to be returned to shipping facilities for ongoing project reuse.

Buildonix[®] Building Components

Geographical Scope: Australia

Product Name: Buildonix building components; MUSIC (Multifunctional Universal Structural Integrated Component), Sole Plate, Corner Block, Corner Bracket Standard, Web Brackets, Heavy Load Bracket, Spacer Blocks, Floor Rails, Floor Pods, Window Interface Component.

Product Identification: Buildonix building components have been designed to embody the principles of the circular economy.

Product Description: Stonelake Pty Ltd has developed a Life Cycle Assessment (LCA) and Environmental Product Disclosure (EPD) for Buildonix building components. The components included in this EPD are music, sole plate, corner block, corner bracket standard, web brackets, heavy load bracket, spacer blocks, floor rails, floor pods and window interface. These components are used to build the Buildonix structure, which is a prefabricated building structure, and it can be disassembled and re-assembled. This prefabricated building structure can be used for both residential and commercial projects.

UN CPC Code:

GROUP: 387 (Prefabricated Buildings) CLASS: 3870 (Prefabricated Buildings) SUBCLASS: 38702 (Prefabricated Buildings, of metal) HS 2007: 9406 CPC 2: 38702 ISIC 4: 2511

Other codes for product classification: 2222 (Prefabricated Metal Building Manufacturing)



I CA Information

Functional unit / declared unit: In this life cycle assessment, a declared unit is taken into consideration instead of a functional unit. The declared unit of the EPD study is '1kg of each Buildonix component' (for example 1kg of music 90, 1kg of floor pod etc.). The life cycle stages included in this study are cradle-to-gate with modules C1–C4 and module D (A1–A3 + C + D).

As Buildonix products consist of different materials, sizes, and shapes the unit of 1kg is seen as more suitable and scalable.

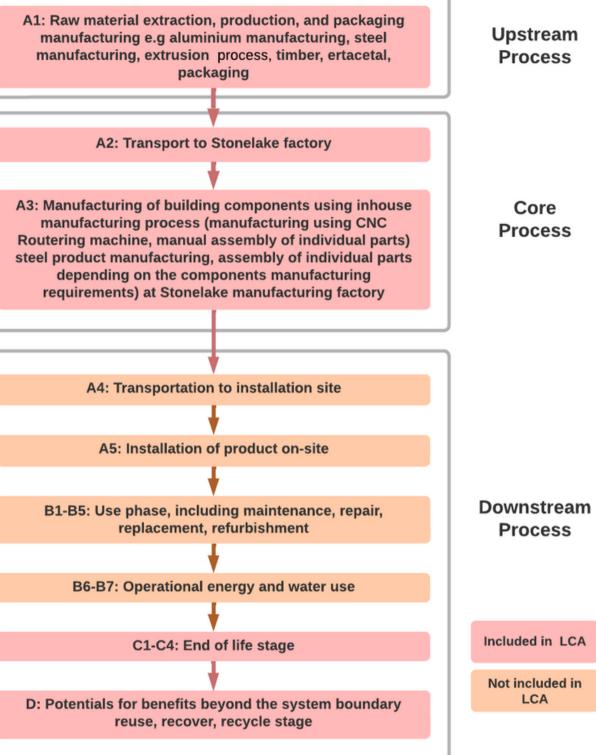
Reference service life: RSL has not been declared because module B (Use stage) is not included in the LCA.

Time representativeness: Primary data were collected from participating sites for the 2020/21 financial year.

Database(s) and LCA software used: The life cycle assessment is calculated using the software SimaPro 9.1.1.7. Most data are taken from ecoinvent 3.6 and AUSLCI V1.34. It is to be noted that, the ecoinvent dataset was chosen only if the relevant datasets are not available in the AusLCI dataset. Considering the manufacturing location of material in Australia, the ecoinvent datasets have been modified adopting the Australian electricity dataset. Only a few datasets have been taken from Industry Data 2.0 when the relevant datasets are not in AusLCI and ecoinvent datasets. Only one dataset (Disposal, packaging cardboard, 19.6% water, to sanitary landfill/CH U/AusSD U) has been chosen from AusLCI SD datasets due to the unavailability of relevant datasets.

Description of system boundaries: The module selected for the Buildonix components LCA study is 'cradle-to-gate with options - modules C and module D'. However, the manufacturing of production equipment, buildings, vehicle production, maintenance and other capital goods, business travels of personnel, and labour work are not counted in this study. The excluded processes are assumed to have a negligible contribution to the overall LCA results.

It is to be noted that no inventory data was used for module C1 as the Buildonix system is deconstructed manually. The components of the Buildonix system can be separated manually at the end-of-life stage; therefore, inventory data for module C3 is also not considered. All modules included in this EPD are marked as X in Table 1 below, and those excluded are marked as 'Not declared' (ND). The system boundary for this EPD is depicted in Figure 1.



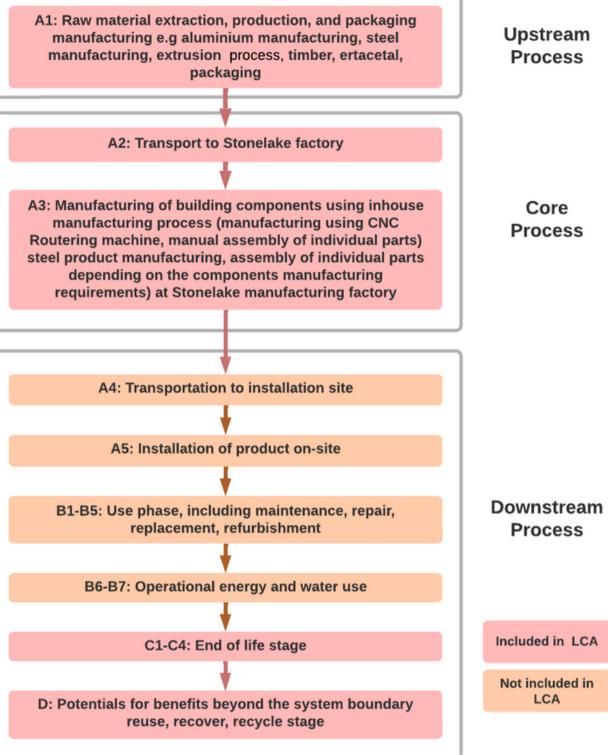


Figure 1. System boundary

Process Description

The life cycle assessment of Buildonix components is divided into three processes: upstream, core and downstream. The upstream processes include the flow of raw materials. The core processes include all activities the manufacturing organisation controls, i.e., transportation of the materials to the manufacturing factory and the actual process of manufacturing the final product. The upstream process consists of the extraction and manufacturing of raw materials. This section also includes packaging materials.

Buildonix's structure consists of different components. Different suppliers from different manufacturing locations supply raw materials for different components. These raw materials include aluminium, galvanised steel sheet, ertacetal, timber and plywood sheet. Stonelake provided information on raw material manufacturing. Then these raw materials are transported to the Stonelake manufacturing site to manufacture the components of the Buildonix structure through Stonelake's internal manufacturing process.

Stonelake's internal manufacturing process includes CNC turning machine and manual assembly for component manufacturing. Depending on the components, the manufacturing process is different. Some components are sent to Stonelake in completed form. Floor pods are assembled manually. These are the core process of manufacturing at Stonelake's internal manufacturing. The upstream process includes raw materials/packaging manufacturing for different components, e.g. aluminium, steel, extrusion process, ertacetal and timber.

CNC turning machine provides the final product with the required design and wastage of metal. As per the econvent dataset of the CNC turning process, 'Aluminium removed by turning, average, conventional {RoW}| aluminium turning, average, conventional | Cut-off, U'- every 1kg of aluminium used in CNC has a wastage of 0.23kgs. Polyoxymethylene (POM/Acetal) is used to make spacer block - using the same CNC machine. The ecoinvent dataset of the CNC turning process only had a CNC machine used for metal. Hence adjustments were made to the current library to be relevant to the production of POM. Only 10% of wastage occurs during the production of POM. It is to be noted that some of the components are supplied to the Stonelake location in complete form.

The downstream processes include the steps controlled by a consumer and the disposal or recycling options of the products. At the end-of-life, some of the component materials are recycled. These components include music components, standard corner brackets, corner blocks, web brackets, H load brackets, sole plate, window interface, rail attachment bracket and floor rail. At the end-of-life, other components are disposed of through general waste, including the floor pod and spacer block.

Table 1 Stages and modules included in this EPD

	Pr	oduct sta	ge	Constr proces				U	se stag	je			E	nd-of-li	ife stag	e	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	Β4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	Х	Х	Х	ND	ND	ND	ND	ND	ND	ND	ND	ND	Х	х	х	х	х
Geography	AU	AU	AU										AU	AU	AU	AU	AU
Specific data used		>90		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	N	ot releva	nt	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	N	ot releva	nt	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Data Quality

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Table 2. Data quality assessment

Stonelake Pty Ltd has supplied the primary data for the components, and the raw material used for the components is for FY2020/21.

Background data have been sourced from AusLCI and ecoinvent datasets. All background data used was less than ten years old. The data quality assessment (Table 2) is based on EN 15804. (EN 15804:2012+A2:2019, 2020).

Module	Input/Output	Data resource	Tempor al Scope	Data Quality
A1	Raw materials used for Buildonix components manufacture and packaging	The component schedule document is provided by the manufacturer, which includes detailed drawings of the components, images of the components, component material, manufacturing location of the raw materials, the manufacturing process involved with raw materials and end-of-life details. They also provided information on different	2020- 2021	Very good
A2	Transport of raw materials with packaging materials	packaging materials used by the suppliers.		
A3	The manufacturing process of the Buildonix components, manufacturing waste, waste treatment of manufacturing waste, packaging waste and transport of waste	The manufacturer provided information on the internal manufacturing process used for each component. They also provided information on the components used to manufacture the Buildonix system and the weight and number of each component used to manufacture a Buildonix system (6.5m x 3.5m one-storey office building). The components manufacturing process includes a CNC Routering machine and manual assembly. For the CNC turning process, the LCI data for the Aluminium turning machine process are based on the ecoinvent v3.4 dataset of "Aluminium removed by turning, average, conventional {RoW}] aluminium turning, average, conventional Cutoff, U" which includes all the resources for turning process. This dataset has been updated with the electricity data inputs to the process flow in order to make the process more representative of Australia.	2020- 2021	Very good
C1	Demolition of the construction product (e.g., manual demolition/ deconstruction/ machine used for demolition)	The manufacturer provided information that the Buildonix system can be deconstructed manually. No data on the energy requirements for this stage was available. Environmental impacts coming from this stage were therefore neglected.	2020- 2021	Fair
C2	Transport of waste to the waste processing site of recycling/landfill disposal	Assumption – an average distance of 100km is taken into consideration as per resource recovery and waste treatment facilities in Australia.	2020- 2021	Good
C3	End-of-life waste processing for reuse/recycling/recove ry (e.g., manual separation of recyclable product)	The manufacturer provided information that the components of the Buildonix system can be separated manually at the end-of-life stage.	2020- 2021	Fair
C4	End-of-life disposal of product and packaging material (packaging materials which are used for finished product packaging	The manufacturer provided information for end-of-life disposal of components.	2020- 2021	Fair
	End-of-life waste for	The manufacturer provided information for Buildonix components end-	2020- 2021	Fair

Cut-off Rules

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According to the Construction Products PCR, the life cycle inventory data shall, according to EN 15804, include a minimum of 95% of total inflows (mass and energy) per module. In case of insufficient input data for a unit process, the cut-off criteria shall be 1% of primary energy usage and 1% of the total mass input of that unit process.

Proxy data or extrapolation should be used to achieve 100% completeness if only 95% of total inflow data is available. Inflows not included in the LCA shall be documented in the EPD (The International EPD System, 2021).

For this study, 100% of the inflows required for the manufacture of the components are taken into consideration.

Allocation

In the manufacturing of Buildonix components, no co-product or by-product is obtained. Allocation of any production processes to more than one product is therefore not needed. Any allocations directly embedded in the LCA database processes were adopted. In the International EPD System framework, the methodological choices for allocation for reuse, recycling and recovery have been set according to the polluter pays principle (PPP).

This means that the generator of the waste shall carry the full environmental impact until the point in the product's lifecycle at which the waste is transported to a scrapyard or the gate of a waste processing plant (collection site). The subsequent user of the waste shall carry the environmental impact from the processing and refinement of the waste but not the environmental impact caused in any previous life cycles (EPD International, 2021). The assessments of the individual Buildonix components are modelled this way.

Key Assumptions

- recovery facilities in Australia.
- 2007).

• The manufacturers provided information that the Buildonix system is deconstructed manually, and the components of the Buildonix system can be separated manually at the end-of-life stage. No inventory data on the energy requirements for this stage were available. Therefore, it was assumed that environmental impacts from lifecycle modules C1 and C3 were considered negligible.

• For module C2, it was assumed that the average distance is 100km which was considered as per resource

• For Module D (end-of-life), it was assumed that 100% aluminium and steel are recycled.

• An assumption was made for the packaging materials of 9% of the total weight of the materials (Pongrácz,

Table 3. Content information

Ц	I.	Table 3. Content	t information	
Information		Product components name	Materials of the component	We
Π		Music 90	Aluminium	1
2			Total	1
F			Packaging materials	We
			Wood	0.0
\Box			Polyfoam wrap	0.0
4			Packaging film	0.0
			Cardboard	0
			Total	0.0
Ţ		Product	Materials of the	We
		components name	component	
נח		Sole plate	Aluminium	1
			Total	1
Content			Packaging materials	We
			Wood	0.0
$\overline{\mathbf{C}}$			Polyfoam wrap	0.0
\Box			Packaging film	0.0
			Cardboard	0
			Total	0.0
		Product	Materials of the	We
		components name	component	<u> </u>
		Corner block	Aluminium	1
			Total	1
			Packaging materials	We

	Materials of the	Weight, kg	Post-consumer	Renewable material,
ents name	component		material, weight-%	weight-%
	Aluminium	1	0	0
	Total	1		
	Packaging	Weight, kg	Weight-% (versus the product)	
	materials			
	Wood	0.03		
	Polyfoam wrap	0.03		
	Packaging film	0.03		
	Cardboard	0		
	Total	0.09	9%	

Product	Materials of the	Weight, kg	Post-consumer	Renewable material, weight-
components name	component		material, weight-%	%
Sole plate	Aluminium	1	0	0
	Total	1		
	Packaging	Weight, kg	Weight-% (versus the	product)
	materials			
	Wood	0.03		
	Polyfoam wrap	0.03		
	Packaging film	0.03		
	Cardboard	0		
	Total	0.09	9%	

Product	Materials of the	Weight, kg	Post-consumer	Renewable material, weight-
components name	component		material, weight-%	%
Corner block	Aluminium	1	0	0
	Total	1		
	Packaging	Weight, kg	Weight-% (versus the	product)
	materials			
	Wood	0.03		
	Polyfoam wrap	0.03]	
	Packaging film	0.03]	
	Cardboard	0]	
	Total	0.09	9%	

Product	Materials of the	Weight, kg	Post-consumer	Renewable material, weight-
components name	component		material, weight-%	%
Standard corner	Steel	1	0	0
bracket	Total	1		
	Packaging	Weight, kg	Weight-% (versus the	product)
	materials			
	Wood	0		
	Polyfoam wrap	0		
	Packaging film	0.045		
	Cardboard	0.045		
	Total	0.09	9%	

Product	Materials of the	Weight, kg	Post-consumer	Renewable material, weight-
components name	component		material, weight-%	%
Web bracket	Aluminium	1	0	0
	Total	1		
	Packaging	Weight, kg	Weight-% (versus the	product)
	materials			
	Wood	0.03		
	Polyfoam wrap	0.03		
	Packaging film	0.03		
	Cardboard			
	Total	0.09	9%	

Product	Materials of the	Weight, kg	Post-consumer	Renewable material, weight	
components name	component		material, weight-%	%	
H load bracket	Aluminium	1	0	0	
	Total				
	Packaging	Weight, kg	Weight-% (versus the	product)	
	materials				
	Wood	0.03			
	Polyfoam wrap	0.03			
	Packaging film	0.03			
	Cardboard				
	Total	0.09	9%		
		•	•		
Product	Materials of the	Weight, kg	Post-consumer	Renewable material, weight	
components name	component		material, weight-%	%	
Spacer blocks	Ertacetal	1	0	0	
	Total	1			
	Packaging	Weight, kg	Weight-% (versus the product)		
	materials				
	Wood	0.09			
	Polyfoam wrap				
	Packaging film				
	Cardboard				
	T 1 1	0.00	0.01		

Product	Materials of the	Weight, kg	Post-consumer	Renewable material, weight-
components name	component		material, weight-%	%
Floor Rails	Steel	1	0	0
	Total	1		
	Packaging	Weight, kg	Weight-% (versus the	product)
	materials			
	Wood	0.09		
	Polyfoam wrap	0	7	
	Packaging film	0	7	
	Cardboard	0		
	Total	0.09	9%	
			•	
Product	Materials of the	Weight, kg	Post-consumer	Renewable material, weight-
components name	component		material, weight-%	%

9%

0.09

Product	Materials of the	Weight, kg	Post-con
components name	component		material,
Floor Pods	Timber	1	100%
	Total	1	
	Packaging materials	Weight, kg	Weight-%
	Wood	0.03	
	Polyfoam wrap	0.03	7
	Packaging film	0.03	7
	Cardboard		7
	Total	0.09	9%

Total

	ouraboura			
	Total	0.09	9%	
Product	Materials of the	Weight, kg	Post-consumer	Renewable material, weight-
components name	component		material, weight-%	%
Window Interface	Aluminium	1	0	0
	Total	1		
	Packaging	Weight, kg	Weight-% (versus the	product)
	materials			
	Wood	0.03		
	Polyfoam wrap	0.03]	
	Packaging film	0.03		
	Cardboard			
	Total	0.09	9%	

	0
% (versus the p	product)

The products included in this EPD do not have environmental/ hazardous properties and do not contain any substances of very high concern as defined by European REACH regulation in concentrations >0.1% (m/m).

The potential environmental impacts used in this EPD are explained in Table 4.

Table 4. Environmental indicators used in the EPD

Environmental Indicators	Explanation	Assessment Method
Core environmental impac	t indicators	
Global Warming Potential	Climate change can cause adverse effects on ecosystem health,	IPCC 2013 baseline (as par
- total, kg CO ₂ eq.	human health, and material welfare. The indicators within this	of Environmental Footprint
Global Warming Potential	category are related to emissions of greenhouse gases into the air.	3.0) (Fazio, et al., 2018)
– fossil, kg CO ₂ eq.	Fossil CO ₂ eq: This is defined as greenhouse gas emissions caused	
Global Warming Potential	due to fossil fuels in Carbon-di-oxide equivalent.	
 biogenic, kg CO₂ eq. 	Biogenic CO ₂ eq: This is defined as greenhouse gas emissions	
Global Warming Potential	caused by the natural carbon cycle. CO ₂ eq from land transformation: This is defined as Greenhouse	
- land use and land use	emissions caused due to direct or indirect land use by humans.	
change, kg CO2 eq.	-	M810 (
Stratospheric ozone	Stratospheric ozone depletion can harm on human health, animal	WMO (as part of
depletion potential, kg	health, terrestrial and aquatic ecosystems, and biochemical cycles.	Environmental Footprint 3.0
CFC 11 eq	The indicators within this category are related to hydrocarbons	
	containing combined bromine, fluorine and chlorine, and chlorofluorocarbons (CFCs).	
Acidification potential, mol	This category considers acidifying substances that cause a wide	Accumulated exceedance
H* eq	range of effects on soil, groundwater, surface water, organisms,	(as part of Environmental
печ	ecosystems, and materials.	Footprint 3.0)
Eutrophication potential -	The eutrophication process that occurs in freshwater bodies due to	Accumulated exceedance
aquatic freshwater, kg P	emissions of phosphorus-containing substances is called freshwater	(as part of Environmental
eq	eutrophication.	Footprint 3.0)
Eutrophication potential –	The eutrophication process that occurs in marine water bodies due	EUTREND model (as part of
aguatic marine, kg N eg	to the emission of nitrogen-containing substances is called marine	Environmental Footprint 3.0
aquato manno, ng n oq	water eutrophication.	Environmental Foophile 5.0
Eutrophication potential -	Air pollution due to excess atmospheric nitrogen or ammonia	EUTREND model (as part o
terrestrial, mol N eq.	deposition is called terrestrial eutrophication.	Environmental Footprint 3.0
Formation potential of	It estimates photochemical smog (air pollution) potential as kg C ₂ H ₄	LOTOS-EUROS model (as
tropospheric ozone, kg	eq.	part of Environmental
NMVOC eq.		Footprint 3.0)
Abiotic depletion potential	It estimates the impact on minerals reserves as antimony (Sb)	CML (as part of
– non fossil resources ^{1,} kg	equivalents.	Environmental Footprint 3.0
Sb eq.		
Abiotic depletion potential	This category considers the impact on fossil fuels reserves as MJ.	CML (as part of
 fossil resources¹, MJ 		Environmental Footprint 3.0
Water deprivation potential	It assesses the potential of water deprivation, to either humans or	Model developed by UNEP-
[m ³ world eq. deprived] ¹	ecosystems, and serves in calculating the impact score of water	SETAC Task Force on
	consumption at midpoint in LCA or to calculate a water scarcity	particulate matter (PM) in
	footprint as per ISO 14046.	2016 (as part of
		Environmental Footprint 3.0
Particulate matter	It estimates the potential incidence of disease due to PM emissions.	USEtox 2.1 (as part of
		Environmental Footprint 3.0
Ionizing radiation, human	Estimates the human health impact caused due to releases of	Frischknecht et al 2000 (as
health ² , kBq U-235 eq	radioactive material to the environment.	part of Environmental
Fas tanisity (free town to as 4	Companying Taxis Unit for a second and (OTU-) and a size	Footprint 3.0)
Eco-toxicity (freshwater) 1,	Comparative Toxic Unit for ecosystems (CTUe) expressing an	USEtox 2.1 (as part of
CTUe	estimate of the potentially affected fraction of species (PAF)	Environmental Footprint 3.0
	integrated over time and volume per unit mass of a chemical emitted	
Human toxicity, concort	(PAF m3 year/kg). Comparative Toxic Unit for human (CTUh) expressing the estimated	LISEtoy 2.1 (as part of
Human toxicity, cancer ¹ ,		USEtox 2.1 (as part of Environmental Exetorint 2.0
CTUe	increase in morbidity in the total human population per unit mass of a chemical emitted (cases per kilogram).	Environmental Footprint 3.0
Human toxicity, non-	Comparative Toxic Unit for humans (CTUh) expressing the	
cancer effects ¹ , CTUe	estimated increase in morbidity in the total human population per unit	
cancel ellects", CTUe	mass of a chemical emitted (cases per kilogram).	
Land use related impacts ¹ ,	Land use is soil quality index.	LANCA (as part of

Resource Use Parameters		
Primary energy resources – renewable, use as	PERE are (first use) bio-based materials used as an energy source. Hydropower, solar and wind power used in the technosphere is also	Cumulative Energy Demand V1.11
energy carrier (PERE) [MJ, net calorific value]	included in this indicator (ISO 21930, 2017).	The Cumulative Energy
Primary energy resources – non-renewable, use as energy carrier (PENRE) [MJ, net calorific value]	PENRE are (first use) materials such as oil, gas, coal and uranium used as an energy source.	Demand V1.11 method is based on the method published by ecoinvent version 2.0 and expanded by PRé Consultants for raw materials.
Primary energy resources – renewable, use as raw materials (PERM) [MJ, net calorific value]	PERM are (first use) bio-based materials used as materials (e.g. wood, hemp, etc.).	Calculated manually based on the lower heating value of renewable raw materials
Primary energy resources – non-renewable, use as raw materials (PENRM) [MJ, net calorific value]	PENRM are (first use) primary resources such as oil, gas and coal, used for products (e.g., plastic-based products).	Calculated manually based on the higher heating value of non-renewable raw materials
Primary energy resources – Renewable – Total (PERT)	PERT are the total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials).	Calculated manually (PERE + PERM)
Primary energy resources – Non-renewable – Total (PENRT)	PENRT are the total use of non- renewable primary energy resources (primary energy and primary energy resources used as raw materials).	Calculated manually (PENRE + PENRM)
Use of secondary material [kg]	Secondary materials are materials recycled from previous use or waste (e.g., scrap metal, broken concrete, broken glass, plastic and wood) that are used as material input from another product system. These include both renewable and non-renewable resources, with or without energy content, depending on the status of the material when it was originally extracted from the environment.	N/A
Use of renewable secondary fuels [MJ, net calorific value]	Renewable secondary fuels are renewable materials with an energy content that have crossed the system boundary between product systems and are used as fuel input (energy source) in another product system (e.g., biomass residue pellets, chipped waste wood).	N/A
Use of non-renewable secondary fuels [MJ, net calorific value]	Non-renewable secondary fuels are non-renewable materials with an energy content that have crossed the system boundary between product systems and are used as fuel input (energy source) in another product system (e.g., processed solvents, shredded tyres).	N/A
Net freshwater use [m ³]	It estimates the use of net freshwater.	ReCiPe 2016 midpoint method
Waste Flow Parameters Hazardous waste disposed [kg]	It estimates the hazardous waste disposed.	EDIP 2003
Non-hazardous waste disposed [kg]	It estimates the non-hazardous waste disposed.	
Radioactive waste disposed [kg]	It estimates the radioactive waste disposed/ stored.	
Output Flows Components for reuse, [kg]	It estimates the components for re-use.	Calculated manually
Materials for recycling, [kg]	It estimates the material for recycling.	
Materials for energy recovery, [kg]	It estimates the materials for energy recovery.	
Exported energy, MJ Exported energy, thermal, [MJ]	It estimates the recovered energy from exported system. It estimates the recovered energy from thermally exported system.	
Additional GWP-GHG indic GWP-GHG	cator The GWP-GHG indicator includes all greenhouse gases included in GWP-total but excludes biogenic CO2 uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013).	IPCC 2013 GWP 100a

Table 5 below shows the environmental impact information for each Buildonix building component according to the declared unit of 1kg of each component.

Table 5. Environmental impacts of MUSIC 90, Corner block per declared unit

Environmental Impact	Unit	A1	A2	A3	C1	C2	C3	C4	D
Indicators									
Core environmen	tal indicato	ors							
Global Warming	kg CO ₂	2.74E+01	2.04E-01	2.77E+00	0.00E+00	3.88E-02	0.00E+00	0.00E+00	
Potential – total	eq								1.96E+0 1
Global Warming	kg CO ₂	2.73E+01	2.04E-01	2.00E+00	0.00E+00	3.88E-02	0.00E+00	0.00E+00	-
Potential – fossil	eq								1.96E+0 1
Global Warming Potential – biogenic	kg CO ₂ eq	5.86E-02	1.99E-04	7.77E-01	0.00E+00	3.77E-05	0.00E+00	0.00E+00	-5.26E- 02
Global Warming Potential – land use and land use change	kg CO ₂ eq	6.82E-02	1.93E-06	1.04E-03	0.00E+00	3.66E-07	0.00E+00	0.00E+00	-8.55E- 05
Stratospheric ozone depletion potential	kg CFC11 eq	9.14E-07	2.71E-08	1.28E-07	0.00E+00	5.15E-09	0.00E+00	0.00E+00	-5.64E- 07
Formation potential of tropospheric ozone	kg NMVOC eq	8.70E-02	1.43E-03	7.84E-03	0.00E+00	2.72E-04	0.00E+00	0.00E+00	-5.60E- 02
Acidification potential	mol H+ eq	1.75E-01	1.55E-03	1.17E-02	0.00E+00	2.94E-04	0.00E+00	0.00E+00	-1.29E- 01
Eutrophication potential – aquatic freshwater	kg Peq	8.34E-03	8.54E-06	5.63E-04	0.00E+00	1.62E-06	0.00E+00	0.00E+00	-5.76E- 04
Eutrophication potential – aquatic marine	kg N eq	2.90E-02	4.08E-04	4.72E-03	0.00E+00	7.75E-05	0.00E+00	0.00E+00	-1.72E- 02
Eutrophication potential – terrestrial	mol N eq	3.00E-01	4.47E-03	2.73E-02	0.00E+00	8.48E-04	0.00E+00	0.00E+00	-1.87E- 01
Acidification	mol H+ eq	1.75E-01	1.55E-03	1.17E-02	0.00E+00	2.94E-04	0.00E+00	0.00E+00	-1.29E- 01
Eutrophication potential – aquatic freshwater	kg Peq	8.34E-03	8.54E-06	5.63E-04	0.00E+00	1.62E-06	0.00E+00	0.00E+00	-5.76E- 04
Eutrophication potential – aquatic marine	kg Neq	2.90E-02	4.08E-04	4.72E-03	0.00E+00	7.75E-05	0.00E+00	0.00E+00	-1.72E- 02
Water deprivation potential ¹	m ³ depriv.	6.66E+01	2.48E+00	1.37E+01	0.00E+00	4.70E-01	0.00E+00	0.00E+00	4.75E+0 2
Abiotic depletion potential – fossil resources ¹	MJ	2.49E+02	2.55E+00	1.68E+01	0.00E+00	4.85E-01	0.00E+00	0.00E+00	- 1.07E+0 2
Abiotic depletion potential – non fossil resources ¹	kg Sb eq	2.10E-04	1.08E-06	2.13E-04	0.00E+00	2.05E-07	0.00E+00	0.00E+00	-6.62E- 06
GWP – GHG ³	kg CO ₂ eq	2.65E+01	2.01E-01	2.58E+00	0.00E+00	3.82E-02	0.00E+00	0.00E+00	- 1.91E+0 1
Additional impac		s and indicator							
lonising radiation ²	kBq U- 235 eq	5.20E-01	1.26E-04	6.64E-02	0.00E+00	2.39E-05	0.00E+00	0.00E+00	-8.17E- 03
Particulate matter	disease inc.	2.20E-06	1.05E-08	3.26E-07	0.00E+00	1.99E-09	0.00E+00	0.00E+00	-1.57E- 06
Human toxicity, non-cancer ¹	CTUh	6.21E-07	2.33E-09	5.33E-08	0.00E+00	4.42E-10	0.00E+00	0.00E+00	-2.67E- 07
Human toxicity, cancer ⁷	CTUh	3.48E-08	6.45E-11	5.33E-09	0.00E+00	1.22E-11	0.00E+00	0.00E+00	-1.98E- 08
Eco-toxicity, freshwater ¹	CTUe	6.68E+02	1.52E+00	7.19E+02	0.00E+00	2.88E-01	0.00E+00	0.00E+00	- 9.63E+0 1
Land use impacts	Pt	7.70E+01	1.17E+00	3.58E+01	0.00E+00	2.22E-01	0.00E+00	0.00E+00	- 4.58E+0 1

Other environme	ntal informa	ation describing	y waste categ	jories					
Hazardous waste disposed	kg	1.15E-04	4.10E-06	5.79E-05	0.00E+00	7.79E-07	0.00E+00	0.00E+00	7.81E- 04
Non-hazardous waste disposed	kg	5.04E+00	2.27E-02	8.51E-01	0.00E+00	4.31E-03	0.00E+00	0.00E+00	- 2.36E+0 0
Radioactive waste disposed	kg	3.32E-04	1.76E-08	3.71E-05	0.00E+00	3.34E-09	0.00E+00	0.00E+00	-1.17E- 06
Parameters desc	ribing reso	urce use							
Primary energy resources – non-renewable - Excluding use as raw materials	MJ	2.65E+02	2.72E+00	1.80E+01	0.00E+00	5.16E-01	0.00E+00	0.00E+00	- 1.14E+0 2
Primary energy resources – Non-renewable - Used as raw materials	MJ	2.39E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0 0
Primary energy resources – Non-renewable - Total	MJ	2.68E+02	2.72E+00	1.80E+01	0.00E+00	5.16E-01	0.00E+00	0.00E+00	- 1.14E+0 2
Primary energy resources – Renewable - Excluding use as raw materials	MJ	2.78E+01	4.95E-02	1.95E+00	0.00E+00	9.40E-03	0.00E+00	0.00E+00	- 1.25E+0 1
Primary energy resources – Renewable - Used as raw materials	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0 0
Primary energy resources – Renewable - Total	MJ	2.78E+01	4.95E-02	1.95E+00	0.00E+00	9.40E-03	0.00E+00	0.00E+00	- 1.25E+0 1
Net use of fresh water	m3	1.60E+00	5.76E-02	3.22E-01	0.00E+00	1.09E-02	0.00E+00	0.00E+00	- 1.10E+0 1
Use of secondary material	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0 0
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0 0
Use of non- renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0 0
Indicators descri	bing output	tflows		· · · · · · · · · · · · · · · · · · ·					
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0 0
Materials for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	0.00E+0 0
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0 0
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0 0
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0 0

	Indicator	Unit	Quantity
Biogenic content (MUSIC	Biogenic carbon content in product	kg C	0.00E+00
90, Corner block)	Biogenic carbon content in packaging	kg C	1.27E-02
Note: 1 ka hinaenic cerhon is	equivalent to 11/12 kg COs		

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂.

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Environmental	Unit	A1	A2	A3	C1	C2	C3	C4	D	Other environmer	ital inform	nation descri
Impact										Hazardous	kg	2.08E-0
Indicators										waste disposed	1	7.96E-0
Core environmen				1005.00						Non-hazardous waste disposed	kg	7.90E-0
Global Warming Potential – total	kg CO₂ eq	3.75E+00	2.49E-01	4.06E+00	0.00E+00	3.88E-02	0.00E+00	1.17E-01	0.00E+00	Radioactive waste disposed	kg	2.35E-1
Global Warming	kg CO ₂	3.75E+00	2.49E-01	3.28E+00	0.00E+00	3.88E-02	0.00E+00	1.17E-01	0.00E+00	Parameters descr	ihing resc	
Potential -	eq									Primary energy	MJ	8.63E+0
fossil Olahal Warming	he 00	2.425.02	2.425.04	7.745.04	0.005.00	2 775 05	0.005.00	4 405 05	0.005.00	resources -		
Global Warming Potential –	kg CO₂ eq	2.43E-03	2.42E-04	7.74E-01	0.00E+00	3.77E-05	0.00E+00	1.18E-05	0.00E+00	Non-renewable		
biogenic	ey									- Excluding use		
Global Warming	kg CO ₂	9.15E-09	2.35E-06	3.31E-03	0.00E+00	3.66E-07	0.00E+00	4.63E-06	0.00E+00	as raw materials		
Potential – land	eq	0.102.00	2.002.00	0.012 00	0.002 00	0.002 07	0.002 00		0.002 00	Primary energy	MJ	0.00E+0
use and land										resources -		0.002
use change										non-Renewable		
Stratospheric	kg	1.96E-07	3.31E-08	2.36E-07	0.00E+00	5.15E-09	0.00E+00	3.27E-09	0.00E+00	- Used as raw		
ozone depletion	CFC11									materials Primary energy	MJ	8.63E+0
potential	eq	4.055.00	4 755 00	4 365 43	0.005.00	2 725 44	0.005.00	4.055.04	0.005.00	resources –	IVIJ	0.032+0
Formation potential of	kg NMVOC	4.95E-03	1.75E-03	1.26E-02	0.00E+00	2.72E-04	0.00E+00	1.25E-04	0.00E+00	Non-renewable		
tropospheric	eq									- Total		
ozone	~Y									Primary energy	MJ	1.19E+(
Acidification	mol H+	7.12E-03	1.89E-03	2.10E-02	0.00E+00	2.94E-04	0.00E+00	9.94E-05	0.00E+00	resources – Renewable -		
potential	eq									Excluding use		
Eutrophication	kg P eq	2.62E-04	1.04E-05	1.68E-03	0.00E+00	1.62E-06	0.00E+00	1.64E-06	0.00E+00	as raw		
potential –										materials		
aquatic										Primary energy	MJ	1.88E+0
freshwater		1 0 5 5 0 0		5 4 45 49		7 755 45		0.445.00		resources -		
Eutrophication	kg N eq	1.35E-03	4.98E-04	5.14E-03	0.00E+00	7.75E-05	0.00E+00	2.14E-03	0.00E+00	Renewable - Used as raw		
potential – aquatic marine										materials		
Eutrophication	mol N	1.42E-02	5.45E-03	3.68E-02	0.00E+00	8.48E-04	0.00E+00	3.52E-04	0.00E+00	Primary energy	MJ	3.07E+0
potential -	eq	1.422 02	0.402 00	0.002 02	0.002.00	0.402 04	0.002.00	0.02E 04	0.002.000	resources -		
terrestrial	- 1									Renewable -		
Water	m ³	2.55E+01	3.02E+00	1.18E+01	0.00E+00	4.70E-01	0.00E+00	3.69E-02	0.00E+00	Total Net use of fresh	m ³	5.93E-0
deprivation	depriv.									water		J.35L-0
potential ¹										Use of	kg	0.00E+0
Abiotic	MJ	7.84E+01	3.12E+00	3.77E+01	0.00E+00	4.85E-01	0.00E+00	2.51E-01	0.00E+00	secondary	-	
depletion										material		
potential – fossil resources ¹										Use of renewable	MJ	0.00E+0
Abiotic	kg Sb	1.76E-06	1.32E-06	1.09E-04	0.00E+00	2.05E-07	0.00E+00	1.13E-07	0.00E+00	secondary fuels		
depletion	eq				0.002.00	2.002 01	0.002.00		5.55E 00	Use of non-	MJ	0.00E+0
potential – non										renewable		
fossil										secondary fuels		
resources ¹										Indicators descrit Components for	kg	0.00E+0
GWP - GHG ³	kg CO ₂	3.66E+00	2.45E-01	3.84E+00	0.00E+00	3.82E-02	0.00E+00	1.02E-01	0.00E+00	reuse	ĸy	0.00E+0
Additional impact	eq	and indicators								Materials for	kg	0.00E+0
lonising	kBq U-	5.59E-01	1.54E-04	2.85E-01	0.00E+00	2.39E-05	0.00E+00	1.16E-03	0.00E+00	recycling		
radiation ²	235 eq	5.59E-01	1.34E-04	2.03E-01	0.00E+00	2.39E-03	0.00E+00	1.10E-03	0.00E+00	Materials for	kg	0.00E+0
Particulate	disease	6.05E-08	1.28E-08	3.44E-07	0.00E+00	1.99E-09	0.00E+00	1.78E-09	0.00E+00	energy recovery Exported	MJ	0.00E+0
matter	inc.	0.002 00		0.112 01	0.002 00		0.002 00		0.002 00	energy	IVIJ	0.00E+0
Human toxicity,	CTUh	1.48E-08	2.84E-09	1.12E-07	0.00E+00	4.42E-10	0.00E+00	2.40E-10	0.00E+00	Exported	MJ	0.00E+0
non-cancer ¹										energy, thermal		
Human toxicity,	CTUh	8.24E-10	7.87E-11	5.94E-09	0.00E+00	1.22E-11	0.00E+00	7.42E-12	0.00E+00			
cancer ¹												Indicato
Eco-toxicity,	CTUe	1.08E+02	1.85E+00	5.82E+02	0.00E+00	2.88E-01	0.00E+00	5.30E-01	0.00E+00	Biogenic conte		Biogenic
freshwater ¹ Land use	Pt	7.25E+00	4.405.00	2045-04	0.005.00	2 225 24	0.005.00		0.00E+00	(Spacer block)		Biogenic
	PT I	/ / >E+00	1.43E+00	2.94E+01	0.00E+00	2.22E-01	0.00E+00	5.95E-01	0.00F+00	1		

Table 6. Environmental impacts of Spacer block per declared unit

-	tion describing	wanta antona	iaa					
d	tion describing 2.08E-08	5.00E-06	9.93E-05	0.00E+00	7.79E-07	0.00E+00	3.82E-07	0.00E+00
	7.96E-05	2.77E-02	8.14E-01	0.00E+00	4.31E-03	0.00E+00	1.00E+00	0.00E+00
	2.35E-10	2.15E-08	1.09E-04	0.00E+00	3.34E-09	0.00E+00	1.48E-06	0.00E+00
u	rce use			1				
	8.63E+01	3.32E+00	4.03E+01	0.00E+00	5.16E-01	0.00E+00	2.67E-01	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
	8.63E+01	3.32E+00	4.03E+01	0.00E+00	5.16E-01	0.00E+00	2.67E-01	0.00E+00
	1.19E+00	6.04E-02	5.18E+00	0.00E+00	9.40E-03	0.00E+00	4.62E-03	0.00E+00
	1.88E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	3.07E+00	6.04E-02	5.18E+00	0.00E+00	9.40E-03	0.00E+00	4.62E-03	0.00E+00
	5.93E-01	7.02E-02	2.83E-01	0.00E+00	1.09E-02	0.00E+00	8.70E-04	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	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	0.00E+00	0.00E+00	0.00E+00
t	flows							
	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	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	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

icator	Unit	Quantity
genic carbon content in product	kg C	0.00E+00
genic carbon content in packaging	kg C	3.81E-02

s equivalent to 44/12 kg CO2.

Environmental Unit A2 A1 A3 C1 C2 C3 C4 D Impact Indicators Core environmental indicators 5.20E-04 2.73E+01 2.77E+00 0.00E+00 3.88E-02 0.00E+00 0.00E+00 Global Warming kg CO₂ 1.96E+01 Potential - total eq kg CO₂ 2.72E+01 5.20E-04 2.00E+00 0.00E+00 3.88E-02 0.00E+00 0.00E+00 Global Warming Potential – fossil 1.96E+01 eq 5.05E-07 Global Warming kg CO₂ 5.10E-02 7.77E-01 0.00E+00 3.77E-05 0.00E+00 0.00E+00 -5.26E-Potential -02 eq biogenic 6.82E-02 4.91E-09 1.04E-03 0.00E+00 3.66E-07 0.00E+00 0.00E+00 Global Warming kg CO₂ -8.55E-Potential – land 05 eq use and land use change 6.90E-11 1.28E-07 0.00E+00 5.15E-09 9.03E-07 0.00E+00 0.00E+00 -5.64E-Stratospheric ka CFC11 ozone depletion 07 potential eq 8.68E-02 3.65E-06 7.84E-03 0.00E+00 2.72E-04 0.00E+00 Formation 0.00E+00 -5.60Ekq NMVOC potential of 02 tropospheric eq ozone 1.79E-01 Acidification 3.95E-06 1.17E-02 0.00E+00 2.94E-04 0.00E+00 0.00E+00 -1.29Emol H+ potential 01 ea Eutrophication 8.30E-03 2.17E-08 0.00E+00 1.62E-06 0.00E+00 0.00E+00 kg P eq 5.63E-04 -5.76Epotential -04 aquatic freshwater 2.89E-02 4.72E-03 0.00E+00 7.75E-05 0.00E+00 -1.72Ekg N eq 1.04E-06 0.00E+00 Eutrophication potential -02 aquatic marine mol N eq 2.98E-01 1.14E-05 2.73E-02 0.00E+00 8.48E-04 0.00E+00 0.00E+00 -1.87E-Eutrophication potential -01 terrestrial 6.62E+01 6.30E-03 1.37E+01 0.00E+00 4.70E-01 0.00E+00 0.00E+00 Water m³ 4.75E+02 deprivation depriv. potential¹ 4.85E-01 Abiotic depletion MJ 2.48E+02 6.50E-03 1.68E+01 0.00E+00 0.00E+00 0.00E+00 1.07E+02 potential - fossil resources1 kg Sb eq 3.05E-04 2.75E-09 2.13E-04 0.00E+00 2.05E-07 0.00E+00 0.00E+00 -6.62E-Abiotic depletion potential – non 06 fossil resources1 2.65E+01 2.58E+00 3.82E-02 GWP GHG³ kg CO₂ 5.12E-04 0.00E+00 0.00E+00 0.00E+00 1.91E+01 ea Additional impact categories and indicators lonising kBq U-5.16E-01 3.21E-07 6.64E-02 0.00E+00 2.39E-05 0.00E+00 0.00E+00 -8.17Eradiation² 235 eq 03 Particulate 2.17E-06 2.66E-11 3.26E-07 0.00E+00 1.99E-09 0.00E+00 0.00E+00 -1.57Edisease matter inc. 06 0.00E+00 Human toxicity, CTUh 6.33E-07 5.92E-12 5.33E-08 0.00E+00 4.42E-10 0.00E+00 -2.67Enon-cancer¹ 07 Human toxicity, CTUh 3.51E-08 1.64E-13 5.33E-09 0.00E+00 1.22E-11 0.00E+00 0.00E+00 -1.98Ecancer¹ 80 6.66E+02 0.00E+00 2.88E-01 0.00E+00 0.00E+00 Eco-toxicity CTUe 3.87E-03 7.19E+02 freshwater¹ 9.63E+01 2.97E-03 0.00E+00 2.22E-01 0.00E+00 Pt 5.49E+01 3.58E+01 0.00E+00 Land use 4.58E+01 impacts

Other environment					_	_	_	_	_
Hazardous	kg	1.27E-04	1.04E-08	5.79E-05	0.00E+00	7.79E-07	0.00E+00	0.00E+00	7.81E-04
waste disposed									
Non-hazardous waste disposed	kg	5.03E+00	5.77E-05	8.51E-01	0.00E+00	4.31E-03	0.00E+00	0.00E+00	- 2.36E+00
Radioactive waste disposed	kg	3.31E-04	4.48E-11	3.71E-05	0.00E+00	3.34E-09	0.00E+00	0.00E+00	-1.17E- 06
Parameters desci	tibing reco		1		1	I	I	1	00
Primary energy	MJ	2.64E+02	6.92E-03	1.80E+01	0.00E+00	5.16E-01	0.00E+00	0.00E+00	
resources – Non- renewable - Excluding use as raw materials	INIO	2.042.02	0.322-03	1.002.01	0.002.00	J. 102-01	0.002.00	0.002.00	1.14E+02
Primary energy resources – Non- renewable - Used as raw materials	MJ	2.39E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Primary energy resources – Non- renewable - Total	MJ	2.67E+02	6.92E-03	1.80E+01	0.00E+00	5.16E-01	0.00E+00	0.00E+00	- 1.14E+02
Primary energy resources – Renewable - Excluding use as raw materials	MJ	2.72E+01	1.26E-04	1.95E+00	0.00E+00	9.40E-03	0.00E+00	0.00E+00	- 1.25E+01
Primary energy resources – Renewable - Used as raw materials	MJ	7.01E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Primary energy resources – Renewable - Total	MJ	2.79E+01	1.26E-04	1.95E+00	0.00E+00	9.40E-03	0.00E+00	0.00E+00	- 1.25E+01
Net use of fresh water	m3	1.59E+00	1.47E-04	3.22E-01	0.00E+00	1.09E-02	0.00E+00	0.00E+00	- 1.10E+0
Use of secondary material	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
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0
Use of non- renewable secondary fuels	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
Indicators descril	bing output	flows							
Components for reuse	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
Materials for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	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
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0
Exported energy,	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+0

	Indicator	Unit	Quantity
Biogenic content (web	Biogenic carbon content in product	kg C	0.00E+00
bracket, sole plate)	Biogenic carbon content in packaging	kg C	1.27E-02
Note: 1 kg biogenic carbon	is equivalent to 44/12 kg CO2.		

Table 7. Environmental impact of Web bracket and Sole plate per declared unit

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I Table 8. Environmental impact of Standard corner bracket per declared unit

Environmental	Unit	A1	A2	A3	C1	C2	C3	C4	D
impact indicators Core environmenta	al indicators						I	I	
Global Warming	kg CO ₂	3.22E+00	2.19E-01	2.31E+00	0.00E+00	3.88E-02	0.00E+00	0.00E+00	
Potential – total	eq co2	J.22L-00	2.136-01	2.512.00	0.002.00	J.00L-02	0.002.00	0.002.00	1.22E+00
Global Warming	kg CO ₂	3.22E+00	2.19E-01	2.09E+00	0.00E+00	3.88E-02	0.00E+00	0.00E+00	-
Potential – fossil	eq	0.222 00	2.102.01	2.002 00	0.002 00	0.002 02	0.002 00	0.002 00	1.22E+00
Global Warming	kg CO ₂	1.26E-03	2.13E-04	2.21E-01	0.00E+00	3.77E-05	0.00E+00	0.00E+00	1.08E-04
Potential –	eq								
biogenic									
Global Warming	kg CO ₂	7.54E-04	2.07E-06	2.49E-03	0.00E+00	3.66E-07	0.00E+00	0.00E+00	-7.40E-
Potential – land	eq								07
use and land use									
change									
Stratospheric	kg	-2.89E-09	2.91E-08	1.49E-07	0.00E+00	5.15E-09	0.00E+00	0.00E+00	-2.17E-
ozone depletion	CFC11								08
potential	eq								1.005
Formation	kg	5.73E-03	1.54E-03	6.33E-03	0.00E+00	2.72E-04	0.00E+00	0.00E+00	-4.08E-
potential of	NMVOC								03
tropospheric	eq								
ozone Acidification	mol H+	9.15E-03	1.66E-03	9.68E-03	0.00E+00	2.94E-04	0.00E+00	0.00E+00	-4.87E-
potential	eq	3.15E-03	1.00E-03	9.00E-03	0.002400	2.940-04	0.002+00	0.002+00	-4.87E- 03
Eutrophication	kg Peq	7.72E-05	9.15E-06	8.43E-04	0.00E+00	1.62E-06	0.00E+00	0.00E+00	-7.07E-
potential – aquatic	Ngi oq	1.122 00	0.10E 00	0.452 04	0.002.000	1.022 00	0.002.00	0.002.00	07
freshwater									0,
Eutrophication	kg N eq	2.03E-03	4.37E-04	2.33E-03	0.00E+00	7.75E-05	0.00E+00	0.00E+00	-9.28E-
potential – aquatic	5 .								04
marine									
Eutrophication	mol N	2.18E-02	4.79E-03	2.03E-02	0.00E+00	8.48E-04	0.00E+00	0.00E+00	-1.08E-
potential –	eq								02
terrestrial									
Water deprivation	m3	2.18E-02	4.79E-03	2.03E-02	0.00E+00	8.48E-04	0.00E+00	0.00E+00	-1.08E-
potential ⁷	depriv.	0.705.04	0.745.00	0.405.04		1055.04	0.005.00		02
Abiotic depletion	MJ	3.73E+01	2.74E+00	2.46E+01	0.00E+00	4.85E-01	0.00E+00	0.00E+00	-
potential – fossil									8.56E+00
resources ¹ Abiotic depletion	ka Sh ac	7.51E-06	1.16E-06	4.94E-05	0.00E+00	2.05E-07	0.00E+00	0.00E+00	4.52E-10
potential – non	kg Sb eq	7.51E-00	1.10E-00	4.94E-05	0.002+00	2.05E-07	0.00E+00	0.002+00	4.52E-10
fossil resources ¹									
GWP - GHG ³	kg CO ₂	3.13E+00	2.16E-01	2.22E+00	0.00E+00	3.82E-02	0.00E+00	0.00E+00	-
	eq eq	0.102.00	2.102-01	2.220.00	0.002.00	0.022-02	0.002.00	0.002.00	1.16E+00
Additional impact		and indicators	1	1	1			I	
Ionising radiation ²	kBq U-	2.35E-02	1.35E-04	1.47E-01	0.00E+00	2.39E-05	0.00E+00	0.00E+00	-1.04E-
contening radiation	235 eq	2.002 02	1.002 04		0.002.00	2.002 00	0.002.00	0.002.00	04
Particulate matter	disease	1.61E-07	1.12E-08	1.39E-07	0.00E+00	1.99E-09	0.00E+00	0.00E+00	-7.80E-
	inc.								08
Human toxicity,	CTUh	8.26E-09	2.49E-09	6.35E-08	0.00E+00	4.42E-10	0.00E+00	0.00E+00	-4.74E-
non-cancer ¹									08
Human toxicity,	CTUh	3.37E-09	6.91E-11	4.96E-09	0.00E+00	1.22E-11	0.00E+00	0.00E+00	-4.78E-
cancer ¹									10
Eco-toxicity,	CTUe	1.06E+01	1.63E+00	1.47E+02	0.00E+00	2.88E-01	0.00E+00	0.00E+00	-
freshwater									2.43E+01
Land use impacts	Pt	-1.14E+00	1.25E+00	1.04E+01	0.00E+00	2.22E-01	0.00E+00	0.00E+00	-
									2.01E+00

Other environment									
Hazardous waste disposed	kg	1.24E-05	4.40E-06	4.89E-05	0.00E+00		0.00E+00	0.00E+00	-1.74E- 04
Non-hazardous waste disposed	kg	7.83E-02	2.43E-02	4.22E-01	0.00E+00		0.00E+00	0.00E+00	-3.31E- 02
Radioactive waste disposed	kg	5.22E-06	1.89E-08	6.92E-05	0.00E+00	3.34E-09	0.00E+00	0.00E+00	-1.41E- 08
Parameters descril	bina reso	ource use							
Primary energy resources – Non- renewable - Excluding use as raw materials	MJ	3.95E+01	2.92E+00	2.63E+01	0.00E+00	5.16E-01	0.00E+00	0.00E+00	- 9.01E+00
Primary energy resources – Non- renewable - Used as raw materials	MJ	1.84E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Primary energy resources – Non- renewable - Total	MJ	4.13E+01	2.92E+00	2.63E+01	0.00E+00	5.16E-01	0.00E+00	0.00E+00	- 9.01E+00
Primary energy resources – Renewable - Excluding use as raw materials	MJ	2.70E+00	5.31E-02	2.08E+00	0.00E+00		0.00E+00	0.00E+00	2.65E-02
Primary energy resources – Renewable - Used as raw materials	MJ	6.21E-01	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00
Primary energy resources – Renewable - Total	MJ	3.32E+00	5.31E-02	2.08E+00	0.00E+00	9.40E-03	0.00E+00	0.00E+00	2.65E-02
Net use of fresh water	m3	-2.42E-03	6.17E-02	1.51E-02	0.00E+00	1.09E-02	0.00E+00	0.00E+00	-6.35E- 02
Use of secondary material	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
Use of renewable secondary fuels	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
Use of non- renewable secondary fuels	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
Indicators describi	ng outpu	It flows							
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	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
Exported energy Exported energy, thermal	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 0.00E+00	0.00E+00 0.00E+00	0.00E+00 0.00E+00
		Indiagtor				11:14			
		Indicator				Unit		ntity	

Biogenic content (Standard corner bracket) Biog Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂.

ndicator	Unit	Quantity
Biogenic carbon content in product	kg C	0.00E+00
Biogenic carbon content in packaging	kg C	0.00E+00

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Table 9. Environmental impact of H load bracket per	r declared unit
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Environmental	Units	A1	A2	A3	C1	C2	C3	C4	D
impact indicators									
Core environmenta			5 205 04	0.705.00	0.005.00	0.005.00	0.005.00	0.005.00	1
Global Warming Potential – total	kg CO ₂ eq	2.86E+01	5.20E-04	2.76E+00	0.00E+00	3.88E-02	0.00E+00	0.00E+00	- 1.96E+01
Global Warming Potential – fossil	kg CO₂ eq	2.85E+01	5.20E-04	1.98E+00	0.00E+00	3.88E-02	0.00E+00	0.00E+00	- 1.96E+01
Global Warming Potential – biogenic	kg CO ₂ eq	5.91E-02	5.05E-07	7.76E-01	0.00E+00	3.77E-05	0.00E+00	0.00E+00	-5.26E- 02
Global Warming Potential – land use and land use change	kg CO ₂ eq	6.87E-02	4.91E-09	1.04E-03	0.00E+00	3.66E-07	0.00E+00	0.00E+00	-8.55E- 05
Stratospheric ozone depletion potential	kg CFC11 eq	9.52E-07	6.90E-11	1.26E-07	0.00E+00	5.15E-09	0.00E+00	0.00E+00	-5.64E- 07
Formation potential of tropospheric ozone	kg NMVOC eq	9.24E-02	3.65E-06	7.75E-03	0.00E+00	2.72E-04	0.00E+00	0.00E+00	-5.60E- 02
Acidification potential	mol H+ eq	1.79E-01	3.95E-06	1.16E-02	0.00E+00	2.94E-04	0.00E+00	0.00E+00	-1.29E- 01
Eutrophication potential – aquatic freshwater	kg Peq	8.77E-03	2.17E-08	5.63E-04	0.00E+00	1.62E-06	0.00E+00	0.00E+00	-5.76E- 04
Eutrophication potential – aquatic marine	kg N eq	3.01E-02	1.04E-06	4.69E-03	0.00E+00	7.75E-05	0.00E+00	0.00E+00	-1.72E- 02
Eutrophication potential – terrestrial	mol N eq	3.11E-01	1.14E-05	2.71E-02	0.00E+00	8.48E-04	0.00E+00	0.00E+00	-1.87E- 01
Water deprivation potential ¹	m ³ depriv.	6.67E+01	6.30E-03	1.35E+01	0.00E+00	4.70E-01	0.00E+00	0.00E+00	- 4.75E+02
Abiotic depletion potential – fossil resources ¹	мj	2.63E+02	6.50E-03	1.66E+01	0.00E+00	4.85E-01	0.00E+00	0.00E+00	- 1.07E+02
Abiotic depletion potential – non fossil resources ¹	kg Sb eq	1.89E-04	2.75E-09	2.13E-04	0.00E+00	2.05E-07	0.00E+00	0.00E+00	-6.62E- 06
GWP - GHG ³	kg CO ₂ eq	2.77E+01	5.12E-04	2.57E+00	0.00E+00	3.82E-02	0.00E+00	0.00E+00	- 1.91E+01
Additional impact	categories a	and indicato	rs	·			·	•	
Ionising radiation ²	kBq U- 235 eq	5.55E-01	3.21E-07	6.64E-02	0.00E+00	2.39E-05	0.00E+00	0.00E+00	-8.17E- 03
Particulate matter	disease inc.	3.07E-06	2.66E-11	3.25E-07	0.00E+00	1.99E-09	0.00E+00	0.00E+00	-1.57E- 06
Human toxicity, non-cancer ¹	CTUh	6.30E-07	5.92E-12	5.32E-08	0.00E+00	4.42E-10	0.00E+00	0.00E+00	-2.67E- 07
Human toxicity, cancer ¹	CTUh	4.13E-08	1.64E-13	5.33E-09	0.00E+00	1.22E-11	0.00E+00	0.00E+00	-1.98E- 08
Eco-toxicity, freshwater ¹	CTUe	6.94E+02	3.87E-03	7.19E+02	0.00E+00	2.88E-01	0.00E+00	0.00E+00	- 9.63E+01
Land use impacts	Pt	7.99E+01	2.97E-03	3.58E+01	0.00E+00	2.22E-01	0.00E+00	0.00E+00	- 4.58E+01

Other environment	al inform	ation describi	ng waste cat	egories					
Hazardous waste	kg	1.18E-04	1.04E-08	5.76E-05	0.00E+00	7.79E-07	0.00E+00	0.00E+00	7.81E-04
disposed									
Non-hazardous	kg	5.29E+00	5.77E-05	8.50E-01	0.00E+00	4.31E-03	0.00E+00	0.00E+00	-
waste disposed									2.36E+00
Radioactive waste	kg	3.44E-04	4.48E-11	3.71E-05	0.00E+00	3.34E-09	0.00E+00	0.00E+00	-1.17E-
disposed									06
Parameters descri				1	1	1	1	1	1
Primary energy	MJ	2.80E+02	6.92E-03	1.78E+01	0.00E+00	5.16E-01	0.00E+00	0.00E+00	-
resources – Non-									1.14E+02
renewable -									
Excluding use as									
raw materials									
Primary energy	MJ	2.39E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
resources - Non-									
renewable - Used									
as raw materials									
Primary energy	MJ	2.82E+02	6.92E-03	1.78E+01	0.00E+00	5.16E-01	0.00E+00	0.00E+00	-
resources - Non-									1.14E+02
renewable - Total									
Primary energy	MJ	2.84E+01	1.26E-04	1.95E+00	0.00E+00	9.40E-03	0.00E+00	0.00E+00	-
resources -		2.0.12 01							1.25E+01
Renewable -									1.202.01
Excluding use as									
raw materials									
Primary energy	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
resources -	INIU	0.002.00	0.002.00	0.002.00	0.002.00	0.002.00	0.002.00	0.002.00	0.002.00
Renewable - Used									
as raw materials									
Primary energy	MJ	2.84E+01	1.26E-04	1.95E+00	0.00E+00	9.40E-03	0.00E+00	0.00E+00	
resources –	IND	2.046+01	1.202-04	1.552+00	0.002+00	9.40E-03	0.002400	0.002+00	1.25E+01
Renewable - Total									1.25E+01
Net use of fresh	m ³	1.61E+00	1.47E-04	3.18E-01	0.00E+00	1.09E-02	0.00E+00	0.00E+00	-
	- m	1.012+00	1.47 E-04	3. IOE-UI	0.00E+00	1.09E-02	0.00E+00	0.00E+00	- 1.10E+01
water Use of secondary	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
material	ĸġ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.002+00
	MJ	0.005.00	0.005.00	0.005.00	0.005.00	0.005.00	0.005.00	0.005.00	0.005.00
Use of renewable	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
secondary fuels		0.005.00	0.005.00	0.005.00	0.005.00	0.005.00	0.005.00	0.005.00	0.005.00
Use of non-	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
renewable									
secondary fuels									
Indicators describi	ng outpu								
Components for	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
reuse									
Materials for	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	0.00E+00
recycling									
Materials for	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
energy recovery	-								
Exported energy	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
Exported energy,	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
thermal		0.002.00	0.002.00	0.000.00	0.002.00	0.002.00	0.002.00	0.002.00	0.002.00
	1	1	1	1	1	1	1	1	1
		Indicator				Unit	Q	uantity	

 Indicator

 Biogenic content (H load bracket)
 Biogenic carbon content in pro-Biogenic carbon content in part Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2.

dicator	Unit	Quantity
ogenic carbon content in product	kg C	0.00E+00
ogenic carbon content in packaging	kg C	1.27E-02

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	Table 10. Environmenta	l impact of Rail attachr	ment profile per declared unit
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Environmental	Unit	A1	A2	A3	C1	C2	C3	C4	D
impact indicators									
Core environmenta			0.775.04	5.075.04					4 005 00
Global Warming Potential – total	kg CO₂ eq	2.79E+00	6.77E-04	5.27E-01	0.00E+0 0	3.88E-02	0.00E+00	0.00E+00	-1.22E+00
Global Warming Potential – fossil	kg CO₂ eq	2.79E+00	6.76E-04	4.22E-01	0.00E+0 0	3.88E-02	0.00E+00	0.00E+00	-1.22E+00
Global Warming Potential – biogenic	kg CO ₂ eq	2.50E-03	6.57E-07	1.05E-01	0.00E+0 0	3.77E-05	0.00E+00	0.00E+00	1.08E-04
Global Warming Potential – land use and land use change	kg CO ₂ eq	5.99E-04	6.38E-09	6.19E-05	0.00E+0 0	3.66E-07	0.00E+00	0.00E+00	-7.40E-07
Stratospheric ozone depletion potential	kg CFC11 eq	-1.06E-08	8.97E-11	1.76E-08	0.00E+0 0	5.15E-09	0.00E+00	0.00E+00	-2.17E-08
Formation potential of tropospheric ozone	kg NMVOC eq	-1.06E-08	8.97E-11	1.76E-08	0.00E+0 0	5.15E-09	0.00E+00	0.00E+00	-2.17E-08
Acidification potential	mol H+ eq	7.88E-03	5.14E-06	2.58E-03	0.00E+0 0	2.94E-04	0.00E+00	0.00E+00	-4.87E-03
Eutrophication potential – aquatic freshwater	kg Peq	2.03E-06	2.83E-08	9.47E-05	0.00E+0 0	1.62E-06	0.00E+00	0.00E+00	-7.07E-07
Eutrophication potential – aquatic marine	kg N eq	1.70E-03	1.35E-06	4.91E-04	0.00E+0 0	7.75E-05	0.00E+00	0.00E+00	-9.28E-04
Eutrophication potential – terrestrial	mol N eq	1.84E-02	1.48E-05	5.21E-03	0.00E+0 0	8.48E-04	0.00E+00	0.00E+00	-1.08E-02
Water deprivation potential ¹	m ³ depriv.	6.91E-01	8.20E-03	6.59E+00	0.00E+0 0	4.70E-01	0.00E+00	0.00E+00	-2.72E+00
Abiotic depletion potential – fossil resources ¹	MJ	2.86E+01	8.45E-03	3.58E+00	0.00E+0 0	4.85E-01	0.00E+00	0.00E+00	-8.56E+00
Abiotic depletion potential – non fossil resources ¹	kg Sb eq	1.00E-05	3.57E-09	3.88E-06	0.00E+0 0	2.05E-07	0.00E+00	0.00E+00	4.52E-10
GWP - GHG ³	kg CO ₂ eq	2.72E+00	6.66E-04	4.96E-01	0.00E+0 0	3.82E-02	0.00E+00	0.00E+00	-1.16E+00
Additional impact		and indicators		·		•	·	•	•
Ionising radiation ²	kBq U- 235 eq	3.08E-02	4.18E-07	5.81E-03	0.00E+0 0	2.39E-05	0.00E+00	0.00E+00	-1.04E-04
Particulate matter	disease inc.	1.25E-07	3.46E-11	2.89E-08	0.00E+0	1.99E-09	0.00E+00	0.00E+00	-7.80E-08
Human toxicity, non-cancer ¹	CTUh	2.17E-08	7.70E-12	7.81E-09	0.00E+0	4.42E-10	0.00E+00	0.00E+00	-4.74E-08
Human toxicity, cancer ¹	CTUh	1.09E-09	2.14E-13	1.35E-09	0.00E+0 0	1.22E-11	0.00E+00	0.00E+00	-4.78E-10
Eco-toxicity, freshwater ¹	CTUe	4.18E+00	5.03E-03	7.27E+00	0.00E+0	2.88E-01	0.00E+00	0.00E+00	-2.43E+01
Land use impacts	Pt	-8.19E-01	3.87E-03	1.45E+00	0.00E+0 0	2.22E-01	0.00E+00	0.00E+00	-2.01E+00

Other environmental information describing waste categories													
Hazardous waste	kg	1.89E-08	1.36E-08	1.62E-05	0.00E+0	7.79E-07	0.00E+00	0.00E+00	-1.74E-04				
disposed					0								
Non-hazardous waste disposed	kg	6.94E-02	7.51E-05	1.74E-01	0.00E+0 0	4.31E-03	0.00E+00	0.00E+00	-3.31E-02				
Radioactive waste disposed	kg	2.13E-10	5.83E-11	4.63E-06	0.00E+0 0	3.34E-09	0.00E+00	0.00E+00	-1.41E-08				
Parameters descrit	hing resour												
Primary energy	MJ	3.02E+01	9.00E-03	3.82E+00	0.00E+0	5.16E-01	0.00E+00	0.00E+00	-9.01E+00				
resources – Non-	INIU	3.02E-01	9.00E-03	3.02L+00	0	J. TOE-01	0.002.00	0.002.00	-9.012.00				
renewable -					ľ								
Excluding use as													
raw materials													
Primary energy	MJ	1.71E+00	0.00E+00	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
resources - Non-					0								
renewable - Used													
as raw materials													
Primary energy	MJ	3.19E+01	9.00E-03	3.82E+00	0.00E+0	5.16E-01	0.00E+00	0.00E+00	-9.01E+00				
resources - Non-					0								
renewable - Total		0.405.00	4.045.04	0.505.04	0.005.0	0.405.00	0.005.00	0.005.00	0.055.00				
Primary energy	MJ	2.13E+00	1.64E-04	2.59E-01	0.00E+0	9.40E-03	0.00E+00	0.00E+00	2.65E-02				
resources – Renewable -					0								
Excluding use as													
raw materials													
Primary energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
resources -		0.002 00	0.002 00	0.002.00	0	0.002.00	0.002.00	0.002.00	0.002 000				
Renewable - Used					-								
as raw materials													
Primary energy	MJ	2.13E+00	1.64E-04	2.59E-01	0.00E+0	9.40E-03	0.00E+00	0.00E+00	2.65E-02				
resources -					0								
Renewable - Total													
Net use of fresh	m3	1.97E-02	1.91E-04	1.53E-01	0.00E+0	1.09E-02	0.00E+00	0.00E+00	-6.35E-02				
water Use of secondary	kg	0.00E+00	0.00E+00	0.00E+00	0 0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
material	Ng	0.002+00	0.002+00	0.002+00	0.002+0	0.002+00	0.002+00	0.002+00	0.002+00				
Use of renewable	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
secondary fuels					0								
Use of non-	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
renewable					0								
secondary fuels													
Indicators describi	ng output f												
Components for	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
reuse					0								
Materials for	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+0	0.00E+00	1.00E+00	0.00E+00	0.00E+00				
recycling	lun.	0.005.00	0.005.00	0.005.00	0	0.005.00	0.005.00	0.005.00	0.005.00				
Materials for	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
energy recovery Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0 0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
Exported energy	WIJ	0.002+00	0.002+00	0.002+00	0.002+0	0.002+00	0.002+00	0.002+00	0.002400				
Exported energy,	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+0	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
thermal					0								
					-	-							

	Indicator	Unit	Quantity
Biogenic content (Rail	Biogenic carbon content in product	kg C	0.00E+00
attachment profile)	Biogenic carbon content in packaging	kg C	3.81E-02
Note: 1 kg biogenic carbon	is equivalent to 44/12 kg CO2.		

Environmental Unit		A1	A2	A3	C1	C2	C3	C4	D
impact indicators									
Core environmenta		·		-					
Global Warming Potential – total	kg CO ₂ eq	1.36E+00	2.59E-01	1.59E-01	0.00E+00	3.88E-02	0.00E+00	1.08E+00	0.00E+00
Global Warming Potential – fossil	kg CO ₂ eq	1.34E+00	2.58E-01	6.76E-03	0.00E+00	3.88E-02	0.00E+00	-6.74E-02	0.00E+00
Global Warming Potential – biogenic	kg CO ₂ eq	1.34E-02	2.51E-04	1.53E-01	0.00E+00	3.77E-05	0.00E+00	1.15E+00	0.00E+00
Global Warming Potential – land use and land use change	kg CO ₂ eq	4.12E-03	2.44E-06	3.86E-07	0.00E+00	3.66E-07	0.00E+00	5.75E-08	0.00E+00
Stratospheric ozone depletion potential	kg CFC11 eq	9.71E-08	3.43E-08	1.68E-09	0.00E+00	5.15E-09	0.00E+00	3.30E-09	0.00E+00
Formation potential of tropospheric ozone	kg NMVOC eq	7.97E-03	1.81E-03	2.63E-03	0.00E+00	2.72E-04	0.00E+00	1.93E-02	0.00E+00
Acidification potential	mol H+ eq	1.02E-02	1.96E-03	1.13E-04	0.00E+00	2.94E-04	0.00E+00	3.45E-04	0.00E+00
Eutrophication potential – aquatic freshwater	kg Peq	2.12E-04	1.08E-05	4.36E-07	0.00E+00	1.62E-06	0.00E+00	-1.48E-08	0.00E+00
Eutrophication potential – aquatic marine	kg N eq	2.34E-03	5.16E-04	8.31E-04	0.00E+00	7.75E-05	0.00E+00	3.80E-04	0.00E+00
Eutrophication potential – terrestrial	mol N eq	2.81E-02	5.65E-03	7.52E-04	0.00E+00	8.48E-04	0.00E+00	4.17E-03	0.00E+00
Water deprivation potential ¹	m3 depriv.	1.61E+01	3.13E+00	-2.16E-01	0.00E+00	4.70E-01	0.00E+00	-2.39E+00	0.00E+00
Abiotic depletion potential – fossil resources ¹	MJ	1.78E+01	3.23E+00	9.87E-02	0.00E+00	4.85E-01	0.00E+00	-1.15E-01	0.00E+00
Abiotic depletion potential – non fossil resources ¹	kg Sb eq	1.59E-05	1.36E-06	4.71E-08	0.00E+00	2.05E-07	0.00E+00	-1.05E-08	0.00E+00
GWP - GHG ³	kg CO ₂ eq	1.33E+00	2.54E-01	1.30E-01	0.00E+00	3.82E-02	0.00E+00	8.70E-01	0.00E+00
Additional impact	categories a	and indicators							
Ionising radiation ²	kBq U- 235 eq	4.31E-02	1.60E-04	8.13E-05	0.00E+00	2.39E-05	0.00E+00	5.89E-07	0.00E+00
Particulate matter	disease inc.	4.46E-07	1.32E-08	3.82E-10	0.00E+00	1.99E-09	0.00E+00	-1.09E-09	0.00E+00
Human toxicity, non-cancer ¹	CTUh	3.38E-08	2.94E-09	7.60E-10	0.00E+00	4.42E-10	0.00E+00	4.92E-09	0.00E+00
Human toxicity, cancer ¹	CTUh	6.23E-09	8.16E-11	4.13E-12	0.00E+00	1.22E-11	0.00E+00	8.75E-12	0.00E+00
Eco-toxicity, freshwater ¹	CTUe	4.23E+01	1.92E+00	1.70E-01	0.00E+00	2.88E-01	0.00E+00	1.54E-01	0.00E+00
Land use impacts	Pt	3.43E+02	1.48E+00	1.34E-01	0.00E+00	2.22E-01	0.00E+00	3.75E-01	0.00E+00

Table 11. Environmental impact of Floor pod per declared unit

Primary energy resources – Non- renewable - Excluding use as raw materials Primary energy resources – Non- renewable - Used as raw materials	kg kg kg	2.55E-05 1.86E-01 3.32E-05	5.19E-06 2.87E-02 2.23E-08 3.44E+00	1.69E-07 1.86E-01 9.84E-08 1.05E-01	0.00E+00 0.00E+00 0.00E+00	7.79E-07 4.31E-03 3.34E-09	0.00E+00 0.00E+00 0.00E+00	-8.93E-08 8.97E-01 4.40E-11	0.00E+00 0.00E+00 0.00E+00										
disposed Non-hazardous waste disposed Radioactive waste disposed Parameters descrit Primary energy resources – Non- renewable - Excluding use as raw materials Primary energy resources – Non- renewable - Used as raw materials	kg kg Ding resour MJ	1.86E-01 3.32E-05	2.87E-02 2.23E-08	1.86E-01 9.84E-08	0.00E+00 0.00E+00	4.31E-03	0.00E+00	8.97E-01	0.00E+00										
Non-hazardous waste disposed Radioactive waste disposed Parameters descritt Primary energy resources – Non- renewable - Excluding use as raw materials Primary energy resources – Non- renewable - Used as raw materials	kg Ding resour MJ	3.32E-05	2.23E-08	9.84E-08	0.00E+00														
waste disposed Radioactive waste disposed Parameters descritt Primary energy resources – Non- renewable - Excluding use as raw materials Primary energy resources – Non- renewable - Used as raw materials	kg Ding resour MJ	3.32E-05	2.23E-08	9.84E-08	0.00E+00														
Radioactive waste disposed Parameters descrit Primary energy resources – Non- renewable - Excluding use as raw materials Primary energy resources – Non- renewable - Used as raw materials	ping resour MJ	ce use				3.34E-09	0.00E+00	4.40E-11	0.00E+00										
disposed Parameters descrit Primary energy resources – Non- renewable - Excluding use as raw materials Primary energy resources – Non- renewable - Used as raw materials	ping resour MJ	ce use				0.042 00	0.002.00	4.402 11	0.002.00										
Parameters descrit Primary energy resources – Non- renewable - Excluding use as raw materials Primary energy resources – Non- renewable - Used as raw materials	MJ		3.44E+00	1.05E-01					,										
Primary energy resources – Non- renewable - Excluding use as raw materials Primary energy resources – Non- renewable - Used as raw materials	MJ		3.44E+00	1.05E-01	Parameters describing resource use														
resources – Non- renewable - Excluding use as raw materials Primary energy resources – Non- renewable - Used as raw materials		1.022-01	5.442.00	1.000 01	0.00E+00	5.16E-01	0.00E+00	-1.23E-01	0.00E+00										
renewable - Excluding use as raw materials Primary energy resources – Non- renewable - Used as raw materials	MJ				0.002.00	0.10E 01	0.002.00	1.202 01	0.002-00										
Excluding use as raw materials Primary energy resources – Non- renewable - Used as raw materials	MJ		I																
raw materials Primary energy resources – Non- renewable - Used as raw materials	MJ																		
Primary energy resources – Non- renewable - Used as raw materials	MJ	1																	
resources – Non- renewable - Used as raw materials	1110	2.14E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00										
renewable - Used as raw materials		2.142.00	0.002.00	0.002.00	0.002.00	0.002.00	0.002.00	0.002.00	0.002.00										
as raw materials																			
Primary energy	MJ	2.14E+01	3.44E+00	1.05E-01	0.00E+00	5.16E-01	0.00E+00	-1.23E-01	0.00E+00										
resources - Non-	1110	2.142.01	3.442.00	1.052-01	0.002.00	3.10E-01	0.002.00	1.236 01	0.002.00										
renewable - Total																			
Primary energy	MJ	7.30E+01	6.27E-02	-5.97E-03	0.00E+00	9.40E-03	0.00E+00	-6.24E-02	0.00E+00										
resources -	1110	1.502.01	0.27 2 02	5.57E 05	0.002.00	0.40E 00	0.002.00	0.246 02	0.002-00										
Renewable -																			
Excluding use as																			
raw materials																			
Primary energy	MJ	6.27E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00										
resources -	1110	0.272.01	0.002.00	0.002.00	0.002.00	0.002.00	0.002.00	0.002.00	0.002.00										
Renewable - Used																			
as raw materials																			
Primary energy	MJ	7.37E+01	6.27E-02	-5.97E-03	0.00E+00	9.40E-03	0.00E+00	-6.24E-02	0.00E+00										
resources -																			
Renewable - Total																			
Net use of fresh	m3	3.75E-01	7.28E-02	-5.02E-03	0.00E+00	1.09E-02	0.00E+00	-5.56E-02	0.00E+00										
water																			
Use of secondary	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										
material	-																		
Use of renewable	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										
secondary fuels																			
Use of non-	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										
renewable																			
secondary fuels																			
Indicators describi	ng output f																		
Components for	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										
reuse	_								L										
Materials for	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										
recycling	-																		
Materials for	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										
energy recovery																			
Exported energy	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										
Exported energy.	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										
		0.002.00	0.002.00	0.002.00	5.002.00	0.002.00	0.002.00	0.002.00	5.00L-00										
thermal								/											
thermal	Indicator Unit Quantity																		

 Indicator

 Biogenic content (Floor pod)
 Biogenic carbon content in Biogenic carbon content in Rote: 1 kg biogenic carbon is equivalent to 44/12 kg CO2.

	Quantity
gC	0.679080997
gC	0.0127005
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Information	
nvironmental	
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Table 12. Environmental impact of Window interface per declared unit

Image and integers Image a	Environmental										Other environment	tal informati	ion describina v	vaste categor	ries						
Global Warming Bay DCA Sp CA 2 72E-01 2 54E-01 2 72E-01 0 00E-00 0 00E-00 1 90E-00 0 00E-00 0 00E-00 </th <th></th> <th>Unit</th> <th>A1</th> <th>A2</th> <th>A3</th> <th>C1</th> <th>C2</th> <th>C3</th> <th>C4</th> <th>D</th> <th></th>		Unit	A1	A2	A3	C1	C2	C3	C4	D											
$ \begin{array}{c} Partial - las i \\ Partia - las i \\ Partial - las i \\ Partial - las i \\ Parti$	Core environmenta	al indicators			•				•		disposed	kg	1.15E-04	5.10E-06	5.77E-05	0.00E+00	7.79E-07	0.00E+00	0.00E+00	7.81E-04	
Gobal Warming Sup Co. Concerned 198 Co. Concerned Concerned	Global Warming	kg CO ₂								-	Non-hazardous									-	
Percental result eq 2.72E-01 2.84E-01 1.96E-01 0.00E-00			2.73E+01	2.54E-01	2.76E+00	0.00E+00	3.88E-02	0.00E+00	0.00E+00	1.96E+01	waste disposed	kg	5.04E+00	2.82E-02	8.40E-01	0.00E+00	4.31E-03	0.00E+00	0.00E+00	2.36E+00	
Global Warming Notificity Ware explored use and use as probability ware explored use and use as probability use and use as probability ware explored use and use as probability use and use as probability ware explored use and use as probability ware explored as probability use and use as probability ware explored as probability ware explore		kg CO ₂								-											
Piekarje marging Vg CO, 5.08-02 2.47E-04 7.7ZE-01 0.00E-00 0.00E-06		eq	2.72E+01	2.54E-01	1.99E+00	0.00E+00	3.88E-02	0.00E+00	0.00E+00	1.96E+01		-		2.19E-08	3.71E-05	0.00E+00	3.34E-09	0.00E+00	0.00E+00	06	
biogenic eq 5.08-02 2.772-61 0.00E-00 377E-05 0.00E-00 0.0	Global Warming										Parameters descri	bing resour	ce use								
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	-											indow Bi	ogenic carbon co	ntent in produ	uct						
	Land use impacts	Pt	5.31E+01	1.45E+00	3.58E+01	0.00E+00	2.22E-01	0.00E+00	0.00E+00	4.58E+01					aging	kg C		1.27E-0	2		

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2.

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NOTE: The range/variability of the LCIA results if significant; the description of the range can be qualitative or quantitative. NOTE: The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risk

¹ The results of this environmental impact indicator shall be used with care as uncertainties on these results are high or as there is limited experience with the indicator.

² This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

^s This indicator is calculated using the characterisation factors from the IPCC AR5 report (IPCC 2013) and has been included in the EPD following the PCR. 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.





Interpretation of Results

This LCA was undertaken to evaluate the environmental impact of the Buildonix building components. Besides this, the following analysis has been undertaken, as shown in Figure 2.

The following can be summarised from this LCA study:

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- Module A1 (raw material and packaging) contributes about 87% of global warming impact. The recycling benefits are the environmental benefits due to avoided production of virgin materials.
- Aluminium accounts for a significant share of the material used for the Buildonix structure. Hence, a significant share of environmental impact is expected from aluminium. In terms of materials, aluminium is the most significant contributor (83%) to the Buildonix building structure.
- In terms of components, Music components contribute about 75% of the global warming impact for the Buildonix building structure.

The results presented in this report provide an understanding of the Buildonix building components and the products' environmental impacts. Stonelake can utilise these results to minimise the environmental impact across the product lifecycle.

ģ % Contribution of global warming impact in terms of components used fo the Buildonix structu ď °,

global warming warming impact in terms of materials and process for buildonix Contribution 2

Compor

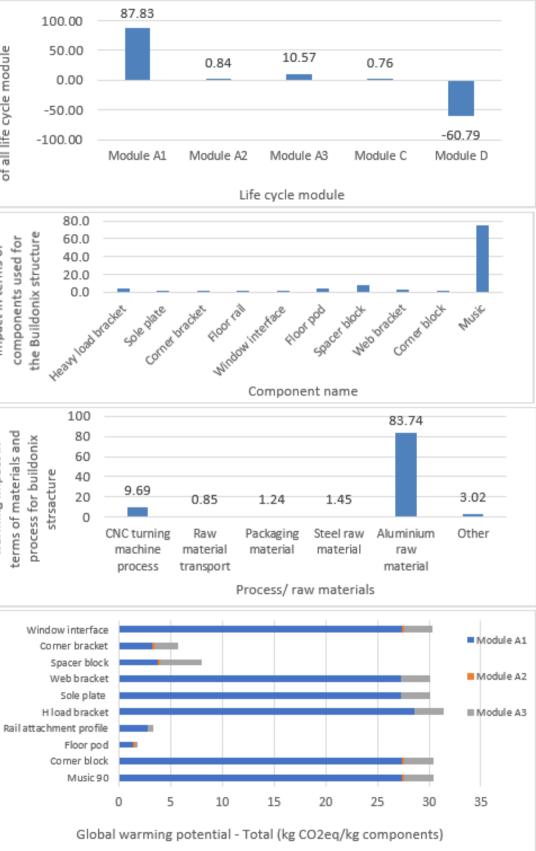


Figure 2. Contribution of climate change impact in terms of lifecycle module, in terms of materials and process, in terms of components used in the Buildonix structure and in terms of impact per kg components, respectively.

Program Information and Vertification

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product category rules (PCR): PCR 2019:14, version 1.11 Construction Products. EPD International., 2021-02-05

PCR review was conducted by: The Technical Committee of the International EPD® System

Important Notice

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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.

Declaraton Owner:

Stonelake Pty Ltd

Unit 4/9-11 Keona Circuit Coffs Harbour NSW 2450 Website: www.buildonix.com.au Email: maurice@stonelake.com.au

EPD produced by:

GECA

Website: <u>www.geca.eco</u> Email: info@geca.org.au Phone: 02 9699 2850

EPD Program Operator:

EPD Australasia Limited

Post: 315a Hardy Street, Nelson, New Zealand 7010 Website: www.epd-australasia.com Email: info@epd-australasia.com

PCR Information:

PCR: PCR 2019:14, version 1.11 Construction Products. EPD International., 2021-02-05 PCR review conducted by: The Technical Committee of the International EPD® System.

Third Party Verifier

Independent verification of the declaration and data, according to ISO 14025: EPD process certification (Internal)

 \checkmark EPD verification (External)

Jonas Bengtsson, Edge Environment L5, 39 East Esplanade, Manly NSW 2095 Australia.

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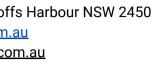
In case of recognised individual verifiers Approved by: EPD Australasia Limited

Procedure Follow-up

✓ Yes 🗌 No









EPD[®] **AUSTRALASIA**

ENVIRONMENTAL PRODUCT DECLARATION

EPD THE INTERNATIONAL EPD® SYSTEM

FDGF

Procedure for follow-up of data during EPD validity involves third party verifier:

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